



Metro Inner Development Assessment Panel Agenda

Meeting Date and Time: Wednesday, 25 September 2024; 2:00pm
Meeting Number: MIDAP/35
Meeting Venue: 140 William Street, Perth

A live stream will be available at the time of the meeting, via the following link:
[MIDAP/35 - 25 September 2024 - City of South Perth](#)

PART A – INTRODUCTION

1. Opening of Meeting, Welcome and Acknowledgement
2. Apologies
3. Members on Leave of Absence
4. Noting of Minutes

PART B – CITY OF SOUTH PERTH

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
 - 3.1 117-119 (Lots 207 & 206) Lockhart Street, Como - 14 Grouped Dwellings – DAP/24/02645
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART C – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals
2. General Business
3. Meeting Closure

Please note, presentations for each item will be invited prior to the items noted on the agenda and the presentation details will be contained within the related information documentation



ATTENDANCE

DAP Members

Francesca Lefante (Presiding Member)
Ian Birch (Deputy Presiding Member)
Peter Lee (Specialist Member)

Part B – City of South Perth

Cr Glenn Cridland (Local Government DAP Member, City of South Perth)
Cr Bronwyn Waugh (Local Government DAP Member, City of South Perth)

Minute Secretary

Laura Simmons (DAP Secretariat)

Officers in Attendance

Ashlee Kelly (DAP Secretariat)



PART A – INTRODUCTION

1. Opening of Meeting, Welcome and Acknowledgement

The Presiding Member declares the meeting open and acknowledges the traditional owners and pay respects to Elders past and present of the land on which the meeting is being held.

This meeting is being recorded and livestreamed on the DAP website in accordance with regulation 40(2A) of the *Planning and Development (Development Assessment Panels) Regulations 2011*. Members are reminded to announce their name and title prior to speaking.

2. Apologies

Nil.

3. Members on Leave of Absence

Nil.

4. Noting of Minutes

Signed minutes of previous meetings are available on the [DAP website](#).



PART B – CITY OF SOUTH PERTH

1. Declarations of Due Consideration

Any member who is not familiar with the substance of any report or other information provided for consideration at the DAP meeting must declare that fact before the meeting considers the matter.

2. Disclosure of Interests

Nil.

3. Form 1 DAP Applications

3.1 117-119 (Lots 207 & 206) Lockhart Street, Como - 14 Grouped Dwellings
– DAP/24/02645

4. Form 2 DAP Applications

Nil

5. Section 31 SAT Reconsiderations

Nil

Item 3.1 – Part B – LOCKHART STREET, COMO No. 117 (Lot 207) AND No. 119 (Lot 206) – 14 GROUPED DWELLINGS

Form 1 – Responsible Authority Report (Regulation 12)

DAP Name:	Metro Inner Development Assessment Panel
Local Government Area:	City of South Perth
Applicant:	Urbanista Town Planning
Owner:	Olivii Pty Ltd
Value of Development:	\$7.7 million
Responsible Authority:	City of South Perth
Authorising Officer:	Fiona Mullen, Manager Development Services Scott van Ierland, Senior Urban Planner
LG Reference:	PDDA-2023/2055
DAP File No:	DAP/2024/02645
Application Received Date:	31 January 2024
Report Due Date:	9 August 2024
Application Statutory Process Timeframe:	90 Days
Attachment(s):	1. Aerial Image and Zoning Map 2. Schedule of Submissions 3. Design Review Panel Minutes 4. Solar Access Diagrams 5. Development Plans 6. Environmentally Sustainable Design Report 7. Waste Management Plan 8. Traffic Impact Statement 9. Acoustic Report 10. Section Drawings

Responsible Authority Recommendation

That the Metro Inner Development Assessment Panel resolves to:

Refuse DAP Application reference DAP/2024/02645 and accompanying plans in accordance with Clause 68 of Schedule 2 (Deemed Provisions) of the *Planning and Development (Local Planning Schemes) Regulations 2015*, and the provisions of City of South Perth Local Planning Scheme No. 7, for the proposed 14 Grouped Dwellings at Lots 207 and 206 (No. 117 and 119 Lockhart Street, Como), for the following reasons:

1. The proposed setbacks are not sufficient to support the desired future character in accordance with the Canning Bridge Activity Centre Plan and the Element Objectives of 2.4 - Side and rear setbacks of the Residential Design Codes Volume 2 as:

- a) The proposed setbacks do not provide for adequate separation between neighbouring lots or provide an appropriate transition between sites;
 - b) The proposed side and rear setbacks do not provide for adequate deep soil areas to support tree growth and canopy to reinforce the landscape character of the area; and
 - c) The proposed setbacks do not facilitate view corridors throughout the precinct, with building bulk presented to external lot boundaries rather than internalised centrally within the subject site.
- 2. The development does not provide adequate building separation in accordance with the Canning Bridge Activity Centre Plan and Element Objective 2.7 - Building separation of the Residential Design Codes Volume 2 as:
 - a) The layout and orientation of the development results in limited opportunities for solar access for dwellings to the south of the subject site.
 - b) The building separation necessitates the use of highlight windows and screening for openings to the north of dwellings 10-14, restricting residential amenity, solar access and outlook.
- 3. The setback and orientation of major openings and private outdoor spaces does not minimise direct overlooking of adjoining sites in accordance with the objectives of Element 3.5 - Visual privacy of the Residential Design Codes Volume 2.
- 4. The development does not provide a range of dwelling types or universal design features in accordance with Element Objectives 4.8 – Dwelling mix and 4.9 - Universal design of the Residential Design Codes Volume 2 as:
 - a) The development does not provide dwellings which cater for diverse household types and changing community demographics, particularly singles, persons living with a disability and the aged; and
 - b) The development does not include dwellings with universal design features which facilitate persons living with disability, or aging in place.
- 5. The development does not satisfy Element Objectives 4.4 – Private open space and balconies of the Residential Design Codes Volume 2 as:
 - a) The proposed private outdoor spaces do not satisfy the minimum area or dimension requirements and are insufficient in size to provide for the amenity of residents; and
 - b) The proposed private outdoor spaces are not sited, orientated or designed to enhance the liveability of residents, being located to the south of the development with limited solar access.
- 6. The development does not satisfy the Desired Outcomes of the Canning Bridge Activity Centre Plan and Element Objectives of 3.3 – Tree canopy and deep soil areas of the Residential Design Codes Volume 2 for landscaping as:

- a) The volume of proposed landscaping does not contribute to the leafy nature of the Canning Bridge Activity Centre Plan;
 - b) Landscaping is proposed to overhang adjoining properties and is inappropriate as its management and maintenance is subject to consent of a third party which is not party to the application.
 - c) The landscaping volume proposed is low and does not reflect the desired built form or character of development envisaged by the Canning Bridge Activity Centre Plan.
- 7. The development does not satisfy the Desired Outcomes of the Canning Bridge Activity Centre Plan and Element Objectives 4.5 - Circulation and common spaces the Residential Design Codes Volume 2 as:
 - a) The proposed pedestrian access path width is not considered functional to provide universal access to dwellings 1-5 and 10-14;
 - b) The development does not provide circulation and common spaces which facilitate universal access within the site;
 - c) The proposed pedestrian path provides unscreened views into the private internal and external living areas and bedrooms, which does not facilitate visual privacy and noise insulation for residents.
- 8. Vehicle manoeuvring required to facilitate waste collection and the associated safety impacts of the reverse entry of the waste vehicle into the development does not satisfy Element 19 of the Canning Bridge Activity Centre Plan and Clause 67(2)(r) and 67(2)(s) of the Deemed provisions, being the suitability of the land for the development taking into account the possible risk to human health or safety and the adequacy of arrangements for access to and egress from the site.
- 9. The development does not appropriately respond to the Design Principles of State Planning Policy 7.0 - Design of the Built Environment for Context and Character, Built Form and Scale and Amenity.
- 10. The development has not demonstrated how the dwellings are protected from unreasonable levels of transport noise to preserve residential amenity of the indoor and outdoor living areas in accordance with State Planning Policy 5.4 Road and Rail Noise.

Reasons for Responsible Authority Recommendation

The development does not satisfy the objectives of the Canning Bridge Activity Centre Plan (CBACP) or the Residential Design Codes Volume 2 or align with the desired future character of the area. The rear boundary setbacks, internal building separation, building layout, and limited solar access would adversely impact the amenity of adjoining properties and result in poor residential amenity for residents within the development.

Accordingly, the application is recommended for refusal.

Details: outline of development application

Region Scheme	Metropolitan Region Scheme
Region Scheme - Zone/Reserve	Urban
Local Planning Scheme	City of South Perth Local Planning Scheme No. 7 (LPS 7)
Local Planning Scheme - Zone/Reserve	Centre
Structure Plan/Precinct Plan	Canning Bridge Activity Centre Plan (CBACP)
Structure Plan/Precinct Plan - Land Use Designation	Grouped Dwellings
Use Class and permissibility:	Use not listed
Lot Size:	2,074m ²
Existing Land Use:	Vacant Land
State Heritage Register	No
Local Heritage	☒ N/A ☐ Heritage List ☐ Heritage Area
Design Review	☐ N/A ☒ Local Design Review Panel ☐ State Design Review Panel ☐ Other
Bushfire Prone Area	No
Swan River Trust Area	No

Proposal:

The application seeks development approval for 14 grouped dwellings at Lots 207 and 206 (No. 117 and No.119) Lockhart Street, Como (the subject site).

The application involves the following:

- Two, two-storey grouped dwellings to the west of the site (rear).
- Four, four storey grouped dwellings to the east of the site (front).
- Eight, three-storey grouped dwellings to the north and south of the site (side).
- The following is a breakdown of the dwelling mix for the development:
 - Two three-bedroom dwellings.
 - Twelve four-bedroom dwellings.
- Vehicle access via a common property driveway in the centre of the site with two separate pedestrian paths provided to the north and south of the site.
- Waste collection via a communal bin store, with on-site private collection proposed.
- Landscaping around the perimeter of the site.

Proposed Land Use	Grouped Dwellings
Proposed No. Storeys	Four (4) Storeys
Proposed No. Dwellings	14

Background:

Site Context

The subject site is zoned 'Centre' under LPS 7 and has a combined site area of 2,072m². The site is currently vacant and abuts three residential lots occupied by Single Houses and Grouped Dwellings.

The development is located within the CBACP area M10 precinct, Q4 quarter. Lockhart Street is a transition street within the CBACP, with lots to the east of Lockhart Street being within the H8 precinct, Q4 quarter (eight storeys permissible) and lots to the west of Lockhart Street being within the M10 precinct, Q4 quarter (ten storeys permissible with possible bonus height applicable). The subject site is located approximately 200m east of the Canning Bridge Railway Station.

Within the CBACP, the Residential Design Codes (R-Codes) do not apply unless explicitly referenced within the CBACP. Where referenced, the CBACP requires assessment against Volume 2 of the R-Codes only, and as such, whilst Grouped Dwellings would generally be assessed against Volume 1 of the R-Codes, assessment against Volume 2 is required for this proposal. The land use permissibility is discussed further within the Planning Assessment section of this report.

The aerial image and zoning map provided at **Attachment 1**, provides a visual context of the site location and its surrounds.

Legislation and Policy:

Legislation

Planning and Development Act 2005
Planning and Development (Local Planning Schemes) Regulations 2015
Planning and Development (Development Assessment Panels) Regulations 2011
 Metropolitan Region Scheme (MRS)
 City of South Perth Local Planning Scheme No. 7 (LPS 7)
Planning and Development (Local Planning Schemes) Regulations 2015 - Residential Design Codes - Volume 2 (R-Codes)

State Government Policies

State Planning Policy 5.4 – Road and Rail Noise
 State Planning Policy 7.0 – Design of the Built Environment (SPP 7.0)

Structure Plans/Activity Centre Plans

Canning Bridge Activity Centre Plan (CBACP)

Local Policies

Local Planning Policy – Advertising of Planning Proposals
 Local Planning Policy – Design Review Policy
 Local Planning Policy – Developer Contributions for Public Art and Public Art Spaces

Consultation:

Public Consultation

Consultation has been undertaken to the extent and in the manner required by the Deemed Provisions and Local Planning Policy – Advertising of Planning Proposals.

The proposed land use ‘Grouped Dwellings’ is a ‘Use Not Listed’ within the M10 precinct, Q4 quarter of the CBACP and has been advertised as a complex application.

A total of 608 letters were sent to landowners and occupiers. At the close of the consultation period, eight submissions were received (one in support, one providing comments and six in opposition).

Key issues and concerns raised within submissions include:

- Visual privacy
- Damage caused to property during construction
- The development not meeting the requirements of the CBACP
- Noise
- Side and rear setbacks
- Traffic
- Landscaping
- Waste management

A schedule of submissions is contained as **Attachment 2**.

Referrals/Consultation with Government/Service Agencies

No referrals to external government agencies or departments were required as part of the assessment.

Design Review Panel Advice

The proposal was reviewed by the Design Review Panel (DRP) on three occasions with the most recent DRP meeting being held in June 2024.

At the June meeting, the DRP made a series of comments and recommendations as contained as **Attachment 3**. A summary of the comments and recommendations from the June meeting, and the corresponding changes made to the development are outlined in the table below.

DRP Comment	Applicant Response/Changes
The design should be modified to provide a 1.0m minimum ground floor setback to the rear (west) lot boundary and a minimum 4.0m rear setback for the remaining floors.	A 1.0m rear (west) setback has been provided for the ground floor western units 1 and 14. The first-floor rear (west) setbacks remain at 1.9m.
The roof form of units 3, 4, 11 and 12 should be modified to allow for ventilation, view and vista to the internalised bedrooms or the provision of more than one operable roof light provided.	Two operable roof lights have been provided to the internalised bedrooms of units 3, 4, 11 and 12.

Approximately 40% of the tree canopy is illustrated as extending beyond the boundary of the site raising concerns about the long-term viability of landscaping.	No changes to tree planting location provided.
The provided ESD consultant report is not sufficient in scope or commitment for the development.	An amended ESD report has been provided.

A summary of the DRP's evaluation of the proposal at each of the reviews is provided in the table below.

Principle	DRP1 – Sept 2023	DRP2 – Nov 2023	DRP3 – Jun 2024	DRP4 – Sept 2024 (DRP Chair Review)
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				

Amendments to the development were made following the June 2024 DRP meeting include:

- Inclusion of a 1.0m ground floor setback to the western lot boundary;
- Increase to the depth of balconies of units 1-5 and 10-14 by approximately 0.1m; and
- Introduction of screening to units 6 and 8 preventing overlooking of adjoining properties.

The amended plans were submitted to the DRP chair for a single member review due to the minor nature of the amendments proposed. Following the revisions submitted in September 2024, the development has received the support of the DRP.

Whilst the City recognises that the applicant has addressed many of the design matters raised by the DRP, the City has reviewed the latest amended plans and reports submitted following the September DRP review and is not satisfied that the development has appropriately addressed the planning framework as detailed below.

Planning Assessment:

The proposal has been assessed against all relevant legislative requirements of the LPS 7, CBACP, and State and Local Planning Policies. The following aspects of the development proposal do not meet the provisions of relevant Policies, the CBACP and LPS 7 and therefore require the application of discretion in the following areas:

- Land Use ('Use Not Listed')
- Form and Mass
- Side and Rear Setbacks
- Building Separation
- Solar Access and Visual Privacy
- Private Open Space and Balconies
- Servicing
- Safety
- Facades
- Landscaping

These matters are outlined and discussed in further detail below.

Canning Bridge Activity Centre Plan (CBACP)

The CBACP outlines the land use permissibility and built form requirements for the subject site. The CBACP requires the consideration of specific provisions of the R-Codes Volume 2 in its application, however, provides its own 'Desired Outcomes' which are to be read in conjunction with the Element Objectives of the R-Codes in considering the exercise of discretion. The below outlines the areas of discretion the development is seeking against the CBACP and where relevant, the R-Codes Volume 2.

Element 1

Land Use

The CBACP groups land use permissibility, dwelling mix and universal access under the Land Use heading. Accordingly, these elements are discussed below.

The M10 precinct, Q4 quarter of the CBACP does not list 'Grouped Dwellings' as a preferred land use and therefore the land use is considered a 'use not listed'.

In considering the appropriateness of the proposed land use, the Desired Outcomes of the CBACP are considered along with the site's context.

The proposed land use is considered appropriate as:

- The Q4 vision of the CBACP envisions a rejuvenated area predominantly characterised by residential development and vibrant main streets, featuring local shops and employment opportunities. The subject site, being residential in nature and not located on a main street, aligns well with this vision, appropriately responding to the intended character of Q4.
- The site interfaces with the H8 precinct of the CBACP, situated to the east of Lockhart Street (refer **Attachment 1**). Grouped Dwellings are identified as a preferred land use within the H8 precinct. A survey of the immediate area reveals that over 50% of parent lots within a 100m radius of the subject site have been developed as Grouped Dwellings, prior to the implementation of the CBACP. The fragmented nature of the land surrounding the subject site limits the redevelopment potential of the adjacent lots such that Grouped Dwellings will be the predominant development typology in the near future. Having regard to the site's transitional context between the M10 and H8 precincts of the CBACP and the prevailing Grouped Dwelling development context, Grouped Dwellings are considered an acceptable land use and development typology for the subject site.

The development seeks discretion for dwelling diversity as per Element 1.15 of the CBACP and the R-Codes Volume 2, Elements 4.8 – Dwelling mix and 4.9 – Universal design. A minimum 20% (three) of the proposed dwellings are required to be provided as single-bedroom or studio dwellings and a minimum 40% (six) of the provided dwellings as two-bedroom dwellings. The development does not provide any single-bedroom or two-bedroom dwellings, with two, three-bedrooms dwellings and twelve, four-bedroom dwellings proposed.

The development is required to provide 20% of dwellings (three) which meet Silver Level requirements as defined in the Liveable Housing Design Guidelines (Liveable Housing Australia). No Silver Level dwellings have been designated by the applicant. It is noted that the proposed pedestrian paths servicing dwellings 1-5 and 10-14 do not meet minimum dimensional requirements for universal access, having a minimum width of 1.0m.

The development does not meet the Element Objectives of the R-Codes Volume 2 or the Desired Outcomes of the CBACP as:

- The development does not provide a range of dwelling types which cater for diverse household types and changing community demographics, particularly singles, and individuals with disabilities and the aged.
- The development does not include dwellings with universal design features which facilitate individuals living with disability, disabled guests or aging in place.

Element 5

Side and Rear Setbacks

A 4.0m average side and rear setback is required for all podiums within the M10 precinct, Q4 quarter of the CBACP. Podiums are to be a minimum of 7.0m above natural ground level and a maximum of 15.0m above natural ground level.

As the development is within the height envelope of the podium requirements within the CBACP, the City has applied the podium setback requirements of the CBACP (compared to the tower setback requirements of the CBACP which require a minimum 4.0m side and rear setback) in its consideration of the side and rear setbacks. This has

been undertaken to reflect the Grouped Dwelling land use as opposed to Multiple Dwellings.

The development does not meet the 4.0m average rear setback requirements of the CBACP, with the following minimum setbacks required:

Elevation	Floor	Minimum Setback	Approx. Average Setback
West (Rear)	Ground	1.0m	1.1m
	Level 1	1.9m	2.7m
	Level 2	8.7m	9.0m

Building Separation

The CBACP requires buildings to be separated in accordance with Element 2.7 – Building separation of the R-Codes Volume 2. The proposal does not meet the minimum building separation requirements as detailed below.

Dwelling Interface	Floor	Minimum Building Separation Requirement	Proposed Building Separation
Dwellings 1-5 interface with Dwellings 10-14	Level 1	7.5m	4.0m
	Level 2	7.5m	4.0m
	Level 3	12.0m	4.0m
Dwelling 7 Interface with Dwelling 8	Level 1	12.0m	9.5m
	Level 2	12.0m	9.5m
Dwelling 5 Interface with Dwellings 6 and 7	Level 1	7.5m	4.2m
	Level 2	4.5m	4.2m
Dwelling 10 Interface with Dwellings 8 and 9	Level 1	7.5m	4.2m
	Level 2	4.5m	4.2m

Orientation, Solar and Daylight Access

The CBACP refers to the R-Codes Volume 2 Element 3.2 – Orientation and Element 4.1 – Solar and Daylight Access. Dwellings 10-14 do not meet the orientation requirements as they do not achieve a northern aspect to outdoor living areas and limited solar access to internal living spaces is provided.

Only 21% of dwellings (dwellings 6 and 16) within the proposed development achieve a minimum of two hours of direct solar access to living spaces and outdoor living areas between 9:00am and 3:00pm. A copy of the solar access diagrams for the development is available at **Attachment 4**.

The development does not satisfy the Desired Outcomes of the CBACP and the Element Objectives of the R-Codes Volume 2 as:

- The development's layout and orientation does not provide adequate building separation resulting in limited opportunities for solar access for dwellings to the south of the site;
- The building separation necessitates the use of highlight windows and screening for openings to the north of dwellings 10-14 restricting residential amenity, solar access and outlook;
- The inadequate building separation results in dwellings 2-5 overshadowing all north facing openings in dwellings 10-13;
- The proposed setbacks do not allow for adequate separation between neighbouring lots or provide an appropriate transition between sites;
- The proposed setbacks do not facilitate view corridors throughout the precinct, with building bulk presented to external lot boundaries rather than internalised centrally within the subject site;
- The proposed setbacks do not allow for adequate separation between neighbouring lots or provide an appropriate transition between sites;
- The proposed side and rear setbacks do not provide for adequate deep soil areas to reinforce the landscape character of the area, resulting in approximately 40% of the proposed tree canopy to be provide outside of the subject site (overhanging adjoining lots). The proposed setbacks do not allow for meaningful deep soil areas for tree planting and long-term viability of tree planting; and
- The proposed setbacks and building separation do not facilitate view corridors throughout the precinct, with building bulk presented to external lot boundaries rather than internalised centrally within the subject site.

Element 9

Private Open Space and Balconies

The CBACP refers to the R-Codes Volume 2 Element Objective 4.4 – Private open space and balconies. Dwellings 2-5 and Dwellings 10-13 seek discretion for the area provided for private open spaces, having approximately 12.0m² outdoor living area provided which meets a minimum dimension of 3.0m.

It is noted that dwellings 10-14 do not have any outdoor living areas which achieve solar access or a northern aspect and will be overshadowed by the development itself due to a lack of building separation and articulation to allow solar access into the south facing outdoor spaces.

The development does not satisfy the Desired Outcomes of the CBACP and the Element Objectives of the R-Codes Volume 2 as:

- The proposed private outdoor spaces are of insufficient size and do not enhance residential amenity;
- The proposed private outdoor spaces are not sited, orientated or designed to enhance the liveability of residents, being located to the south of the development and achieving limited solar access; and
- The proposed private outdoor spaces do not have adequate separation or privacy from communal areas (pedestrian paths).

Element 10

Landscaping

The development is required to provide 75% of the parent lot area as landscaping, inclusive of balconies with an area of 12.0m² or greater. The development proposes to provide 22% of the parent lot as landscaping, resulting in a landscaping shortfall of 686m².

The submitted landscaping plan indicates approximately 40% of the proposed tree canopy coverage proposed is located outside of the site boundaries, overhanging adjoining lots. A copy of the landscaping plans can be found at **Attachment 5** within the Development Plans.

The development does not satisfy the Desired Outcomes of the CBACP and Element Objectives of 3.3 - Tree Canopy and Deep Soil Areas of the R-Codes Volume 2 as:

- The proposed landscaping volume does not contribute to the leafy nature of the CBACP;
- Landscaping which proposes to overhang adjoining properties is inappropriate as its management and maintenance is subject to consent of a third party;
- The landscaping volume proposed is inadequate and does not reflect the desired built form or character of development envisaged by the CBACP; and
- The side and rear setbacks proposed by CBACP are designed to site development within a landscaped setting, providing meaningful landscaping strips between development, preserving a green leafy character of the precinct and softening transitions between developments.

Element 11

Sustainability

The CBACP refers to the R-Codes Volume 2 Element 4.15 - Energy efficiency, which requires the nomination of a minimum of one sustainability initiative for the development.

The development has not nominated sustainability initiatives within the provided Environmentally Sustainable Design report contained at **Attachment 6**.

Notwithstanding, in the event the development application is approved, this element may be addressed via a condition of development approval.

Element 19

Servicing

The CBACP requires all development within the M10 precinct, Q4 quarter to provide on-site waste collection, with all manoeuvring and circulating of vehicles to occur wholly within the subject site.

The development proposes on site waste servicing by a private contractor. The Waste Management Plan (WMP) is contained as **Attachment 7**. The proposed WMP requires the waste vehicle to reverse into the subject site to facilitate waste collection, with vehicle manoeuvring occurring within the adjoining public street and verge abutting the site.

The proposed WMP and servicing strategy is not supported by the City for the reasons detailed in the waste management section of this report.

Element 20

Safety

This section of the CBACP refers to both safety and universal access.

The CBACP refers to the R-Codes Volume 2 Element 4.5 – Circulation and common spaces, which requires common circulation areas to have a minimum functional width of 1.5m to facilitate universal access. Element 4.5 also requires windows to bedrooms and living spaces to be screened from common circulation spaces to manage privacy and noise intrusion.

The development proposed the inclusion of two independent pedestrian paths to the north and south of the development to service dwellings 1-5 and 10-14. The proposed pedestrian paths have a functional minimum width of 1.0m and require manoeuvring around landscaping and infrastructure.

The proposed pedestrian access paths to the north and the south of the development provide unscreened views into the ground floor bedrooms, outdoor living spaces and internal living areas of dwellings 1-5 and 10-14.

The development does not satisfy the Desired Outcomes of the CBACP and the Element Objectives of the R-Codes Volume 2 as:

- The proposed pedestrian access path width is not considered functional to provide universal access to dwellings 1-5 and 10-14 due to the constrained width and winding nature of the proposed paths. Alternative access to these dwellings is provided through the garage of each dwelling and includes an approximate 100mm step between the finished floor level of the garage and the ground floor of the dwelling;
- The indirect pedestrian access paths are not considered to be convenient for residents and the layout does not provide adequate lines of sight for safe pedestrian access in accordance with Crime Prevention Through Environmental Design (CPTED) principles; and
- The proposed design and placement of landscape areas, along with the layout of pedestrian paths, create the potential for obstructed sightlines and concealment opportunities within the development, which is inconsistent with CPTED principles.

The proposed pedestrian path also provides unscreened views into the private internal and external living areas, and bedrooms, which does not provide adequate amenity for residents.

Waste Management

The City has reviewed the submitted WMP at **Attachment 7**. The WMP proposes the use of a private contractor to provide a small rear loading waste vehicle to service the site bi-weekly (both general waste and recycling). The waste vehicle is proposed to reverse into the site with manoeuvring occurring within the road and adjoining verge, crossing the centreline of the road before entering the development.

The TIS also includes additional details on waste collection. The provided swept path diagram demonstrates the reverse movement of the waste vehicle such that the vehicle will cross the centre line of the road (into oncoming traffic) to facilitate the required movement.

The CBACP requires waste servicing and vehicle manoeuvring to be contained wholly on site. The City does not support reverse entry or manoeuvring of the waste vehicle within the road and adjoining verge in accordance with Element 19 of the CBACP.

The City does not support the reversing of waste vehicles within the road (crossing the centreline) and adjoining verge to service the development in accordance with Element 19 of the CBACP.

It is noted that during waste servicing, the waste collection vehicle would obstruct the access and egress of vehicles for the development site. The disruption to the site access and the potential for noise associated with waste vehicle movements four times a week has not been appropriately addressed through the submitted acoustic report.

The proposed waste collection is not considered a safe or an appropriate outcome for the scale of the development or the public realm and is not supported by City.

Traffic and Parking

Traffic

The submitted Traffic Impact Statement (TIS) at **Attachment 8** indicates the proposed development is predicted to have a total trip generation of 12 vehicle movements during the peak am and pm movement periods.

As outlined within the Western Australian Planning Commission's Transport Impact Assessment Guidelines, an increase of between 10 to 100 peak hour vehicle trips is considered to have a low to moderate impact on the road network and is generally deemed acceptable.

Lockhart Street has a projected capacity of 7,000-15,000 vehicles per day in accordance with Liveable Neighbourhoods - Integrator 'B' street. The road network surrounding the development site has the carrying capacity to service the proposed development. The development is considered to have no material impact on the surrounding road network.

Parking

The CBACP requires a minimum of two car bays be provided per dwelling and two visitor parking bays. The development satisfies the applicable car parking ratios within the development. The visitor bays are located behind an access gate and the development proposes the use of an intercom for visitors and deliveries which can be accessed within each dwelling.

The TIS concludes that on site resident and visitor parking provision is appropriate for the development.

Noise

The Acoustic Report at **Attachment 9** has been reviewed by the City; further information/clarification was requested regarding outdoor living areas affected by noise from the Kwinana Freeway and Canning Highway, as well as air conditioning units, which has not been provided.

Under section 6 - Assessment and Recommendations of the report, application of quiet house packages according to the exposure category are made. The Acoustic Report does not identify the number of lanes and the distance from the edge of the nearest main road carriageway (noting entrance/exit ramps) for Canning Highway and the Kwinana Freeway.

Under section 4.2.3 Traffic Data, the report has provided justification for what is/is not constituted in the assessment (traffic, rail etc), but no further specifics for Canning Highway or the Kwinana Freeway have been provided as it relates to the exposure forecast.

Appendix A, Figure 1, shows an aerial, however the carriageway information used and distance to determine exposure forecast has not been stated. The report only makes mention of which floor floor/dwelling falls into what exposure category and then specifies the applicable quiet house package, with Appendix C showing façade orientation.

The submitted Acoustic Report does not include recommendations for the daily operation of the dwellings.

Should the application be approved, a condition requiring an updated Acoustic Report addressing the requirements of State Planning Policy 5.4 - Road and Rail Noise, as well as onsite noise sources such as air conditioning units and waste vehicles is recommended. Further, a noise management plan prepared by a suitably qualified person is also recommended to confirm the measures contained in the Acoustic Report have been satisfactorily implemented.

Planning and Development (Local Planning Schemes) Regulations 2015

In considering an application for development approval, the local government is to have due regard to the matters listed in Clause 67(2) of the Deemed Provisions to the extent that, in the opinion of the local government, those matters are relevant to the development the subject of the application. The proposed is not considered to meet the following provisions of Clause 67(2):

Provision	Assessment
67(2)(b) the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving;	The development does not provide appropriate internal amenity for residents and will result in a detrimental impact on adjoining lots through building bulk presented by reduced side and rear setbacks.

62(2)(h) any structure plan or local development plan that relates to the development	The development is inconsistent with the requirements and objectives of the CBACP.
67(2)(m) the compatibility of the development with its setting, including — (i) the compatibility of the development with the desired future character of its setting; and (ii) the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;	The built form of the development is not compatible with its setting as it will result in an adverse impact on adjoining lots through the presentation of building bulk to adjoining lots. The proposed built form is not compatible with its setting or reflect the desired future character of the precinct.
67(2)(n) the amenity of the locality including the following — (i) environmental impacts of the development; (ii) the character of the locality; (iii) social impacts of the development;	The development will have an adverse impact on the desired future character of the area, including adjoining properties due to the proposed setbacks and low landscaping volume.
67(2)(p) whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;	The development does not make adequate provision for landscaping, having an extensive landscaping shortfall, with 22% landscape area proposed in lieu of 75% and proposed tree canopy extending over adjoining lots.
67(2)(r) the suitability of the land for the development taking into account the possible risk to human health or safety;	The development does not provide safe waste servicing or vehicle manoeuvring. The proposed WMP required the waste vehicle to reverse into the subject site, crossing the centreline of the road into oncoming traffic. The proposed waste vehicle manoeuvring presents a risk to vehicles, cyclists and pedestrians due to the reversing of the waste vehicle occurring within the public realm.
67(2)(s) the adequacy of — (i) the proposed means of access to and egress from the site; and (ii) arrangements for the loading, unloading, manoeuvring and parking of vehicles;	The development does not provide adequate waste servicing or vehicle manoeuvring. The proposed waste management plan requires the waste vehicle to reverse into the subject site, crossing the centreline of the road into oncoming traffic.

	During the period of waste servicing ingress and egress from the development is blocked by the waste service vehicle, which occurs four times per week.
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Conclusion:

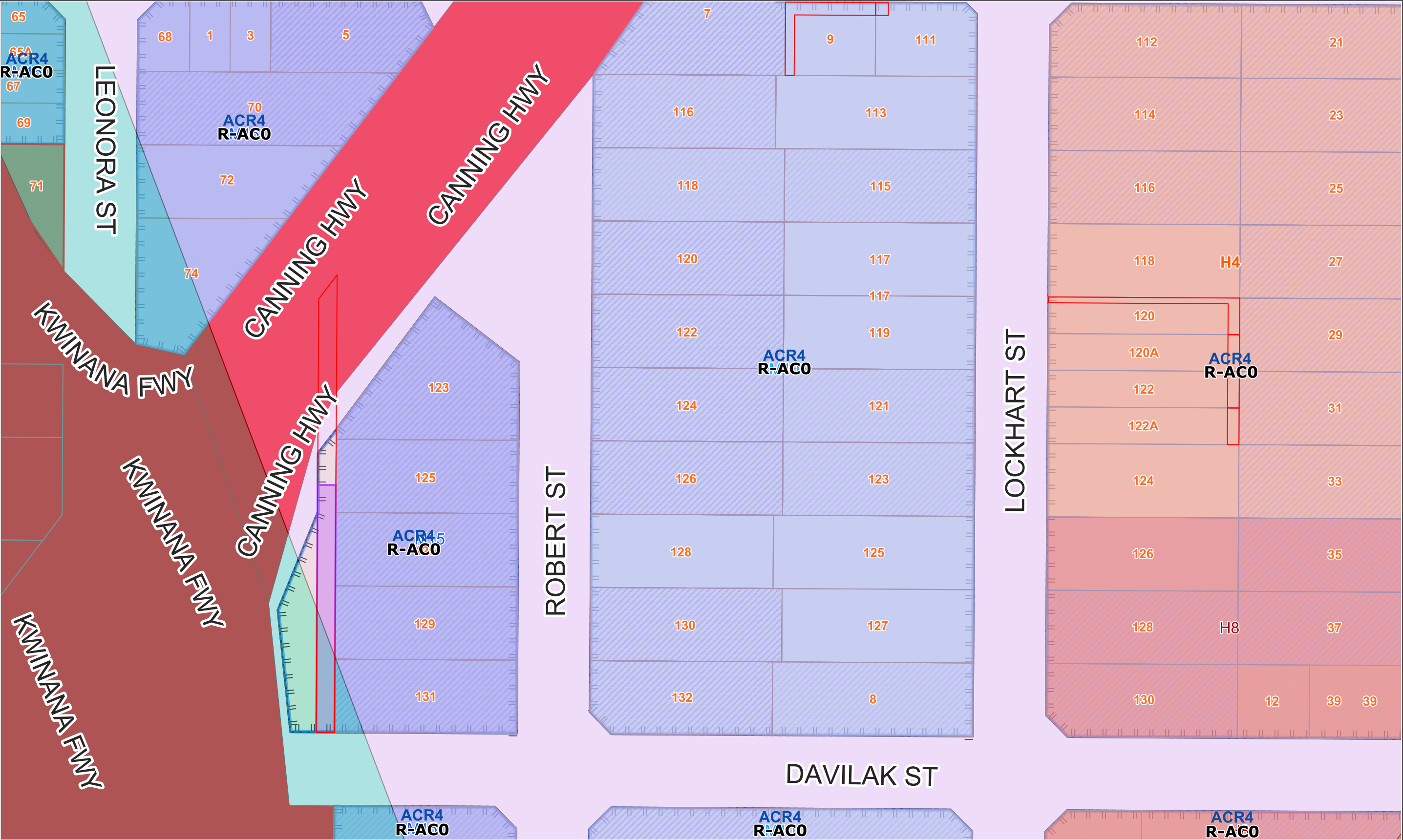
Whilst the City can consider Grouped Dwellings on the subject site, the proposed design does not provide an appropriate standard of internal amenity for residents or preserve the amenity of surrounding lots. The proposal has insufficient building separation and landscaping, poorly designed habitable spaces and outdoor living areas and inadequate solar access. Additionally, the development would adversely impact adjoining properties through insufficient setbacks and associated excessive building bulk.

As outlined with the report, the design of the proposed development fails to appropriately respond to adjoining properties and the planning framework.

The development does not achieve the desired outcomes of the CBACP or the Element Objectives of the R-Codes Volume 2.

Accordingly, the application is recommended for refusal.





The City of South Perth does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that The City of South Perth shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

05/08/2024

1:1200



Submission

^ Details

Submitter

Ross Weaver

Engagement

ENG-000194

Reference

SUB-00000149

Submission Date

15-May-2024 00:00:00

Submission Text

I consider the proposal far better than the earlier development proposed for the site (DAP/18/01512). The grouped dwellings format is far more appropriate for the area particularly in regard to the height and density impact an neighbouring properties.

Sentiment Metric

Support

Status

Approved

^ Submitter Details

Title

First Name

Ross

Last Name

Weaver

Organisation

Full Name

Ross Weaver

Address

106b Lockhart St Como WA 6152

Details

Submitter

Marco Susilo

Engagement

ENG-000194

Reference

SUB-00000148

Submission Date

25-May-2024 00:00:00

Submission Text

I am owner of 121A Lockhart st.

We have concerns about privacy to our backyard and pool. With current plan we potentially have up to 5 properties that could peer over the wall and invade our privacy.

Secondly, what is the plans for the shared wall. We do not have any intention to replace it as it will cause substantial damage and cost to our property. Additionally we do not like colour bond wall and want to retain the double brick wall. What is the developers plan for the wall?

Sentiment Metric

Neutral

Status

Approved

Submitter Details

Title

First Name

Marco

Last Name

Susilo

Organisation

Full Name

Marco Susilo

Address

121A Lockhart Street Como, WA 6152

Submission

Details

Submitter

Marco Susilo

Engagement

ENG-000194

Reference

SUB-00000147

Submission Date

25-May-2024 00:00:00

Submission Text

I have concerns that construction will adversely impact my property, for example, building materials going onto my property causing mess/damage and requiring clean up costs, structural damage to my property due to ground shifting etc. How can we prove that any damage to our property is caused by the construction/development and will the developers remediate/compensate for any damages caused? We would like to request for the developers to provide a dilapidation report on our property prior to commencement of development at their expense.

Sentiment Metric

Neutral

Status

Approved

Submitter Details

Title

First Name

Marco

Last Name

Susilo

Organisation

Full Name

Marco Susilo

Address

121A Lockhart Street Como, WA 6152

Details

Submitter

Marco Susilo

Engagement

ENG-000194

Reference

SUB-00000146

Submission Date

01-Jun-2024 00:00:00

Submission Text

Unless developers can address below concerns I have concerns about the development and oppose it.

1. Privacy to my property. A 3-4 story property will violate my family's privacy. How will the development be done whilst also protecting my family privacy.
2. Shared wall. We have no intention to replace the shared wall. If developers damage or want to replace the shared wall they will cover all costs and replace to similar or better quality (double brick wall material or better).
3. Cover any damage caused to our property. Prior to development developers will provide at their cost dilapidation report. Any damages caused to our property due to development will be reimbursed by the developers.

Sentiment Metric

Oppose

Status

Approved

Submitter Details

Title**First Name**

Marco

Last Name

Susilo

Organisation**Full Name**

Marco Susilo

Submission

^ Details

Submitter
Lucian Anders

Engagement
ENG-000194

Reference
SUB-00000145

Submission Date
02-Jun-2024 00:00:00

Submission Text
Hi,
I oppose the development at 117, Lockhart Street Como 6152. As an owner living on the fifth floor of a relatively new apartment block 1 street away, I am fully supportive and new dwellings in the area, which increase the density of population. And improve the structure of the neighborhood.
What I am against is developers deliberately submitting development plans that are outside the South Perth guidelines. Why submit a proposal that does not conform to the guide lines?
Why reward developers who will continually push the government regulations.
Why have guidelines if the developers are going to blatantly ignore them from the very start.

I would have no objection if the proposal met all South Perth new development guide lines

Regards

Lucian Anders

Sentiment Metric
Oppose

Status
Approved

^ Submitter Details

Title

First Name
Lucian

Last Name
Anders

Organisation

Full Name
Lucian Anders

Address
Unit 504, 36 Edgecumbe Street Como Western Australia 6152

Submission

^ Details

Submitter

Shashikumar Pilakudi Madhusudanan

Engagement

ENG-000194

Reference

SUB-00000144

Submission Date

06-Jun-2024 00:00:00

Submission Text

see attached PDF for comments. In summary, noise impact assessment, traffic study need to be updated / redone. Privacy concerns of neighbouring properties to be addressed, visual privacy needs to be re-evaluated and adequate measures to be put in place.

Sentiment Metric

Neutral

Status

Approved

^ Submitter Details

Title

First Name

Shashikumar

Last Name

Pilakudi Madhusudanan

Organisation

Address

122A Lockhart Street Como

PDDA-2023/2055 - Development Application – 117, Lockhart Street COMO WA 6152			
Item No	Clause/Page No	Comment	
1	Page 8 Section A and B	Mark Section lines in Plan	
2	Page 8	Please clarify “future development”, by whom	
3	Page 27- 36, artist’s impression	For clarity, please mark view from which elevation i.e. North, South, East, West etc	
4	Clause 5.2 Page 51 NCC ACOUSTIC REQUESTMENTS	Are there any emergency power supply units, like Diesel gen sets that would generate noise from the dwellings. Noise emissions and the impact of noise emissions caused by the development (during construction and post construction) to the neighbourhood is to be included in the noise assessments.	
5	REQUEST FOR FURTHER INFORMATION (PDDA-2023/2055) Item 3 Page 116	General Comment: Privacy Screens, frosted windows and/or clerestory windows shall be installed on all sides overlooking the neighbouring properties to protect the privacy of other dwellings in the neighbourhood.	
6	REQUEST FOR FURTHER INFORMATION (PDDA-2023/2055) Item 3 Page 118 Setbacks	3 metre setbacks do not comply with Design codes. This needs to be increased to meet the design code requirements. As per Canning Bridge Activity Centre Design Guidelines –Division Two, Element 5- Side and Rear setbacks, clause 5.8 states that provisions of privacy and solar access and overshadowing for Q3, Q4 and Q5, development shall be designed in accordance with Residential Design Codes Vol.2 Element 3.5 in respect to visual privacy. Element 3.5 of R Code vol.2 Table 3.5 specifies that for unenclosed private outdoor spaces, (backyards for e.g) the set back is 7.5m. Therefore, the proposal is not considered to conform to the design principles of the R-Codes and/or the requirements of CBACP.	

7	REQUEST FOR FURTHER INFORMATION (PDDA-2023/2055) Item 3 Page 118 cone of vision	The cone of vision/ line of sight details are to be provided and the impact on privacies of overlooking neighbouring properties need to be demonstrated to ensure compliance to design code.	
8	Traffic impact assessment, page 158 1.4 Existing traffic volumes	The traffic count was taken on the 30 th of November 2023. Please note that 30 November is not a representative date, nor dates around 30th Nov can be considered as a representative period for traffic count. Nov, Dec, and Jan are part of summer holiday season. Therefore the traffic assessment needs to be updated using traffic counts taken during a more representative period outside of school holidays and holiday season.	
9	Traffic impact assessment, page 163, 4.2 access arrangements	It is to be noted that the on-street parking is normally taken by daily commuters and may not be available. This issue has not been addressed in the assessment.	
10	Traffic impact assessment, page 164, 165 and 167, 5.0 Development traffic generation, 5.1 traffic distribution, 7.0 site specific issues and 8.0 summary and findings	There is no consideration given to the traffic generated by other developments on Lockhart streets and in the vicinity. Considering the points raised in items 8,9 and 10 traffic impact assessment has to be redone.	

Details

Submitter

Meng Chee

Engagement

ENG-000194

Reference

SUB-00000143

Submission Date

06-Jun-2024 00:00:00

Submission Text

PDA-2023/2055 117 LOCKHART ST COMO WA6152

Sentiment Metric

Neutral

Status

Approved

Submitter Details

Title

First Name

MENG

Last Name

CHEE

Organisation

Full Name

Meng Chee

Address

118 LOCKHART ST COMO

SUBMISSION IN RESPECT OF PROJECT AT LOT 207 (#117) & LOT 207 (#119) LOCKHART ST COMO

LODGED BY:

Name: Meng Chee

Address: 118 Lockhart St Como

SECTION 3 CANNING BRIDGE ACTIVITY CENTRE PLAN ASSESSMENT

CBACP Provisions Q4, M10 (Davalak Quarter)

Element 1 – Land Use DO1.4 & DO1.7

Comment:

In 1.10, it has been proposed that the front ground floor units will have separate entry and “suitable as an office space, if so desired”.

Please make it clear that only “home office” space and not “office” space is meant in this provision. This will attempt to limit the number of employees and whole day street parking.

Element 10 – Open Space and Landscaping

Comment:

It is unclear how the 75% minimum requirement (Sect. 10.3) is met.

The total landscaping area is 19.9%, Total Deep Soil Planting is 14% and Total Canopy Cover is 30%.

Element 17 – Public Art DO17

Comment:

It is disappointing that public artwork is not proposed.

I support the requirement that “any provision for public art form part of a condition of approval”.

Element 18 – Parking DO18

Comment:

The provision of 2 visitor bays, even if parking requirements are met, is grossly inadequate.

The street is very popular for train commuters who park their cars on Lockhart St.

Element 19 – Servicing and Functionality DO19

Comment:

In the updated Waste Management Plan, it is proposed that the private waste trucks can be operated even on Sundays and Public Holidays. This will reduce the amenity of the street. It is recommended that this be deleted.

Date: 6 June 2024

Details

Submitter

Tinashe Kamangira

Engagement

ENG-000194

Reference

SUB-00000142

Submission Date

07-Jun-2024 00:00:00

Submission Text

Dear Sir/Madam,

Re: Development Application for 117-119 Lockhart Street, Como - Consultation Feedback

I am writing to provide feedback on the proposed development plan for 117-119 Lockhart Street, Como, as outlined in the Development Application Consultation - PDDA-2023 2055. As a neighbouring resident, I have reviewed the application in the context of the Canning Bridge Activity Centre Plan (CBACP) and South Perth Council guidelines. I have several concerns and suggestions that I believe should be considered to ensure the development is in line with the community's interests and regulatory requirements.

Broadly, we welcome the change to townhouses instead of apartments, which would clearly have been an eyesore based on what everyone can observe from the Applecross developments.

Building Height:

The plans indicate a multi-storey development. It is essential to confirm that the proposed building heights do not exceed the maximum allowable height under the CBACP and South Pe

Sentiment Metric

Neutral

Status

Approved

Submitter Details

Title

First Name

Tinashe

Last Name

Kamangira

Organisation

Full Name

Tinashe Kamangira

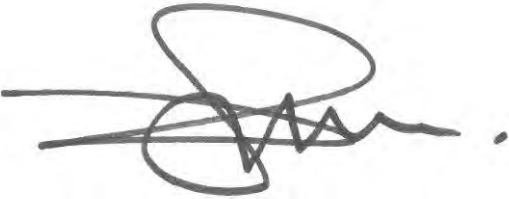
Address

116 Lockhart Street COMO WA 6152

Design Review Report

117 & 119 Lockhart Street Como DR01

September 2023

Design Review Report		
Subject	117 & 119 Lockhart Street Como – Design Review 01	
Date	2023-09-05	
Time		
Location	City of South Perth	
Design Reviewers	Name Dominic Snellgrove Damien Pericles Malcolm MacKay Chris Maher Fred Chaney	Chair Panel member Panel Member Panel Member Panel Member
Proponent	Projekt	
Project Team		
Planning Authority	City of South Perth	
Stakeholders		
Declarations	None	
Briefings		
Relevant Authorities Project Team		
Design Review Report endorsement		
Reviewer's signature	 (Name) Dominic Snellgrove	

Introductory Comments	
Design quality evaluation	
	Supported
	Pending further attention
	Not yet supported
	Yet to be addressed
Strengths of the Proposal	- Comprehensive and instructive presentation including a detailed context, character and historical account. - Streetscape engagement - Large extent of glazing at ground floor street frontage. - Separation of vehicle access from pedestrian entry. 'Snaking' pedestrian pathway and landscaped journey to rear units - Alternative masterplan arrangement avoiding central 'bowling alley' laneway typology. - Landscape professional and concept and verge treatment/incorporation. - Optional Lift and ground floor bedroom arrangement to support aging in place and future flexibility. - Tapering down built form from the street to the rear. - Contemporary architecture and face brick materiality - AC condenser enclosure identified.
Principle 1 Context and character	<i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i>
	a) Whilst the proposed scale and density is less than what has been contemplated for this zone, the Panel supports the proposal and is sympathetic with the commercial drivers that support a project of this scale and typology. b) The height of the front fencing to the development has an invasive presence on the streetscape. c) The rear boundary nil set back is not consistent with statutory requirements and will have an impact on the adjoining neighbor. d) The south and north boundary also have a reduced setback from the contemplated 4M to 3M at the front of the project. The contemplated character of the area is one that achieves a minimum separation of built form when viewed from the street to allow for space and landscape. e) A north south site section and a streetscape elevation illustrating the proposal within its current and future context has not been provided.
Recommendations	Incorporate compliant and contemplated setbacks to the rear and to the side. The front fencing is successful in its visual permeability. However, consider reducing its height to 1.5M or 1.6M. Provide site cross section and streetscape elevations illustrating the proposal in its current and future context with the outline of potential adjoining built form.
Principle 2 Landscape quality	<i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i>
	a) The appointment of a landscape professional is commended. b) Further design development is encouraged

Recommendations	1. Consider a higher proportion of native species to support a biodiverse and place sensitive outcome. 2. Consider additional tree canopy.
Principle 3 Built form and scale	<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>
	a) Whilst the proposed scale and density is less than what has been contemplated for this zone, the Panel supports the proposal and is sympathetic with the commercial drivers that support a project of this scale and typology. b) The rear boundary nil set back is not consistent with statutory requirements and will have an impact on the adjoining neighbor. c) The south and north boundary also have a reduced setback from the contemplated 4M to 3M at the front of the project. The contemplated character of the area is one that achieves a minimum separation of built form when viewed from the street to allow for space and landscape.
Recommendations	1. Incorporate compliant and contemplated setbacks to the rear and to the side.
Principle 4 Functionality and build quality	<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>
	a) The proposal is well arranged and functional in its operation.
Recommendations	1. None
Principle 5 Sustainability	<i>Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.</i>
	a) The Proponent does not appear to have appointed an ESD Professional and it is therefore difficult to evaluate the proposal.
Recommendations	1. Appoint an ESD Professional to produce a comprehensive sustainable design approach that considers solar PV's.
Principle 6 Amenity	<i>Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.</i>
	a) The gap between units in the east-west laneway is very constrained with the potential for opposing windows to experience privacy issues. b) Five units to the south have solely south facing living areas with limited access to direct sun either to their indoor or outdoor private living spaces. c) The internalized bedrooms relying solely on a small sunken courtyard for light, view and vista are not supported in their current form. d) All units incorporate a powder/WC room directly adjacent to living areas without any separation or privacy.
Recommendations	1. Consider ways in which the amenity of the constrained central laneway can be improved. This may include enhanced and oblique openings overlooking the space, perforated or transparent garage doors, soffit treatments to the overhang and lighting. 2. Introduce glazing to all levels of the east elevations of the rear units. 3. Consider rearranging the living spaces in the southern units to capitalize on solar access to living spaces. 4. In addition to the light well, incorporate a folded generous saw tooth roof form to deliver light, ventilation and sky views to the central internal bedroom. 5. Address privacy issues associated with the WC/Powder Room location adjacent to living space.

Principle 7 Legibility	<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>
	a) The proposed arrangement of built form provides very good legibility for residents and visitors.
Recommendations	1. None
Principle 8 Safety	<i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i>
	a. The proposed arrangement of built form and the accompanying streetscape provide good passive surveillance over the public realm.
Recommendations	1. See commentary under Principle 6 Amenity for initiatives to improve passive surveillance over the internal mews/laneway.
Principle 9 Community	<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>
	a) In a project of this scale the best thing that can be done for the community is to provide an active and engaged streetscape with effective passive surveillance.
Recommendations	1. None
Principle 10 Aesthetics	<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>
	a) The proposal incorporates a contemporary approach to built form with layering, shadow and materiality resulting in an attractive street presence.
Recommendations	1. Consider a modest amount of additional materiality as a foil to the extensive white render including face brick. 2. This may include timber garage doors.

Concluding Remarks

The Panel do not yet support the proposal. The Proponent is invited to respond to commentary under Principle 1-10 above.

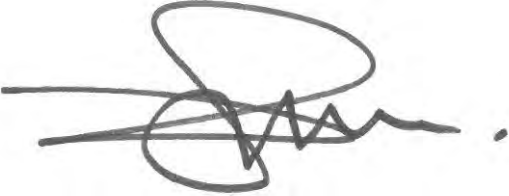
Design Review progress

	Supported			
	Pending further attention			
	Not yet supported			
	Yet to be addressed			
	DR1	DR2	DR3	
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				

Design Review Report

117 & 119 Lockhart Street Como DR02

November 2023

Design Review Report		
Subject	117 & 119 Lockhart Street Como – Design Review 02	
Date	2023-11-07	
Time		
Location	City of South Perth	
Design Reviewers	Name Dominic Snellgrove Damien Pericles Malcolm MacKay Fred Chaney	Chair Panel member Panel Member Panel Member
Proponent	Projekt	
Project Team		
Planning Authority	City of South Perth	
Stakeholders		
Declarations	None	
Briefings		
Relevant Authorities Project Team		
Design Review Report endorsement		
Reviewer's signature	 (Name) Dominic Snellgrove	

Introductory Comments	
Design quality evaluation	
	Supported
	Pending further attention
	Not yet supported
	Yet to be addressed
Strengths of the Proposal	- Comprehensive and instructive presentation including a detailed context, character and historical account. - Streetscape engagement - Large extent of glazing at ground floor street frontage. - Separation of vehicle access from pedestrian entry. 'Snaking' pedestrian pathway and landscaped journey to rear units - Landscape professional and concept and verge treatment/incorporation. - Optional Lift and ground floor bedroom arrangement to support aging in place and future flexibility. - Tapering down built form from the street to the rear. - Contemporary architecture and face brick materiality - AC condenser enclosure identified. - ESD professional engaged and a 5 Star Green Star equivalency target. - Ground floor streetscape, reduced fence height and good permeability. - Ground floor studio/office - Increased native tree selection. - Landscape backdrop to the internal street - Permeable paving and bollard lighting to internal laneway. - North facing living areas and passive surveillance over the central walkway. - High quality paved central driveway. - Additional fenestration to the east and west internal elevations.
Principle 1 Context and character	<i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i>
	a) Whilst the proposed scale and density is less than what has been contemplated for this zone, the Panel supports the proposed typology and is sympathetic with the commercial drivers that support a project of this scale and typology. b) The rear boundary nil setback for the ground level is not consistent with statutory requirements and contemplated character of the area which conceives of buildings set within landscaped spaces. c) The south and north boundary also have a reduced setback from the contemplated 4M to 3M at the front of the project. The contemplated character of the area is one that achieves a minimum separation of built form when viewed from the street to allow for space and landscape.
Recommendations	1. Consider incorporating a 1M setback for the ground level at the rear boundary.
Principle 2 Landscape quality	<i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i>

		a) The appointment of a landscape professional is commended. b) Further design development is encouraged
Recommendations		1. None
Principle 3 Built form and scale		<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>
		a) Whilst the proposed scale and density is less than what has been contemplated for this zone, the Panel supports the proposal and is sympathetic with the commercial drivers that support a project of this scale and typology. b) The rear boundary nil set back is not consistent with statutory requirements and will have an impact on the adjoining neighbor.
Recommendations		1. Consider incorporating a 1M setback for the ground level at the rear boundary.
Principle 4 Functionality and build quality		<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>
		a) The proposal is well arranged and functional in its operation.
Recommendations		1. None
Principle 5 Sustainability		<i>Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.</i>
		a) The Proponent is commended for appointing an ESD professional and for identifying a 5 Star Green Star equivalency target.
Recommendations		1. None
Principle 6 Amenity		<i>Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.</i>
		a) The internalised bedrooms relying solely on a small sunken courtyard or roof light for light, view and vista are not supported. Internalised bedrooms without access to adequate light, view or vista are specifically prohibited under SPP7.3 b) The bathrooms that sit adjacent to one-another between two dwellings have the capacity for privacy issues.
Recommendations		1. Either remove the internal bedrooms or find a way of re-arranging the master plan to allow all habitable rooms, including bedrooms to have adequate access to light, view and vista. 2. Consider privacy between adjoining dwellings bathrooms.
Principle 7 Legibility		<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>
		a) The proposed arrangement of built form provides very good legibility for residents and visitors.
Recommendations		1. None
Principle 8 Safety		<i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i>
		a. The proposed arrangement of built form and the accompanying streetscape provide good passive surveillance over the public realm.
Recommendations		1. None

Principle 9 Community	<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>
	a) In a project of this scale the best thing that can be done for the community is to provide an active and engaged streetscape with effective passive surveillance.
Recommendations	1. None
Principle 10 Aesthetics	<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>
	a) The proposal incorporates a contemporary approach to built form with layering, shadow and materiality resulting in an attractive street presence.
Recommendations	1. None

Concluding Remarks

The Panel does not support the proposal in its current form.

