MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

3 Holdsworth Avenue, St Leonards

DA Acoustic Assessment

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 98 145 324 714
www.acousticlogic.com.au

Project ID	20241220.1
Document Title	DA Acoustic Assessment
Attention To	New Golden St Leonards Pty Ltd

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	11/11/2024	20241220.1/1111A/R0/RF	RF		RF

TABLE OF CONTENTS

1 INTRODUCTION

An acoustic assessment has been prepared on behalf of the applicant for the proposed residential development located at 3 Holdsworth Avenue, St Leonards. The assessment pertains to a revised proposal for the site noting that the previous scheme was approved under DA187/2021. The proposed development is described in Section 4 of the report.

The assessment reviews the impacts associated with the following noise sources:

- Traffic noise intrusion
- Mechanical plant noise emissions (in principle)

Noise levels at the site have been measured using EPA recommended methodologies and detailed in the approved acoustic report for the original scheme prepared by Acoustic Works with reference 1021099 R01G 3 Holdsworth Avenue St Leonards ENV RTN.docx, dated 24th June 2022.

The predicted likely impacts have been assessed using the previously established criteria relevant to the site.

Where required, complying controls and mitigation have been determined to prevent adverse amenity impacts., and these are summarised in Section 6 of the report.

The subject site and local context are indicated in Figure 1.

The report has been prepared for the sole purpose of a development application assessment and should not be used or relied on for any other purpose.

2 REFERENCED DOCUMENTS

2.1 BACKGROUND INFORMATION USED

The assessment is based on the following drawings, reports and other information:

- Architectural Drawings prepared by PTW, project number PA030370 revision E, dated 30.10.2024.
- Acoustic Report prepared by Acoustic Works with reference 1021099 R01G 3 Holdsworth Avenue St Leonards ENV RTN.docx, dated 24th June 2022 ("**Acoustic Report**").

3 ABBREVIATIONS AND DEFINITIONS

The following Abbreviations and definitions are used in this noise impact assessment.

dB	Decibels - unit for the measurement of sound
dB(A)	A-weighted decibels. Unit of measurement for broadband sound with the A-frequency weighting applied to approximate human loudness perception to sounds of different pitch.
L_{eq}	Energy, time averaged sound level
L_{max}	Maximum sound pressure level, fast response
L_{90}	Sound level exceeded for 90% of the measurement period
R_w	Frequency weighted sound reduction index.
NRC	Average absorption co-efficient for the octave bands with centre frequencies of 250Hz to 2 kHz inclusive.
Day*	For noise emissions assessment - the period from 7 am to 6 pm (Monday to Saturday) and 8 am to 6 pm(Sundays and public holidays). For transportation noise - the period from 7 am to 10 pm
Evening*	Refers to the period from 6 pm to 10 pm.
Night*	The period from 10 pm to 7 am (Monday to Saturday), and 10 pm to 8 am(Sundays and public holidays). For transportation noise - the period from 10 pm to 7am
Project Trigger Level	Target receiver noise levels for a particular noise-generating facility.
Assessment Background Level (ABL)	A-weighted background noise level representative of a single period. (Calculated in accordance with NPfI unless noted otherwise)
Rating Background Level (RBL)	The overall, single-figure A-weighted background level representing each assessment period (day/evening/night) over the whole monitoring period. (Calculated in accordance with NPfI unless noted otherwise)

* Unless nominated otherwise.

4 SITE AND PROPOSAL DESCRIPTION

4.1 DESCRIPTION OF THE PROPOSAL

The subject site, approximately 2,631m^2 in area, is located at 3 Holdsworth Avenue (Lot 8 in DP1275969) and includes the combined lots of 10 and 12 Marshall Avenue and 1 and 3 Holdsworth Avenue. It is zoned R4 High Density Residential under the Lane Cove Local Environmental Plan 2009.

The proposed development includes a residential building with 120 apartments, a 4-storey basement for car parking, a 400m^2 public open space, and a green spine communal area at ground level.

4.2 SENSITIVE RECEIVERS

The following table lists the nearest/potentially most impacted sensitive receivers surrounding the site. An aerial photo of the site indicating nearby noise sensitive receivers and measurement locations is presented in Figure 1.

Table 1 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Future Residential apartment development located to the east
R2	Residential	Single storey residential dwelling at southern site boundary at 5 Holdsworth Avenue.
R3	Residential	Single and two storey residential dwellings are at the western site boundary.
R4	Residential	Multi-storey residential apartment buildings to the north at 1 to 25 Marshall Avenue.

Figure 1 – Site Plan Showing Local Context

- Residential

5 TRAFFIC NOISE INTRUSION ASSESSMENT

The noise sources assessed as potentially impacting the proposed development are traffic noise from Marshall Avenue and Pacific Highway.

5.1 GUIDELINES AND ASSESSMENT CRITERIA

Assessment criteria relevant to the site have been formulated in accordance with relevant guidelines and are detailed in the approved Acoustic Report for the previous scheme (Refer Appendix A). The criteria are repeated below.

Table 2 – Summarised Airborne Noise Criteria

Building Use	Room	Noise Level dB(A) L_{eq}
Residential	Sleeping Area (Bedroom)	35 (10pm to 7am)
	Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40 Any time

5.2 SITE AMBIENT NOISE LEVELS

A survey of ambient noise has been undertaken to characterise the existing environment and is detailed in the approved Acoustic Report for the previous scheme (Refer Appendix A).

A summary of the site data used in the assessment is provided below.

Table 3 – Noise Measurement Summary

Noise Source	Descriptor/Time Period	Noise Level (dB(A))
Marshall Avenue Traffic	$L_{eq,15hr}$	54
	$L_{eq,9hr}$	50

5.3 AIRBORNE NOISE ASSESSMENT

An assessment of noise impact has been undertaken using the following methodology:

- Windows Closed Noise Levels

  Windows closed noise levels were calculated to the centre of the room using the predicted octave band façade incident external noise levels and, for each façade element, correcting for the exposed area, octave band sound transmission loss and room sound power to pressure correction. The room noise level was calculated by accumulating all significant noise paths.

  Envelope performance requirements to comply with the noise criteria stipulated in Section 5.1 have been assessed.

- Windows Open Noise Levels

  "Windows open" noise levels have been calculated by subtracting 10 dB(A) from the façade incident noise level, as promulgated by the RNP (Table 7). The noise reduction assumes the open area of window is equivalent to 5% of the room floor area. Where openable windows to the room are located on different facades, the façade opening(s) with the lowest noise levels have been assessed first.

5.3.1 External Noise Levels

The measured noise levels have been used as a basis for predicting façade-incident noise levels around the development by:

- Accounting for any likely changes in traffic volumes in the long term.

  For the subject roads, analysis of traffic volumes on the TfNSW website indicates there has been no significant increase in traffic volumes. Given this, and the trend to quieter electric vehicles, a zero long term increase in noise has been adopted.
- Correcting for different distances between the noise source compared to the monitoring location.
- Barrier effects, where applicable.
- Reflections off adjacent structures, where significant.

The CoRTN traffic noise prediction model has been used to calculate the above adjustments indicated above.

5.3.2 Discussion

The modelling indicates that mitigation of noise impacts is needed to achieve compliance with the nominated assessment criteria. Complying mitigation is provided in Section 6.

6 COMPLYING MITIGATION

The assessment indicates that the building envelope is required to be upgraded beyond what is considered to be a "standard" form of construction to comply with the internal noise criteria. The following complying mitigation has been determined to comply with the required internal noise levels.

6.1 GLAZED WINDOWS AND DOORS

Acoustically rated external windows and doors are required. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria.

All external windows and doors listed are required to be fitted with Q-lon type (or equal) acoustic seals. (**Mohair Seals are unacceptable**). The suitability of alternative seal types should be determined to an appropriately qualified acoustic expert.

The complying constructions are listed below.

Table 4 – Complying Glazing Constructions

Level	Space	Facade	Glazing Construction	Acoustic Seals
All	Living	All	4mm float or toughened	**Yes**
	Bedroom			

Thicker glazing may be required for structural, safety or other purposes. Where it is required to use thicker glazing than scheduled, this will also be acoustically acceptable.

It is recommended that only window systems having test results indicating compliance with the required ratings obtained in a certified laboratory be used where windows with acoustic seals have been recommended.

In addition to complying with the minimum complying glazing construction, the R_w rating of the glazing fitted into open-able frames and fixed into the building opening should not be lower than the values listed in the following table. This will require the use of acoustic seals around the full perimeter of open-able frames and the frame will need to be sealed into the building opening using a flexible sealant.

Table 5 – Minimum Rw of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w/Rw+C_{tr} of Installed Window
4mm float or toughened	28

6.1.1 Use of Insulated Glass Units (Double Glazing)

Where single glazing has been recommended in Table 4, the following IGU's can be used in place of the tabled single glazing.

Table 6 – Equivalent IGU Sytems

Single Glazing Assembly	Equivalent IGU	Minimum R_w/Rw+C_{tr} of Installed Window
4mm float or toughened	6/12AG/6	33/30

6.2 ROOF/CEILING CONSTRUCTION DETAILS

Roof is to be constructed from concrete/masonry elements and so will not require any acoustic upgrading to achieve the acoustic requirements.

6.3 EXTERNAL WALLS

External walls constructed from concrete/masonry elements will not require any acoustic upgrading to achieve the acoustic requirements. For light-weight materials, the following complying constructions are provided.

Table 5 – Complying External Light Weight Wall Construction

Space	Internal Lining	Stud System	External Lining
Bedroom	1x13mm Plasterboard	Minimum of 90mm timber stud with 75mm thick 11kg/m^3 glasswool insulation in cavity	7mm Fibre-cement cladding
Living Room			

6.4 NON-GLAZED ENTRY DOORS

Doors to be minimum 44mm thick solid core timber (minimum 32 kg/m^2 surface density), fitted with full perimeter acoustic seals equal to Raven RP10 to the top and sides and Raven RP38 to the underside of a hinged door.

For glazed external doors refer Section 0.

6.4.1 Penetrations in the External Envelope

Acoustically treat all penetrations in the external envelope, including any supplementary ventilation system, to prevent that the acoustic performance of the building envelope from being reduced.

6.5 VENTILATION REQUIREMENTS

6.5.1 Traffic Noise

The assessment indicates that there are no rooms that will exceed the DNRCBR "windows open" noise level. As such, no further mitigation is indicated.

7 NOISE EMISSION ASSESSMENT

7.1 ENVIRONMENTAL NOISE SOURCES

The following significant noise sources have been identified as requiring assessment:

- Air conditioning and ventilation plant.

7.2 NOISE ASSESSMENT CRITERIA FOR ON-SITE NOISE SOURCES

Criteria to assess noise emissions from the operation of the proposed development have been developed using the NSW EPA Noise Policy for Industry. This policy was primarily developed to assess noise impacts from industrial development, but can also be adapted to assess other types of development such as commercial buildings and air conditioning plant. The criteria relevant to the site are detailed in the approved Acoustic Report for the previous scheme and repeated below.

Table 7 – Project Triger Levels

Receiver	Period	Trigger Noise Level (dB(A) $L_{eq,15min}$)
Residential receivers surrounding site	Day	53
	Evening	47
	Night	39

7.3 MECHANICAL PLANT NOISE (IN PRINCIPLE)

Plant selections have not been determined at this stage. Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels. Satisfactory levels will be achievable through appropriate plant selection and location and, if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures.

Noise emissions from all mechanical services plant to the closest residential receiver should comply with the noise emission criteria detailed in this section.

8 CONCLUSION

This report summarises the noise and vibration impact assessment undertaken for the proposed development. The outcomes are:

- Ambient noise and vibration has been measured at the site. The data obtained have been used to predict exposure around the envelope of the proposed development, and the impacts assessed using relevant project specific criteria.
- The assessment indicates that treatment of the building envelope will be required to mitigate impacts from the environmental noise sources impacting the site, as identified in the assessment. Complying mitigation is provided in in Section 6 of this report.
- With the implementation of adequate mitigation the proposed development will achieve an acceptable level of acoustic amenity for the future occupants.
- It is recommended that a condition for obtaining a Construction Certificate should be a detailed assessment of the measures needed to comply with the performance objectives adopted in this assessment. The completed development should incorporate those recommendations.
- A detailed assessment of mechanical plant noise is to be conducted at CC stage to ensure that the noise emission limits established for the development can be achieved.

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

Yours faithfully,

Acoustic Logic Pty Ltd
Ross Ferraro

APPENDIX A –APPROVED ACOUSIC REPORT FOR PREVIOUS SCHEME

acousticworks

Proposed Residential Development
3 Holdsworth Avenue
St Leonards

ACOUSTIC REPORT




Client:
New Golden St Leonards Pty Ltd
ATTN: Connie Wang

Reference:
1021099 R01G 3 Holdsworth Avenue St Leonards ENV RTN.docx

Date Issued:
24 June 2022

Document Information

Contact Details

Acoustic Works
75/45 Huntley St
Alexandria NSW 2015
(02) 9666 5444
ABN: 35 607 558 707

Greg Pearce
Ph: 0450 337 375
Email: gpearce@acousticworks.com.au

Mark Enersen
Ph: 0409 317 416
Email: menersen@acousticworks.com.au

Report Register

Date	Revision	Author	Reviewer	Manager
25/11/2021	R01A	Matthew Bechara	Greg Pearce	GP
26/11/2021	R01B	Matthew Bechara	Greg Pearce	GP
01/12/2021	R01C	Matthew Bechara	Greg Pearce	GP
02/12/2021	R01D	Matthew Bechara	Greg Pearce	GP
24/06/2022	R01G	Matthew Bechara	Greg Pearce	GP

Disclaimer

TABLE OF CONTENTS

TABLE INDEX

FIGURE INDEX

1. Introduction

This report is in response to a request by New Golden St Leonards Pty Ltd for an environmental and road traffic noise assessment for a proposed residential development to be located at 3 Holdsworth Avenue, St Leonards. The noise assessment was conducted in accordance with Lane Cove Council planning policies, the NSW *Development Near Rail Corridors and Busy Roads – Interim Guideline* and the NSW *Noise Policy for Industry* 2017. To facilitate the assessment, unattended noise monitoring was conducted to determine road traffic impacts to the proposed development and compliance of onsite activities to sensitive receivers. Based on the outcomes of the assessment, recommendations for acoustic treatments are specified.

2. Site Description

2.1 Site location

The site is described by the following:

3 Holdsworth Avenue
Lot 8 on DP1275969

Refer to Figure 1 for site location.

Figure 1: Site location (not to scale)

A comprehensive site survey was conducted on the 26th October 2021 and identified the following:

a) The site is currently occupied by single and two storey residential dwellings which will be demolished to make way for the proposed development.
b) The site is located in a R4 High Density Residential zone as defined in the Lane Cove Local Environmental Plan 2009.
c) The surrounding area consists of residential and commercial land uses.
d) The Pacific Highway is located approximately 100m to the north of the site.

2.2 Proposal

The proposal is to construct a residential apartment building comprised of the following:

- Lower Ground Floor to Level 12 – One, two, three and four bedroom units.
- Communal open space on level 11 and public open space on Level 1.
- 110 car parking spaces across 4 basement levels with site access via Holdsworth Avenue.

Refer to the Appendices for development plans.

2.3 Acoustic environment

The surrounding area is primarily affected by road traffic noise from the surrounding road network.

3. Equipment

The following equipment was used to record noise levels:

- 2 x Rion NL42 Environmental Noise Monitors (SN# 00345935 & 00509261)
- Pulsar Model 105 Ltd Sound Calibrator (SN # 57417)

The Environmental Noise Monitors hold current NATA Laboratory Certification and were field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Noise Monitoring Location

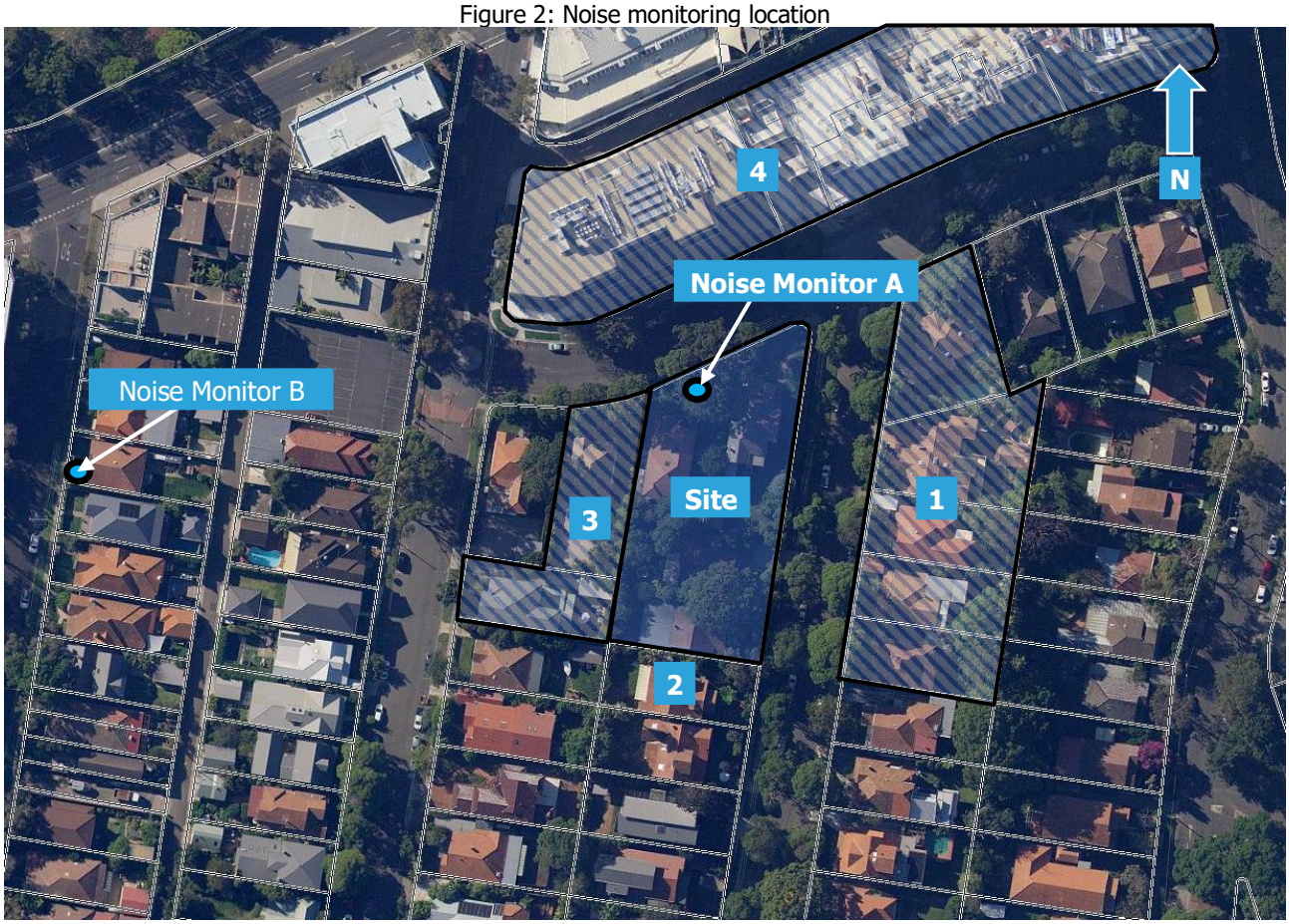
4.1 Receiver locations

The nearest representative residential receiver locations were identified as follows;

1. Single storey residential dwellings are located to the east at 8 Marshall Avenue and 2-8 Holdsworth Avenue.
2. A single storey residential dwelling is located adjacent the southern site boundary at 5 Holdsworth Avenue.
3. Single and two storey residential dwellings are located adjacent the western site boundary at 14 Marshall Avenue and 2 Berry Road.
4. Multi-storey residential apartment buildings are located to the north at 1 to 25 Marshall Avenue.

Refer to Figure 2 for these locations.

Figure 2: Noise monitoring location



4.1.1 Ambient Noise Monitoring (Monitor A)

A Rion NL42 environmental noise monitor was placed onsite at 12 Marshall Avenue to measure ambient noise levels. The monitor was located in a free field position with the microphone approximately 1.4 metres above ground surface level. The noise monitor was set to record noise levels between 26th October and 4th November 2021.

The environmental noise monitor was set to record noise levels in "A" Weighting, Fast response using 15-minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS1055:2018 *Acoustics – Description and measurement of environmental noise*. Refer to Figure 2 for noise monitoring location.

4.1.2 Road Traffic Noise Monitoring (Monitor B)

A Rion NL42 environmental noise monitor was placed at 8 Park Road, approximately 60m from the nearest lane of the Pacific Highway to measure road traffic noise levels. The monitor was located in a free field position with the microphone approximately 1.4 metres above ground surface level. The noise monitor was set to record noise levels between the 27th October and 4th November 2021.

The environmental noise monitor was set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS1055:2018 *Acoustics – Description and measurement of environmental noise*. Refer to Figure 2 for noise monitoring location.

5. Existing Ambient Noise Levels

The following tables present the measured ambient noise levels from the unattended noise survey and meteorological conditions. Any periods of inclement weather or extraneous noise are omitted from the measured data prior to determining the overall results.

5.1 Meteorological conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological conditions – Sydney NSW

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Tuesday	26/10/2021	0	9	WNW	22	ESE
Wednesday	27/10/2021	0	4	E	22	ENE
Thursday	28/10/2021	0	15	W	17	E
Friday	29/10/2021	0	9	NNW	50	W
Saturday	30/10/2021	0	17	SSE	24	SE
Sunday	31/10/2021	0	13	WNW	20	E
Monday	01/11/2021	0	4	W	17	NE
Tuesday	02/11/2021	0	11	E	30	ENE
Wednesday	03/11/2021	0	20	NNE	26	NE

5.2 Background noise level

The measured rating background noise levels (RBL), in accordance with the NSW Noise Policy for Industry, are as follows;

Table 2: Measured RBL noise levels

Day	Date	Background L90 dBA		
		Day	Evening	Night
Tuesday	26/10/2021	x	40.3	32.1
Wednesday	27/10/2021	48.5	42.6	34.6
Thursday	28/10/2021	48.4	42.7	36.4
Friday	29/10/2021	*50.4	42.1	34.9
Saturday	30/10/2021	45.5	41.3	33.9
Sunday	31/10/2021	42.5	39.8	32.9
Monday	01/11/2021	48.4	41.3	34.0
Tuesday	02/11/2021	48.4	41.9	34.3
Wednesday	03/11/2021	48.5	45.3	33.7
RBL		48	42	34

*Note high wind speeds recorded on Friday 29th October were found to have affected the measured noise levels, therefore the data for these time periods was omitted.

5.3 Road traffic noise levels

The measured road traffic noise levels at the monitoring location are as follows;

Table 3: Measured road traffic noise levels

Day	Date	LA10(18h)	LAeq(15h)	LAeq(9h)
		6am-12am	7am-10pm	10pm-7am
Thursday	28/10/2021	55.8	54.4	48.7
Friday	29/10/2021	54.8	53.7	48.8
Saturday	30/10/2021	54.0	53.0	46.9
Sunday	31/10/2021	55.4	55.9	55.6
Monday	01/11/2021	54.3	53.9	47.4
Tuesday	02/11/2021	54.6	53.5	52.0
Wednesday	03/11/2021	54.9	54.3	51.3
Overall		54.9	54.0	49.7

Weekends were omitted from the data as they were not considered relevant to the assessment.

Refer to the appendix for graphical representation of the measured noise levels.

6. Noise Criteria

To determine the appropriate noise criteria to be applied, a review of the Lane Cove Council planning policies, and NSW Development Near Rail Corridors and Busy Roads – Interim Guideline was conducted.

6.1 Lane Cove Council

Section B.7 of the Lane Cove Development Control Plan 2009 states the following:

> *"Acoustic assessments for noise sensitive developments as defined in clauses 87 and 102 of the Infrastructure SEPP may be required if located in the vicinity of a rail corridor or busy roads."*

Therefore, further reference is made to the State Environmental Planning Policy (Infrastructure) 2007.

6.2 Road Traffic Noise Criteria

On the condition compliance is achieved with State Environmental Planning Policy (Infrastructure) 2007 and the Development Near Rail Corridors and Busy Roads criteria, the development is predicted to comply with Lane Cove Council criteria.

6.2.1 SEPP

The NSW Department of Planning document "*State Environmental Planning Policy (Infrastructure) 2007*" (SEPP) May 2019 includes noise criteria specific to rail and road traffic. The relevant criteria are contained in Clause 87 and 102 Part (3) of the policy as follows;

Table 4: SEPP Clause 87 & 102

Location	Noise Level LAeq dBA
Any bedroom in the residential building (from 10pm to 7am)	≤35
Anywhere else in the residential building (other than a garage, kitchen, bathroom or hallway)	≤40

It should be noted that for any criteria based on Leq descriptor, a time duration for the Leq must be specified otherwise a variety of outcomes could be possible. The policy does not state the duration for the LAeq assessment, therefore guidance for the appropriate Leq duration is sought from other road traffic noise documents.

6.2.2 Development Near Rail and Corridors and Busy Roads – Interim Guideline

The NSW Department of Planning's Development Near Rail Corridors and Busy Roads –Interim Guideline 2008 specifies internal noise criterion for residential buildings as follows:

Table 5: Road Traffic Noise Criteria

Location	Noise Level dBA	Applicable time period
Living Areas	≤40 (L_{eq}9h) & (L_{eq}15h)	At any time
Sleeping Areas	≤35 (L_{eq}9h)	Night (10 pm to 7 am)

It is noted that Interim Guideline uses Leq 9-hour and 15-hour assessment for night and day respectively.

6.3 Noise Policy for Industry

Assessment of noise in accordance with NSW EPA Noise Policy for Industry (2017) has two main components: intrusiveness and amenity criteria. These are compared to each other (after conversion of amenity noise level to LAeq,15min equivalent level) to determine the overall project noise trigger level.

6.3.1 Intrusiveness noise level

The intrusiveness noise level is based on the $L_{Aeq\ (15\ min)}$ associated with commercial activity being less than or equal to the measured L_{A90} Rating Background Level + 5dB as per section 2.3 of the policy. A modifying factor should also be added where appropriate to allow for tonality, impulsiveness, and intermittency or low frequency effects.

6.3.2 Amenity noise level

The amenity noise level is determined in accordance with Section 2.4 of the policy based on the land use and relevant noise criteria specified in Tables 2.2 and 2.3.

The Noise Policy for Industry sets out acceptable noise levels for various locations. Determination of which residential receiver category applies is described in Table 2.3 of the policy.

