

139-149 Boundary Road, North Melbourne

Acoustic Assessment

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1 INTRODUCTION

Acoustic Logic Pty Ltd (AL) has been engaged by BEG Developments Pty Ltd to undertake an acoustic assessment of the proposed mixed-use development located at 139-149 Boundary Road, North Melbourne. The assessment has been conducted to address Condition 37 of Planning Permit No. PA1900753-1 by Minister of Planning as well as to the address the external noise intrusion from the nearby traffic, train and industrial noise sources.

The assessment has been conducted based on the following documentation.

Table 1 – Referenced Documents

Company	Document No.	Date
Minister of Planning	Planning Permit No. PA1900753-1	29 July 2022
CHT Architects	Drawing No. TP2.00 to TP2.16 (rev F)	24 November 2022

2 PROJECT DESCRIPTION

The proposed is a mixed-use development located at 139-149 Boundary Road, North Melbourne which consists of car parking on two basement levels and at the lower ground level, residential apartments on level 1 to 11, and communal areas on the upper ground level.

The subject site is bounded by Boundary Road to the east and existing commercial buildings to the north, south and west. Boundary Road which carries a high volume of vehicles is located East of the site. Racecourse Road which also carries a high volume of traffic is located approximately 70 metres north of the subject site. The Upfield Metropolitan Line rail corridor approximately 100 metres west of the subject site (between western façade and the centre of the nearest track), and the Citylink (Toll Road) is also located approximately 100 metres west of the subject site.

The nearest industrial precinct is located on Stubbs Street which is approximately 360 metres south-west of site. The Laurens Street Industrial Precinct (Arden-Macaulay) is located approximately 1km to the south of the subject site.

Figure 1 below details the subject site and the surrounding environments.

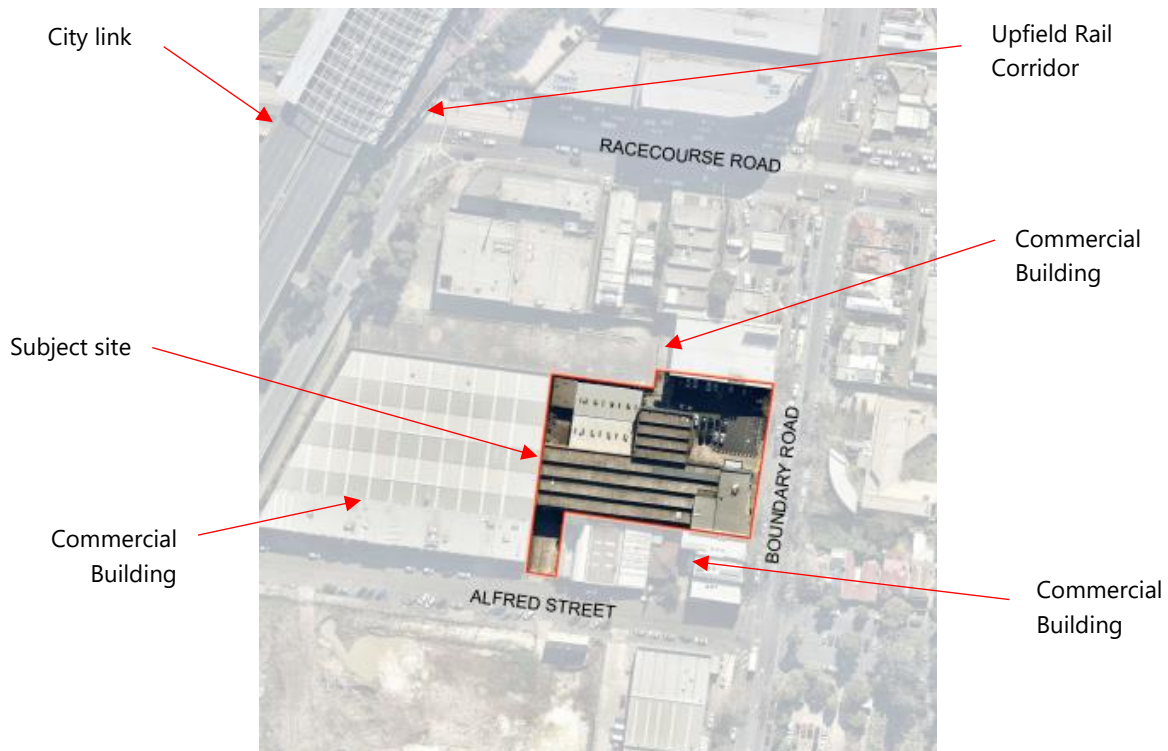


Figure 1 – Subject site and surrounding environments (source: CHT Architects drawing)

2.1 LOCAL NOISE SOURCES

Based on the review of the subject development, the following have been identified as external noise sources which has been addressed in this report:

- Citylink Tollway - traffic noise associated with vehicle movement on the Citylink Tollway which is the dominant noise source impacting the subject site.
- Railway corridor - train noise associated with train movement along the Upfield Metropolitan Line rail corridor.
- Boundary Road - traffic noise associated with vehicle movement along Boundary Road.
- The existing industrial precinct on Stubbs Street located approximately 360 metres south-west of subject site.
- Laurens Street Industrial Precinct (Arden-Macaulay) located approximately 1km south of subject site.

3 PLANNING PERMIT

Planning Permit No. PA1900753-1 by Minister of Planning contains the following:

Design and Development Overlay – Schedule 26 (noise attenuation)

37. Prior to the commencement of the development, excluding bulk excavation and site remediation, an amended Acoustic Report prepared by a suitably qualified professional must be submitted to and approved by the Responsible Authority. The report must:

- a) Provide for noise attenuation measures to achieve a maximum noise level of 35dB(A)Leq in unfurnished and uncarpeted habitable rooms with all windows and doors closed, unless there is no suitable air conditioning and/or mechanical ventilation, in which case the maximum noise level of 35dB(A)Leq in unfurnished and uncarpeted habitable rooms must be achieved with all the windows half open and the doors closed.
- b) Be based on external noise levels measured as part of a noise level assessment representative of the noise from industrial operations which occur in Arden-Macaulay. The recommendations in the approved acoustic report must be implemented at no cost to the Responsible Authority, prior to the occupation of the dwellings.

4 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including traffic, tram and train. Accordingly, a 15-minute measurement interval is normally utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In the case of environmental noise three principle measurement parameters are used, namely L_{10} , L_{90} and L_{eq} .

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source depends on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of traffic and rail noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

The L_1 parameter (or the noise level exceeded for 1% of the time) is used during the night period to assess potential sleep arousal effects due to transient noise sources.