All habitable rooms must have access to light view and vista and not rely solely on light wells and roof lights. See SPP 7.3 Section 4.1 for advice.

The panel supports the reduced setbacks to the side boundary. However, the Panel retain some concern with the nil set back at ground to the rear boundary and invite the Proponent to engage with the City to resolve the way forward.

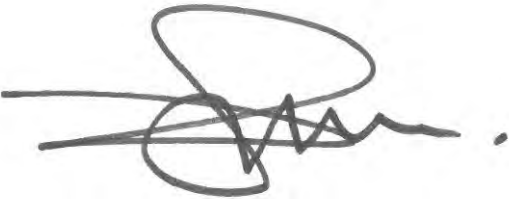
Design Review progress

	Supported		
	Pending further attention		
	Not yet supported		
	Yet to be addressed		
	DR1	DR2	DR3
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			

Design Review Report

117 & 119 Lockhart Street Como DR03

4th June 2024

Design Review Report		
Subject	117 & 119 Lockhart Street Como – Design Review 03	
Date	2024-06-04	
Time	11:30am	
Location	City of South Perth	
Design Reviewers	Name Dominic Snellgrove Oliver Grimaldi Matthew Dunstan	Chair Panel member Panel Member
Proponent	Petar Mrdja – Urbanista Town Planning	
Project Team	Vadim Boyko (Proekt Architecture)	
Planning Authority	City of South Perth	Courtney Wynn Scott Van Ierland
Stakeholders	N/A	
Declarations	None	
Briefings		
Relevant Authorities Project Team	Petar Mrdja – Urbanista Town Planning Vadim Boyko (Proekt Architecture)	
Design Review Report endorsement		
Reviewer's signature	 (Name) Dominic Snellgrove	

Introductory Comments	
Design quality evaluation	
	Supported
	Pending further attention
	Not yet supported
	Yet to be addressed
Strengths of the Proposal	- Comprehensive and instructive presentation including a detailed context, character and historical account. - Streetscape engagement - Large extent of glazing at ground floor street frontage. - Separation of vehicle access from pedestrian entry. 'Snaking' pedestrian pathway and landscaped journey to rear units - Landscape professional and concept and verge treatment/incorporation. - Optional Lift and ground floor bedroom arrangement to support aging in place and future flexibility. - Tapering down built form from the street to the rear. - Contemporary architecture and face brick materiality - AC condenser enclosure identified. - ESD professional engaged and a 5 Star Green Star equivalency target. - Ground floor streetscape, reduced fence height and good permeability. - Ground floor studio/office - Increased native tree selection. - Landscape backdrop to the internal street - Permeable paving and bollard lighting to internal laneway. - North facing living areas and passive surveillance over the central walkway. - High quality paved central driveway. - Additional fenestration to the east and west internal elevations. DRP03 - The Proponent is commended for further design work which has resulted in two out of four internalized bedrooms now having access to natural light, view, ventilation and vista. - Further landscape design development has resulted in an increase in native species selection. - The Proponent is commended for extending the blade wall between adjoin bathrooms to assist with privacy.
Principle 1 Context and character	<i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i>
	a) Whilst the proposed scale and density is less than what has been contemplated for this zone, the Panel supports the proposed typology and is sympathetic with the commercial drivers that support a project of this scale and typology. b) The rear boundary nil setback for the ground level is not consistent with statutory requirements and contemplated character of the area which conceives of buildings set within landscaped spaces.

	c) The south and north boundary also have a reduced setback from the contemplated 4M to 3M (at the balcony projection) and at the front of the project. The contemplated character of the area is one that achieves a minimum separation of built form when viewed from the street to allow for space and landscape.
Recommendations	1. Panel support for this principle is contingent on the implementation of a minimum 1M setback at ground for the rear boundary and the minimum required set back above level 1.
Principle 2 Landscape quality	<i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i>
	a) The appointment of a landscape professional is commended. b) Further design development is encouraged
Recommendations	1. Approximately 40% of the tree canopy is illustrated extending beyond the boundary raising concerns about long term viability which should be carefully considered. 2. Driveway landscape cutouts raise concerns about viability and sight lines when reversing. 3. Trellis planting, which is supported, is not illustrated on the architectural drawings.
Principle 3 Built form and scale	<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>
	a) Whilst the proposed scale and density is less than what has been contemplated for this zone, the Panel supports the proposal and is sympathetic with the commercial drivers that support a project of this scale and typology. b) The rear boundary nil set back is not consistent with statutory requirements and will have an impact on the adjoining neighbor.
Recommendations	1. Panel support for this principle is contingent on the implementation of a minimum 1M setback at ground for the rear boundary and the minimum required set back above level 1.
Principle 4 Functionality and build quality	<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>
	a) The proposal is well arranged and functional in its operation.
Recommendations	1. None
Principle 5 Sustainability	<i>Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.</i>
	a) The Proponent is commended for appointing an ESD professional and for identifying a 5 Star Green Star equivalency target.
Recommendations	1. Whilst the appointment of an ESD consultant and the production of a preliminary report is welcome, the report is not yet sufficient in scope and commitment. 2. A NatHERS rating is not identified. 3. It is also worth noting that NCC 2022 is commencing in May 2025 and brings with it some considerable requirements including a 7 Star NatHERS Rating and ambitious GWP Rates for AC condensers.
Principle 6 Amenity	<i>Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.</i>

		a) The remaining internalised bedrooms relying solely on a small sunken courtyard or roof light for light, view and vista are not supported. Internalised bedrooms without access to adequate light, view or vista are specifically prohibited under SPP7.3
Recommendations		1. Support for this Principle is contingent on either a generous roof form that folds up to allow for ventilation, view and vista or the generous provision of more than 1 operable roof light in each habitable room. Whilst this will not solve access to view and vista it will facilitate cross ventilation and natural light.
Principle 7 Legibility		<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>
		a) The proposed arrangement of built form provides very good legibility for residents and visitors.
Recommendations		1. None
Principle 8 Safety		<i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i>
		a. The proposed arrangement of built form and the accompanying streetscape provide good passive surveillance over the public realm.
Recommendations		1. None
Principle 9 Community		<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>
		a) In a project of this scale the best thing that can be done for the community is to provide an active and engaged streetscape with effective passive surveillance.
Recommendations		1. None
Principle 10 Aesthetics		<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>
		a) The proposal incorporates a contemporary approach to built form with layering, shadow and materiality resulting in an attractive street presence.
Recommendations		1. None

Concluding Remarks

The Panel does not yet support the proposal in its current form.

Panel support for the proposal is contingent on the implementation of a minimum 1m setback at ground for the rear boundary and the minimum required set back above level 1 and the introduction of either a generous roof form that folds up to allow for ventilation, view and vista into the remaining internal bedrooms or the generous provision of more than 1 operable roof light in each habitable room.

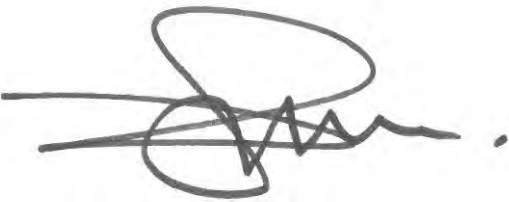
Design Review progress

	<i>Supported</i>		
	<i>Pending further attention</i>		
	<i>Not yet supported</i>		
	<i>Yet to be addressed</i>		
	DR1	DR2	DR3
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			

Design Review Report

117 & 119 Lockhart Street Como DR04

4th September 2024

Design Review Report		
Subject	117 & 119 Lockhart Street Como – Design Review 04	
Date	2024-09-04	
Time		
Location		
Design Reviewers	Name Dominic Snellgrove	Chair Review
Proponent	Petar Mrdja – Urbanista Town Planning	
Project Team	Vadim Boyko (Proekt Architecture)	
Planning Authority	City of South Perth	Courtney Wynn Scott Van Ierland
Stakeholders	N/A	
Declarations	None	
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Relevant Authorities Project Team	Petar Mrdja – Urbanista Town Planning Vadim Boyko (Proekt Architecture)	
Design Review Report endorsement		
Reviewer's signature		
	(Name) Dominic Snellgrove	

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Principle 1 Context and character	<i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i>
	a) The one-meter built form set back from the west boundary at ground enables the development to achieve a high-quality built form outcome in relation to its neighbours.
Recommendations	1. None
Principle 2 Landscape quality	<i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i>
	a) The appointment of a landscape professional is commended. b) Further design development is encouraged
Recommendations	1. Approximately 40% of the tree canopy is illustrated extending beyond the boundary raising concerns about long term viability which should be carefully considered. 2. Driveway landscape cutouts raise concerns about viability and sight lines when reversing. 3. Trellis planting, which is supported, is not illustrated on the architectural drawings.
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Recommendations	1. None
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Recommendations	1. None
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	a. The proposed arrangement of built form and the accompanying streetscape provide good passive surveillance over the public realm.
Recommendations	1. None
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Recommendations	1. None
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	a) The proposal incorporates a contemporary approach to built-form with layering, shadow and materiality resulting in an attractive street presence.
Recommendations	1. None

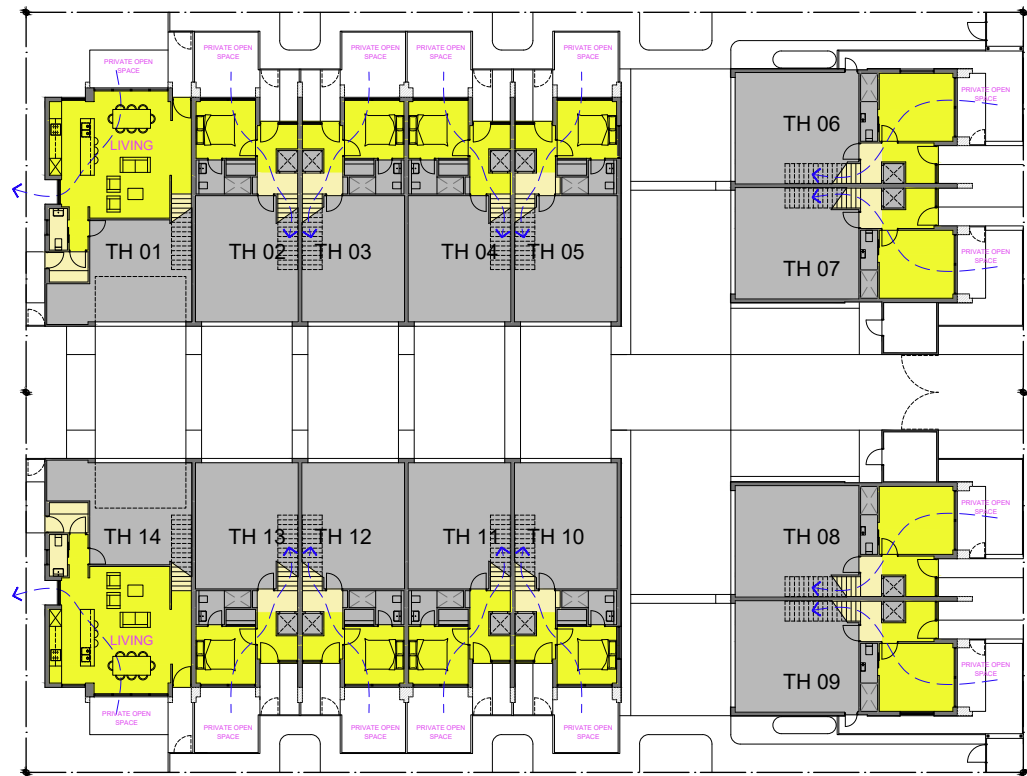
Concluding Remarks

The Proponent is commended for their collaborative approach to Design Review and for addressing the last remaining design amendments.

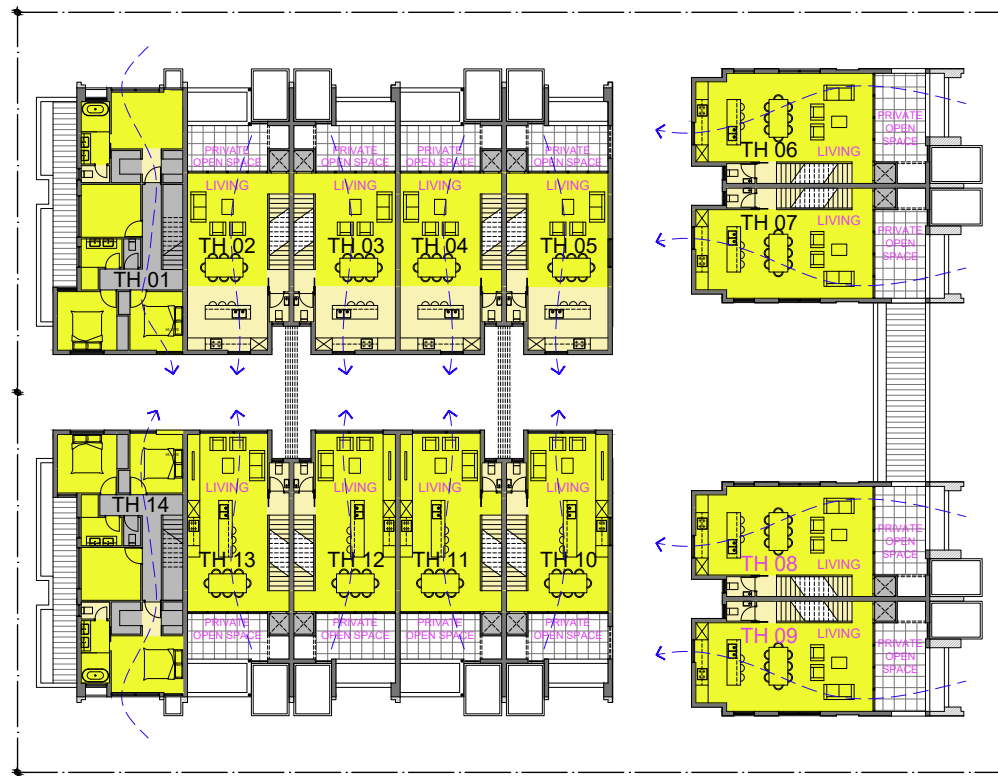
This review supports the proposal

Design Review progress

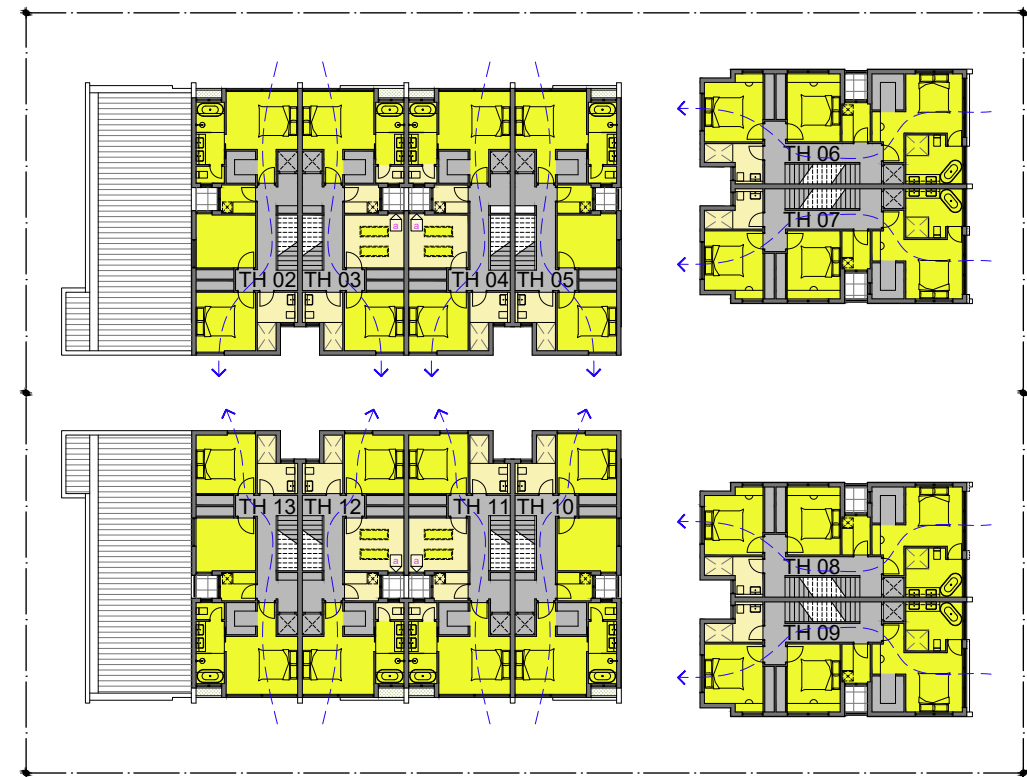
	Supported			
	Pending further attention			
	Not yet supported			
	Yet to be addressed			
	DR1	DR2	DR3	DR4
Principle 1 - Context and character				
Principle 2 - Landscape quality				
Principle 3 - Built form and scale				
Principle 4 - Functionality and build quality				
Principle 5 - Sustainability				
Principle 6 - Amenity				
Principle 7 - Legibility				
Principle 8 - Safety				
Principle 9 - Community				
Principle 10 - Aesthetics				



GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



MEZZANINE FLOOR PLAN

NATURAL VENTILATION

LEGEND

→ PATH OF VENTILATION

SOLAR AND DAYLIGHT ACCESS

STATE PLANNING POLICY 7.3

RESIDENTIAL DESIGN CODE VOLUME 2 - APARTMENTS :

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.

RESPONSE NOTE: (REFER TO SK 21, SK 22, SK 23 and SK24)

NOTE:

- (a) 79% DWELLINGS HAVING LIVING ROOMS THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE
- 71% DWELLINGS HAVING PRIVATE OPEN SPACE THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE
- (b) 0% 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.

RESPONSE NOTE:

a WINDOW a = 23% OF FLOOR AREA

SIZE AND LAYOUT OF DWELLINGS

A 4.3.4 The length of a single aspect open plan living area is equal to or less than 3 x the ceiling height. An additional 1.8m length may be provided for a kitchen, where the kitchen is the furthest point from the window in an open plan living area provided that the maximum length does not exceed 9m.

LEGEND

- OPTIMAL LIGHT
- INDIRECT LIGHT
- LIMITED NATURAL LIGHT

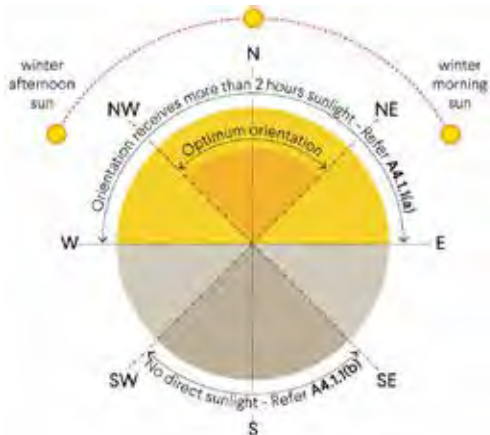
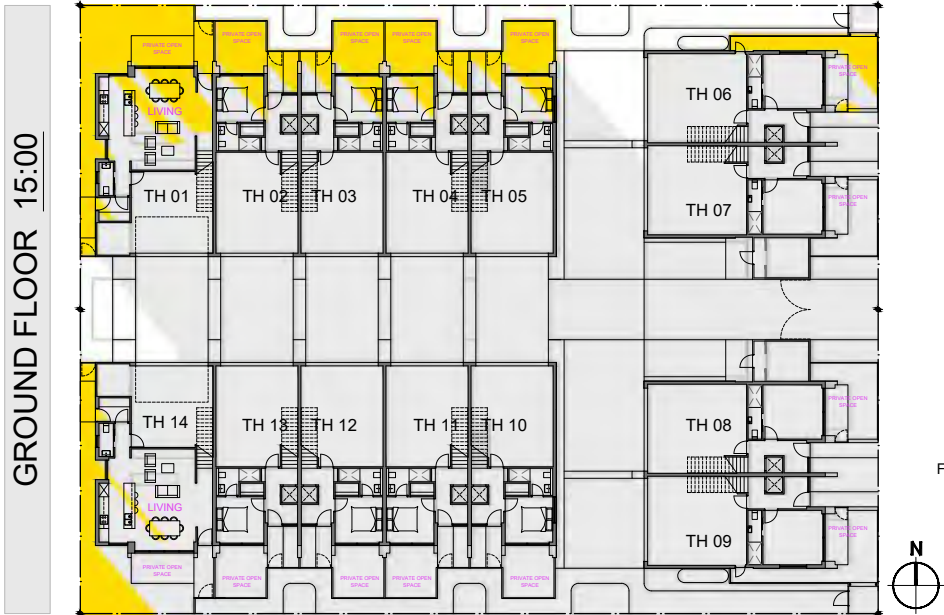
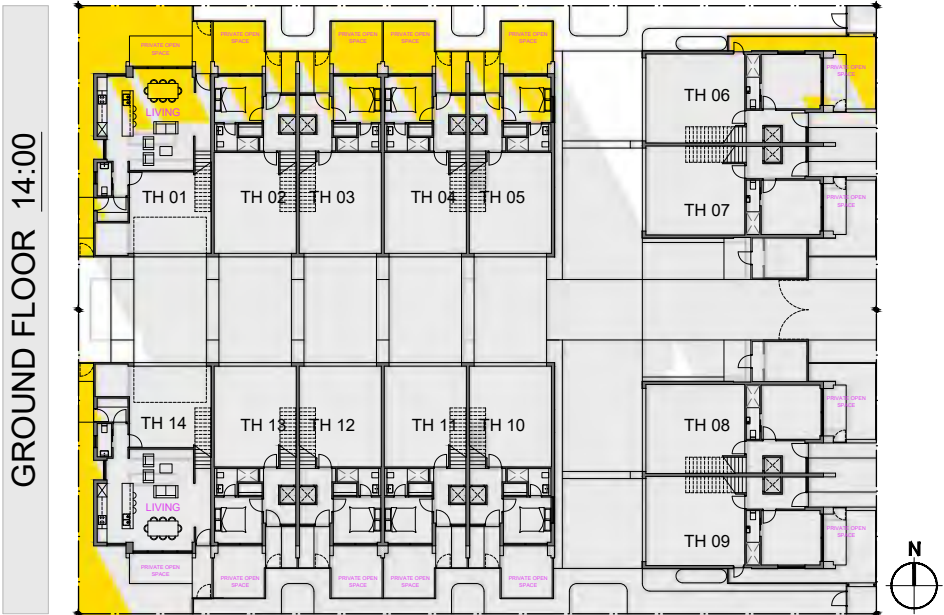
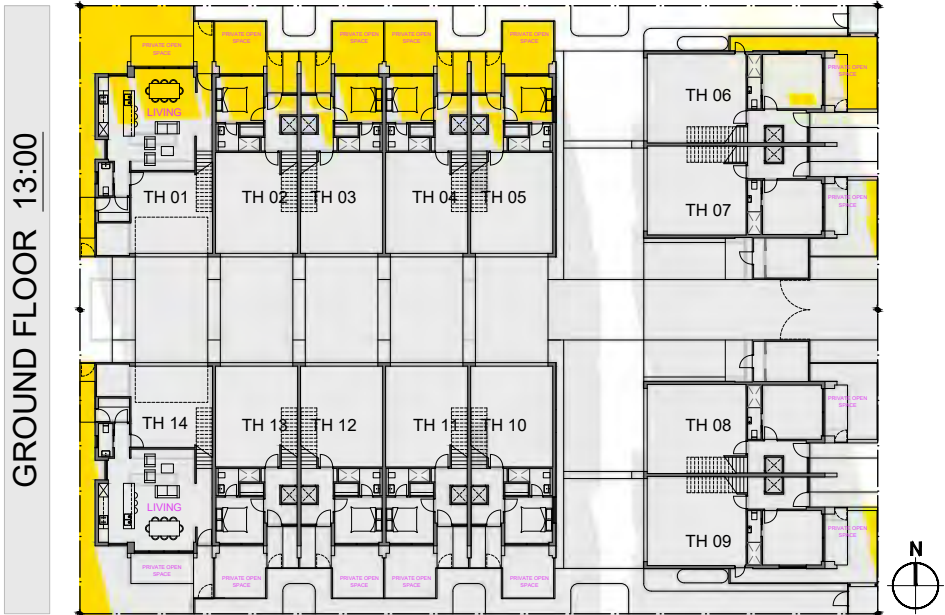
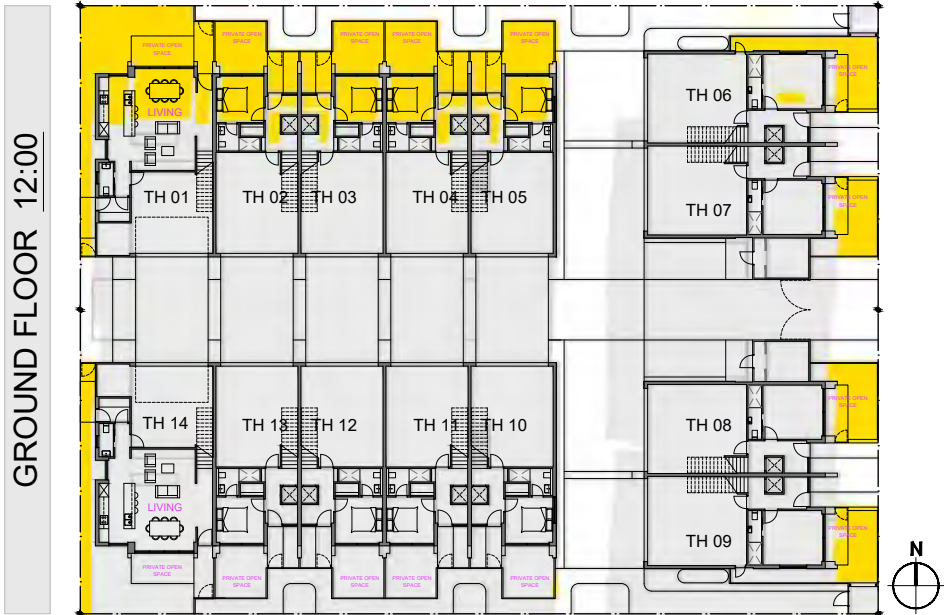
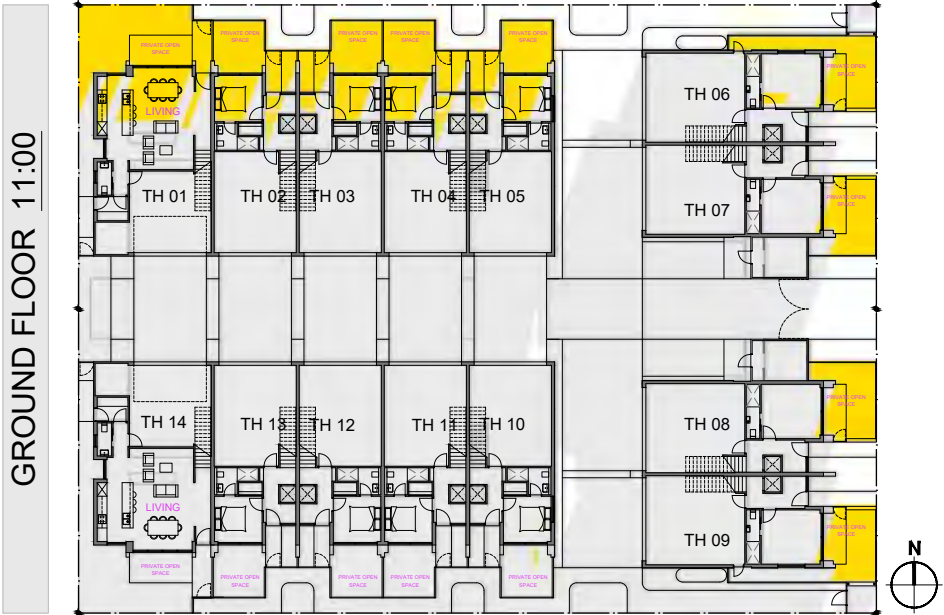
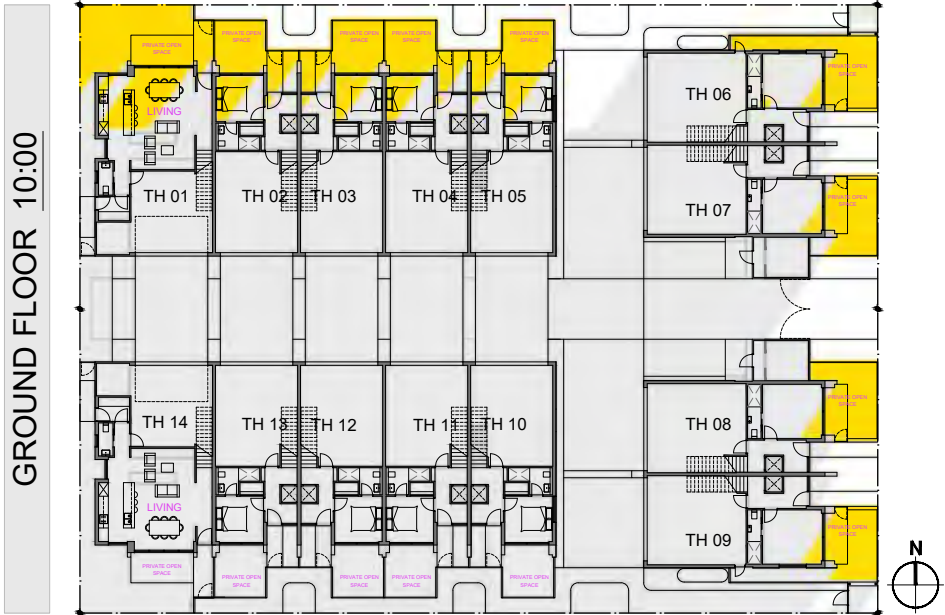
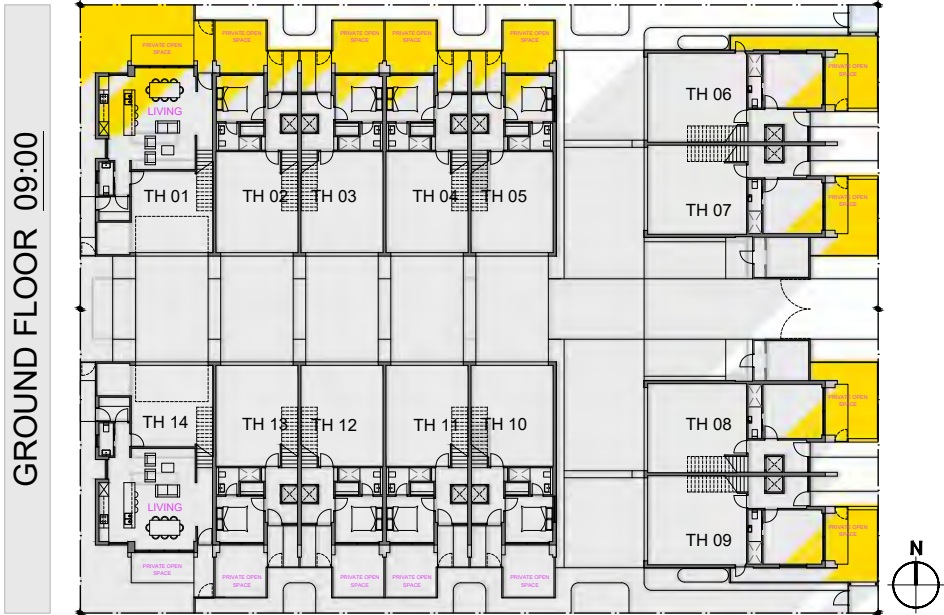


Figure 4.1b The hours of sunlight that can be expected in mid winter are directly related to the orientation of the windows or balconies. To achieve 2 hours sunlight (refer A4.1.1(a)), windows must be facing between west and north; or between north and east. This diagram shows the optimal orientation for sunlight to reach any portion of a window or balcony on 21 June in climate zones 4, 5 and 6.

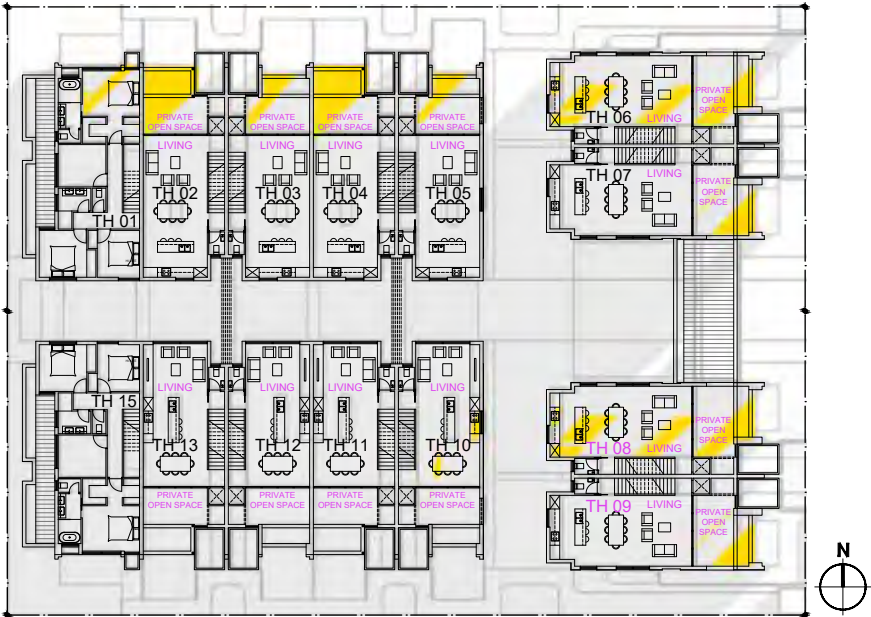
SOLAR ACCESS HOURLY SCHEDULE (9:00am/09:00 - 3:00pm/15:00)

TIME RANGE	TH 01			TH 02			TH 03			TH 04			TH 05			TH 06			TH 07		
	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS
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TOTAL HOURS	7	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7	7	7	1	5	3

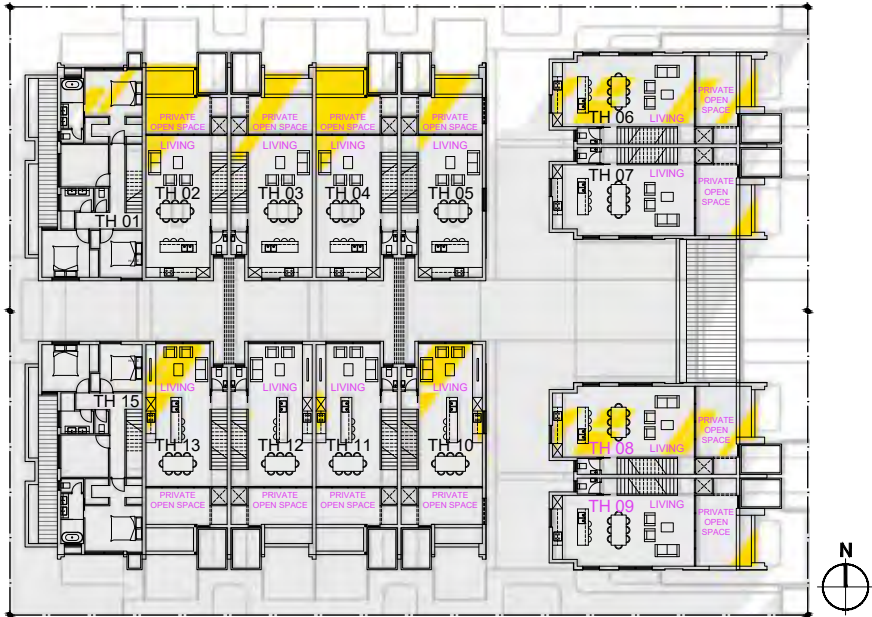
TIME RANGE	TH 08			TH 09			TH 10			TH 11			TH 12			TH 13			TH 14		
	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS
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15:00																					
TOTAL HOURS	7	7	7	1	5	3	6	2	7	5	0	7	5	0	7	6	0	7	1	4	5

NOTE: 79% DWELLINGS HAVING LIVING ROOMS THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE
79% DWELLINGS HAVING PRIVATE OPEN SPACE THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE

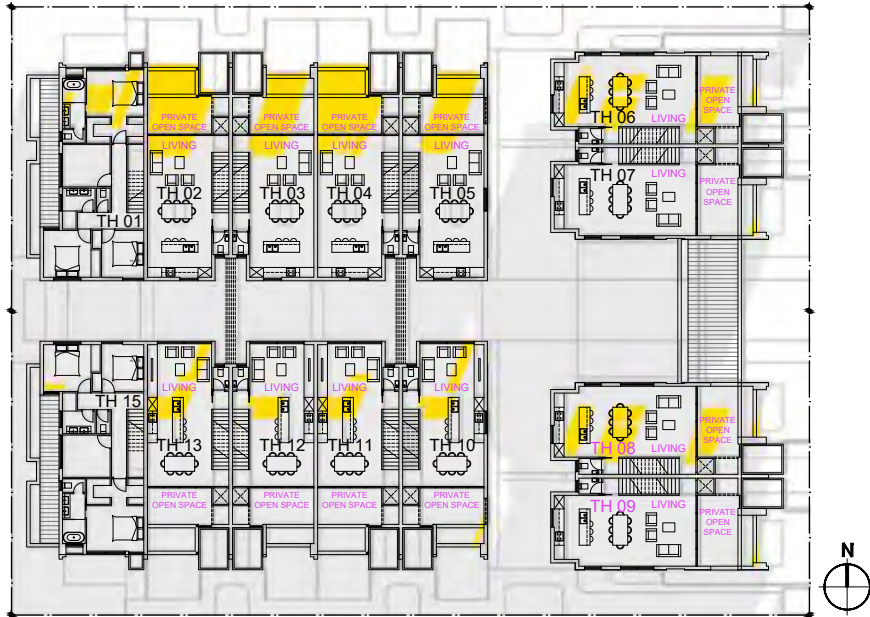
FIRST FLOOR 09:00



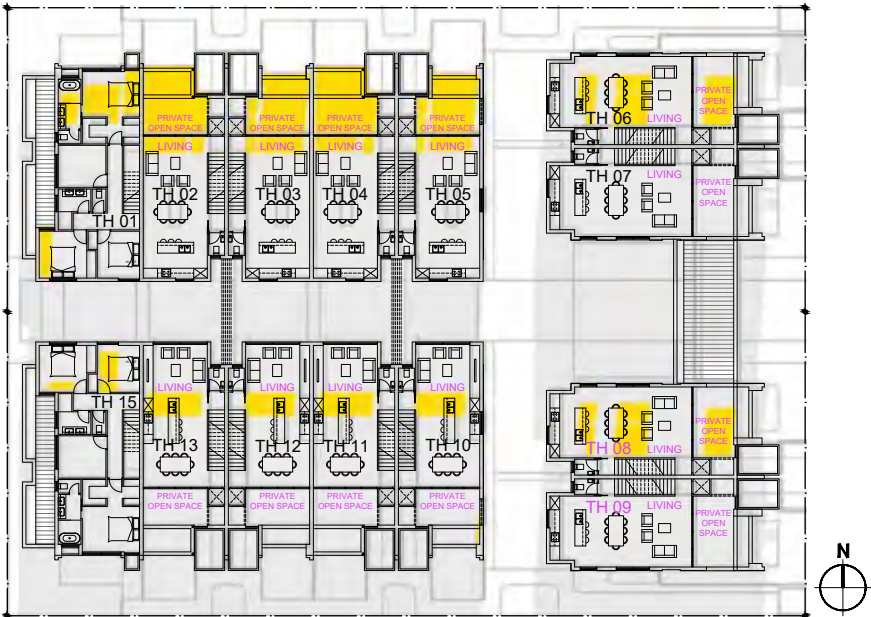
FIRST FLOOR 10:00



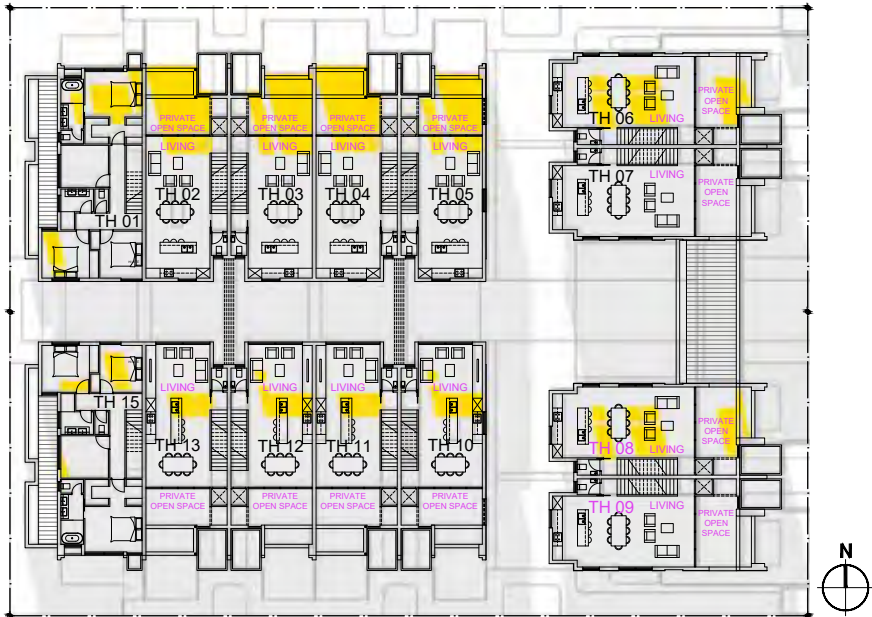
FIRST FLOOR 11:00



FIRST FLOOR 12:00



FIRST FLOOR 13:00



FIRST FLOOR 14:00



FIRST FLOOR 15:00

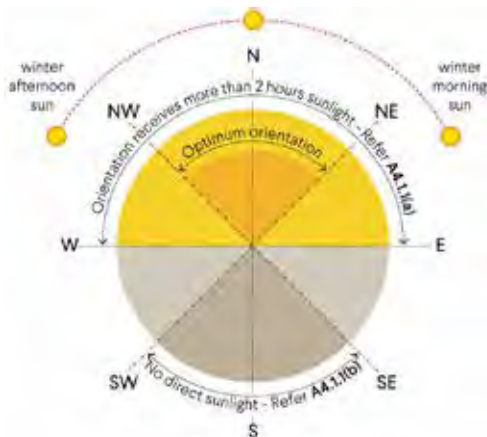
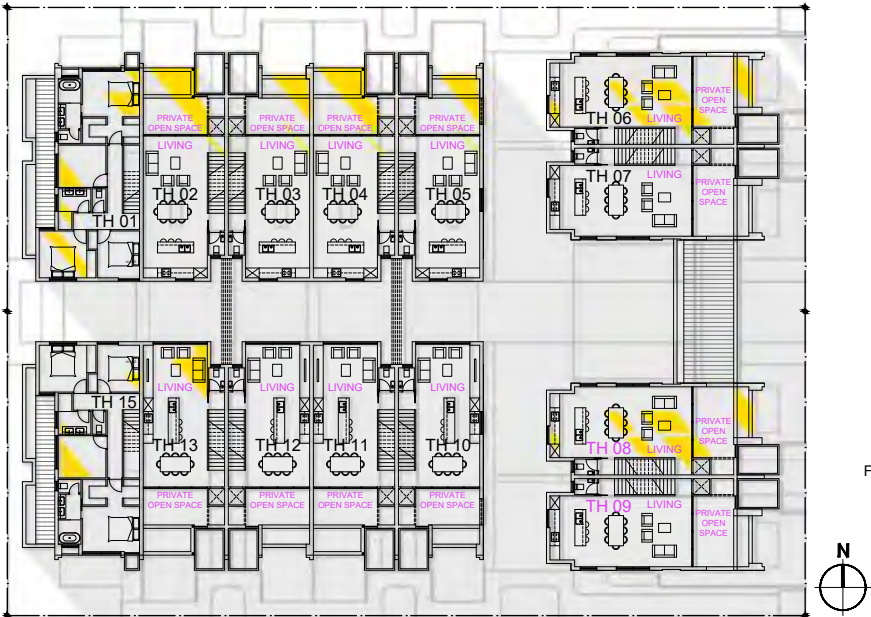


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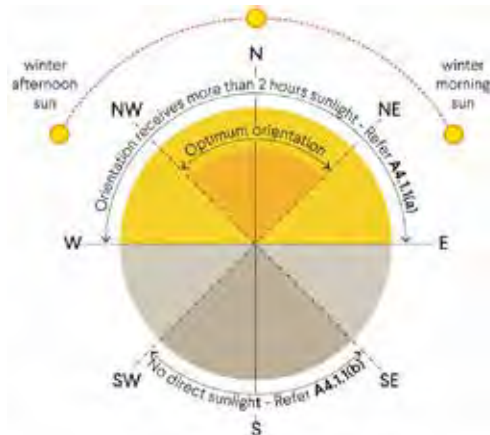
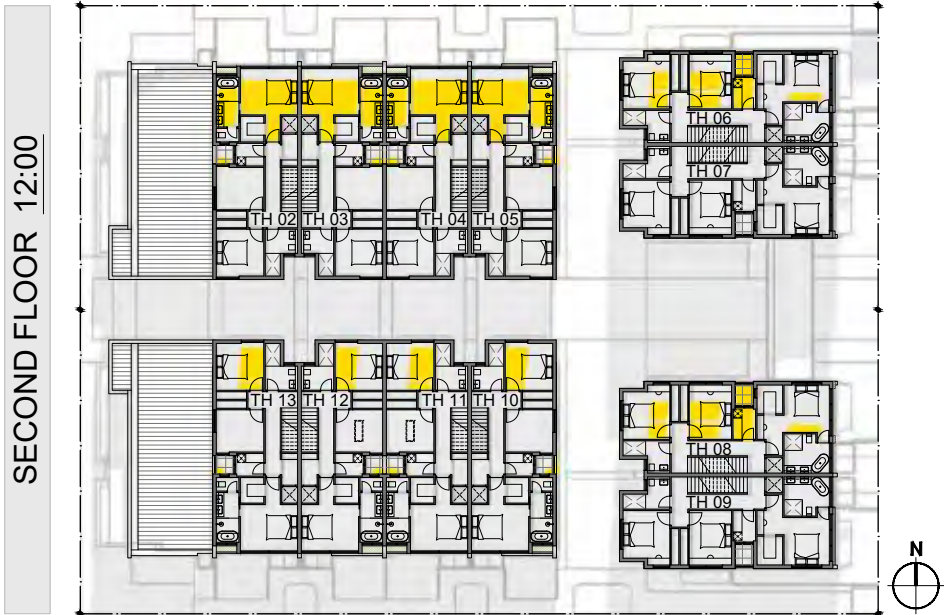


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10:00																					
11:00																					
12:00																					
13:00																					
14:00																					
15:00																					
TOTAL HOURS	7	7	7	1	5	3	6	2	7	5	0	7	5	0	7	6	0	7	1	4	5

NOTE: 79% DWELLINGS HAVING LIVING ROOMS THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE
79% DWELLINGS HAVING PRIVATE OPEN SPACE THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE

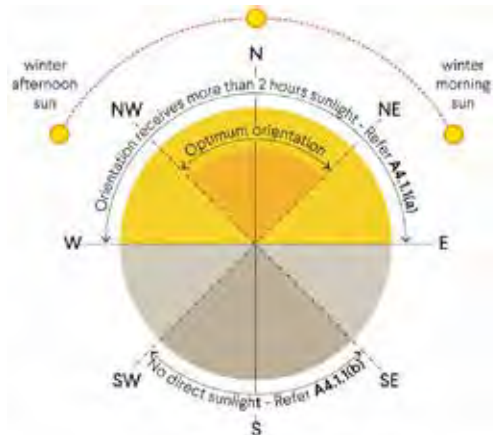
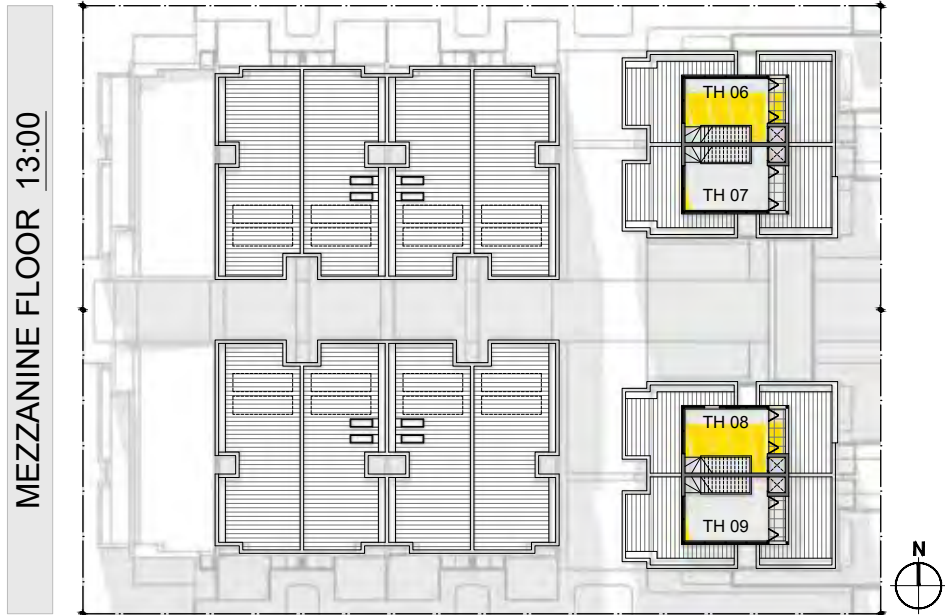
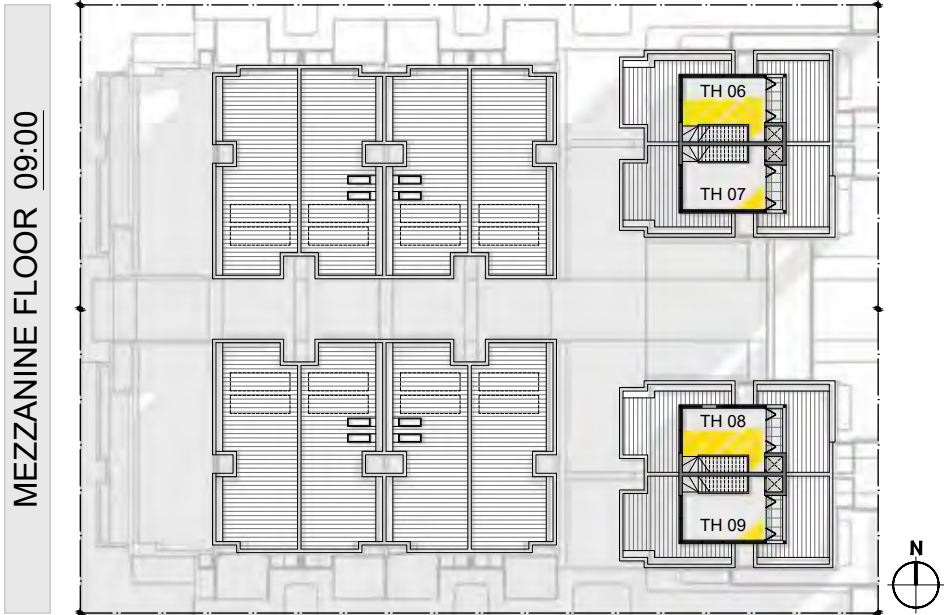


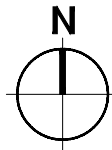
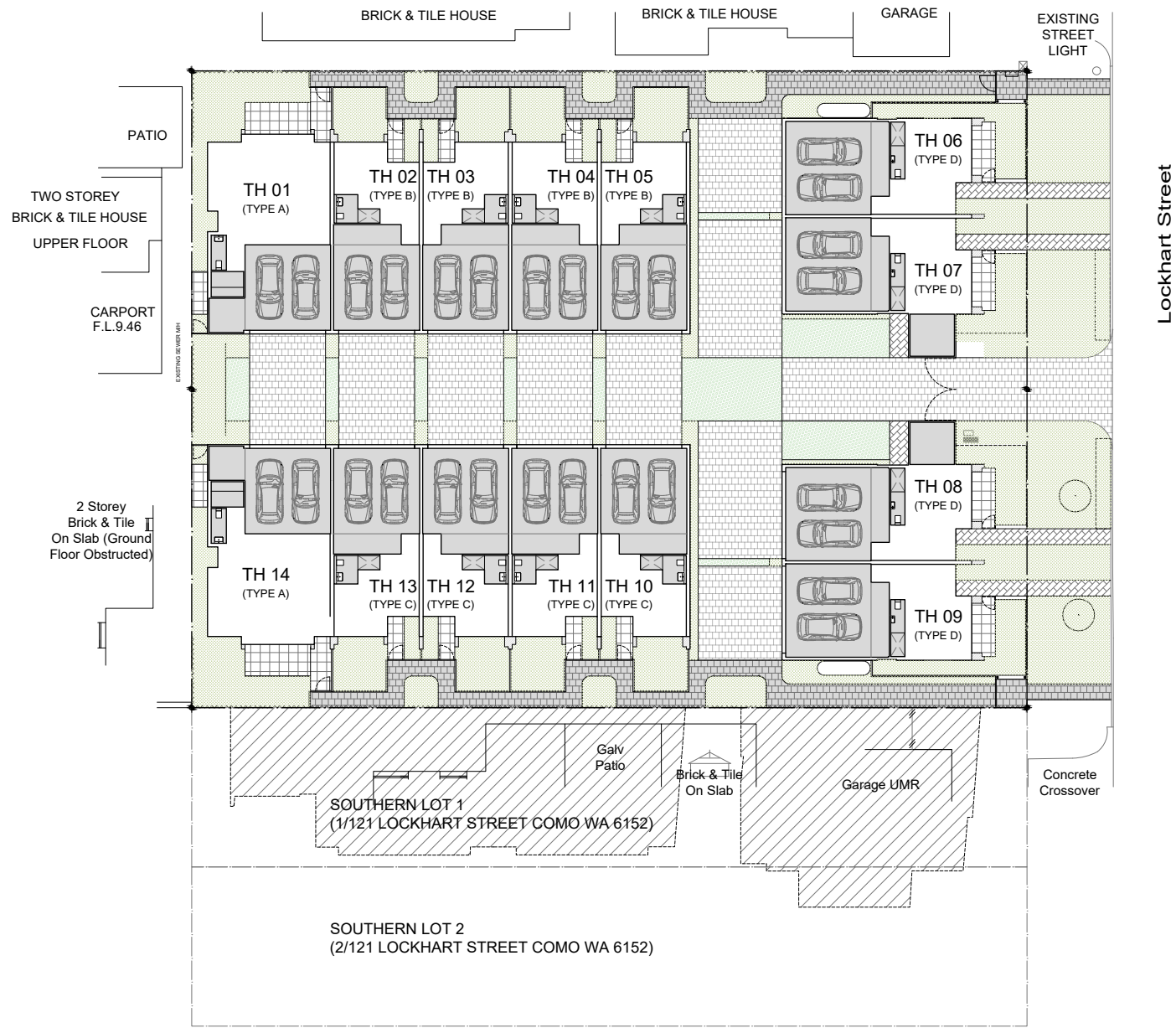
Figure 4.1b The hours of sunlight that can be expected in mid winter are directly related to the orientation of the windows or balconies. To achieve 2 hours sunlight (refer A4.1.1(a)), windows must be facing between west and north; or between north and east. This diagram shows the optimal orientation for sunlight to reach any portion of a window or balcony on 21 June in climate zones 4, 5 and 6.