Table 7: Receiver category (Table 2.3 of the Noise Policy for Industry)

Receiver category	**Typical planning zoning – standard instrument**	**Typical existing background noise levels**	**Description**
Rural residential	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime RBL <40 dB(A) Evening RBL <35 dB(A) Night RBL <30 dB(A)	**Rural** – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented in column 3 due to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.

Receiver category	Typical planning zoning – standard instrument	Typical existing background noise levels	Description
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL<45 dB(A) Evening RBL<40 dB(A) Night RBL <35dB(A)	**Suburban** – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime RBL> 45 dB(A) Evening RBL> 40 dB(A) Night RBL >35 dB(A)	**Urban** – an area with an acoustical environment that: • is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources • has through-traffic with characteristically heavy and continuous traffic flows during peak periods • is near commercial districts or industrial districts • has any combination of the above.

To determine the appropriate receiver category, the following observations were made:

- Receivers 1 - 3 are zoned R4 – High Density Residential and receiver 4 is zoned B4 – Mixed Use which corresponds with typical planning zoning of the urban category.
- The measured RBL values presented in Section 5.3 correspond with the typical existing background noise levels of the urban category.
- The acoustical environment of the surrounding area has through traffic with characteristically heavy and continuous traffic flows during peak periods and is dominated by 'urban hum', which corresponds with the description of the urban category.

Therefore, all receivers will be assessed against the urban criteria.

6.3.3 Modifying factors

The Noise Policy for Industry includes correction factors such as tonal noise, low-frequency noise, intermittent noise and duration. Where two or more modifying factors are present, the maximum adjustment to a noise source level is 10dBA (excluding duration correction).

6.4 Project noise trigger level

To determine the project trigger noise level, the amenity noise level must first be standardised to an equivalent LAeq 15min in order to compare to the intrusiveness noise level. This is done in accordance with Sections 2.2 and 2.4 of the policy as follows;

$$L_{Aeq,15min} = L_{Aeq,\ period} + 3dB$$

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise. Project amenity noise level for industrial developments = recommended amenity noise level minus 5dB(A).

Therefore, based on the measured data presented in Section 5, the project specific noise limits are determined.

6.4.1 Sleep disturbance noise level

Sleep disturbance is based on the maximum noise level of events from premises during the night-time period. The Noise Policy for Industry defines sleep disturbance as a noise from a premise at a residential location that exceeds:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

6.4.2 Sleep disturbance

The sleep disturbance noise levels are as follows;

Table 6: Sleep disturbance criteria

Time period	Criteria $L_{eq(15min)}$ dBA	Criteria L_{AFmax} dBA
Night	40	52

6.4.3 Intrusive noise impacts

Based on the measured data, the intrusive noise limits are as follows;

Table 7: Intrusiveness noise criteria

Time period	Criteria $L_{eq\ (15min)}$ dB(A)
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	53
Evening (6pm-10pm)	47
Night (10pm-7am Mon-Sat; 10pm-8am Sun)	39

6.4.4 Amenity criteria

Based on the measured data, the amenity noise limits are as follows;

Table 8: Amenity criteria

Time period	Criteria $L_{eq(period)}$ dB(A)
Day	58
Evening	48
Night	43

6.4.5 Project specific noise criteria

The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Therefore, the project noise trigger levels are as follows:

Table 9: Project specific noise criteria

Time period	Criteria $L_{eq\ (15min)}$ dB(A)
Day	53
Evening	47
Night	39

7. Road Traffic Assessment

7.1 Traffic volumes

Traffic volumes for Pacific Highway were obtained from Roads and Maritime Services (Traffic Volume Viewer http://www.rms.nsw.gov.au). The 2008 AADT was used for predictions as this was considered to be representative of typical traffic volumes for the area.

Table 10: Traffic Volumes

Location	2008 AADT	Percentage of Heavy Vehicles
Pacific Highway	32,248	7%

7.2 Road Traffic Noise Verification

To ensure the CoRTN noise model is accurate, a verification model of the predicted $L_{A10(18hr)}$ was created and compared to the measured noise level. The CoRTN method allows a 2dBA variation from the predicted and measured level, if the variation exceeds 2dBA a correction to the predicted level is required.

Table 11: Comparison of Measured and Predicted Noise Levels

Location	Measured $L_{A10(18hr)}$ dBA	Predicted $L_{A10(18hr)}$ dBA	Correction
8 Park Road, St Leonards	54.9	55.6	0

7.3 Predicted road traffic noise levels - 2031

Road traffic noise modelling for the proposed development was based on the following information:

- Proposed layout, floor plans, unit numbering and elevations provided by PTW Architects, Project no PA030370, drawings DA-00-0000 to DA-00-0003, DA-09-0010, DA-09-0030, DA-09-0040, DA-10-001, DA-10-002 to DA-10-0009, DA-10-0012 to DA-10-0014, DA-20-0001 to DA-20-004, DA-30-0001 to DA-30-0003, revision A, B, C and D , dated 8/06/2022.
- Pacific Highway speed limit of 60km/h.
- Receiver heights 1.5m above finished floor level.

Table 12 presents the free field external predicted road traffic noise levels for the development.

Table 12: Predicted road traffic noise impacts

Unit	Level	Room	LAeq(15hr)	LAeq(9hr)
G01	GF	Living/Kitchen/Dining	38.1	-
G01	GF	Bed 1	39.4	35.4
G01	GF	Bed 2	38.1	34.1
G02	GF	Living/Kitchen/Dining	38.1	-
G02	GF	Bed 1	38.1	34.1
G02	GF	Bed 2	38.1	34.1
G03	GF	Living/Kitchen/Dining	38.1	-
G03	GF	Bed 1	38.1	34.1
G03	GF	Bed 2	38.1	34.1
UG01	UG	Living/Kitchen/Dining	39.1	-
UG01	UG	Bed 1	39.1	35.1
UG01	UG	Bed 2	39.1	35.1
UG02	UG	Living/Kitchen/Dining	39.1	-
UG02	UG	Bed 1	39.1	35.1
UG02	UG	Bed 2	39.1	35.1
UG03	UG	Living/Kitchen/Dining	39.1	-
UG03	UG	Bed 1	39.1	35.1
UG03	UG	Bed 2	39.1	35.1
101	Level 1	Living/Kitchen/Dining	39.4	-
101	Level 1	Bed 1	39.4	35.4
101	Level 1	Bed 2	39.4	35.4
101	Level 1	Study	39.4	-
102	Level 1	Living/Kitchen/Dining	39.4	-
102	Level 1	Bed 1	39.4	35.4
102	Level 1	Bed 2	39.4	35.4
102	Level 1	Bed 3	39.4	35.4
102	Level 1	Study	39.4	-
103	Level 1	Living/Kitchen/Dining	31.4	-
103	Level 1	Bed 1	39.4	35.4
103	Level 1	Bed 2	39.4	35.4
103	Level 1	Study	39.4	35.4
104	Level 1	Living/Kitchen/Dining	39.4	-
104	Level 1	Bed 1	39.4	35.4
104	Level 1	Bed 2	39.4	35.4
105	Level 1	Living/Kitchen/Dining	39.4	-
105	Level 1	Bed 1	39.4	35.4
105	Level 1	Bed 2	39.4	35.4
106	Level 1	Living/Kitchen/Dining	39.4	-
106	Level 1	Bed 1	39.4	35.4
106	Level 1	Bed 2	42.4	38.4
106	Level 1	Study	39.4	-
107	Level 1	Living/Kitchen/Dining	42.4	-
107	Level 1	Bed 1	42.4	38.4
108	Level 1	Living/Kitchen/Dining	42.4	-
108	Level 1	Bed 1	42.4	38.4
108	Level 1	Bed 2	39.4	
109	Level 1	Living/Kitchen/Dining	39.4	-
109	Level 1	Bed 1	39.4	35.4
109	Level 1	Bed 2	39.4	35.4
201	Level 2	Living/Kitchen/Dining	39.8	-
201	Level 2	Bed 1	39.8	35.8
201	Level 2	Bed 2	39.8	35.8
201	Level 2	Study	39.8	-
202	Level 2	Living/Kitchen/Dining	39.8	-
202	Level 2	Bed 1	39.8	35.8
203	Level 2	Living/Kitchen/Dining	39.8	-
203	Level 2	Bed 1	39.8	35.8
204	Level 2	Living/Kitchen/Dining	39.8	-
204	Level 2	Bed 1	39.8	35.8

Unit	Level	Room	LAeq(15hr)	LAeq(9hr)
204	Level 2	Study	31.8	-
205	Level 2	Living/Kitchen/Dining	39.8	-
205	Level 2	Bed 1	39.8	35.8
206	Level 2	Living/Kitchen/Dining	39.8	-
206	Level 2	Bed 1	39.8	35.8
206	Level 2	Bed 2	39.8	35.8
207	Level 2	Living/Kitchen/Dining	39.8	-
207	Level 2	Bed 1	39.8	35.8
207	Level 2	Bed 2	39.8	35.8
208	Level 2	Living/Kitchen/Dining	40.8	-
208	Level 2	Bed 1	40.8	36.8
209	Level 2	Living/Kitchen/Dining	40.8	-
209	Level 2	Bed 1	40.8	36.8
210	Level 2	Living/Kitchen/Dining	40.8	-
210	Level 2	Bed 1	40.8	36.8
210	Level 2	Bed 2	39.8	35.8
211	Level 2	Living/Kitchen/Dining	39.8	-
211	Level 2	Bed 1	39.8	35.8
211	Level 2	Bed 2	39.8	35.8
301	Level 3	Living/Kitchen/Dining	40	-
301	Level 3	Bed 1	40	36
301	Level 3	Bed 2	40	36
301	Level 3	Study	40	-
302	Level 3	Living/Kitchen/Dining	40	-
302	Level 3	Bed 1	40	36
303	Level 3	Living/Kitchen/Dining	40	-
303	Level 3	Bed 1	40	36
304	Level 3	Living/Kitchen/Dining	40	-
304	Level 3	Bed 1	40	36
304	Level 3	Study	32	-
305	Level 3	Living/Kitchen/Dining	40	-
305	Level 3	Bed 1	40	36
306	Level 3	Living/Kitchen/Dining	40	-
306	Level 3	Bed 1	40	36
306	Level 3	Bed 2	40	36
307	Level 3	Living/Kitchen/Dining	40	-
307	Level 3	Bed 1	40	36
307	Level 3	Bed 2	40	36
308	Level 3	Living/Kitchen/Dining	41	-
308	Level 3	Bed 1	41	
309	Level 3	Living/Kitchen/Dining	41	-
309	Level 3	Bed 1	41	37
310	Level 3	Living/Kitchen/Dining	41	-
310	Level 3	Bed 1	41	37
310	Level 3	Bed 2	40	36
311	Level 3	Living/Kitchen/Dining	40	-
311	Level 3	Bed 1	40	36
311	Level 3	Bed 2	40	36
401	Level 4	Living/Kitchen/Dining	40.2	-
401	Level 4	Bed 1	40.2	36.2
401	Level 4	Study	40.2	-
402	Level 4	Living/Kitchen/Dining	40.2	-
402	Level 4	Bed 1	40.2	36.2
402	Level 4	Bed 2	40.2	36.2
402	Level 4	Study	32.2	-
403	Level 4	Living/Kitchen/Dining	40.2	-
403	Level 4	Bed 1	40.2	36.2
403	Level 4	Study	40.2	-
404	Level 4	Living/Kitchen/Dining	40.2	-
404	Level 4	Bed 1	40.2	36.2
404	Level 4	Bed 2	40.2	36.2

Unit	Level	Room	LAeq(15hr)	LAeq(9hr)
405	Level 4	Living/Kitchen/Dining	40.2	-
405	Level 4	Bed 1	40.2	36.2
405	Level 4	Bed 2	40.2	36.2
405	Level 4	Study	40.2	-
406	Level 4	Living/Kitchen/Dining	40.2	-
406	Level 4	Bed 1	41	37.2
406	Level 4	Bed 2	41	37.2
406	Level 4	Bed 3	41	37.2
407	Level 4	Living/Kitchen/Dining	41	-
407	Level 4	Bed 1	40.2	36.2
407	Level 4	Bed 2	40.2	36.2
407	Level 4	Study	40.2	-
501	Level 5	Living/Kitchen/Dining	40.2	-
501	Level 5	Bed 1	40.2	36.2
501	Level 5	Study	40.2	-
502	Level 5	Living/Kitchen/Dining	40.2	-
502	Level 5	Bed 1	40.2	36.2
502	Level 5	Study	40.2	-
503	Level 5	Living/Kitchen/Dining	40.2	-
503	Level 5	Bed 1	40.2	36.2
503	Level 5	Bed 2	33.2	29.6
503	Level 5	Bed 3	33.2	29.6
504	Level 5	Living/Kitchen/Dining	40.2	-
504	Level 5	Bed 1	40.2	36.2
504	Level 5	Bed 2	40.2	36.2
505	Level 5	Living/Kitchen/Dining	40.2	-
505	Level 5	Bed 1	40.2	36.2
505	Level 5	Bed 2	40.2	36.2
506	Level 5	Living/Kitchen/Dining	41.2	-
506	Level 5	Bed 1	41.2	37.2
506	Level 5	Bed 2	41.2	37.2
507	Level 5	Living/Kitchen/Dining	41.2	-
507	Level 5	Bed 1	41.2	37.1
507	Level 5	Bed 2	40.2	36.2
508	Level 5	Living/Kitchen/Dining	40.2	-
508	Level 5	Bed 1	40.2	36.2
601	Level 5	Living/Kitchen/Dining	41.7	-
601	Level 5	Bed 1	41.7	37.7
601	Level 5	Study	41.7	37.7
602	Level 5	Living/Kitchen/Dining	41.7	-
602	Level 5	Bed 1	41.7	37.7
602	Level 5	Study	41.7	-
603	Level 5	Living/Kitchen/Dining	41.7	-
603	Level 5	Bed 1	41.7	37.7
603	Level 5	Bed 2	33.7	29.7
603	Level 5	Bed 3	33.7	29.7
604	Level 5	Living/Kitchen/Dining	41.7	-
604	Level 5	Bed 1	41.7	37.7
604	Level 5	Bed 2	41.7	37.7
605	Level 5	Living/Kitchen/Dining	41.7	-
605	Level 5	Bed 1	41.7	37.7
605	Level 5	Bed 2	41.7	37.7
606	Level 5	Living/Kitchen/Dining	41.7	-
606	Level 5	Bed 1	43.7	39.7
606	Level 5	Bed 2	43.7	39.7
607	Level 5	Living/Kitchen/Dining	43.7	-
607	Level 5	Bed 1	43.7	39.7
607	Level 5	Bed 2	41.7	37.7
608	Level 5	Living/Kitchen/Dining	41.7	-
608	Level 5	Bed 1	41.7	37.7
701	Level 7	Living/Kitchen/Dining	42	-

Unit	Level	Room	LAeq(15hr)	LAeq(9hr)
701	Level 7	Bed 1	42	38
701	Level 7	Bed 2	42	38
701	Level 7	Bed 3	42	38
701	Level 7	Bed 4	42	38
702	Level 7	Living/Kitchen/Dining	42	-
702	Level 7	Bed 1	42	38
702	Level 7	Bed 2	34	30
702	Level 7	Bed 3	34	30
703	Level 7	Living/Kitchen/Dining	42	-
703	Level 7	Bed 1	42	38
703	Level 7	Bed 2	42	38
704	Level 7	Living/Kitchen/Dining	42	-
704	Level 7	Bed 1	42	38
704	Level 7	Bed 2	42	38
705	Level 7	Living/Kitchen/Dining	42	-
705	Level 7	Bed 1	44	40
706	Level 7	Living/Kitchen/Dining	44	-
706	Level 7	Bed 1	44	40
707	Level 7	Living/Kitchen/Dining	44	-
707	Level 7	Bed 1	42	38
707	Level 7	Bed 2	42	38
707	Level 7	Bed 3	42	38
801	Level 8	Living/Kitchen/Dining	42.3	-
801	Level 8	Bed 1	42.3	38.3
801	Level 8	Bed 2	42.3	38.3
801	Level 8	Bed 3	42.3	38.3
801	Level 8	Bed 4	42.3	38.3
802	Level 8	Living/Kitchen/Dining	42.3	-
802	Level 8	Bed 1	42.3	38.3
802	Level 8	Bed 2	35.3	31.3
802	Level 8	Bed 3	35.3	31.3
803	Level 8	Living/Kitchen/Dining	42.3	-
803	Level 8	Bed 1	42.3	38.3
803	Level 8	Bed 2	42.3	38.3
804	Level 8	Living/Kitchen/Dining	42.3	-
804	Level 8	Bed 1	42.3	38.3
804	Level 8	Bed 2	42.3	38.3
805	Level 8	Living/Kitchen/Dining	42.3	-
805	Level 8	Bed 1	44.3	40.3
806	Level 8	Living/Kitchen/Dining	44.3	-
806	Level 8	Bed 1	44.3	40.3
807	Level 8	Living/Kitchen/Dining	44.3	-
807	Level 8	Bed 1	42.3	38.3
807	Level 8	Bed 2	42.3	38.3
807	Level 8	Bed 3	42.3	38.3
901	Level 9	Living/Kitchen/Dining	42.3	-
901	Level 9	Bed 1	42.3	38.3
901	Level 9	Bed 2	42.3	38.3
901	Level 9	Bed 3	42.3	38.3
901	Level 9	Bed 4	42.3	38.3
902	Level 9	Living/Kitchen/Dining	42.3	-
902	Level 9	Bed 1	42.3	38.3
902	Level 9	Bed 2	35.3	31.3
902	Level 9	Bed 3	35.3	31.3
903	Level 9	Living/Kitchen/Dining	42.3	-
903	Level 9	Bed 1	42.3	38.3
903	Level 9	Bed 2	42.3	38.3
904	Level 9	Living/Kitchen/Dining	42.3	-
904	Level 9	Bed 1	42.3	38.3
904	Level 9	Bed 2	42.3	38.3
905	Level 9	Living/Kitchen/Dining	42.3	-

Unit	Level	Room	LAeq(15hr)	LAeq(9hr)
905	Level 9	Bed 1	44.3	38.3
906	Level 9	Living/Kitchen/Dining	44.3	-
906	Level 9	Bed 1	44.3	38.3
907	Level 9	Living/Kitchen/Dining	44.3	-
907	Level 9	Bed 1	42.3	38.3
907	Level 9	Bed 2	42.3	38.3
907	Level 9	Bed 3	42.3	38.3
1001	Level10	Living/Kitchen/Dining	42.7	-
1001	Level10	Bed 1	42.7	38.7
1001	Level10	Bed 2	42.7	38.7
1001	Level10	Bed 3	42.7	38.7
1001	Level10	Bed 4	42.7	38.7
1002	Level10	Living/Kitchen/Dining	42.7	-
1002	Level10	Bed 1	35.7	31.7
1002	Level10	Bed 2	35.7	31.7
1002	Level10	Bed 3	42.7	38.7
1003	Level10	Living/Kitchen/Dining	42.7	-
1003	Level10	Bed 1	42.7	38.7
1003	Level10	Bed 2	42.7	38.7
1004	Level10	Living/Kitchen/Dining	42.7	-
1004	Level10	Bed 1	42.7	38.7
1004	Level10	Bed 2	42.7	38.7
1005	Level10	Living/Kitchen/Dining	44.7	-
1005	Level10	Bed 1	44.7	40.7
1006	Level10	Living/Kitchen/Dining	44.7	-
1006	Level10	Bed 1	44.7	40.7
1007	Level10	Living/Kitchen/Dining	42.7	-
1007	Level 10	Bed 1	42.7	38.7
1007	Level 10	Bed 2	42.7	38.7
1007	Level 10	Bed 3	42.7	38.7
1201-L	Level 11	Bed 1	44.2	40.2
1201-L	Level 11	Study	44.2	40.2
1202-L	Level 11	Bed 1	44.2	40.2
1202-L	Level 11	Bed 2	44.2	40.2
1202-L	Level 11	Bed 3	44.2	40.2
1101	Level 11	Living/Kitchen/Dining	44.2	-
1101	Level 11	Bed 1	44.2	40.2
1101	Level 11	Bed 2	44.2	40.2
1102	Level 11	Living/Kitchen/Dining	45.2	-
1102	Level 11	Bed 1	45.2	41.2
1102	Level 11	Bed 2	45.2	41.2
1102	Level 11	Bed 3	45.2	41.2
1103	Level 11	Living/Kitchen/Dining	45.2	-
1103	Level 11	Bed 1	44.2	40.2
1103	Level 11	Bed 2	44.2	40.2
1103	Level 11	Bed 3	44.2	40.2
1201-U	Level 12	Living/Kitchen/Dining	44.8	-
1202-U	Level 12	Living/Kitchen/Dining	44.8	-
1203	Level 12	Living/Kitchen/Dining	44.8	-
1203	Level 12	Bed 1	44.8	40.8
1203	Level 12	Bed 2	44.8	40.8
1204	Level 12	Living/Kitchen/Dining	45.9	-
1204	Level 12	Bed 1	45.9	41.9
1204	Level 12	Bed 2	45.9	41.9
1204	Level 12	Bed 3	45.9	41.9
1205	Level 12	Living/Kitchen/Dining	45.9	-
1205	Level 12	Bed 1	44.8	40.8
1205	Level 12	Bed 2	44.8	40.8
1205	Level 12	Bed 3	44.8	40.8

Refer to Section 9 for recommendations.

8. Environmental Assessment

8.1 Onsite activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume nominated activities are located at a representative distance within the development site to each receiver location. Any relevant shielding or building transmission loss is taken into account for these activities.

8.2 Project specific criteria

The noise source levels at the receiver locations are shown in Table 13. LAeq results are not shown where the calculated total is less than 0dBA.

Table 13: Project specific noise levels

Receiver	Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T ext. dB(A) Night	LAeq 15 min Compliance Day	Eve	Night
	Receivers: 1. 8 Marshall Avenue & 2-8 Holdsworth Avenue (E); 2. 5 Holdsworth Avenue (S); 3. 14 Marshall Avenue & 2 Berry Road (W); 4. 1 to 25 Marshall Avenue (N)									
	Criteria							53	47	39
1	Car passby	69		69	32	31	29	Yes	Yes	Yes
	Car start	74	2	76	26	25	23	Yes	Yes	Yes
	Car door closure	75	2	77	27	26	24	Yes	Yes	Yes
	Communal Area (ground)	70		70	12	12		Yes	Yes	n/a
	Communal Area (L11)	70		70	20	20		Yes	Yes	n/a
	Total				34	33	31	**Yes**	**Yes**	**Yes**
	Criteria							53	47	39
2	Car passby	69		69	25	24	22	Yes	Yes	Yes
	Car start	74	2	76	23	22	20	Yes	Yes	Yes
	Car door closure	75	2	77	24	23	21	Yes	Yes	Yes
	Communal Area (ground)	70		70	40	40		Yes	Yes	n/a
	Communal Area (L11)	70		70	26	26		Yes	Yes	n/a
	Total				40	40	26	**Yes**	**Yes**	**Yes**
	Criteria							53	47	39
3	Car passby	69		69	24	23	21	Yes	Yes	Yes
	Car start	74	2	76	22	21	19	Yes	Yes	Yes
	Car door closure	75	2	77	23	22	20	Yes	Yes	Yes
	Communal Area (ground)	70		70	46	46		Yes	Yes	n/a
	Communal Area (L11)	70		70	20	20		Yes	Yes	n/a
	Total				47	47	25	**Yes**	**Yes**	**Yes**
	Criteria							53	47	39
4	Car passby	69		69	14	13	11	Yes	Yes	Yes
	Car start	74	2	76	12	11	9	Yes	Yes	Yes
	Car door closure	75	2	77	13	12	10	Yes	Yes	Yes
	Communal Area (ground)	70		70	35	35		Yes	Yes	n/a
	Communal Area (L11)	70		70	25	25		Yes	Yes	n/a
	Total				35	35	16	**Yes**	**Yes**	**Yes**

Compliance is predicted for onsite activities on the condition the recommendations presented in Section 9 are implemented.

8.3 Noise impacts – Sleep disturbance

The noise source levels and predicted levels of noise at the receiver locations are shown in Table 14.

Table 14: Predicted noise impacts – sleep disturbance

	Receivers					
Receiver	1. 8 Marshall Avenue & 2-8 Holdsworth Avenue (E) 2. 5 Holdsworth Avenue (S) 3. 14 Marshall Avenue & 2 Berry Road (W) 4. 1 to 25 Marshall Avenue (N) Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	$L_{Amax\ adj,T}$ ext.. dB(A)	Complies Lmax dB(A)
	Criteria					52
	Car passby	72		72	43	Yes
1	Car start	78	2	80	46	Yes
	Car door closure	79	2	81	47	Yes
	Criteria					52
	Car passby	78		78	41	Yes
2	Car start	74		74	37	Yes
	Car door closure	78		78	41	Yes
	Criteria					52
	Car passby	78		78	40	Yes
3	Car start	74		74	36	Yes
	Car door closure	72		72	34	Yes
	Criteria					52
	Car passby	78		78	30	Yes
4	Car start	74		74	26	Yes
	Car door closure	78		78	30	Yes

Compliance is predicted for onsite activities on the condition the recommendations presented in Section 9 are implemented.

9. Recommendations

Building treatments for road traffic noise were calculated using Australian Standard *AS3671:1989 'Road Traffic Noise Intrusion – Building Siting and Construction'* and *'Development Near Rail Corridors and Busy Road Interim Guideline 2008'*.

9.1 Road Traffic Noise

9.1.1 Glazing

The minimum glazing treatments presented in Table 15 are required to comply with the following:

- The minimum glass thickness specified shall not be reduced regardless of the R_w performance of the glazing system.
- If compliance cannot be achieved with the minimum R_w ratings, the glazing system shall be upgraded until compliance is achieved.
- Glazing specified with acoustic seals requires a Q-lon seal or an equivalent product, mohair seals are not acceptable.
- The glazier shall provide NATA test reports on request to verify compliance with the minimum R_w ratings. Generic reports are not acceptable.