5 ASSESSMENT CRITERIA

5.1 SCHEDULE 26 TO THE DESIGN AND DEVELOPMENT OVERLAY

Schedule 26 reference in Condition 37 of the Planning Permit contains the following:

10/06/2010
C122

SCHEDULE 26 TO THE DESIGN AND DEVELOPMENT OVERLAY

Shown on the planning scheme map as **DDO26**

NORTH AND WEST MELBOURNE NOISE ATTENUATION AREA

1.0

Design objectives

19/01/2006
VC37

- To ensure that new, refurbished or converted developments for new residential and other noise sensitive uses constructed in the vicinity of the Laurens Street, North Melbourne Industrial Area include appropriate acoustical measures to attenuate noise levels within the building.
- To ensure that land use and development in the vicinity of the Laurens Street, North Melbourne Industrial Area does not adversely affect the viability of industry within the Area.

2.0

Requirements

19/01/2006
VC37

2.1

Building Design and Pre-construction Noise Measurement

19/01/2006
VC37

Any new or refurbished development or any conversion of part or all of an existing building that will accommodate new residential or other noise-sensitive uses must:

- Be designed and constructed to include noise attenuation measures. These noise attenuation measures must achieve a maximum noise level of 35dB(A)Leq in unfurnished and uncarpeted habitable rooms, with all windows and doors closed, unless there is no suitable air conditioning and/or mechanical ventilation, in which case the maximum noise level of 35dB(A)Leq in unfurnished and uncarpeted habitable rooms must be achieved with all the windows half open and the doors closed.
- Be fitted with suitable air conditioning and /or mechanical ventilation system to the satisfaction of the responsible authority unless the maximum noise level of 35dB(A)Leq in unfurnished and uncarpeted habitable rooms can be achieved with all the windows half open and the doors closed.
- Have walls, roof, windows, doors and external glazing and the air conditioning or ventilation system designed by a qualified acoustical consultant who must certify that the incorporation of the design features recommended by the consultant will achieve a maximum noise level in unfurnished and uncarpeted habitable rooms of 35dB(A)Leq, based on the external noise levels measured by the consultant as part of a noise level assessment conducted to the satisfaction of the responsible authority.

The pre-construction noise measurement will be conducted as follows:

- Be sufficient in detail and duration to be representative of the noise from the industrial operations which occur in the vicinity of the Laurens Street North Melbourne Industrial Area. This monitoring shall include sampling during the day, evening and night periods on weekdays and weekends.

Based on the above, the assessment criteria based on Schedule 26 are summarized in the table below. It is AL's understanding that the proposed development will be installed with suitable air conditioning.

Table 2 – Noise Level Criteria for the Laurens Street North Melbourne Industrial Area (Arden-Macaulay)

Location	Internal Noise Level Criteria dB(A) $L_{eq}(1hr)$ ¹
Apartment Habitable Rooms	35

Note 1 – Noise level within unfurnished and uncarpeted habitable rooms with all windows and doors closed.

5.2 STANDARD D16 AT CLAUSE 58.04-3

Standard D16 of Clause 58.04-3 was considered to establish the suitable internal noise level criteria for the subject development. The standard contains the following condition:

To contain noise sources in developments that may affect existing dwellings.

To protect residents from external and internal noise sources.

Standard D16

Noise sources, such as mechanical plants should not be located near bedrooms of immediately adjacent existing dwellings.

The layout of new dwellings and buildings should minimise noise transmission within the site.

Noise sensitive rooms (such as living areas and bedrooms) should be located to avoid noise impacts from mechanical plants, lifts, building services, non-residential uses, car parking, communal areas and other dwellings.

New dwellings should be designed and constructed to include acoustic attenuation measures to reduce noise levels from off-site noise sources.

Buildings within a noise influence area specified in Table D3 should be designed and constructed to achieve the following noise levels:

- *Not greater than 35dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10pm to 6am.*
- *Not greater than 40dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6am to 10pm.*

Buildings, or part of a building screened from a noise source by an existing solid structure, or the natural topography of the land, do not need to meet the specified noise level requirements.

Noise levels should be assessed in unfurnished rooms with a finished floor and the windows closed.

Table D3 Noise influence area

Noise Source	Noise influence area
Zone interface	
<i>Industry</i>	<i>300 metres from the industrial 1, 2 and 3 zone boundaries</i>
Roads	
<i>Freeways, tollways and other roads carrying 40,000 Annual Average Daily Traffic Volume</i>	<i>300 metres from the nearest trafficable lane</i>
Railways	
<i>Railway servicing passengers in Victoria</i>	<i>80 metres from the centre of the nearest track</i>
<i>Railway servicing freight outside Metropolitan Melbourne</i>	<i>80 metres from the centre of the nearest track</i>
<i>Railway servicing freight in Metropolitan Melbourne</i>	<i>135 metres from the centre of the nearest track</i>

Note: The noise influence area should be measured from the closest part of the building to the noise source.

Decision guidelines

Before deciding on an application, the responsible authority must consider:

- The design response.*
- Whether it can be demonstrated that the design treatment incorporated into the development meets the specified noise levels or an acoustic report by a suitably qualified consultant submitted with the application.*
- Whether the impact of potential noise sources within a development have been mitigated through design, location and siting.*
- Whether the layout of rooms within a dwelling mitigates noise transfer within and between dwellings.*
- Whether an alternative design meets the relevant objectives having regard to the amenity of the dwelling and the site context.*

Based on these conditions, the subject site has been reviewed as follows:

1. The development is **not** located within 300 metres of an industrial zone.
 - The nearest industrial zoned land is located on Stubbs Street approximately 360 metres south-west of subject site.
2. The development is within 300m of a freeway or road carrying an AADT >40,000.
 - Citylink Tollway is classified as a freeway and located approximately 100 metres west of subject site.
3. The development is **not** within 80m of railway servicing passengers.
 - Upfield Metropolitan Line rail corridor is approximately 100m from the closest façade of the development.
 - Although technically not applicable, the criteria has been considered to address train noise level intrusion within the subject site.

Based on the above the following criteria are recommended for this development to achieve the objective of protecting residents from external noise sources:

Table 3 – Internal Noise Criteria for Apartments with View of Citylink Tollway

Location	Internal Design Noise Level ¹
Apartment living rooms with façade facing the west, north and south	40 dB(A) $L_{eq(16hr)}$ (6am – 10pm)
Apartment bedrooms with façade facing the west, north and south	35 dB(A) $L_{eq(8hr)}$ (10pm – 6am)

Note 1 – With external windows and doors closed. Apartments are unfurnished with finished floor.

For apartments with no view of the Citylink Tollway (ie facing the east), the internal noise level criteria shall be designed to ensure compliance with Australian Standards 2107:2016 per below.

5.3 AUSTRALIAN STANDARDS 2107:2016

Internal noise level criteria for external noise intrusion from traffic on Boundary Road has been developed in accordance with *Australian Standard AS/NZS 2107:2016 "Recommended Design Sound Levels and Reverberation Times for Building Interiors"*. AS/NZS 2107:2016 sets out recommended design sound levels for residential developments depending on locality to minor or major roads. The Table 4 below details the criteria for the proposed development which is located adjacent to a major road.