SOLAR ACCESS HOURLY SCHEDULE (9:00am/09:00 - 3.00pm/15:00)

TIME RANGE	TH 01			TH 02			TH 03			TH 04			TH 05			TH 06			TH 07		
	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS
09:00																					
10:00																					
11:00																					
12:00																					
13:00																					
14:00																					
15:00																					
TOTAL HOURS	7	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7	7	7	1	5	3

TIME RANGE	TH 08			TH 09			TH 10			TH 11			TH 12			TH 13			TH 14		
	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS	LIVING	PRIVATE OPEN SPACE	BEDROOMS
09:00																					
10:00																					
11:00																					
12:00																					
13:00																					
14:00																					
15:00																					
TOTAL HOURS	7	7	7	1	5	3	6	2	7	5	0	7	5	0	7	6	0	7	1	4	5

NOTE: 79% DWELLINGS HAVING LIVING ROOMS THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE
79% DWELLINGS HAVING PRIVATE OPEN SPACE THAT OBTAIN AT LEAST 2 HOURS DIRECT SUNLIGHT BETWEEN 9AM AND 3PM ON 21 JUNE



OVERSHADOWING PLAN

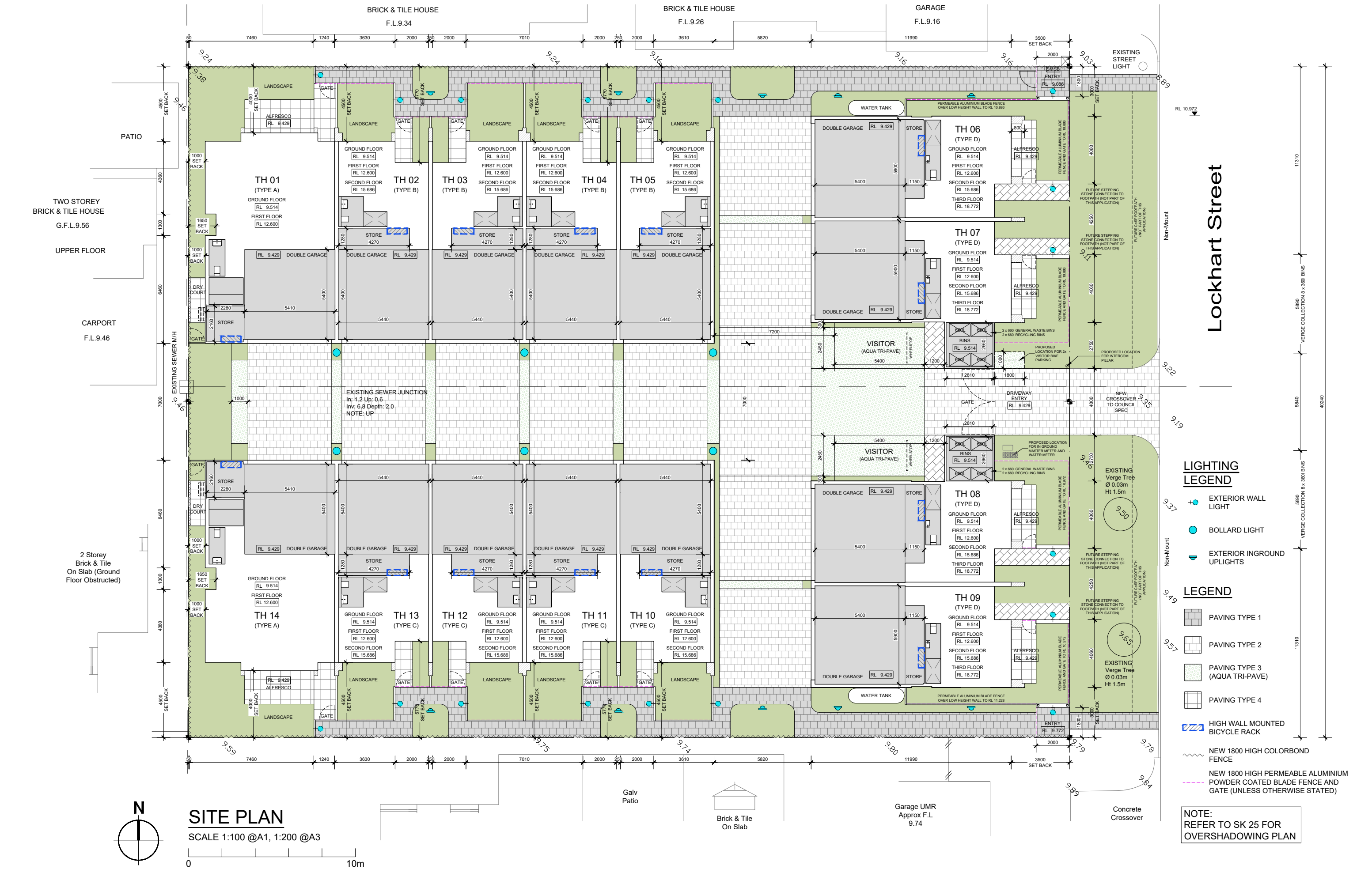
SCALE 1:200 @A1, 1:400 @A3



OVERSHADOWING DIAGRAM AS PER: NOON 21st JUNE

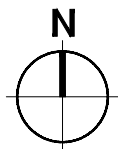
SOUTHERN LOT 1 (1/121 LOCKHART STREET COMO WA 6152)
LOT AREA: 532m²
AREA OF OVERSHADOWING: 388.4m²
OVERSHADOWING PERCENTAGE: 73.0%

SOUTHERN LOT 2 (2/121 LOCKHART STREET COMO WA 6152)
LOT AREA: 531m²
AREA OF OVERSHADOWING: 19.4m²
OVERSHADOWING PERCENTAGE: 3.6%



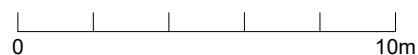


Lockhart Street



GROUND FLOOR PLAN

SCALE 1:100 @ A1, 1:200 @ A3



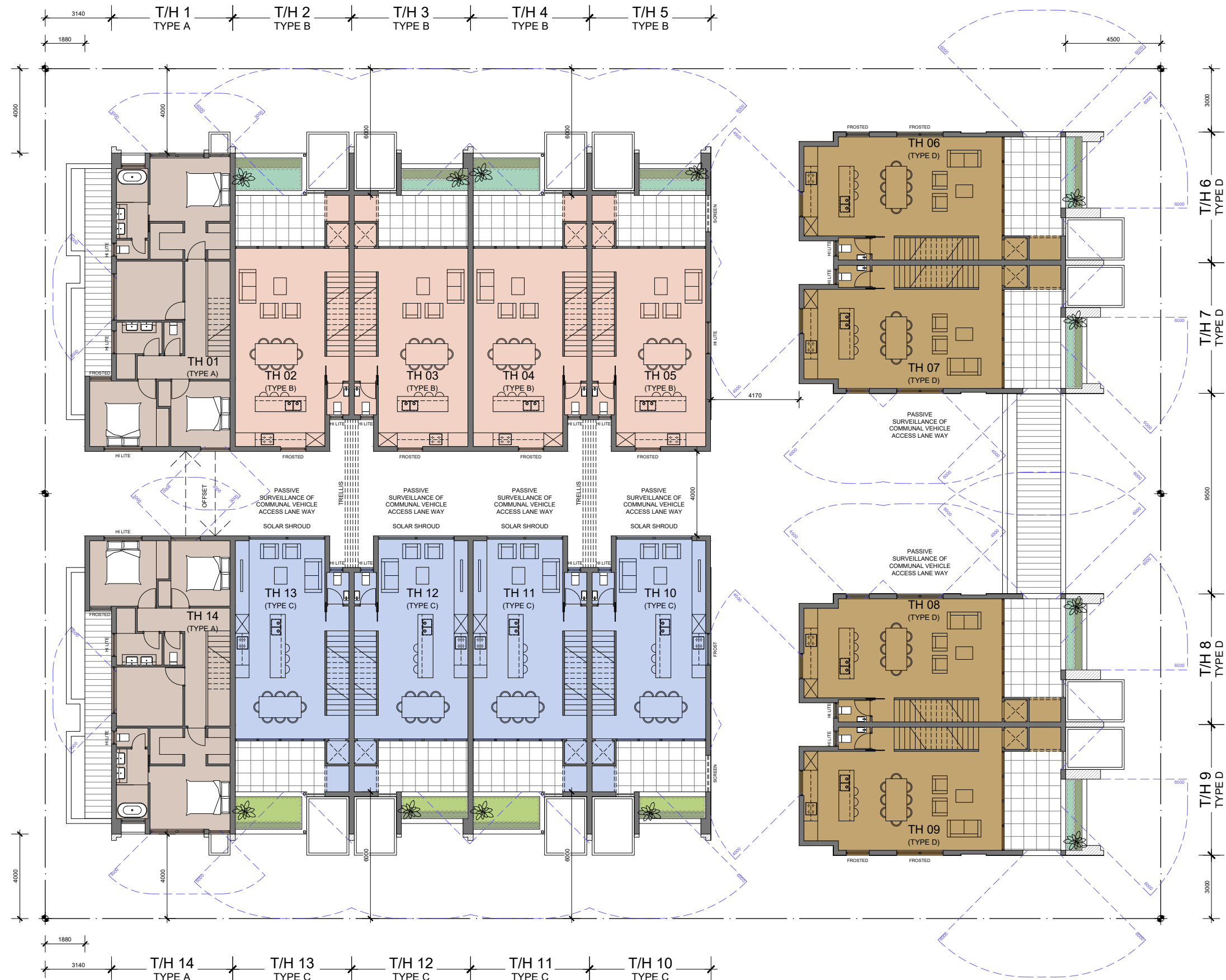
SCALE
1:100 @ A1, 1:200 @ A3

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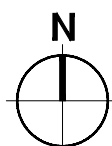
PROJECT TITLE
ELIA COMO
117-119 LOCKHART STREET, COMO
19/07/2024

PROEKT

PROJECT #
2306
DRAWING #
SK04

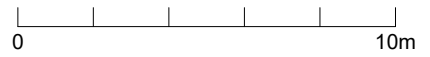


Lockhart Street



FIRST FLOOR PLAN

SCALE 1:100 @A1, 1:200 @A3

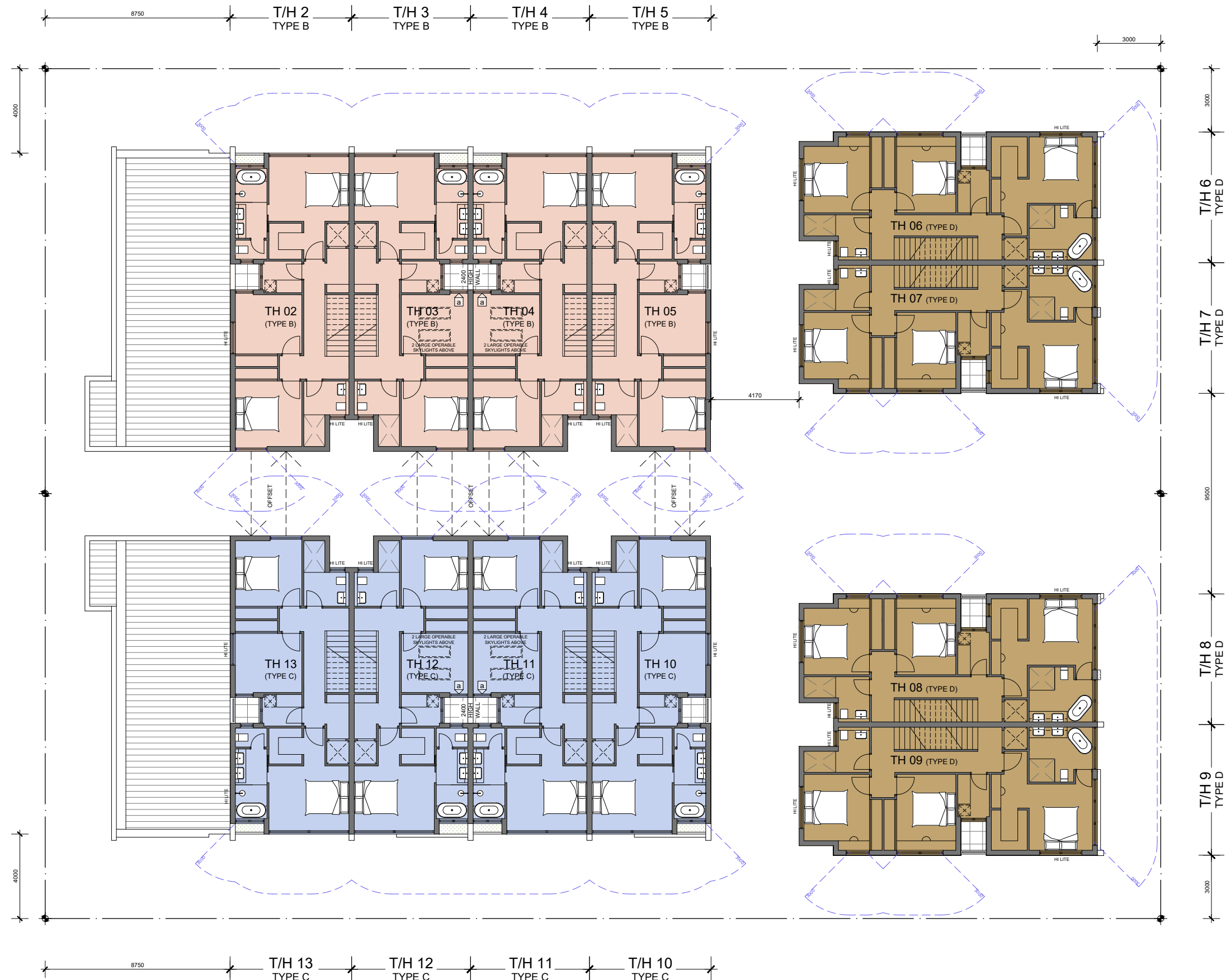


1:100 @ A1, 1:200 @ A3

ELIA COMO
117-119 LOCKHART STREET, COMO
11/06/2024

PROEKT

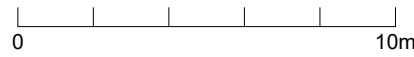
PROJECT #
2306
DRAWING #
SK05



Lockhart Street

SECOND FLOOR PLAN

SCALE 1:100 @A1, 1:200 @A3



STATE PLANNING POLICY 7.3, RESIDENTIAL DESIGN CODES VOLUME 2 - APARTMENTS :
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 WINDOW **a** = 23% OF FLOOR AREA

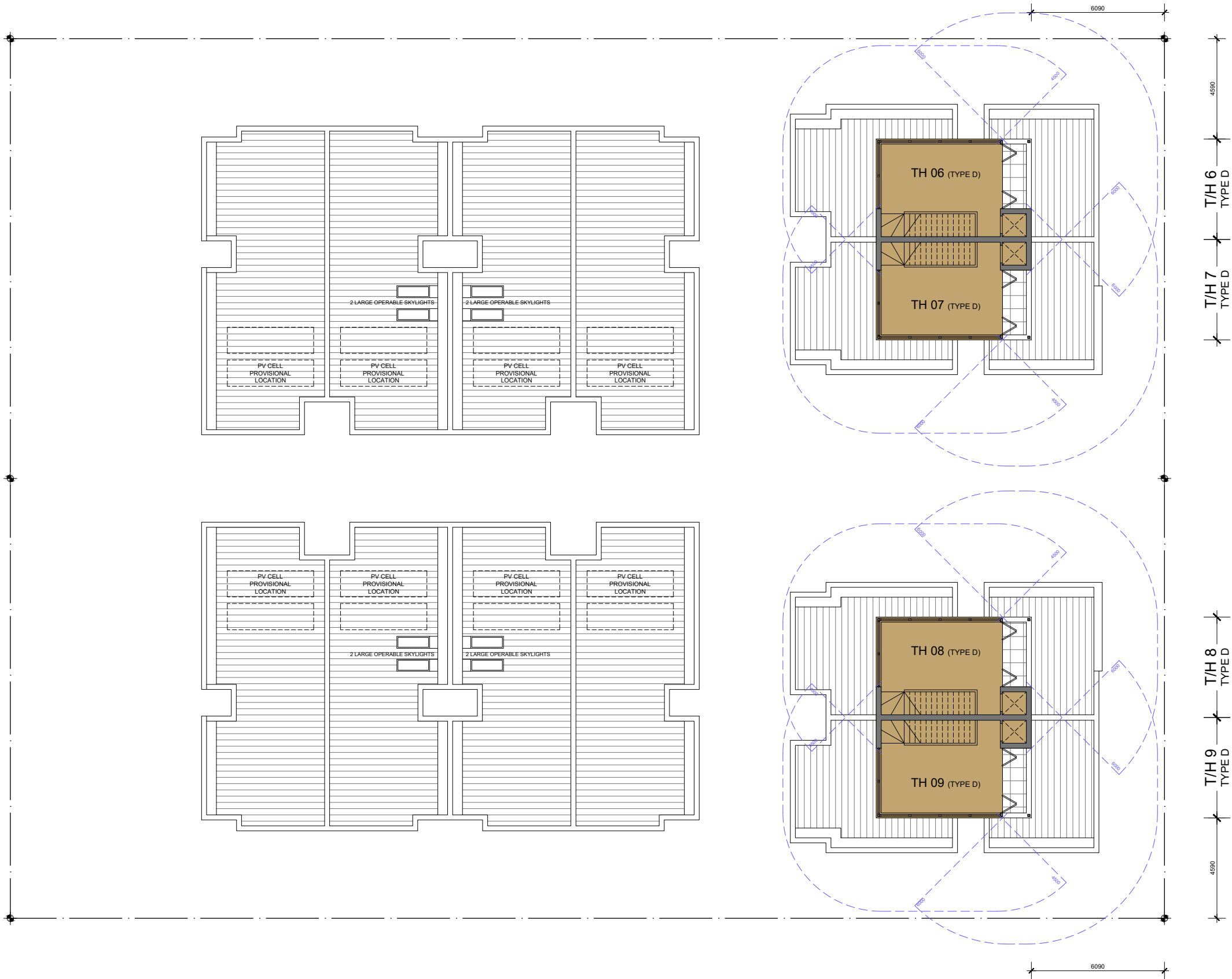
SCALE
1:100 @ A1, 1:200 @ A3

COPYRIGHT: The copyright of these drawings and all parts thereof remain the property of Proekt Architecture.

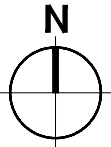
PROJECT TITLE
ELIA COMO
117-119 LOCKHART STREET, COMO
11/06/2024

PROEKT

PROJECT #
2306
DRAWING #
SK06



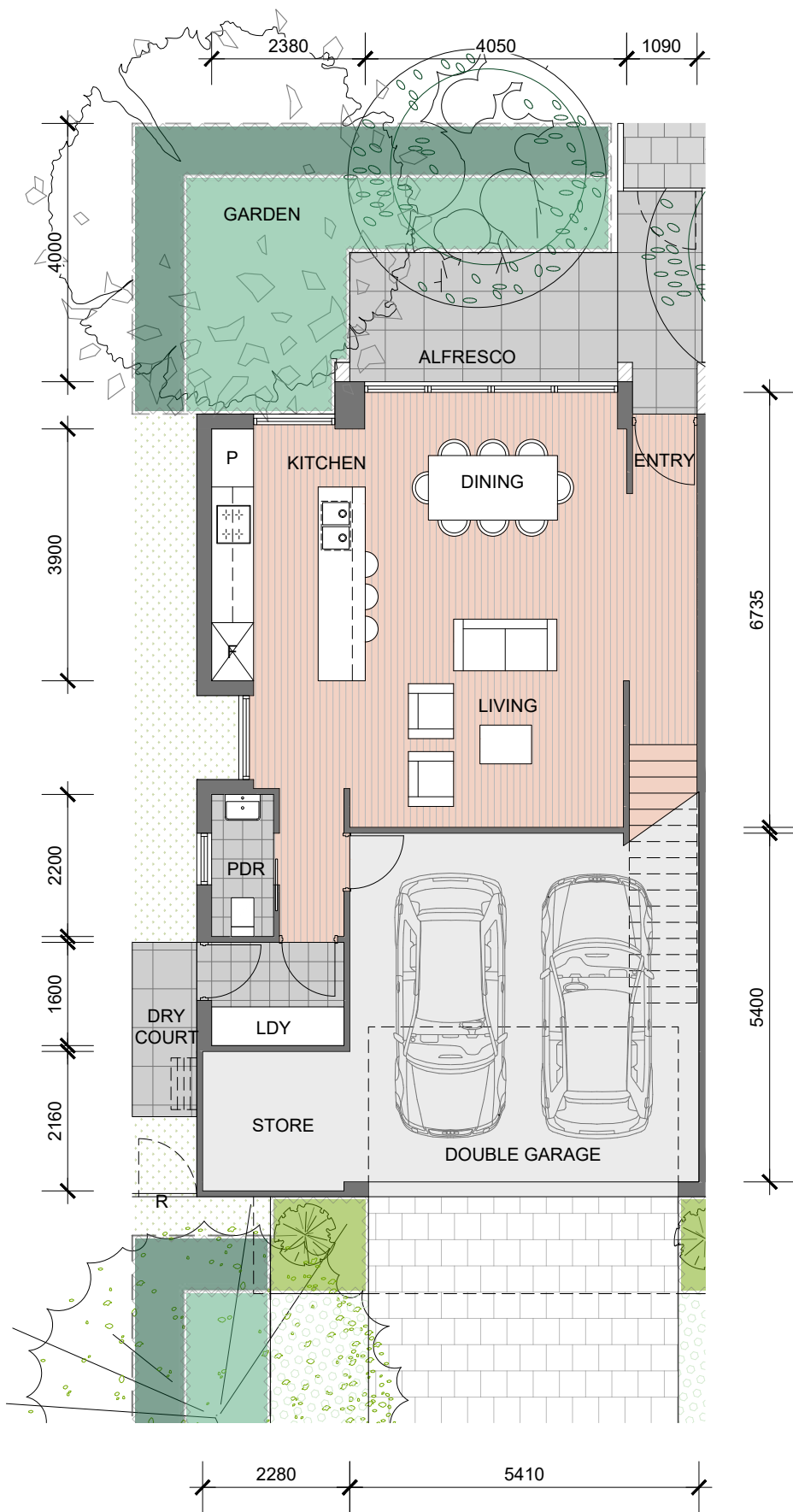
Lockhart Street



MEZZANINE FLOOR PLAN

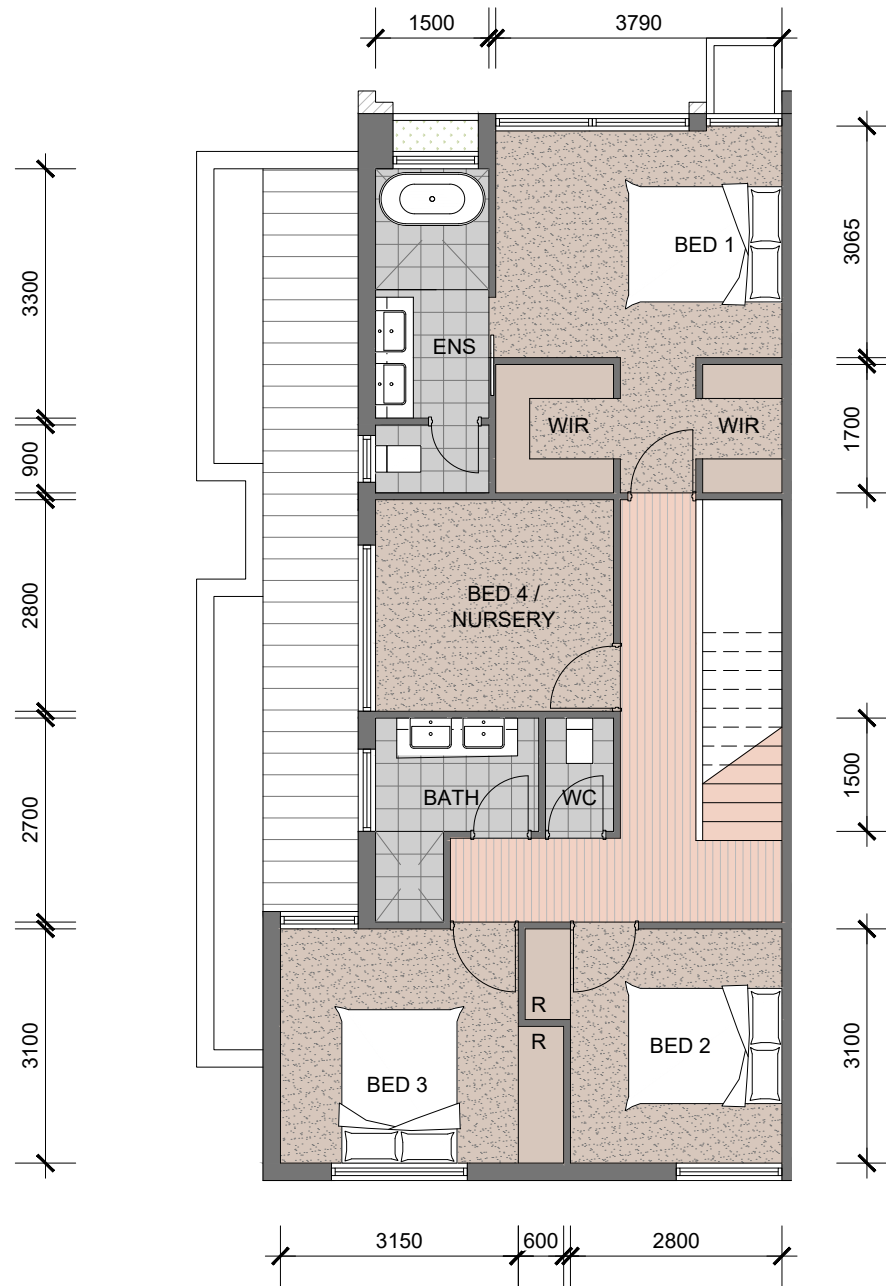
SCALE 1:100 @A1, 1:200 @A3





GROUND FLOOR PLAN

SCALE 1:100 @ A3



FIRST FLOOR PLAN

SCALE 1:100 @ A3

TH TYPE A LOCKHART ST

117 - 119 LOCKHART STREET



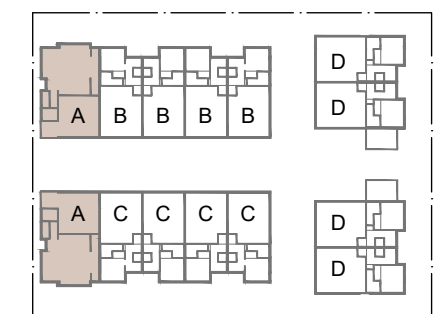
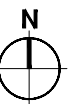
BED x 4
BATH x 2.5

AREA

GARAGE + STORE - 36.8m²
GROUND LIVING - 60.1m²
FIRST LIVING - 84.7m²
TOTAL - 181.6m²

ALFRESCO - 12.9m²
DRY COURT - 2.7m²
GARDEN - 33.5m²
TOTAL - 49.1m²
(OUTDOOR LIVING AREA)

LOCATION



TH TYPE B

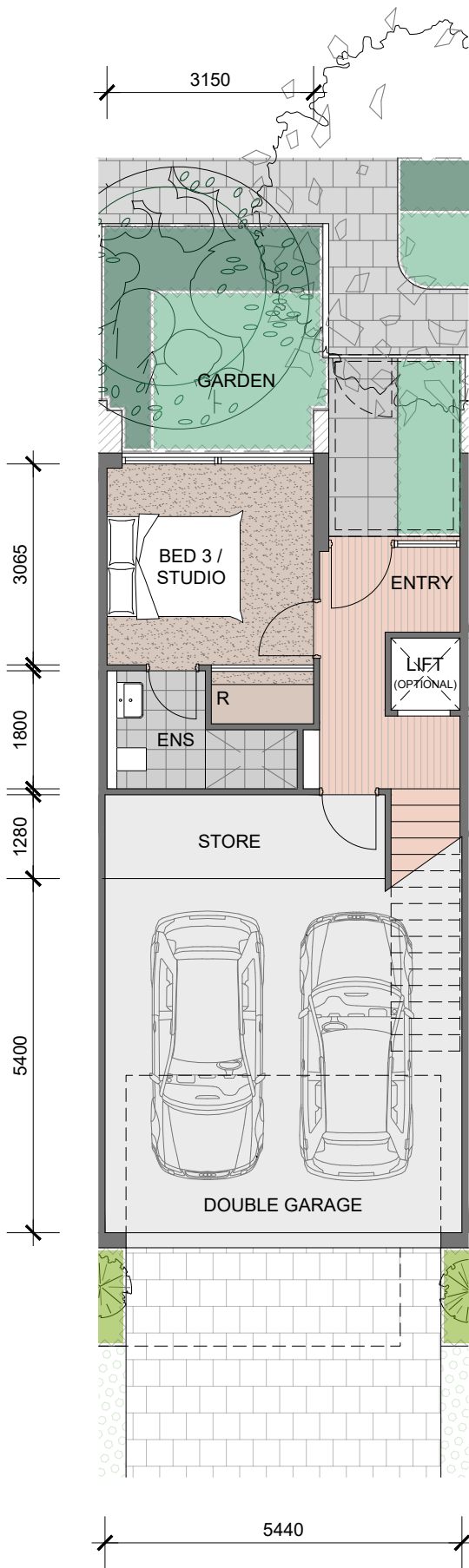
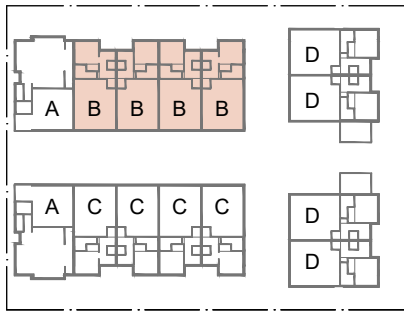
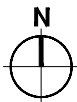
LOCKHART ST

117 - 119 LOCKHART STREET

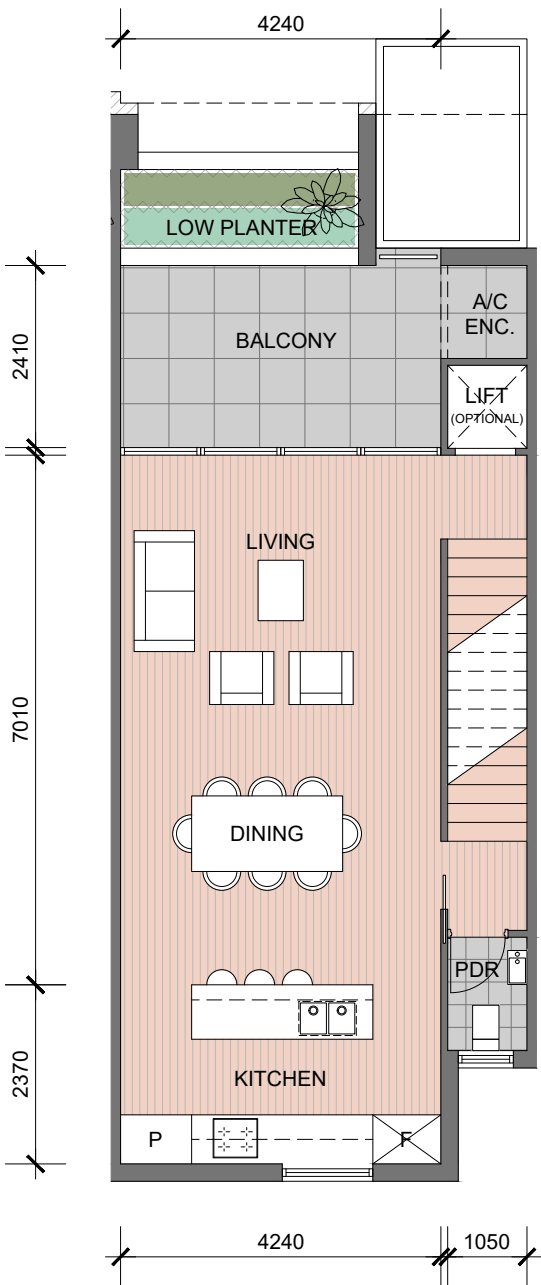


BED x 3
OFFICE / NURSERY x 1
BATH x 3.5

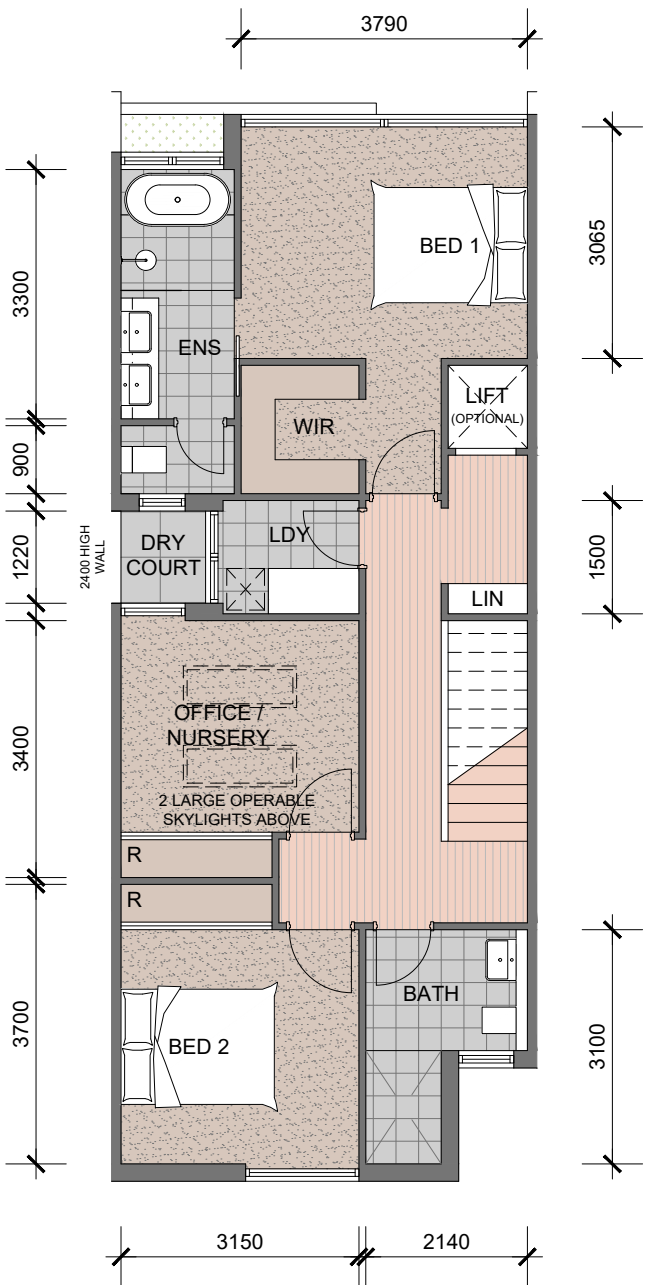
AREA	
GARAGE + STORE	- 37.6m ²
GROUND LIVING	- 27.9m ²
FIRST LIVING	- 54.6m ²
SECOND LIVING	- 75.7m ²
TOTAL	- 195.8m²
BALCONY+PLANTER	- 17.8m ²
DRY COURT	- 1.5m ²
GARDEN	- 17.3m ²
TOTAL (OUTDOOR LIVING AREA)	- 36.6m²



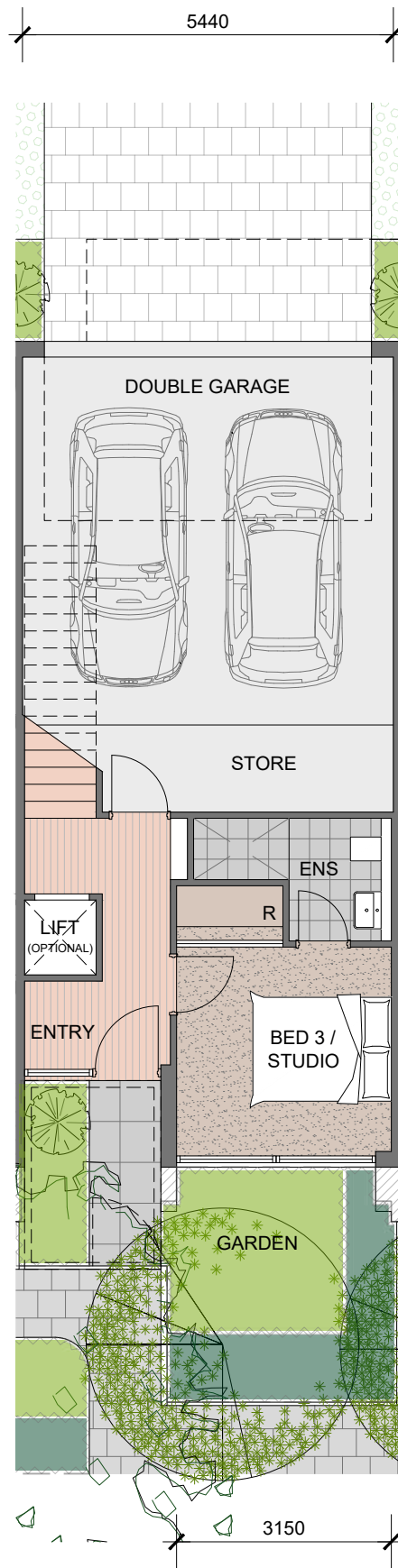
GROUND FLOOR PLAN
SCALE 1:100 @ A3



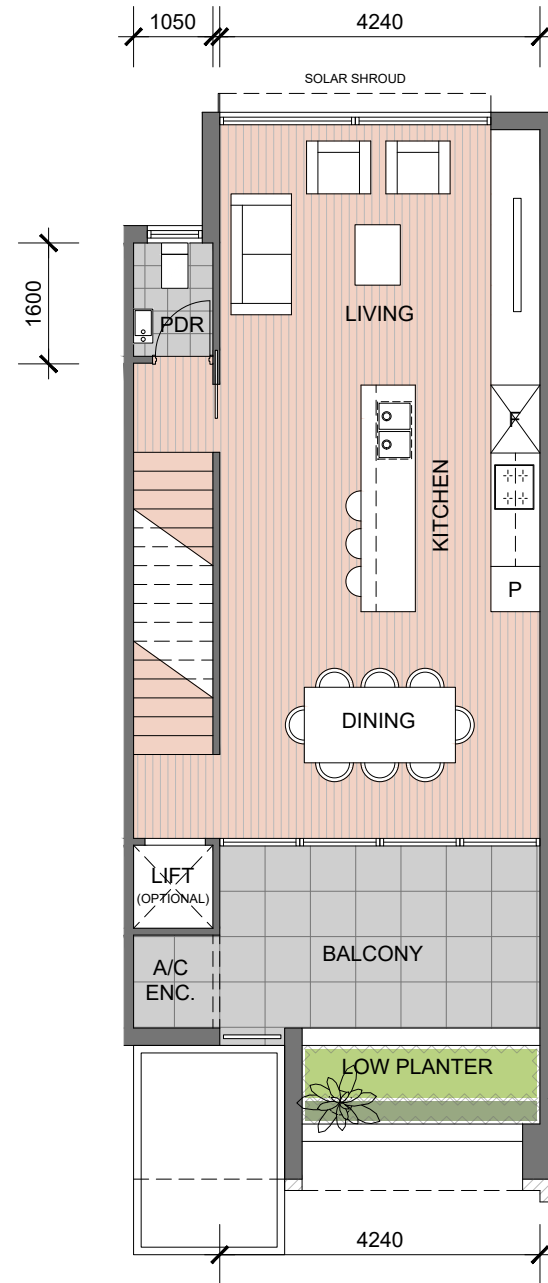
FIRST FLOOR PLAN
SCALE 1:100 @ A3



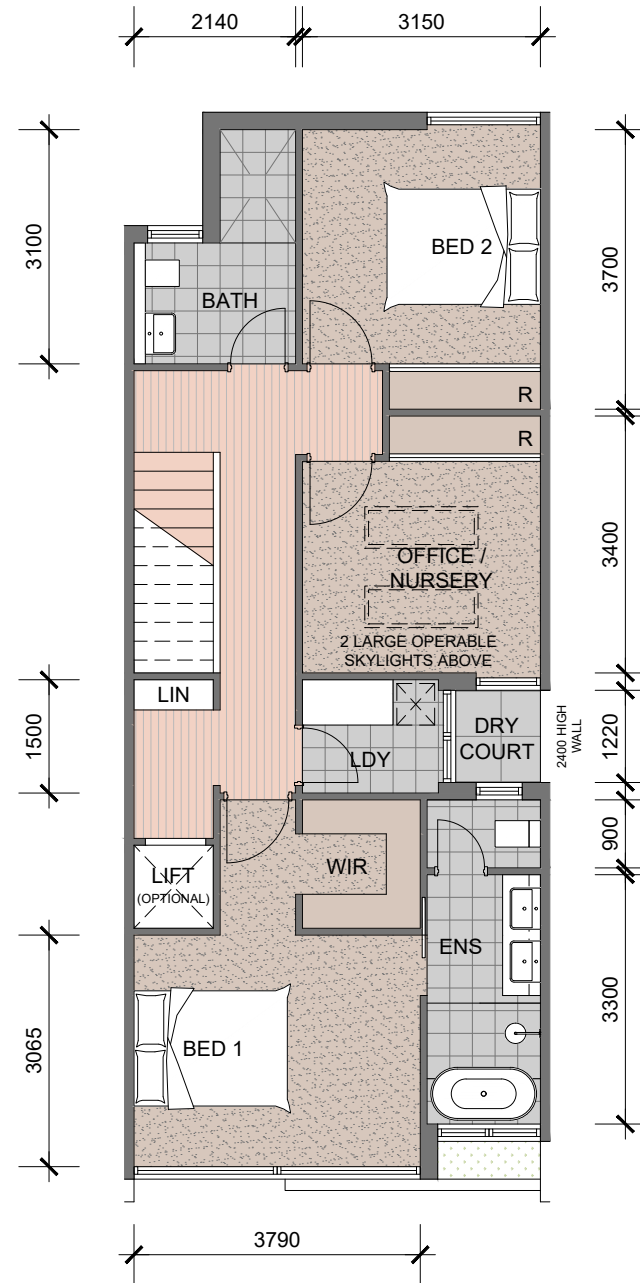
SECOND FLOOR PLAN
SCALE 1:100 @ A3



GROUND FLOOR PLAN
SCALE 1:100 @ A3



FIRST FLOOR PLAN
SCALE 1:100 @ A3



SECOND FLOOR PLAN
SCALE 1:100 @ A3

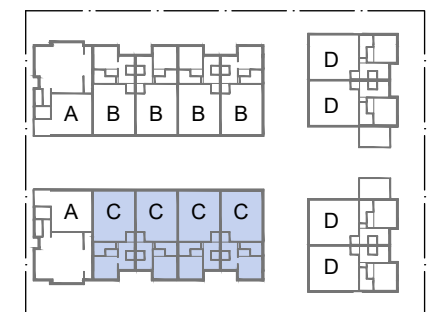
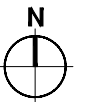
TH TYPE C

LOCKHART ST

117 - 119 LOCKHART STREET

BED	x 3
OFFICE / NURSERY	x 1
BATH	x 3.5

AREA	
GARAGE + STORE	- 37.6m ²
GROUND LIVING	- 27.9m ²
FIRST LIVING	- 54.6m ²
SECOND LIVING	- 75.7m ²
TOTAL	- 195.8m²
BALCONY+PLANTER	- 17.8m ²
DRY COURT	- 1.5m ²
GARDEN	- 17.3m ²
TOTAL	- 36.6m²
(OUTDOOR LIVING AREA)	



TH TYPE D

LOCKHART ST

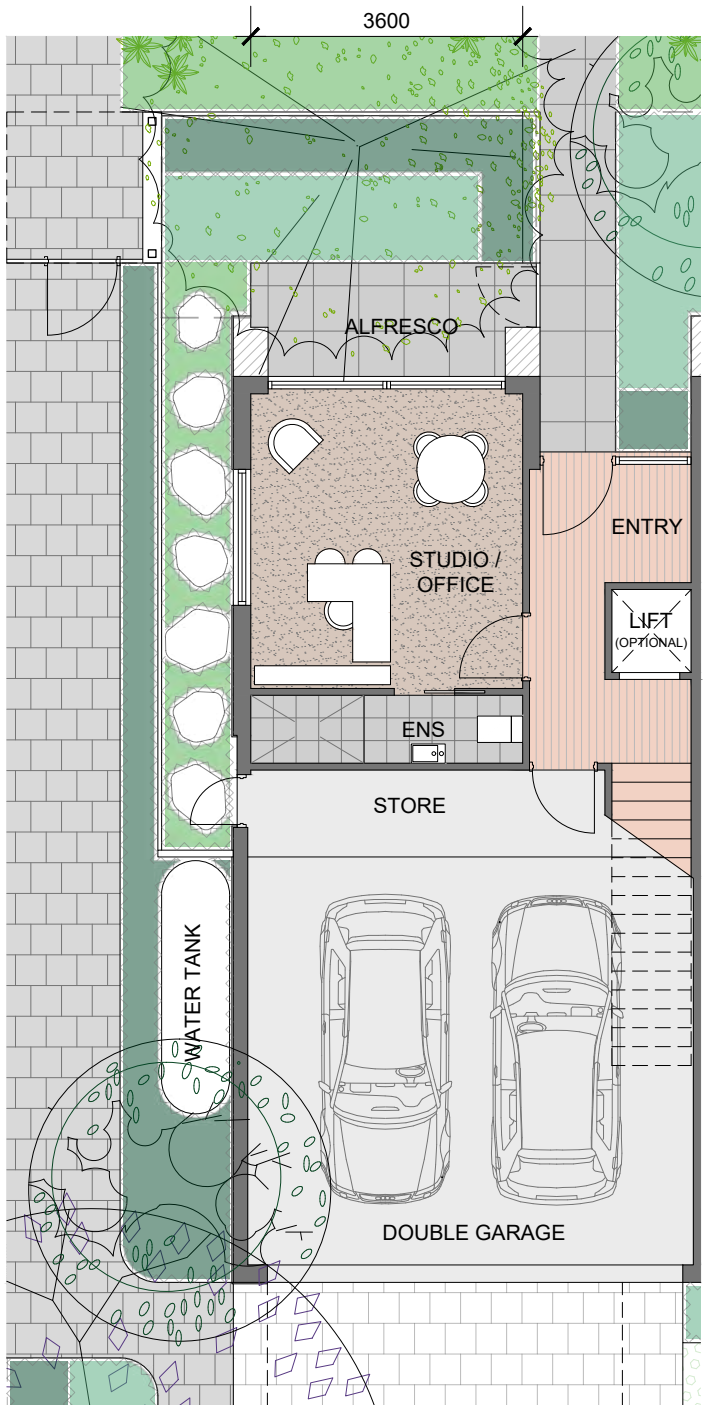
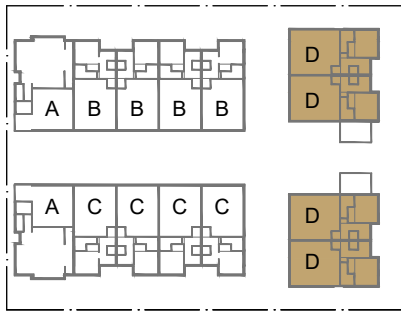
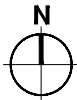
117 - 119 LOCKHART STREET



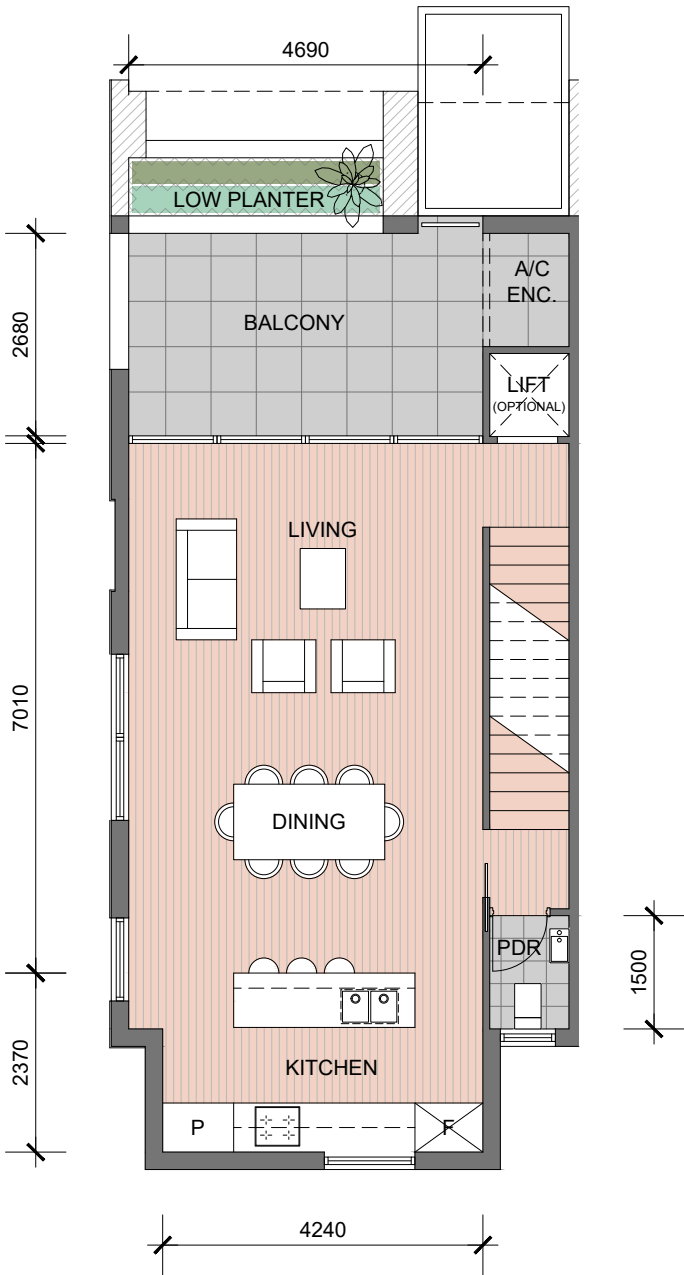
BED x 3
OFFICE/STUDIO x 1
BATH x 3.5

AREA
GARAGE + STORE - 40.8m²
GROUND LIVING - 31.2m²
FIRST LIVING - 59.0m²
SECOND LIVING - 83.0m²
MEZZANINE - 28.8m²
TOTAL - 242.8m²

BALCONY+PLANTER - 24.4m²
DRY COURT - 1.9m²
GARDEN - 24.5m²
TOTAL - 50.8m²
(OUTDOOR LIVING AREA)



GROUND FLOOR PLAN
SCALE 1:100 @ A3



FIRST FLOOR PLAN
SCALE 1:100 @ A3

TH TYPE D

LOCKHART ST

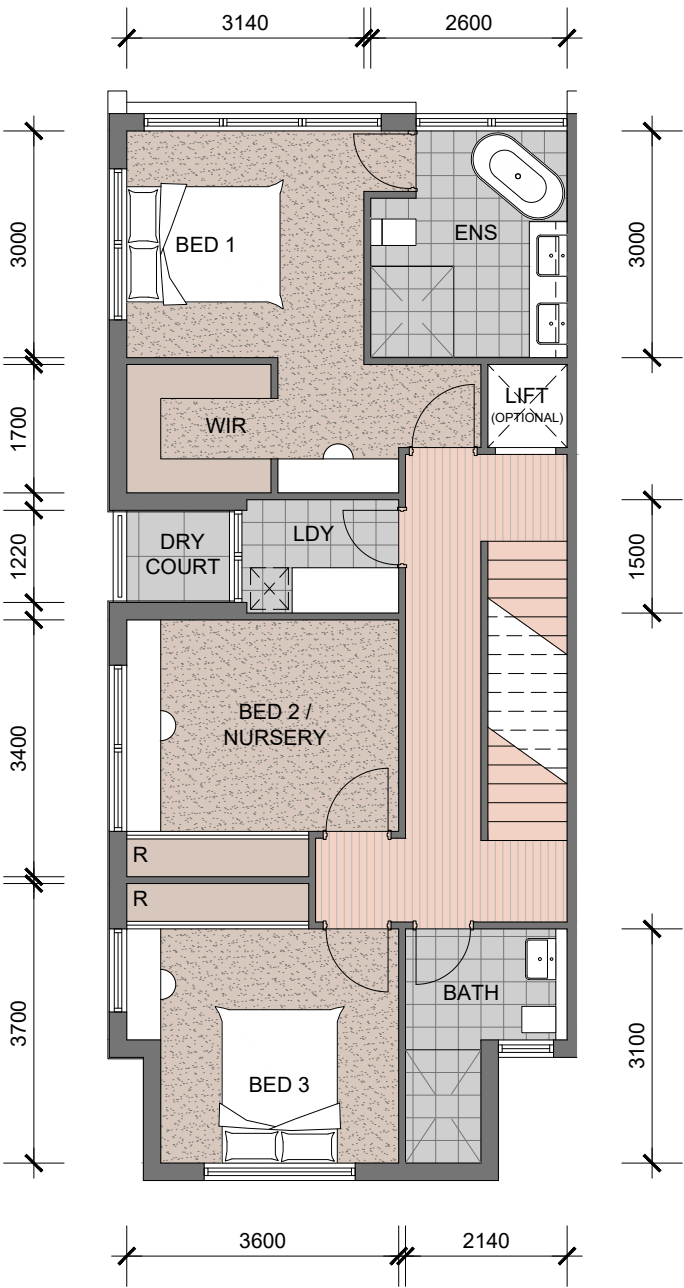
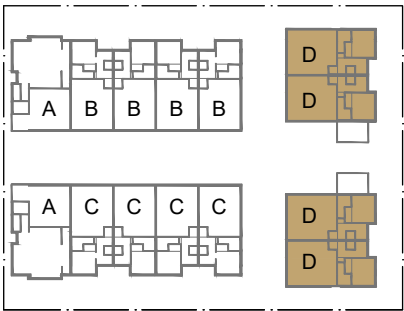
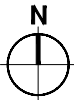
117 - 119 LOCKHART STREET



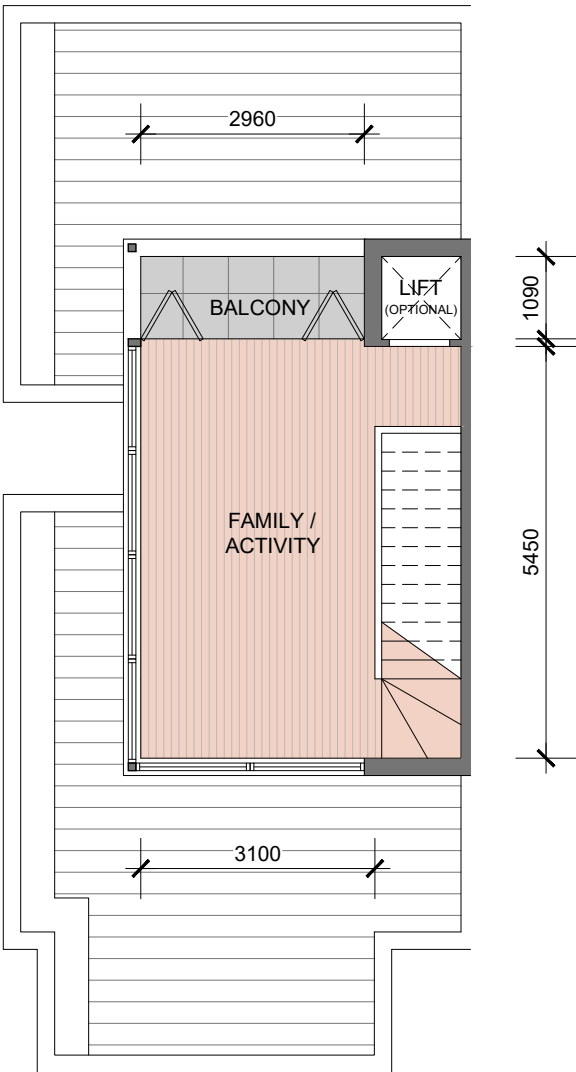
BED	x 3
OFFICE/STUDIO	x 1
BATH	x 3.5

AREA	
GARAGE + STORE	- 40.8m ²
GROUND LIVING	- 31.2m ²
FIRST LIVING	- 59.0m ²
SECOND LIVING	- 83.0m ²
MEZZANINE	- 28.8m ²
TOTAL	- 242.8m ²

BALCONY+PLANTER	- 24.4m ²
DRY COURT	- 1.9m ²
GARDEN	- 24.5m ²
TOTAL	- 50.8m ²
(OUTDOOR LIVING AREA)	



SECOND FLOOR PLAN
SCALE 1:100 @ A3



MEZZANINE FLOOR PLAN
SCALE 1:100 @ A3



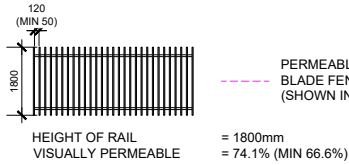
NORTH ELEVATION

SCALE 1:100 @A1, 1:200 @A3

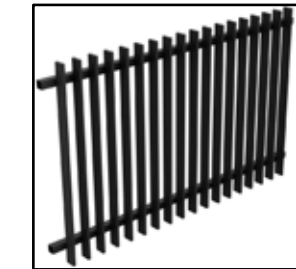


INTERNAL NORTH ELEVATION

SCALE 1:100 @A1, 1:200 @A3



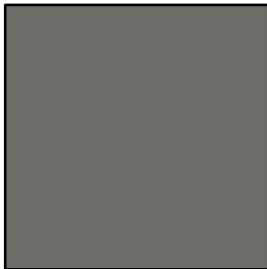
BLADE FENCING
(DULUX POWDER COAT NIGHT SKY)



WINDOW FRAME
(DULUX POWDER COAT NIGHT SKY)



EXTERNAL PAINT RENDER
(DARK DULUX PEWTER FRAME)



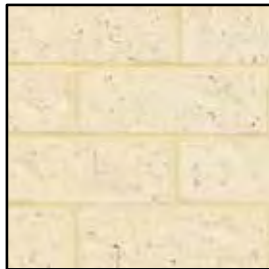
EXTERNAL PAINT RENDER
(LIGHT DULUX LEXICON HALF)