Table 15: Required façade acoustic ratings

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
G01	GF	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
G01	GF	Bed 1	35		27	4mm float (toughened for sliding)	yes
G01	GF	Bed 2	35		27	4mm float (toughened for sliding)	yes
G02	GF	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
G02	GF	Bed 1	35		27	4mm float (toughened for sliding)	yes
G02	GF	Bed 2	35		27	4mm float (toughened for sliding)	yes
G03	GF	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
G03	GF	Bed 1	35		27	4mm float (toughened for sliding)	yes
G03	GF	Bed 2	35		27	4mm float (toughened for sliding)	yes
UG01	UG	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
UG01	UG	Bed 1	35		27	4mm float (toughened for sliding)	yes
UG01	UG	Bed 2	35		27	4mm float (toughened for sliding)	yes
UG02	UG	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
UG02	UG	Bed 1	35		27	4mm float (toughened for sliding)	yes
UG02	UG	Bed 2	35		27	4mm float (toughened for sliding)	yes
UG03	UG	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
UG03	UG	Bed 1	35		27	4mm float (toughened for sliding)	yes
UG03	UG	Bed 2	35		27	4mm float (toughened for sliding)	yes
101	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
101	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
101	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
101	Level 1	Study	35		27	4mm float (toughened for sliding)	yes
102	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
102	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
102	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
102	Level 1	Bed 3	35		27	4mm float (toughened for sliding)	yes
102	Level 1	Study	35		27	4mm float (toughened for sliding)	yes
103	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
103	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
103	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
103	Level 1	Study	35		27	4mm float (toughened for sliding)	yes
104	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
104	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
104	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
105	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
105	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
105	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
106	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
106	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
106	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
106	Level 1	Study	35		27	4mm float (toughened for sliding)	yes
107	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
107	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
108	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
108	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
108	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
109	Level 1	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
109	Level 1	Bed 1	35		27	4mm float (toughened for sliding)	yes
109	Level 1	Bed 2	35		27	4mm float (toughened for sliding)	yes
201	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
201	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
201	Level 2	Bed 2	35		27	4mm float (toughened for sliding)	yes
201	Level 2	Study	35		27	4mm float (toughened for sliding)	yes
202	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
202	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
203	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
203	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
204	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
204	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
204	Level 2	Study	35		27	4mm float (toughened for sliding)	yes
205	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
205	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
206	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
206	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
206	Level 2	Bed 2	35		27	4mm float (toughened for sliding)	yes
207	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
207	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
207	Level 2	Bed 2	35		27	4mm float (toughened for sliding)	yes
208	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
208	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
209	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
209	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
210	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
210	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
210	Level 2	Bed 2	35		27	4mm float (toughened for sliding)	yes
211	Level 2	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
211	Level 2	Bed 1	35		27	4mm float (toughened for sliding)	yes
211	Level 2	Bed 2	35		27	4mm float (toughened for sliding)	yes
301	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
301	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
301	Level 3	Bed 2	35		27	4mm float (toughened for sliding)	yes
301	Level 3	Study	35		27	4mm float (toughened for sliding)	yes

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
302	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
302	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
303	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
303	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
304	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
304	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
304	Level 3	Study	35		27	4mm float (toughened for sliding)	yes
305	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
305	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
306	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
306	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
306	Level 3	Bed 2	35		27	4mm float (toughened for sliding)	yes
307	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
307	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
307	Level 3	Bed 2	35		27	4mm float (toughened for sliding)	yes
308	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
308	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
309	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
309	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
310	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
310	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
310	Level 3	Bed 2	35		27	4mm float (toughened for sliding)	yes
311	Level 3	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
311	Level 3	Bed 1	35		27	4mm float (toughened for sliding)	yes
311	Level 3	Bed 2	35		27	4mm float (toughened for sliding)	yes
401	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
401	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
401	Level 4	Study	35		27	4mm float (toughened for sliding)	yes
402	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
402	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
402	Level 4	Bed 2	35		27	4mm float (toughened for sliding)	yes
402	Level 4	Study	35		27	4mm float (toughened for sliding)	yes
403	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
403	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
403	Level 4	Study	35		27	4mm float (toughened for sliding)	yes
404	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
404	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
404	Level 4	Bed 2	35		27	4mm float (toughened for sliding)	yes
405	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
405	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
405	Level 4	Bed 2	35		27	4mm float (toughened for sliding)	yes
405	Level 4	Study	35		27	4mm float (toughened for sliding)	yes
406	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
406	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
406	Level 4	Bed 2	35		27	4mm float (toughened for sliding)	yes
406	Level 4	Bed 3	35		27	4mm float (toughened for sliding)	yes
407	Level 4	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
407	Level 4	Bed 1	35		27	4mm float (toughened for sliding)	yes
407	Level 4	Bed 2	35		27	4mm float (toughened for sliding)	yes
407	Level 4	Study	35		27	4mm float (toughened for sliding)	yes
501	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
501	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
501	Level 5	Study	35		27	4mm float (toughened for sliding)	yes
502	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
502	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
502	Level 5	Study	35		27	4mm float (toughened for sliding)	yes
503	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
503	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
503	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
503	Level 5	Bed 3	35		27	4mm float (toughened for sliding)	yes
504	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
504	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
504	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
505	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
505	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
505	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
506	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
506	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
506	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
507	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
507	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
507	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
508	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
508	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
601	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
601	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
601	Level 5	Study	35		27	4mm float (toughened for sliding)	yes
602	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
602	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
602	Level 5	Study	35		27	4mm float (toughened for sliding)	yes
603	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
603	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
603	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
603	Level 5	Bed 3	35		27	4mm float (toughened for sliding)	yes
604	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
604	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
604	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
605	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
605	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
605	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
606	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
606	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
606	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
607	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
607	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
607	Level 5	Bed 2	35		27	4mm float (toughened for sliding)	yes
608	Level 5	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
608	Level 5	Bed 1	35		27	4mm float (toughened for sliding)	yes
701	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
701	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
701	Level 7	Bed 2	35		27	4mm float (toughened for sliding)	yes
701	Level 7	Bed 3	35		27	4mm float (toughened for sliding)	yes
701	Level 7	Bed 4	35		27	4mm float (toughened for sliding)	yes
702	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
702	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
702	Level 7	Bed 2	35		27	4mm float (toughened for sliding)	yes
702	Level 7	Bed 3	35		27	4mm float (toughened for sliding)	yes
703	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
703	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
703	Level 7	Bed 2	35		27	4mm float (toughened for sliding)	yes
704	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
704	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
704	Level 7	Bed 2	35		27	4mm float (toughened for sliding)	yes
705	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
705	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
706	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
706	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
707	Level 7	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
707	Level 7	Bed 1	35		27	4mm float (toughened for sliding)	yes
707	Level 7	Bed 2	35		27	4mm float (toughened for sliding)	yes
707	Level 7	Bed 3	35		27	4mm float (toughened for sliding)	yes
801	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
801	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
801	Level 8	Bed 2	35		27	4mm float (toughened for sliding)	yes
801	Level 8	Bed 3	35		27	4mm float (toughened for sliding)	yes
801	Level 8	Bed 4	35		27	4mm float (toughened for sliding)	yes
802	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
802	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
802	Level 8	Bed 2	35		27	4mm float (toughened for sliding)	yes
802	Level 8	Bed 3	35		27	4mm float (toughened for sliding)	yes
803	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
803	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
803	Level 8	Bed 2	35		27	4mm float (toughened for sliding)	yes
804	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
804	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
804	Level 8	Bed 2	35		27	4mm float (toughened for sliding)	yes
805	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
805	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
806	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
806	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
807	Level 8	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
807	Level 8	Bed 1	35		27	4mm float (toughened for sliding)	yes
807	Level 8	Bed 2	35		27	4mm float (toughened for sliding)	yes
807	Level 8	Bed 3	35		27	4mm float (toughened for sliding)	yes
901	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
901	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
901	Level 9	Bed 2	35		27	4mm float (toughened for sliding)	yes
901	Level 9	Bed 3	35		27	4mm float (toughened for sliding)	yes
901	Level 9	Bed 4	35		27	4mm float (toughened for sliding)	yes
902	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
902	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
902	Level 9	Bed 2	35		27	4mm float (toughened for sliding)	yes
902	Level 9	Bed 3	35		27	4mm float (toughened for sliding)	yes
903	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
903	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
903	Level 9	Bed 2	35		27	4mm float (toughened for sliding)	yes
904	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
904	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
904	Level 9	Bed 2	35		27	4mm float (toughened for sliding)	yes
905	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
905	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
906	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
906	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
907	Level 9	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
907	Level 9	Bed 1	35		27	4mm float (toughened for sliding)	yes
907	Level 9	Bed 2	35		27	4mm float (toughened for sliding)	yes
907	Level 9	Bed 3	35		27	4mm float (toughened for sliding)	yes
1001	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1001	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1001	Level10	Bed 2	35		27	4mm float (toughened for sliding)	yes
1001	Level10	Bed 3	35		27	4mm float (toughened for sliding)	yes
1001	Level10	Bed 4	35		27	4mm float (toughened for sliding)	yes
1002	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1002	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1002	Level10	Bed 2	35		27	4mm float (toughened for sliding)	yes
1002	Level10	Bed 3	35		27	4mm float (toughened for sliding)	yes
1003	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1003	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1003	Level10	Bed 2	35		27	4mm float (toughened for sliding)	yes
1004	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1004	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1004	Level10	Bed 2	35		27	4mm float (toughened for sliding)	yes
1005	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1005	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1006	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1006	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1007	Level10	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1007	Level10	Bed 1	35		27	4mm float (toughened for sliding)	yes
1007	Level10	Bed 2	35		27	4mm float (toughened for sliding)	yes
1007	Level10	Bed 3	35		27	4mm float (toughened for sliding)	yes
1201-L	Level 11	Bed 1	35		27	4mm float (toughened for sliding)	yes
1201-L	Level 11	Study	35		27	4mm float (toughened for sliding)	yes
1202-L	Level 11	Bed 1	35		27	4mm float (toughened for sliding)	yes
1202-L	Level 11	Bed 2	35		27	4mm float (toughened for sliding)	yes
1202-L	Level 11	Bed 3	35		27	4mm float (toughened for sliding)	yes
1101	Level 11	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1101	Level 11	Bed 1	35		27	4mm float (toughened for sliding)	yes
1101	Level 11	Bed 2	35		27	4mm float (toughened for sliding)	yes
1102	Level 11	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1102	Level 11	Bed 1	35		27	4mm float (toughened for sliding)	yes
1102	Level 11	Bed 2	35		27	4mm float (toughened for sliding)	yes
1102	Level 11	Bed 3	35		27	4mm float (toughened for sliding)	yes
1103	Level 11	Living/Kitchen/Dining	35		27	4mm float (toughened for sliding)	yes
1103	Level 11	Bed 1	35		27	4mm float (toughened for sliding)	yes
1103	Level 11	Bed 2	35		27	4mm float (toughened for sliding)	yes
1103	Level 11	Bed 3	35		27	4mm float (toughened for sliding)	yes
1201-U	Level 12	Living/Kitchen/Dining	35	35	27	4mm float (toughened for sliding)	yes
1202-U	Level 12	Living/Kitchen/Dining	35	35	27	4mm float (toughened for sliding)	yes
1203	Level 12	Living/Kitchen/Dining	35	35	27	4mm float (toughened for sliding)	yes
1203	Level 12	Bed 1	35	35	27	4mm float (toughened for sliding)	yes
1203	Level 12	Bed 2	35	35	27	4mm float (toughened for sliding)	yes
1204	Level 12	Living/Kitchen/Dining	35	35	27	4mm float (toughened for sliding)	yes
1204	Level 12	Bed 1	35	35	27	4mm float (toughened for sliding)	yes
1204	Level 12	Bed 2	35	35	27	4mm float (toughened for sliding)	yes
1204	Level 12	Bed 3	35	35	27	4mm float (toughened for sliding)	yes
1205	Level 12	Living/Kitchen/Dining	35	35	27	4mm float (toughened for sliding)	yes

Unit	Level	Location	Glazing				
			Wall	Roof	Glazing	Glazing	Acoustic seals
1205	Level 12	Bed 1	35	35	27	4mm float (toughened for sliding)	yes
1205	Level 12	Bed 2	35	35	27	4mm float (toughened for sliding)	yes
1205	Level 12	Bed 3	35	35	27	4mm float (toughened for sliding)	yes

Any locations not identified in Table 15 would require 4mm float for windows (minimum R_w 22) and 4mm toughened for sliding doors (minimum R_w 23)

9.1.2 Wall construction

The minimum required acoustic rating of the external wall is Rw 35. To achieve the rating one of the following constructions would be required:

Table 16: Typical wall construction

Description	Cavity insulation	R_W Rating
13mm plasterboard internal, 92mm steel studs at 600mm maximum centres, cavity with infill, 75mm Hebel Panel screw fixed to top hats, metal cladding	75mm Glasswool batts (11kg/m^3)	35

Note that the construction systems listed in the table are not the only possible types of construction. Other similar systems achieving at least minimum Rw 35 would also be suitable.

More detailed information for external wall systems may be provided on request.

9.1.3 Roofing construction

The required roof/ceiling acoustic rating is Rw 35. To achieve the rating the following construction would be required.

Table 17: Typical roof construction

Description	Cavity insulation	R_W Rating
150mm concrete slab external, clip fixed furring channels at 600mm maximum centres, cavity, 10mm plasterboard internal	Nil	35

Note that the construction system listed in the table is not the only possible type of construction. Other similar systems achieving at least minimum Rw 35 would also be suitable.

More detailed information for external wall systems may be provided on request.

9.1.1 Alternative Ventilation

To achieve the required internal noise levels for the development, all bedrooms and living spaces would require the provision for an alternative ventilation system (in accordance with National Construction Code 2019 requirements and AS1668.2) similar to air-conditioning or mechanical ventilation to allow doors and windows to be closed.

9.2 Onsite Activities

Based on the predicted noise levels and subjective assessment of the site and surrounds for all time periods, noise impacts at the residential receiver locations are predicted to comply with the assessment criteria on the condition that use of the outdoor communal area is limited to the day and evening time periods (7am-10pm weekdays, 8am-10pm weekends).

9.3 Waste collection

We recommend that waste collection be conducted in accordance with the surrounding residential properties.

9.4 Onsite mechanical plant

No information regarding mechanical services was available at the time of the assessment. We recommend that any new mechanical plant is designed to comply with the criteria stated in Section 6.4.5 with an assessment undertaken by a qualified acoustic consultant to be conducted prior to installation.

10. Conclusion

An environmental and road traffic noise assessment was conducted for the proposed residential development to be located at 3 Holdsworth Avenue, St Leonards. On the condition the recommendations in Section 9 are implemented, compliance is predicted with all assessment requirements.

Should you have any queries please do not hesitate to contact us.

Regards,

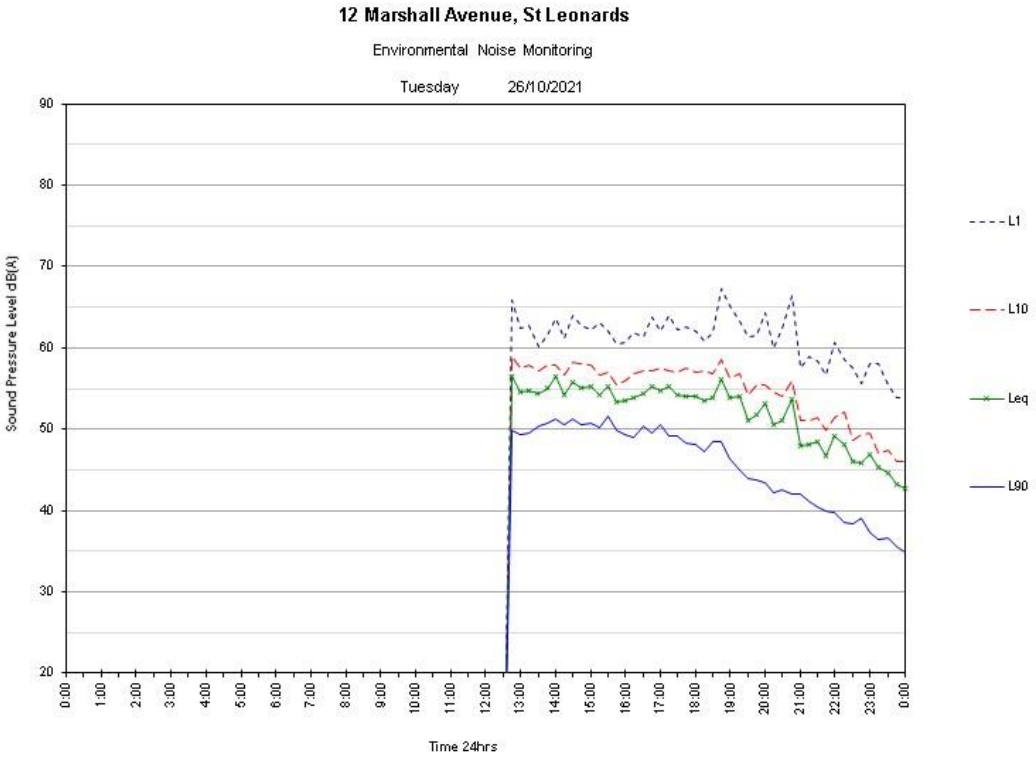
Matthew Bechara M.ArchSci MAAS
Senior Acoustic Consultant

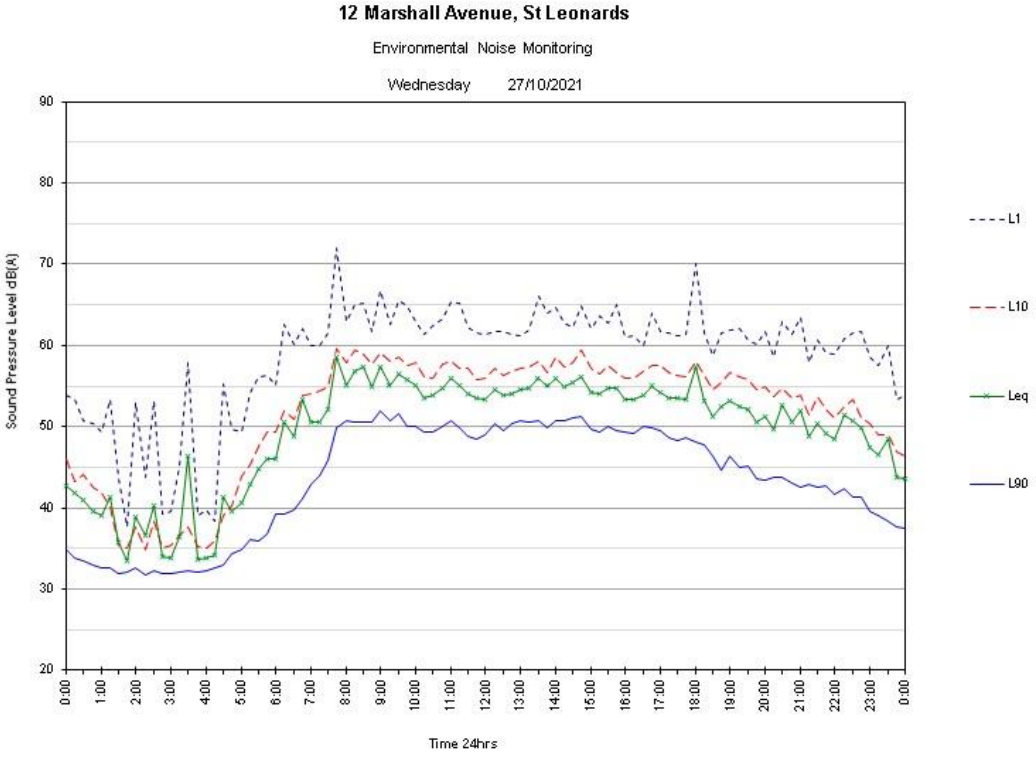
acousticworks)))

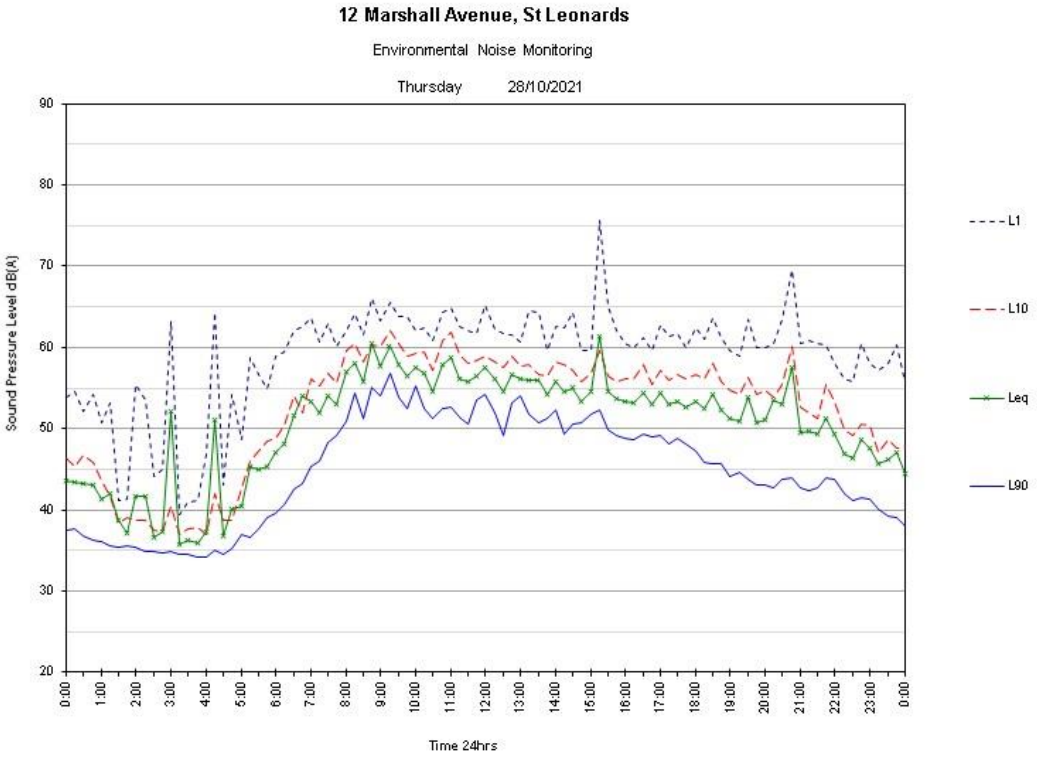
11. Appendices

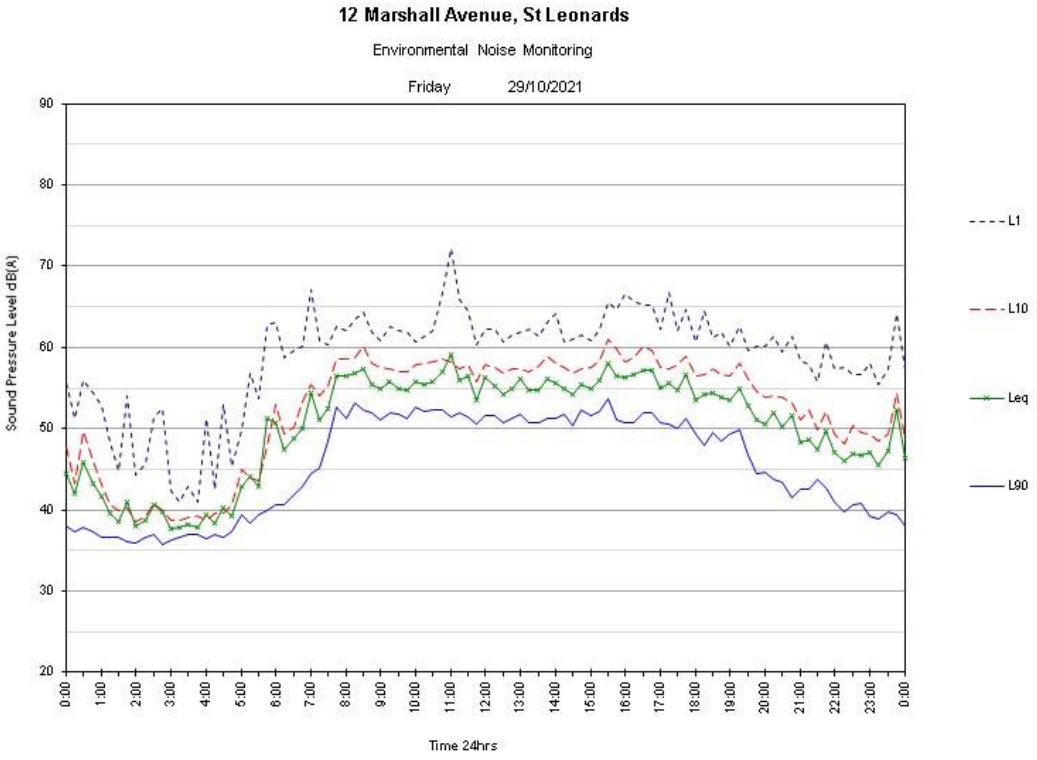
11.1 Noise Monitoring Charts

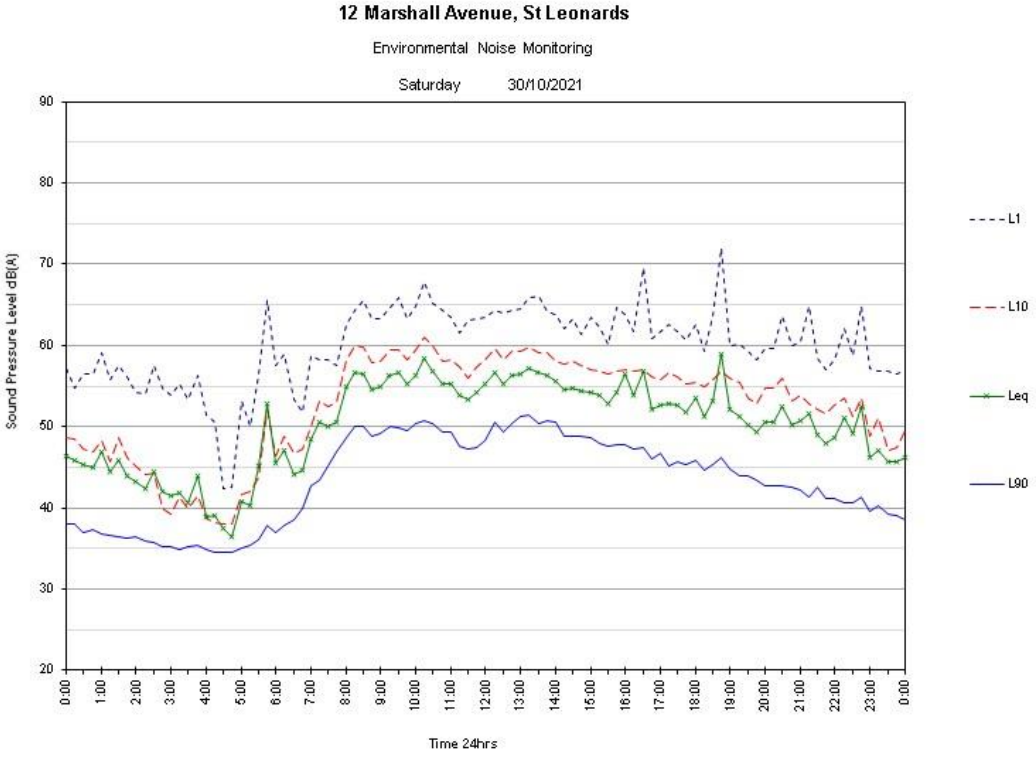
11.1.1 Noise Monitor A (12 Marshall Avenue)