Table 4 – Apartments facing away from Citylink Tollway (Eastern Façade)

Location	Required Internal Noise Level	
	Day dB(A) $L_{eq,1hr}$ (7am – 10pm)	Night dB(A) $L_{eq,1hr}$ (10pm – 7am)
Apartment Bedrooms	35-45 ¹	30-40
Apartment Living rooms	35-45	N/A

Note 1 - Bedrooms are assessed as living areas outside the night-time period of 10pm to 7am.

Note 2 - Assessment is based on apartments suitably furnished ready for occupation.

6 NOISE LEVEL MEASUREMENTS

6.1 MEASUREMENT LOCATION

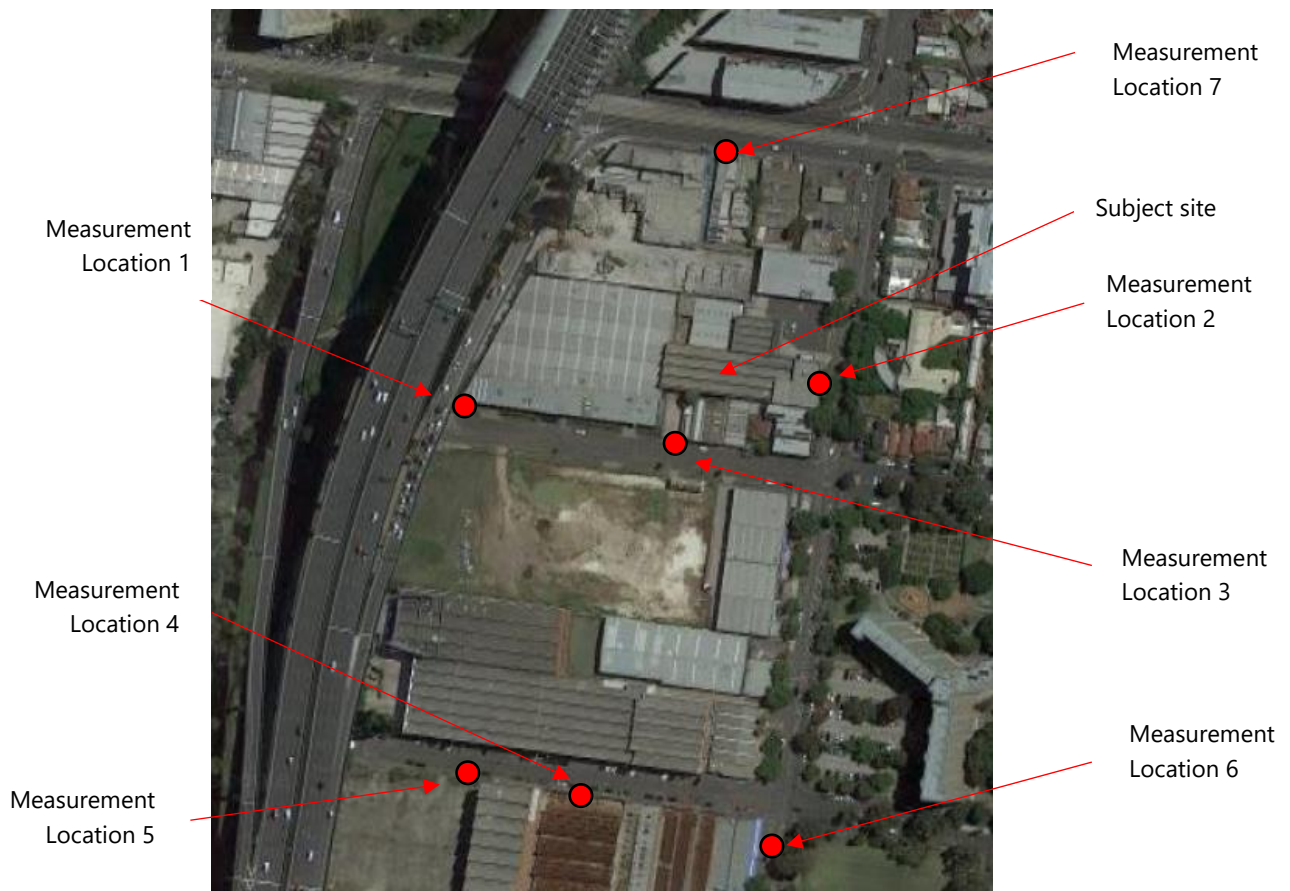


Figure 1 - Measurement Locations (source: Google Maps)

The measurement locations are as the following:

- Measurement location 1 – attended noise level measurements were conducted adjacent the Upfield Metropolitan Line rail corridor. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were free-field and has full view of the train line and impacted by the vehicle movement on Citylink Tollway.
- Measurement location 2 – attended noise level measurements were conducted adjacent Boundary Road. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were affected by façade reflections and has full view of Boundary Road.
- Measurement location 3 – attended noise level measurements were conducted adjacent Alfred Street. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were influenced by façade reflections and has full view of the Citylink freeway.
- Measurement location 4 – attended noise level measurements were conducted the subject site. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were free-field and has full view of the freeway.

- Measurement location 5 – attended noise level measurements were conducted facing the freeway. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were free-field and has full view of the Citylink freeway.
- Measurement location 6 – attended noise level measurements were conducted adjacent Boundary Road. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were influenced by façade reflections and has full view of the Boundary Road.
- Measurement location 7 – attended noise level measurements were conducted adjacent Racecourse Road. The microphone of the sound level meter was located approximately 1.5 metres above grade. The measurements were influenced by façade reflections and has full view of the Racecourse Road.

Additionally, the noise level measurements of the Citylink (Toll Road) had been previously measured by AL on the following locations (not show in Figure 2):

- Location A – an unattended noise monitor was installed on an apartment external balcony on level 8 of the 111 Canning Street, North Melbourne development facing the Citylink Tollway. The microphone of the noise monitor was located approximately 1.5 metres above FFL of the balcony and has full view of Citylink Tollway. The measurements were affected by façade reflections. The monitor was installed on site between 23 and 26 August 2016.
- Location B – an unattended noise monitor was installed on an apartment external balcony on level 4 of the Parkville Stage 7 residential development located at Galada Avenue, Parkville. The microphone of the noise monitor was located approximately 1.5 metres above FFL of the balcony and has full view of Citylink Tollway. The measurements were affected by façade reflections. The monitor was installed on site between 24 and 26 September 2018.