EXTERNAL PAINT RENDER
(MID DULUX FEATHER SOFT)



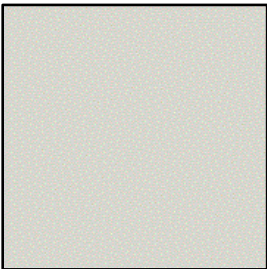
FACE BRICK MIDLAND BRICK
(LIMESTONE HUE CLASSIC RANGE)



FACE BRICK MIDLAND BRICK
(NOUVEAU GREY CLASSIC RANGE)



GARGAGE DOORS
(COLORBOND SURFMIST)



SOFFITS TO ALFRESCO
(CAPRI LINING GOLDEN OAK)





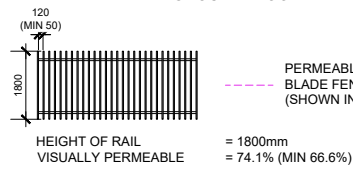
SOUTH ELEVATION

SCALE 1:100 @A1, 1:200 @A3

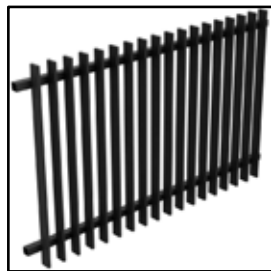


INTERNAL SOUTH ELEVATION

SCALE 1:100 @A1, 1:200 @A3



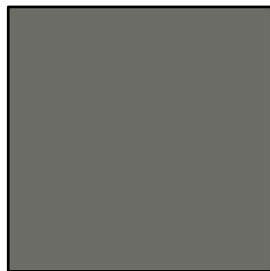
BLADE FENCING
(DULUX POWDER COAT NIGHT SKY)



WINDOW FRAME
(DULUX POWDER COAT NIGHT SKY)



EXTERNAL PAINT RENDER
(DARK DULUX PEWTER FRAME)



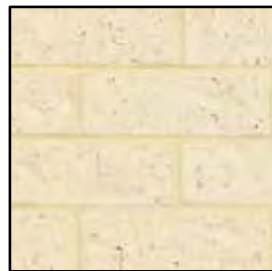
EXTERNAL PAINT RENDER
(LIGHT DULUX LEXICON HALF)



EXTERNAL PAINT RENDER
(MID DULUX FEATHER SOFT)



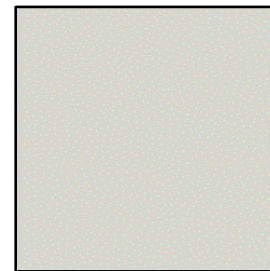
FACE BRICK MIDLAND BRICK
(LIMESTONE HUE CLASSIC RANGE)



FACE BRICK MIDLAND BRICK
(NOUVEAU GREY CLASSIC RANGE)



GARGAGE DOORS
(COLORBOND SURFMIST)



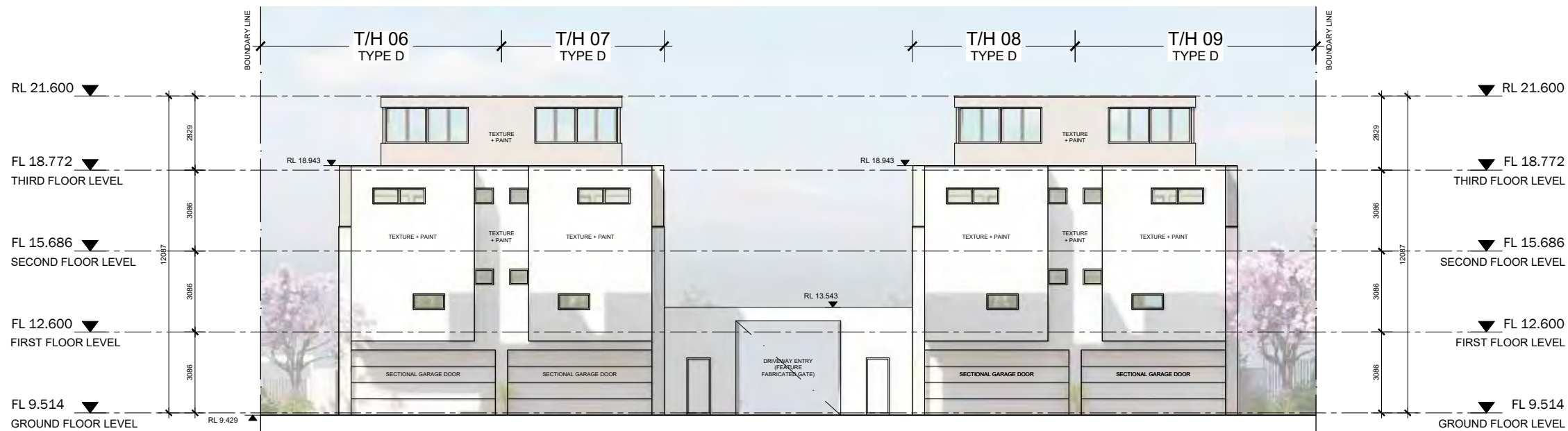
SOFFITS TO ALFRESCO
(CAPRI LINING GOLDEN OAK)





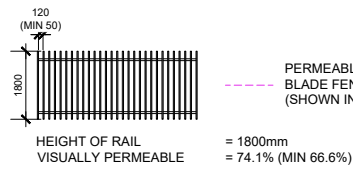
WEST ELEVATION

SCALE 1:100 @A1, 1:200 @A3

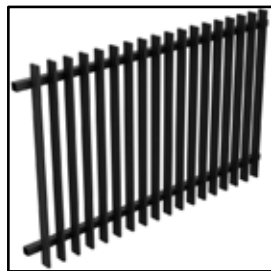


INTERNAL WEST ELEVATION

SCALE 1:100 @A1, 1:200 @A3



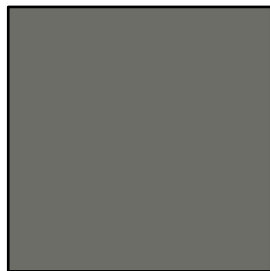
BLADE FENCING
(DULUX POWDER COAT NIGHT SKY)



WINDOW FRAME
(DULUX POWDER COAT NIGHT SKY)



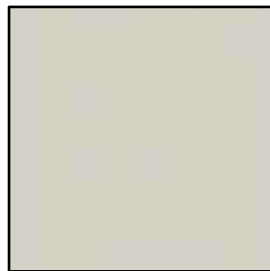
EXTERNAL PAINT RENDER
(DARK DULUX PEWTER FRAME)



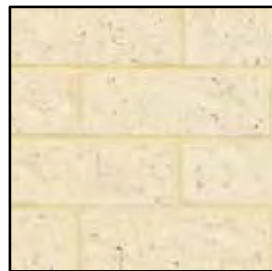
EXTERNAL PAINT RENDER
(LIGHT DULUX LEXICON HALF)



EXTERNAL PAINT RENDER
(MID DULUX FEATHER SOFT)



FACE BRICK MIDLAND BRICK
(LIMESTONE HUE CLASSIC RANGE)



FACE BRICK MIDLAND BRICK
(NOUVEAU GREY CLASSIC RANGE)

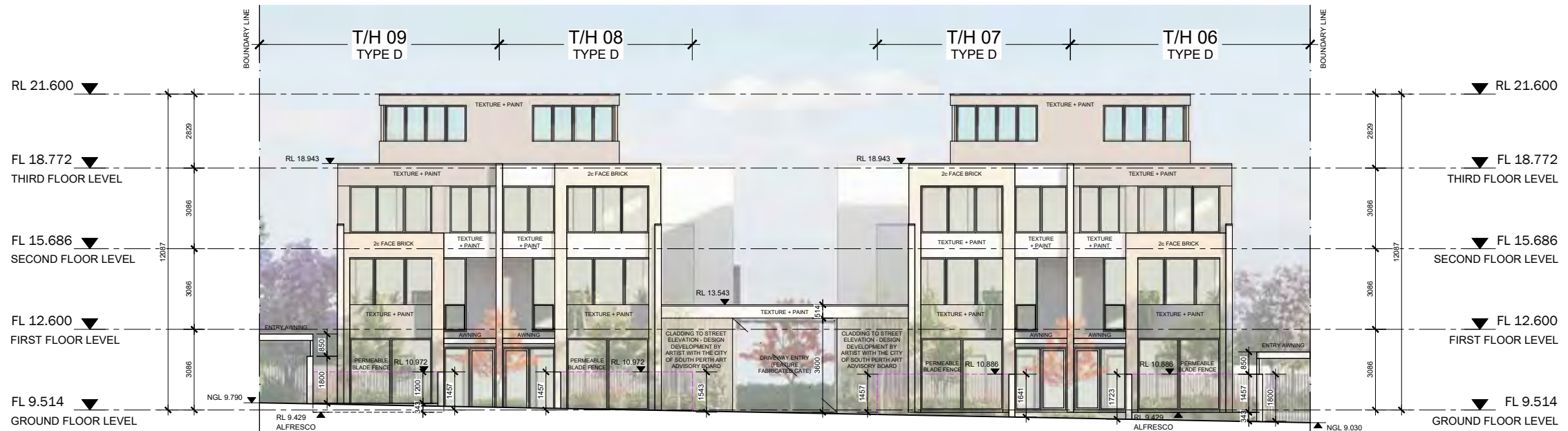


GARGAGE DOORS
(COLORBOND SURFMIST)



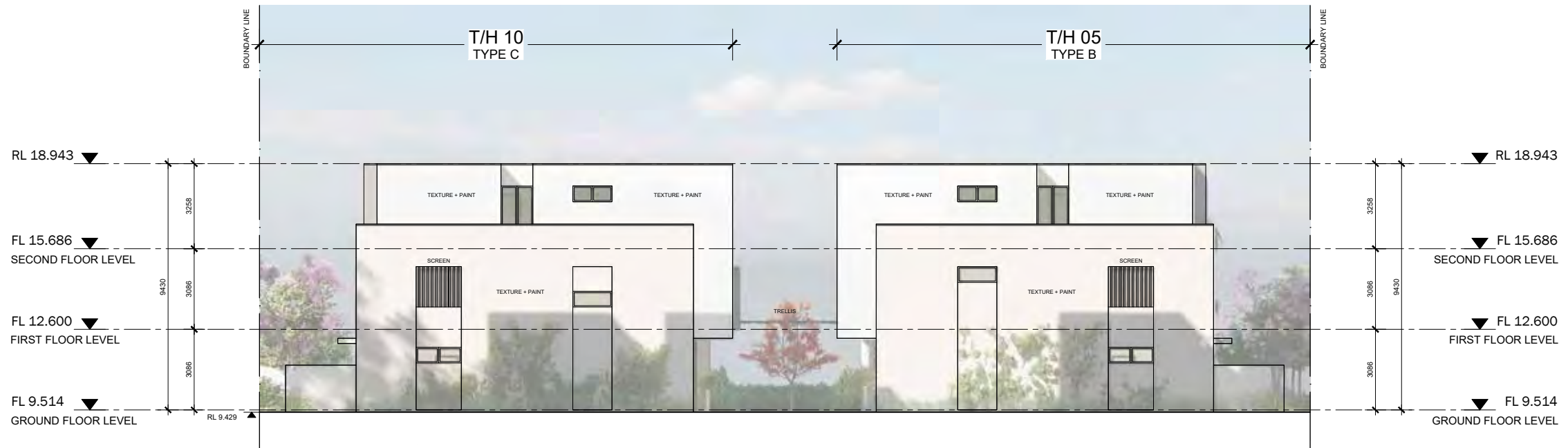
SOFFITS TO ALFRESCO
(CAPRI LINING GOLDEN OAK)





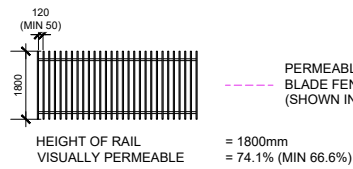
WEST ELEVATION

SCALE 1:100 @A1, 1:200 @A3

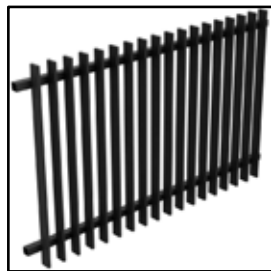


INTERNAL WEST ELEVATION

SCALE 1:100 @A1, 1:200 @A3



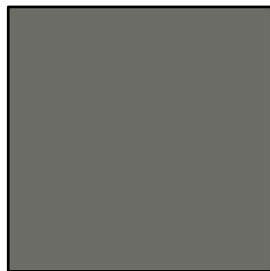
BLADE FENCING
(DULUX POWDER COAT NIGHT SKY)



WINDOW FRAME
(DULUX POWDER COAT NIGHT SKY)



EXTERNAL PAINT RENDER
(DARK DULUX PEWTER FRAME)



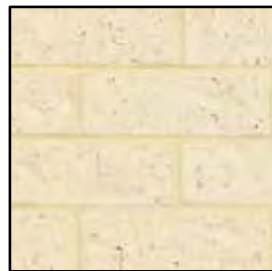
EXTERNAL PAINT RENDER
(LIGHT DULUX LEXICON HALF)



EXTERNAL PAINT RENDER
(MID DULUX FEATHER SOFT)



FACE BRICK MIDLAND BRICK
(LIMESTONE HUE CLASSIC RANGE)



FACE BRICK MIDLAND BRICK
(NOUVEAU GREY CLASSIC RANGE)

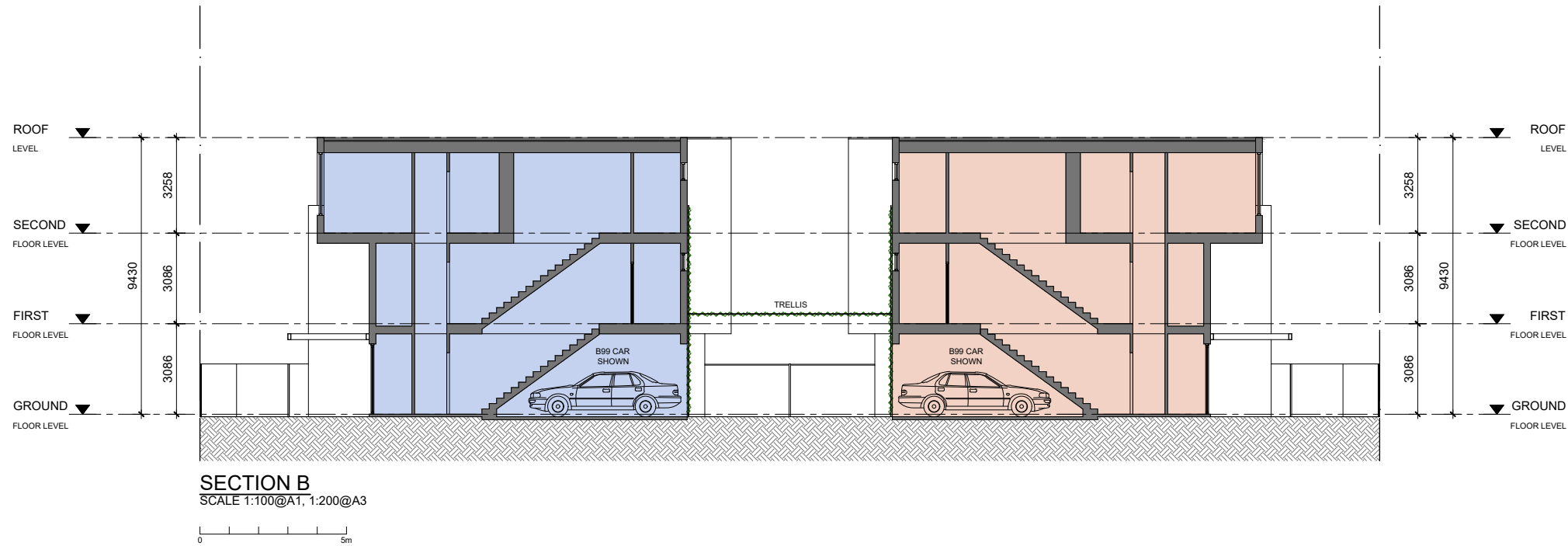
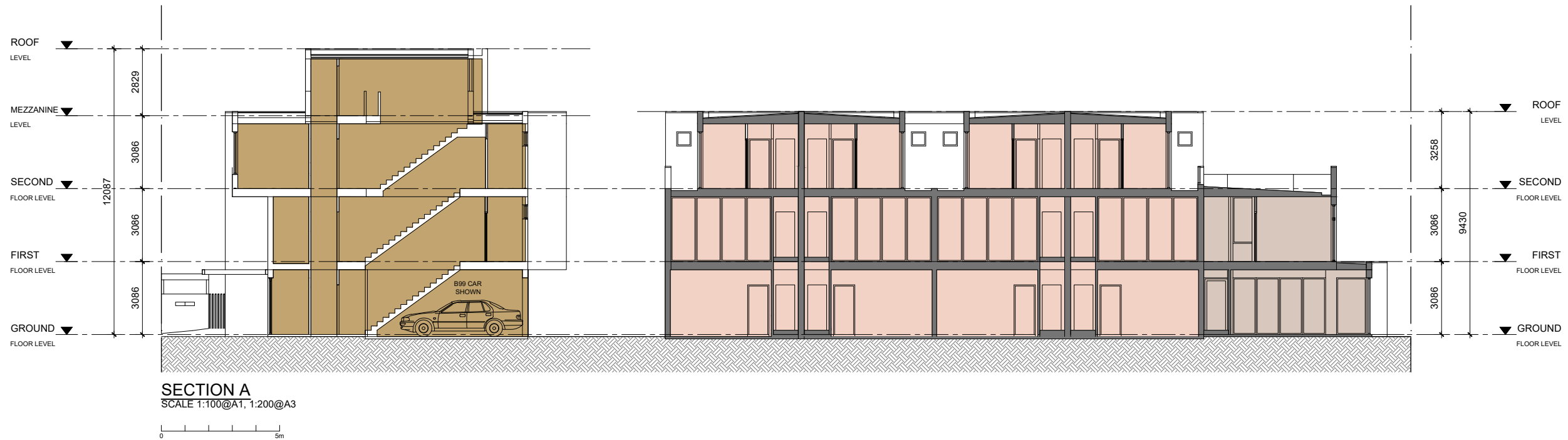


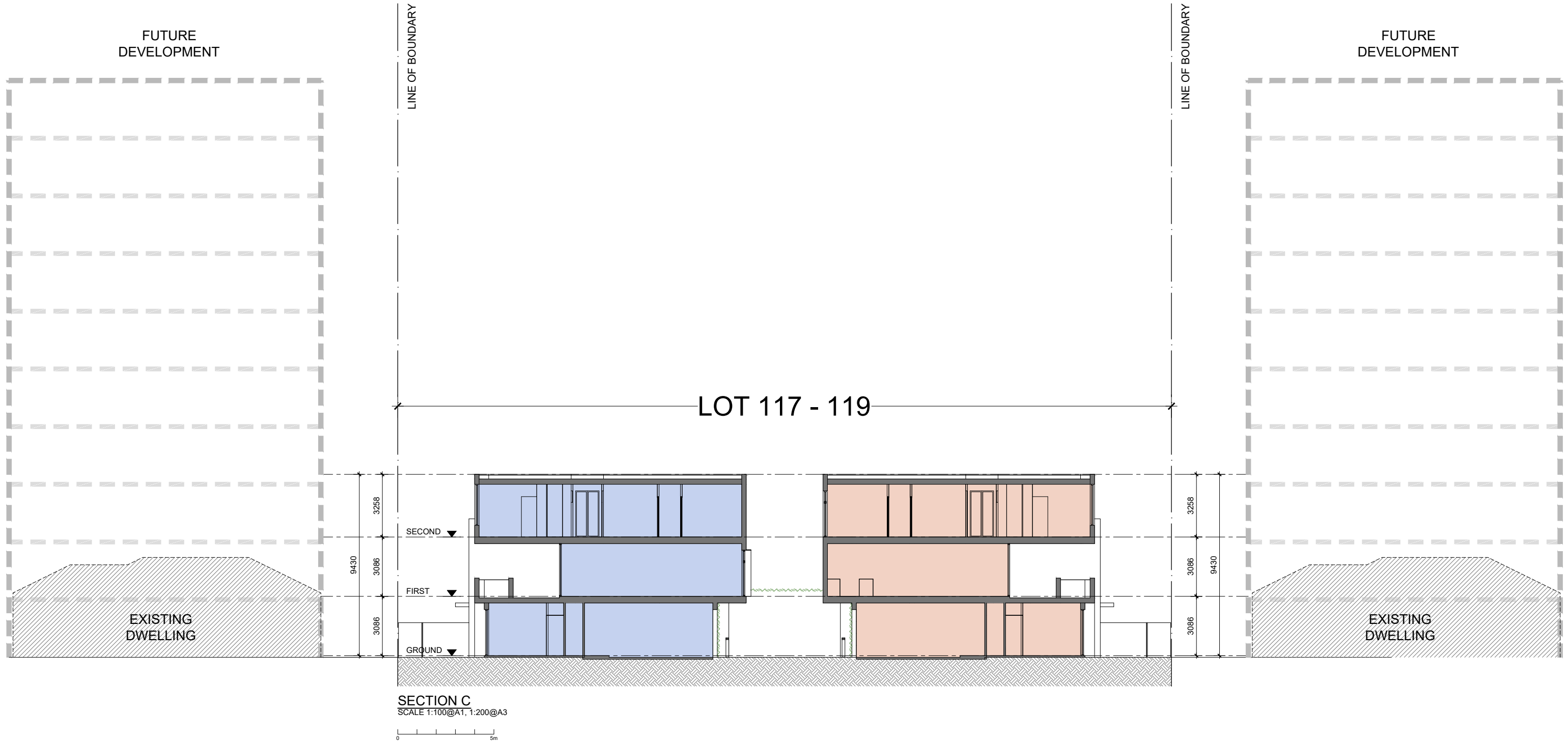
GARGAGE DOORS
(COLORBOND SURFMIST)



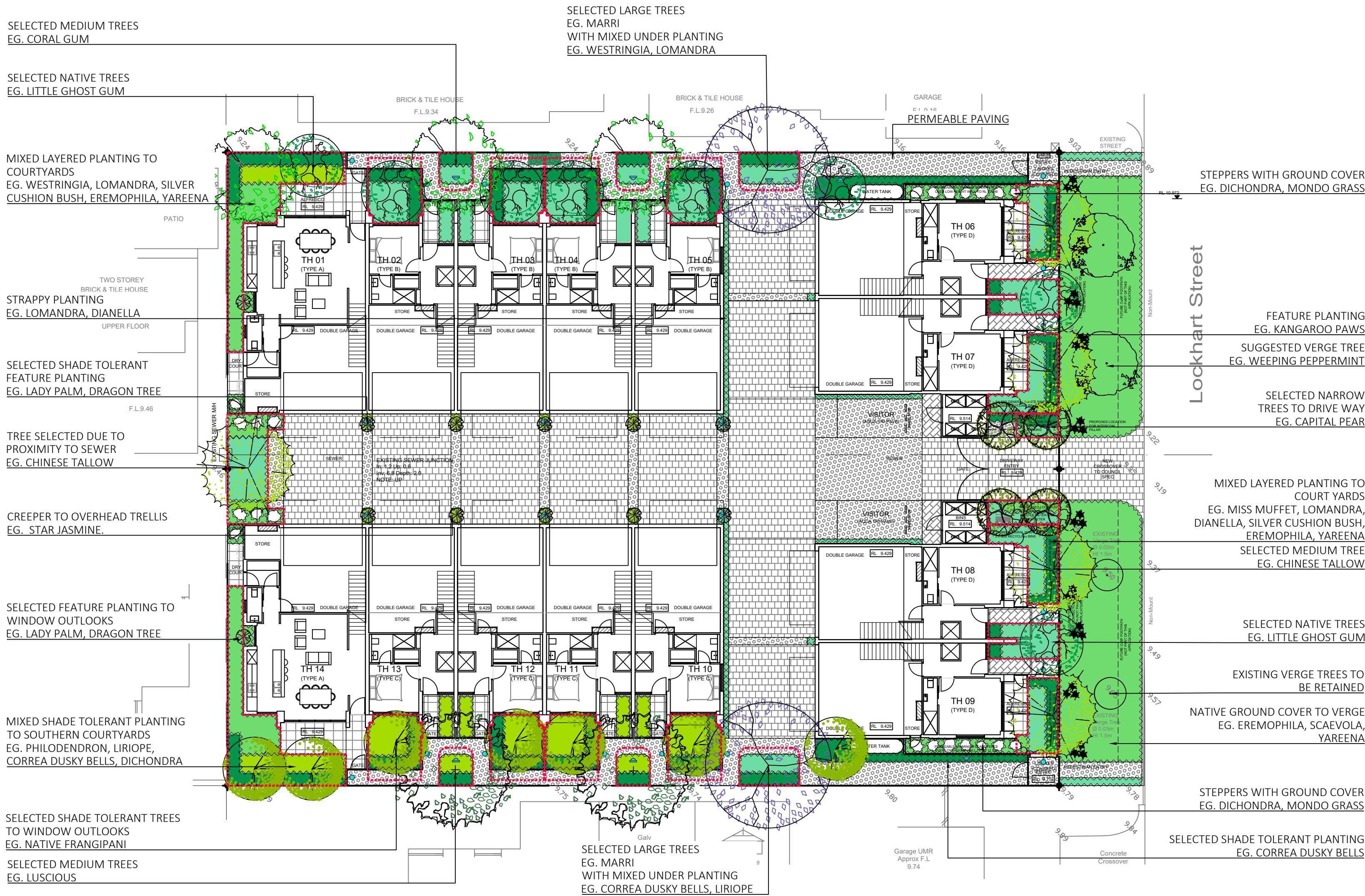
SOFFITS TO ALFRESCO
(CAPRI LINING GOLDEN OAK)







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3. ALL MEASUREMENTS TO BE CHECKED PRIOR TO CONSTRUCTION.



REFER TO PAGE 102 FOR
NOTES AND FIRST FLOOR
LANDSCAPE CONCEPT PLAN

LANDSCAPE AREA CALCULATIONS
LANDSCAPE AREAS
Total Landscape areas (all levels) = 404.7m² (17.3% of site)
DEEP SOIL AREAS (DSA)
Ground Floor (into natural earth) = 291m²
Total = 312.5m² (14.7% of site)
CANOPY COVER
Proposed Large Trees (8m canopy) x 2 = 100.6m²
Proposed Large Trees (7m canopy) x 2 = 77m²
Proposed Medium Trees (6m canopy) x 8 = 226.4m²
Proposed Small Trees (4m canopy) x 15 = 189m²
Proposed Small Trees (3m canopy) x 4 = 28m²
Total Canopy Cover = 621m² (29% of site)

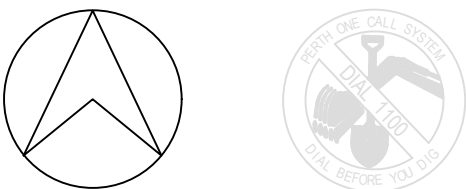
LEGEND
TREES
EXISTING VERGE TREES
TO REMAIN
SUGGESTED VERGE TREES
EG. WEeping PEPPERMINT
SELECTED SMALL TREES
EG. CAPITAL PEAR
CANOPY: 3m
SELECTED SMALL TREES
EG. LITTLE GHOST GUM
CANOPY: 4m
SELECTED SMALL TREES
EG. NATIVE FRANGIPANI
CANOPY: 4m
SELECTED MEDIUM TREES
EG. CORAL GUM
CANOPY: 6m
SELECTED MEDIUM TREES
EG. CHINESE TALLOW
CANOPY: 6m
SELECTED MEDIUM TREES
EG. LUSCIOUS
CANOPY: 7m
SELECTED LARGE TREES
EG. MARRI
CANOPY: 8m
FEATURE PLANTS
SELECTED FEATURE PLANTING
EG. PALMS AND KANGAROO PAWS
PLANTING
PLANTING TYPE 01
GROUNDCOVERS
PLANTING TYPE 02
SHRUBS
PLANTING TYPE 03
STRAPPY/MIXED
PLANTING TYPE 04
SHADE TOLERANT
DEEP SOIL AREAS (DSA)
PERMEABLE PAVING
EG. TRIPAVE

PLANTING IMAGES

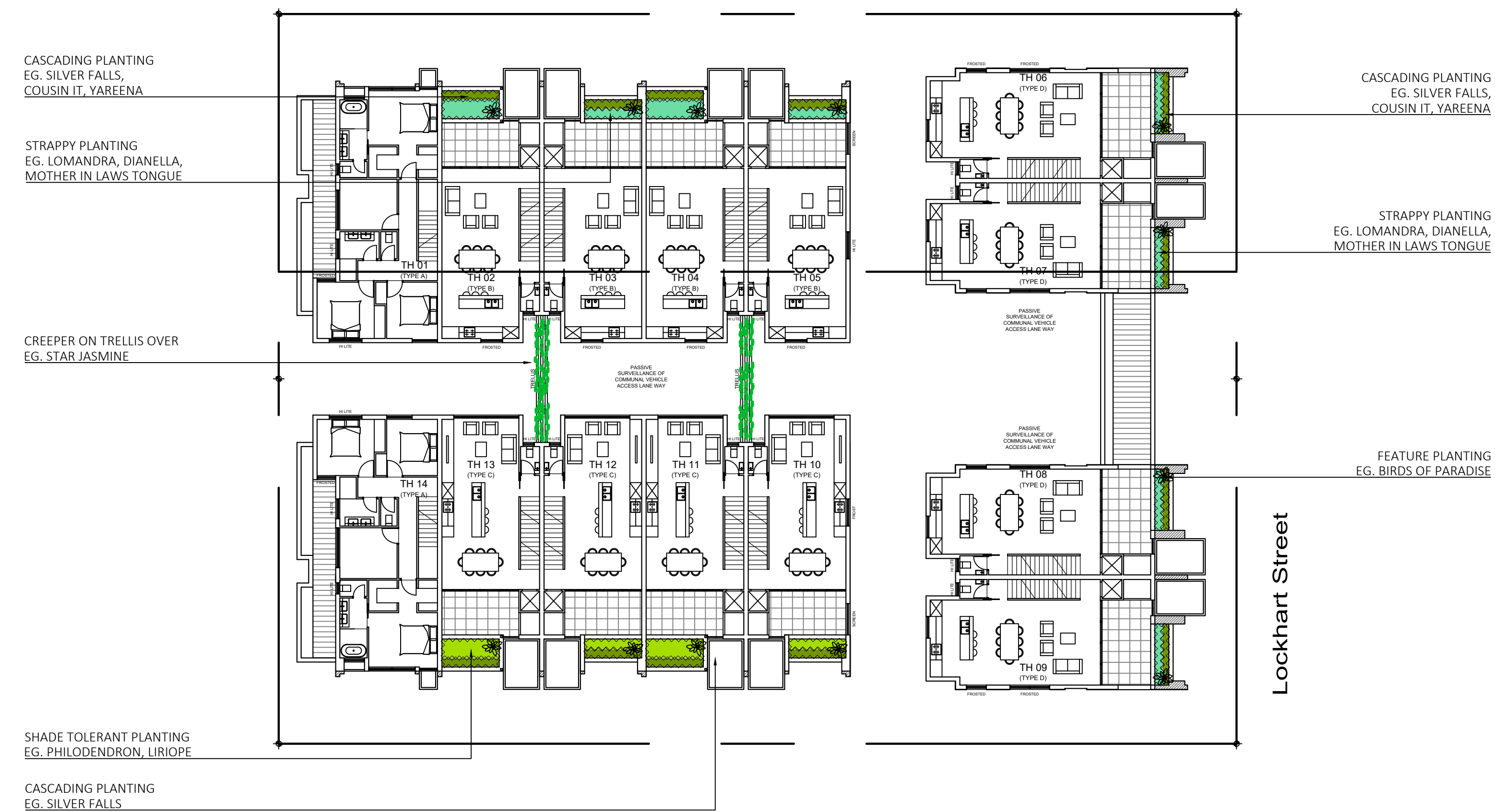


PLANTING PALETTE

Symbol	Species	Common Name	Quantities	Size
Trees:				
CORcal	Corymbia calophylla	Marri Tree	As Shown	100L
EUQcor	Eucalyptus torquata	Coral Gum	As Shown	100L
EUQvic	Eucalyptus vidrix	Little Ghost Gum	As Shown	100L
HYMfla	Hymenoporum flavum	Native Frangipani	As Shown	100L
PYRcal	Pyrus calleryana	Capital Pear	As Shown	100L
SAPseb	Sapium sebifera	Chinese Tallow	As Shown	100L
TRILau	Tristanopsis laurina	Luscious	As Shown	100L
Shrubs and Groundcovers:				
CORdus	Correa 'Dusky Bells'	Dusky Bells	2/1m	200mm
DIAeme	Dianella tasmanica 'Emerald Arch'	Emerald Arch	3/m2	140mm
DIAbia	Dianella tasmanica 'Blaze'	Blaze	3/m2	140mm
DICrep	Dichondra repens	Kidney Weed	3/m2	140mm
DICsil	Dichondra 'Silver Falls'	Silver Falls	3/m2	140mm
EREBlu	Eremophila 'Blue Horizon'	Blue Horizon	3/m2	140mm
GREgin	Grevillea 'Gin Gin Gem'	Gin Gin Gem	3/m2	140mm
LEUbro	Leucophylon brownii	Silver Cushion Bush	3/m2	140mm
LIRjus	Liriope 'Just Right'	Just Right	3/m2	140mm
LOMTan	Lomandra 'Tanika'	Tanika	3/m2	200mm
OPHjap	Ophiopogon japonicus	Modno grass	3/m2	140mm
PHIXan	Phiolodendron Xanadu	Xanadu	3/m2	140mm
PITmis	Pittosporum tobira 'Miss Muffet'	Miss Muffet	2/1m	200mm
MYOpar	Myoporum parvifolium 'Yareena'	Yareena	3/m2	140mm
SANtri	Sansevieria trifasciata laurentii	Mother-in-law's Tongue	3/m2	200mm
SCAhum	Scaevola humilis 'Purple Fusion'	Fan Flower	3/m2	140mm
TRAJas	Trachelospermum jasminoides	Star Jasmine	2/1m	140mm
WESgre	Westringia 'Grey Box'	Compact Coastal Rosemary	2/1m	200mm
Feature Plants:				
ANIrub	Anigozanthos 'Ruby Velvet'	Kangaroo Paw	As Shown	12L
DRAMar	Dracaena marginata	Dragon Tree	As Shown	12L
RHAexc	Rhepiss excelsa	Lady Palm	As Shown	12L



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LEGEND PLANTING

- PLANTING TYPE 03
STRAPPY/MIXED
- PLANTING TYPE 04
SHADE TOLERANT
- PLANTING TYPE 05
CASCADING

FEATURE PLANTS



SELECTED FEATURE PLANTING
BIRDS OF PARADISE

NOTES

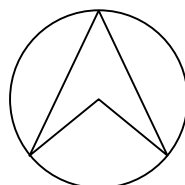
- GENERAL
 - DRAINAGE FROM THE RAISED PLANTER AREAS AND POTS TO BE PROVIDED BY BUILDER
 - ALL SCALES ARE AS NOTED AND TO SUIT A1 PAPER SIZE
 - THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT SCHEDULES, REPORTS AND DRAWINGS AND PROJECT SPECIFICATIONS
 - FOR ALL FINISHED LEVELS, PLANTER HEIGHTS, DRAINAGE DESIGN AND WATER CONNECTION POINTS REFER TO ASSOCIATED PROJECT DOCUMENTATION (BY OTHERS).
 - FOR ALL ASSOCIATED IRRIGATION DESIGN REFER TO IRRIGATION DOCUMENTATION AND SPECIFICATION (TO FUTURE DETAIL).
- SOIL PREPARATION
 - ALL AREAS ARE TO BE FINE GRADED EVENLY TO CONFORM TO KERB LEVELS AND SURROUNDING FINISHES.
 - SURFACES SHALL BE FREE FROM DEPRESSIONS, IRREGULARITIES AND NOTICEABLE CHANGES IN GRADE. GENERALLY, GRADES SHALL DEViate IN LEVEL NO GREATER THAN 20mm IN ONE LINEAR METRE.
 - PLANTED AREAS SHALL BE SPREAD WITH MIN. 50mm OF APPROVED STANDARD SOIL CONDITIONER THAT SHALL BE RIPPED INTO EXISTING SOIL TO A MIN. DEPTH OF 200mm.
 - RAISED PLANTER AREAS AND POTS SHALL BE INSTALLED WITH APPROPRIATE DRAINAGE CELL, AGGREGATE AND GEOTEXTILE MEMBRANE BELOW SOIL.
 - FILL SOIL TO RAISED PLANTER AREAS AND POTS TO BE APPROVED LIGHTWEIGHT LANDSCAPE MIX.
 - ALL SITE AND IMPORTED SOILS, POTTING MIX, SOIL CONDITIONERS AND MULCHES TO BE IN ACCORDANCE TO RELEVANT AUSTRALIAN STANDARDS.
- PLANTING
 - PLANTED AREAS SHALL BE MULCHED WITH AN ORGANIC MULCH UNLESS OTHERWISE STATED TO A MINIMUM DEPTH OF 75mm.
 - ADVANCED TREES SHALL BE STAKED W/ 50x50mm DIA HARDWOOD POSTS. POSTS SHALL BE PAINTED BLACK AND INSTALLED TO A MIN DEPTH OF 500mm. TREES SHALL BE SECURED TO POLES W/ RUBBER TIES IN FIGURE 8.
 - TREES PLANTED WITH IN 1000mm OF BOUNDARY WALLS AND/OR PARKING AREAS SHALL BE INSTALLED WITHIN 600mm DEPTH NYLEX ROOT BARRIER MEMBRANE. MEMBRANE SHALL BE INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS.
 - REFER TO PLANTING SCHEDULE FOR PROPOSED SPECIES, SPACING AND SIZES.
 - PLANTS TO BE SET OUT IN EVEN SPACING TO FILL THE DESIGNATED AREAS.
 - IN AREAS OF MIXED PLANTING, SPECIES TO BE SPREAD OUT AT RANDOM, IN GROUPINGS OF 2 OR 3.
 - PLANTS SHALL BE SUPPLIED FROM AN INDUSTRY ACCREDITED WHOLESALE NURSERY. PLANTS SHALL BE IN APPROPRIATE SIZE FOR THE LISTED POT SIZE AND IN GOOD HEALTH.
 - IF SPECIES ARE UNAVAILABLE (OR IN SIZES SPECIFIED), SUBSTITUTES MUST BE APPROVED BY SUPERINTENDENT BEFORE DELIVERY AND INSTALLATION.
- IRRIGATION
 - PLANTING TO GROUND LEVEL TO BE IRRIGATED VIA A FULLY AUTOMATIC SYSTEM FROM MAINS.
 - WATER PRESSURE TO HAVE A MINIMUM FLOW RATE OF 30L/pm AT 300kPa FROM THE WATER CONNECTION POINT (OR AS STIPULATED).
 - PLANTING TO COURTYARDS TO BE IRRIGATED VIA DIGITAL TAP TIMER (INDIVIDUAL CONNECTION POINTS TO BE PROVIDED).
 - PLANTING ON ALL UPPER LEVELS TO BE IRRIGATED VIA BATTERY OPERATED VALVE (CONNECTION POINTS TO BE PROVIDED TO EACH LEVEL).
 - CONTROLLER TO BE LOCATED IN SERVICE ROOM (OR AS SHOWN ON IRRIGATION DETAILS).
 - SLEEVES BENEATH PAVED SURFACES AND TO RAISED PLANTING AREAS TO BE PROVIDED BY OTHERS.
 - IRRIGATION TO GARDEN BEDS TO BE NETAFIM TECHLINE, SUB SURFACE IRRIGATION. INSTALLED TO MANUFACTURERS SPECIFICATION. IRRIGATION TO TUBE TO BE POP UP SPRINKLERS, MP ROTATORS OR SIMILAR. IRRIGATION TO TREES TO BE BUBBLERS; TORO FLOOD BUBBLERS OR SIMILAR.
 - ASCON DRAWINGS, MANUALS AND 12 MONTH WARRANTY SHALL BE SUPPLIED BY THE IRRIGATION CONTRACTOR TO THE CLIENT UPON PRACTICAL COMPLETION.
 - PLEASE REFER TO IRRIGATION DRAWING SET FOR FINAL LAYOUT AND SCHEDULE

PLANTING IMAGES



PLANTING PALETTE

Symbol	Species	Common Name	Quantities	Size
Shrubs and Groundcovers:				
CAScou	Casuarina glauca 'Cousin It'	Cousin It	3/m ²	140mm
DIAeme	Dianella tasmanica 'Emerald Arch'	Emerald Arch	3/m ²	140mm
DIABla	Dianella tasmanica 'Blaze'	Blaze	3/m ²	140mm
DICrep	Dichondra repens	Kidney Weed	3/m ²	140mm
DICsil	Dichondra 'Silver Falls'	Silver Falls	3/m ²	140mm
LIRjus	Liriope 'Just Right'	Just Right	3/m ²	140mm
LOMTan	Lomandra 'Tanika'	Tanika	3/m ²	200mm
MYOpar	Myoporum parvifolium 'Yareena'	Yareena	3/m ²	140mm
SANtri	Sansevieria trifasciata laurentii	Mother-in-law's Tongue	3/m ²	200mm
TRAjas	Trachelospermum jasminoides	Star Jasmine	2/linm	140mm
Feature Plants:				
STRreg	Strelitzia reginae	Birds of Paradise	As Shown	12L



Sustainable Design Report

117-119 Lockhart Street

Date: 24 June 2024
Our Reference: 23-15568
Client Job Number: Elia Como

Project Address: Lot 207 (#117) & Lot 206 (#119) Lockhart Street, Como
BCA Climate Zone: 5

Report Commissioned by: Olivii Pty Ltd

On Behalf of: Olivii Pty Ltd

Technical Contact: Nathan Peart

Document Control

Doc name:	ESD Report (GS-Buildings) - Rev 23-1.docx				
Version	Date	Author		Reviewer	
4	24/06/2024	Nathan Peart	NP	Nathan Peart	NP
	Updated report to clarify sustainability commitments				

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1 INTRODUCTION

This report has been compiled to demonstrate the sustainable initiatives and commitments for the project at Lot 207 (#117) & Lot 206 (#119) Lockhart Street, Como as per the details on the cover page. The design will integrate sustainability commitments that are equivalent to a 5-star assessment using the Green Building Council of Australia Green Star Building scorecard in order to satisfy the sustainability policies contained within the Canning Bridge Activity Centre Plan.

The recommendation in this report allows the project to meet best practice as defined by GBCA – green star buildings by committing to improvements that:

- o Delivers a new definition of a sustainable building.
- o Meets the Paris Agreement.
- o Responds to Sustainability megatrends.
- o Creates clear expectations for new buildings.
- o Delivers opportunities for supply chain transformation.

Included in the report below is an overview of the planning requirement to be met, overview of the rating tool and requirements, and an analysis of how this project meets the minimum requirements with an overview of the commitments in section 2 along with a table showing specific points targeted to achieve the 5-star green star equivalency rating applicable to this project.

2 COMPLIANCE OVERVIEW

2.1 Planning Policy

The development sits within the City of South Perth, Davilak Quarter of the Canning Bridge Activity Centre Plan and must therefore comply with Design Guidelines, Element 11 – Sustainability. This element contains five prescriptive clauses that are required to be satisfied to demonstrate the developments compliance.

Clauses 11.1 through to 11.4 only apply to non-residential developments. All levels of the development are residential, or for the use of the residents, therefore these clauses do not apply.

Clause 11.5 states: All new development shall be designed to maximise passive solar principles for heating, cooling, ventilation and energy conservation. East and west facing glazing shall be minimised and shading devices shall be employed to reduce heat loads within buildings and reduce the need for air-conditioning systems. All buildings shall be designed to enable access to natural light and cross ventilation.

All apartments have north facing living areas along with north facing windows. West or east facing glazing is only installed on a small scale where no other option exists and are well shaded, shading devices are included over all windows. Cross ventilation is provided (Assuming all windows are operable). All apartments have access to natural light.

Additionally, Clause 11.5 calls for the development to achieve a rating that is equivalent to a 5-star green star rating. This is demonstrated through the use of the Green Building Council of Australia (GBCA) Green Star building tool.

To ensure the building project meets the 5-star Green Star requirement using the GBCA calculator, the following commitments have been made:

Green Star Professional: A Green Star Accredited Professional has been appointed to the project.

Environmental Management: The builder or head contractor is committed to implementing an environmental management plan covering construction activity, with commitments to divert 80-90% of construction and demolition waste from landfill, ensuring compliance with Green Star criteria.

Metering and Performance: The building will include accessible energy and water metering for all common and major uses. It is committed to setting environmental performance targets, being designed and tested for airtightness, commissioned, and tuned. Operations and maintenance information, including instructions for building users, will be provided.

Soft Landings Approach: The project will be using a soft landings approach involving the future facilities management team.

Waste and Resource Management: The building will provide a dedicated and adequately sized waste and resource storage area, ensuring safe and efficient access for occupants and contractors.

Ventilation System: The ventilation system is being designed to mitigate outdoor pollutants, ensure ease of maintenance and cleaning, comply with ASHRAE Standard 62.1:2013 or AS 1668:2012, and provide a 50% improvement of outdoor air requirements. Kitchens and photocopy/print rooms will be exhausted separately to AS1668.2:2012.

Lighting: All LED lighting installed will meet the IEEE 1789-2015 standard, have a minimum CRI of 85, and achieve best practice illuminance levels as per AS/NZS 1680.1:2006. Light sources will have a MacAdam Ellipse or SDCM of 3 or lower, and bare light sources will be fitted with appropriate diffusers or baffles.

Daylight and Blinds: Blinds or screens will be installed in regularly occupied areas for glare reduction, and 40% of these areas will receive high levels of daylight.

Acoustic Comfort: An Acoustic Comfort Strategy will be prepared, addressing maximum and minimum internal noise levels, acoustic separation, impact noise transfer, and reverberation control.

Low-Emission Materials: The building will use low TVOC or non-toxic paints, adhesives, sealants, carpets, and engineered wood products. Occupants will not be exposed to banned or highly toxic materials.

Climate Change Resilience: The project team commits to completing a climate change pre-screening checklist, communicating climate change risks, and addressing high or extreme system-level interdependency risks. The design will maintain survivability during a blackout and address shocks and stresses impacting the building's community serviceability.

Roof and Facade: Roofing materials will comply with specified SRI values, and the facade will demonstrate a 10% improvement over a reference building modelled to National Construction Code requirements.

Carbon and Energy Reduction: The building's upfront carbon emissions and energy use will be at least 10% less than those of a reference building. A Zero Carbon Action Plan will be developed and signed off by the building owner.

Refrigerants and Water Efficiency: Refrigerants with a GWP of 10 or less will be used, and efficient water appliances will be installed.

Transport and Amenities: The building will include showers, changing facilities, bicycle parking, EV charging points. Publicly accessible spaces and design elements will enhance the urban context and public realm.

Inclusive Facilities: Gender-inclusive facilities and protective equipment will be provided during construction, with policies to reduce discrimination. The building design will ensure inclusivity, providing equitable access and diverse spaces for all users.

Ecological Value: The building site will not significantly impact a site with high ecological value. Light pollution will be minimized.

Stormwater Management: The project commits to demonstrating an 80% reduction in average annual stormwater discharge and meeting specified pollution reduction targets. Onsite retention for stormwater will be implemented, with compliant runoff management.

By committing to these principles, the building project is on track to achieve a 5-star Green Star rating, demonstrating excellence in environmental sustainability and performance.

2.2 Rating Tool

The Green Star Buildings rating is determined by comparing the percentage of available points achieved out of the 100 total available points. Points are available within 8 categories:

The rating features eight categories:

Responsible

Recognises activities that ensure the building is designed, procured, built, and handed over in a responsible manner.

Places

Supports the creation of safe, enjoyable, integrated, and comfortable places.

Healthy

Promotes actions and solutions that improve the physical and mental health of occupants.

People

Encourages solutions that address the social health of the community.

Resilient

Encourages solutions that address the capacity of the building to bounce back from short-term shocks and long-term stresses.

Nature

Encourages active connections between people and nature and rewards creating biodiverse green spaces in cities.

Positive

Encourages a positive contribution to key environmental issues of carbon, water, and the impact of materials.

Leadership

Recognises projects that set a strategic direction, build a vision for industry, or enhance the industry's capacity to innovate.

Within each of these categories there are mandatory requirements along with optional points to be met. The rating scale shown below details the percentage thresholds for the Star ratings awarded.

- Legal compliance – The building is compliant with legislation (National Construction Code – 2019 or later)
- Good Practice – The building meets the Minimum Expectations of good practice – energy and water efficient, good indoor environment quality, and built to operate well.
- 4 Star – reflects a Best Practice environmental performer. It builds on the Minimum Expectations to deliver a building that is either climate positive or a higher performer in energy, water, and health related issues (15 out of 100 points)
- 5 Star – demonstrates Australian Excellence by being a high environmental performer that addresses social issues relevant to the building owner (35 out of 100 points)

- 6 Star – showcases World Leadership. It has been built to be a highly efficient building fully powered by renewables that addresses a significant number of environmental and social issues, and contributes to the community (70 out of 100 points)

This project is targeting a 5 Star rating, therefore needs a minimum of 35 points in addition to the minimum expectations.

3 ANALYSIS AND MODELLING

3.1 Scorecard

The following summary demonstrates the overall green star rating and total points achieved.

Green Star Buildings - Summary of Results			
Climate Positive Pathway targeted	No	Targeted Green Star rating	5 Stars
Minimum expectations met	Yes	Total points targeted	35

The table on the following pages demonstrates the points to be targeted along with minimum expectations required to be met. The items that are in grey text out are not being targeted, but rather left in the table to provide guidance on possible substitutes, if required.