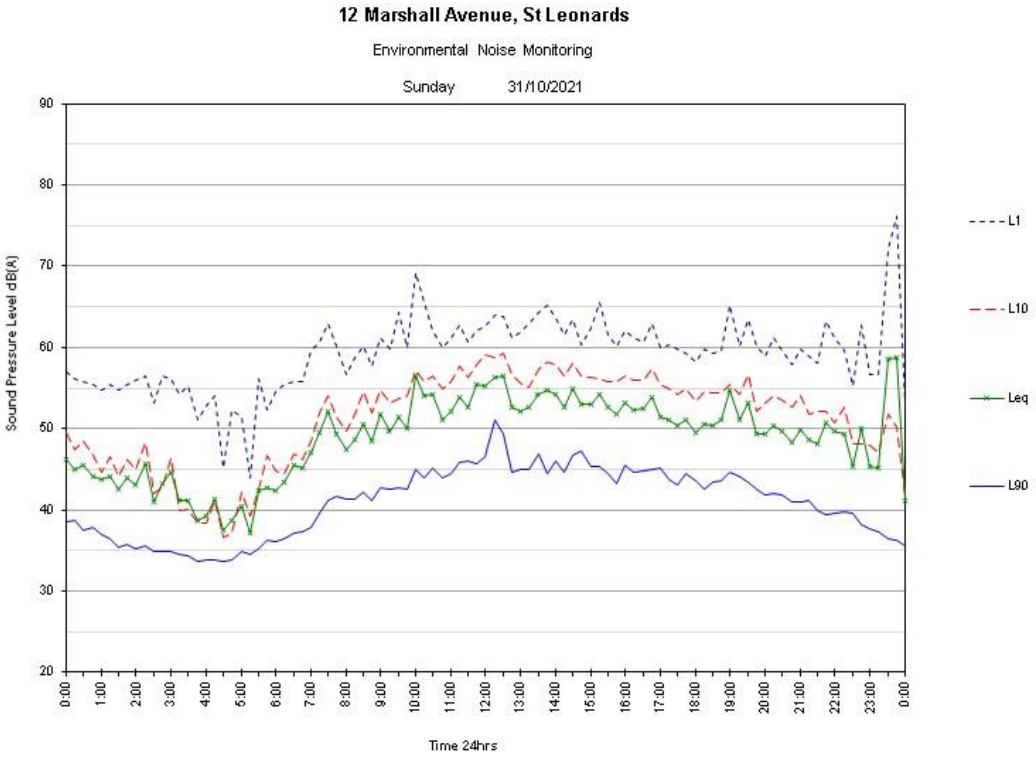


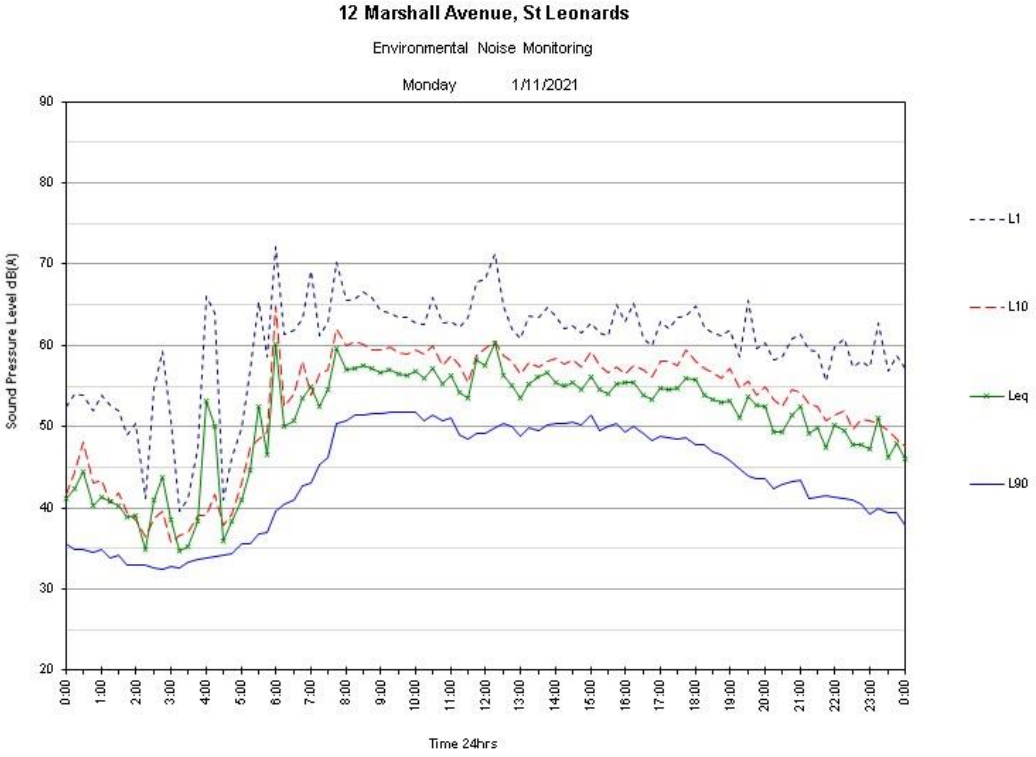


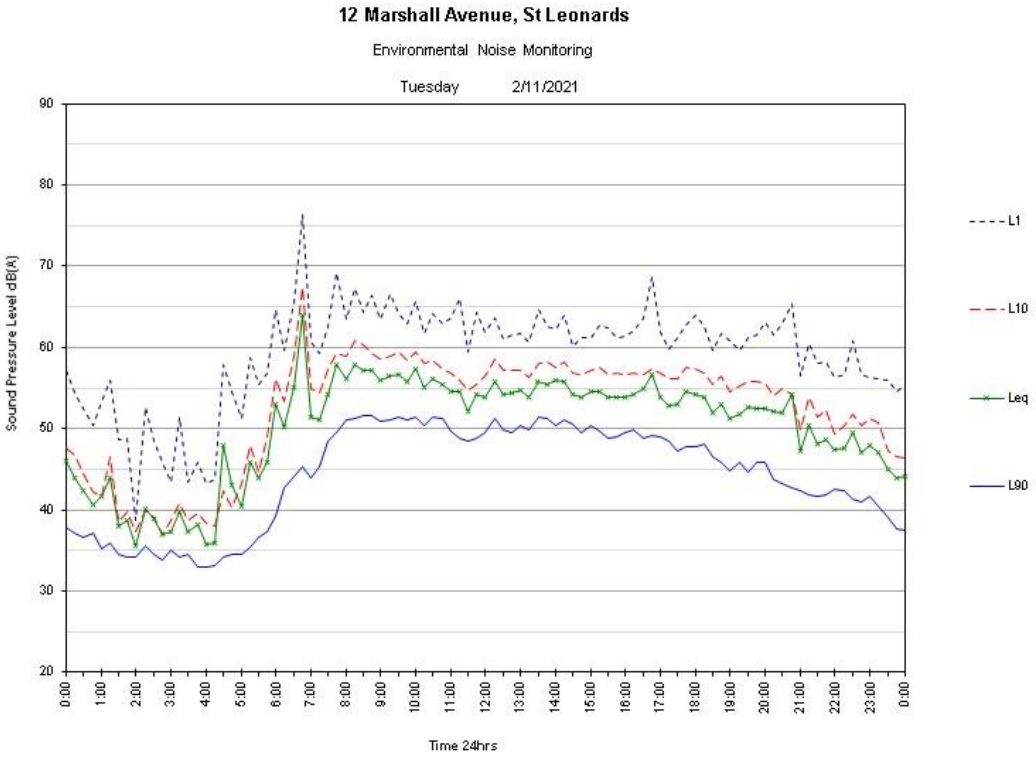

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Thursday 28/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

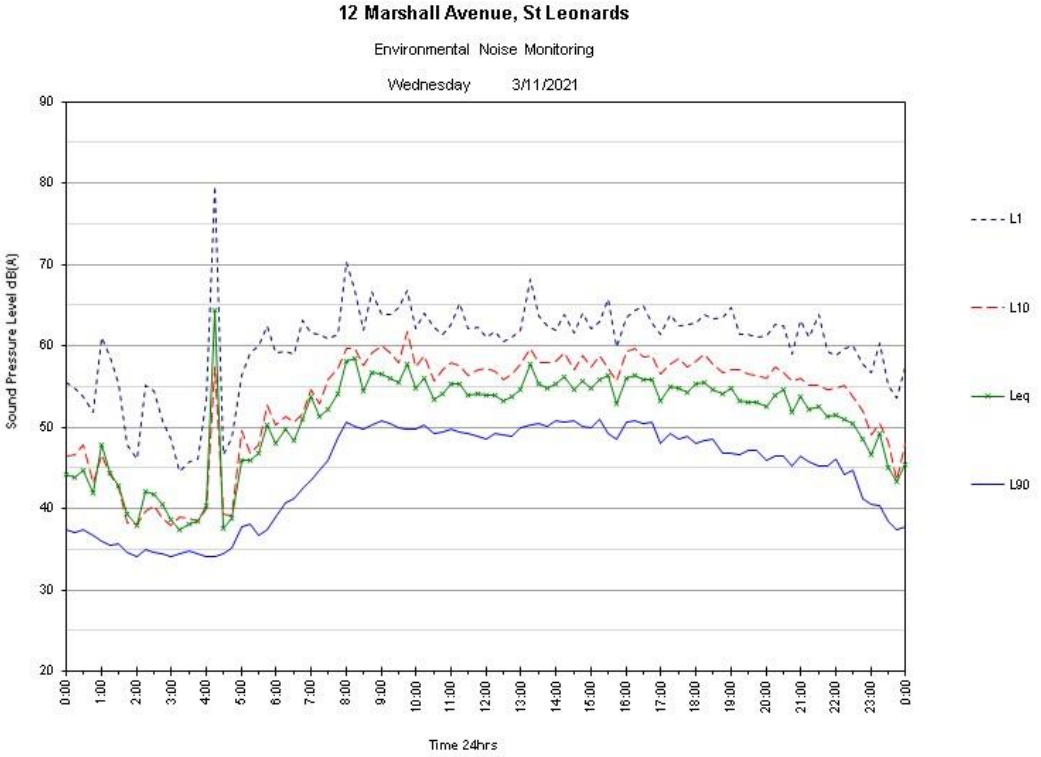

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Friday 29/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

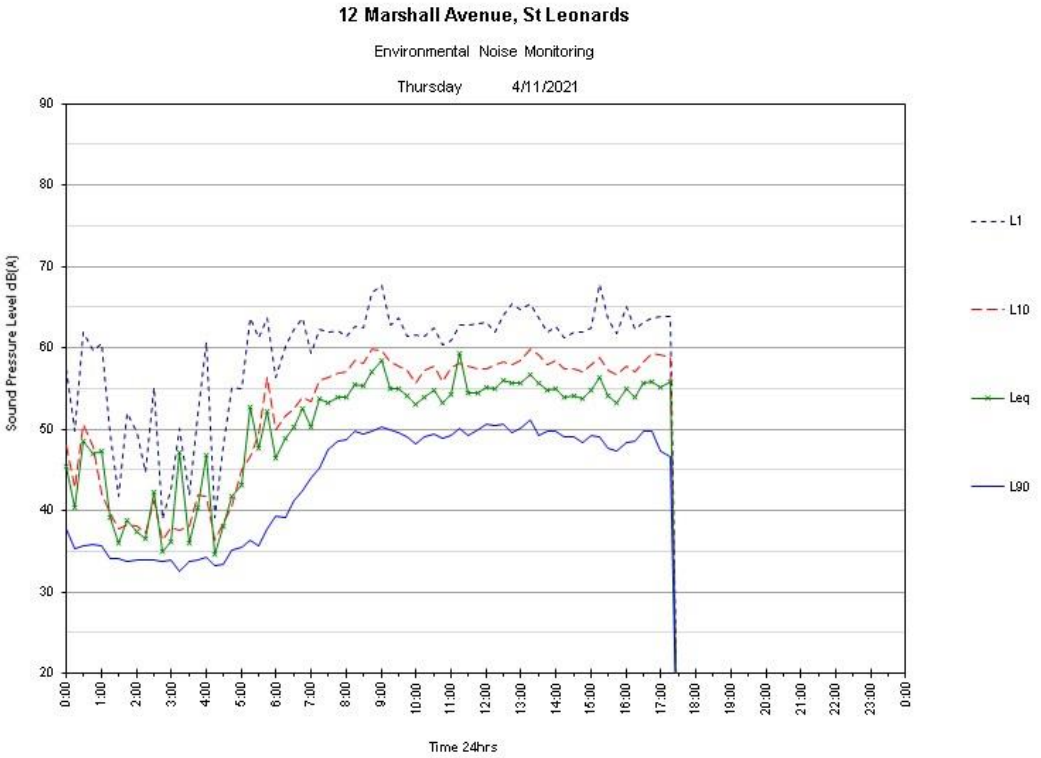

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Saturday 30/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Sunday 31/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

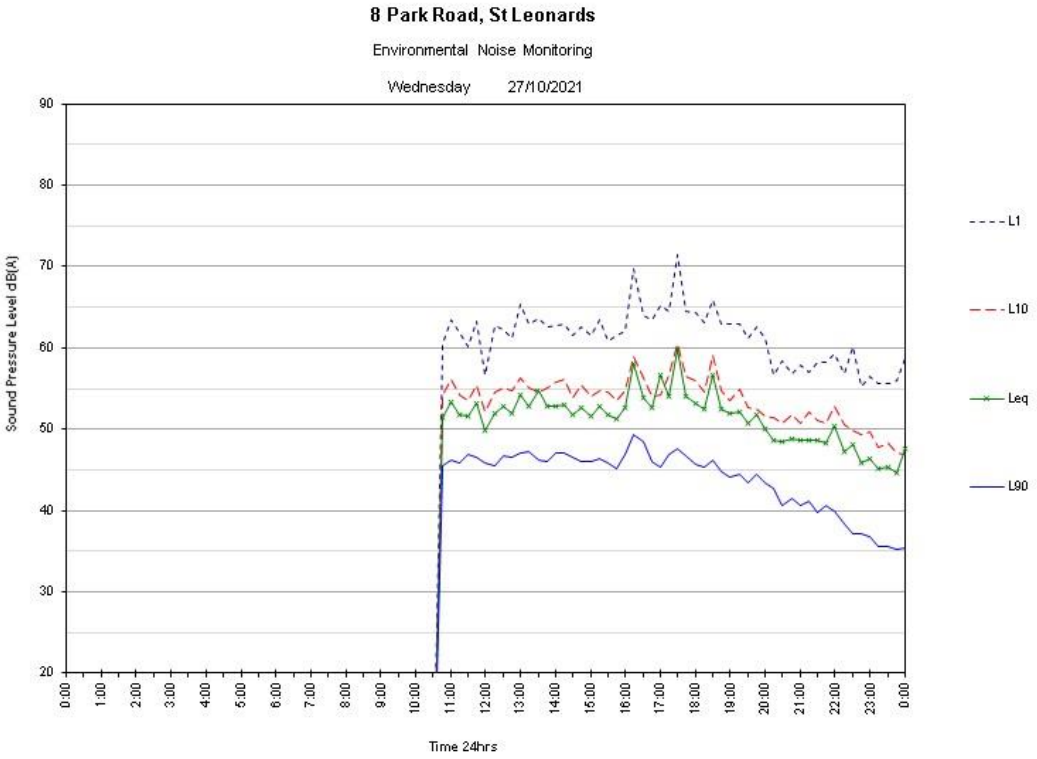

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Monday 1/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

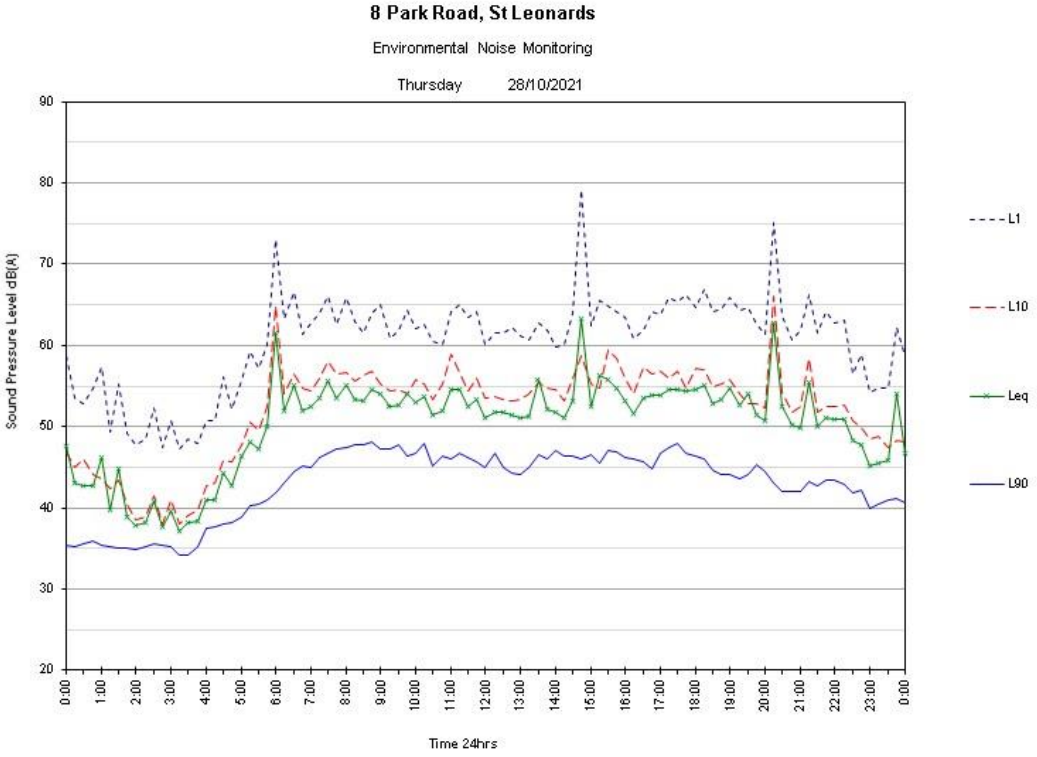

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Tuesday 2/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

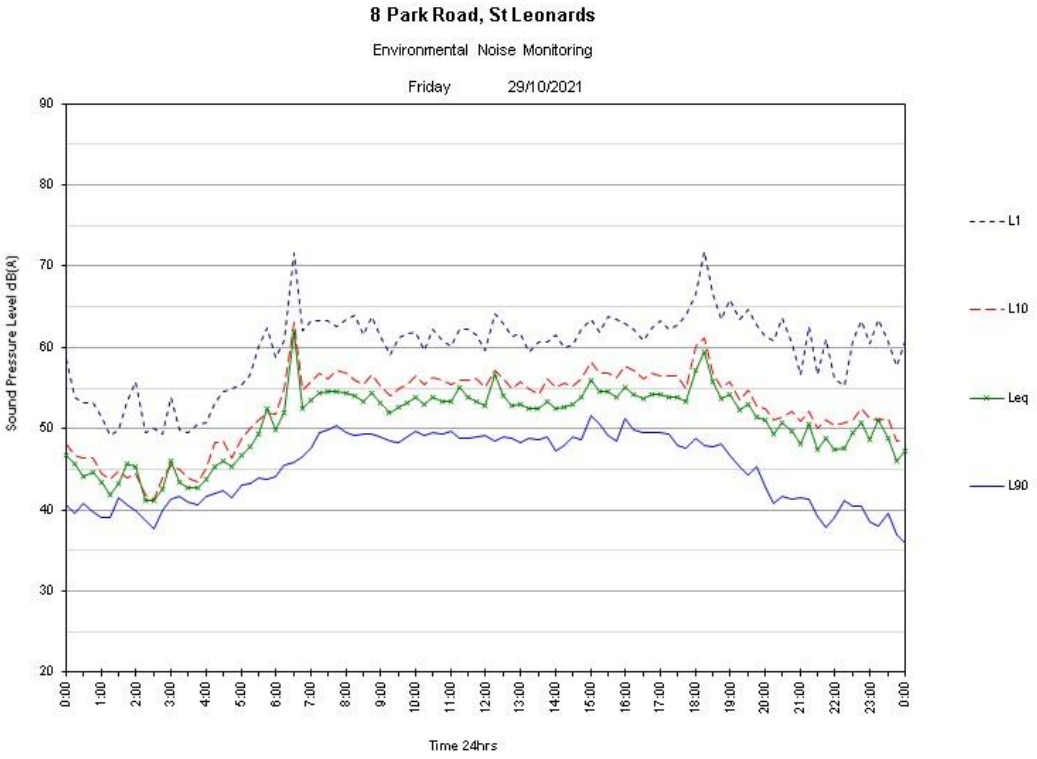

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Wednesday 3/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

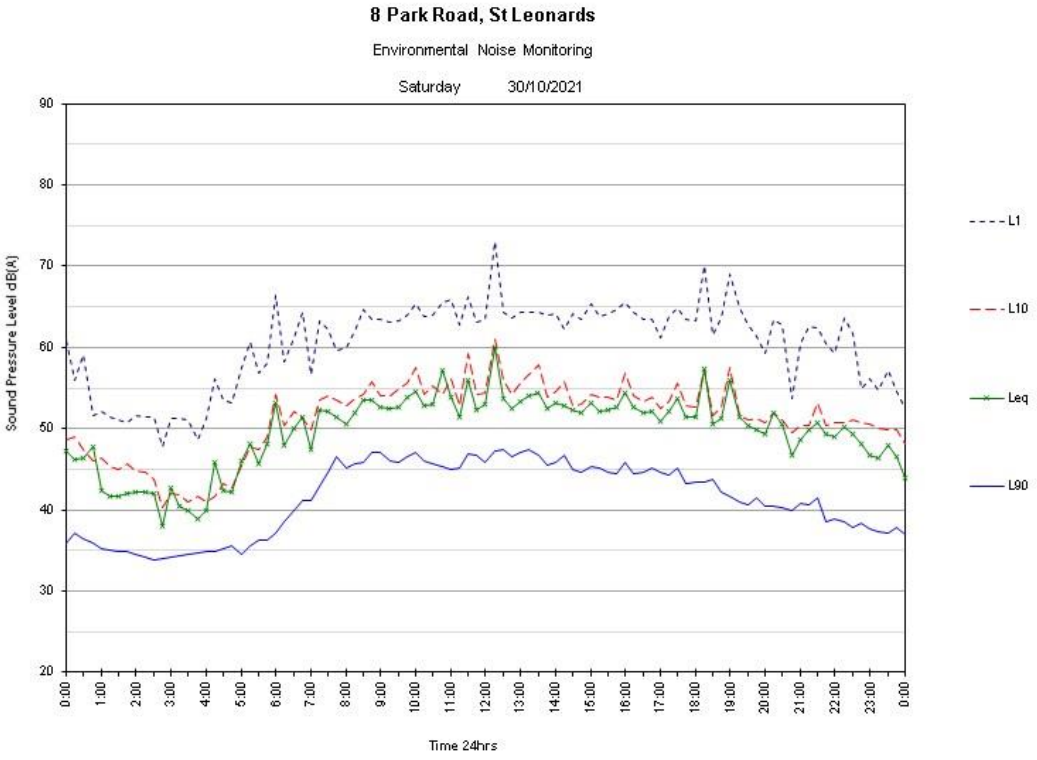

12 Marshall Avenue, St Leonards
Environmental Noise Monitoring
Thursday 4/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

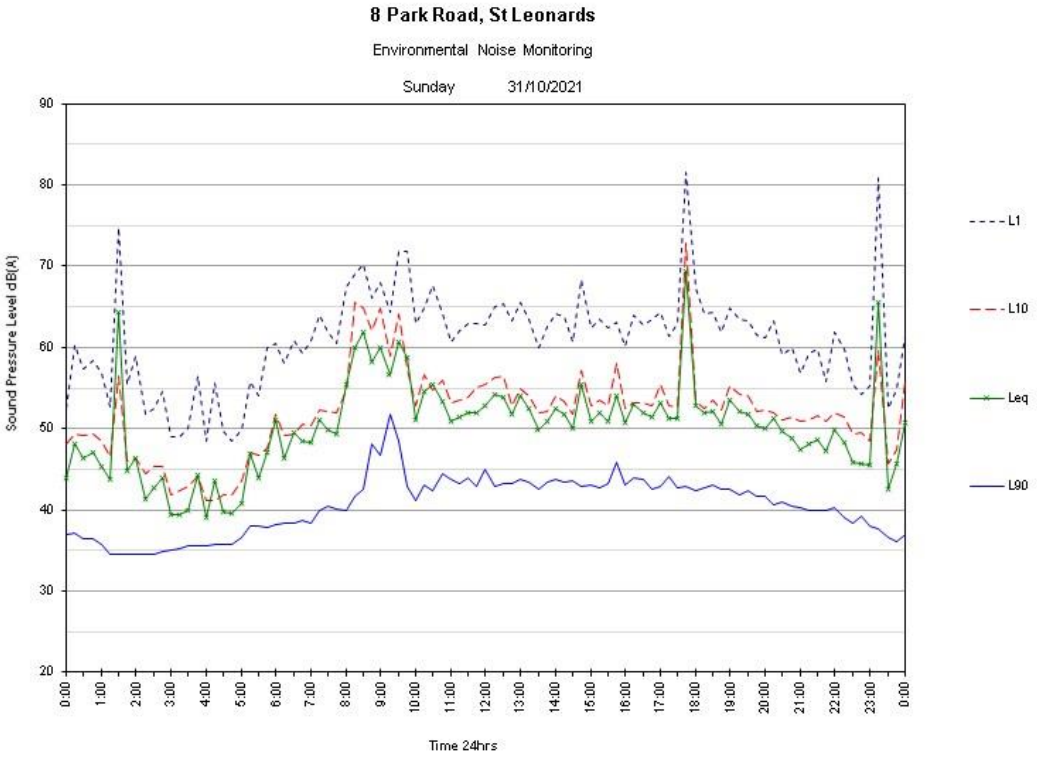
11.1.2 Noise Monitor B (8 Park Road)