The industrial noise level measurements of the Laurens Street Industrial Precinct (Arden-Macaulay) conducted in the locations indicated in Figure 3 below:



Figure 3 – Measurement Locations (source: Google Maps)

The measurement locations are the following:

- Measurement Location C – Laurens Street between Weston Milling and Holcim facilities: The microphone of the monitor was placed 1.5 metres above grade and the measurements were affected by façade reflections.
- Measurement Location D – Attended noise measurements at 8 Munster Terrace. Measurements was conducted 1.5m above grade and were affected by façade reflections.
- Measurement Location E – Attended noise measurements at Arden Street at the Laurens Street Industrial Precinct (Arden-Macaulay)'s northern boundary. Measurements was conducted 1.5m above grade and were affected by façade reflections.

6.2 MEASUREMENT EQUIPMENT

All attended noise level measurements were conducted using a Norsonic Nor140 Sound Level Analyser. The equipment was calibrated at the beginning and the end of the measurement using a B&K 4231 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

All unattended long-term noise monitoring was conducted using an ARL-315 noise monitor. The equipment was calibrated at the beginning and the end of the measurement using a B&K 4231 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

6.2.1 Traffic Noise Level Measurements

The tables below detail the measures noise level used in the assessment.

Table 5 – Measured Traffic Noise Levels (Attended Measurements)

Measurement Locations ¹	Date of Measurements	Time of Measurements	Measured Noise Levels $L_{eq, 15mins} \text{ dB(A)}^3$
Location 1 (Citylink Tollway and railway corridor)	5/02/2021	07:20am-07:35am	61
Location 2 (Boundary Rd)	30/11/2018	03:24pm-03:39pm	65 ²
Location 3 (facing Citylink Tollway)	30/11/2018	03:44pm-03:59pm	56 ²
Location 4 (adjacent subject site)	02/12/2020	01:48pm-02:03pm	60
Location 5 (facing Citylink Tollway)	02/12/2020	02:04pm-02:19pm	60
		02:20pm-02:35pm	62
		03:00pm-03:15pm	62
		03:15pm-03:30pm	64
		03:30pm-03:45pm	59
Location 6 (Boundary Rd)	02/12/2020	02:43pm-02:58pm	69 ²
Location 7 (Racecourse Rd)	30/11/2018	04:05pm-04:20pm	72 ²

Note 1 – Refer Section 6.1 for measurement locations.

Note 2 – Measured noise levels presented have been corrected -2.5 dB for façade reflections.

Note 3 – Noise from the Stubbs Street and Laurens Street Industrial Precinct (Arden-Macaulay) were inaudible at the measurement location.

Table 6 – Citylink Tollway Traffic Noise Level Measurements

Measurement Locations ¹	Period	Measured Noise Levels ²
Measurement location A at 111 Canning Street (facing Citylink Tollway)	Day (6.00 – 22.00)	66 dB(A) $L_{eq,16hr}$
	Night (22.00 – 6.00)	62 dB(A) $L_{eq,8hr}$
Measurement location B at Parkville Stage 7 (facing Citylink Tollway)	Day (6.00 – 22.00)	74 dB(A) $L_{eq,16hr}$
	Night (22.00 – 6.00)	68 dB(A) $L_{eq,8hr}$

Note 1 – Refer Section 6.1 for measurement locations.

Note 2 – Measured noise levels presented have been corrected -2.5 dB for façade reflections.

6.2.2 Train Noise Level Measurements

Table 7 – Measured Train Noise Levels (Attended Measurements)

Measurement Location ¹	Time	Measured Noise Levels ²
Measurement location 1 (facing the Upfield Metropolitan Line rail corridor)	Day (6am – 10pm)	74 $L_{eq,16hr}$ dB(A)
	Night (10pm – 6am)	68 $L_{eq,8hr}$ dB(A)

Note 1 – Refer Section 6.1 for measurement locations.

Note 2 – Train noise L_{eq} is derived by measuring the level of multiple train pass-bys and deriving a Sound Exposure Level (SEL). A $L_{eq,16hr}$ and $L_{eq,8hr}$ value is then derived from this based on the frequency of the train service during these periods.

6.2.3 Laurens Street Industrial Precinct (Arden-Macaulay) Noise Level Measurements

To address the Schedule 26 detail in Section 5 above, the noise levels from the Laurens Street Industrial Precinct (Arden-Macaulay) has been assessed.

The table below details the measured noise levels of the Laurens Street Industrial Precinct (Arden-Macaulay).

Table 8 – Attended Industrial Noise Levels

Measurement Location	Date and Time	Measured Noise Level dB(A) L_{eq}
Measurement Location C	25/11/2019: 10:50am – 11:00am	62 ¹
Measurement Location D	30/11/2017: 2:47pm	57 ¹
	06/12/2017: 7:32am	55 ¹
Measurement Location E	09/02/2020: 4:30pm to 4:45pm	59 ²

Note 1 – The measured noise levels have been corrected to account for façade reflections

Note 2 – The noise levels presented is based on the measured noise between the traffic at Arden Street.

7 EVALUATION OF EXTERNAL NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows, doors and roof as these are relatively light building elements that offer less resistance to the transmission of sound. Walls that are proposed to be precast / heavy masonry elements will not require upgrading acoustically.

The measured traffic and train noise levels conducted have been used to predict the noise levels at the façade of the proposed development, which considered the distance between measurement location and proposed building location.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to traffic/train noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

The constructions set out below are necessary for the satisfactory control of external noise.

7.1 TRAFFIC AND TRAIN NOISE ASSESSMENT

7.1.1 Recommended Glazing

The minimum glazing requirements schedule for this development is detailed in **Appendix 1 – Façade Markup**. The glass thicknesses shown in the schedule do not consider thermal, structural, safety or any other requirements other than acoustic requirements and thus may require upgrading in some instances. In these instances, increasing the glass thickness beyond the acoustic requirement will be acceptable. Where the glazing thickness has not been specified, standard glazing will be acceptable.

Table 9 below details the minimum R_w performance requirements for the glazing assembly installed. Where open-able windows or sliding doors are installed, the total R_w performance of the system shall not be lower than the values listed in Table 9. It is noted that the system supplied shall meet the overall minimum R_w ratings nominated based on a laboratory test report for the system. If an alternative system is proposed the system shall be reviewed and will require approval by a suitably qualified acoustic consultant to ensure that the proposed system is acceptable and will ensure compliance with the nominated internal noise design criteria.

Table 9 – Minimum External Glazing Requirements / Performance

Location	Required Glazing Construction ¹	Minimum R_w of Installed Window System	Acoustic Seals ²
Refer Appendix 1 – Façade Mark-up	6mm <u>or</u> 6/12/6 IGU	29	Yes
	6.38mm lam <u>or</u> 6/12/6.38 lam IGU	31	Yes
	10.38mm lam <u>or</u> 6/12/10.38 lam IGU	35	Yes
	12.76mm lam <u>or</u> 6/12/12.76 lam IGU	37	Yes
	12/12/8.76 lam IGU	39	Yes

Note 1 – or equivalent as approved by a suitably qualified acoustic consultant.