#	Credit	Points Available	Points Targeted	Criteria/Comments	Responsibility
Responsible		17			
1	Industry Development	1	1	The building owner or developer has appointed a Green Star Accredited Professional.	
2	Responsible Construction	1	1	- The builder or head contractor to implement an environmental management plan to cover the scope of construction activities 80% of construction and demolition waste to be diverted from landfill (ME). 90% of construction and demolition waste to be diverted from landfill, and waste contractors and facilities comply with the Green Star Construction and Demolition Waste Reporting Criteria.	B
3	Verification and Handover	1	1	- The building to have accessible energy and water metering for all common uses, major uses, and major sources. The building has set environmental performance targets, designed and tested for airtightness, been commissioned, and will be tuned. The project team create and deliver operations and maintenance information including descriptions of the functions, intended operation, and maintenance requirements of individual nominated building systems. Information is to be provided to building users on how to best use the building (ME). - The project uses a soft landings approach that involves the future facilities management team.	D/B
4	Operational Waste	0	-	The building provides a dedicated and adequately sized waste and resource storage area. The building ensures safe and efficient access to waste and resource storage areas for both occupants and waste and resource collection contractors (ME).	D
5	Responsible Procurement	1	-	The building's design and construction procurement processes follow ISO 20400 Sustainable Procurement – Guidance by undertaking a risk and opportunities assessment.	
6	Responsible Structure	5		50% of all structural components (by cost) to meet a Responsible Products Value of at least 10 (3 Points) 10% of all products in the structure (by cost) to meet a Responsible Products Value of at least 15 (2 Points) 80% of all products in the structure (by cost) to meet a Responsible Products Value of at least 10 (2 Points)	D/B
7	Responsible Envelope	4		30% of all building envelope components (by cost) to meet a Responsible Products Value of at least 10 (2 Points) 10% of all building envelope components (by cost) to meet a Responsible Products Value of at least 15 (2 Points) 60% of all products in the structure (by cost) to meet a Responsible Products Value of at least 10 (2 Points)	D/B
8	Responsible Systems	2		20% of all active building systems (by cost) to meet a Responsible Products Value of at least 6 (1 Points) 10% of all active building systems (by cost) to meet a Responsible Products Value of at least 11 (1 Points)	D/B

				80% of all active building systems (by cost) to meet a Responsible Products Value of at least 6 (1 Points)	
9	Responsible Finishes	2		40% of all internal building finishes (by cost) to meet a Responsible Products Value of at least 7 (1 Points) 10% of all internal building finishes (by cost) to meet a Responsible Products Value of at least 12 (1 Points) 60% of all internal building finishes (by cost) to meet a Responsible Products Value of at least 7 (1 Points)	D/B
		Total	3		

Healthy		14			
10	Clean Air	2	2	Ventilation System Attributes – Verification that the system has been designed to ensure, entry of outdoor pollutants is mitigated; system is designed for ease of maintenance and cleaning; and specification states system to be cleaned prior to occupation and use (ME). Ventilation systems must be designed to comply with ASHRAE Standard 62.1:2013 or AS 1668:2012 (whichever is greater) regarding minimum separation distances between pollution sources and outdoor air intakes. The building must provide a 50% improvement of outdoor air required by AS 1668.2:2012 to each space in the regularly occupied areas. Exhaust or Elimination of Pollutants- Ensure kitchens and photocopy/print rooms are exhausted separately to AS1668.2:2012.	D/M
11	Light Quality	4	4	Lighting: - o All LED lighting installed across the whole project has no observable effect as per the standard IEEE 1789-2015 - IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers (ME). - o Light sources must have a minimum Colour Rendering Index (CRI) 85 or higher, in all internal and external applications (ME). - o Light sources must meet best practice illuminance levels for each task within each space type with a maintained illuminance that meets the levels recommended in AS/NZS 1680.1:2006 series applicable to the project type and including maintenance (ME). - o The maintained Illuminance values must achieve a uniformity of no less than that specified in Table 3.2 of AS/NZS 1680.1:2006, with a maintenance factor method as defined in AS/NZS 1680.4 (ME). - o All light sources must have a MacAdam Ellipse or a Standard Deviation Colour Matching (SDCM) of 3 or lower (ME). - o Bare light sources must be fitted with baffles, louvers, translucent diffusers, ceiling design, or other means that obscures the direct light source from all viewing angles of occupants, including occupants looking directly upwards. Alternatively, for LED luminaires the Unified Glare Rating (UGR), as estimated from the manufacturers data sheets for a standard room, must not exceed the maximum values listed in Table 8.2 of AS/NZS1680.1:2006 (ME). - o Horizontal illuminance levels must meet or exceed the recommended levels in AS/NZS 1680 for the relevant task for at least 90% of the GFA. At least one wall in the field of view of a regularly occupied area is to be illuminated to create demonstrable contrast and visual interest. The total area of illuminated wall must represent at least 20% of the area of walls in the field of view. Vertical illuminance in all regularly occupied workplaces (e.g., offices, retail counters, etc), ensure that 50% of the horizontal task illuminance reaches the average eye height for 90% of primary spaces using vertical illuminance calculation grid (2 Points).	D/E

				Daylight : - o Blinds or screens to be installed in the regularly occupied areas. The blinds must provide glare reduction to at least 95% of the area of viewing façades and skylights, be controlled by all affected occupants within each individual space, and have a visual light transmittance (VLT) of $\leq 10\%$ OR Nominated planes shaded from direct sunlight for 80% of the nominated hours for each day of the autumn and spring equinoxes and the summer and winter solstices. And to be blackout blinds to bedrooms. - o 40% of the regularly occupied areas across the building must receive high levels of daylight (2 Points)	
12	Acoustic Comfort	2	2	An Acoustic Comfort Strategy is prepared to describe how the building and acoustic design aims to deliver acoustic comfort to the building occupants (ME). In addition to the Minimum Expectation, a combination of the following subject to building type - o Maximum Internal Noise Levels - o Minimum Internal Noise Levels - o Acoustic Separation - o Impact Noise Transfer - o Reverberation Control (non-residential spaces only)	D/A
13	Exposure to Toxins	2		- o The building's paints adhesives, sealants, and carpets are low in TVOC or non-toxic (ME). - o The building's engineered wood products are low in TVOC or non-toxic (ME). - o Occupants are not exposed to banned or highly toxic materials in the building (ME). - o On-site tests verify the building has low Volatile Organic Compounds (VOC) and formaldehyde levels (2 Points).	D/B
14	Amenity and Comfort	2	-	There is a Parent, Relaxation, meditation, prayer, or exercise room. Common areas provided complies.	D
15	Connection to Nature	2	2	The building provides views, includes indoor plants, and incorporates nature-inspired design. 5% of the site area is allocated to nature which occupants can engage with.	D
		Total	10		

16	Climate Change Resilience	1		The project team completes the climate change pre-screening checklist. The project team communicates the building's exposure to climate change risks to the applicant (ME). A project-specific climate change risk and adaptation assessment to be completed for the building addressing extreme high risks.	
17	Operations Resilience	2	2	The building's design and future operational plan addresses any high or extreme system-level interdependency risks. The building's design maintains a level of survivability and design purpose in a blackout. (Assumed compliance for residential dwellings).	D/O
18	Community Resilience	1	1	The building design addresses shocks and stresses that impact the building's ability to service the community and has responses to manage these. (Assumed compliance for residential dwellings).	D/O
19	Heat Resilience	1	1	Roofing materials, including shading structures, having the following: o For roof pitched <15° – a three-year SRI of minimum 64 o For roof pitched >15° – a three-year SRI of minimum 34	D
20	Grid Resilience	3	1	o The building's facade demonstrates a 10% improvement over a reference building modelled to requirements of the National Construction Code. o The building is mostly naturally ventilated (that is, the building has no mechanical cooling or heating for 80% of the building's occupiable area). o The building's occupiable area is less than 3,000sqm.	D
		Total	5		

21	Upfront Carbon Emissions	6	-	The building's upfront carbon emissions are at least 10% less than those of a reference building (ME). The building's upfront carbon emissions are at least 20% less than those of a reference building (3 Points) The building's upfront carbon emissions are at least 40% less than those of a reference building (6 Points) This requires: - Specify the use of Hansons or BGC Green Concrete (Or similar). - Specify steel to be sourced from a Responsible Steel Maker (RSI) and 60% is produced using energy reducing processes - PVC products to be registered at: http://www.vinyl.org.au/in-greenstar/best-practice-pvc-product-register - Waste contractor to be contracted to dispose of construction waste Maximum of 5KG of waste per square metre of GFA. Where an existing building less than 30 years old has been fully or partly demolished for construction, an embodied carbon calculation must be done for the demolished portion and these emissions offset.	D
22	Energy Use	6		The building's energy use is at least 10% less than a reference building (ME). The building's energy use is at least 20% less than a reference building (3 Points) The building's energy use is at least 30% less than a reference building (6 Points)	D
23	Energy Source	6		The project team must develop a Zero Carbon Action Plan for the building. The plan must be signed off by the building owner or developer and included in any operational documents for the building (ME). 100% of the building's electricity comes from renewable electricity (3 Points) 100% of the building's energy comes from renewables (3 Points)	D/E
24	Other Carbon Emissions	4	2	Refrigerants with a GWP of 10 or less is considered to comply. Natural refrigerants in most cases comply (2 points) All other emissions are eliminated from site (2 points)	D/M
25	Water Use	6	-	Efficient water appliances to be installed (ME). The building uses 45% (40% for Class 2 and Class 3 buildings) less potable water compared to a reference building (3 points) The building uses 75% (60% for Class 2 and Class 3 buildings) less potable water compared to a reference building (6 points)	D/P
26	Life Cycle Impacts	2		The project demonstrates a 30% reduction in life cycle impacts when compared to standard practice.	D
		Total	2		

Places		8			
27	Movement and Place	3	3	The building includes showers and changing facilities for building occupants which are accessible, inclusive, and located in a safe and protected space (ME). Bicycle parking facilities are included. Ready to charge EV charging points provide to at least 5% of all car parking spaces. 10 amenities within 400m of building (Defined by Movement and Place calculator)	D/E
28	Enjoyable Places	2	2	Publicly accessible space that is 2.5% of GFA or more. The spaces are inclusive, safe, flexible, and enjoyable. (Assumed compliant for residential dwellings).	D
29	Contribution to Place	2	2	The building's design contributes to the liveability of the wider urban context and enhances the public realm by providing visual and physical permeability on ground level frontages, using designs, materials, colour, and details to break long sections to make it attractive to walking, having sidewalks around the building to encourage safe walking and cycling activities, as well as provide shading for pedestrians and other activities, particularly with trees, and designing entrances to be welcoming and to contribute to the public realm	D
30	Culture, Heritage and Identity	1		The building's design reflects and celebrates local demographics and identities, the history of the place, and any hidden or minority entities.	D
Total		7			

People		9			
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31	Inclusive Construction Practices	1		During the building's construction, the head contractor will provide gender inclusive facilities and protective equipment. The head contractor also installs policies on-site to increase awareness and reduces instances of discrimination, racism, and bullying. Provide training to all contractors and subcontractors on these policies (ME) The head contractor to provide high quality staff support on-site to reduce at least five key physical and mental health impacts.	B
32	Indigenous Inclusion	2		The project team plays an active role in the organisational Reconciliation Action Plan. or The building's design and construction incorporates design elements using the Indigenous design and planning strategies and principles.	D
33	Procurement and Workforce Inclusion	3		The project implements a social procurement plan and at least 2% of the building's total contract value has been directed to generate employment opportunities for disadvantaged and under-represented groups (2 Points) The project implements a social procurement plan and at least 4% of the building's total contract value has been directed to generate employment opportunities for disadvantaged and under-represented groups. (3 Points)	D/B
34	Design for Inclusion	3	2	The building is designed and constructed to be inclusive to a diverse range of people with different needs. (2 points) Provides equitable, appealing, safe, and secure access in a manner that does not segregate or stigmatise users through all principal entrance points and main thoroughfares inside and outside the building. Introduce internal and external spaces for a diverse range of users, including parents, family restrooms, emergency rooms, quiet rooms, and social interaction rooms. These rooms must be accessible to all users. Engagement with target groups has informed the inclusive design. (1 point)	D
		Total	2		

35	Impacts to Nature	2	2	The building was not built on, or significantly impacted, a site with a high ecological value. The building's light pollution has been minimised through: - No external luminaire on the project has a ULOR that exceeds 5%, relative to its actual mounted orientation, or - direct illuminance from external luminaires on the project produces a maximum initial point illuminance value no greater than 0.5 Lux to the site boundary 0.1 Lux to 4.5 metres beyond the site into the night sky, when modelled using a calculation plane set at the highest point of the building (ME). There is ongoing monitoring, reporting, and management of the site's wetland ecosystem (ME). The building's design and construction conserves existing natural soil, hydrological flows, and vegetation elements (2 Points)	D/E
36	Biodiversity Enhancement	4		Landscaping provided to 15 % of the site area. Greater than 60% of plants must be indigenous and the site must include at least one significant (nesting) tree or equivalent habitat provision per 500m² of landscaped area. No invasive species are allowed, as per the Australian Weeds Strategy 2017 to 2027.(2 Points) Greater than 80% of plants must be indigenous and the site must include at least one significant (nesting) tree or equivalent habitat provision per 250m² of landscaped area. No invasive species are allowed, as per the Australian Weeds Strategy 2017 to 2027.(4 Points)	D/L
37	Nature Connectivity	2		Nature connectivity is being achieved through landscaping, this must be contiguous with existing, restored, and new habitats. As a minimum requirement for habitat connectedness, the conservation area must make up at least 25% of the total external area within the building's site boundary. To be eligible, this must be at least 182m². Design features such as a canopy bridge, wildlife tunnels, green roofs, amphibian tunnels and green infrastructure are used to connect nature on site to adjacent natural areas, which are either existing, restored, or new.	D/L
38	Nature Stewardship	2		The building owner, as part of the project's development, undertakes activities that protects or restores biodiversity at scale. The area of restoration must be equivalent to the total GFA of the development or site area, whichever is greater.	D/O
39	Waterway Protection	4	4	The project demonstrates a reduction in average annual stormwater discharge (ML/yr) of 40% across the whole site and specified pollution reduction targets are met (2 points). The project demonstrates a reduction in average annual stormwater discharge (ML/yr) of 80% across the whole site and specified pollution reduction targets are met (4 points). Onsite retention or stormwater required. Driveways undercover, runoff predominantly roof runoff which will comply.	D/H
Total			6		

Leadership		0			
40	Market Transformation	0			
41	Leadership Challenges	0			
Total		0			

Responsibility Codes:

D - Design Team

B – Builder

O – Owner/Occupant

E – Electrical Consultant/contractor

L – Landscaping Consultant/contractor

H – Hydraulic Consultant/contractor

P – Plumbing Consultant/contractor

4 EVALUATION OF RESULTS

4.1 Comparison of results with acceptance criteria

The Green Star Buildings scorecard requires a minimum of 35 points in addition to the minimum expectations to achieve a 5 Star rating. The above analysis demonstrates the project achieves this requirement and therefore will comply with the planning policy as detail in part 2.1.

5 CONCLUSION

In summary, the sustainability measures committed to and detailed in this report allow Lot 207 (#117) & Lot 206 (#119) Lockhart Street, Como to surpass 'business as usual' energy efficiency benchmarks and minimum requirements of the National Construction Code and can be recognised as an 'Australian Excellence' environmental performer. The design not only responds to the surrounding environment but also ensures a high standard of sustainability and energy efficiency, leading to a building with a positive environmental footprint.

We are confident that these measures will contribute to a greener and more sustainable future for the proposal and set a commendable example for future developments in the area.

6 APPENDIX A: MAXIMUM TVOC LIMITS FOR PAINTS, ADHESIVES AND SEALANTS

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	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

7 APPENDIX B: CARPET TEST STANDARDS AND TVOC EMISSIONS LIMITS

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

*Both limits should be met when testing against ASTM D5116

8 APPENDIX C: FORMALDEHYDE EMISSION LIMIT VALUES FOR ENGINEERED WOOD

PRODUCTS

Test Protocol	Emmision Limit/Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ² hr
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ² hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m ² hr (at 3 days)
ASTM D6007	≤0.12mg/m ³ **
ASTM E1333	≤0.12mg/m ³ ***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m ³
EN 717-1 (also known as DIN EN 717-2)	≤0.12mg/m ³

*mg/m²hr may also be represented as mg/m²/hr.

**The test report must confirm that the conditions of Table 3 comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

***The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ratio of 0.98.

9 APPENDIX C: STORMWATER POLLUTION REDUCTION TARGETS

Pollutant	Reduction Target (% of the post development annual average load)
Total Suspended Solids (TSS)**	60%
Gross Pollutants	95%
Total Nitrogen (TN)***	60%
Total Phosphorus (TP)***	70%
Environmental Management	Minimise the risk of chemical pollutants and other toxicants entering the stormwater system, including by, but not limited to: • Chemical storage, loading, refuelling or work areas must install bunding, with any spills draining to trade waste or appropriate treatment devices. These areas must have an awning or roofing to separately divert rainfall into the stormwater system. • If a site has more than 200m² of uncovered areas where vehicles are likely to transit and/or park, then hydrocarbon treatment devices must be installed, specified to remove at least 98% of hydrocarbons, sized to treat a 1-in-3 month ARI (4EY) flow. Electric vehicle only parking areas do not count towards the total.

**Load based on the following particulate size distribution (by mass): 20% <20 µm; 20% 20-60 µm; 20% 60-150 µm; 20% 150-400 µm; 20% 400-2000 µm.

***Load includes particulate and dissolved fraction.



Waste Management Plan

117 – 119 Lockhart Street, Como

Prepared for Olivii Pty Ltd

17 July 2024

Project Number: WMP23086

DOCUMENT CONTROL

Version	Description	Date	Author	Reviewer	Approver
1.0	First Approved Release	21/12/2023	MA	DP	AB
2.0	Second Approved Release	18/04/2024	AB	DP	AB
3.0	Third Approved Release	15/07/2024	AB	DP	DP
4.0	Fourth Approved Release	17/07/2024	AB	DP	DP

Approval for Release

Name	Position	File Reference
Dilan Patel	Project Manager – Waste Management Consultant	WMP23086-01_Waste Management Plan_4.0
Signature		

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Executive Summary

Olivii Pty Ltd is seeking development approval for the proposed residential development located at 117 – 119 Lockhart Street, Como (the Proposal).

To satisfy the conditions of the development application the City of South Perth (the City) requires the submission of a Waste Management Plan (WMP) that will identify how waste is to be stored and collected from the Proposal. Talis Consultants has been engaged to prepare this WMP to satisfy the City's requirements.

A summary of the bin size, numbers, collection frequency and collection method is provided in the below table.

Proposed Waste Collection Summary

Waste Type	Generation (L/week)	Bin Size (L)	Number of Bins	Collection Frequency	Collection
Bin Storage Area 1					
Refuse	1,680	660	2	Twice each week	Private Contractor
Recycling	1,680	660	2	Twice each week	Private Contractor
Bin Storage Area 2					
Refuse	1,680	660	2	Twice each week	Private Contractor
Recycling	1,680	660	2	Twice each week	Private Contractor

A private contractor will collect refuse and recyclables from the Proposal, directly from the Bin Storage Area utilising its rear loader waste collection vehicle. The private contractor's waste collection vehicle will reverse into the Proposal and exit in a forward gear via Lockhart Street.

Strata management will oversee the relevant aspects of waste management at the Proposal.

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Figure 1: Locality Plan

1 Introduction

Olivii Pty Ltd is seeking development approval for the proposed residential development located at 117 – 119 Lockhart Street, Como (the Proposal).

To satisfy the conditions of the development application the City of South Perth (the City) requires the submission of a Waste Management Plan (WMP) that will identify how waste is to be stored and collected from the Proposal. Talis Consultants has been engaged to prepare this WMP to satisfy the City's requirements.

The Proposal is bordered by residential developments to the north, south and west and Lockhart Street to the east, as shown in Figure 1.

1.1 Objectives and Scope

The objective of this WMP is to outline the equipment and procedures that will be adopted to manage waste (refuse and recyclables) at the Proposal. Specifically, the WMP demonstrates that the Proposal is designed to:

- Adequately cater for the anticipated volume of waste to be generated;
- Provide adequately sized Bin Storage Areas, including appropriate bins; and
- Allow for efficient collection of bins by appropriate waste collection vehicles.

To achieve the objective, the scope of the WMP comprises:

- Section 2: Waste Generation;
- Section 3: Waste Storage;
- Section 4: Waste Collection;
- Section 5: Waste Management; and
- Section 6: Conclusion.

2 Waste Generation

The following section shows the waste generation rates used and the estimated waste volumes to be generated at the Proposal.

2.1 Proposed Tenancies

The anticipated volume of refuse and recyclables is based on the number of townhouses at the Proposal. The Proposal consists of the following:

Bin Storage Area 1

- Three/Four Bedroom Townhouses – 7.

Bin Storage Area 2

- Three/Four Bedroom Townhouses – 7.

2.2 Waste Generation Rates

In order to achieve an accurate projection of waste volumes for the Proposal, consideration was given to the City of South Perth's *Guidelines for Waste Management Plans – New Multi residential Developments* (Version 11/2011).

Table 2-1 shows the waste generation rates which have been applied to the Proposal.

Table 2-1: Waste Generation Rates

Tenancy Use Type	City's Guideline Reference	Refuse Generation Rate	Recycling Generation Rate
Bin Storage Area 1			
Three/Four Bedroom Townhouses	Individual Dwellings	240L/week	240L/week
Bin Storage Area 2			
Three/Four Bedroom Townhouses	Individual Dwellings	240L/week	240L/week

2.3 Waste Volumes

Waste generation is estimated by volume in litres (L) as this is generally the influencing factor when considering bin size, numbers and storage space required.

2.3.1 Bin Storage Area 1

Waste generation volumes in litres per week (L/week) adopted for this waste assessment is shown Table 2-2. It is estimated that the residential townhouses associated with Bin Storage Area 1 will generate 1,680L of refuse and 1,680L of recyclables.

Table 2-2: Estimated Waste Generation – Bin Storage Area 1

Three/Four Bedroom Townhouses	Number of Townhouses	Waste Generation Rate	Waste Generation (L/week)
Refuse	7	240L/week	1,680
Recyclables	7	240L/week	1,680
Total			3,360

2.3.2 Bin Storage Area 2

Waste generation volumes in litres per week (L/week) adopted for this waste assessment is shown in Table 2-3. It is estimated that the residential townhouses associated with Bin Storage Area 2 will generate 1,680L of refuse and 1,680L of recyclables.

Table 2-3: Estimated Waste Generation – Bin Storage Area 2

Three/Four Bedroom Townhouses	Number of Townhouses	Waste Generation Rate	Waste Generation (L/week)
Refuse	7	240L/week	1,680
Recyclables	7	240L/week	1,680
Total			3,360

3 Waste Storage

Waste materials generated within the Proposal will be collected in the bins located in the Bin Storage Areas, as shown in Diagram 1, and discussed in the following sub-sections.

3.1 Internal Transfer of Waste

To promote positive recycling behaviour and maximise diversion from landfill, the Proposal will have room to accommodate two under counter/kitchen bins for the separate disposal of refuse and recyclables. The resident will then take the contents of these internal bins to the associated Bin Storage Area and dispose into the respective bins.

All bins will be colour coded and labelled in accordance with Australian Standards (AS 4123.7) to assist residents to dispose of their separate waste materials in the correct bins.

3.2 Bin Sizes

Table 3-1 gives the typical dimensions of standard bins sizes that may be utilised at the Proposal. It should be noted that these bin dimensions are approximate and can vary slightly between suppliers.

Table 3-1: Typical Bin Dimensions

Dimensions (m)	Bin Sizes	
	240L	660L
Height (mm)	1,100	1,200
Width (mm)	600	1,300
Depth (mm)	800	800

Reference: City of South Perth's Guidelines for Waste Management Plans

3.3 Bin Storage Area Size

3.3.1 Bin Storage Area 1

To ensure sufficient area is available for storage of the bins, the amount of bins required for Bin Storage Area 1 was modelled utilising the estimated waste generation in Table 2-2, bin sizes in Table 3-1 and based on collection of refuse and recyclables twice each week.

Based on the results shown in Table 3-2, Bin Storage Area 1 has been sized to accommodate:

- Two 660L refuse bins; and
- Two 660L recycling bins.

Table 3-2: Bin Requirements for Bin Storage Area 1

Waste Stream	Waste Generation (L/week)	Number of Bins Required	
		240L	660L
Refuse	1,680	4	2
Recycling	1,680	4	2

The configuration of these bins within Bin Storage Area 1 is shown in Diagram 1. It is worth noting that the number of bins and corresponding placement of bins shown in Diagram 1 represents the maximum requirements assuming two collections each week of refuse and recyclables.

3.3.2 Bin Storage Area 2

To ensure sufficient area is available for storage of the bins, the amount of bins required for Bin Storage Area 2 was modelled utilising the estimated waste generation in Table 2-3, bin sizes in Table 3-1 and based on collection of refuse and recyclables twice each week.

Based on the results shown in Table 3-3, Bin Storage Area 2 has been sized to accommodate:

- Two 660L refuse bins; and
- Two 660L recycling bins.

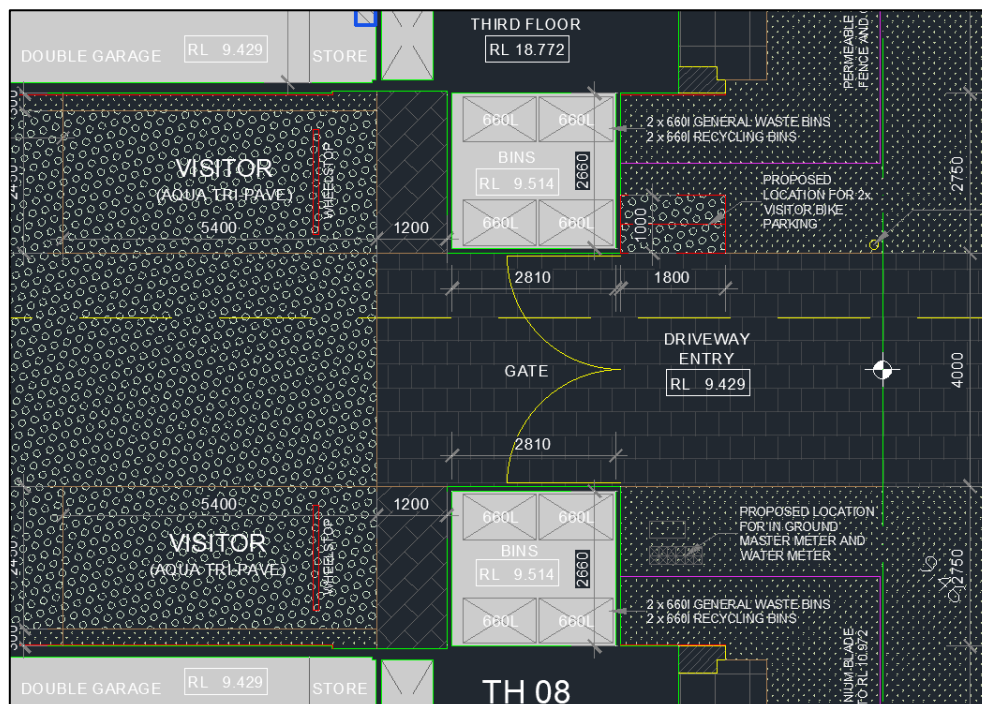
Table 3-3: Bin Requirements for Bin Storage Area 2

Waste Stream	Waste Generation (L/week)	Number of Bins Required	
		240L	660L
Refuse	1,680	4	2
Recycling	1,680	4	2

The configuration of these bins within Bin Storage Areas is shown in Diagram 1. It is worth noting that the number of bins and corresponding placement of bins shown in Diagram 1 represents the maximum requirements assuming two collections each week of refuse and recyclables.

The Bin Storage Areas have been located towards the front of the development to maintain amenity of the townhouse frontages, minimise waste transfer distances throughout the complex, and allow efficient access for waste collection vehicles.

Diagram 1: Bin Storage Areas



3.4 Bin Storage Area Design

The design of the Bin Storage Areas will take into consideration:

- Bins sitting next to each other not behind each other;
- Smooth and impervious bin room walls;
- Ventilated to a suitable standard where the outlet for vented air will not adversely impact residents;
- Functional to allow all bins to be easily moved, washed, and cleaned;
- Should have mains water supply with floor graded to a plumbed sewer drainage outlet/s to allow for the washing of all room surfaces and for the cleaning of bins as required;
- All personnel access ways a minimum width of 900mm wide accommodate the largest bin;
- All bins having a minimum 50mm clearance on all sides (between bins, against walls etc.);
- Have a minimum 1500mm in width door opening to allow easy removal and return of all bin sizes;
- Doors to the Bin Storage Area should be vermin proof, self-closing but be able to be locked open;
- Signage should identify allowable items and encourage positive waste management behaviour through stickers on bins and posters in and around the Bin Storage Area;
- Bin Storage Area must have a smooth impervious floor sloped to a drain connected to the sewer system of not less than 75mm in thickness;
- Bin Storage Area must be vermin proof, fitted with a self-closing door or gate; and
- Bin Storage Areas shall be provided with artificial lighting, to comply with AS4282-1997, and include safety signing clearly identifying prohibited standing areas.

Bin numbers and storage space within the Bin Storage Area will be monitored by strata management during the operation of the Proposal to ensure that the number of bins and collection frequency is sufficient.

4 Waste Collection

A private contractor will service the Proposal utilising its rear loader waste collection vehicle as follows:

Bin Storage Area 1

- Two 660L refuse bins, collected twice each week; and
- Two 660L recycling bins, collected twice each week.

Bin Storage Area 2

- Two 660L refuse bins, collected twice each week; and
- Two 660L recycling bins, collected twice each week.

A private contractor will collect refuse and recyclables twice each week from the Proposal utilising its rear loader waste collection vehicle.

The private contractor's rear loader waste collection vehicle will service the bins onsite, directly from the Bin Storage Area. The private contractor's waste collection vehicle will travel with left hand traffic flow on Lockhart Street and turn into the Proposal's driveway in reverse gear, pulling up adjacent to the Bin Storage Areas, refer Diagram 2.

Private contractor staff will ferry bins to and from the rear loader waste collection vehicle and the Bin Storage Areas during servicing. There is adequate clearance to service the bins with the ceiling height exceeding the 3.4m waste collection vehicle operational height. The private contractor will be provided with key/pin code access to the Bin Storage Areas to facilitate servicing, if required.

Once servicing is complete the private contractor's rear loader waste collection vehicle will exit the Proposal in forward gear and turn left onto Lockhart Street moving with traffic flow.

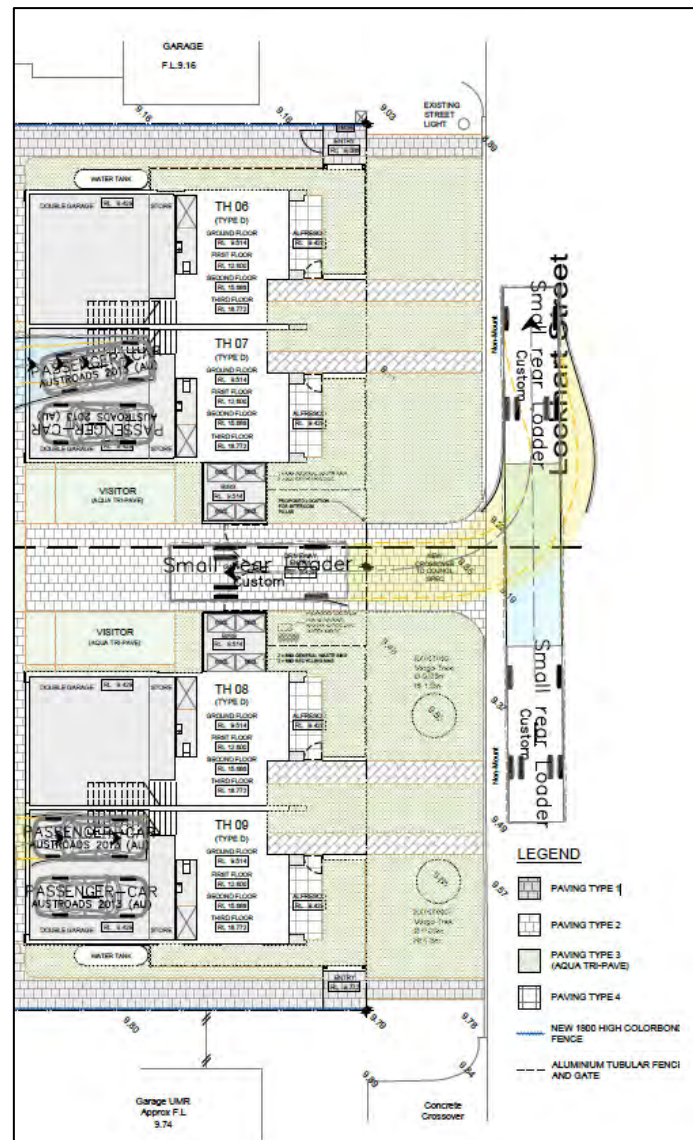
Upon engagement, private contractors can be engaged to have two operators to service the Proposal with one operator being used as a spotter to guide the waste collection vehicle into the Proposal safely. The spotter can provide hand signals and signs to aid the driver into the Proposal as well as being equipped with a two-way communications system for verbal communication. In addition, warning beacons/lights may be provided as a feature which would operate when the truck is emptying the bins so drivers can proceed with further caution.

The above servicing method will preserve the amenity of the area by removing the requirement for bins to be presented to the street on collection days. Additionally, due to the short amount of time it is expected the rear loader collection vehicle would be onsite on collection days (maximum four waste collection vehicle movements each week), this servicing arrangement is considered safe and will mitigate any potential local traffic issues, with servicing proposed to occur during non-peak hours.

Servicing of bins onsite will also reduce the noise generated in the area during collection. Noise must comply with the Environmental Protection (Noise) Regulations and such vehicles should not service the site before 7.00am or after 7.00pm Monday to Saturday, or before 9.00am or after 7.00pm on Sundays and Public Holidays.

The ability for the private contractor's rear loader waste collection vehicle to access the Proposal in a safe manner has been assessed by Talis' Engineering Team and further information is included within their Traffic Impact Statement.

Diagram 2: Waste Collection Vehicle Swept Path



4.1 Bulk Waste

To assist with the reduction of illegal dumping of bulky wastes, each townhouse will utilise its' storage room for the temporary storage bulk waste. Each townhouse has been provided with over 5m³ of storage space, which is above the grouped dwelling storage area requirement of 4m³, leaving available space for the temporary storage of bulk waste.

Bulk waste will be removed from the Proposal by residents as they are generated on an as required basis or organised and arranged through a private bulk waste collection contractor. Strata management will liaise with residents on procedures for bulky waste disposal within the Proposal, as required.

5 Waste Management

Strata management will be engaged to complete the following tasks:

- Monitoring and maintenance of bins and the Bin Storage Areas;
- Cleaning of bins and Bin Storage Areas, when required;
- Ensure all residents at the Proposal are made aware of this WMP and their responsibilities thereunder;
- Monitor resident behaviour and identify requirements for further education and/or signage;
- Monitor bulk and speciality waste accumulation and assist with its removal, as required;
- Regularly engage with residents to develop opportunities to reduce waste volumes and increase resource recovery; and
- Regularly engage with the City to ensure efficient and effective waste service is maintained.

6 Conclusion

As demonstrated within this WMP, the Proposal provides sufficiently sized Bin Storage Areas for storage of refuse and recyclables, based on the estimated waste generation volumes and suitable configuration of bins. This indicates that adequately designed Bin Storage Areas have been provided, and collection of refuse and recyclables can be completed from the Proposal.

The above is achieved using:

Bin Storage Area 1

- Two 660L refuse bins, collected twice each week; and
- Two 660L recycling bins, collected twice each week.

Bin Storage Area 2

- Two 660L refuse bins, collected twice each week; and
- Two 660L recycling bins, collected twice each week.

A private contractor will collect refuse and recyclables from the Proposal, directly from the Bin Storage Area utilising its rear loader waste collection vehicle. The private contractor's waste collection vehicle will reverse into the Proposal and exit in a forward gear via Lockhart Street.

Strata management will oversee the relevant aspects of waste management at the Proposal.

Figures

Figure 1: Locality Plan



Data source: Roads, Cadastre • Landgate, 2023. Imagery: Nearmap, 2023.

LEGEND

Site Boundary

Cadastre

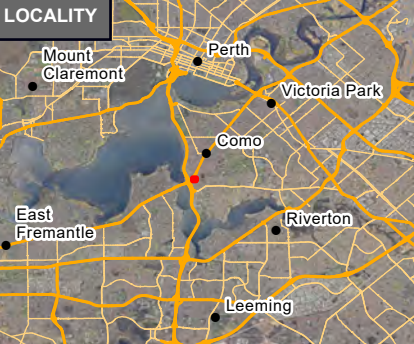
Freehold

Road

Strata Plan or Lot

Easement

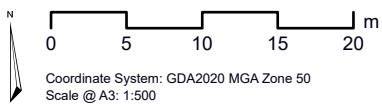
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LOCALITY

117 -119 Lockhart St
Como WA 6152

Olivii Pty Ltd



Prepared: T Baskerville	Date: 14/11/2023
Reviewed: A Brouwer	Revision: A
Project: WMP23086	



Figure 01



Assets | Engineering | Environment | Noise | Spatial | Waste

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117-119 Lockhart Street Proposed Development

Traffic Impact Statement

Prepared for Olivii Pty Ltd

22 July 2024

Project Number: TC23047

DOCUMENT CONTROL

Version	Description	Date	Author	Reviewer	Approver
1.0	First Approved Release	12/12/2023	VL/ JM	PG	JM
2.0	Inclusion of swept paths	21/12/2023	JM	PG	JM
3.0	Additional swept paths, parking requirements amended, Waste collection access amended.	18/04/2024	JM	PG/MA	PG
4.0	Swept paths updated based on amended site layout. Inclusion of requirement for residents to book visitor bays.	19/07/2024	JM	PG	JM
5.0	Swept Path underlays updated	22/07/2024	JM	PG	JM
6.0	Formatting edit	22/07/2024			JM

Approval for Release

Name	Position	File Reference
Joseph Mowat	Civil Engineer	TC23047_Olivii Pty Ltd_Traffic Impact Statement_6.0
Signature		

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APPENDIX A WAPC TRANSPORT STATEMENT CHECKLIST FOR DEVELOPMENT
APPENDIX B PROPOSED DEVELOPMENT LAYOUT PLANS
APPENDIX C SWEPT PATHS

1 Introduction

1.1 Background

Talis Consultants were commissioned by Olivii Pty Ltd (the Client) to prepare a Traffic Impact Statement (TIS) to support the proposed development at 117 to 119 Lockhart Street, Como WA 6152 ('the Site').

This TIS has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines for Developments: Volume 4 – Individual Development (2016)* and the checklist is included at Appendix A.

1.2 Existing Site

The Site is located 117 to 119 Lockhart Street in the suburb of Como within the City of South Perth (the City), as shown in Figure 1-1.



Figure 1-1: Site Location (not to scale)¹

The Site is currently vacant land with previous occupancy of the site including a single-story residential property on 117 Lockhart Street, and one double-storey residential property at 119 Lockhart Street. Vehicle access to both previous properties was via Lockhart Street.

¹ Source – Nearmap (2023)

Under the *Canning Bridge Activity Centre Plan* the proposed development site is located within the Centre zone. Refer to LGA planning Scheme zone related to the site and reference details to Figure 1-2.

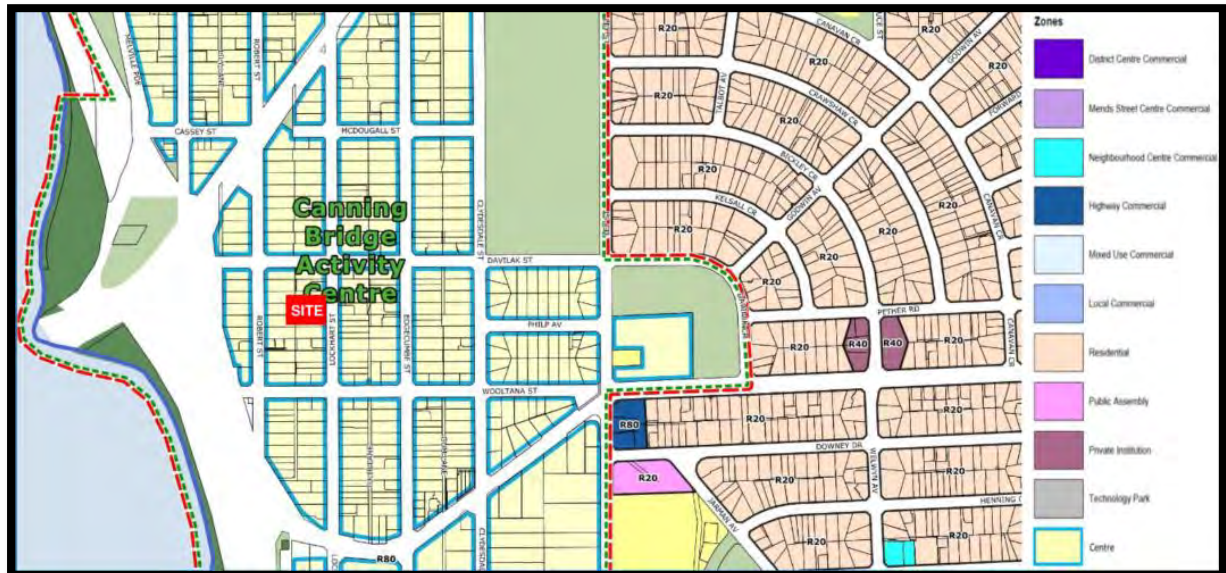


Figure 1-2: LGA Zoning Map²

² Source- City of South Perth (2023)

1.3 Existing Road Network

The surrounding local road network is summarised in Table 1-1.

Table 1-1: Local Road Network

Road/ Street name	Reserve		Road			Footpaths		Cycling	
	Hierarchy classification (MRWA)	Jurisdiction (LGA etc)	Cross section width (m)	Posted speed. (Km/ Hr)	Number of traffic lanes	Footpaths on Both/ one side?	Average width (m)	Cycling paths on Both/ one side?	Average width (m)
Lockhart Street	Access Road	City of South Perth	9m	50	1	East Side	1.5m	-	-
Davilak Street	Access Road	City of South Perth	9m	50	1	South Side	1.5m	Both Sides	1.5m
McDougall Street	Access Road	City of South Perth	10m	50	1	North Side	1.5m	-	-

1.4 Existing Traffic Volumes

Existing traffic volumes for nearby Main Roads were sourced from MRWA Traffic Map, this recent data is summarised in Table 1-2.

Table 1-2: Surrounding Main Roads Network

Road/ name	Street	Source of data	Year	AADT Volume	AM Peak		PM Peak	
					Time	Volume	Time	Volume
Canning Highway		MRWA	2018/19	42,266	07:30-08:30	1726	16:30 – 17:30	1881
Manning Road		MRWA	2018/19	28,218	07:30-08:30	1072	16:30 – 17:30	726

Average annual daily traffic count data is not available for the relevant section of Lockhart Street. A site count was undertaken by Talis Engineers on 30 November 2023 to determine AM and PM peak traffic volumes of the following intersections which are most likely to be impacted by the proposed development:

- Lockhart Street/ Davilak Street Intersection,
- Lockhart Street/ Mc Dougall Street Intersection.

Existing traffic volumes were assessed by counting traffic movements of the above intersections over a 15-minute period during the middle of the peak hours. These representative counts were then multiplied by 4 to provide existing volumes during the peak hour. Values for each movement of the existing scenario are shown in Figure 1-3 to Figure 1-6.

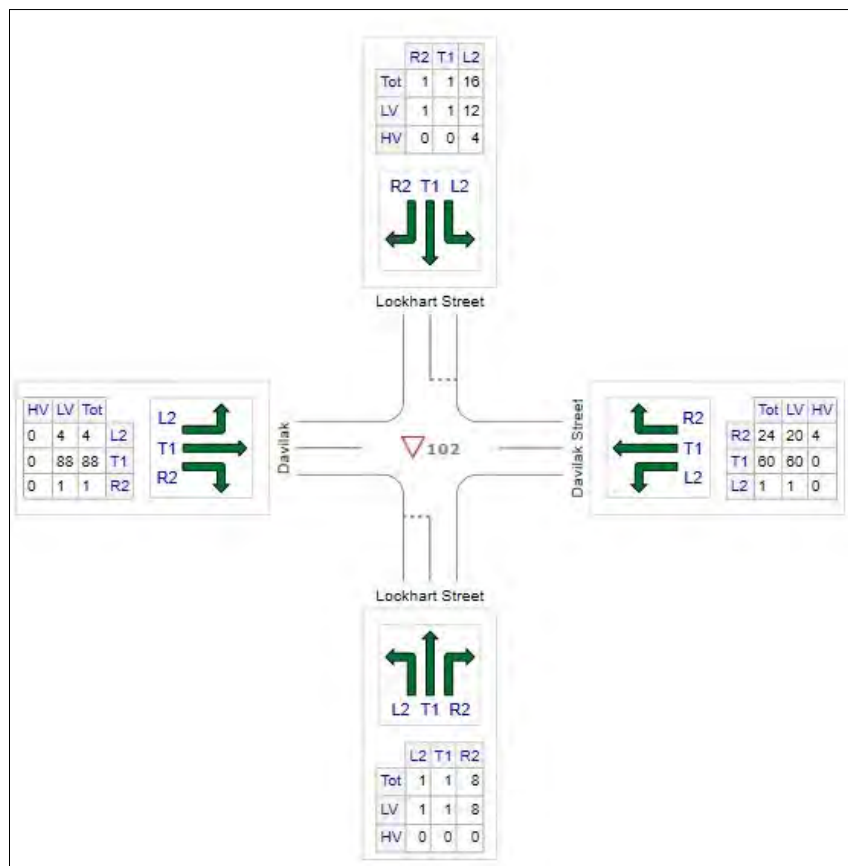


Figure 1-3: Lockhart Street/ Davilak Street Intersection Existing AM Peak

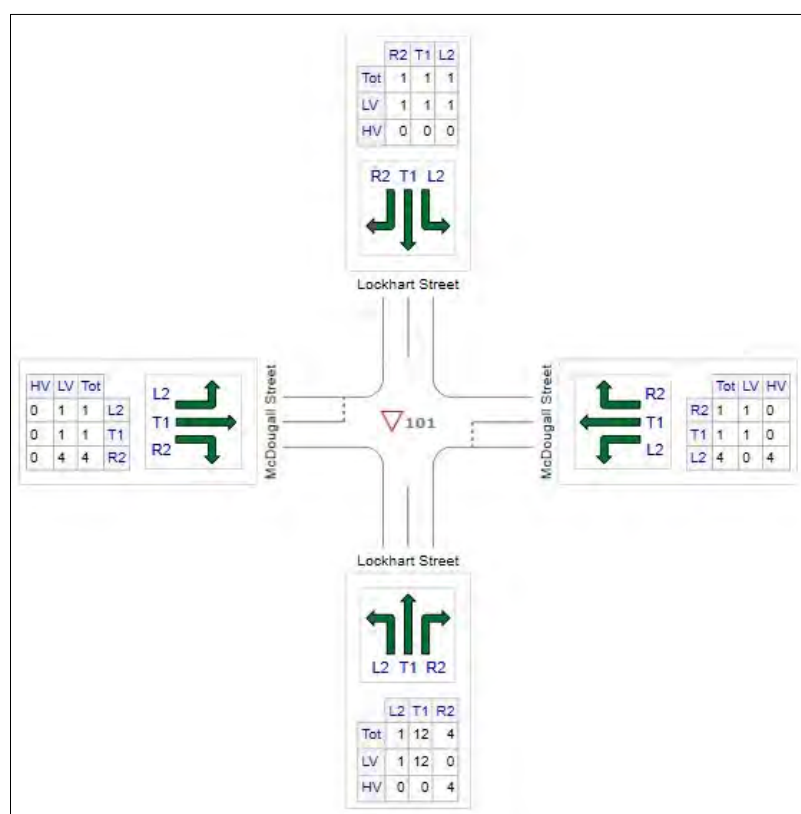


Figure 1-4: Lockhart Street McDougall Street Existing AM Peak Hour Traffic Volumes

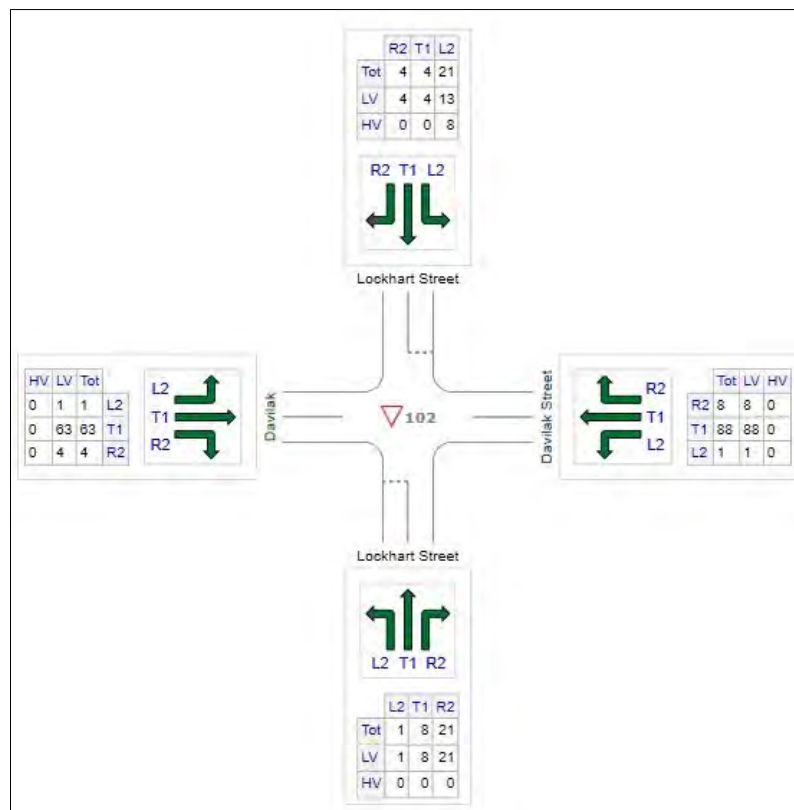


Figure 1-5: Lockhart Street/ Davilak Street Intersection Existing PM Peak Hour Volumes

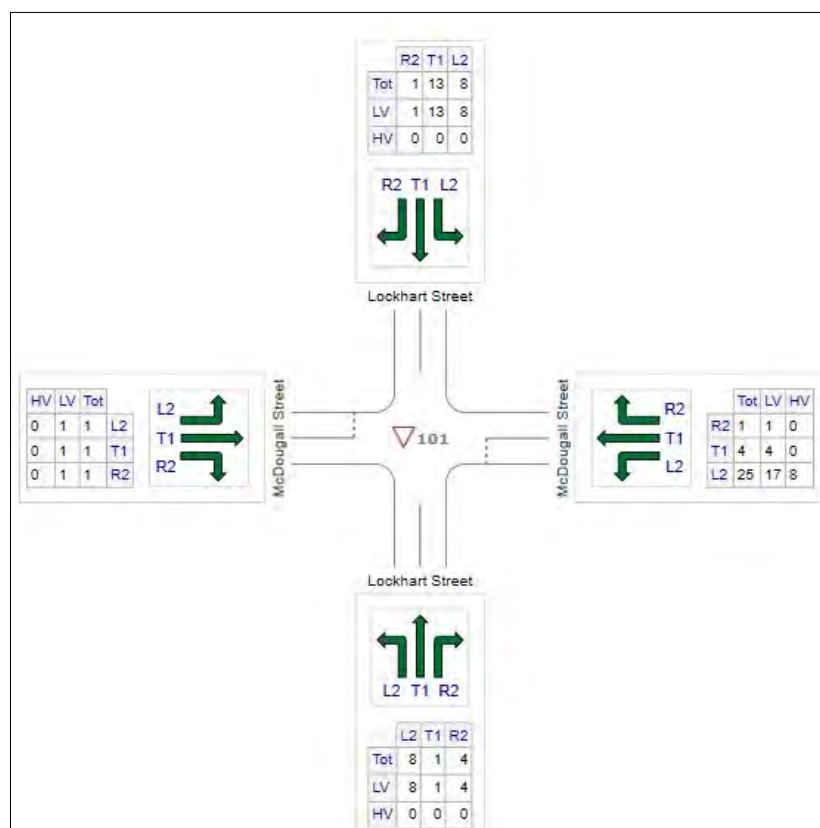


Figure 1-6: Lockhart Street McDougall Street Intersection Existing PM Traffic Volumes

2 Public Transport Facilities

2.1 Bus and Rail Services

The nearest available public transport stops are bus stops at the following locations:

- Lockhart Street approximately 90m south of the site, providing services to Curtin University Bus station and Perth bus stop (Transperth Service No.30), and
- Canning Bridge train station located on Canning Highway approximately 500m from the site, providing services to Mandurah and Perth CBD.

Frequency of each is summarised as:

- Peak Period:
 - o AM: 07:30 to 08:30 every 15 mins (Bus Service No 30), and every 5 mins (Mandurah Line).
 - o PM: 16:30 to 18:00 every 15mins (Bus Service No 30), and every 5 mins (Mandurah Line).
- Off peak period:
 - o every 30 mins (Bus Service No 30), and every 15 mins (Mandurah Line).

The location of these stops and routes local to the Site are shown in Figure 2-1.

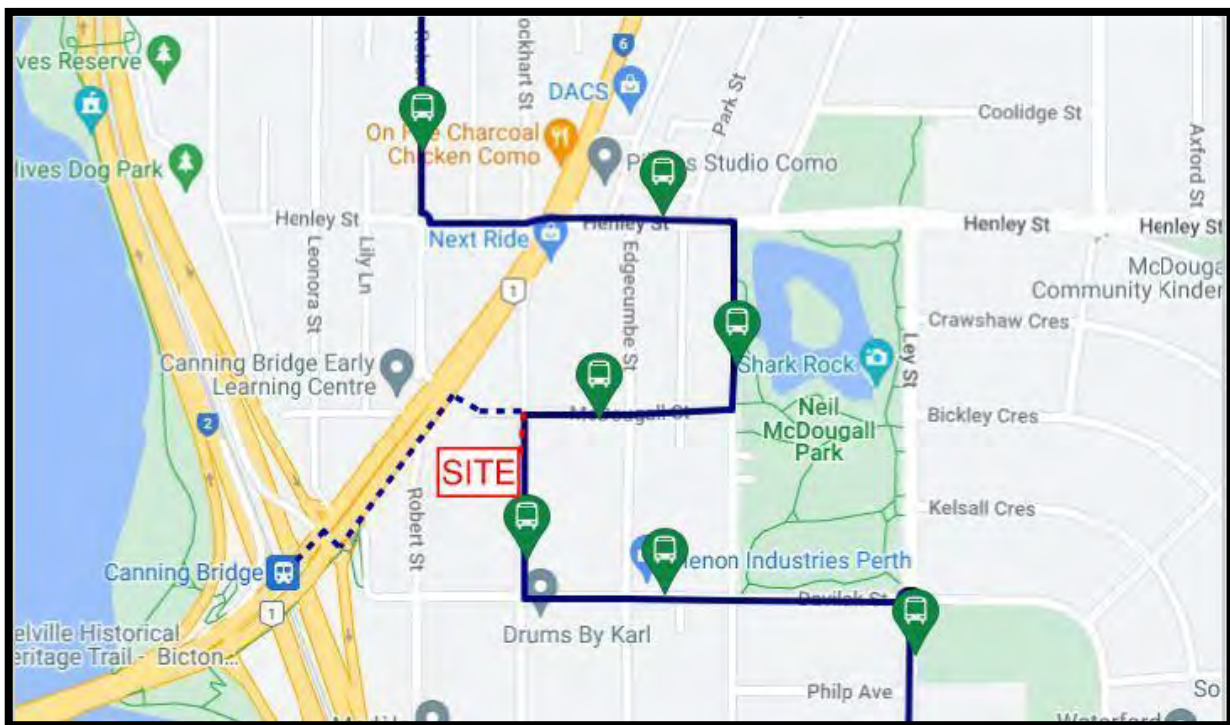


Figure 2-1: Location of Nearest Bus Stops/ Train Station

2.2 Future Public Transport Facilities

At the time of preparing this report Talis is not aware of any planned changes to the public transport within the area.

3 Active Transport Networks and Facilities

3.1 Existing Networks and Facilities

A footpath (approximately 1.5 metres) exists along the eastern verge of Lockhart Street. Liveable Neighbourhoods gives a standard footpath width of 1.5 metres, stating that this “enables two pedestrians to pass with comfort, and enables ease of use by people with prams, wheelchairs and other mobility aids”. As this path is of sufficient width for “ease of use by people with prams, wheelchairs and other mobility aids”, this suggests that cyclists and e-ridable users would also be able to use this path, albeit at low speed, giving way to pedestrians.

4 Proposed Development

4.1 Proposed Land Uses

The Development Site proposal consists of a 14-unit residential development. Concept layout plans for the Site as provided by the Client are shown in Appendix B.

4.2 Access Arrangements

Pedestrian and cycle access will be via Lockhart Street, connecting locally to footpaths on the eastern side of Lockhart Street. Vehicular access to the Site will be via a central crossover on Lockhart Street as shown in Appendix B.

It is understood that waste collection will occur via a private waste collection contractor utilising a small rear loader (8m length). Due to the cantilevered first floor of the proposed development, a vehicle with the height of a small rear loader (3.2m) will not be able to complete a three-point turn manoeuvre within the complex and reverse entry will be required to access the bin store adjacent to the front gate. A swept path for this movement is shown in Appendix B. It is noted that the swept path of rear loader during entry movement crosses the centre of the road, however with consideration of the traffic volumes, low frequency of waste collection (anticipated to be up to twice weekly), and width of the road, this is believed to be an acceptable outcome.

Swept path analysis was undertaken for the proposed development to assess turning movements of a 5.2m Austroads Passenger Vehicles accessing the development complex and garages parking. Swept paths provided in Appendix B indicate that an Austroads 5.2m Passenger vehicle is able to access the development, and parking garages with multiple manoeuvres. Based on feedback from the City following original Traffic Impact Assessment Report, and outcomes of a subsequent meeting with the City of South Perth, Parking bays located adjacent to the stairs have been assessed for 4.9m (B85) vehicle accessing the bay in forward gear, and exiting the site in forward gear.

Access for visitors and delivery vehicles will be managed through a pillar-mounted intercom system at the front gate. Additionally, there is existing permitted on street parking available for three vehicles on the Western side of Lockhart street adjacent to the development property. It is expected that these will remain permitted parking bays following development, providing an option for short term parking of delivery vehicles.

Through discussion with the design team it is understood that a condition is to be included in the residential Strata by-laws requiring residents to book visitor bays for loading/unloading within the complex.

5 Development Traffic Generation

Trip generation has been calculated for the Site utilising trip generation rates from the Institute of Transportation Engineers (ITE) “Trip Generation” 10th Ed and the RTA Guide to Traffic Generating Developments. Table 5-1 shows the anticipated trip generation rates for AM and PM peak hour periods.

Table 5-2 presents the resultant anticipated trip generation of the proposed development during AM and PM peak hours periods.

Table 5-1: Trip Rate Generation – Peak hour

Land use	ITE Code/ Source	AM peak	PM peak
Residential	RTA	0.85 trips per dwelling	0.85 trips per dwelling

Table 5-2: Total Trip Generation of Proposed Development

Land use	AM peak		PM peak	
	In	Out	In	Out
Residential	3	9	7	5

The proposed development represents a trip generation of approximately 12 trips in the AM peak and 12 trips in the PM peak hour.

The Site has good access to public transport services, as well as direct access to walking and cycling infrastructure.

5.1 Development Trip Distribution

The proposed development site is located on a section of Lockhart Street between McDougall Street and Davilak Street. It is expected that all inbound and outbound traffic will be through these roads. Based on observations of existing traffic movements; it is expected that the majority of the Site generated trips will travel eastbound along Davilak Street. Anticipated directional distribution of generated trips is shown in Table 5-3.

Table 5-3: Directional Distribution of Generated Traffic

	AM peak		PM peak	
	McDougall Street	Davilak Street	McDougall Street	Davilak Street
Portion	~15%	~85%	~20%	~80%
Total Vehicles	2	10	2	10

6 Parking

The car parking provision required for the Site is set out in the Canning Bridge Activity Centre Plan (CBACP) requirements, which are summarised in Table 6-1.

Table 6-1: CBACP Parking Requirements

Land use	Parking requirements
Residential (2 or 3 bedroom dwelling)	1 bay per dwelling
Residential (4 bedroom dwelling)	1.25 bays per dwelling
Visitor car Parking	1 bay per 8 dwellings

Table 6-2 summarises the parking provision and requirements for the proposed development Site.

Table 6-2: Parking Bay Requirement and Provision

Land use	Number of bays required	Proposed development provision
Residential (2 x 4 bedroom dwellings)	2.5	4
Residential (12 x 3 bedroom dwellings)	12	24
Visitor	2	2

The number of proposed parking bays exceeds the minimum number of bays required by thirteen bays. Based on this the proposed parking supply is anticipated to be sufficient to accommodate the estimated demand on-site.

7 Site Specific Issues

A search of the Main Roads WA Reporting Centre for traffic crash data was undertaken for reported crashes between 1 January 2018 and 31 December 2022 for the following sections of road:

- Davilak Street and Lockhart Street intersection; and
- McDougall Street and Edgecumbe Street intersection.

The crash data are summarised in Table 7-1 and Table 7-2.

Table 7-1: Davilak Street and Lockhart Street Intersection Crash Data

Crash type	Fatality	Hospital	Medical	Major property	Minor property	Total crashes
Right Angle	-	-	-	-	01	01

Table 7-2: McDougall Street and Edgecumbe Street Intersection Crash Data

Crash type	Fatality	Hospital	Medical	Major property	Minor property	Total crashes
Right Angle	-	-	-	01	-	01

A summary of the crash data review is as follows:

- A total of 1 crash was recorded at Davilak Street with Lockhart Street intersection crash data and 1 crash was recorded at McDougall Street with Edgecumbe Street intersection.
- These crashes occurred at dusk outside the peak traffic period of 07:30am to 08:30am and 04:30 pm to 06:00pm.
- Both crashes led to property damage.
- It is unlikely that the Site will cause any material impact to traffic safety of the surrounding road network.

8 Summary and Findings

This Transport Impact Statement outlines the transport aspects of the proposed development focusing on traffic operations, waste collection vehicle operations, access, and car parking. Discussions regarding public transport and active transport considerations are also provided.

This Traffic Impact Statement has been prepared in accordance with the WAPC Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016).

The following conclusions are made regarding the proposed development at 117-119 Lockhart Street, Como:

- The development site is anticipated to generate approximately 12 trips during the peak AM period and 12 trips during the peak PM period.
- The volume of trips generated to and from the Site is anticipated to be low and expected to have minimal impact to the surrounding road network.
- The nearest bus stop is located approximately 90m away from the Site and train station is located 500m away from the Site. Overall, the public transport amenity within the area is satisfactory.
- The Site benefits from good infrastructure for active transport with wide pedestrian footpaths and good shared paths within the surrounding area.
- The on-site car parking provision satisfies the Canning Bridge Activity Centre Plan requirements of 17 parking spaces.