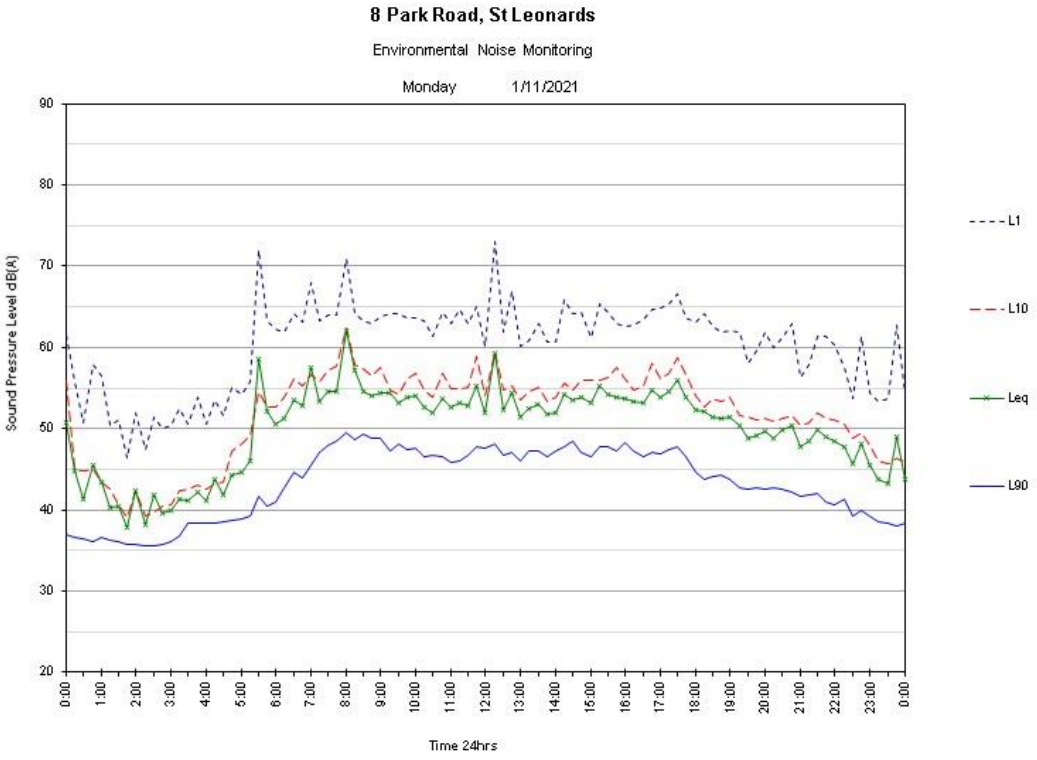


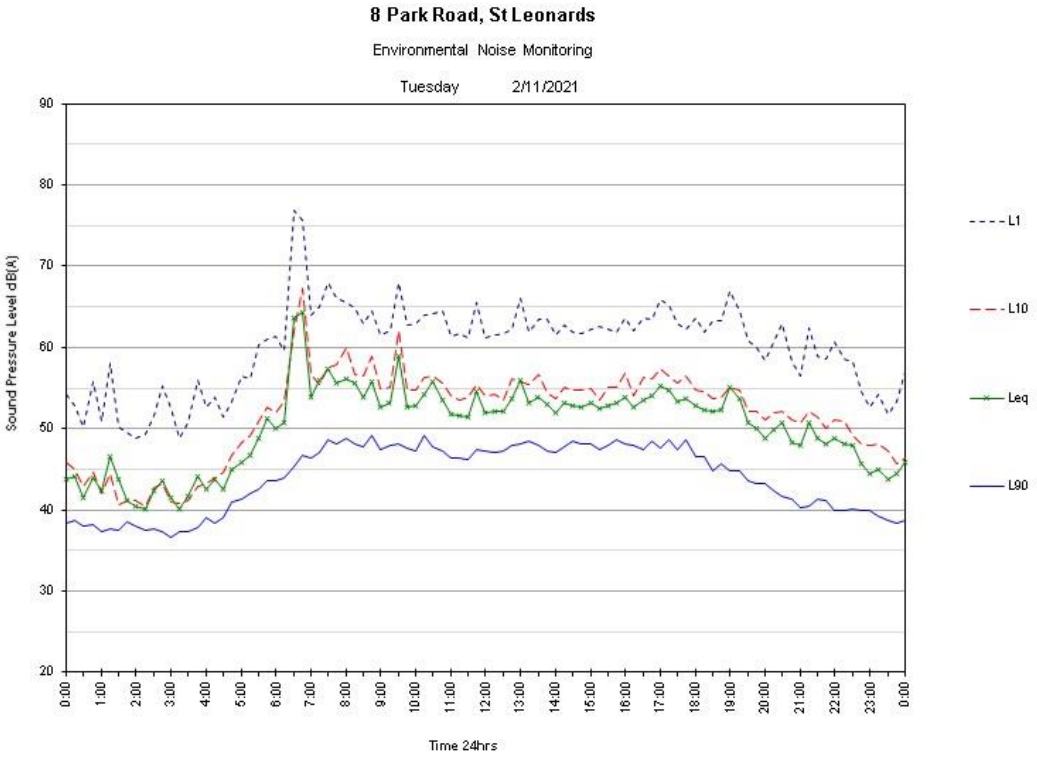


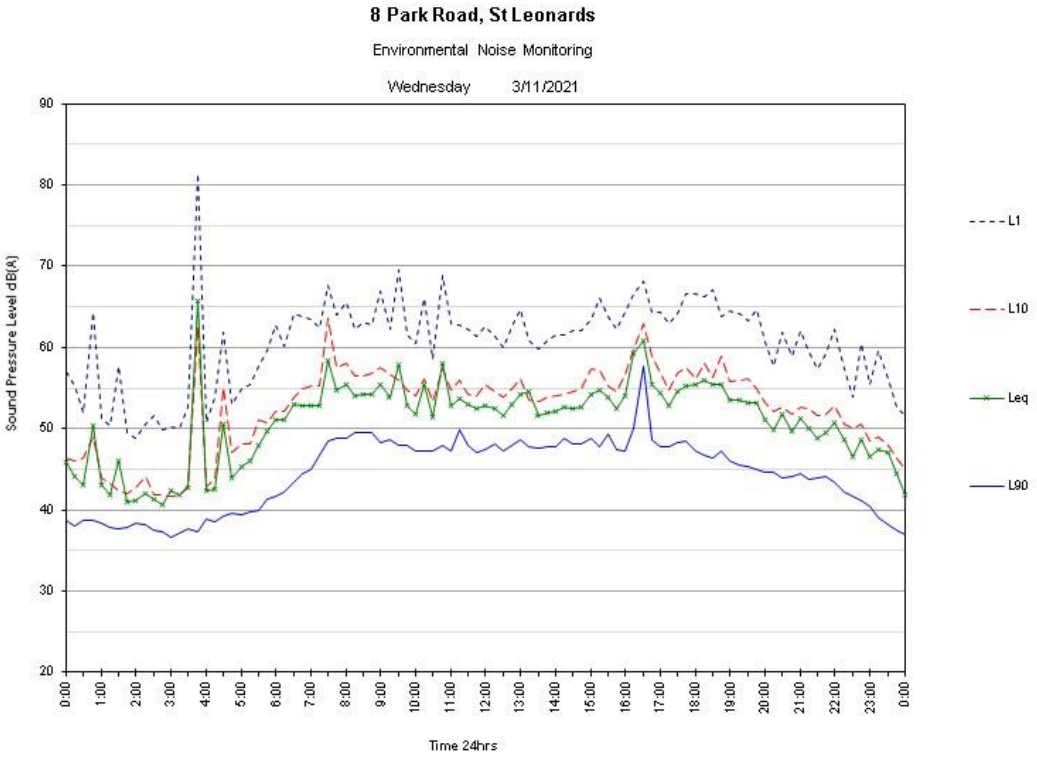

8 Park Road, St Leonards
Environmental Noise Monitoring
Friday 29/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90

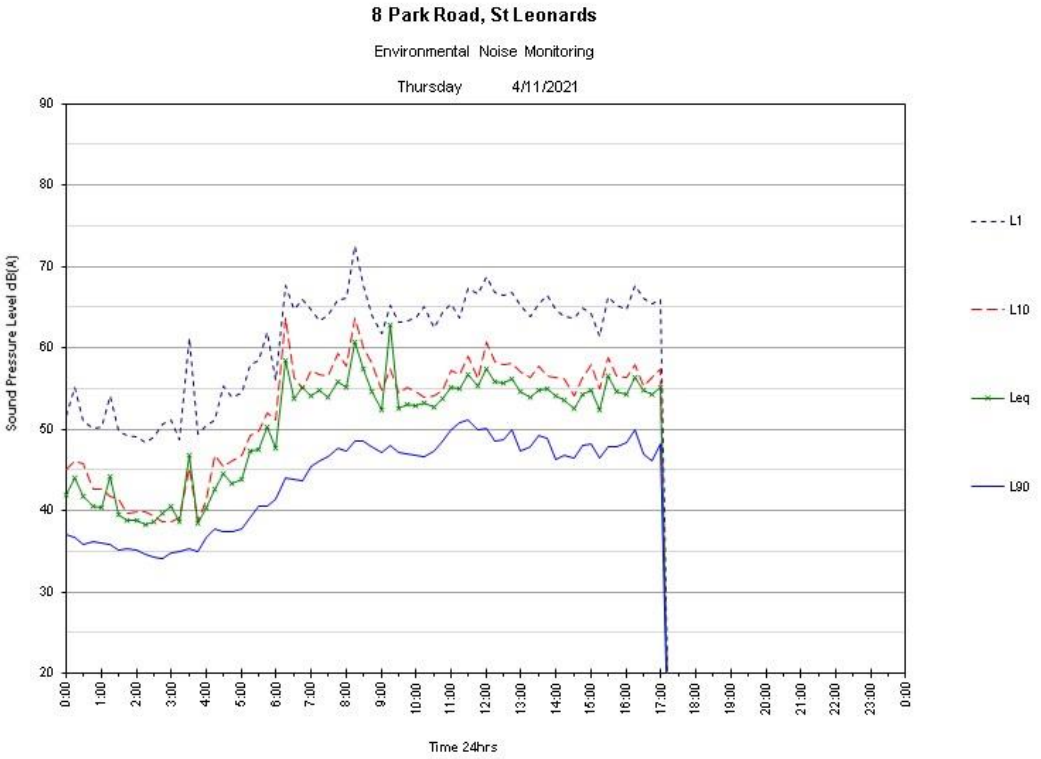

8 Park Road, St Leonards
Environmental Noise Monitoring
Saturday 30/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


8 Park Road, St Leonards
Environmental Noise Monitoring
Sunday 31/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


8 Park Road, St Leonards
Environmental Noise Monitoring
Monday 1/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


8 Park Road, St Leonards
Environmental Noise Monitoring
Tuesday 2/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


8 Park Road, St Leonards
Environmental Noise Monitoring
Wednesday 3/11/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


8 Park Road, St Leonards
Environmental Noise Monitoring
Thursday 4/11/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
Leq
L90

11.2 Development Plans

DA DRAWING LIST	
SHEET NUMBER	SHEET NAME
00-GENERAL INFORMATION	
DA-00-0000	COVER
DA-00-0001	SITE ANALYSIS PLAN
DA-00-0002	DEMOLITION PLAN
DA-00-0003	SITE PLAN
10-GENERAL ARRANGEMENT PLANS	
DA-09-0010	LEVEL B4 PLAN
DA-09-0030	LEVEL B3-B2 PLAN
DA-09-0040	LEVEL B1 PLAN
DA-10-0001	LOWER GROUND PLAN
DA-10-0003	UPPER GROUND PLAN
DA-10-0004	LEVEL 01 PLAN
DA-10-0005	LEVEL 02-03 PLAN
DA-10-0006	LEVEL 04 PLAN
DA-10-0007	LEVEL 05-06 PLAN
DA-10-0009	LEVEL 07-10 PLAN
DA-10-0012	LEVEL 11 PLAN
DA-10-0013	LEVEL 12 PLAN
DA-10-0014	PLANT PLAN
DA-10-0015	ROOF PLAN
20-ELEVATIONS	
DA-20-0001	NORTH ELEVATION
DA-20-0002	SOUTH ELEVATION
DA-20-0003	EAST ELEVATION
DA-20-0004	WEST ELEVATION
30-SECTIONS	
DA-30-0001	SECTION 1
DA-30-0002	SECTION 2
DA-30-0003	SECTION 3
50-ADDITIONAL DETAIL	
DA-50-2000	ADAPTABLE/SILVER LIVABLE UNITS
DA-50-2100	ADAPTABLE/SILVER LIVABLE UNITS
DA-50-2200	ADAPTABLE/SILVER LIVABLE UNITS
DA-50-3000	ADG COMLIANCE DIAGRAM
DA-50-4000	LEP HEIGHT PLANE DIAGRAM
78-MATERIALS BOARD	
DA-78-0001	EXTERNAL FINISHES
90-SCHEDULES	
DA-90-0001	GFA PLANS
DA-90-0010	DEVELOPMENT DATA
93-SOLAR ACCESS	
DA-93-0100	SOLAR ACCESS COMPLIANCE DIAGRAMS
94-CROSS VENTILATION	
DA-94-0100	CROSS VENTILATION COMPLIANCE DIAGRAMS
95-SUN EYE VIEWS	
DA-95-0101	SUN EYE VIEWS
DA-95-0102	SUN EYE VIEWS
96-SHADOW DIAGRAM	
DA-96-0001	SHADOW DIAGRAM-9AM 21st JUNE
DA-96-0002	SHADOW DIAGRAM-12PM 21st JUNE
DA-96-0003	SHADOW DIAGRAM-3PM 21st JUNE
97-PERSPECTIVE VIEWS	
DA-97-0001	PERSPECTIVE VIEW 01
DA-97-0002	PERSPECTIVE VIEW 02

3 HOLDSWORTH AVENUE, ST LEONARDS

APARTMENT UNITS MIX		
	COUNT	%
1B	29	30.2%
2B	45	46.9%
3B	18	18.8%
4B	4	4.2%
TOTAL UNITS	96	100.0%

SITE AREA (sqm)	2631m²
FSR	3.45:1
Allowable GFA	9076.95m²
GFA	8876.82m²

BASIX Thermal Specification - 3 Holdsworth Avenue, St Leonards NSW

Architect: PTW Architects, Level 11, 88 Phillip Street, Sydney NSW 2000 Australia, T +61 2 9232 5877, ptw.com.au

PTW

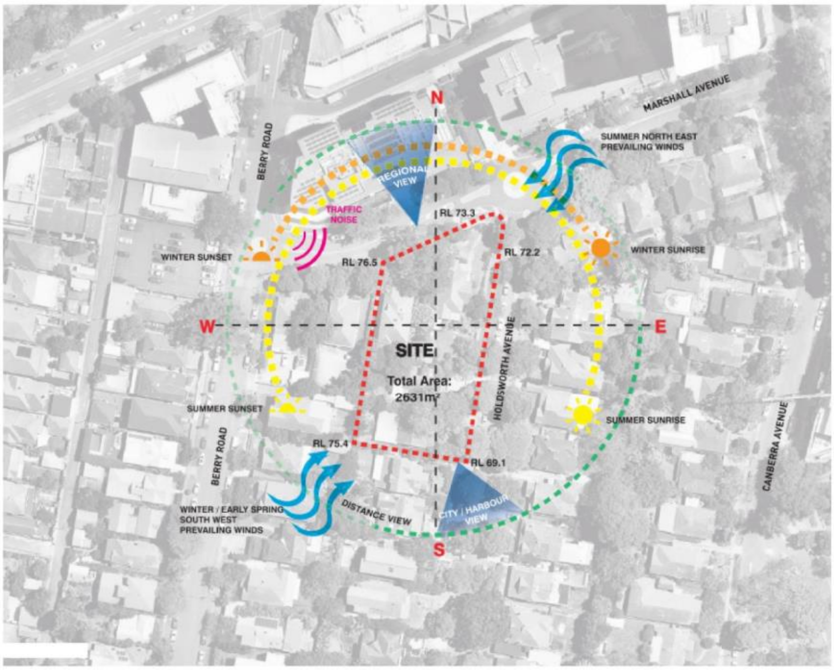
Project PA030370 3 Holdsworth Avenue, St Leonards

Title: 00-GENERAL INFORMATION COVER

Status: DA SUBMISSION

Drawing Number: DA-00-0000 Revision: D

A3



Architect: PTW Architects, Level 11, 88 Phillip Street, Sydney NSW 2000 Australia, T +61 2 9232 5877, ptw.com.au

PTW

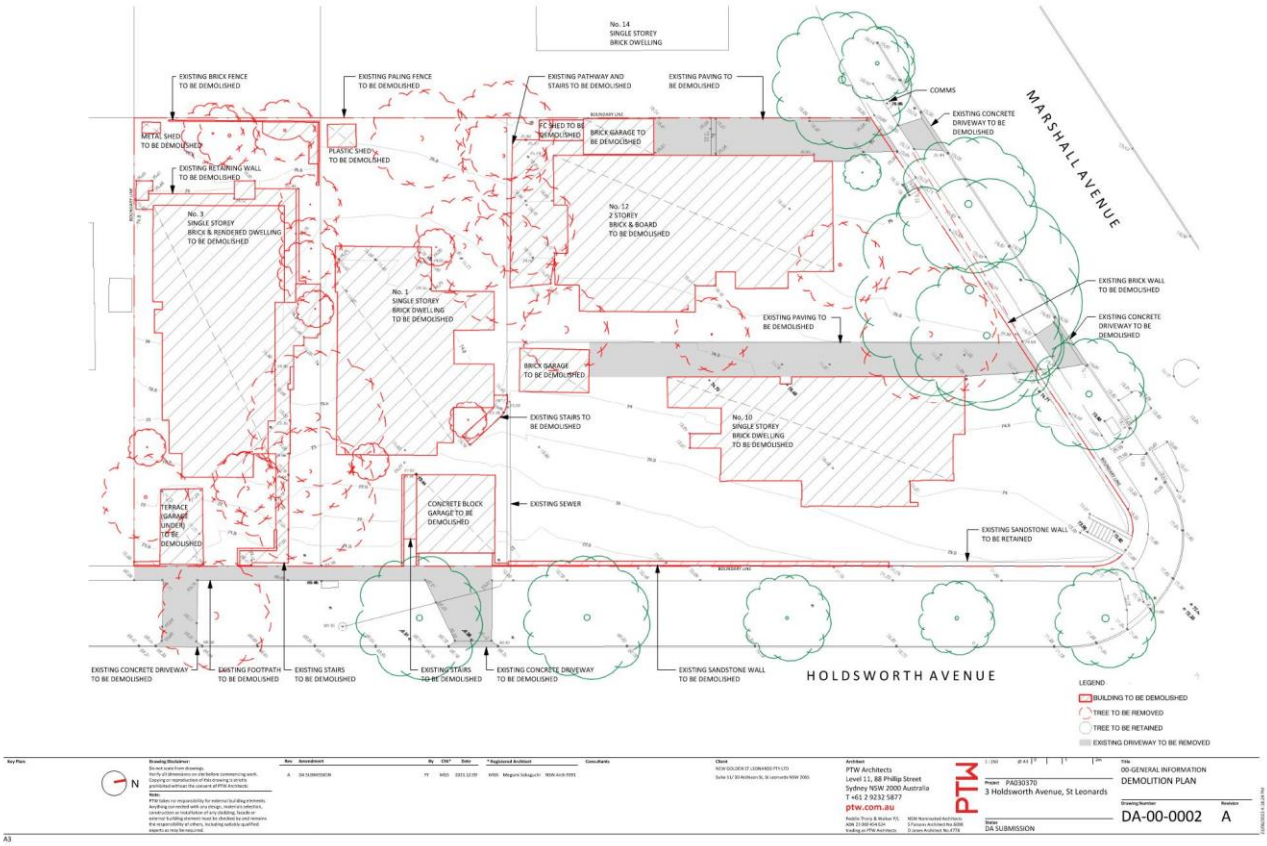
Project PA030370 3 Holdsworth Avenue, St Leonards

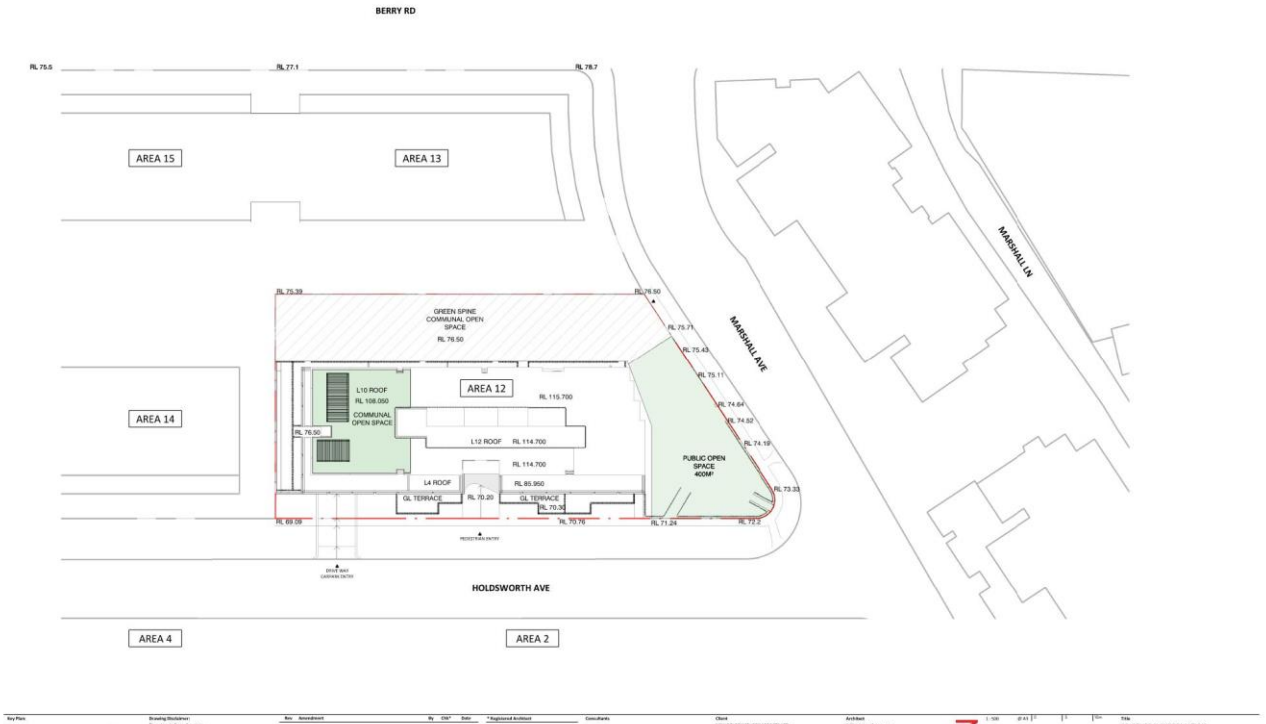
Title: 00-GENERAL INFORMATION SITE ANALYSIS PLAN

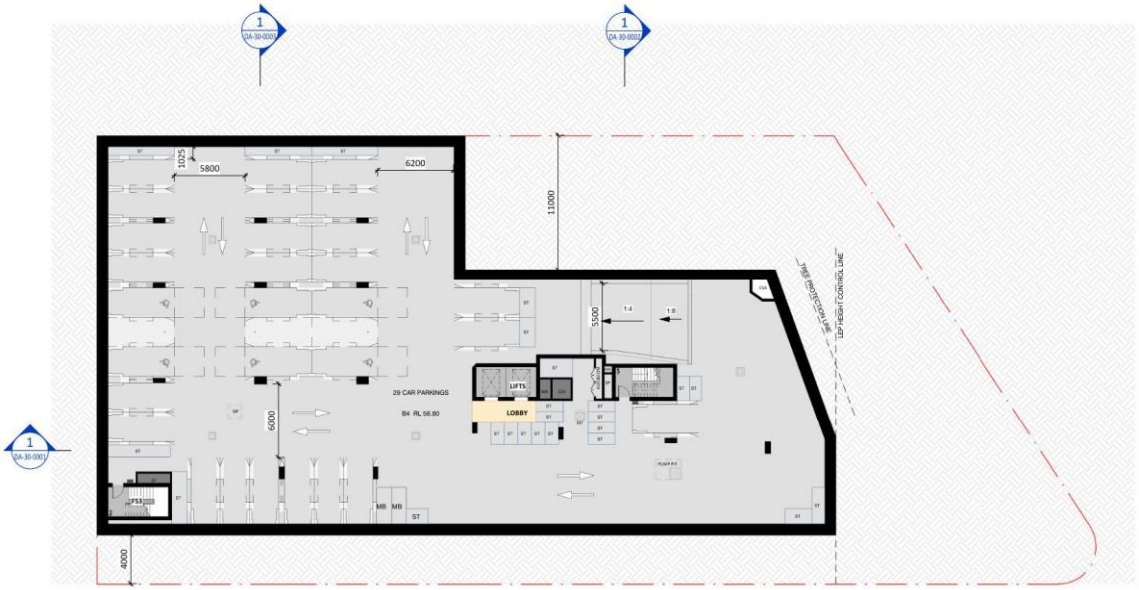
Status: DA SUBMISSION

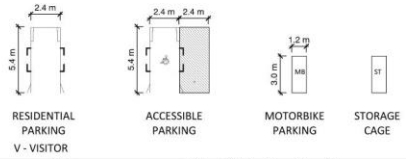
Drawing Number: DA-00-0001 Revision: A

A3

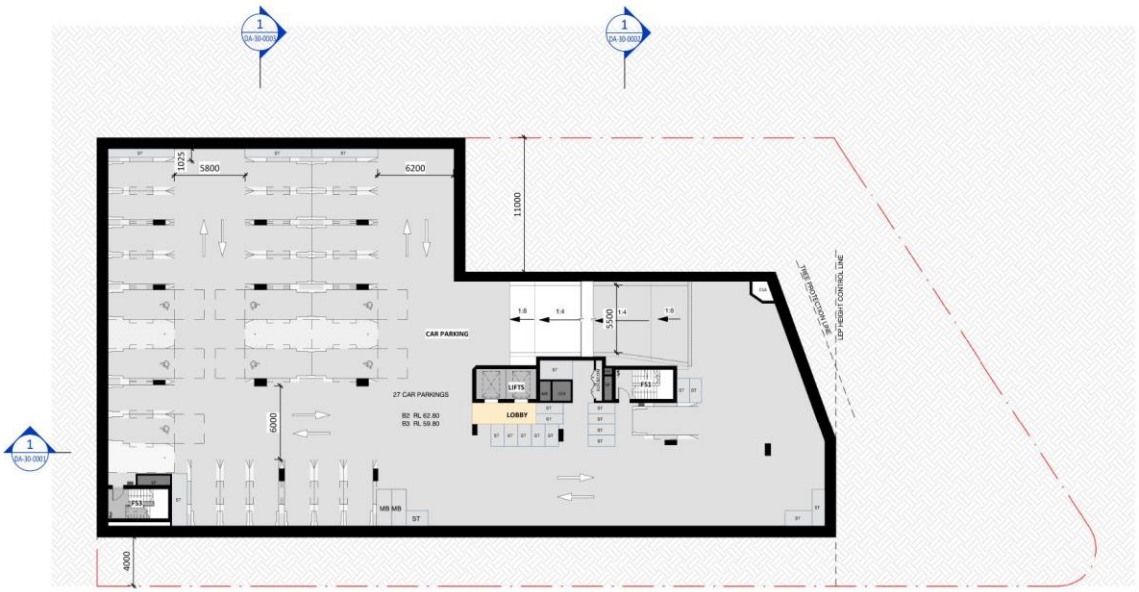

No. 14
SINGLE STOREY
BRICK DWELLING
EXISTING BRICK FENCE
TO BE DEMOLISHED
EXISTING PALING FENCE
TO BE DEMOLISHED
EXISTING PATHWAY AND
STAIRS TO BE DEMOLISHED
EXISTING PAVING TO
BE DEMOLISHED
COMMS
MARSHALL AVENUE
METAL SHED
TO BE DEMOLISHED
PLASTIC SHED
TO BE DEMOLISHED
FC SHED TO BE
DEMOLISHED
BRICK GARAGE TO
BE DEMOLISHED
EXISTING CONCRETE
DRIVEWAY TO BE
DEMOLISHED
EXISTING RETAINING WALL
TO BE DEMOLISHED
No. 3
SINGLE STOREY
BRICK & RENDERED DWELLING
TO BE DEMOLISHED
No. 12
2 STOREY
BRICK & BOARD
TO BE DEMOLISHED
No. 1
SINGLE STOREY
BRICK DWELLING
TO BE DEMOLISHED
EXISTING BRICK WALL
TO BE DEMOLISHED
EXISTING PAVING TO
BE DEMOLISHED
EXISTING CONCRETE
DRIVEWAY TO BE
DEMOLISHED
BRICK GARAGE
TO BE DEMOLISHED
EXISTING STAIRS TO
BE DEMOLISHED
No. 10
SINGLE STOREY
BRICK DWELLING
TO BE DEMOLISHED
TERRACE
GARAGE
UNDER
TO BE
DEMOLISHED
CONCRETE BLOCK
GARAGE TO BE
DEMOLISHED
EXISTING SEWER
EXISTING SANDSTONE WALL
TO BE RETAINED
EXISTING CONCRETE DRIVEWAY
TO BE DEMOLISHED
EXISTING FOOTPATH
TO BE DEMOLISHED
EXISTING STAIRS
TO BE DEMOLISHED
EXISTING STAIRS
TO BE DEMOLISHED
EXISTING CONCRETE DRIVEWAY
TO BE DEMOLISHED
EXISTING SANDSTONE WALL
TO BE DEMOLISHED
HOLDSWORTH AVENUE
LEGEND
BUILDING TO BE DEMOLISHED
TREE TO BE REMOVED
TREE TO BE RETAINED
EXISTING DRIVEWAY TO BE REMOVED
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Title 00-GENERAL INFORMATION
DEMOLITION PLAN
Drawing Number DA-00-0002
Revision A