Note 2 – Mohair Seals in windows and doors are not acceptable where acoustic seals are required. Seals in these instances shall be equal to Schlegel Q-Ion.

7.1.2 Apartment Roof / Ceiling Construction

Concrete roof construction does not require further upgrade acoustically. Any lightweight element shall be designed to ensure compliance with the assessment criteria is achieved.

Penetrations in ceilings (such as for light fittings etc.) must be sealed gap free with a flexible sealant. Any ventilation openings in the ceilings would need to be acoustically treated to maintain the acoustic performance of the ceiling construction.

7.1.3 Apartment External Walls

Concrete or masonry external walls will not require upgrading acoustically. Penetrations in walls must be sealed gap free with a flexible sealant. Any ventilation openings in the walls would need to be acoustically treated to maintain the acoustic performance of the wall construction.

7.2 LAURENS STREET INDUSTRIAL PRECINCT (ARDEN-MACAULAY) NOISE ASSESSMENT

Our inspection and noise level measurements at the subject site indicate that the noise from the Laurens Street Industrial Precinct (Arden-Macaulay) was inaudible. As such, industrial noise levels from the Laurens Street Precinct (Arden-Macaulay) have been predicted on the subject site based on the noise level measurements detailed in Table 8 above.

The noise levels from the operation of Laurens Street Industrial Precinct (Arden-Macaulay) at the façade of the subject development is predicted to be <55 dB(A). Based on this, the façade design recommended in Section 7.1 above will ensure that compliance with the criteria nominated under Schedule 26 requirement will be met by achieving an internal noise level of $\leq 35 \text{ dB(A)}_{L_{eq,1hr}}$ within unfurnished and uncarpeted habitable rooms with all windows and doors closed. As noted above, it is AL's understanding that the proposed development will be installed with suitable air conditioning.

8 CONCLUSION

This report details our acoustic assessment for the proposed mixed-use development located at 139-149 Boundary Road, North Melbourne. The assessment has been conducted to ensure that the operation of the Laurens Street Industrial Precinct (Arden-Macaulay) complies with the criteria nominated under Schedule 26 of the Design and Development Overlay, and therefore satisfies Condition 37 of Planning Permit No. PA1900753-1 prepared by Minister for Planning.

In addition, Section 7 of the report has detailed our acoustic treatment recommendations to ensure that the internal noise level criteria established in Section 5 is achieved.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,



Acoustic Logic Pty Ltd
Barli Wibisono

APPENDIX 1 – FAÇADE MARKUP

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

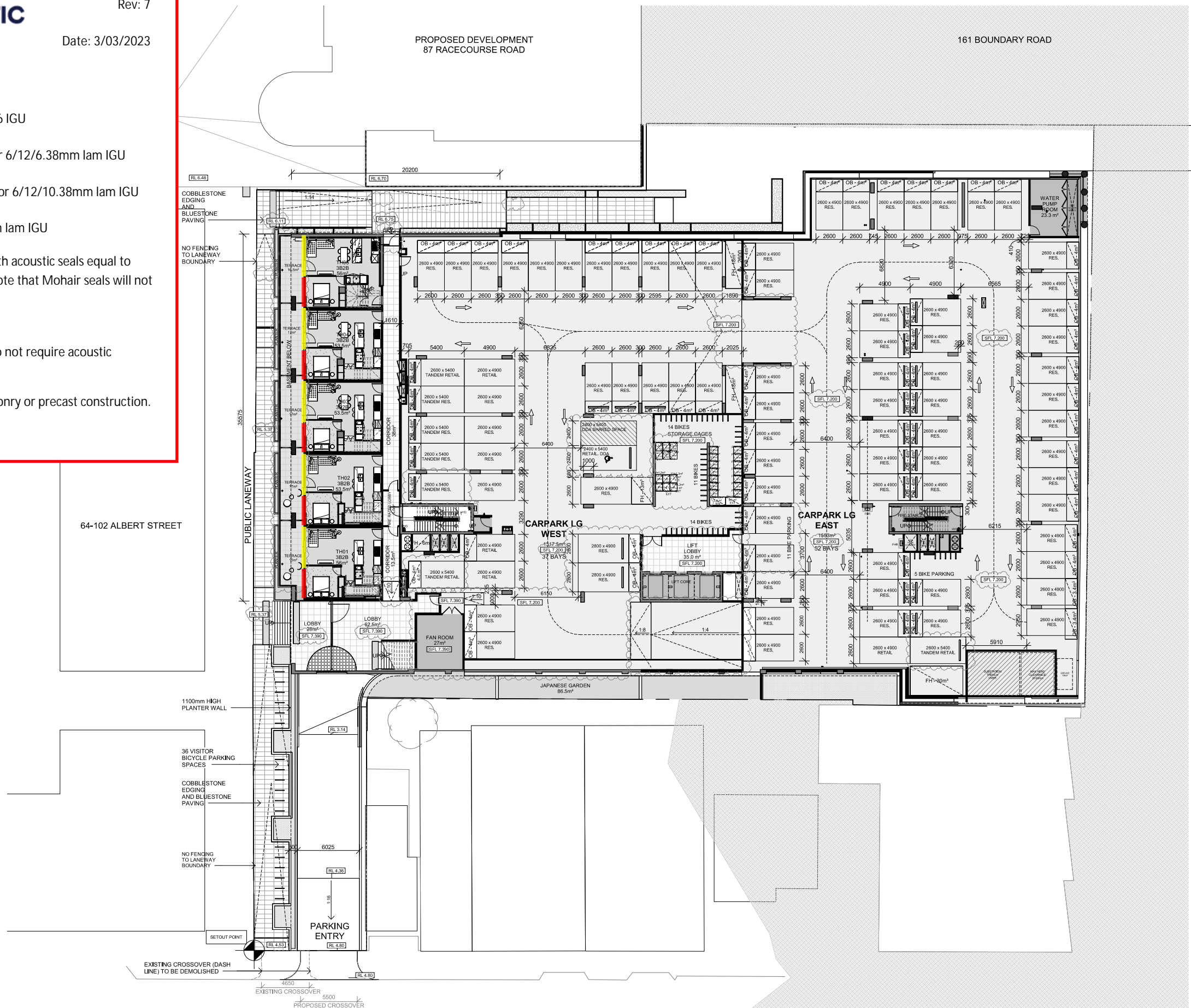
All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



TP - PARKING SCHEDULE - LOWER GROUND FLOOR		
LEVEL	USE	NUMBER
LOWER GROUND FLOOR WEST	RES.	77
LOWER GROUND FLOOR WEST	RETAIL	4
LOWER GROUND FLOOR WEST	RETAIL DDA	1
LOWER GROUND FLOOR WEST	TANDEM RES.	4
LOWER GROUND FLOOR WEST	TANDEM RETAIL	3
TOTAL PARKING: 89		

TP - BIKE SCHEDULE - LOWER GROUND FLOOR		
LEVEL	USE	NUMBER
LOWER GROUND FLOOR EAST	BIKES (RESIDENT)	51
LOWER GROUND FLOOR WEST	BIKES (VISITOR)	36
TOTAL BIKE PARKS: 87		

STORAGE CAGES - 4M3 FULL HEIGHT - LOWER GROUND FLOOR	
LEVEL	NUMBER
LOWER GROUND FLOOR WEST	32
LOWER GROUND FLOOR EAST	1

STORAGE CAGES - 4M3 OVER BONNET - LOWER GROUND FLOOR	
LEVEL	NUMBER
LOWER GROUND FLOOR WEST	19
LOWER GROUND FLOOR EAST	52

TOWN PLANNING NOTES
OVER BONNET STORAGE TO HAVE A MINIMUM CLEARANCE OVER PARKING SPACE OF 1.2m.