APPENDIX A

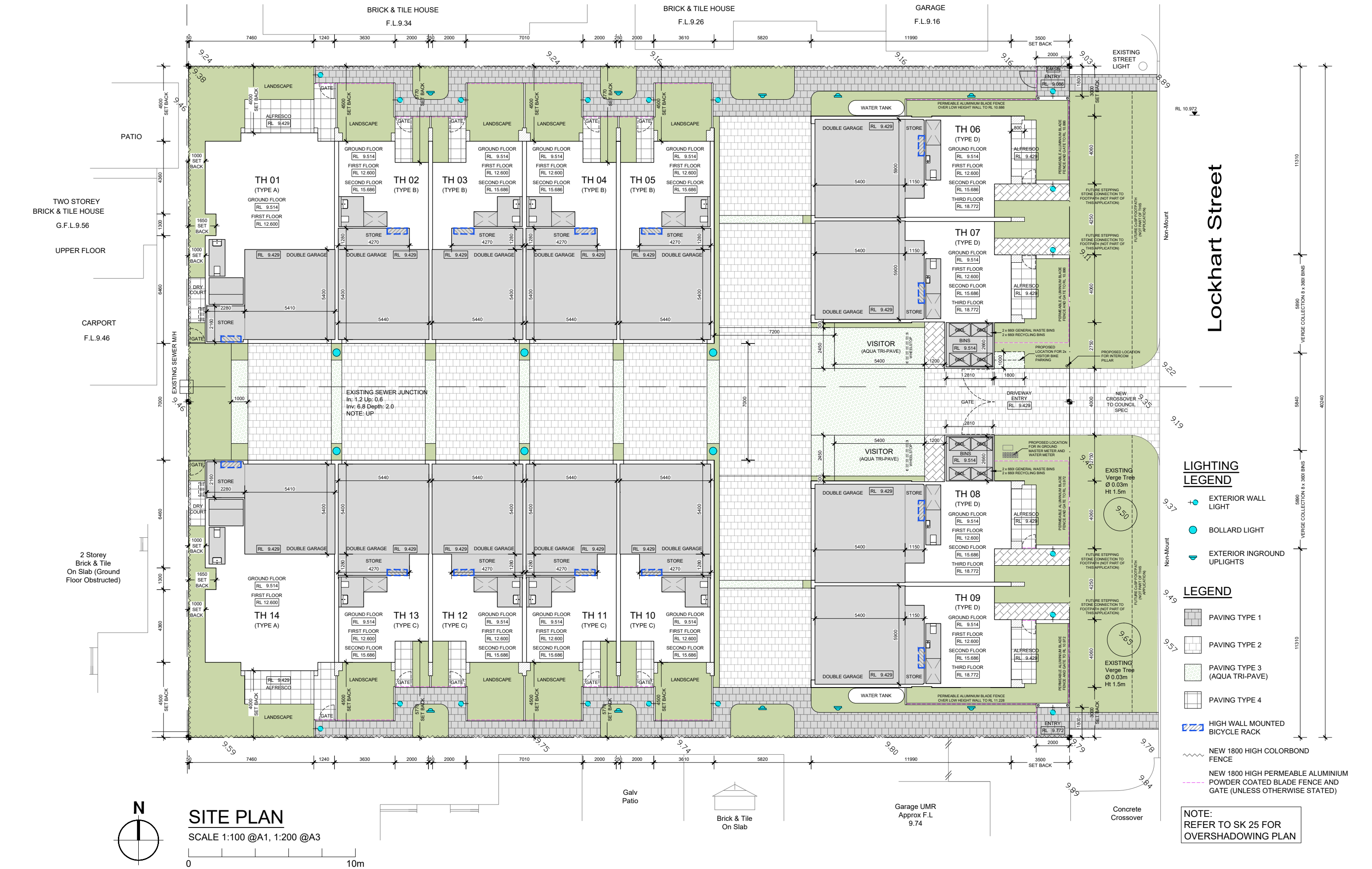
WAPC TRANSPORT STATEMENT CHECKLIST FOR DEVELOPMENT

Table A-1: Checklist for a Transport Statement, *Individual Development*

ITEM	TIS SECTION REFERENCE
Residential Development 14 units	
Proposed land use	Section 4,5 and 6
Existing land use	Section 1
Context of Development with surrounds	Section 1
Parking and access Public/ private/ ACROD/ Kiss n Drive Access arrangements	Section 1 and 4
Service vehicles Access arrangements Loading facilities Rubbish collection (residential only) Operational hours (non-residential)	Section 4 and 6
Traffic volumes All day and/ or peak times classification	Section 1 and 5
LATM features – Within frontage	Section 4
Public transport Bus stops Bus/ Train stations Active transport linkages	Section 2
Active transport Existing facilities for walking On site Street frontage Locally on surrounding streets/ roads Existing facilities for cycling/ ETPs On site Street frontage Locally on surrounding streets/ roads	Section 1 and 3
Site specific issues	Section 1 and 7
Safety issues	Section 6

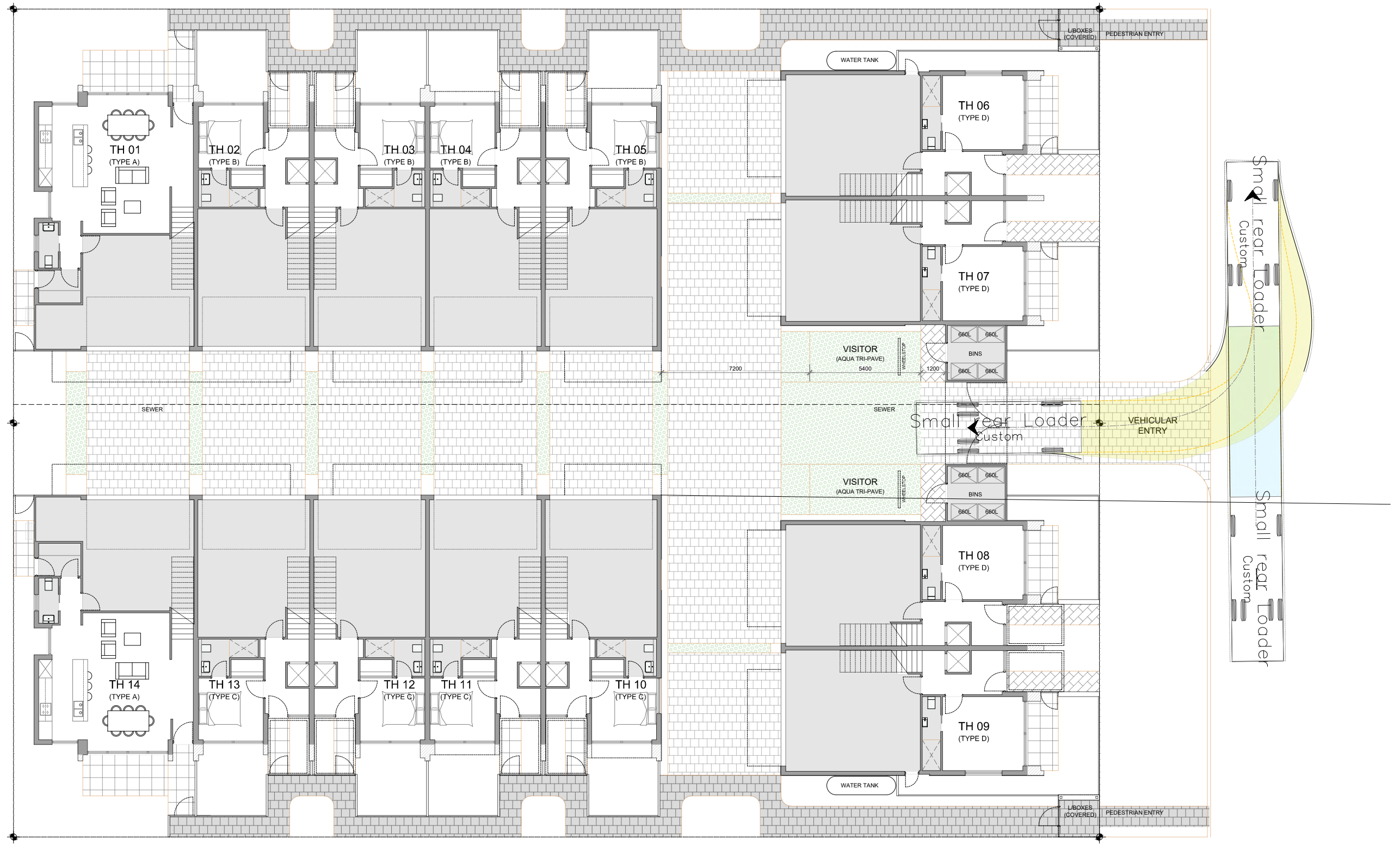
APPENDIX B

PROPOSED DEVELOPMENT LAYOUT PLANS



APPENDIX C

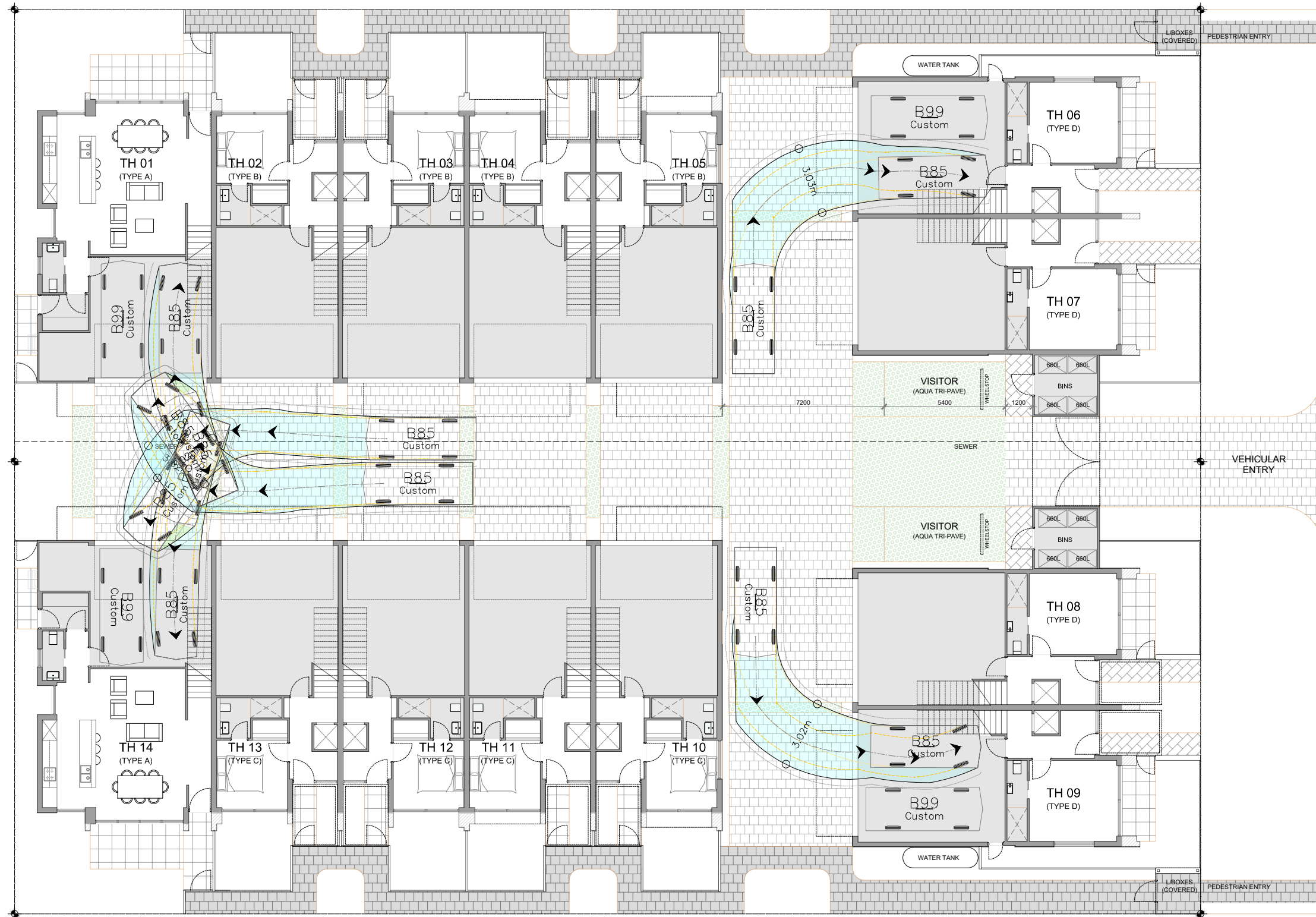
SWEPT PATHS



Small rear Loader

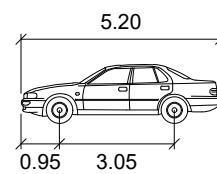
meters
 Width : 2.50
 Track : 2.50
 Lock to Lock Time : 4.0
 Steering Angle : 36.1





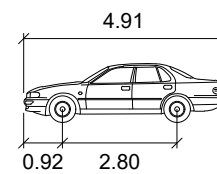
Lockhart Street

FORWARD IN MOVEMENTS



B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.6

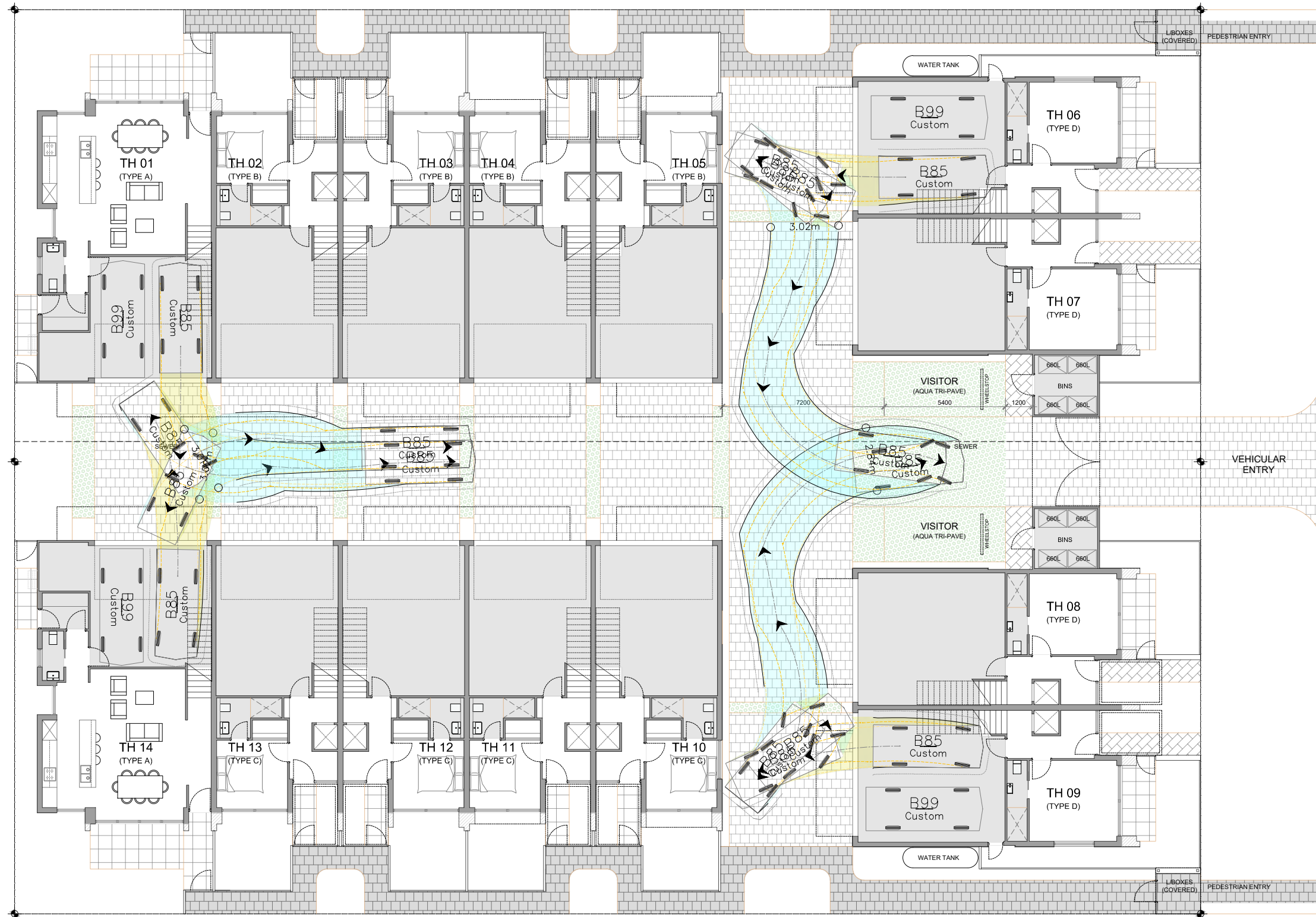


B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

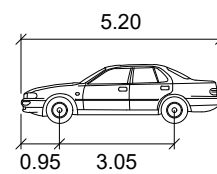


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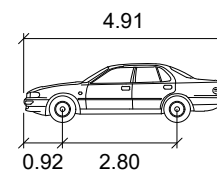
Lockhart Street

REVERSE/FORWARD EXIT MOVEMENTS



B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.6



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



1:200 @ A3



Assets | Engineering | Environment | Noise | Spatial | Waste

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ACOUSTIC REPORT

FOR

117 LOCKHART STREET COMO

15 March 2024

AES-890366-R01-0-15032024

DOCUMENT CONTROL

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Date: 15 March 2024
Doc NO: AES-890366-R01-0-15032024

Acoustic Engineering Solutions

ABN: 64 451 362 914

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EXECUTIVE SUMMARY

Acoustic Engineering Solutions (AES) has been commissioned by XL Projects to undertake the road traffic noise impact assessment of development at 117 Lockhart Street Como. The assessment is undertaken for the traffic noises from Kwinana Fwy and Canning Hwy in accordance with the State Planning Policy 5.4 - Road and Rail Noise (SPP5.4). The future (year 2044) traffic flows are also considered in the assessment.

Attended noise monitoring was undertaken at the development site during the peak hour (between 3:30pm and 4:30pm) on Tuesday 5th March 2024.

An acoustic model is developed using SoundPlan v8.0 program, and the *Calculation of Road Traffic Noise* (the CoRTN) algorithm is selected for this study. Traffic flow data on Kwinana Fwy and Canning Hwy are obtained from WA Main Roads website. The acoustic model was calibrated using the attended peak-hour noise monitoring results.

Day-time noise levels $L_{Aeq(Day)}$ are predicted and then adjusted according to the SPP5.4 Guidelines. For the future road traffic conditions, the highest adjusted day-time noise level $L_{Aeq(Day)}$ falls into exposure category:

- A for the first floor of units 1, 2, 9, 13 and 14, and also for the second floor of units 7 and 8.
- B for the second floor of units 2 to 6 and 9 to 13.
- C for the mezzanine floor of units 6 to 9.

To comply with the requirements of SPP5.4 and achieve reasonable indoor amenity, the following measures are recommended:

- Implement the "Quiet House" package A for the construction of the first floor of units 1, 2, 9, 13 and 14, and also the second floor of units 7 and 8.
- Implement the "Quiet House" package B for the construction of the second floor of units 2 to 6 and 9 to 13.
- Implement the "Quiet House" package C for the construction of mezzanine floor of units 6 and 9.
- Incorporate "Notifications on Titles" for all of the units.

"Quiet House" packages A to C are detailed in APPENDIX C and also in the SPP5.4 Guidelines.

Under the future road traffic conditions the adjusted day-time noise level $L_{Aeq(Day)}$ is:

- Below the day-time outdoor noise target in all of the ground floor courtyards; and
- Not above the day-time outdoor noise target in all of the first floor balconies.

This means that all of the units have outdoor living area of "reasonable degree of acoustic amenity".

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1.0 INTRODUCTION

A group of townhouses is proposed at 117 Lockhart Street Como and close to Kwinana Fwy and Canning Hwy, which are the major traffic routes. An acoustic report is required to undertake the road traffic noise assessment in accordance with the State Planning Policy 5.4 - Road and Rail Noise (SPP5.4).

Acoustic Engineering Solutions (AES) has been commissioned by XL Projects to prepare the acoustic report. The aim of this report is to:

- Measure the existing road traffic noise received at the most exposure location of the development site;
- Predict road traffic noise received at the development site from Kwinana Fwy and Canning Hwy;
- Assess the noise levels with the criteria set by SPP5.4; and
- Recommend "Quiet House" packages if required.

1.1 DEVELOPMENT SITE

Figure 1 in APPENDIX A presents an aerial view of the development site and surrounding area including the attended noise monitoring location.

Figure 2 to Figure 6 in APPENDIX A present the floor plans and 3D views of the proposed apartment building. XL Projects advised that:

- The existing 1.8m to 2.4m brickwork and colorbond fences along the site (northern, western and southern) boundaries will stay.
- A new 1.8m colorbond fence will be installed on the small (about 2m) gap of the western site boundary.
- No solid fences will be installed on the front (eastern) boundary facing Lockhart Street.
- All of the townhouses are brick walls and metal roofing.

2.0 NOISE CRITERIA

Noise management for land use and road/rail transport corridor planning in Western Australia is implemented through the WAPC State Planning Policy 5.4 “*Road and Rail Noise*” (SPP5.4). SPP5.4 sets out the noise targets, as shown in Table 1.

Table 1: Noise Targets

Proposals	New/Upgrade	Noise Targets in dB(A)		
		Outdoor		Indoor
		Day ¹ L _{Aeq} (Day)	Night ² L _{Aeq} (Night)	L _{Aeq}
Noise-sensitive Land-use and/or Development	New noise-sensitive land-use and/or development within the trigger distance of an existing/proposed transport corridor	55	50	L _{Aeq} (Day) = 40 (living and work areas) L _{Aeq} (Night) = 35 (Bedrooms)
Roads	New	55	50	NA
	Upgrades	60	55	NA
Railways	New	55	50	NA
	Upgrades	60	55	NA

Notes:

- The noise target is to be measured at one meter from the most exposed, habitable façade of the proposed building, which has the greatest exposure to the noise-source. A habitable room has the same meaning as defined in State Planning Policy 3.1 Residential Design Codes.
- For all noise-sensitive land-use and/or development, indoor noise targets for other room usages may be reasonably drawn from Table 1 of Australian Standard/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors (as amended) for each relevant time period.
- The 5dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.

¹ Day: from 6am to 10pm.

² Night: from 10pm to 6am.

- Outdoor targets are to be met at all outdoor areas as far as is reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines. For example, it is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.

In the application of the noise targets the objective is to achieve:

- indoor noise levels as specified in Table 1 in noise-sensitive areas (for example, bedrooms and living rooms of houses, and school classrooms); and
- a reasonable degree of acoustic amenity for outdoor living areas on each residential lot. For non-residential noise-sensitive developments, for example schools and child care centres the design of outdoor areas should take into consideration the noise target.

It is recognised that in some instances, it may not be reasonable and/or practicable to meet the outdoor noise targets. Where transport noise is above the noise targets, measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.

If a noise-sensitive development takes place in an area where outdoor noise levels will meet the noise targets, no further measures are required under this policy.

2.1 POLICY TRIGGER DISTANCES

Table 2 identifies the State's transport corridors and the trigger distances to which this policy applies. Where any part of the lot is within the specified trigger distance, an assessment against the policy is required to determine the likely level of transport noise and management/mitigation required. An initial screening assessment will determine if the lot is affected and to what extent.

Table 2: Transport Corridor Classification and Trigger Distances

Transport Corridor Classification	Trigger Distance	Distance Measured From
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	Road carriageway edge
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	200 metres	Road carriageway edge

Transport Corridor Classification	Trigger Distance	Distance Measured From
vehicles daily or $\geq 23,000$ daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes).		
Passenger railways		
	100 metres	Centreline of the closest track
Freight railways		
	200 metres	Centreline of the closest track

2.2 NOTIFICATION ON TITLE

A notification on title is required as a condition of subdivision (including strata subdivision) and development approval for the purposes of noise-sensitive development as well as planning approval involving noise-sensitive development to advise that the site is located in a noise-affected area where existing and or forecasted noise levels are to exceed the outdoor noise targets shown in Table 1, regardless of proposed noise attenuation measures. The notification on title should be identified in the noise management 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.

The notification is to ensure that prospective purchasers are advised of:

- the potential for transport noise impacts; and
- the potential for quiet house design requirements to minimise noise intrusion through house layout and noise insulation.

3.0 NOISE MONITORING

The development site is currently vacant land, and located closer to Canning Hwy than Kwinana Fwy. But the traffic noise from Kwinana Fwy is louder than that from Canning Hwy.

Attended noise monitoring was performed onsite at the most exposure location (on the middle driveway and 4m from the edge of Lockhart Street), as shown in Figure 1 and Figure 7 in APPENDIX A, between 3:30pm and 4:30pm (peak hour for Kwinana Fwy) on Tuesday 5th March 2024, when it was sunny day with light (south-westerly) winds sometimes and temperature of 32°C.

Noise levels were recorded using a Nor139 Sound Level Meter (SLM). The SLM complies with the instrumentation requirements of AS2702:1984³ and SPP5.4 Guidelines⁴. The SLM was programmed to record the S (slow) and A-weighted noise levels of L_{A1} , L_{A10} , L_{A90} , and L_{Aeq} in every 15-minute interval. The SLM microphone was placed at 1.4m above the ground pointing to Kwinana Fwy. The SLM was calibrated using an SV33A Class 1 Sound Calibrator immediately before and after the measurements. No level difference was observed between the two calibrations.

Attended noise monitoring was undertaken to:

- Quantify the current noise levels at the most exposure location onsite during the peak hour;
- Determine the peak-hour relationships between L_{A10} and L_{Aeq} ; and
- Calibrate the noise model.

Noise levels were measured in accordance with the measurement procedures of SPP5.4 Guidelines⁴ and AS2702:1984³.

Figure 8 in APPENDIX A presents the logged noise levels for the peak hour (between 3:30pm and 4:30pm, peak hour for Kwinana Fwy). During the measurements it was noticed that:

- Traffic noises from Kwinana Fwy were continuously and dominant and louder than those from Canning Hwy although Canning Hwy can be sighted but Kwinana Fwy cannot.
- Aircraft noise was present (one to three aircrafts were flying over for every 15 minute interval) and much louder than traffic noises but for short time periods.
- Local traffic including buses on Lockhart Street was present sometimes.
- Local activities (open garage doors, closing car doors, placing rubbish bins on the street verge) were present sometimes.
- Bird noises were present sometimes.

Table 3 summarises the monitoring results while Table 4 presents the standard deviations of measured noise levels. It is shown that the variations of logged noise levels L_{A10} and L_{Aeq} are within 2.3 dB. The level difference between L_{A10} and L_{Aeq} during the peak hour is 1.4 dB.

³ Australian Standard 2702-1984 Acoustics – Methods for the Measurement of Road Traffic Noise.

⁴ Road and Rail Noise Guidelines, September 2019.

Table 3: Measured Noise Levels in dB(A)

Time Intervals	Measured Noise Levels in dB(A)				Difference (dB)
	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	$L_{A10} - L_{Aeq}$
3:30pm – 4:30pm (Peak Hour)	65.6	55.1	45.6	53.7	1.4

Table 4: Standard Deviation of Measured Noise Levels in dB(A)

Time Intervals	Standard Deviation of Measured Noise Levels in dB(A)			
	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}
3:30pm – 4:30pm (Peak Hour)	0.8	2.3	0.5	1.1

Figure 9 and Figure 10 in APPENDIX A show that the traffic flows reduce significantly after 8pm. The traffic noise from Kwinana Fwy and Canning Hwy should become much lower after 8pm. It is expected that the average daily noise level $L_{Aeq(Day)}$ is less than the measured peak-hour noise level $L_{Aeq(PeakHour)}$ because the noise levels L_{Aeq} become lower during non-peak hours.

4.0 NOISE MODELLING

4.1 METHODOLOGY

An acoustic model is developed using SoundPlan v8.0 program, and the *Calculation of Road Traffic Noise* (the CoRTN) algorithm is selected for this study. The acoustic model considers traffic volume, road surface type, vehicle speeds, road gradient, ground absorption, shielding from ground topography and intervening structures such as boundary fences and buildings.

The acoustic model is used to predict road traffic noise levels at the development site. The acoustic model does not include noise emissions from any sources other than from the traffic of Kwinana Fwy and Canning Hwy. Therefore, noise emissions from the other road traffic, birds; aircraft; dog barking; etc are excluded from the modelling.

4.2 INPUT DATA

4.2.1 Topography

The ground elevation contours of the development site and surrounding area are obtained from the intramaps of the City of South Perth. The Canning river, Kwinana Fwy and Canning Hwy are assumed to be reflective while the other areas are assumed to have averaged ground absorption of 0.6.

The proposed townhouses onsite and the existing buildings in the surrounding area are digitized into the acoustic model together with the solid site boundary fences. The aluminium tubular fences are not considered because they have little impact on noise propagation.

4.2.2 Receiver Locations

Seventy-eight point representative receivers are selected, as shown in Figure 2 to Figure 5 in APPENDIX A, for the detailed assessment of traffic noise impact. G1 to G18 are the ground receivers at 1.4 metres above the ground while F1 to F28 represent the first floor receivers at 4.5 metres above the ground. S1 to S24 represent the second floor receivers at 7.6 metres above the ground. T1 to T8 represent the mezzanine floor receivers at 10.7 metres above the ground. All of them are 1m from the building facades.

G2 to G6, G8 to G11 and G12 to G17 also represent the courtyard receivers while F3, F5, F7, F9, F12, F13, F16, F17, F19, F21, F23 and F25 represent balcony receivers on the first floors.

4.2.3 Traffic Data

According to the SPP5.4 Guidelines, Kwinana Fwy and Canning Hwy are the major traffic routes. The other major and significant traffic routes are more than 300m away from the development site. Only Kwinana Fwy and Canning Hwy are considered in this study.

Mandurah passenger line is more than 200m from the development site, and is not required to be included in this assessment.

No traffic data are not available for the Canning Hwy section of Kwinana Fwy. AES consulted the Main Roads and be advised that the traffic flow data at the North of Mount Henry Bridge is used as an approximation.

Traffic flow data for Kwinana Fwy (North of Mount Henry Bridge) and Canning Hwy (North of Henley Street) was obtained from the Main Roads website. Table 5 presents the traffic flow data. As suggested in the SPP5.4 Guidelines, the future (year 2044) traffic flow data are assumed to be 2.5% annual traffic growth over 20 years.

Table 5: Current and Future Traffic Flows.

Direction	Speed Limit (km/Hour)	Average Daily Traffic Flows (Monday to Friday)		
		Current	Future (2044)	Heavy Vehicles
Kwinana Fwy				
Both	100	134,197	201,296	8.0%
Northbound	100	62,575	93,863	7.8%
Southbound	100	71,622	107,433	7.9%
Canning Hwy				
Both	60	37,458	56,187	5.6%
Northbound	60	19,346	29,019	6.0%
Southbound	60	18,112	27,168	5.8%

Figure 9 and Figure 10 in APPENDIX A present the averaged daily traffic flow data for Monday to Friday. The traffic flow data indicate that the daily traffic peak hour is:

- between 3:30pm and 4:30pm with the traffic flow of 10,553 (both directions) for Kwinana Fwy.
- between 4:30pm and 5:30pm with the traffic flow of 3,155 (both directions) for Canning Hwy.

Since Kwinana Fwy has much higher traffic flows than Canning Hwy, the site noise monitoring was undertaken during the peak hour (3:30pm and 4:30pm) of Kwinana Fwy.

Therefore, the noise modelling for the peak hour is taken between 3:30pm and 4:30pm, when the traffic flow of Canning Hwy is 2,981 for both directions.

The night-time (10pm to 6am) traffic flow rate (vehicle number per hour) is less than:

- 17% of the day-time traffic flow rate for Kwinana Fwy; but
- 13% of the day-time traffic flow rate for Canning Hwy.

For such traffic flow rates, it is expected that the night-time traffic noise level $L_{Aeq(night)}$ is much lower than the daytime noise level $L_{Aeq(Day)}$, and their difference ($L_{Aeq(Day)} - L_{Aeq(night)}$) should be greater than 5dB. Therefore, daytime noise level $L_{Aeq(Day)}$ is more critical for compliance assessment.

4.2.4 Modified Source Heights

The CoRTN calculation algorithm assumes road traffic noise emission height of 0.5 m above road surface for all vehicle classes. This assumption can overestimate the effect of noise barriers, particularly on heavy vehicle routes, as heavy vehicle noise sources (namely engine and exhaust) have a significantly higher noise emission height. In order to account for the elevated heavy vehicle noise emission height, traffic volumes were split into light and heavy vehicles (Austroads Class 1 and 2, and 3-12 respectively). According to the Implementation Guidelines for SPP5.4, light (passenger) vehicle (Austroads Class 1 and 2) source heights were unmodified (0.5 m above road surface), while heavy vehicle (Austroads Class 3 and up) source heights were modelled at a height of 1.5 m for heavy vehicle engines and 3.6 m for heavy vehicle exhausts. Note that corrections were applied to the exhaust of -8.0 dB (based on *Transportation Noise Reference Book, Paul Nelson, 1987*) and to the engine source of -0.8 dB in order to balance the combined output to 0 dB(A) (i.e. no additional gain from having two heavy vehicle noise source strings).

4.2.5 Road Surface Corrections

Canning Hwy and Kwinana Fwy are assumed to have Dense Graded asphalt surfaces. Table 6 presents a summary of relative noise relationships between different types of road surfaces.

Table 6: Noise Relationship between Different Road Surfaces.

Chip Seal			Asphalt			
14mm	10mm	5mm	Dense Graded	Novachip	Stone Mastic	Open Graded
+ 3.5 dB	+ 2.5 dB	+ 1.5 dB	0 dB	- 0.2 dB	- 1.5 dB	- 2.5 dB

4.2.6 Correction of Façade Reflection

The CoRTN algorithm does not calculate the noise reflections from building facades. According to the SPP5.4 Guidelines, the predicted noise levels $L_{A10,18\text{hour}}$ are adjusted by 2.5 dB to account for the facade reflections at all of the receivers.

4.2.7 Noise Level Conversion

The CoRTN algorithms were originally developed to calculate the $L_{A10,18\text{hour}}$ noise levels. SPP5.4 however uses noise levels of $L_{Aeq(\text{Day})}$ and $L_{Aeq(\text{Night})}$. Generally the relationship between the parameters varies depending on the composition of traffic on the road. For the cases where a receiver and the road of interest are close and have no buildings or fences present between them, the difference between $L_{Aeq(\text{Day})}$ and $L_{A10,18\text{hour}}$ is about 3 dB⁵. For this project, buildings and fences are present between the development site and Canning Hwy/ Kwinana Fwy. Based on the measured peak-hour noise level difference (1.4 dB) shown in Table 3, the following relationship is used:

$$L_{Aeq(\text{Day})} = L_{A10,18\text{hour}} - 1 \quad \text{dB(A)}$$

The above may give a conservative calculation of noise level $L_{Aeq(\text{Day})}$.

⁵ NSW Road Noise Policy, 2011.

5.0 MODELLING RESULTS

5.1 MODEL CALIBRATION

The acoustic model was calibrated based on the measured peak-hour $L_{A10,1h}$ (55.1 dB(A) shown in Table 3) by comparing the calculated $L_{A10,1h}$ with the measured $L_{A10,1h}$ at the noise logger location.

5.2 POINT MODELLING RESULTS

As indicated in section 4.2.3 and Figure 9/Figure 10, the night-time (10pm to 6am) traffic flow rate is below 17% of the day-time (6am to 10m) traffic flow rate. This indicates that the onsite night-time noise level $L_{Aeq(Night)}$ is more than 5dB lower than the onsite daytime noise level $L_{Aeq(Day)}$. The onsite daytime noise level $L_{Aeq(Day)}$ compliance guarantees the onsite night-time noise level $L_{Aeq(Night)}$ compliance.

Table 7 presents the predicted and adjusted A-weighted day-time noise levels $L_{Aeq(Day)}$. Since they do not account for building facade reflections, the predicted noise levels are adjusted by adding 2.5dB to account for façade reflections. According to the SPP5.4 Guidelines, the predicted and adjusted noise levels are rounded to integer numbers. Table 7 indicates that for the future road traffic conditions, the highest adjusted day-time noise level $L_{Aeq(Day)}$ is:

- ≤ 52 dB(A) for all units at the ground floor including the courtyards.
- ≤ 55 dB(A) at all of the balconies.
- ≤ 55 dB(A) at the first floor of units 3 to 8 and 10 to 12.
- 56 dB(A) at the first floor of units 2, 9 and 13.
- 57 dB(A) at the first floor of units 1 and 14.
- 56 dB(A) at the second floor of units 7 and 8.
- 59 dB(A) at the second floor of units 9 to 11.
- 60 dB(A) at the second floor of units 5, 6 and 12.
- 61 dB(A) at the second floor of units 3 and 4.
- 62 dB(A) at the second floor of units 2 and 13.
- 63 dB(A) at the mezzanine floor.

Table 7: Predicted and Adjusted Day-time Noise Levels $L_{Aeq(Day)}$ in dB(A).

Units	Receivers	Current		Future (2044)	
		Predicted Level	Adjusted Level	Predicted Level	Adjusted Level
U1	G1	47	49	48	51
	G2	47	50	49	52

Units	Receivers	Current		Future (2044)	
		Predicted Level	Adjusted Level	Predicted Level	Adjusted Level
	F1	52	55	54	57
	F2	52	55	54	56
U2	G3	46	49	48	51
	F3	46	49	48	51
	F4	52	54	53	56
	S1	58	60	59	62
	S2	55	58	57	60
U3	G4	47	49	48	51
	F5	49	51	51	53
	F6	50	52	51	54
	S3	56	59	58	61
	S4	53	56	55	58
U4	G5	47	49	49	51
	F7	48	50	50	52
	F8	49	51	51	53
	S5	56	59	58	61
	S6	53	55	54	57
U5	G6	47	49	48	51
	F9	50	52	51	54
	F10	48	51	50	53
	S7	56	59	58	60
	S8	52	55	54	56
U6	G7	46	49	48	50

Units	Receivers	Current		Future (2044)	
		Predicted Level	Adjusted Level	Predicted Level	Adjusted Level
	G8	46	48	48	50
	F11	51	54	53	55
	F12	46	48	47	50
	S9	56	58	58	60
	S10	53	55	54	57
	T1	58	61	60	62
	T2	59	62	61	63
U7	G9	46	49	48	51
	F13	44	46	46	48
	F14	48	51	50	52
	S11	51	53	53	55
	S12	52	54	54	56
	T3	59	61	61	63
	T4	56	59	58	61
U8	G10	47	49	48	51
	F15	48	51	50	52
	F16	46	49	48	51
	S13	51	54	53	56
	S14	51	53	52	55
	T5	56	59	58	61
	T6	59	61	60	63
U9	G11	48	50	50	52
	G12	47	50	49	52

Units	Receivers	Current		Future (2044)	
		Predicted Level	Adjusted Level	Predicted Level	Adjusted Level
	F17	45	48	47	50
	F18	52	54	54	56
	S15	52	54	53	56
	S16	55	57	56	59
	T7	59	61	61	63
	T8	57	59	59	61
U10	G13	47	50	49	52
	F19	51	53	52	55
	F20	49	51	51	53
	S17	55	57	57	59
	S18	53	55	54	57
U11	G14	47	50	49	52
	F21	50	52	51	54
	F22	49	52	51	54
	S19	55	58	57	59
	S20	53	55	55	57
U12	G15	48	51	50	52
	F23	50	53	52	54
	F24	50	53	52	54
	S21	55	58	57	60
	S22	54	57	56	58
U13	G16	49	51	50	53
	F25	49	52	51	53

Units	Receivers	Current		Future (2044)	
		Predicted Level	Adjusted Level	Predicted Level	Adjusted Level
	F26	52	54	54	56
	S23	58	60	60	62
	S24	56	59	58	60
U14	G17	48	50	50	52
	G18	46	48	48	50
	F27	53	55	54	57
	F28	51	54	53	56

5.3 NOISE CONTOURS

Figure 11 to Figure 18 in APPENDIX B present the predicted noise level $L_{Aeq(Day)}$ contours. The black lines represent the site boundary fences. These noise contours consider the barrier effect of the proposed buildings onsite and the existing buildings in the surrounding area and boundary fences, but do not account for building facade reflections.

Figure 11 to Figure 14 present the daytime noise level $L_{Aeq(Day)}$ contours for the current road traffic conditions while Figure 15 to Figure 18 show the daytime $L_{Aeq(Day)}$ contours for the future road traffic conditions.

Figure 11 and Figure 15 show the $L_{Aeq(Day)}$ contours at the ground floor level (1.4m above the ground) while Figure 12 and Figure 16 show the $L_{Aeq(Day)}$ contours at the first floor level (4.5m above the ground). Figure 13 and Figure 17 present the $L_{Aeq(Day)}$ contours at the 2nd floor level (7.6m above the ground). Figure 14 and Figure 18 present the $L_{Aeq(Day)}$ contours at the Mezzanine floor level (10.7m above the ground).

6.0 ASSESSMENT AND RECOMMENDATIONS

Under SPP5.4, noise mitigation measures are necessary if the adjusted noise levels of a new development exceed the outdoor target levels.

Table 7 shows that for the future road traffic conditions, the highest adjusted day-time noise level $L_{Aeq(Day)}$ falls into exposure category:

- A for the first floor of units 1, 2, 9, 13 and 14, and also for the second floor of units 7 and 8.
- B for the second floor of units 2 to 6 and 9 to 13.
- C for the mezzanine floor of units 6 to 9.

To comply with the requirements of SPP5.4 and achieve reasonable indoor amenity, the following measures are recommended:

- Implement the "Quiet House" package A for the construction of the first floor of units 1, 2, 9, 13 and 14, and also the second floor of units 7 and 8.
- Implement the "Quiet House" package B for the construction of the second floor of units 2 to 6 and 9 to 13.
- Implement the "Quiet House" package C for the construction of mezzanine floor of units 6 and 9.
- Incorporate "Notifications on Titles" for all of the units.

"Quiet House" packages A to C are detailed in APPENDIX C and also in the SPP5.4 Guidelines.

Table 7 shows that for the future road traffic conditions the adjusted noise level is:

- Below the day-time outdoor noise target in all of the ground floor courtyards; and
- Not above the day-time outdoor noise target in all of the first floor balconies.

This means that outdoor living area of "reasonable degree of acoustic amenity" is achieved for all of the units.

6.1 BUILDING FACE ORIENTATION

The acoustic requirements of windows and doors in the "Quiet House" packages depend on the building face orientations. SPP5.4 Guidelines define three terms to relate the building facade orientations to the transport corridors:

- "Facing" the transport corridor: Any part of a building facade is 'facing' the transport corridor if any straight line drawn perpendicular (at a 90 degree angle) to its nearest road lane or railway line intersects that part of the facade without obstruction (ignoring any fence).
- "Side on" to transport corridor: Any part of a building facade that is not 'facing' is 'side on' to the transport corridor if any straight line, at any angle, can be drawn

from it to intersect the nearest road lane or railway line without obstruction (ignoring any fence).

- "Opposite" to transport corridor: Neither "side on" nor "facing", as defined above.

For this project, the "facing" building facades are indicated in thick red lines and the "side-on" facades are illustrated in thick blue lines in Figure 19 to Figure 21 in APPENDIX C.

APPENDIX A SITE LAYOUTS

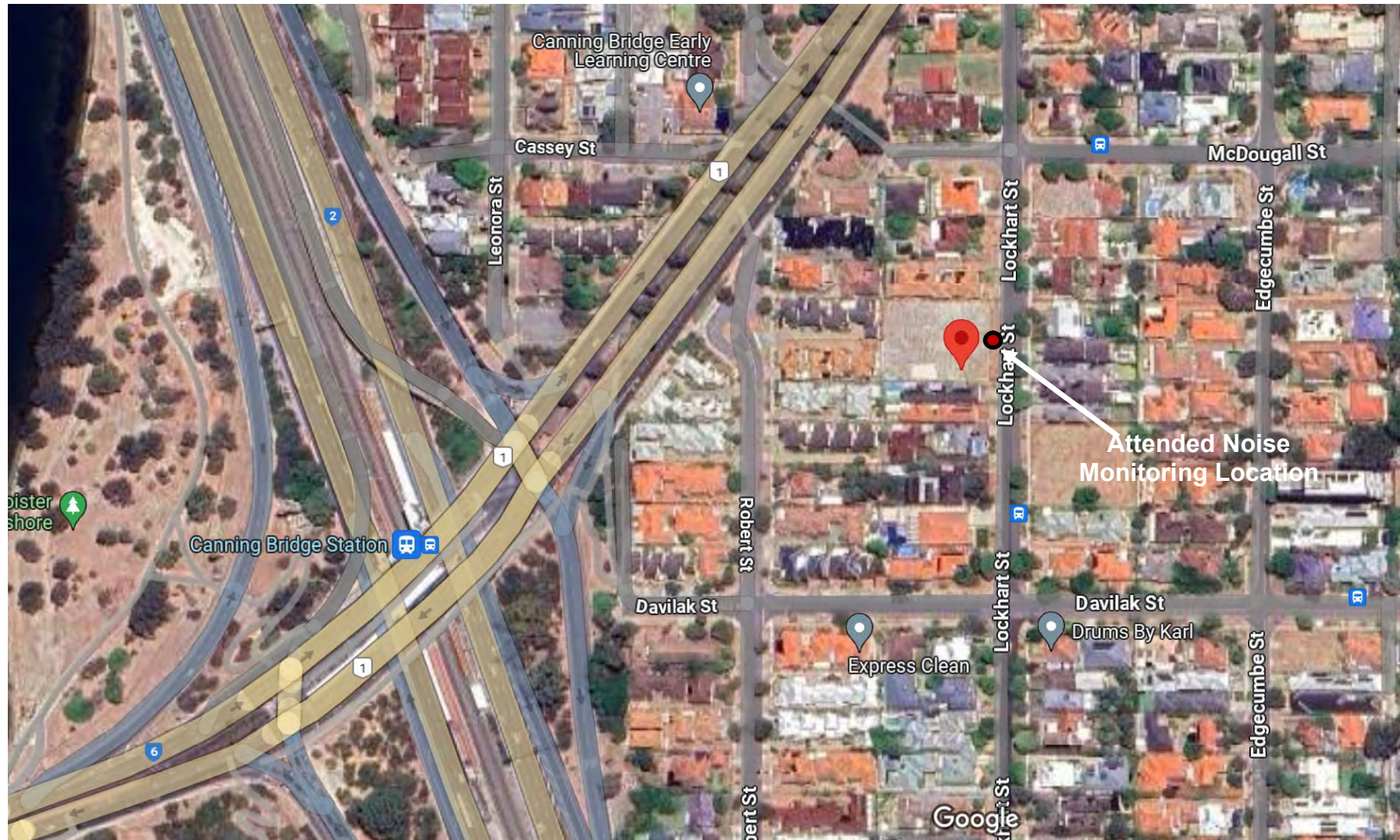


Figure 1: Aerial view of development site and surrounding area.

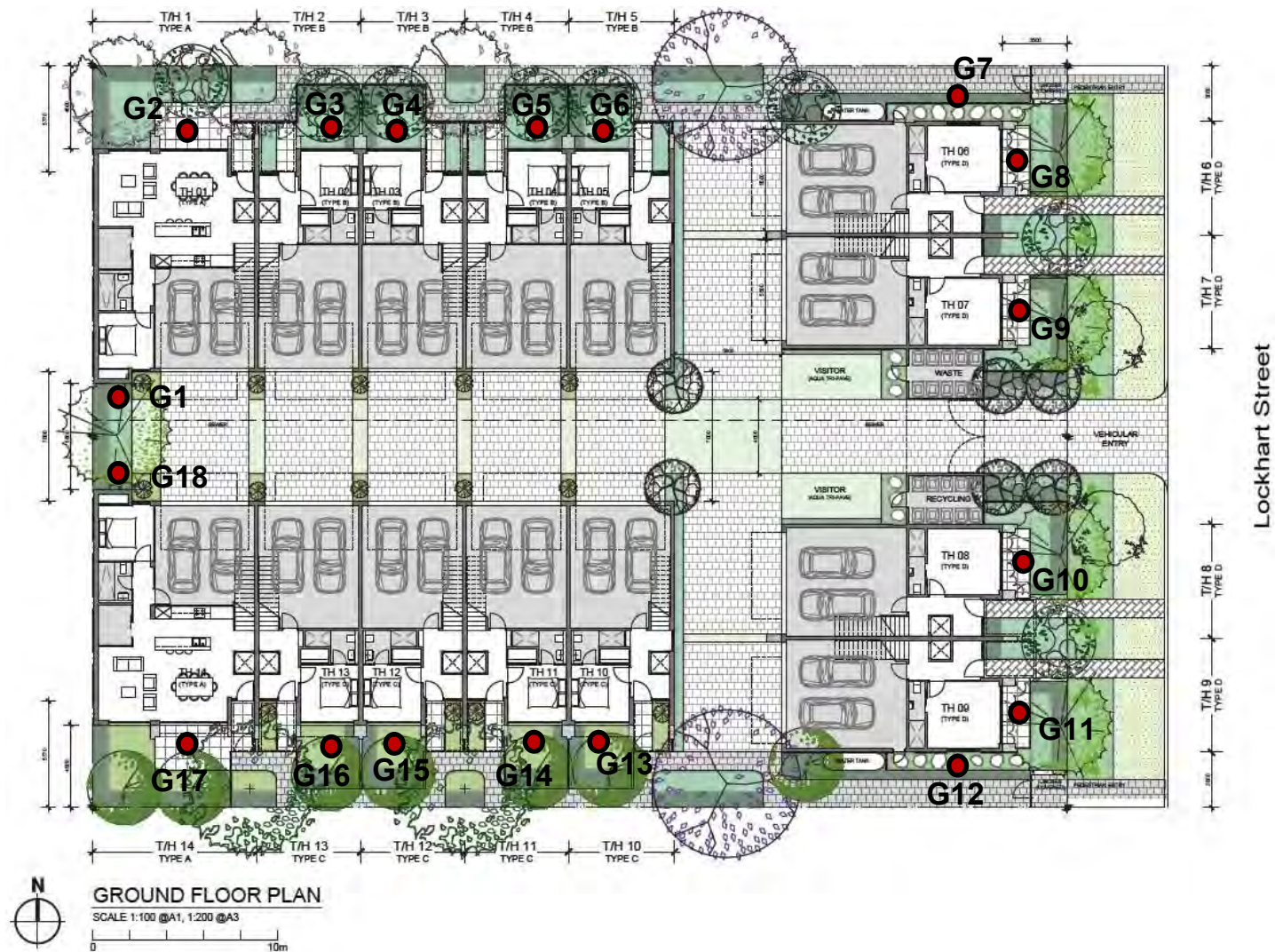


Figure 2: Ground floor plan.

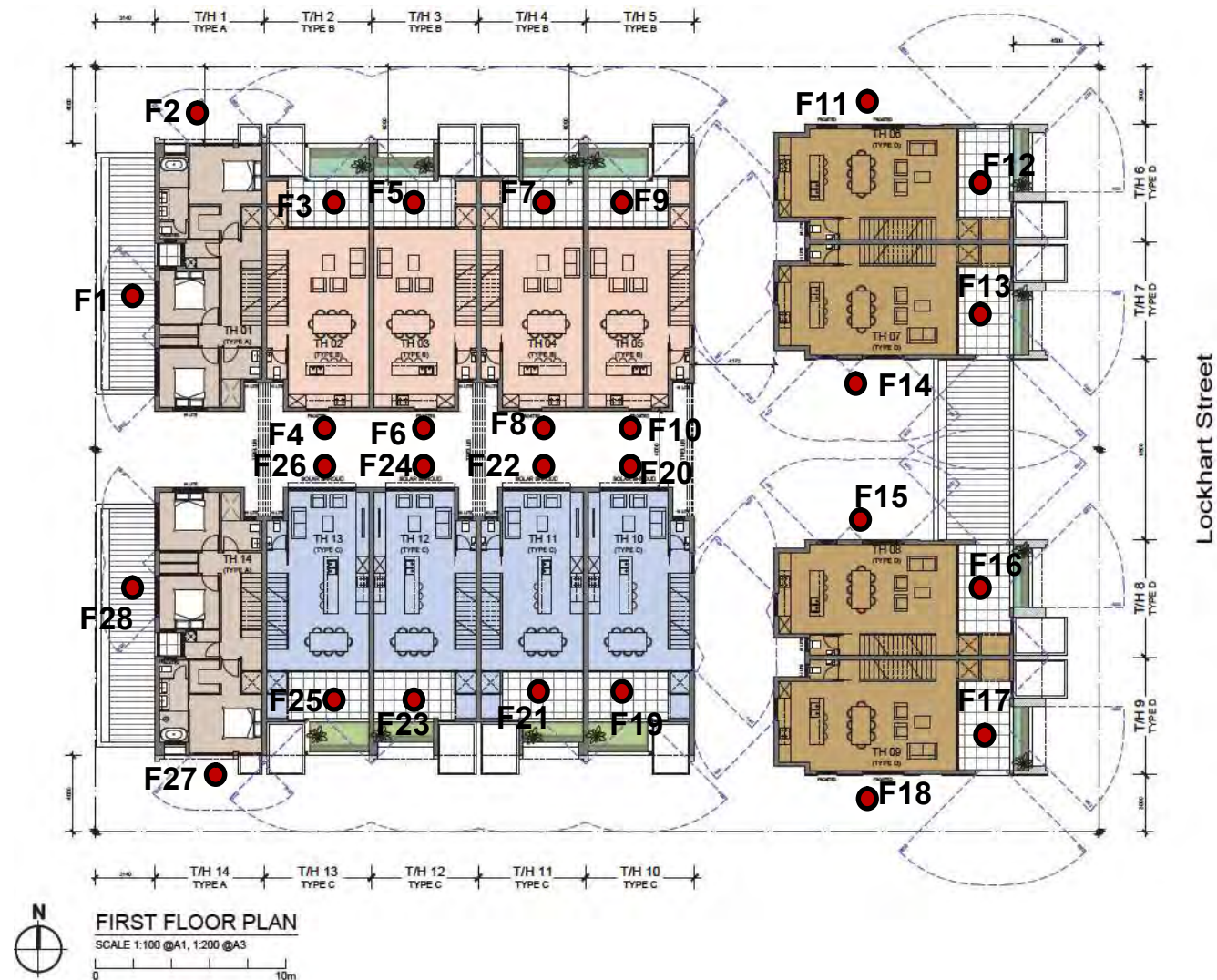


Figure 3: First floor plan.

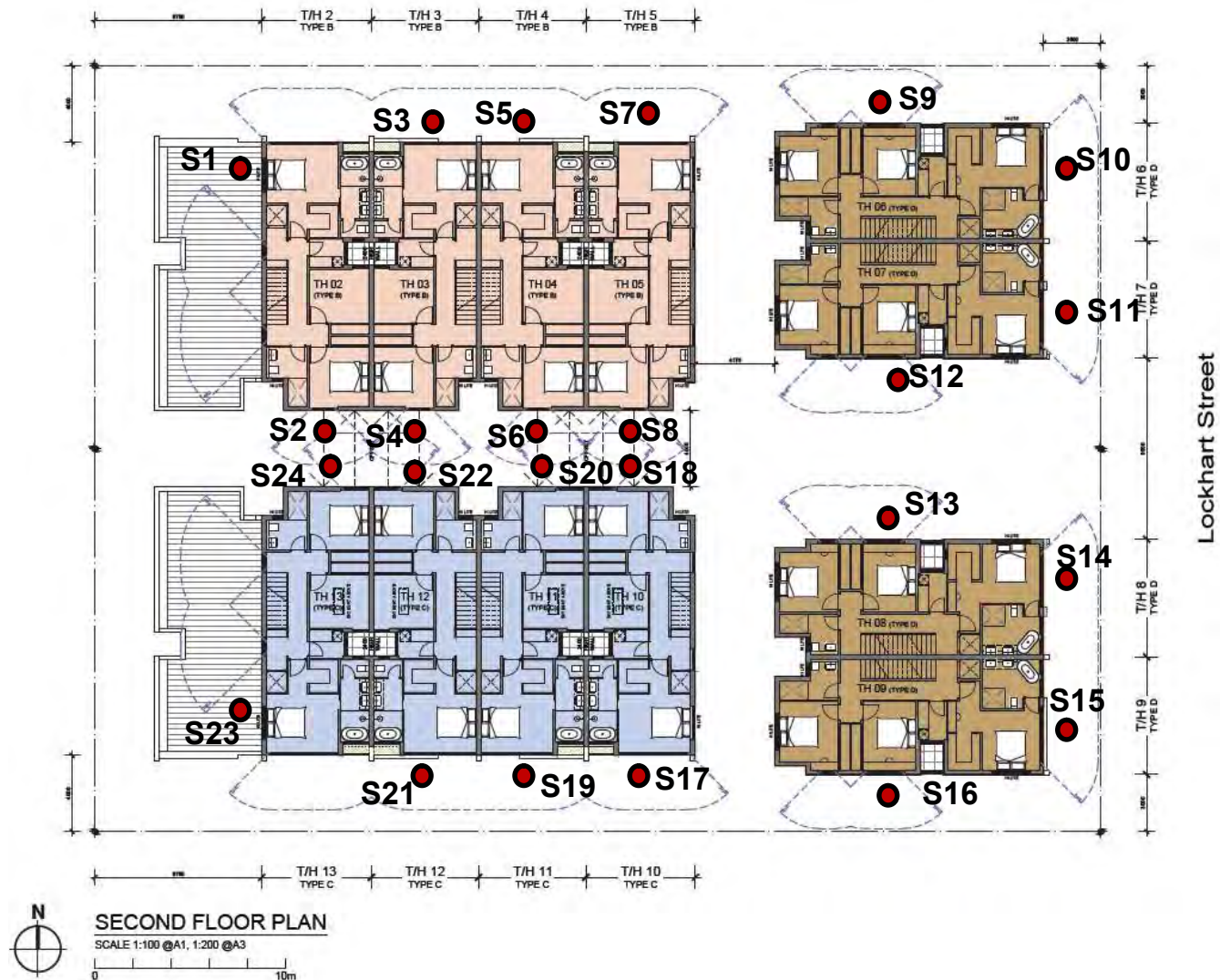


Figure 4: Second floor plan.