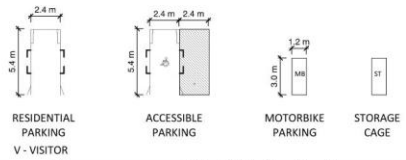

BERRY RD
RL 75.5
RL 77.1
RL 78.7
AREA 15
AREA 13
AREA 14
AREA 12
AREA 4
AREA 2
GREEN SPINE
COMMUNAL OPEN
SPACE
RL 76.50
L10 ROOF
RL 108.050
COMMUNAL
OPEN SPACE
L12 ROOF RL 114.700
L4 ROOF
RL 85.950
GL TERRACE
RL 70.20
RL 115.700
RL 114.700
RL 75.39
RL 69.09
RL 70.76
RL 71.24
RL 72.2
RL 73.33
RL 74.19
RL 74.82
RL 74.64
RL 75.11
RL 75.43
RL 75.71
RL 76.50
MARSHALL AVE
MARSHALL LN
PUBLIC OPEN
SPACE
400M²
HOLDSWORTH AVE
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Title 00-GENERAL INFORMATION
SITE PLAN
Drawing Number DA-00-0003
Revision D


1
DA-30-0003
1
DA-30-0002
1
DA-30-0001
1025
5800
6200
11000
5500
1.4
1.8
6000
4000
29 CAR PARKINGS
B4 RL 56.80
LIFTS
LOBBY
FP53
MB MB
ST
FIRE PROTECTION LINE
LDP FREIGHT CONTROL LINE

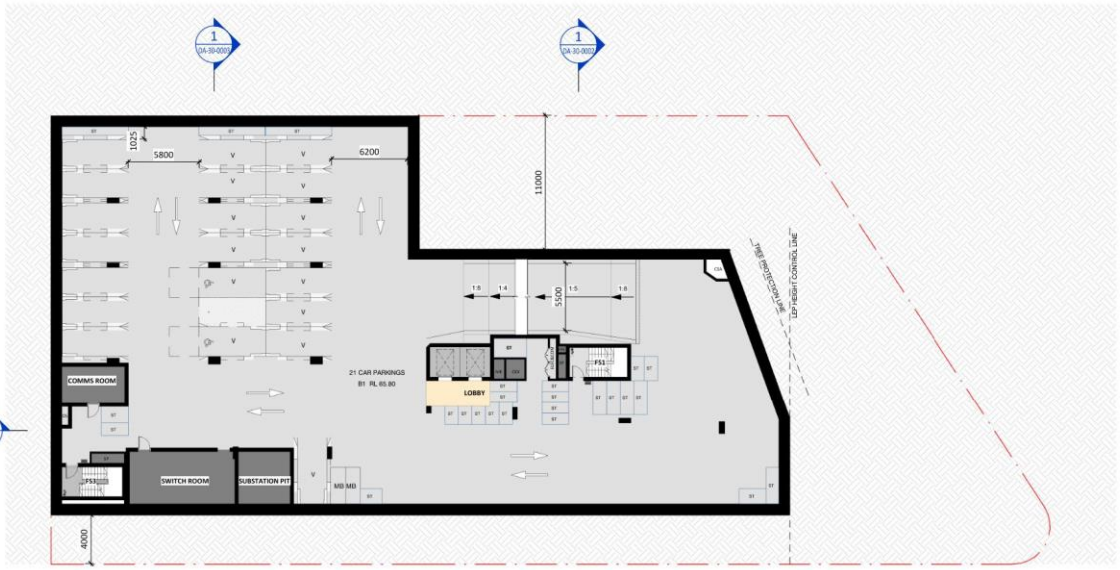

2.4 m
5.4 m
RESIDENTIAL PARKING
V - VISITOR
2.4 m
2.4 m
5.4 m
ACCESSIBLE PARKING
1.2 m
3.0 m
MB
MOTORBIKE PARKING
ST
STORAGE CAGE

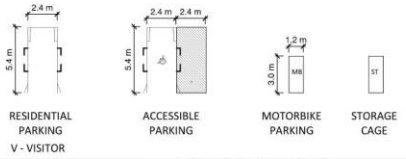

N
A3
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Drawing Number DA-09-0010
Revision B
10-GENERAL ARRANGEMENT PLANS
LEVEL B4 PLAN


1
DA-30-0003
1
DA-30-0002
1
DA-30-0001
1025
5800
6200
11000
5500
1.4
1.8
6000
4000
CAR PARKING
27 CAR PARKINGS
B2 RL 62.80
B3 RL 59.80
LIFTS
LOBBY
FP51
MB MB
ST
FIRE PROTECTION LINE
LDP FREIGHT CONTROL LINE


2.4 m
5.4 m
RESIDENTIAL PARKING
V - VISITOR
2.4 m
2.4 m
5.4 m
ACCESSIBLE PARKING
1.2 m
3.0 m
MB
MOTORBIKE PARKING
ST
STORAGE CAGE

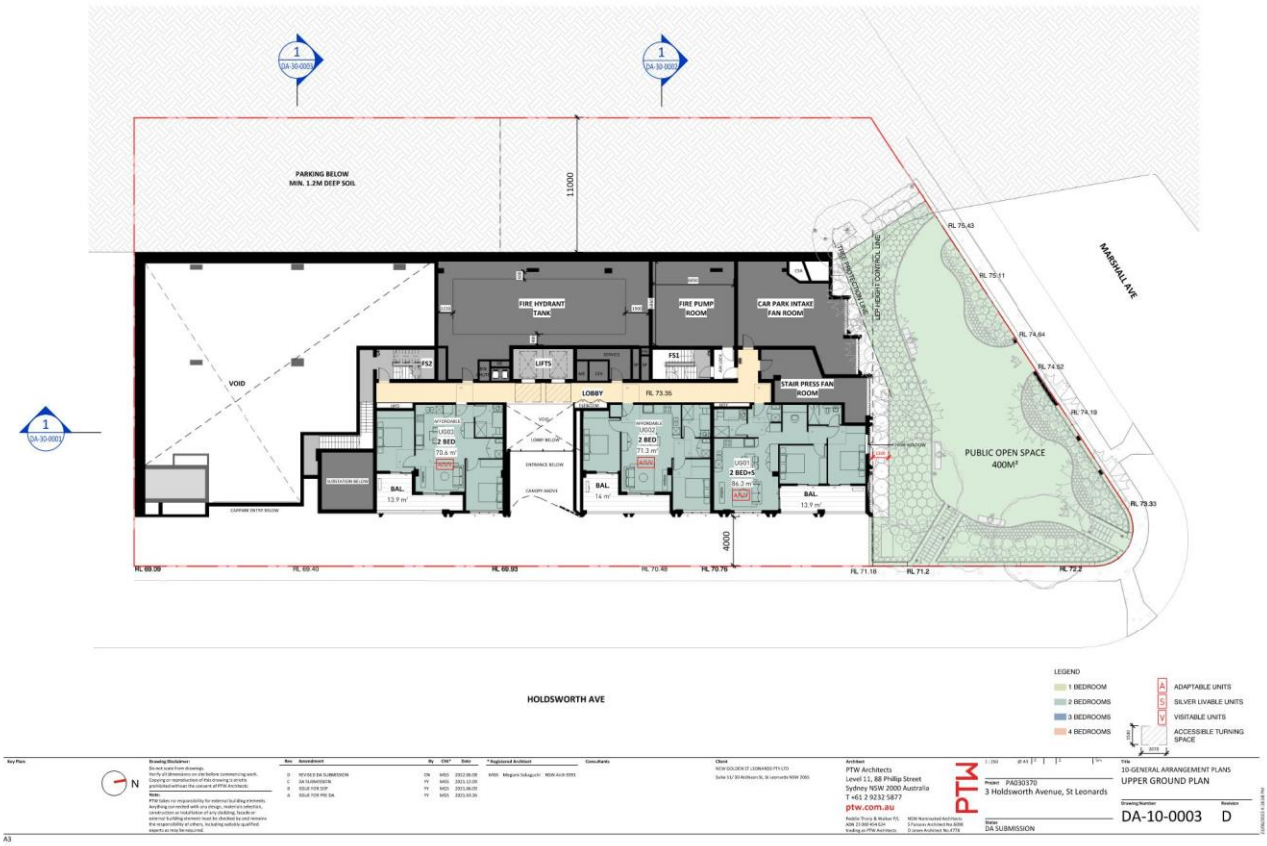

N
A3
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Drawing Number DA-09-0030
Revision B
10-GENERAL ARRANGEMENT PLANS
LEVEL B3-B2 PLAN

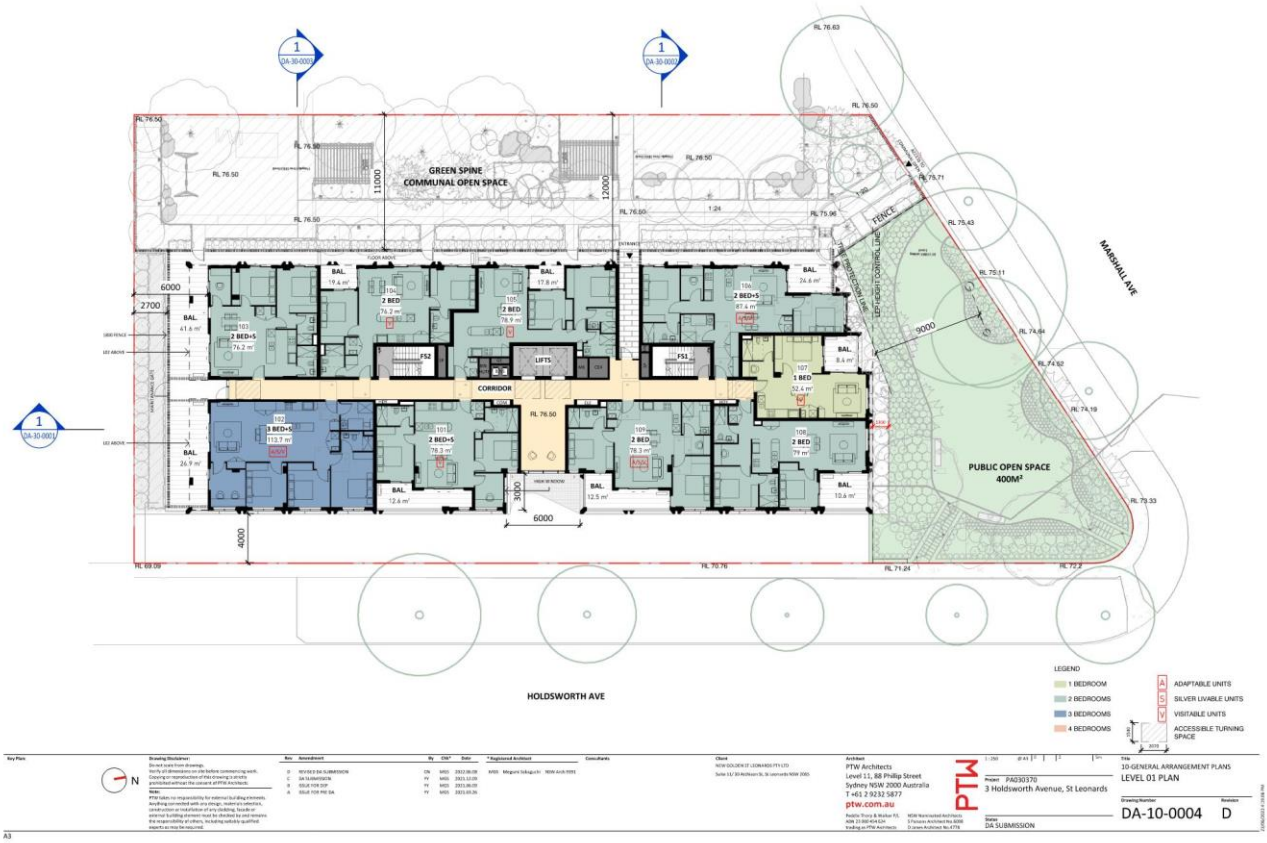

1
DA-30-0003
1
DA-30-0003
1
DA-30-0001
1025
5800
6200
11000
5500
4000
COMMS ROOM
21 CAR PARKINGS
B1 RL 65.80
LOBBY
SWITCH ROOM
SUBSTATION PIT
MB
MB
FS1
FS2
PBP PROTECTION LINE
LDP HEIGHT CONTROL LINE


2.4 m
5.4 m
RESIDENTIAL PARKING
V - VISITOR
2.4 m
2.4 m
5.4 m
ACCESSIBLE PARKING
1.2 m
3.0 m
MB
MOTORBIKE PARKING
ST
STORAGE CAGE

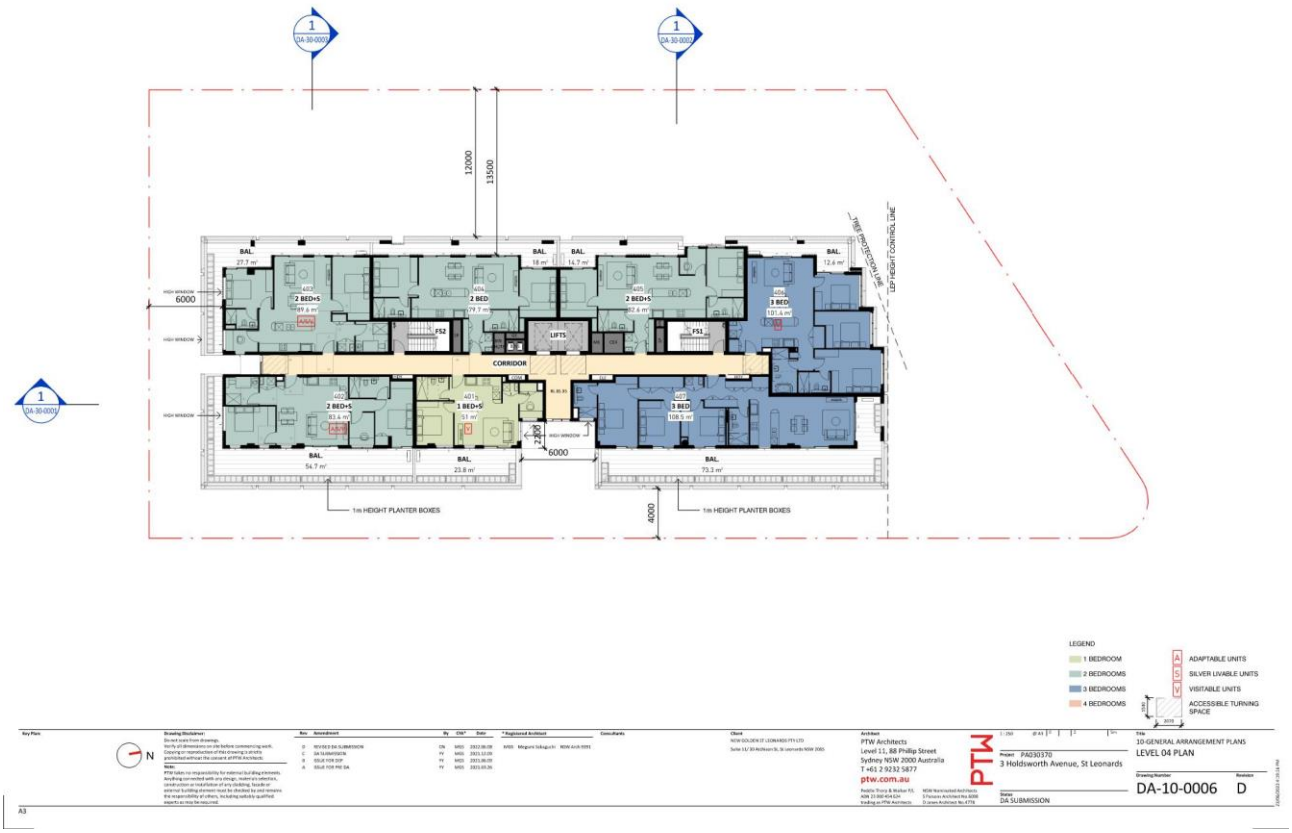

N
A3
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Title 10-GENERAL ARRANGEMENT PLANS
LEVEL B1 PLAN
Drawing Number DA-09-0040
Revision B


1
DA-30-0003
1
DA-30-0003
1
DA-30-0001
GARBAGE HOLDING ROOM
6 VISITOR PARKING
2000
6550
11000
MRV
LOADING
BULK GOOD
11 VISITOR BICYCLE
RL 68.90
5500
OSD TANK
RAIN WATER TANK
RL 70.40
RL 70.20
LIFTS
LOBBY
FS1
CAR WASH BAY
SUBSTATION
FHBV
HARD PAVING
BAL.
LG01
2 BED
LG02
2 BED
LG01
2 BED
4000
6000
1.20
1.40
RL 68.650
RL 68.780
RL 68.613
RL 68.743
RL 68.450
RL 68.740
RL 69.93
RL 70.70
RL 71.18
RL 71.2
RL 72.2
RL 73.33
PBP PROTECTION LINE
LDP HEIGHT CONTROL LINE
HOLDSWORTH AVE
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
N
A3
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Title 10-GENERAL ARRANGEMENT PLANS
LOWER GROUND PLAN
Drawing Number DA-10-0001
Revision D


PARKING BELOW
MIN. 1.2M DEEP SOIL
11000
FIRE HYDRANT TANK
FIRE PUMP ROOM
CAR PARK INTAKE FAN ROOM
LIFTS
FS1
FS2
LOBBY
STAIR PRESS FAN ROOM
VOID
PUBLIC OPEN SPACE
400M²
MARSHALL AVE
HOLDSWORTH AVE
4000
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
UPPER GROUND PLAN
DA-10-0003
D
DA SUBMISSION


GREEN SPINE
COMMUNAL OPEN SPACE
11000
12000
CORRIDOR
LIFTS
FS1
FS2
FENCE
PUBLIC OPEN SPACE
400M²
MARSHALL AVE
HOLDSWORTH AVE
4000
6000
9000
3000
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 01 PLAN
DA-10-0004
D
DA SUBMISSION


12000
4200
4500
CORRIDOR
LIFTS
6000
3000
4000
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PA030370
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 02-03 PLAN
DA-10-0005
D
DA SUBMISSION
A3

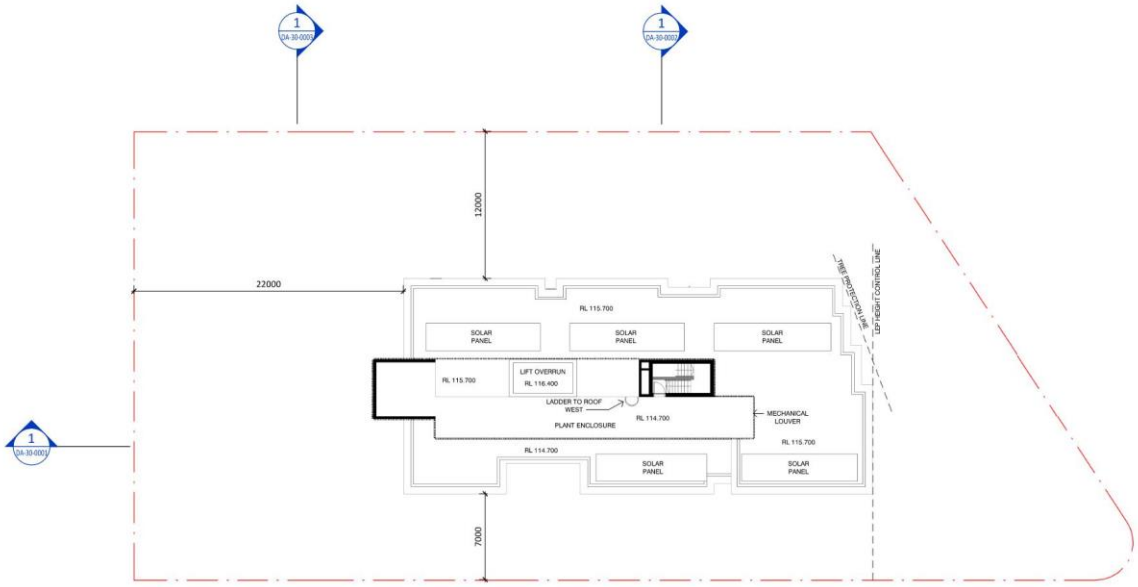

12000
13500
CORRIDOR
LIFTS
6000
1m HEIGHT PLANTER BOXES
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PA030370
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 04 PLAN
DA-10-0006
D
DA SUBMISSION
A3


12000
5700
6000
2200
6000
CORRIDOR
LIFTS
FS1
FS2
1 BED
2 BED
1 BED+S
3 BED
BAL.
LEP HEIGHT CONTROL LINE
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PA030370
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 05-06 PLAN
DA-10-0007
D
DA SUBMISSION

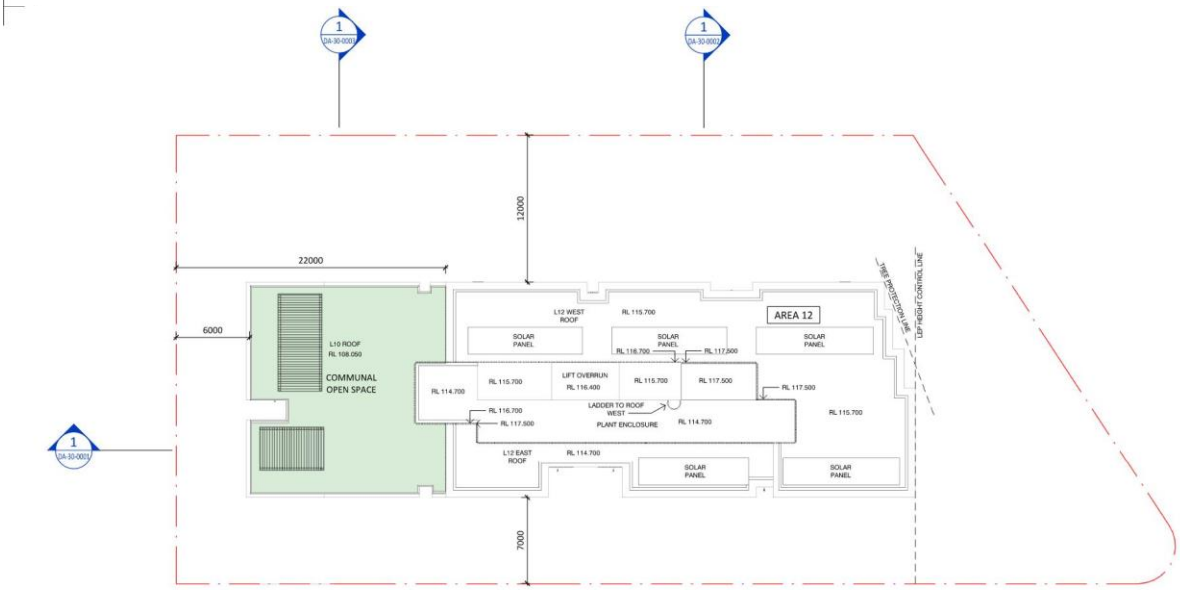

12000
5700
6000
2200
6000
7000
CORRIDOR
RL 111.20
LIFTS
FS1
FS2
1 BED
2 BED
3 BED
4 BED
BAL.
LEP HEIGHT CONTROL LINE
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PA030370
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 07-10 PLAN
DA-10-0009
B
DA SUBMISSION