UNIT DESCRIPTION

- 3B2B TOWNHOUSE
- BALCONY
- CARPARK
- CIRCULATION
- COMMUNAL ROOF GARDEN
- LOBBY
- PLANTER
- SERVICES

ALFRED STREET

TOWN PLANNING



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Project
MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE
Client
BLUE EARTH GROUP

Amendments	
No.	Date
A	09/12/2019
B	27/03/2020
C	31/07/2020
D	22/09/2021
E	24/11/2022

Title
LOWER GROUND FLOOR PLAN
Sheet
PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No.
TP2.03
Scale
1 : 200@A1
Date
24/11/2022

Revision
F
18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

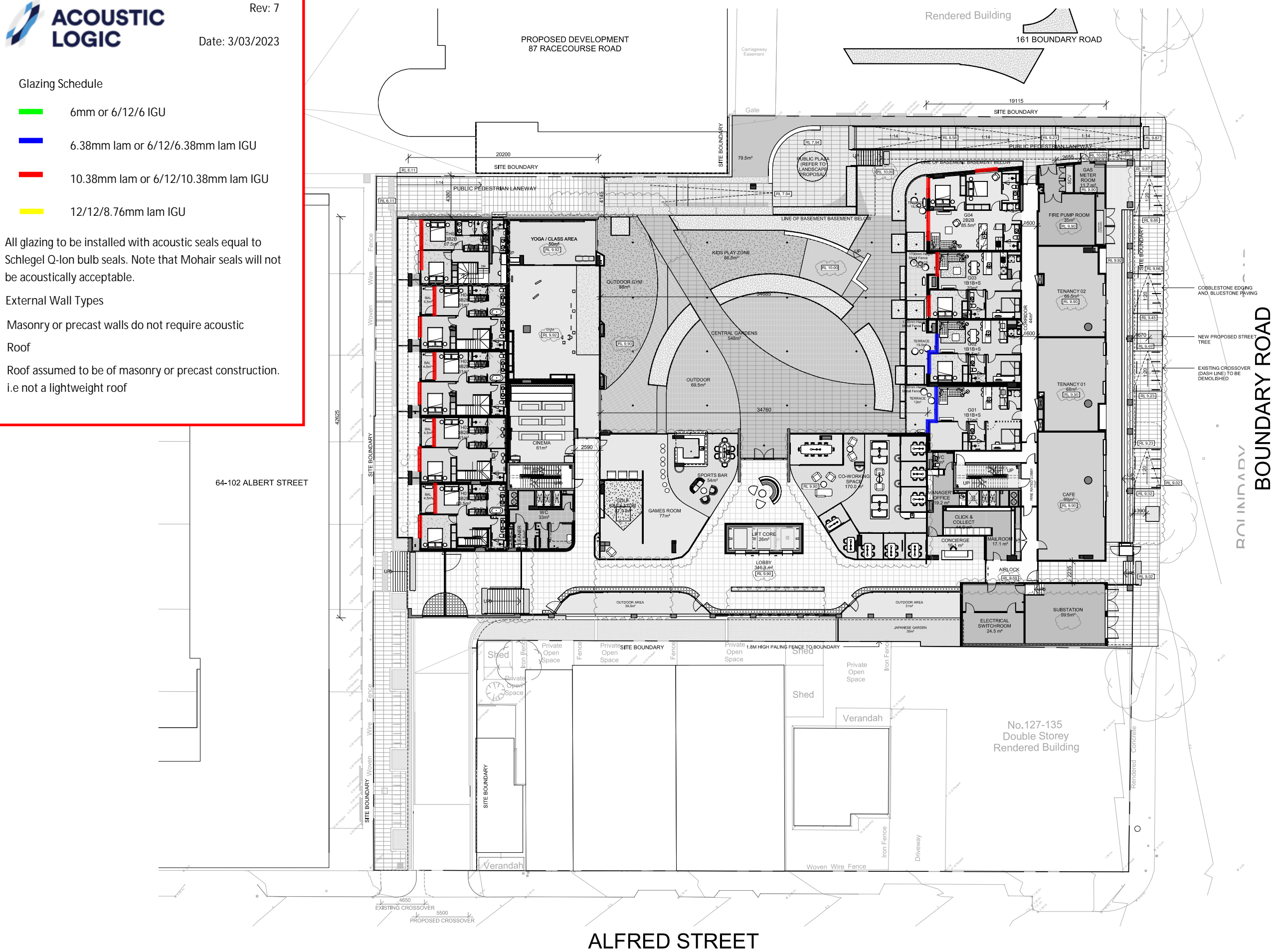
All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



TP - BIKE SCHEDULE - UPPER GROUND FLOOR		
LEVEL	USE	NUMBER
UPPER GROUND FLOOR	BIKES (VISITOR)	40
TOTAL BIKE PARKS: 40		

- UNIT DESCRIPTION
- 1 BED & 1 BATH + STUDY
 - 2 BED & 2 BATH
 - 3B2B TOWNHOUSE
 - BALCONY
 - CIRCULATION
 - COMMUNAL
 - CORE
 - COURTYARD
 - JAPANESE GARDEN
 - PUBLIC SPACE
 - RETAIL
 - SERVICES

18113 - 4/12/2022 2:51:00 PM



Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof

64-102 ALBERT STREET

PROPOSED DEVELOPMENT
87 RACECOURSE ROAD

161 BOUNDARY ROAD



BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 2 BATH
- BALCONY
- CIRCULATION
- CORE
- SERVICES

ALFRED STREET

TOWN PLANNING

Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEVELOPER RESPONSE
C	31/07/2020	DEVELOPER RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 01

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No.

TP2.05

Revision

F

Scale

1 : 200@A1

Date

24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 2 BATH
- BALCONY
- CIRCULATION
- CORE
- SERVICES

ALFRED STREET

TOWN PLANNING



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Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEVELOPER RESPONSE
C	31/07/2020	DEVELOPER RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 02

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No.