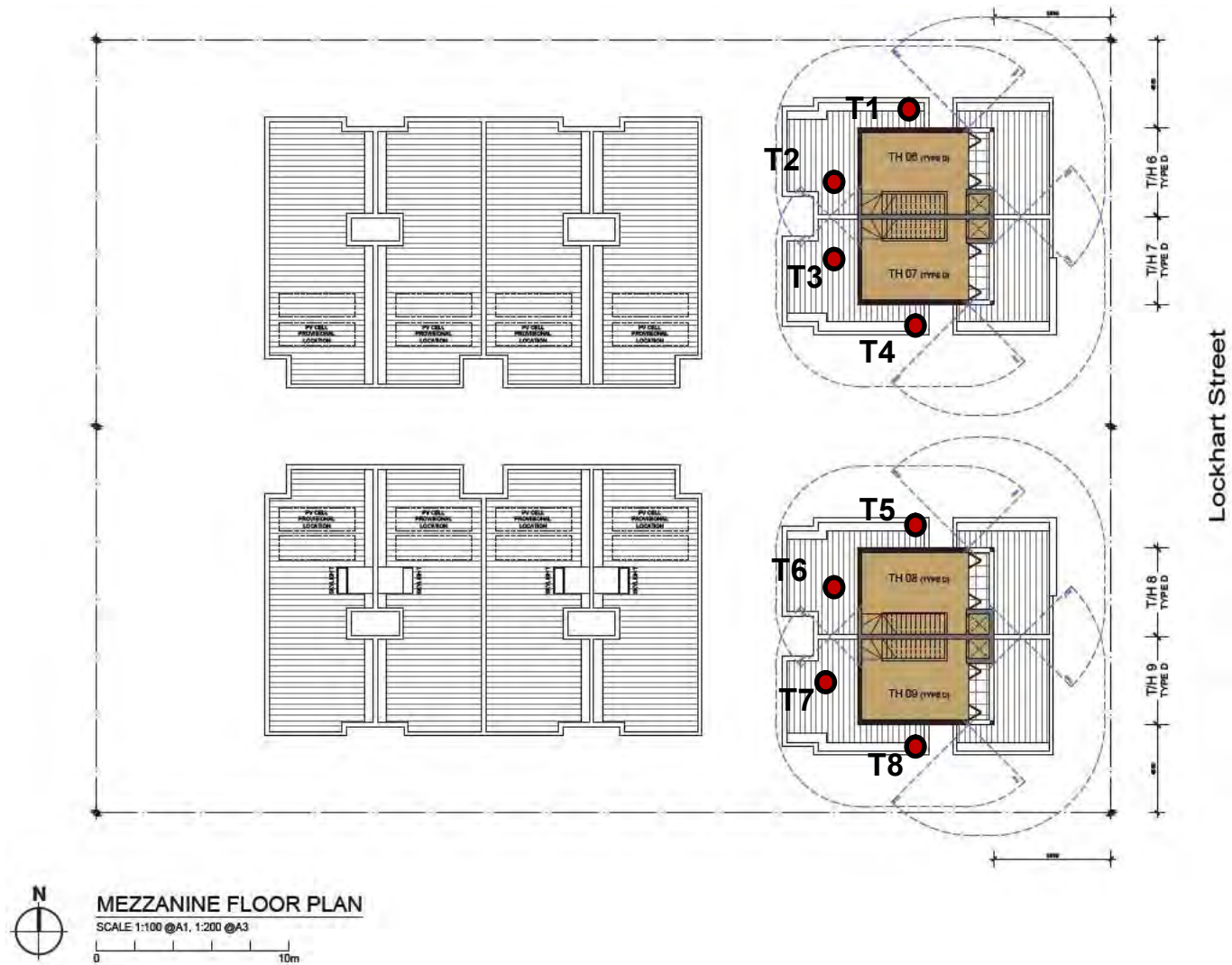


Figure 5: Mezzanine floor plan.



Figure 6: 3D views.



Figure 7: Photo of the sound level meter.

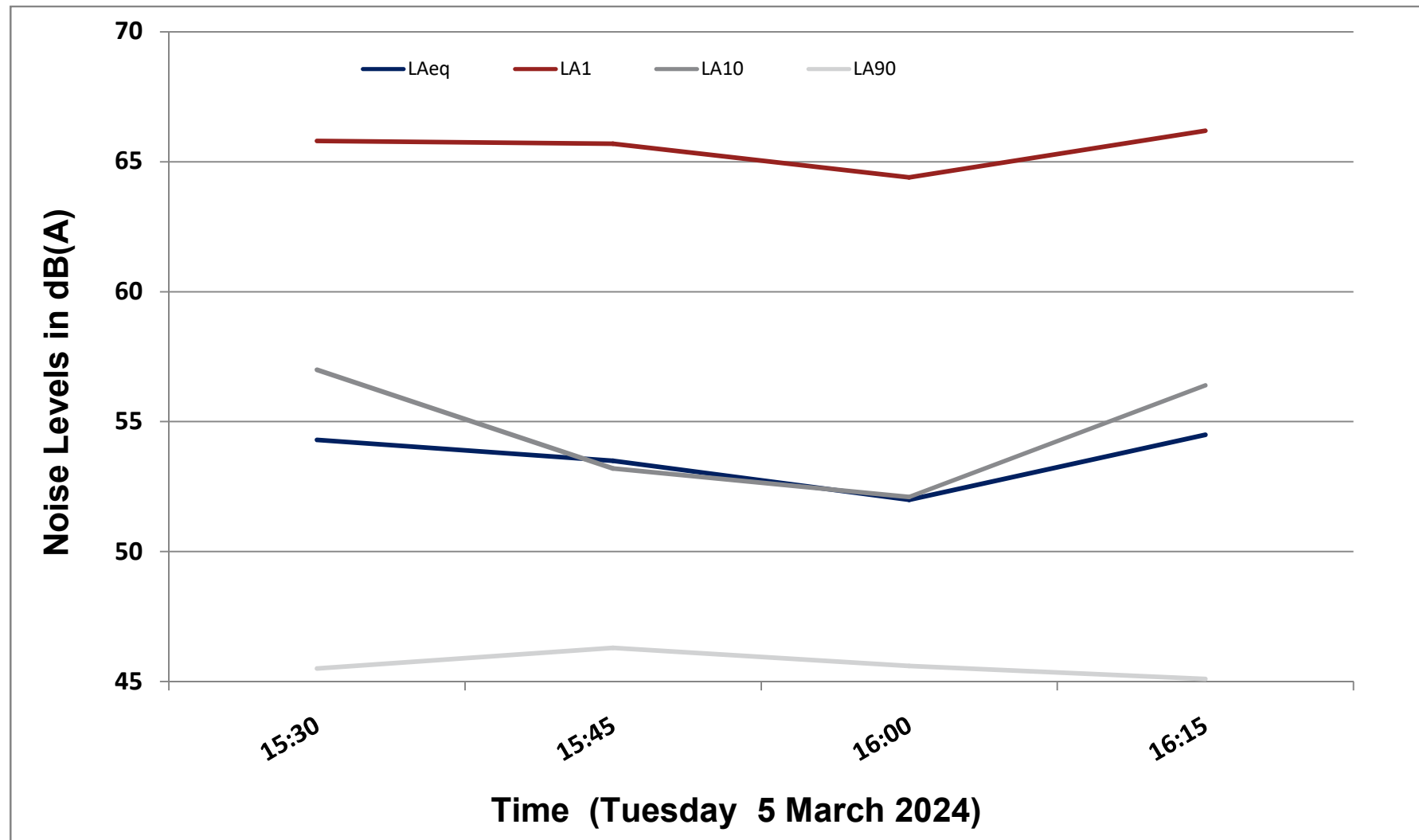


Figure 8: Measured noise levels from 3:30pm to 4:30pm on Tuesday 5/3/2024.



SITE 51976

Hourly Volume

Kwinana Fwy (H015)

2019/20
Monday to Friday

North of Mount Henry Bridge (SLK 7.15)

	 All Vehicles			 Heavy Vehicles			
	 NB	 SB	 Both	 NB	 SB	 Both	 %
00:00	222	379	601	19	21	40	6.7
01:00	139	226	365	17	23	40	11.0
02:00	123	182	305	22	24	46	15.1
03:00	173	232	405	37	33	70	17.3
04:00	474	520	994	88	55	143	14.4
05:00	1997	1943	3940	238	206	444	11.3
06:00	4895	3789	8684	531	443	974	11.2
07:00	4075	4770	8845	291	393	684	7.7
08:00	3198	4230	7428	222	343	565	7.6
09:00	4042	3718	7760	347	412	759	9.8
10:00	4030	3602	7632	402	426	828	10.8
11:00	4053	3824	7877	414	439	853	10.8
12:00	4015	4096	8111	402	440	842	10.4
13:00	3797	4234	8031	397	446	843	10.5
14:00	4189	5049	9238	407	463	870	9.4
15:00	4628	5766	10394	369	438	807	7.8
16:00	4476	5895	10371	273	315	588	5.7
17:00	4240	5657	9897	184	204	388	3.9
18:00	3447	4115	7562	132	146	278	3.7
19:00	2122	2532	4654	78	99	177	3.8
20:00	1599	2144	3743	58	74	132	3.5
21:00	1298	2253	3551	43	64	107	3.0
22:00	870	1592	2462	30	49	79	3.2
23:00	473	874	1347	20	29	49	3.6
TOTAL	62575	71622	134197	5021	5585	10606	7.9



Peak Statistics

AM	TIME	06:15	07:15	08:30	06:00	06:15	06:15
	VOL	5225	4847	9455	531	462	991
PM	TIME	15:15	15:30	15:30	13:45	14:15	14:15
	VOL	4651	5915	10553	409	469	872

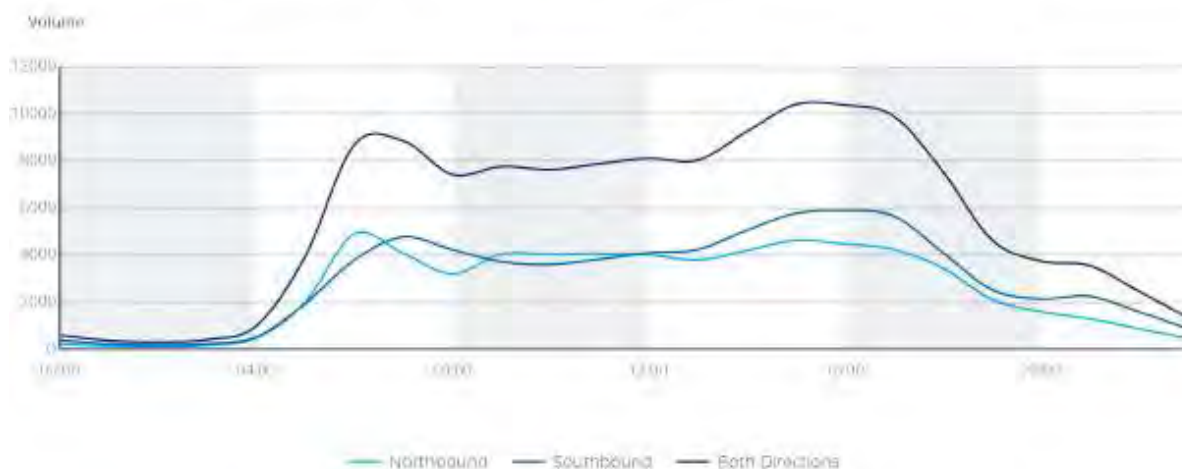


Figure 9: Weekday traffic flows for Kwinana Fwy.



ITE 0644

Hourly Volume

Canning Hwy (H013)

2020/21
Monday to Friday

North of Henley St (SLK 4.93)

	All Vehicles				Heavy Vehicles				
	NB	SB	Both		NB	SB	Both	%	
00:00	61	86	147		1	4	5	3.4	
01:00	44	69	113		3	2	5	4.4	
02:00	31	54	85		1	3	4	4.7	
03:00	53	51	104		5	4	9	8.7	
04:00	107	115	222		9	6	15	6.8	
05:00	296	295	591		29	26	55	9.3	
06:00	889	693	1582		87	67	154	9.7	
07:00	1567	1135	2722		97	75	172	6.3	
08:00	1670	1283	2953		73	76	149	5.0	
09:00	1184	1014	2198		85	95	180	8.2	
10:00	1085	988	2073		88	71	159	7.7	
11:00	1188	1057	2245		73	78	151	6.7	
12:00	1108	1057	2165		80	76	156	7.2	
13:00	1035	1029	2064		75	76	151	7.3	
14:00	1217	1227	2444		78	97	175	7.2	
15:00	1418	1486	2904		76	91	167	5.8	
16:00	1478	1614	3092		71	64	135	4.4	
17:00	1519	1535	3054		54	59	113	3.7	
18:00	1104	1051	2155		32	39	71	3.3	
19:00	790	677	1467		21	24	45	3.1	
20:00	519	545	1064		16	14	30	2.8	
21:00	473	476	949		11	16	27	2.8	
22:00	308	349	657		8	10	18	2.7	
23:00	182	236	408		7	8	15	3.7	
TOTAL	19346	18112	37458		1080	1081	2161	5.8	



Peak Statistics

AM	TIME	07:30	07:45	07:30	06:30	09:00	09:15
	VOL	1797	1322	3117	100	95	184
PM	TIME	16:45	16:15	16:30	15:30	14:00	14:00
	VOL	1524	1651	3155	85	97	175

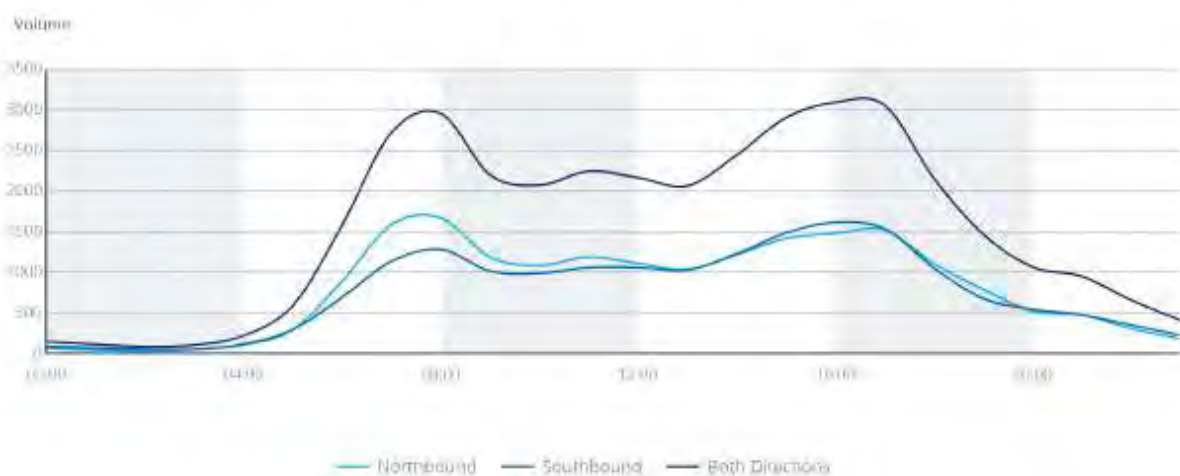


Figure 10: Weekday traffic flows for Canning Hwy.

APPENDIX B NOISE CONTOURS



Figure 11: Day-time $L_{Aeq}(\text{Day})$ contours at 1.4m above the ground for current traffic flows.



Figure 12: Day-time $L_{Aeq}(\text{Day})$ contours at 4.5m above the ground for current traffic flows.

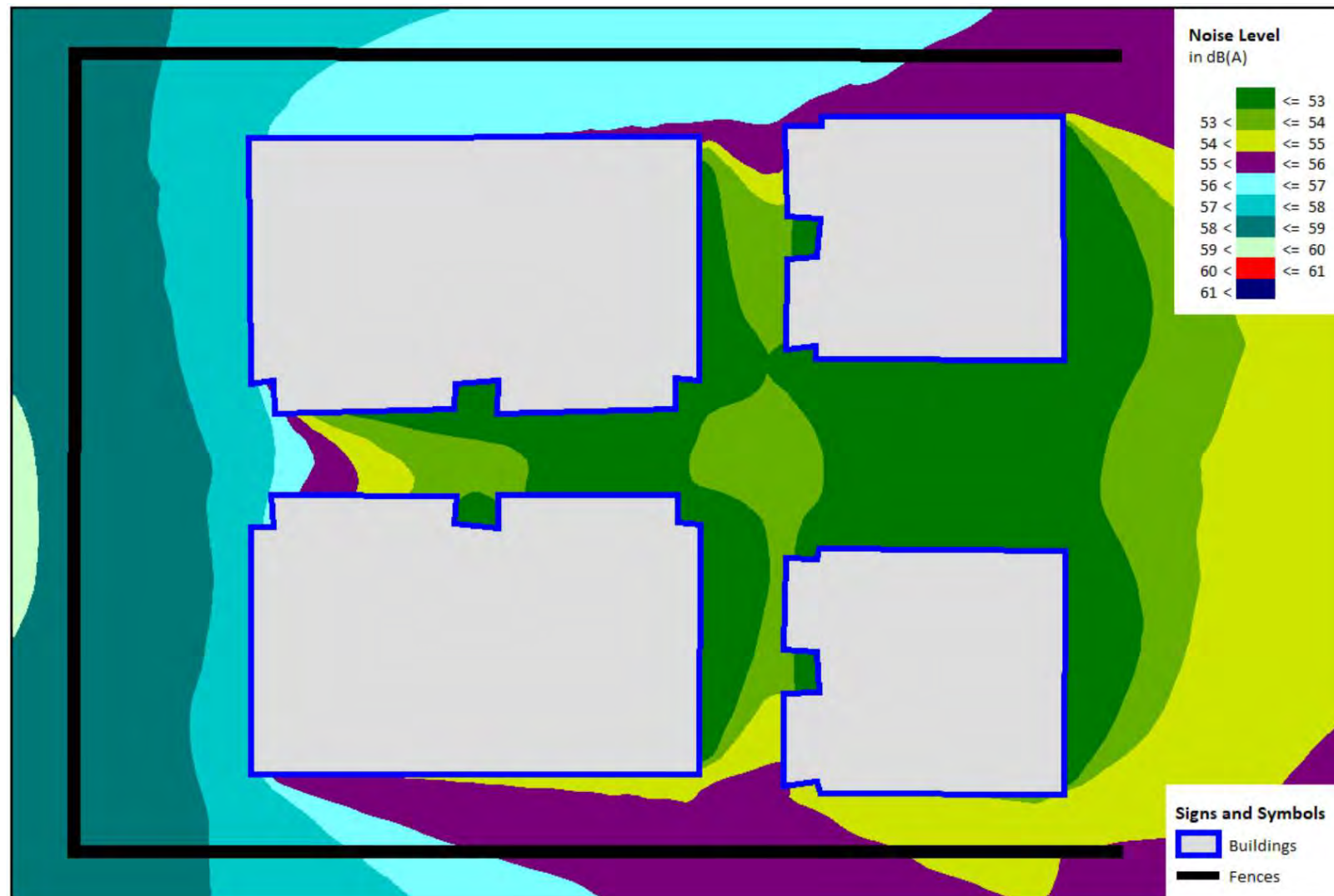


Figure 13: Day-time $L_{Aeq}(\text{Day})$ contours at 7.6m above the ground for current traffic flows.

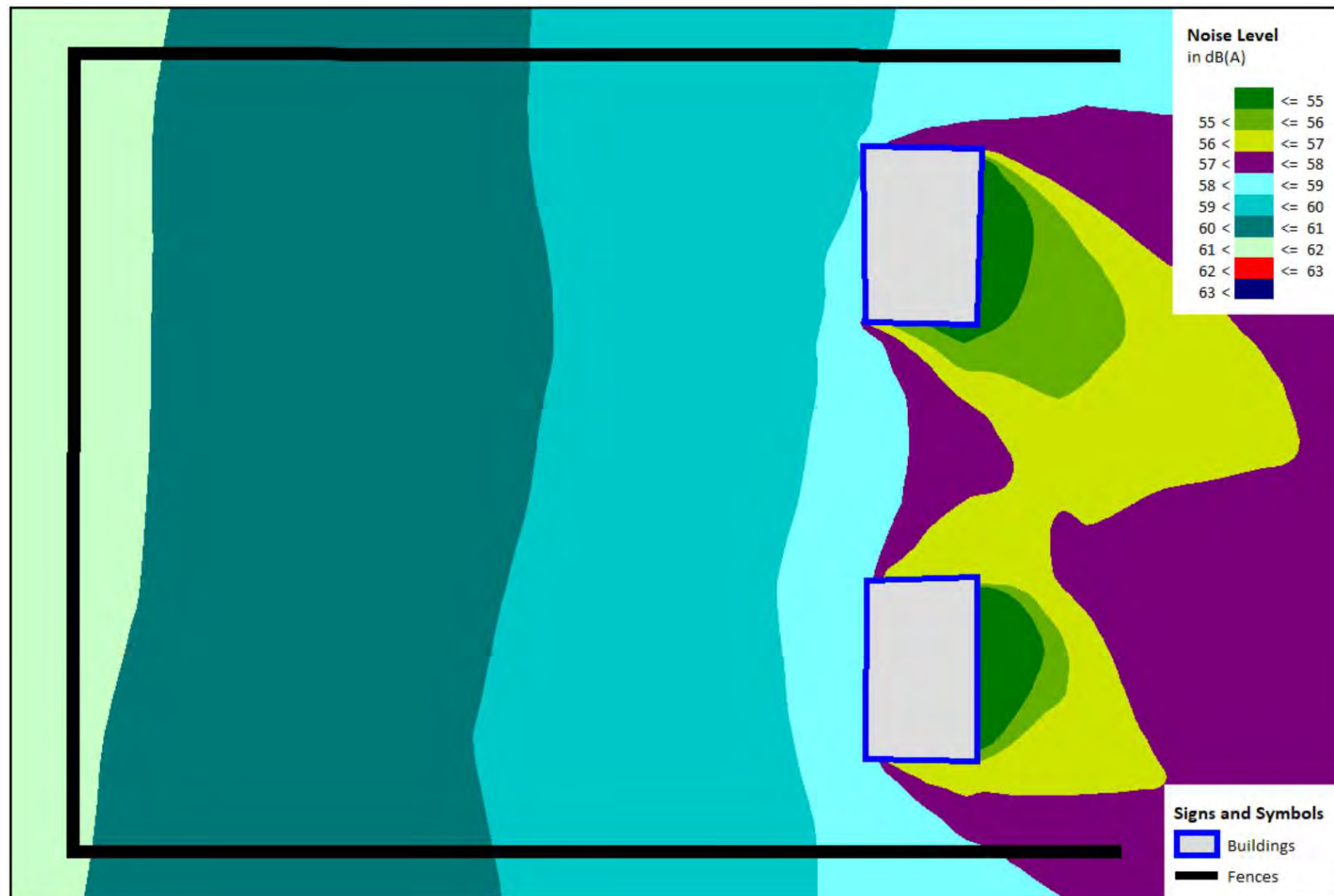


Figure 14: Day-time $L_{Aeq}(\text{Day})$ contours at 10.7m above the ground for current traffic flows.



Figure 15: Day-time $L_{Aeq}(\text{Day})$ contours at 1.4m above the ground for future traffic flows.

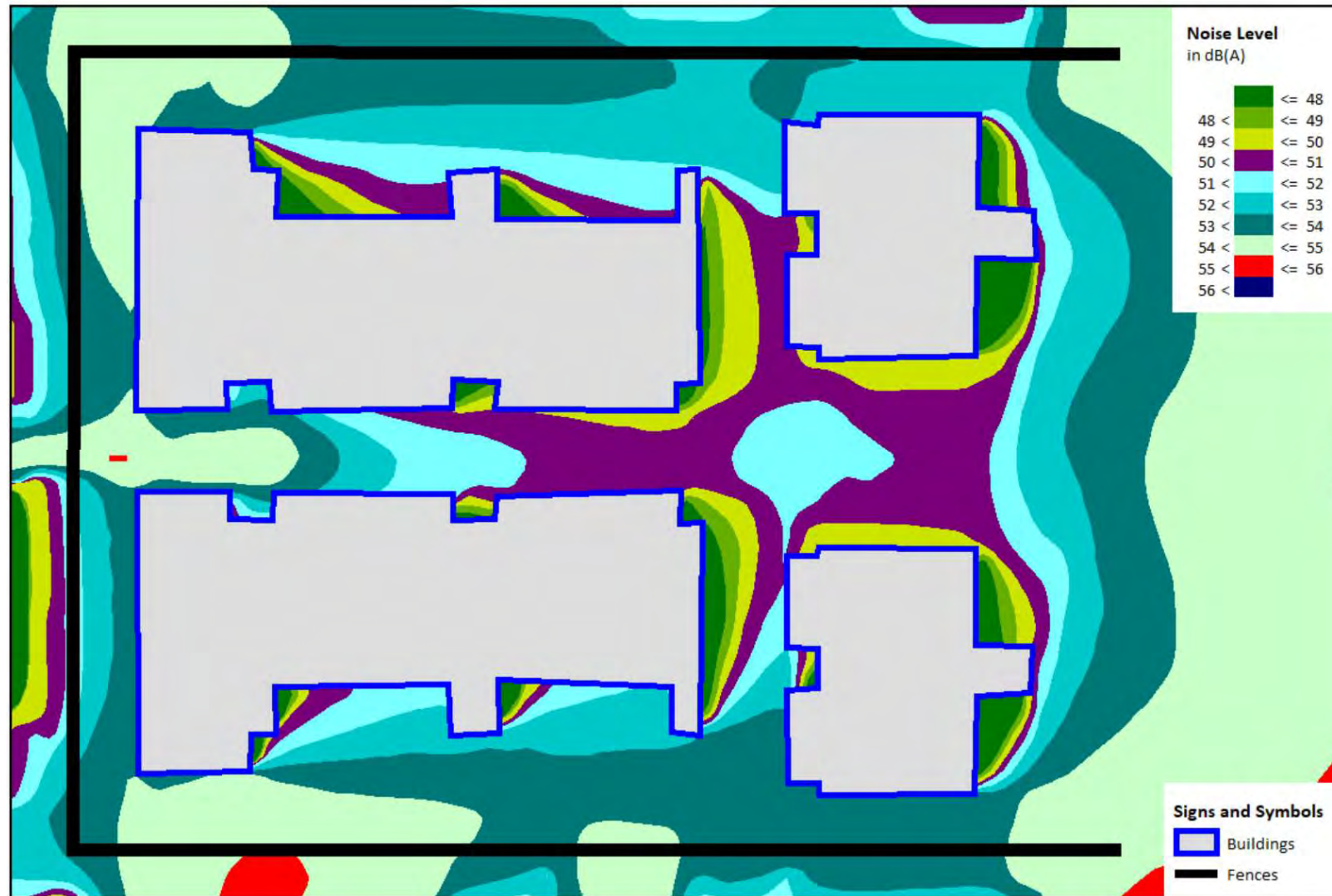


Figure 16: Day-time $L_{Aeq}(\text{Day})$ contours at 4.5m above the ground for future traffic flows.

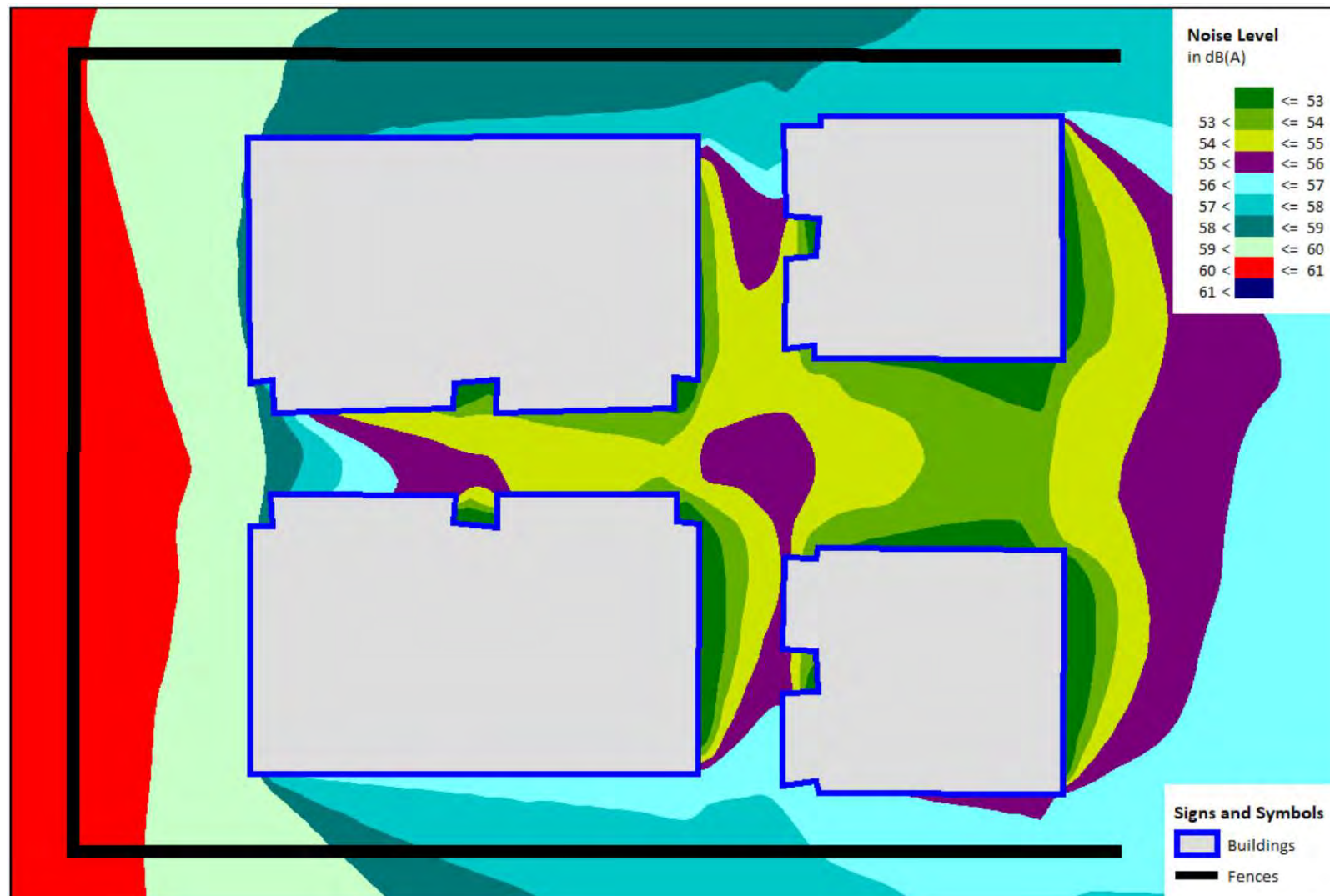


Figure 17: Day-time $L_{Aeq}(Day)$ contours at 7.6m above the ground for future traffic flows.

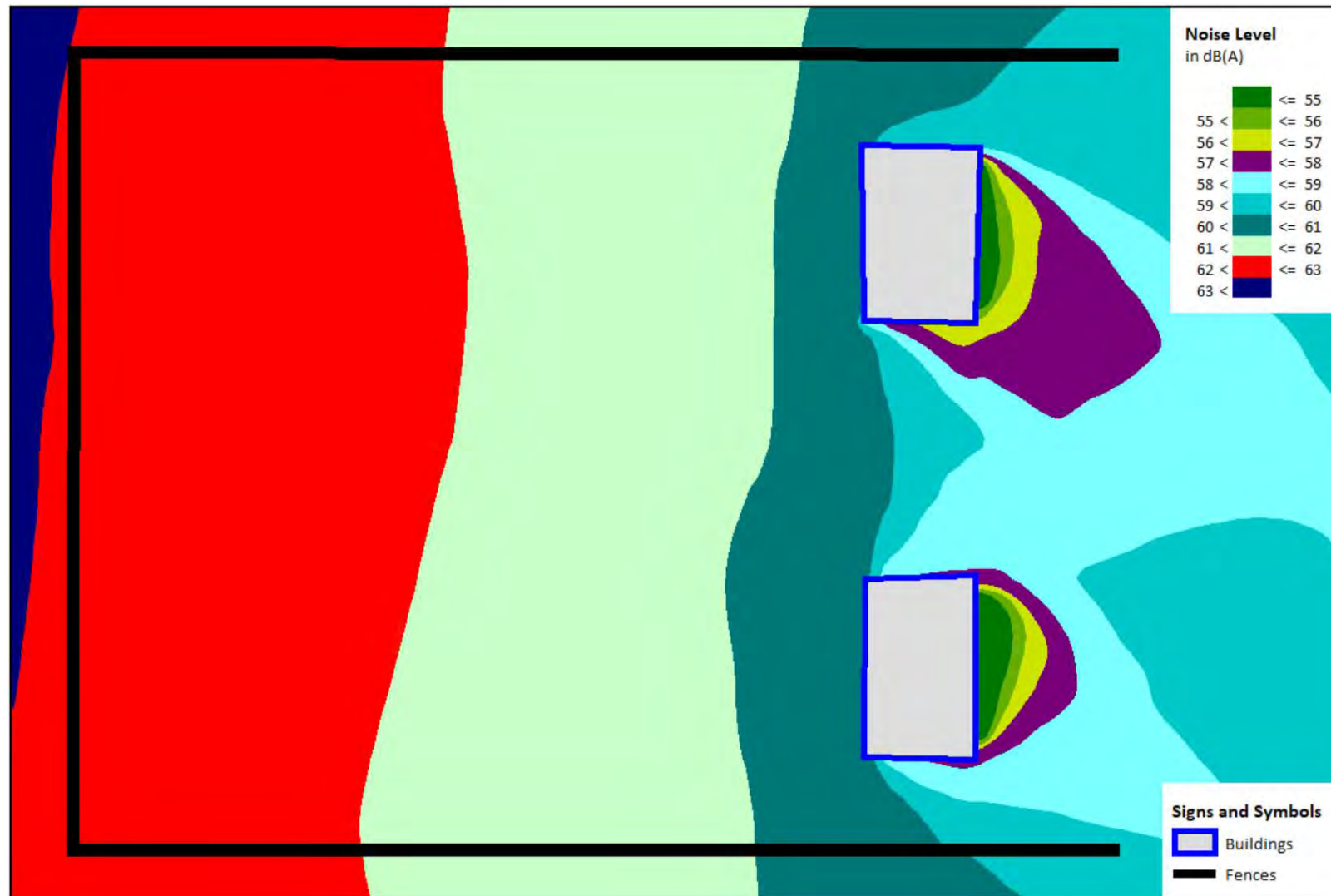


Figure 18: Day-time $L_{Aeq}(\text{Day})$ contours at 10.7m above the ground for future traffic flows.

APPENDIX C QUIET HOUSE PACKAGES

Exposure Category	Orientation to corridor	Acoustic rating and example constructions					Mechanical ventilation / air conditioning considerations
		Walls	External doors	Windows	Roofs and ceilings of highest floors	Outdoor living areas	
A Quiet House A	Facing	Bedroom and indoor living and work areas to $Rw+Ctr$ 45dB - One row of 92mm studs at 600mm centres with: - Resilient steel channels fixed to the outside of the studs; and 9.5mm hardboard or 9mm fibre cement sheeting or 11mm fibre cement weatherboards or one layer of 19mm board cladding fixed to the outside of the channels; and 75mm glass wool (11kg/m³) or 75mm polyester (14kg/m³) insulation, positioned between the studs; and - Two layers of 16mm fire-protective grade plasterboard fixed to the inside face of the studs. - Single leaf of 150mm brick masonry with 13mm cement render on each face. - Double brick: two leaves of 90mm clay brick masonry with a 20mm cavity between leaves.	Bedrooms: - Fully glazed hinged door with certified $Rw+Ctr$ 28dB rated door and frame including seals and 6mm glass Other external doors to $Rw+Ctr$ 25dB, e.g. 35mm solid core timber hinged door and frame system certified to Rw 28dB including seals - Glazed sliding door with 10mm glass and weather seals	Bedrooms: - Total external door and window system area up to 40% of room floor area: Sliding or double hung with minimum 10mm single or 6mm-12mm-10mm double insulated glazing ($Rw+Ctr$ 28 dB). Sealed awning or casement windows may use 6 mm glazing instead. - Up to 60% floor area: as per above but must be sealed awning or casement type windows ($Rw+Ctr$ 31dB). Indoor living and work areas - Up to 40% floor area: Sliding, awning, casement or double hung with minimum 6mm single pane or 6mm-12mm-6mm double insulated glazing ($Rw+Ctr$ 25dB). - Up to 60% floor area: As per Bedrooms at up to 40% area ($Rw+Ctr$ 28 dB). - Up to 80% floor area: As per Bedrooms at up to 60% area ($Rw+Ctr$ 31dB).	To $Rw+Ctr$ 35dB Concrete or terracotta tile or metal sheet roof with sarking and at least 10mm plasterboard ceiling	At least one outdoor living area located on the opposite side of the building from the transport corridor and/or at least one ground level outdoor living area screened using a solid continuous fence or other structure of minimum 2 metres height above ground level.	- Acoustically rated openings and ductwork to provide a minimum sound reduction performance of Rw 40dB into sensitive spaces - Evaporative systems require attenuated ceiling air vents to allow closed windows - Refrigerant-based systems need to be designed to achieve National Construction Code fresh air ventilation requirements - Openings such as eaves, vents and air inlets must be acoustically treated, closed or relocated to building sides facing away from the corridor where practicable
	Side-on						
	Opposite		As per 'Facing' above, except $Rw+Ctr$ values may be 3dB less, e.g. glazed sliding door with 10mm glass and weather seals for bedrooms. No specific requirements	As above, except $Rw+Ctr$ values may be 3dB less, or max % area increased by 20%			
A Quiet House A+	All	As per Quiet House A, except double leaf masonry / brick construction only.	As per Quiet House A.	As per Quiet House A, except that 'Side-on' requirements same as 'Facing'. - All windows comprise minimum 6 mm thick laminated or toughened glass in sealed awning or casement frames. Polymer (e.g. uPVC) window framing should be used. Evaporative air conditioning systems are not recommended. - No external doors for bedrooms with entry 'Facing' transport corridor	No specific requirements		
B Quiet House B	Facing	Bedroom and indoor living and work areas to $Rw+Ctr$ 50dB - Single leaf of 90mm clay brick masonry with: - A row of 70mm x 35mm timber studs or 64mm steel studs at 600mm centres; - A cavity of 25mm between leaves; 50mm glass wool or polyester cavity insulation ($R2.0+$) insulation between studs; and - One layer of 10mm plasterboard fixed to the inside face - Single leaf of 220mm brick masonry with 13mm cement render on each face	Bedrooms - Fully glazed hinged door with certified $Rw+Ctr$ 31dB rated door and frame including seals and 10mm glass Other external doors to $Rw+Ctr$ 28dB, e.g. - As per Quiet House A Bedrooms.	Bedrooms: - Total external door and window system area up to 40% of room floor area: Fixed sash, awning or casement with minimum 6mm single or 6mm-12mm-6mm double insulated glazing ($Rw+Ctr$ 31 dB). - Up to 60% floor area: as per above but must be minimum 10 mm single or 6mm-12mm-10mm double insulated glazing ($Rw+Ctr$ 34dB). Indoor living and work areas - Up to 40% floor area: Sliding or double hung with minimum 6mm single pane or 6mm-12mm-6mm double insulated glazing ($Rw+Ctr$ 28dB). Sealed awning or casement windows may use 6 mm glazing instead. - Up to 60% floor area: As per Bedrooms at up to 40% area ($Rw+Ctr$ 31 dB). - Up to 80% floor area: As per Bedrooms at up to 60% area ($Rw+Ctr$ 34dB).	To $Rw+Ctr$ 35dB Concrete or terracotta tile or metal sheet roof, sarking and at least 10mm plasterboard ceiling, $R3.0+$ insulation	At least one outdoor living area located on the opposite side of the building from the corridor and/or at least one ground level outdoor living area screened using a solid continuous fence or other structure of minimum 2.4 metres height above ground level	
	Side-on	150mm thick unlined concrete panel or 200mm thick concrete panel with one layer of 13mm plasterboard or 13mm cement render on each face					
	Opposite	- Double brick: two leaves of 90mm clay brick masonry with: - A 50mm cavity between leaves 50mm glass wool or polyester cavity insulation ($R2.0+$) - resilient ties where required to connect leaves - Double brick: two leaves of 110mm clay brick masonry with a 50mm cavity between leaves and $R2.0+$ cavity insulation	As per Quiet House A 'Facing' above ($Rw+Ctr$ values may be 3dB less, or max % area increased by 20%). As per Quiet House A 'Side-on' above.				
B Quiet House B+	All	As per Quiet House B example above, except use double leaf masonry construction only.	As per Quiet House B, except No external doors for bedrooms with entry 'Facing' or 'Side-on' to transport corridor	As per Quiet House B, except that 'Side-on' requirements become the same as Quiet House B 'Facing'. - All windows comprise minimum 6 mm thick laminated or toughened glass in sealed awning or casement frames. Polymer (e.g. uPVC) window framing should be used. - Evaporative air conditioning systems are not recommended.	As per Quiet House C (to $Rw+Ctr$ 40dB).		

Cont. next page

Exposure Category	Orientation to corridor	Acoustic rating and example constructions					Mechanical ventilation / air conditioning considerations
		Walls	External doors	Windows	Roofs and ceilings of highest floors	Outdoor living areas	
C Quiet House C	Facing	Bedroom and indoor living and work areas to $Rw+Ctr$ 50dB • As per Quiet House B example above	Bedrooms • External doors to bedrooms facing the corridor are not recommended. Other external doors to $Rw+Ctr$ 30dB, e.g. • Fully glazed hinged door with certified $Rw+Ctr$ 31dB rated door and frame including seals and 10mm glass. • 40mm solid core timber frame and door (without glass or with glass inserts not less than 6mm), side hinged with certified Rw 32dB acoustically rated door and frame system including seals	Bedrooms: • Total external door and window system area up to 20% of room floor area: Fixed sash, awning or casement with minimum 6mm single or 6mm-12mm-6mm double insulated glazing ($Rw+Ctr$ 31 dB). • Up to 40% floor area: as per above but must be minimum 10 mm single or 6mm-12mm-10mm double insulated glazing ($Rw+Ctr$ 34dB). Indoor living and work areas • Up to 40% floor area: Sliding or double hung with minimum 6mm single pane or 6mm-12mm-6mm double insulated glazing ($Rw+Ctr$ 31dB). Sealed awning or casement windows may use 6 mm glazing instead. • Up to 60% floor area: As per Bedrooms at up to 40% area ($Rw+Ctr$ 34 dB).	To $Rw+Ctr$ 40dB • To all bedrooms, 2 layers of 10mm plasterboard, or one layer 13 mm high density sealed plasterboard (minimum surface density of 12.5 kg/m ²), affixed using steel furring channels beneath ceiling rafters / supports. • R3.0+ insulation batts laid in cavity. • Concrete or terracotta tile roof with sarking, or metal sheet roof with foil backed R2.0+ fibre insulation between steel sheeting and roof battens.	As per Quiet House B	- Acoustically rated openings and ductwork to provide a minimum sound reduction performance of Rw 40dB into sensitive spaces - Evaporative systems require attenuated ceiling air vents to allow closed windows - Refrigerant-based systems need to be designed to achieve National Construction Code fresh air ventilation requirements - Openings such as eaves, vents and air inlets must be acoustically treated, closed or relocated to building sides facing away from the corridor where practicable
	Side-on		As per Quiet House B 'Facing' above ($Rw+Ctr$ values may be 3dB less, or max 9% area increased by 20%).				
	Opposite		As per Quiet House A 'Facing' above.				
C Quiet House C+	All	As per Quiet House B example above, except using double leaf masonry construction only. • Double brick: two leaves of 90mm clay brick masonry with: – A 50mm cavity between leaves – R2.0+ cavity insulation – resilient ties where required to connect • Double brick: two leaves of 110mm clay brick masonry with a 50mm cavity between leaves and R2.0+ cavity insulation	As per Quiet House C, except • No external doors for bedrooms with entry 'Facing' or 'Side-on' to transport corridor.	As per Quiet House C, except that • 'Side-on' requirements same as Quiet House C 'Facing'. • All windows into habitable areas comprise minimum 6 mm thick glazing in sealed awning or casement frames. Polymer (e.g. uPVC) window framing and hardware which cannot rattle loose should be used throughout. • Evaporative air conditioning systems are not recommended.	To $Rw+Ctr$ 45dB As per Quiet House C, except • the roof must be concrete or terracotta tile construction with sarking (i.e. no steel sheet roof option). • Ceilings to bedrooms must be constructed from at least 2 overlapping layers of flush plasterboard.		

Footnotes:

- The airborne weighted sound reduction index (Rw) and traffic correction term (Ctr) are published by manufacturers/suppliers, can be determined by acoustical consultants or measured in accordance with AS ISO 717.1. Higher $Rw+Ctr$ values infer greater sound insulation. All values are minimum $Rw+Ctr$ (dB)
- Example construction for different external wall ratings of $Rw+Ctr$ 45dB and 50dB are provided and are listed within Specification F5.2 in Volume 1 Part F of the National Construction Code. These values are based on the installation and sealing of joints and penetrations in accordance with Specification F5.2.

- Window and external door sound reduction values provided are based on the provision of suitable acoustic seals to prevent sound leakage. To comply with the above ratings, all external glass windows and doors specified under requirements A, B and C must have the following:
 - Operable windows and external doors must have a seal to restrict air infiltration fitted to each edge and doors must have a drop seal to provide an airtight seal when closed
 - 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 approved person that the construction system as to be installed achieves the relevant $Rw+Ctr$ value

- In this context, a seal is foam or silicon based rubber compressible strip, fibrous seal with vinyl film interleaf or the like. Brush / pile type seals without this seal included are not allowed.
- Glazing referenced can be monolithic, laminated or toughened safety glass
- Any penetrations in a part of the building envelope must be acoustically treated so as not to degrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar

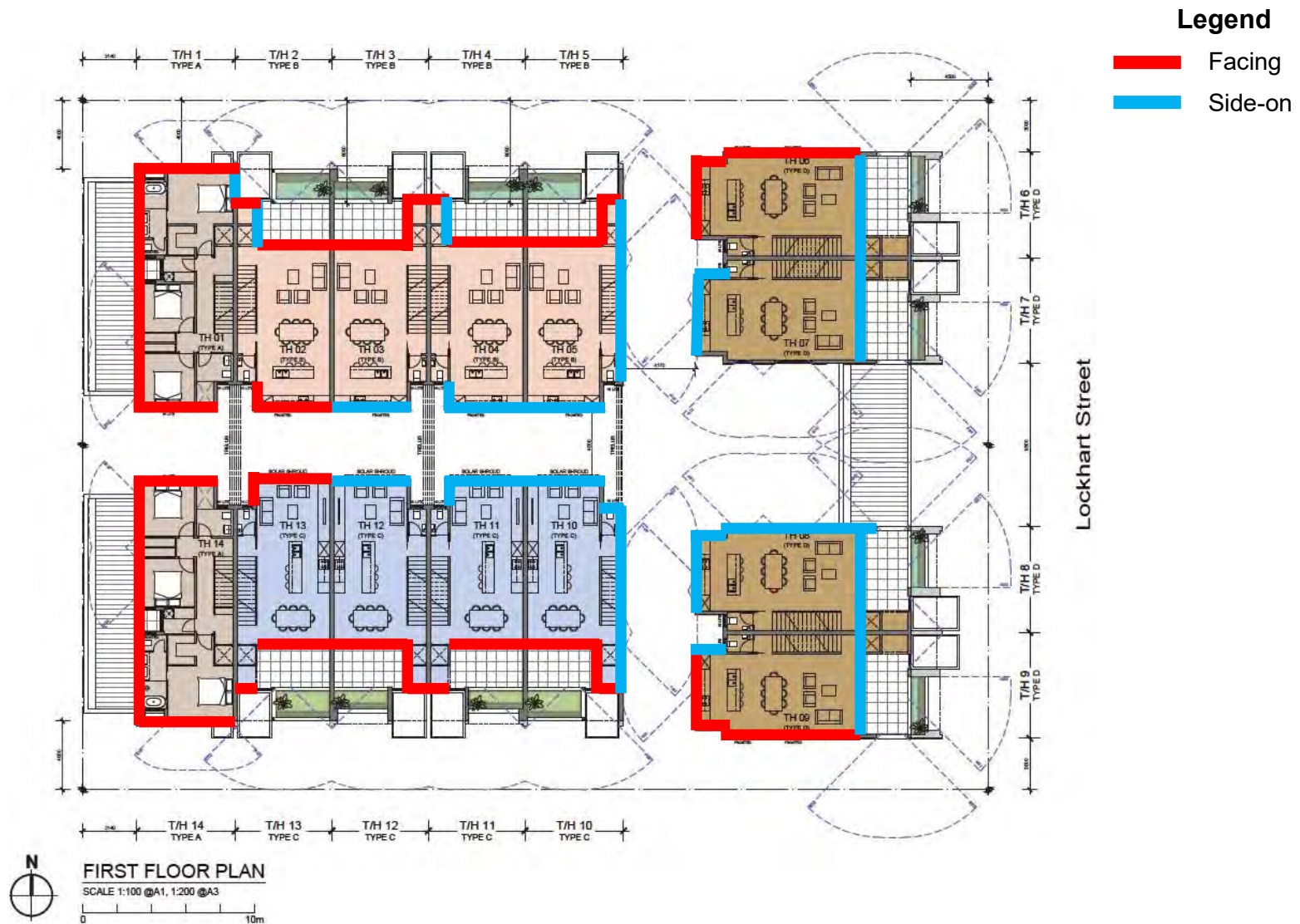


Figure 19: Building facade orientation of first floor.

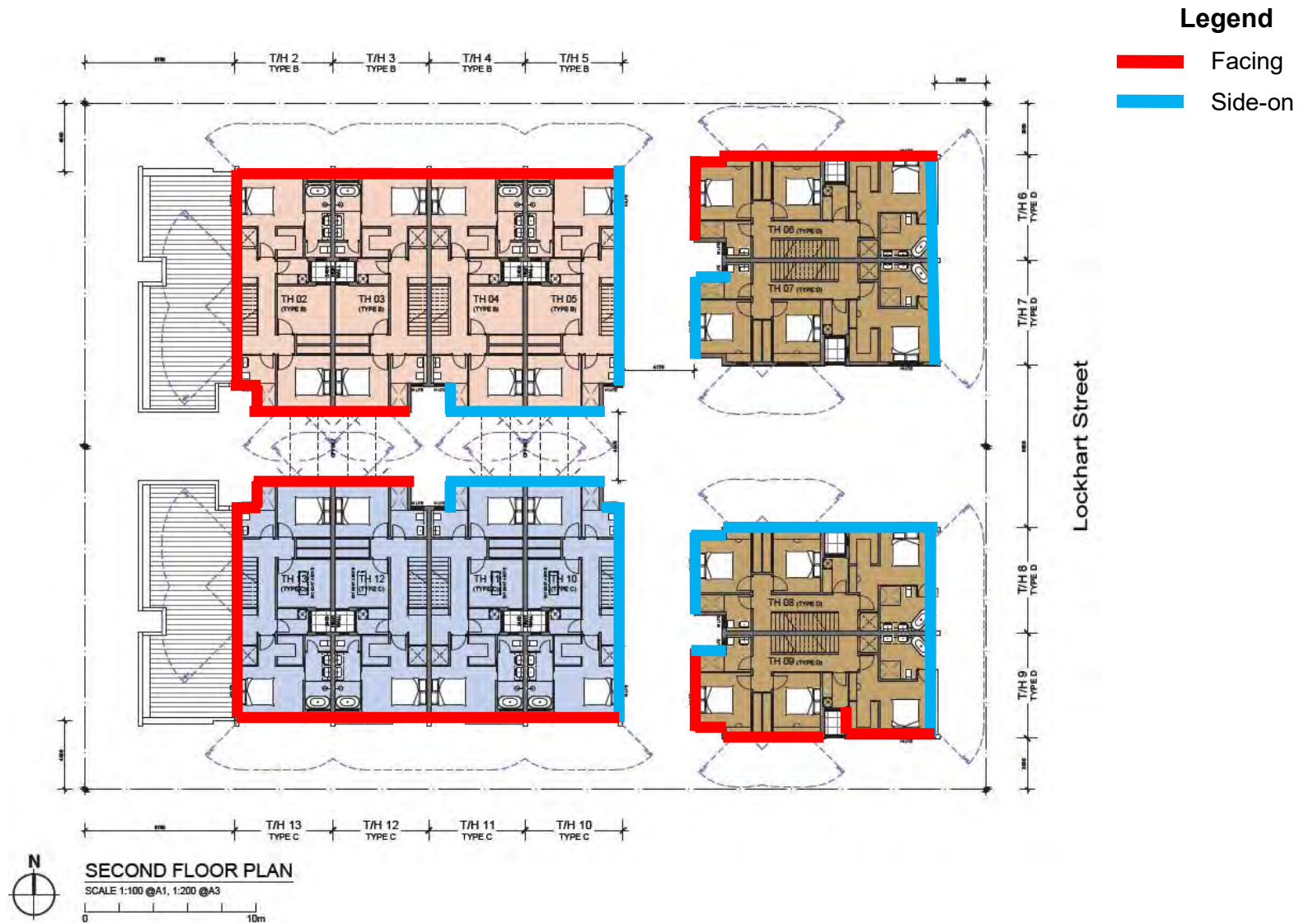


Figure 20: Building facade orientation of second floor.

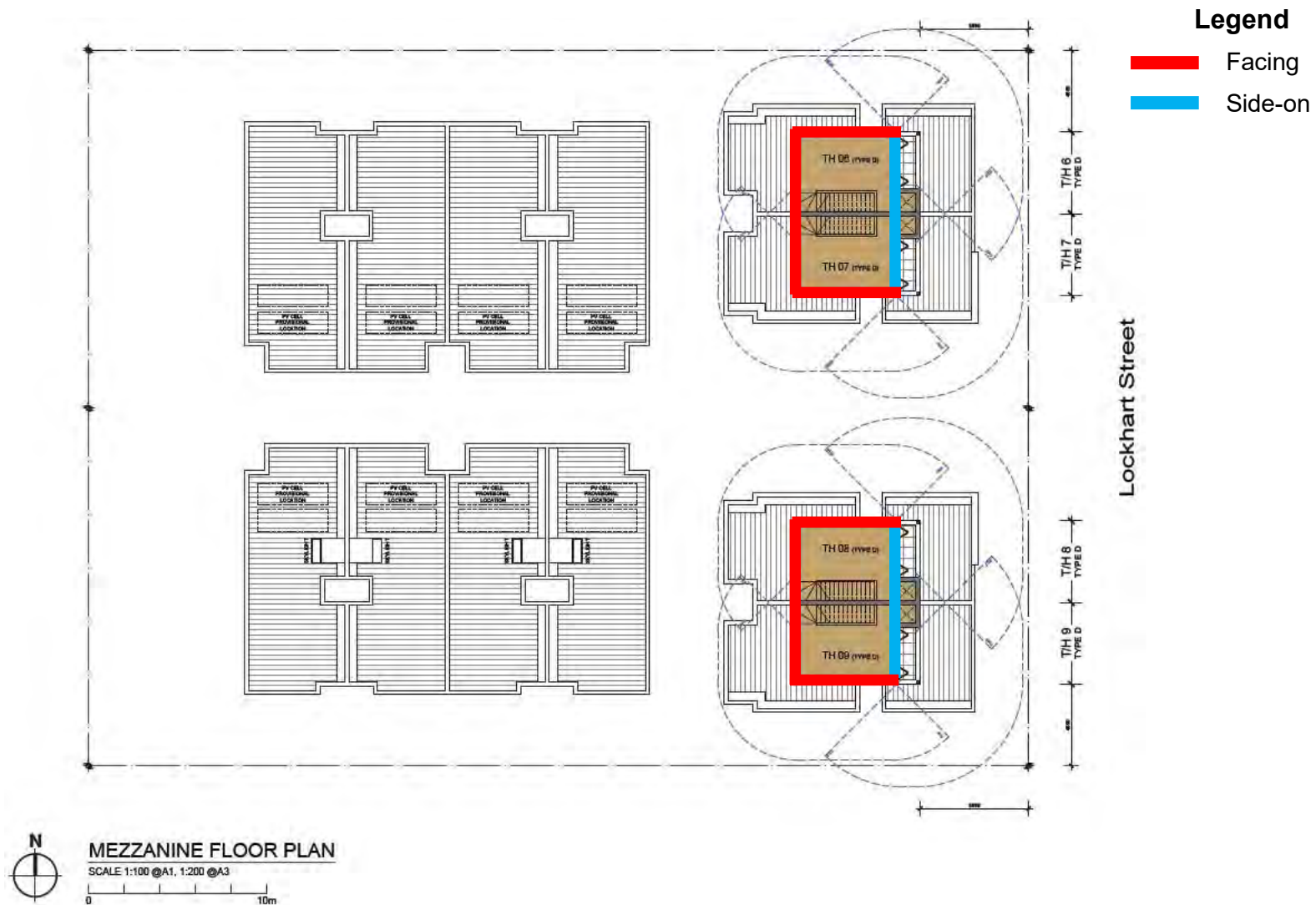


Figure 21: Building facade orientation of mezzanine floor.