12000
22000
19000
COMMUNAL
OPEN SPACE
CORRIDOR
LIFTS
RL 108.50
6000
7000
2200
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 11 PLAN
DA-10-0012
D
DA SUBMISSION


12000
22000
19000
CORRIDOR
LIFTS
RL 111.20
6000
7000
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
3 Holdsworth Avenue, St Leonards
10-GENERAL ARRANGEMENT PLANS
LEVEL 12 PLAN
DA-10-0013
D
DA SUBMISSION


1
DA-30-0003
12000
22000
RL 115.700
SOLAR PANEL
SOLAR PANEL
SOLAR PANEL
RL 115.700
LIFT OVERRUN
RL 116.400
LADDER TO ROOF
WEST
PLANT ENCLOSURE
RL 114.700
MECHANICAL LOUVER
RL 115.700
RL 114.700
SOLAR PANEL
SOLAR PANEL
7000
NEW PROTECTION LINE
LEP HEIGHT CONTROL LINE


PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PTW
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Title 10-GENERAL ARRANGEMENT PLANS
PLANT PLAN
Drawing Number DA-10-0014
Revision A


1
DA-30-0003
12000
22000
6000
L10 ROOF
RL 108.050
COMMUNAL OPEN SPACE
L12 WEST ROOF
RL 115.700
AREA 12
SOLAR PANEL
SOLAR PANEL
SOLAR PANEL
RL 118.700
RL 117.300
RL 115.700
LIFT OVERRUN
RL 116.400
RL 115.700
RL 117.500
RL 114.700
RL 117.500
RL 116.700
LADDER TO ROOF
WEST
RL 117.500
PLANT ENCLOSURE
RL 114.700
RL 115.700
L12 EAST ROOF
RL 114.700
SOLAR PANEL
SOLAR PANEL
7000
NEW PROTECTION LINE
LEP HEIGHT CONTROL LINE


PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PTW
Project PA030370
3 Holdsworth Avenue, St Leonards
Status DA SUBMISSION
Title 10-GENERAL ARRANGEMENT PLANS
ROOF PLAN
Drawing Number DA-10-0015
Revision C

ALL HIGH WINDOW
+1800 FROM FFL

EXTERNAL FINISHES

D1 - BRICK
D2 - COLORBOND CLADDING (DARK BLUE)
D3 - BALUSTRADE (CLEAR GLASS)
D4 - BALUSTRADE (DARK GREY)
D5 - CONCRETE/CFC PANEL PAINT FINISH (DARK BLUE)
D6 - CONCRETE/CFC PANEL PAINT FINISH (LIGHT GREY)
D7 - ALUMINIUM FENCE (DARK GREY)
D8 - ALUMINIUM LOUVRE (DARK GREY)
D9 - ALUMINIUM WINDOW FRAME (DARK GREY)
D10 - SANDSTONE CLADDING
D11 - PERFORATED MESH SCREEN (COPPER OR SIMILAR)
D12 - CONCRETE/CFC PANEL PAINT FINISH (DARK BROWN)
D13 - ALUMINIUM MECHANICAL LOUVRE (DARK GREY)
D14 - ALUMINIUM SLOTS (TIMBER LOOK)
D15 - ALUMINIUM SLOTS (DARK GREY)

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

PTW

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 20-ELEVATIONS NORTH ELEVATION

Drawing Number DA-20-0001 Revision D

Status DA SUBMISSION

ALL HIGH WINDOW
+1800 FROM FFL

EXTERNAL FINISHES

D1 - BRICK
D2 - COLORBOND CLADDING (DARK BLUE)
D3 - BALUSTRADE (CLEAR GLASS)
D4 - BALUSTRADE (DARK GREY)
D5 - CONCRETE/CFC PANEL PAINT FINISH (DARK BLUE)
D6 - CONCRETE/CFC PANEL PAINT FINISH (LIGHT GREY)
D7 - ALUMINIUM FENCE (DARK GREY)
D8 - ALUMINIUM LOUVRE (DARK GREY)
D9 - ALUMINIUM WINDOW FRAME (DARK GREY)
D10 - SANDSTONE CLADDING
D11 - PERFORATED MESH SCREEN (COPPER OR SIMILAR)
D12 - CONCRETE/CFC PANEL PAINT FINISH (DARK BROWN)
D13 - ALUMINIUM MECHANICAL LOUVRE (DARK GREY)
D14 - ALUMINIUM SLOTS (TIMBER LOOK)
D15 - ALUMINIUM SLOTS (DARK GREY)

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

PTW

Project PA030370
3 Holdsworth Avenue, St Leonards

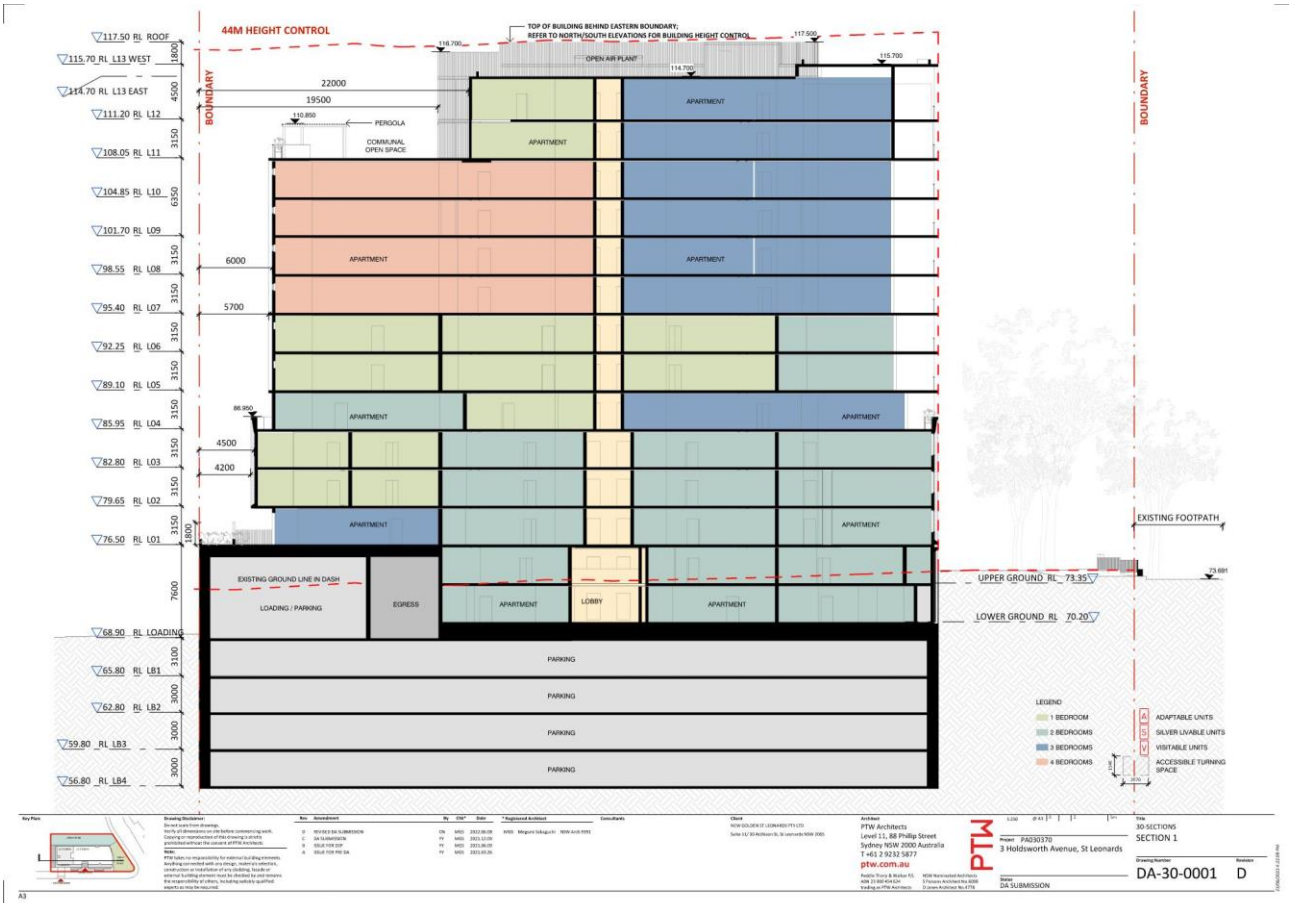
Title 20-ELEVATIONS SOUTH ELEVATION

Drawing Number DA-20-0002 Revision D

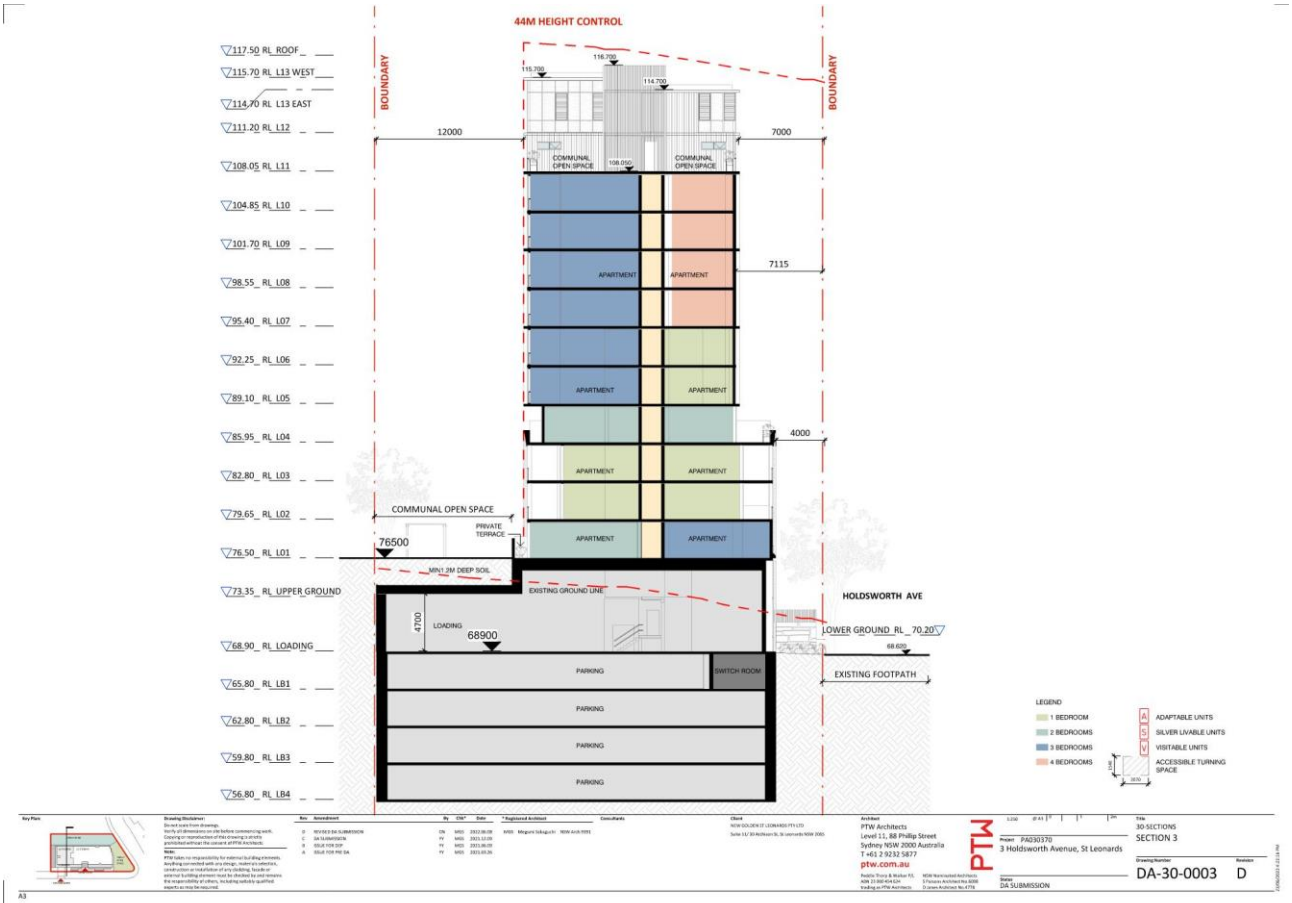
Status DA SUBMISSION


BOUNDARY
BOUNDARY
TOP OF BUILDING BEHIND EASTERN BOUNDARY;
REFER TO NORTH/SOUTH ELEVATIONS FOR BUILDING HEIGHT CONTROL
44M HEIGHT CONTROL
PERGOLA
COMMUNAL OPEN SPACE
APPROX. OVERLAND FLOW
69000
69700
72218
ALL HIGH WINDOW +1800 FROM FFL
EXTERNAL FINISHES
01 - BRICK
02 - COLORBOND CLADDING (DARK BLUE)
03 - BALUSTRADE (CLEAR GLASS)
04 - BALUSTRADE (DARK GREY)
05 - CONCRETE/CFC PANEL PAINT FINISH (DARK BLUE)
06 - CONCRETE/CFC PANEL PAINT FINISH (LIGHT GREY)
07 - ALUMINIUM FENCE (DARK GREY)
08 - ALUMINIUM LOUVRE (DARK GREY)
09 - ALUMINIUM WINDOW FRAME (DARK GREY)
10 - SANDSTONE CLADDING
11 - PERFORATED MESH SCREEN (COPPER OR SIMILAR)
12 - CONCRETE/CFC PANEL PAINT FINISH (DARK BROWN)
13 - ALUMINIUM MECHANICAL LOUVRE (DARK GREY)
14 - ALUMINIUM SLOTS (TIMBER LOOK)
15 - ALUMINIUM SLOTS (DARK GREY)
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PTW
PA030370
3 Holdsworth Avenue, St Leonards
20-ELEVATIONS
EAST ELEVATION
DA-20-0003
D
DA SUBMISSION


BOUNDARY
BOUNDARY
44M HEIGHT CONTROL
COMMUNAL OPEN SPACE
PERGOLA
AREA 14
ALL HIGH WINDOW +1800 FROM FFL
EXTERNAL FINISHES
01 - BRICK
02 - COLORBOND CLADDING (DARK BLUE)
03 - BALUSTRADE (CLEAR GLASS)
04 - BALUSTRADE (DARK GREY)
05 - CONCRETE/CFC PANEL PAINT FINISH (DARK BLUE)
06 - CONCRETE/CFC PANEL PAINT FINISH (LIGHT GREY)
07 - ALUMINIUM FENCE (DARK GREY)
08 - ALUMINIUM LOUVRE (DARK GREY)
09 - ALUMINIUM WINDOW FRAME (DARK GREY)
10 - SANDSTONE CLADDING
11 - PERFORATED MESH SCREEN (COPPER OR SIMILAR)
12 - CONCRETE/CFC PANEL PAINT FINISH (DARK BROWN)
13 - ALUMINIUM MECHANICAL LOUVRE (DARK GREY)
14 - ALUMINIUM SLOTS (TIMBER LOOK)
15 - ALUMINIUM SLOTS (DARK GREY)
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PTW
PA030370
3 Holdsworth Avenue, St Leonards
20-ELEVATIONS
WEST ELEVATION
DA-20-0004
D
DA SUBMISSION


44M HEIGHT CONTROL
TOP OF BUILDING BEHIND EASTERN BOUNDARY, REFER TO NORTH/SOUTH ELEVATIONS FOR BUILDING HEIGHT CONTROL
117.50 RL ROOF
115.70 RL L13 WEST
114.70 RL L13 EAST
111.20 RL L12
108.05 RL L11
104.85 RL L10
101.70 RL L09
98.55 RL L08
95.40 RL L07
92.25 RL L06
89.10 RL L05
85.95 RL L04
82.80 RL L03
79.65 RL L02
76.50 RL L01
68.90 RL LOADING
65.80 RL LB1
62.80 RL LB2
59.80 RL LB3
56.80 RL LB4
BOUNDARY
22000
19500
PERGOLA
COMMUNAL OPEN SPACE
OPEN AIR PLANT
APARTMENT
6000
5700
4500
4200
EXISTING GROUND LINE IN DASH
LOADING / PARKING
EGRESS
LOBBY
PARKING
EXISTING FOOTPATH
UPPER GROUND RL 73.35
LOWER GROUND RL 70.20
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW
30-SECTIONS
SECTION 1
DA-30-0001
D


44M HEIGHT CONTROL
117.50 RL ROOF
115.70 RL L13 WEST
114.70 RL L13 EAST
111.20 RL L12
108.05 RL L11
104.85 RL L10
101.70 RL L09
98.55 RL L08
95.40 RL L07
92.25 RL L06
89.10 RL L05
85.95 RL L04
82.80 RL L03
79.65 RL L02
76.50 RL L01
73.35 RL UPPER GROUND
70.20 RL LOWER GROUND
65.80 RL LB1
62.80 RL LB2
59.80 RL LB3
56.80 RL LB4
BOUNDARY
SOLAR PANEL
SERVICE ENCLOSURE
APARTMENT
12000
7000
4000
11000
CORRIDOR
COMMUNAL OPEN SPACE
PRIVATE TERRACE
EXISTING GROUND LINE
SERVICE
STAIRS
RAMP
PARKING
EXISTING GROUND LINE IN DASH
EXISTING FOOTPATH
LEGEND
1 BEDROOM
2 BEDROOMS
3 BEDROOMS
4 BEDROOMS
ADAPTABLE UNITS
SILVER LIVABLE UNITS
VISITABLE UNITS
ACCESSIBLE TURNING SPACE
PTW
30-SECTIONS
SECTION 2
DA-30-0002
D



1 UNIT UG01 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT UG01

2 UNIT UG02 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT UG02

3 UNIT UG03 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT UG03

4 UNIT UG01 POST-ADAPTABLE
1 : 200 @A3

UNIT UG01

5 UNIT UG02 POST-ADAPTABLE
1 : 200 @A3

UNIT UG02

6 UNIT UG03 POST-ADAPTABLE
1 : 200 @A3

UNIT UG03

ADAPTABLE / SILVER LIVABLE/ VISITABLE UNIT SCHEDULE		
NUMBER	TYPE	ADP/LIV/VIS
UPPER GROUND		
UG01	2B	A/S/V
UG02	2B	A/S/V
UG03	2B	A/S/V
L01		
102	3B	A/S/V
106	2B	A/S/V
109	2B	A/S/V
L02		
202	1B	A/S/V
204	1B	A/S/V
211	2B	A/S/V
L03		
302	1B	A/S/V
304	1B	A/S/V
311	2B	A/S/V
L04		
402	2B	A/S/V
403	2B	A/S/V
L05		
503	3B	A/S/V
L06		
603	3B	A/S/V
L07		
702	3B	A/S/V
L08		
802	3B	A/S/V
L09		
902	3B	A/S/V
L10		
1002	3B	A/S/V
TOTAL: 20		

LIVABLE CIRCULATION CLEARANCE
VISITABLE CIRCULATION CLEARANCE
ADAPTABLE CIRCULATION CLEARANCE

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
PA030370
3 Holdsworth Avenue, St Leonards
50-ADDITIONAL DETAIL
ADAPTABLE/SILVER LIVABLE UNITS
DA-50-2000
B
DA SUBMISSION

1 UNIT 102 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 102

2 UNIT 106 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 106

3 UNIT 109 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 109
UNIT 211
UNIT 311

4 UNIT 202 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 202
UNIT 302

5 UNIT 102 POST-ADAPTABLE
1 : 200 @A3

UNIT 102

6 UNIT 106 POST-ADAPTABLE
1 : 200 @A3

UNIT 106

7 UNIT 109 POST-ADAPTABLE
1 : 200 @A3

UNIT 109
UNIT 211
UNIT 311

8 UNIT 202 POST-ADAPTABLE
1 : 200 @A3

UNIT 202
UNIT 302

LIVABLE CIRCULATION CLEARANCE
VISITABLE CIRCULATION CLEARANCE
ADAPTABLE CIRCULATION CLEARANCE

1 UNIT 204 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 204
UNIT 304

2 UNIT 402 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 402

3 UNIT 403 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 403

4 UNIT 503 PRE-ADAPTABLE/SILVER LIVABLE
1 : 200 @A3

UNIT 503
UNIT 603
UNIT 702
UNIT 802
UNIT 902
UNIT 1002

5 UNIT 204 POST-ADAPTABLE
1 : 200 @A3

UNIT 204
UNIT 304

6 UNIT 402 POST-ADAPTABLE
1 : 200 @A3

UNIT 402

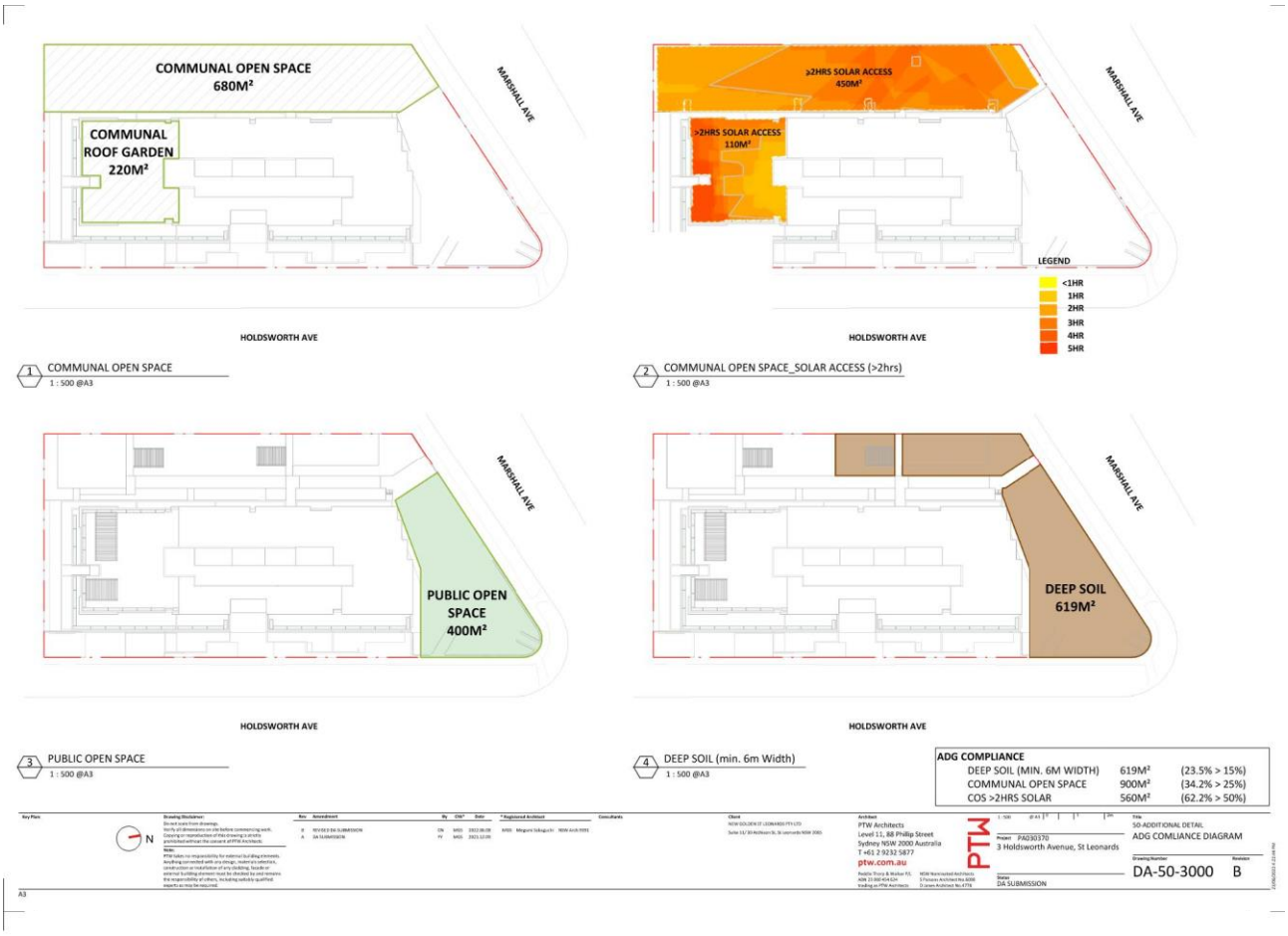
7 UNIT 403 POST-ADAPTABLE
1 : 200 @A3

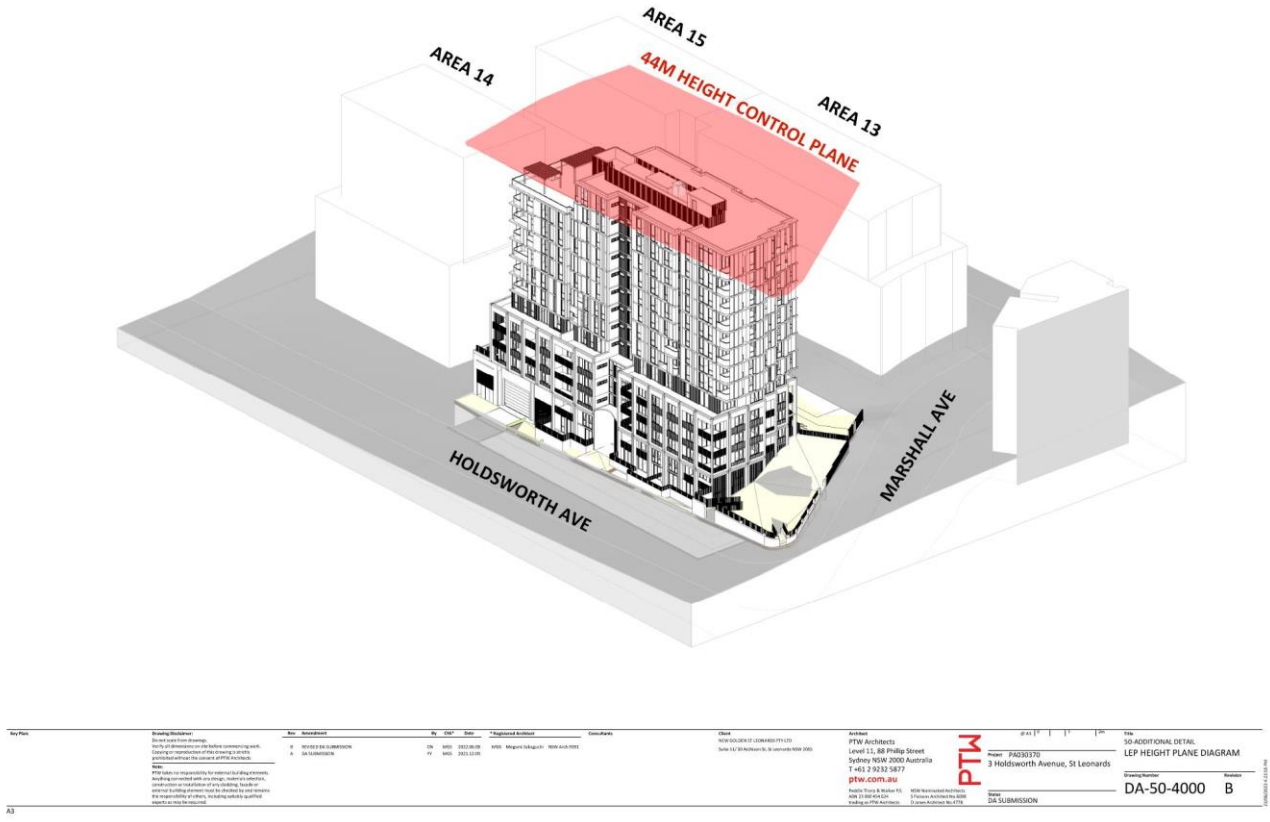
UNIT 403

8 UNIT 503 POST-ADAPTABLE
1 : 200 @A3

UNIT 503
UNIT 603
UNIT 702
UNIT 802
UNIT 902
UNIT 1002

LIVABLE CIRCULATION CLEARANCE
VISITABLE CIRCULATION CLEARANCE
ADAPTABLE CIRCULATION CLEARANCE


COMMUNAL OPEN SPACE
680M²
COMMUNAL
ROOF GARDEN
220M²
MARSHALL AVE
HOLDSWORTH AVE
1 COMMUNAL OPEN SPACE
1 : 500 @A3
≥2HRS SOLAR ACCESS
450M²
>2HRS SOLAR ACCESS
110M²
LEGEND
<1HR
1HR
2HR
3HR
4HR
5HR
2 COMMUNAL OPEN SPACE_SOLAR ACCESS (>2hrs)
1 : 500 @A3
PUBLIC OPEN
SPACE
400M²
3 PUBLIC OPEN SPACE
1 : 500 @A3
DEEP SOIL
619M²
4 DEEP SOIL (min. 6m Width)
1 : 500 @A3
ADG COMPLIANCE
DEEP SOIL (MIN. 6M WIDTH) 619M² (23.5% > 15%)
COMMUNAL OPEN SPACE 900M² (34.2% > 25%)
COS >2HRS SOLAR 560M² (62.2% > 50%)
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
50-ADDITIONAL DETAIL
ADG COMLIANCE DIAGRAM
DA-50-3000
B
DA SUBMISSION