TP2.06

Revision

F

Scale

1 : 200@A1

Date

24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof

64-102 ALBERT STREET

PROPOSED DEVELOPMENT
87 RACECOURSE ROAD

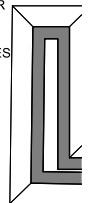
161 BOUNDARY ROAD

BOUNDARY ROAD

ALFRED STREET

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 2 BATH
- BALCONY
- CIRCULATION
- CORE
- PLANTER
- SERVICES



Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEVELOPER RESPONSE
C	31/07/2020	DEVELOPER RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 03

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

TOWN PLANNING

Sheet No.

TP2.07

Revision

F

Scale

1 : 200@A1

Date

24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 2 BATH
- BALCONY
- CIRCULATION
- CORE
- SERVICES

ALFRED STREET

TOWN PLANNING



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Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEWLP RPT RESPONSE
C	31/07/2020	DEWLP RPT RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 04

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No.

TP2.08

Revision

F

Scale


1 : 200@A1

Date

24/11/2022



18113



ACOUSTIC LOGIC

Rev: 7

Date: 3/03/2023

Glazing Schedule

6mm or 6/12/6 IGU

6.38mm lam or 6/12/6.38mm lam IGU

10.38mm lam or 6/12/10.38mm lam IGU

12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof

PROPOSED DEVELOPMENT
87 RACECOURSE ROAD

64-102 ALBERT STREET

BOUNDARY ROAD

ALFRED STREET

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 2 BATH
- BALCONY
- CIRCULATION
- CORE
- PLANTER
- SERVICES

CHT ARCHITECTS

CHT Architects Pty Ltd

ABN 29 108 008 519

Architecture

Interior Design

Urban Design

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MIXED USE DEVELOPMENT

145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEWLP R1 RESPONSE
C	31/07/2020	DEWLP R1 RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 05

Sheet

PRELIMINARY

NOT FOR CONSTRUCTION

TOWN PLANNING

Sheet No.

TP2.09

Revision

F

Scale

1 : 200@A1

Date

24/11/2022

18113

Drawn by:AutoChecked by:Checker

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

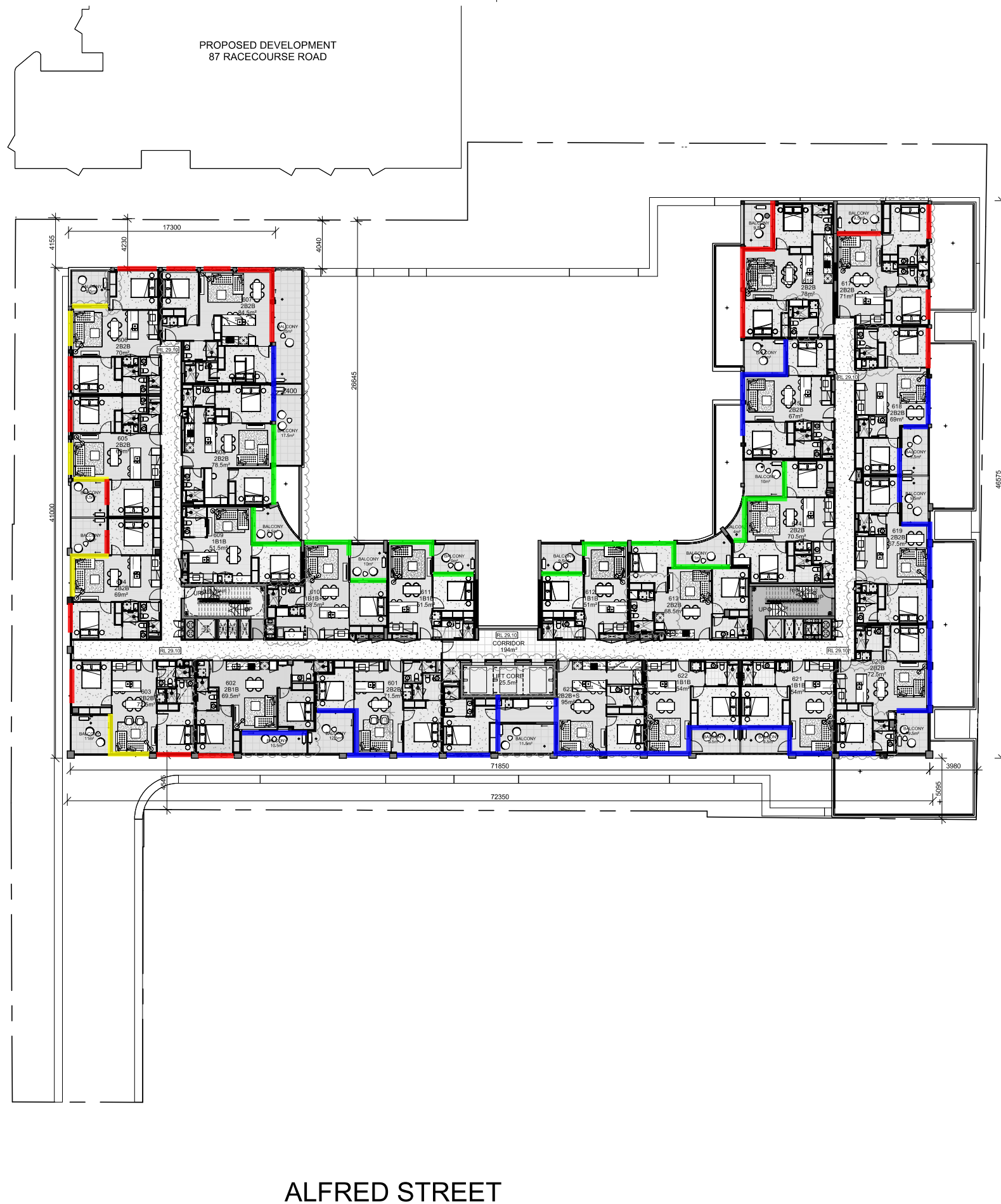
All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 1 BATH
- 2 BED & 2 BATH
- 2 BED & 2 BATH + STUDY
- BALCONY
- CIRCULATION
- CORE
- SERVICES

ALFRED STREET

Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEVELOPER RESPONSE
C	31/07/2020	DEVELOPER RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 06

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

TOWN PLANNING

Sheet No.

TP2.10

Revision

F

Scale

1 : 200@A1

Date

24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

ALFRED STREET

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 1 BATH
- 2 BED & 2 BATH
- 2 BED & 2 BATH + STUDY
- BALCONY
- CIRCULATION
- CORE
- PLANTER
- SERVICES

Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEVELOPER RESPONSE
C	31/07/2020	DEVELOPER RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 07

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

TOWN PLANNING

Sheet No.

TP2.11

Revision

F

Scale

1 : 200@A1

Date

24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

ALFRED STREET

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 1 BATH
- 2 BED & 2 BATH
- 2 BED & 2 BATH + STUDY
- BALCONY
- CIRCULATION
- CORE
- SERVICES

Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEWLP RPT RESPONSE
C	31/07/2020	DEWLP RPT RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 08

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

TOWN PLANNING

Sheet No.