NCC ACOUSTIC REQUESTMENTS

FOR

117 LOCKHART STREET COMO

15 March 2024

AES-890366-R02-0-15032024

DOCUMENT CONTROL

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Doc NO: AES-890366-R02-0-15032024

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EXECUTIVE SUMMARY

Multiple townhouses are proposed at 117 Lockhart Street Como. Acoustic Engineering Solutions (AES) has been commissioned by XL Projects to establish the acoustic performance requirements for:

- The construction of internal building elements of the townhouses in accordance with Part F7 of the National Construction Code (NCC) 2022 Volume 1; and
- The noise emissions from mechanical plant in accordance with the Environmental Protection (Noise) Regulations 1997 (Regulations).

This report details the NCC acoustic performance requirements for the building elements of townhouses and assessed the proposed party wall construction. The proposed party wall meets the NCC acoustic performance requirements of party walls provided the both wall sides have a 13mm render plus a 2mm plaster.

The NCC F7 does not address the acoustic performance requirements of external walls and roofs. For this project, the acoustic requirements of external walls and roofs are presented in the Acoustic Report for 117 Lockhart Street Como (Report NO: AES-890366-R01-0-15032024, 15 March 2024).

Noise emissions from mechanical plant are required to comply with the criteria set by the Regulations. This report identifies the mechanical sources of this project and addresses their acoustic requirements and selection criteria. The mechanical plant of townhouses is proposed at best possible (practical) location to minimise the noise impact on the neighbouring properties.

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1.0 INTRODUCTION

A group of townhouses is proposed at 117 Lockhart Street Como. According to the National Construction Code (NCC) classification, the proposed townhouse buildings are classed as the class 1 building.

Acoustic Engineering Solutions (AES) has been commissioned by XL Projects to establish the acoustic requirements for:

- The construction of internal building elements of the townhouses in accordance with Part F7 of the National Construction Code Volume 1 (the NCC F7); and
- The noise emissions from mechanical plant in accordance with the Environmental Protection (Noise) Regulations 1997 (Regulations).

1.1 DEVELOPMENT SITE

Figure 1 in APPENDIX A presents an aerial view of the development site and surrounding area. The development site is surrounded by residential premises.

Figure 2 to Figure 5 in APPENDIX A present the floor plans of proposed townhouses. The townhouses are 2 to 4 storey units. XL Projects advised that the party walls will be constructed of rendered 90-70-90 cavity brick wall:

- 90mm Acoustic Maxis brick; and
- 70mm cavity with resilient ties; and
- 90mm Acoustic Maxis brick; and
- Float and set both sides.

Mechanical plant within the townhouses includes air-conditioners, kitchen exhausts, and bathroom/toilet ventilations. XL Projects advised that:

- Air-conditioners are located on the first floor balcony behind a louver screen.
- Ground floor bathroom vents will be wall-mounted to garage plenum.
- First floor kitchen and bathroom vents will be wall-mounted to the internal driveway.
- Second floor bathroom vents will be directly up to roof.

2.0 ACOUSTIC CRITERIA

2.1 NCC F7 ACOUSTIC REQUIRMENTS

The National Construction Code is a uniform set of technical provisions for the design, construction and performance of buildings and other structures throughout Australia.

Volume one of the NCC 2022 is split into nine sections with section F7 dealing with the requirements of sound transmission and insulation for internal walls, floors and building services. NCC classifies townhouses as class 1a buildings. Table 2-1 summaries the requirements, which are the minimum acceptable requirements for class 1a buildings.

Table 2-1: NCC F7 acoustic requirements for class 1a buildings.

Building Element Name		NCC Minimum Requirements
Walls	separating separate sole occupancy units	Rw + Ctr 50
	separating a wet area (bathrooms, sanitary compartment, laundry or kitchen) in one sole occupancy unit from a habitable room (other than kitchen) in an adjoining apartment	Rw+Ctr 50 + discontinuous construction
Services ¹	adjacent to habitable room(other than a kitchen); or	Rw + Ctr 40
	adjacent to kitchen or non-habitable room	Rw + Ctr 25

Alternatively, compliance with the NCC sound transmission/insulation performance can be achieved by construction in accordance with the "Deemed-to-Satisfy" provisions listed in NCC Specification 28 (NCC, 2022).

2.2 ENVIRONMENTAL NOISE EMISSIONS

Environmental noise management in Western Australia is implemented through the Environmental Protection (Noise) Regulations 1997. The Regulations set noise limits which are the highest noise levels that can be received at noise-sensitive (residential), commercial and industrial premises. These noise limits are defined as 'assigned noise levels' at receiver locations. Regulation 7 requires that "noise emitted from any premises or public place when received at other premises must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind".

¹ If a duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, serves or passes through more than one sole-occupancy unit, the duct or pipe must be separated from the rooms of any sole-occupancy unit.

2.2.1 Assigned Noise Levels

Assigned noise level varies from residence to residence depending on the surrounding land use (within 450m radius).

Figure 1 in APPENDIX A presents an aerial view of the development site and surrounding area. The development site is zoned as "Centre", and surround by residential houses. Kwinana Fwy is more than 100m but less than 450m from the development site and surrounding residences. Canning Hwy is more than 100m from the eastern, southern and north-eastern neighbouring premises (R1 to R3 and R6) but less than 100m away from the other neighbouring residential premises (R4 and R5). Both Kwinana Fwy and Canning Hwy are classified as the main roads. Therefore, transport factor is 2 dB for the eastern, southern and north-eastern neighbour (R1 to R3 & R6) but 6 dB for the other neighbours (R4 & R5).

No industrial premises but several individual local centres are present within 450m from the development site and neighbouring premises. The presence of individual local centres gives influencing factors of less than 0.2 dB (rounded to zeros). Table 2-2 presents the assigned noise levels for the selected receivers.

Table 2-2: Assigned noise levels in dB(A)

Closest Residences	Assigned Noise Levels in dB(A)		
	L _{A10}	L _{A1}	L _{Amax}
Day² of Monday to Saturday			
R4 and R5	51	61	71
R1 to R3, R6	47	57	67
Day³ of Sunday and Public Holidays			
R4 and R5	46	56	71
R1 to R3, R6	42	52	67
Evening⁴			
R4 and R5	46	56	61
R1 to R3, R6	42	52	57

² 0700 to 1900 hours for Monday to Saturday.

³ 0900 to 1900 hours for Sunday and Public Holidays.

⁴ 1900 to 2200 hours for all days.

Closest Residences	Assigned Noise Levels in dB(A)		
	L _{A10}	L _{A1}	L _{Amax}
Night⁵			
R4 and R5	41	51	61
R1 to R3, R6	37	47	57

2.2.2 Corrections for Characteristics of Noise

If the noise exhibits intrusive or dominant characteristics, i.e. if the noise is impulsive, tonal, or modulating, noise levels at noise-sensitive premises must be adjusted. Table 2-3 presents the adjustments incurred for noise exhibiting dominant characteristics.

Table 2-3: Adjustments for dominant noise characteristics

Adjustment where noise emission is not music. These adjustments are cumulative to a maximum of 15 dB.			Adjustment where noise emission is music	
Where tonality is present	Where Modulation is present	Where Impulsiveness is present	Where Impulsiveness is not present	Where Impulsiveness is present
+5 dB	+5 dB	+10 dB	+10 dB	+15 dB

⁵2200 to 0700 hours for Monday to Saturday, and 2200 to 0900 hours for Sunday and Public Holidays.

3.0 WALL CONSTRUCTION

3.1 OVERVIEW OF NCC REQUIREMENTS

The NCC F7 establishes the minimum acoustic performance requirements for internal walls of Class 1a buildings:

Party walls separating habitable units:	Rw+Ctr 50.
Party walls between wet & habitable spaces:	Rw+Ctr 50 + discontinuous construction.

The discontinuous construction is required to provide adequate resistance to structure-borne (or impact) sound transmission.

3.2 PARTY WALLS

XL Projects advised that the party walls will be constructed of rendered 90-70-90 cavity brick wall:

- 90mm Acoustic Maxis brick; and
- 70mm cavity with resilient ties; and
- 90mm Acoustic Maxis brick; and
- Float and set both sides.

If the both wall sides have a 13mm render plus a 2mm plaster, the above proposed party wall can achieve $R_w + C_{tr} 53$ and meet the party wall acoustic requirement.

3.3 FULL HEIGHT WALLS

NCC F7D6 (5) and (6) state:

Where a wall required to have sound insulation has a floor above, the wall must continue to:

- (i) *the underside of the floor above; or*
- (ii) *a ceiling that provides the sound insulation required for the wall.*

Where a wall required to have sound insulation has a roof above, the wall must continue to:

- (i) *the underside of the roof above; or*
- (ii) *a ceiling that provides the sound insulation required for the wall.*

Full height walls should not stop short of the slab soffit or roof above; they should extend to the element above and be sealed airtight with a flexible caulking compound or mastic compound. There should be no residual gaps around full-height sound-rated walls, especially around roof structure such as rafters and purlins. If separating wall constructions are not inherently sealed, a sealing detail must be incorporated at the head of the wall to ensure flanking transmission over the wall apex is controlled. This can be achieved by packing any void space between partition and slab or roof sheeting over with a mineral wool or fibreglass

batt off-cut and then sealed with plasterboard sheets. The plasterboard sheets should be fixed to both wall surfaces.

3.4 WALL PERFORMANCE COMPLIANCE

Bricks must be laid with all bed and perpend joints filled solid, including those between the masonry wall and any adjoining construction.

Where they are proposed, render coat must maintain full thickness and cavity must maintain the required space. Where discontinuous construction is required, cavity walls should be constructed with no ties where structurally possible. The no-tie constructed walls result in better acoustic performance than the resilient-tie constructed walls. Insulation should be evenly spaced throughout the entire cavity where possible. No building debris or rubbish is left in wall cavities causing bridging or short circuiting.

Direct stick plasterboard lining to masonry walls in lieu of rendered walls can result in significant loss of acoustic performance. Therefore, direct stick plasterboard on masonry walls is not permitted.

3.5 FLANKING PATHS

Flanking is the transmission of noise through paths around a building element, rather than through the element directly. Flanking can describe the transmission of noise through gaps and cracks in a building element, or via incorrectly sealed junctions between two materials.

Flanking reduces the effectiveness of acoustic performance of walls. All gaps and holes should be sealed to minimise flanking sound transmission ensuring that walls perform to the desired level. The method of sealing should reflect the environment where the penetration occurs. A seal normally has to remain effective over the life of the building. Sealing is best performed on both sides of the wall. Sealing treatments are most effective where the penetrations are neatly cut or drilled avoiding excessively sized penetrations.

To reduce/prevent flanking sound transmission via cavities, cavities in walls should be closed at their joints. This can be achieved:

- Extend concrete slab to the external leaf wall closing the vertical cavities.
- Extend party wall closing (but not touch) to the outer leaf of external wall, and then fill the gap between the party wall ends and external leaf wall by using flashing compriband seals or fibreglass insulation batt off-cut.

4.0 BUILDING SERVICES

4.1 OVERVIEW OF NCC REQUIREMENTS

The NCC F7D7 states that if a duct, soil, waste, storm water or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, serves or passes through more than one sole occupancy unit, the duct or pipe must be separated from the rooms of any sole occupancy unit by construction with an $R_w + C_{tr}$ (airborne) not less than:

- 40 if adjacent to habitable room (other than a kitchen); or
- 25 if the adjacent room is a kitchen or non-habitable room.

The NCC Specification 28 requires that:

- Services must not be chased into concrete or masonry elements.
- A door or panel required to have a certain $R_w + C_{tr}$ that provides access to a duct, pipe or other service must—
 - not open into any habitable room (other than a kitchen); and
 - be firmly fixed so as to overlap the frame or rebate of the frame by not less than 10 mm, be fitted with a sealing gasket along all edges and be constructed of—
 - ✓ wood, particleboard or blockboard not less than 33 mm thick; or
 - ✓ compressed fibre-reinforced cement sheeting not less than 9 mm thick; or
 - ✓ other suitable material with a mass per unit area not less than 24.4 kg/m².
- A water supply pipe must—
 - only be installed in the cavity of discontinuous construction; and
 - 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 not less than 10 mm to the other wall leaf.
- Electrical outlets must be offset from each other —
 - in masonry walling, not less than 100 mm; and
 - in timber or steel framed walling, not less than 300 mm.

The term “chased” means embedded or rigidly connected to these elements (walls & floors).

4.2 SERVICE PIPES AND DUCTS

The NCC requires that service pipes/ducts must not be chased in party walls.

Service pipes must not be fixed to or recessed in party walls. They should only be attached to the side of internal wall to which the services belong. They should not be located in the cavity of party walls to bridge across wall discontinuities.

For kitchens and bathrooms located on party walls, water supply pipes can be recessed within an internal side wall (but not in the party wall itself) and then be resiliently fixed within a cupboard servicing hob mounted tap. Water supply pipes attached internal walls must be located as far as practicable from party walls.

Where access panels for service pipes are required, they should be constructed of either 33 mm wood or 9 mm compressed fibre cement or alternative material with surface density of not less than 25 Kg/m^2 , as required in the NCC. Panels are to be installed within a 10mm recessed frame with closed cell foam seal.

Where an access panel is located in a habitable area it is required to achieve $R_w + C_{tr}$ 40 performance.

XL Projects advised that for this project no service pipes/ducts are located or penetrate the party walls.

4.3 CEILING VOIDS

To meet the NCC criteria, service pipes (exhaust/ventilation pipes, water supply pipes, waste pipes, stormwater pipes and ductwork) concealed in ceiling cavities must be acoustically wrapped by specialist contractor. All acoustic wrappings should be inspected and approved. Consideration should be given to the use of plastic pipes as they generate less noise than metal ones.

Ceilings must be resiliently suspended and acoustic insulated. For example, a single layer of 13mm plasterboard is used over a wet area or double 13mm plasterboards are used for habitable areas with 50mm dense insulation quilt laid loose over the plasterboard. Ceiling should be located at least 100 mm below the underside of the unwrapped pipe.

Any pipe penetrations should be acoustically sealed. No recessed light fitting is permitted within 2 metres of service pipes unless light fitting is fully enclosed.

Access panel should be located in non-habitable area and have the required $R_w + C_{tr}$. Access panel should overlap the frame or rebate of the frame by not less than 10mm and be fitted with a sealing gasket along all edges.

4.4 ELECTRICAL SERVICES

The NCC Specification 28 establishes specific requirements for locations of switches and power points on party walls. Switches and power point boxes located on either side of a party wall are to be offset (not less than 100 mm for masonry walls) to ensure acoustic integrity of the party wall is maintained.

If switches and power outlets are required in cavity party walls (even with 100mm offsets), small single cable conduits can be chased into the party wall but must be fully grouted. Multi cable conduits cannot be chased into party walls, but can be chased into side walls and mounted in cupboards.

Any penetrations for electrical services through party walls must be acoustically sealed to ensure the required acoustic performance.

5.0 MECHANICAL PLANT

5.1 OVERVIEW

Noise emission from mechanical plant is required to comply with the Regulations. The assigned noise levels shown in Table 2-2 apply to the neighbouring residences (R1 to R6) in this project. For the proposed townhouses, the assigned noise levels of:

- Units 1, 2 and 14 are the same as those of R4 and R5.
- The other units are the same as those of R1 to R3 and R6.

Since mechanical plant may radiate tonal components, a 5dB adjustment applies to the mechanical noise received at the development site and at the neighbouring premises.

Table 2-2 shows that the night has stringent noise limits. The night-time compliance guarantees full compliance. For this project, the target level of mechanical noise at a receiving location is the night-time assigned noise level L_{A10} after 5dB tonality adjustment.

5.2 MECHANICAL NOISES

For the proposed townhouses, the major mechanical noise sources include:

- Air-conditioner (AC) outdoor condensing units.
- Kitchen/toilet/bathroom ventilation outlets.

XL Projects advised that:

- Air-conditioners are located on the first floor balcony behind a louver screen.
- Ground floor bathroom vents will be wall-mounted to garage plenum.
- First floor kitchen and bathroom vents will be wall-mounted to the internal driveway.
- Second floor bathroom vents will be directly up to roof.

5.2.1 Air-conditioner Condensing Units

Section 80(1) of the Environmental Protection Act places responsibility on installers to ensure that an air conditioner does not emit unreasonable noise. The installer is required to assess likely noise impact of air conditioner installation on neighbouring properties. An installer's guide⁶, prepared by the WA Department of Water and Environmental Regulation (DWER), provides simple methods to estimate the likely noise impact of an air conditioner installation on neighbouring properties:

- Method 1: determines the suitable "Sound Power Level" of an air conditioner for a given installation position.
- Method 2: determines the distance or location of an air conditioner installation for a given "Sound Power Level" of an air conditioner.

⁶ An installer's guide to Air Conditioner Noise, the WA Department of Environmental Protection Water and Rivers Commission.

Quieter air-conditioners should be selected based on the target levels at the neighbouring properties. Noise emission from an AC outdoor unit must be assessed as soon as it is proposed.

Outdoor AC units must be installed on vibration isolation mounts. Double deflection Rubber Mounts are recommended. No neoprene-in-shear pads are permitted.

For this project, the locations of air-conditioner (AC) outdoor units are located on the first floor balcony behind a louver screen. The AC outdoor units are best located because the balcony floors and walls act as screens to reduce the AC noises towards the windows and/or doors of adjoining apartments. Method 1 in the installer's guide to Air Conditioner Noise should be used to select air-conditioners.

5.2.2 Exhaust and Ventilation Outlets

The exhaust/vent fans of kitchen, bathroom and toilet should be selected on the basis of quiet operation. The fans are installed with speed controllers so that minimum speed can be used to achieve the required air flow and minimise noise emission. Noise emission from an exhaust fan outlet must be assessed to be below the target levels at the windows of adjoining apartments and/or within highly sensitive areas of the neighbouring properties.

Similar to the AC outdoor units, the location of kitchen and bathroom exhaust outlets is very important. If possible, the exhaust outlets are located above the roof and screened by the roof structure. If the exhaust outlets are wall outlets, they should locate at maximum distance and, if possible, without direct line of sight to windows/doors of neighbouring properties. Noisy closing shutters are not permitted in the wall outlets.

For this project, the kitchen/bath/toilet vents are wall-mounted to internal drive/path ways and gardens for the first and ground floors, but upto the roofs for the top floors. These ventilation outlets are proposed away (at maximum distance practically) from the neighbouring premises to minimise the noise impact on the neighbouring properties. Method 1 in the installer's guide to Air Conditioner Noise applies to select the vents.

APPENDIX A FLOOR PLANS



Figure 1: Aerial view of development site and surrounding area.

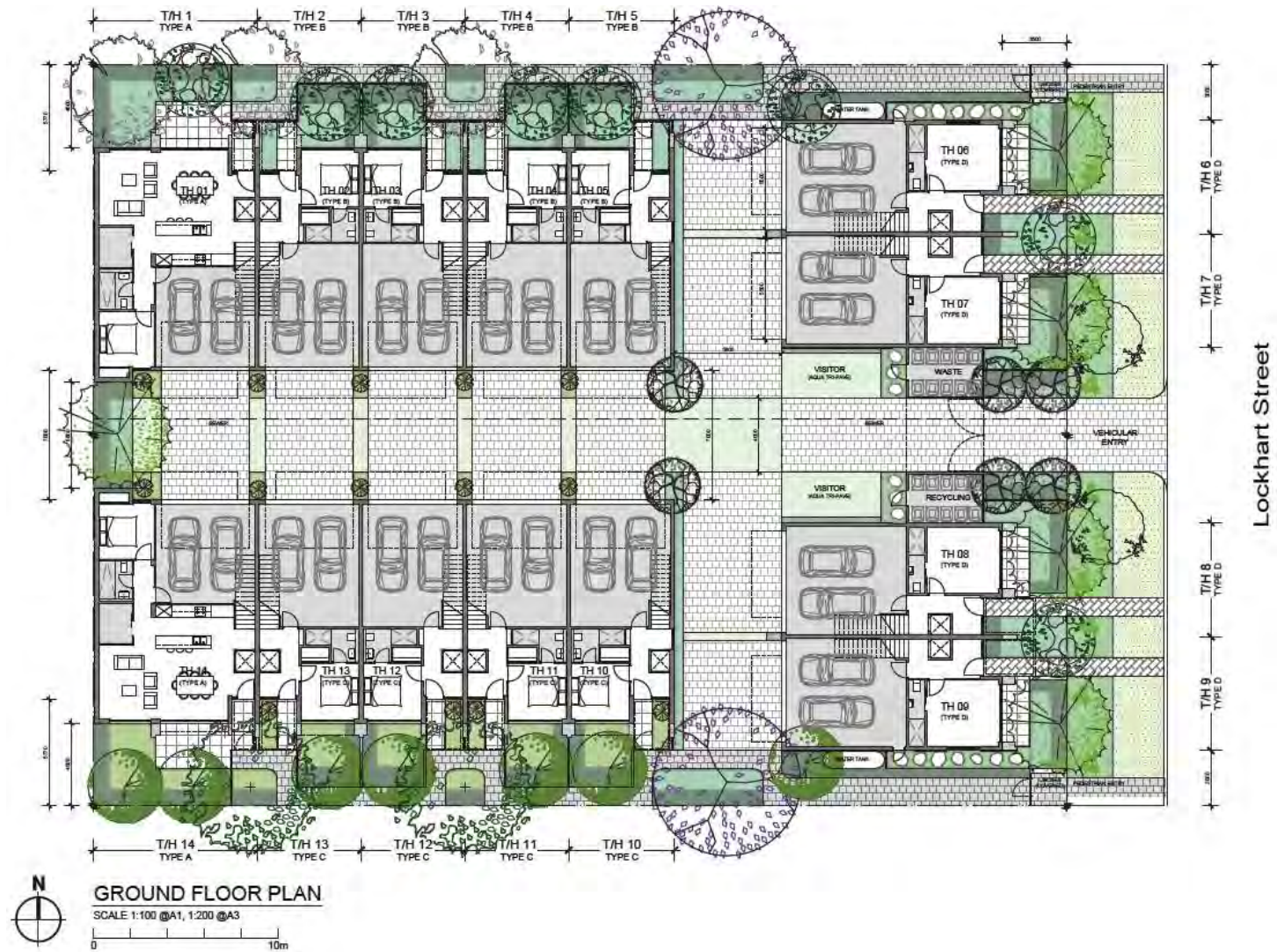


Figure 2: Ground floor plan.

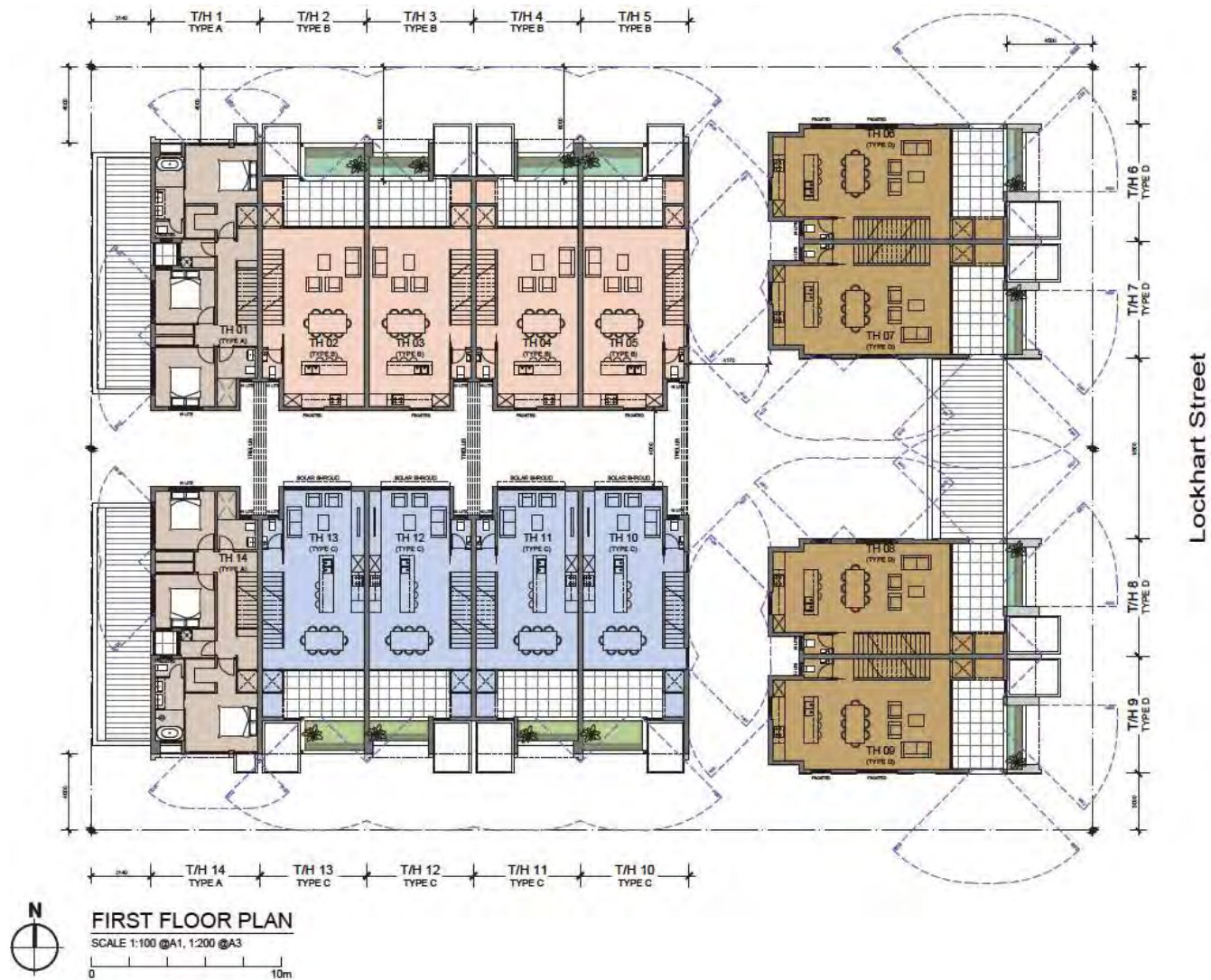


Figure 3: First floor plan.

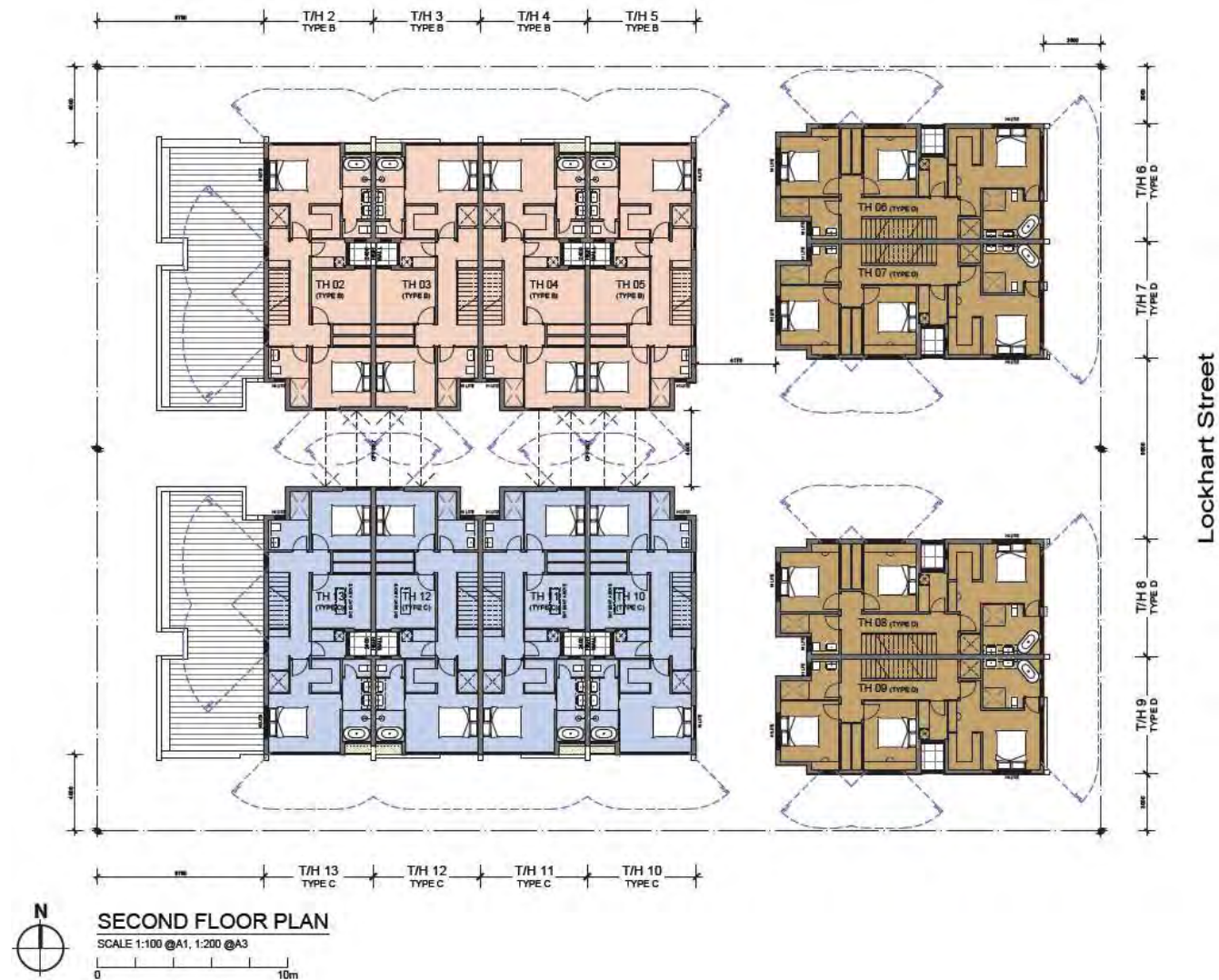


Figure 4: Second floor plan.

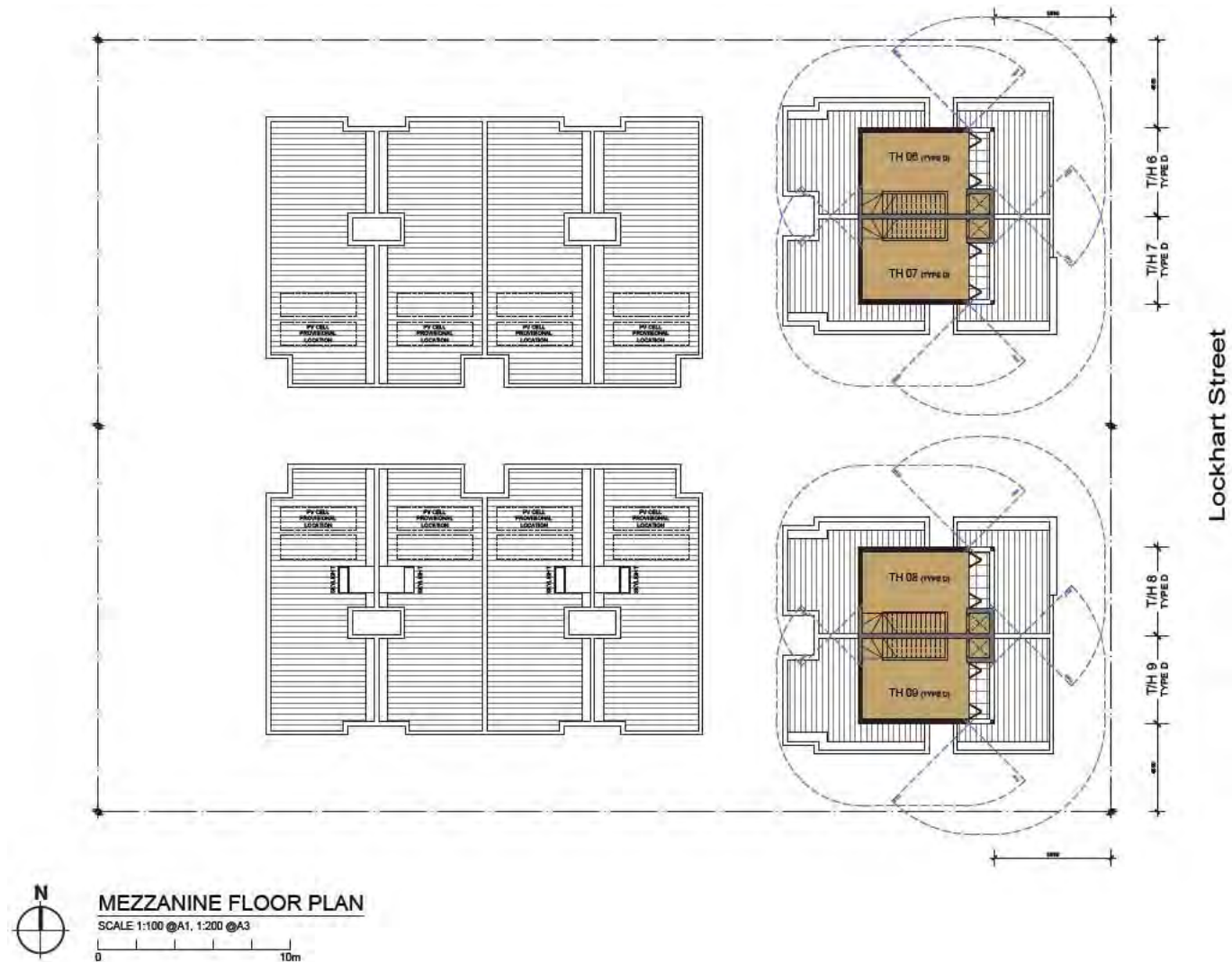


Figure 5: Mezzanine floor plan.



Figure 6: Party walls for the ground floor.

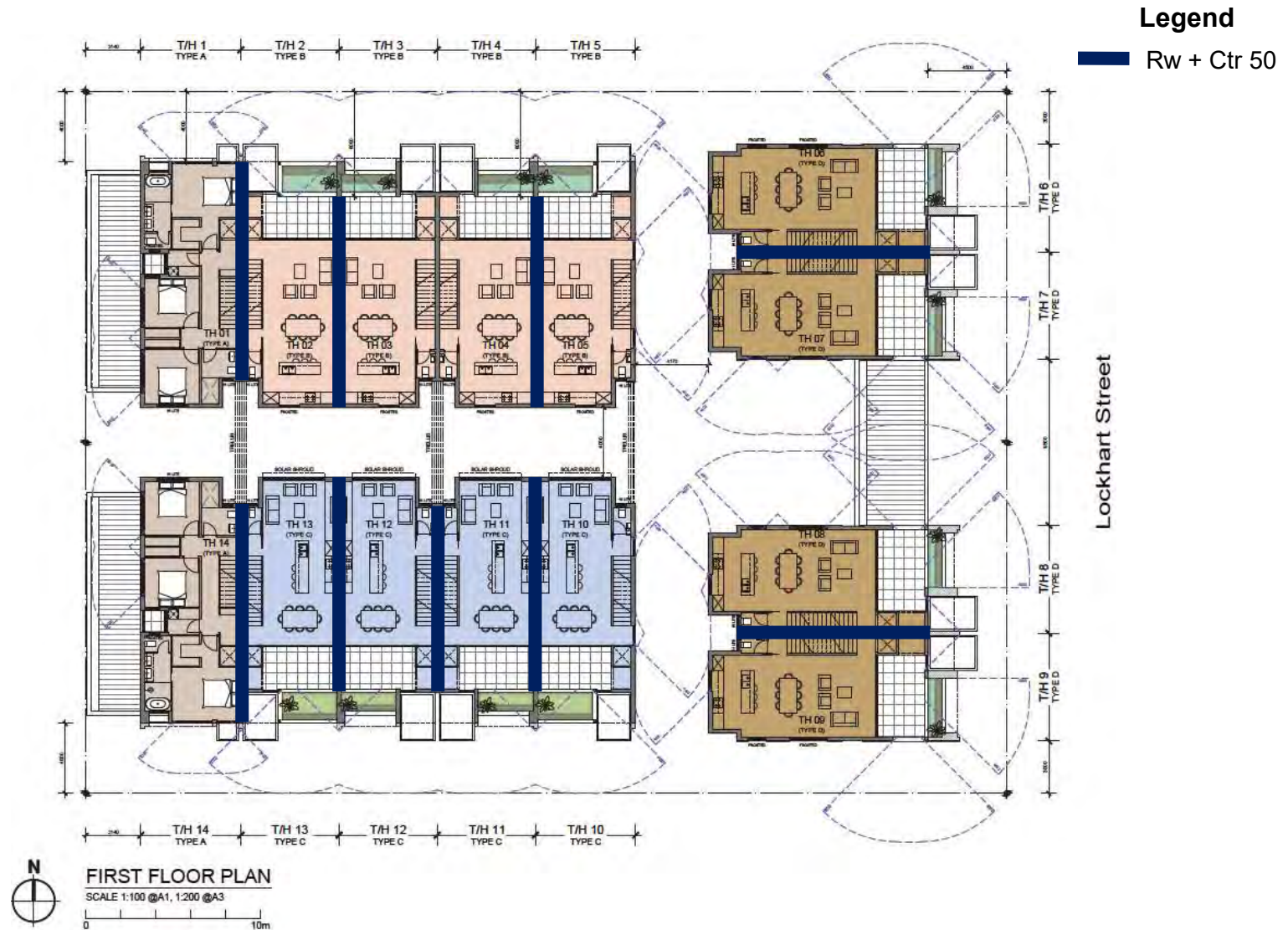


Figure 7: Party walls for the first floor.

Legend

Rw + Ctr 50

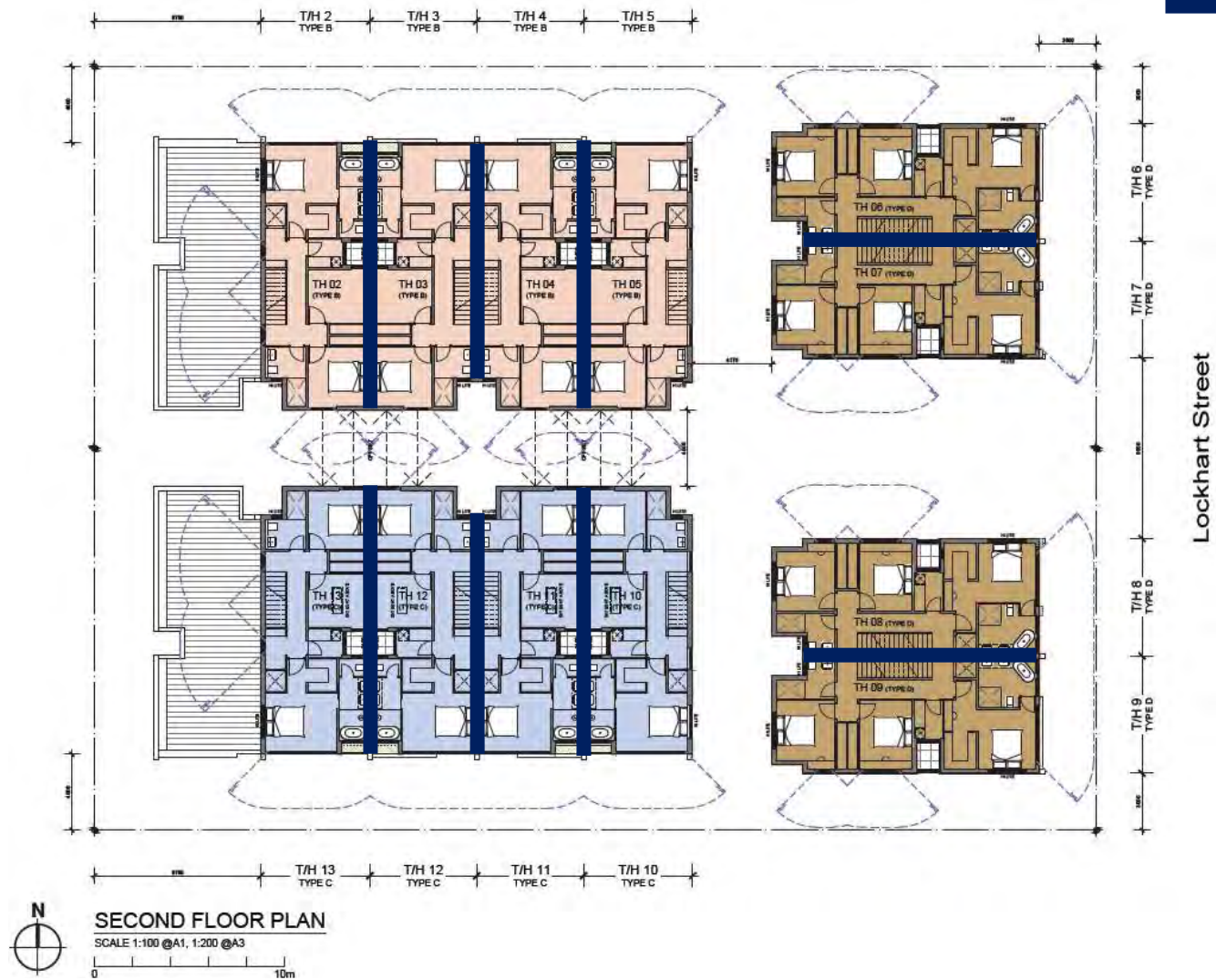


Figure 8: Party walls for the second floor.

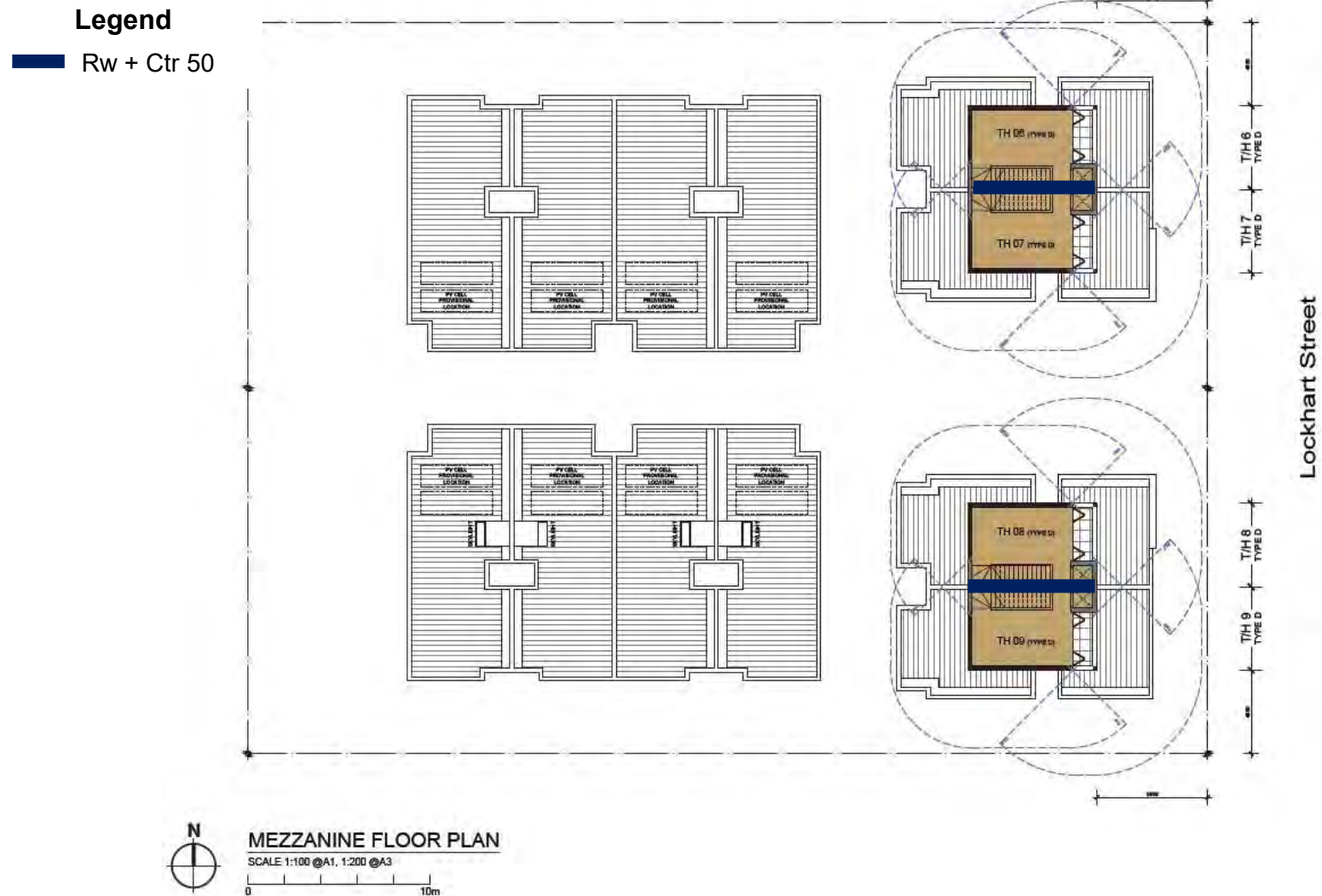


Figure 9: Party walls for the mezzanine floor.

APPENDIX B TERMINOLOGY

Terminology

Rw: Weighted Sound Reduction Index, a single number used to rate the effectiveness of a soundproofing system or material. It is measured in very controlled conditions in a laboratory.

Ctr: An adjustment factor used to account for low frequency components of noise in apartments. It is always a negative number, so the $Rw + Ctr$ will always be less than the Rw value.

Ln,w : Impact Sound Isolation, a measure of the noise impact performance of a floor. It is measured in very controlled conditions in a laboratory and is characterised by how much sound reaches the receiving room from a standard tapping machine. Unlike Rw value, a better performing floor has a lower Ln,w value. When specified, Ln,w value is a maximum while Rw value is a minimum.

Discontinuous Construction: Wall systems having a minimum 20 mm cavity between two separate leaves, with—

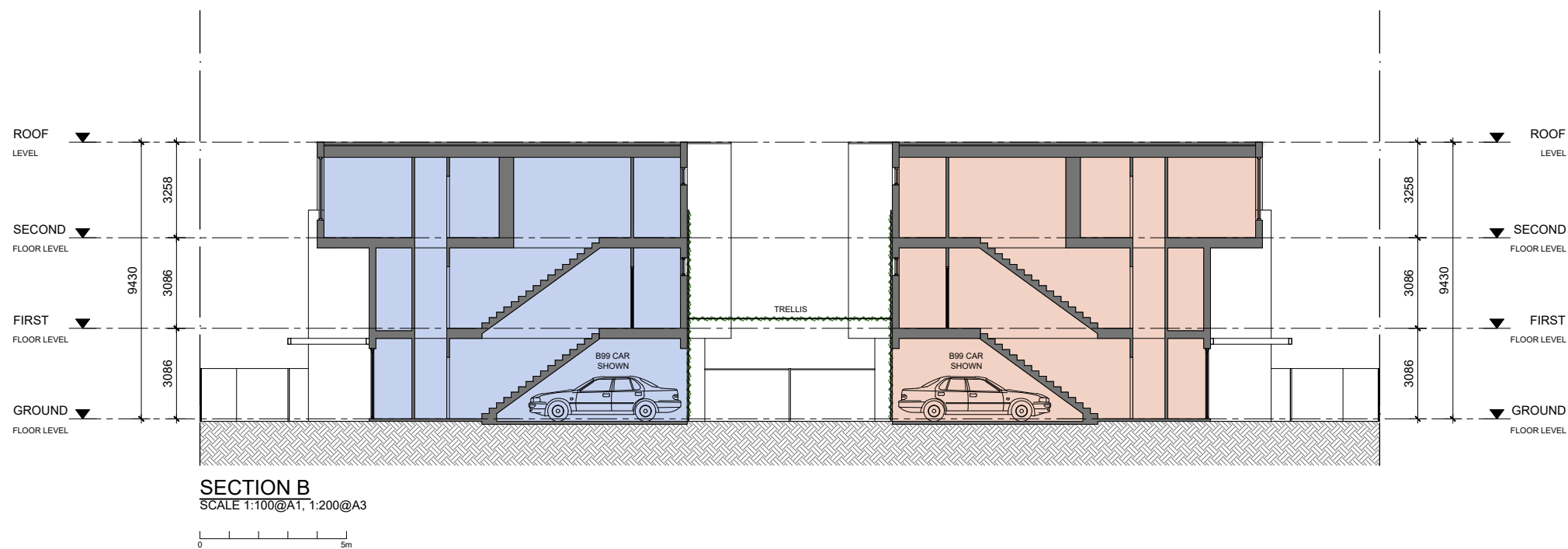
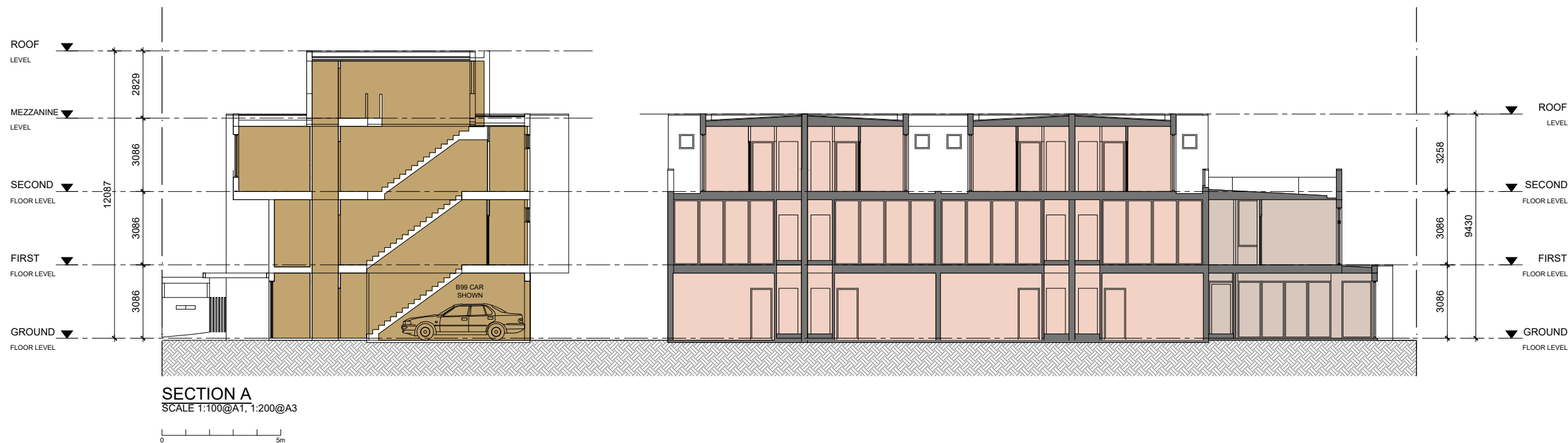
- (i) for masonry, where wall ties are required to connect leaves, the ties are of the resilient type; and
- (ii) for other than masonry, there is no mechanical linkage between leaves except at the periphery.

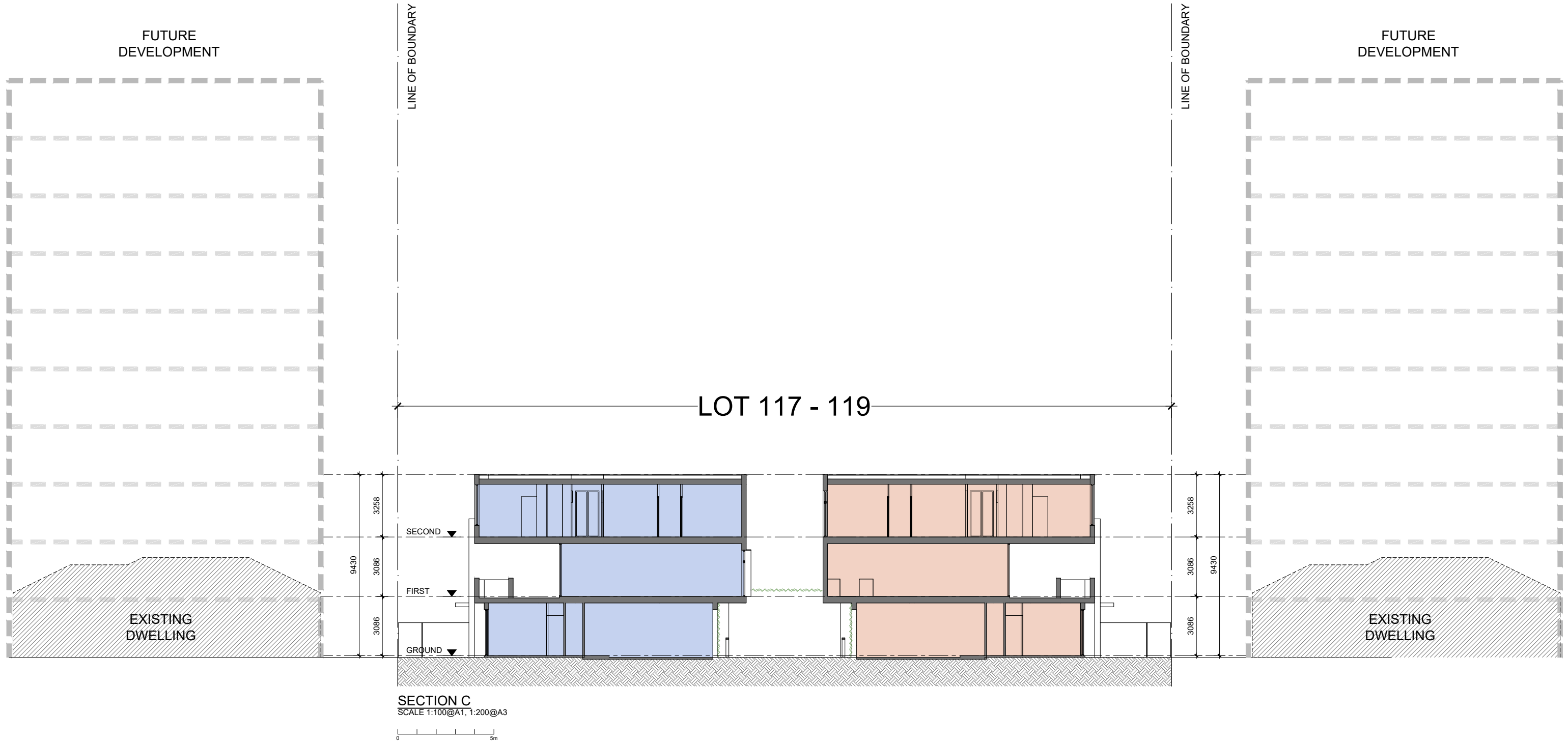
External Wall: Separates the interior air space of a building with the outside air space.

Party Wall: Separating sole occupancy units.

Public Wall: Adjoining public spaces such as public corridors, public lobby or stairway.

Service Riser Wall: Adjoining pipes/ducts, electrical cable outlets.







PART C – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals

The DAP notes the status of the following State Administrative Tribunal Applications and Supreme Court Appeals:

Current SAT Applications				
File No. & SAT DR No.	LG Name	Property Location	Application Description	Date Lodged
DAP/22/02317 DR81/2023	City of Vincent	41-43 and 45 Angove Street, North Perth	Proposed Service Station	31/05/2023
DAP/22/02259 DR166/2023	City of Subiaco	No. 424-428 (Lot 2) & No. 440 (Lots 4, 5 & 6) Hay Street, Subiaco	Demolition Of Existing Commercial Buildings and Construction Of Single And Two Storey Commercial Building	11/01/2024
DAP/22/02372 DR44/2024	City of Perth	Lot 20 (No.141) Wellington Street, East Perth	Proposed Convenient Store	28/03/2024

2. General Business

3. Meeting Closure

In accordance with Section 7.3 of the DAP Standing Orders 2024 a DAP member must not publicly comment on any action or determination of a DAP.