AREA 15
AREA 14
AREA 13
44M HEIGHT CONTROL PLANE
HOLDSWORTH AVE
MARSHALL AVE
PTW
PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au
Project PA030370
3 Holdsworth Avenue, St Leonards
50-ADDITIONAL DETAIL
LEP HEIGHT PLANE DIAGRAM
DA-50-4000
B
DA SUBMISSION

EXTERNAL FINISHES

		PRODUCT (DESIGN INTENT)
01	BRICK	GIBSON (PGH BRICK)
02	COLORBOND (DARK GREY)	DEEP OCEAN (COLORBOND)
03	BALUSTRADE (CLEAR GLASS)	-
04	BALUSTRADE (DARK GREY)	MONUMENT (INTERPON)
05	CONCRETE/CFC PANEL PAINT FINISH (DARK BLUE)	COMPANION (DULUX)
06	CONCRETE/CFC PANEL PAINT FINISH (LIGHT GREY)	PALE GREY (DULUX)
07	ALUMINIUM FENCE (DARK GREY)	MONUMENT (INTERPON)
08	ALUMINIUM LOUVRE (DARK GREY)	MONUMENT (INTERPON)
09	ALUMINIUM WINDOW FRAME (DARK GREY)	MONUMENT (INTERPON)
10	SANDSTONE CLADDING	-
11	PERFORATED MESH SCREEN	CHAMPAGNE SIMMER (INTERPON)
12	CONCRETE/CFC PANEL PAINT FINISH (DARK BROWN)	BEGGAR (DULUX)
13	ALUMINIUM MECHANICAL LOUVRE	MONUMENT (INTERPON)
14	ALUMINIUM SLOTS (TIMBER LOOK)	PREMIUM OAK (INNOWOOD)
15	ALUMINIUM SLOTS (DARK GREY)	MONUMENT (INTERPON)

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 78-MATERIALS BOARD
EXTERNAL FINISHES

Drawing Number DA-78-0001
Revision C

Status DA SUBMISSION

A3

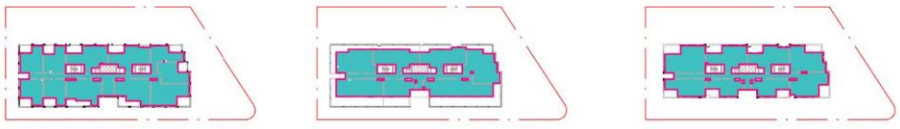
1 GFA_L00_LOWER 1 : 1000 @A3

2 GFA_L00_UPPER 1 : 1000 @A3

3 GFA_L01 1 : 1000 @A3

AREA_GFA

LEVEL	AREA
LOWER GROUND	348.84 m²
UPPER GROUND	291.1 m²
L01	844.99 m²
L02	828.48 m²
L03	828.48 m²
L04	693.37 m²
L05	676.98 m²
L06	676.98 m²
L07	684.94 m²
L08	684.94 m²
L09	684.94 m²
L10	684.94 m²
L11	482.1 m²
L12	465.75 m²
TOTAL	8876.82 m²



4 GFA_L02-03 1 : 1000 @A3

6 GFA_L04 1 : 1000 @A3

5 GFA_L05-L06 1 : 1000 @A3

9 GFA_L07-L10 1 : 1000 @A3

7 GFA_L11 1 : 1000 @A3

8 GFA_L12 1 : 1000 @A3

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 90-SCHEDULES
GFA PLANS

Drawing Number DA-90-0001
Revision C

Status DA SUBMISSION

A3

APARTMENT SCHEDULE			STORAGE SCHEDULE		LHD PERFORMANCE
UNIT NUMBER	INTERNAL AREA	EXTERNAL AREA	UNIT TYPE	INTERNAL STORAGE	ADPTABEL/SILVER LIVABLE/VISITABLE
LG01	98.2 m²	25.6 m²	2 BED	28.29 m³	V
LG02	87.3 m²	24.8 m²	2 BED	17.97 m³	V
LG03	84.6 m²	28.8 m²	2 BED	16.09 m³	V
UG01	86.3 m²	13.9 m²	2 BED+S	5.15 m³	A/S/V
UG02	71.3 m²	14 m²	2 BED	4.14 m³	A/S/V
UG03	70.6 m²	13.9 m²	2 BED	4.00 m³	A/S/V
101	78.3 m²	12.6 m²	2 BED+S	15.15 m³	V
102	113.7 m²	26.9 m²	3 BED+S	26.59 m³	A/S/V
103	76.2 m²	41.6 m²	2 BED+S	11.74 m³	
104	76.2 m²	19.4 m²	2 BED	4.06 m³	V
105	78.9 m²	17.8 m²	2 BED	4.01 m³	V
106	87.4 m²	24.6 m²	2 BED+S	16.12 m³	A/S/V
107	52.4 m²	8.4 m²	1 BED	8.61 m³	V
108	79 m²	10.6 m²	2 BED	13.69 m³	
109	78.3 m²	12.5 m²	2 BED	6.00 m³	A/S/V
201	77.7 m²	12.6 m²	2 BED+S	15.15 m³	V
202	50.5 m²	8.4 m²	1 BED	3.70 m³	A/S/V
203	53.7 m²	8.2 m²	1 BED+S	16.76 m³	V
204	56 m²	8.1 m²	1 BED+S	10.66 m³	A/S/V
205	52.6 m²	8.3 m²	1 BED	13.25 m³	V
206	77.5 m²	11 m²	2 BED	4.76 m³	V
207	76.3 m²	10.7 m²	2 BED	4.08 m³	V
208	51.3 m²	8.1 m²	1 BED	12.42 m³	V
209	52.4 m²	8.3 m²	1 BED	8.61 m³	V
210	79 m²	10.6 m²	2 BED	13.69 m³	
211	77.7 m²	12.5 m²	2 BED	6.00 m³	A/S/V
301	77.7 m²	12.6 m²	2 BED+S	15.15 m³	V
302	50.5 m²	8.4 m²	1 BED	3.70 m³	A/S/V
303	53.7 m²	8.2 m²	1 BED+S	16.76 m³	V
304	56 m²	8.1 m²	1 BED+S	10.66 m³	A/S/V
305	52.6 m²	8.3 m²	1 BED	13.25 m³	V
306	77.5 m²	11 m²	2 BED	4.76 m³	V
307	76.3 m²	10.7 m²	2 BED	4.08 m³	V
308	51.3 m²	8.1 m²	1 BED	12.42 m³	V
309	52.4 m²	8.3 m²	1 BED	8.61 m³	V
310	79 m²	10.6 m²	2 BED	13.69 m³	
311	77.7 m²	12.5 m²	2 BED	6.00 m³	A/S/V
401	51 m²	23.8 m²	1 BED+S	11.96 m³	V
402	83.4 m²	54.7 m²	2 BED+S	15.19 m³	A/S/V
403	89.6 m²	27.7 m²	2 BED+S	12.58 m³	A/S/V
404	79.7 m²	18 m²	2 BED	4.01 m³	
405	82.6 m²	14.7 m²	2 BED+S	10.33 m³	
406	101.4 m²	12.6 m²	3 BED	6.45 m³	V
407	108.5 m²	73.3 m²	3 BED	16.87 m³	
501	51.4 m²	8.3 m²	1 BED+S	10.08 m³	V
502	63.9 m²	8.2 m²	1 BED+S	22.24 m³	
503	102.7 m²	12.5 m²	3 BED	5.06 m³	A/S/V
504	77.5 m²	10.2 m²	2 BED	4.76 m³	V
505	76.1 m²	10 m²	2 BED	4.08 m³	V
506	79.6 m²	10.2 m²	2 BED	5.55 m³	
507	77.7 m²	10.4 m²	2 BED	8.51 m³	V
508	52.6 m²	8.2 m²	1 BED+S	10.08 m³	V
601	51.4 m²	8.3 m²	1 BED+S	10.08 m³	V
602	63.9 m²	8.2 m²	1 BED+S	22.24 m³	
603	102.7 m²	12.5 m²	3 BED	5.06 m³	A/S/V
604	77.5 m²	10.2 m²	2 BED	4.76 m³	V
605	76.1 m²	10 m²	2 BED	4.08 m³	V
606	79.6 m²	10.2 m²	2 BED	5.55 m³	
607	77.7 m²	10.4 m²	2 BED	8.51 m³	V
608	52.6 m²	8.2 m²	1 BED+S	10.08 m³	V
701	122.2 m²	12.3 m²	4 BED	13.54 m³	V
702	102.7 m²	12.5 m²	3 BED	5.06 m³	A/S/V
703	77.5 m²	10.2 m²	2 BED	4.76 m³	V
704	76.3 m²	10 m²	2 BED	4.08 m³	V
705	51.3 m²	8.1 m²	1 BED	12.42 m³	V
706	52.4 m²	8.3 m²	1 BED	8.61 m³	V
707	103.5 m²	12.5 m²	3 BED	15.04 m³	
801	122.2 m²	12.3 m²	4 BED	13.54 m³	V
802	102.7 m²	12.5 m²	3 BED	5.06 m³	A/S/V
803	76.9 m²	10.2 m²	2 BED	4.76 m³	V
804	75.9 m²	10 m²	2 BED	4.08 m³	V
805	51.3 m²	8.1 m²	1 BED	12.42 m³	V
806	52.4 m²	8.3 m²	1 BED	8.61 m³	V
807	103.5 m²	12.5 m²	3 BED	15.04 m³	
901	122.2 m²	12.3 m²	4 BED	13.54 m³	V
902	102.7 m²	12.5 m²	3 BED	5.06 m³	A/S/V
903	77.5 m²	10.2 m²	2 BED	4.76 m³	V
904	76.3 m²	10 m²	2 BED	4.08 m³	V
905	51.3 m²	8.1 m²	1 BED	12.42 m³	V
906	52.4 m²	8.3 m²	1 BED	8.61 m³	V
907	103.5 m²	12.5 m²	3 BED	15.04 m³	
1001	122.2 m²	12.3 m²	4 BED	13.54 m³	V
1002	102.7 m²	12.5 m²	3 BED	5.06 m³	A/S/V
1003	77.5 m²	10.2 m²	2 BED	4.76 m³	V
1004	76.3 m²	10 m²	2 BED	4.08 m³	V
1005	51.3 m²	8.1 m²	1 BED	12.42 m³	V
1006	52.4 m²	8.3 m²	1 BED	8.61 m³	V
1007	103.5 m²	12.5 m²	3 BED	15.04 m³	
1101	76.3 m²	10 m²	2 BED	4.08 m³	V
1102	106.3 m²	17.6 m²	3 BED	5.00 m³	V
1103	103.4 m²	12.5 m²	3 BED	15.04 m³	
1201	88.9 m²	8.2 m²	1 BED+S	33.15 m³	
1202	134.8 m²	15 m²	3 BED	8.06 m³	
1203	76.1 m²	10 m²	2 BED	4.08 m³	V
1204	106.3 m²	17.7 m²	3 BED	5.00 m³	V
1205	103.5 m²	12.3 m²	3 BED	15.04 m³	

APARTMENT TYPE BY LEVEL

LEVEL	UNIT TYPE 1B	2B	3B	4B	COUNT
LOWER GROUND	0	3	0	0	3
UPPER GROUND	0	3	0	0	3
L01	1	7	1	0	9
L02	6	5	0	0	11
L03	6	5	0	0	11
L04	1	4	2	0	7
L05	3	4	1	0	8
L06	3	4	1	0	8
L07	2	2	2	1	7
L08	2	2	2	1	7
L09	2	2	2	1	7
L10	2	2	2	1	7
L11	0	1	2	0	3
L12	1	1	3	0	5
TOTAL	29	45	18	4	96

DDA UNITS

ADAPTABLE	20	20.2%
SILVER LIVABLE	20	20.2%
VISITABLE	77	80.8%

CAR PARKING

	DCP MIN.	PROVIDED
RESI	90	90
VISITOR	20	20
TOTAL	110	110

BYCYLE PARKING

	DCP MIN.	PROVIDED
RESI	26	26
VISITOR	11	11
TOTAL	37	37

MOTOBIKE PARKING

TOTAL	8	8

ADG COMPLIANCE

DEEP SOIL	619M²	(23.5% > 7%)
COMMUNAL OPEN SPACE	900M²	(34.2% > 25%)
COS >2HRS SOLAR	560M²	(62.2% > 50%)
CROSS VENTILATION		(61.2% > 60%)
>2HRS SOLAR		(70.8% > 70%)

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 90-SCHEDULES
DEVELOPMENT DATA

Drawing Number DA-90-0010 Revision B

Status DA SUBMISSION

1 SOLAR_LOWER GROUND (0/3)
1 : 1000 @A3

8 SOLAR_UPPER GROUND (0/3)
1 : 1000 @A3

2 SOLAR_L01 (5/9)
1 : 1000 @A3

3 SOLAR_L02-03 (7/11)
1 : 1000 @A3

9 SOLAR_L04 (5/7)
1 : 1000 @A3

4 SOLAR_L05-06 (5/8)
1 : 1000 @A3

5 SOLAR_L07-08 (6/7)
1 : 1000 @A3

10 SOLAR_L09-10 (7/7)
1 : 1000 @A3

6 SOLAR_L11 (3/3)
1 : 1000 @A3

7 SOLAR_L12 (5/5)
1 : 1000 @A3

SOLAR ACCESS	NO. OF APARTMENTS	%
0HRS	0	0.0%
<2HRS	28	29.2%
>2HRS	68	70.8%
TOTAL	96	100.0%

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 93-SOLAR ACCESS
SOLAR ACCESS COMPLIANCE DIAGRAMS

Drawing Number DA-93-0100 Revision D

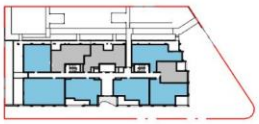
Status DA SUBMISSION

1 LOW GROUND
1 : 1000 @A3

LOWER GROUND	
NO	2
YES	1

6 UPPER GROUND
1 : 1000 @A3

UPPER GROUND	
NO	2
YES	1



2 L01
1 : 1000 @A3

L01	
NO	3
YES	6

3 L02-L03
1 : 1000 @A3

L02	
NO	5
YES	6

5 L04
1 : 1000 @A3

L04	
NO	2
YES	5

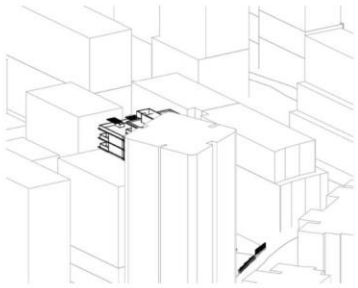
4 L05-L06
1 : 1000 @A3

L05	
NO	2
YES	6

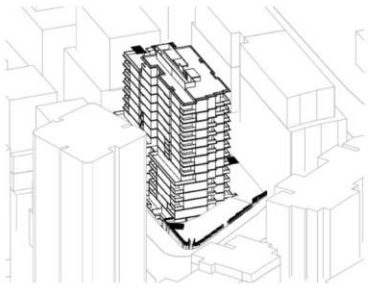
7 L07-10
1 : 1000 @A3

L07	
NO	3
YES	4

CROSS VENTILATION	NO. OF APARTMENTS	%
NO	26	38.8%
YES	41	61.2%
TOTAL	67	100.0%

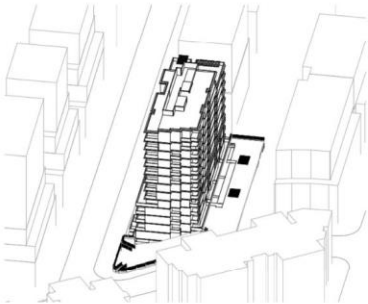


1 SOLA_21Jun0900
@A3



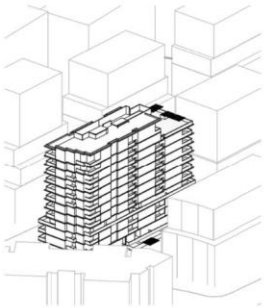
2 SOLA_21Jun1000
@A3

3 SOLA_21Jun1100
@A3

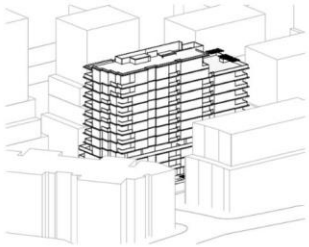


4 SOLA_21Jun1200
@A3

1 SOLA_21Jun1300
@A3



2 SOLA_21Jun1400
@A3



3 SOLA_21Jun1500
@A3

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

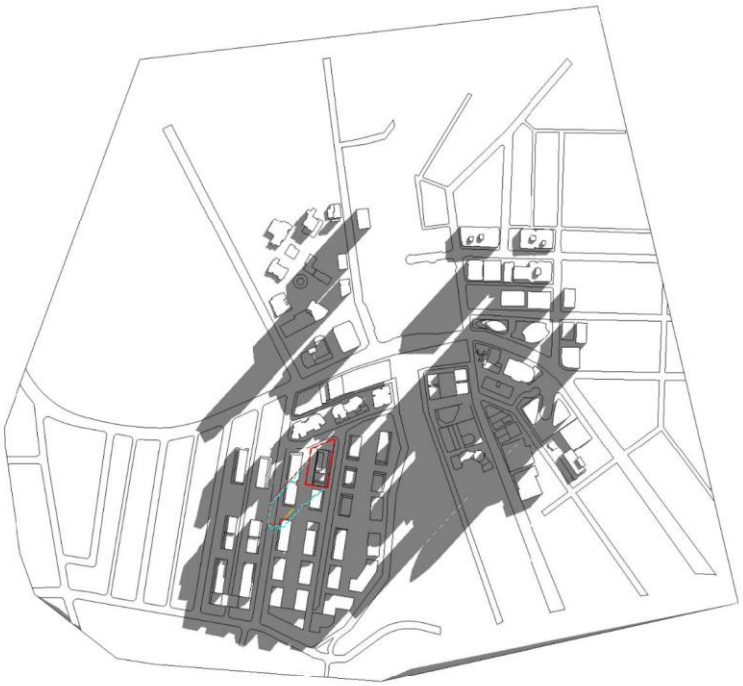
Project PA030370
3 Holdsworth Avenue, St Leonards

Title
95-SUN EYE VIEWS
SUN EYE VIEWS

Drawing Number DA-95-0102 Revision D

Status
DA SUBMISSION

A3



PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

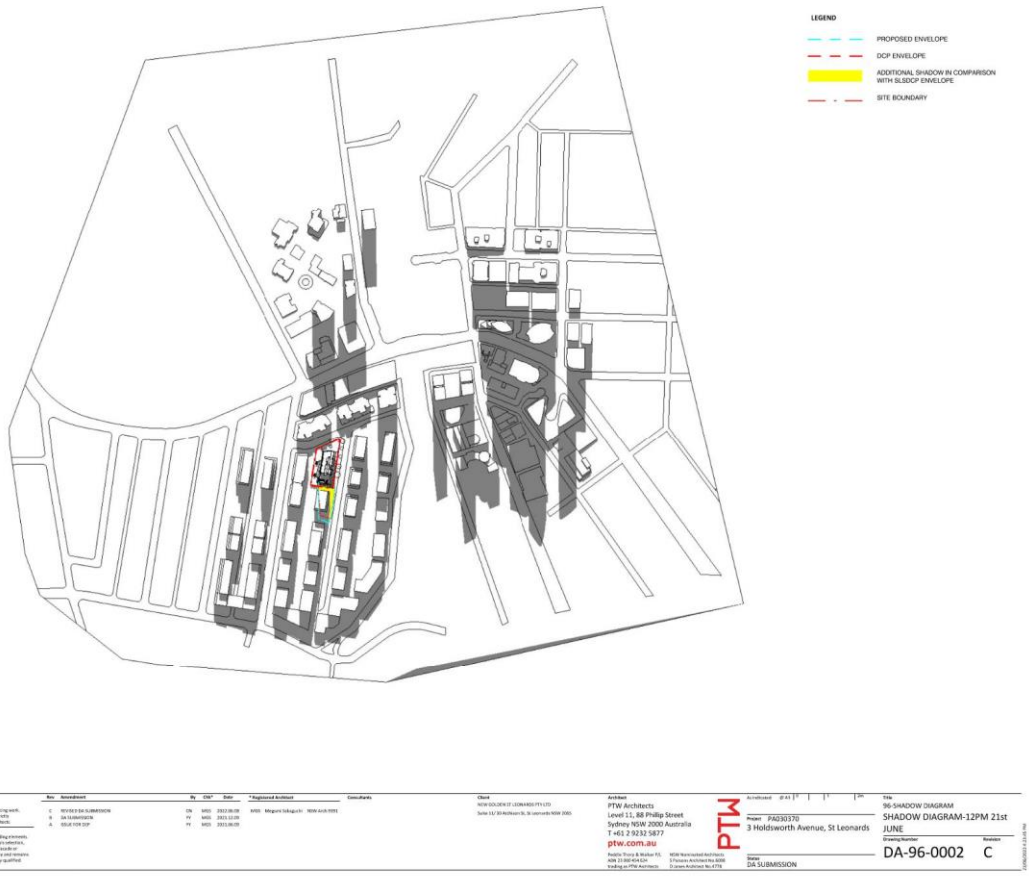
Project PA030370
3 Holdsworth Avenue, St Leonards

Title
96-SHADOW DIAGRAM
SHADOW DIAGRAM-9AM 21st JUNE

Drawing Number DA-96-0001 Revision C

Status
DA SUBMISSION

A3



PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

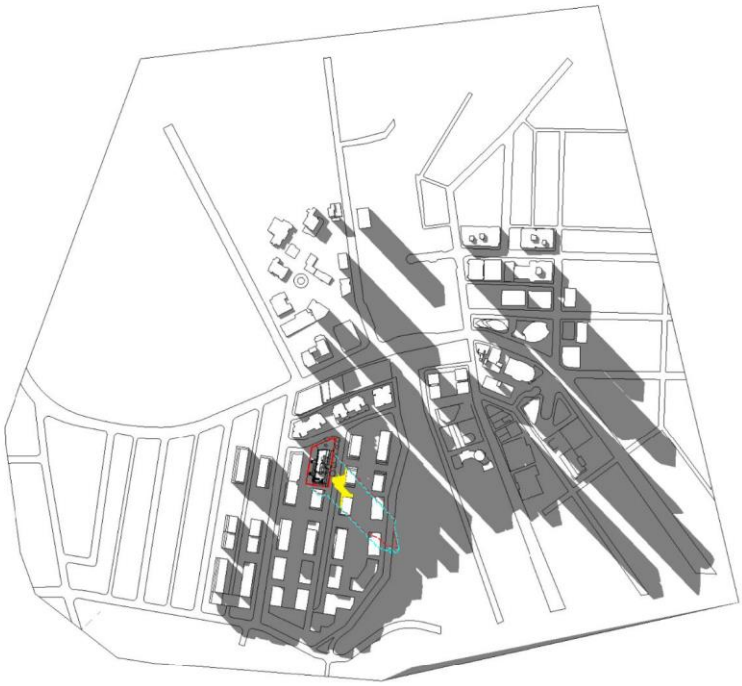
Project PA030370
3 Holdsworth Avenue, St Leonards

Title 96-SHADOW DIAGRAM
SHADOW DIAGRAM-12PM 21st JUNE

Drawing Number DA-96-0002 Revision C

Status DA SUBMISSION

A3



PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 96-SHADOW DIAGRAM
SHADOW DIAGRAM-3PM 21st JUNE

Drawing Number DA-96-0003 Revision C

Status DA SUBMISSION

A3

CORNER OF HOLDSWORTH AVENUE AND MARSHALL AVENUE

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 97-PERSPECTIVE VIEWS
PERSPECTIVE VIEW 01
NORTH EAST VIEW

Drawing Number DA-97-0001 Revision B

Status DA SUBMISSION

SOUTH EAST VIEW
HOLDSWORTH AVENUE

PTW Architects
Level 11, 88 Phillip Street
Sydney NSW 2000 Australia
T +61 2 9232 5877
ptw.com.au

Project PA030370
3 Holdsworth Avenue, St Leonards

Title 97-PERSPECTIVE VIEWS
PERSPECTIVE VIEW 02
SOUTH EAST VIEW

Drawing Number DA-97-0002 Revision B

Status DA SUBMISSION