TP2.12

Revision

F

Scale

1 : 200@A1

Date

24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

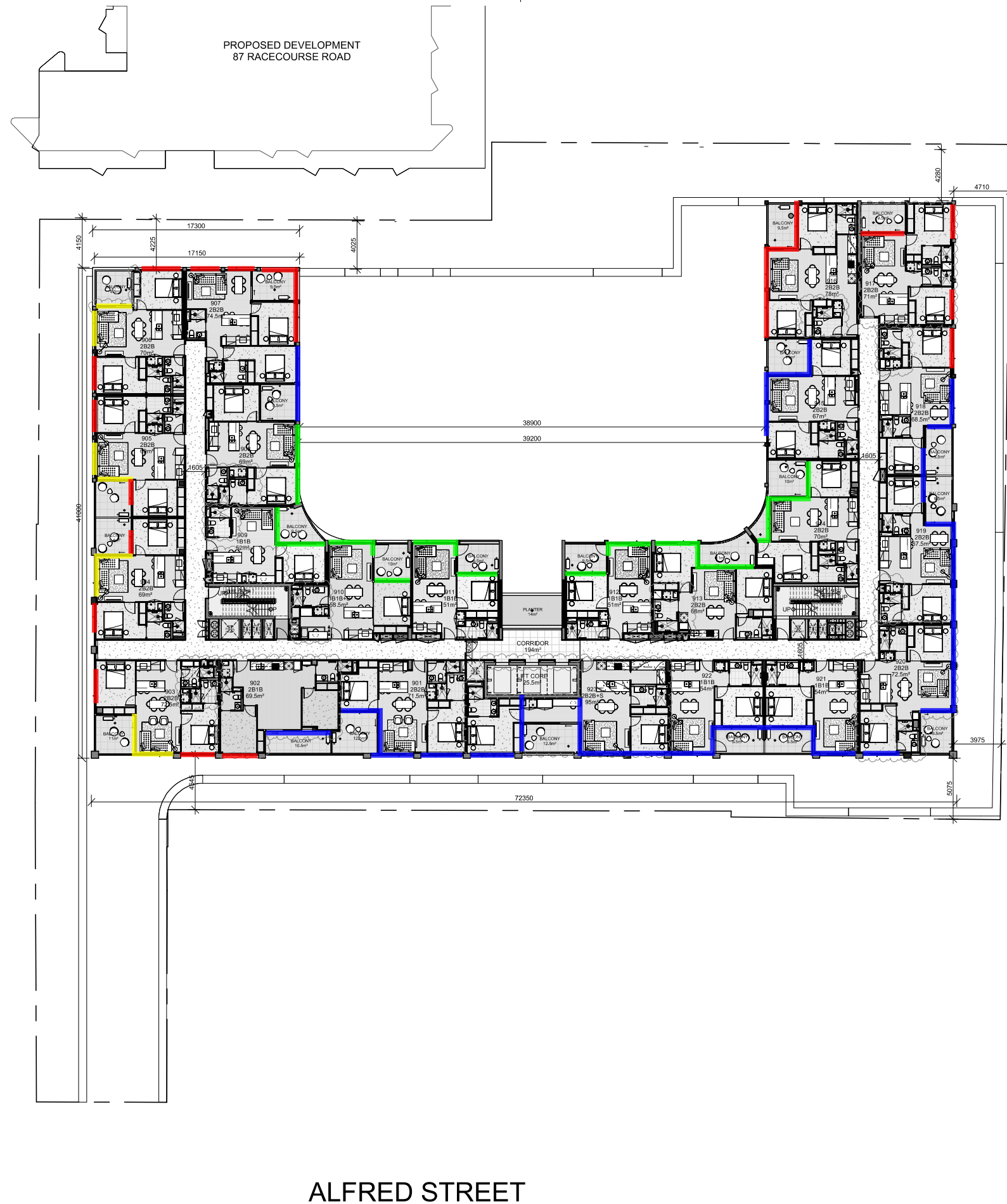
All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 1 BATH
- 2 BED & 2 BATH
- 2 BED & 2 BATH + STUDY
- BALCONY
- CIRCULATION
- CORE
- PLANTER
- SERVICES

ALFRED STREET

TOWN PLANNING



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Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEWLP RPT RESPONSE
C	31/07/2020	DEWLP RPT RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 09

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No.

TP2.13

Revision

F

Scale
1 : 200@A1

Date
24/11/2022



18113

Glazing Schedule

- 6mm or 6/12/6 IGU
- 6.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU
- 12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof



BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 1 BATH
- 2 BED & 2 BATH
- 2 BED & 2 BATH + STUDY
- BALCONY
- CIRCULATION
- CORE
- SERVICES

ALFRED STREET

TOWN PLANNING



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Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEVELOPER RESPONSE
C	31/07/2020	DEVELOPER RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 10

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No.

TP2.14

Revision

F

Scale


1 : 200@A1

Date

24/11/2022



18113



Rev: 7
Date: 3/03/2023

Glazing Schedule

6mm or 6/12/6 IGU

6.38mm lam or 6/12/6.38mm lam IGU

10.38mm lam or 6/12/10.38mm lam IGU

12/12/8.76mm lam IGU

All glazing to be installed with acoustic seals equal to Schlegel Q-Ion bulb seals. Note that Mohair seals will not be acoustically acceptable.

External Wall Types

Masonry or precast walls do not require acoustic

Roof

Roof assumed to be of masonry or precast construction. i.e not a lightweight roof

BOUNDARY ROAD

UNIT DESCRIPTION

- 1 BED & 1 BATH
- 1 BED & 1 BATH + STUDY
- 2 BED & 2 BATH
- BALCONY
- CIRCULATION
- COMMUNAL ROOF GARDEN
- CORE
- PLANTER
- SERVICES

ALFRED STREET

CHT Architects Pty Ltd
ABN 29 108 008 519
Architecture
Interior Design
Urban Design

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Project

MIXED USE DEVELOPMENT
145 BOUNDARY ROAD, NORTH MELBOURNE

Client

BLUE EARTH GROUP

Amendments

No.	Date	Notes
A	09/12/2019	TP SUBMISSION
B	27/03/2020	DEWLP RPT RESPONSE
C	31/07/2020	DEWLP RPT RESPONSE - FULL RE-DESIGN
D	02/03/2021	GROUND WATER LEVELS
E	22/09/2021	PLANNING PERMIT AMENDMENT
F	24/11/2022	SECTION 72

Title

LEVEL 11

Sheet

PRELIMINARY
NOT FOR CONSTRUCTION

TOWN PLANNING

Sheet No.

TP2.15

Revision

F

Scale

1 : 200@A1

Date

24/11/2022

18113

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