Long Reef Mixed Use Development
DA Noise Assessment
1010 - 1014 Pittwater Road, Collaroy

Client:
Collaroy Projects Pty Ltd ATF Collaroy Projects Unit Trust

25 September 2023

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Document	Rev	Date	Prepared	Reviewed	Authorised	Approved
5448R001.BC.230722	0	20 July 2022	BC	RH	RH	RH
5448R002.BC.230921	1	25 September 2023	BC	RH	RH	

CONTENTS

GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined below.

NOISE DESCRIPTORS

dB – Decibels. The fundamental unit of sound, a Bel is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bel. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

L_{Aeq} – The A-weighted sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period. Measured in dB.

L_{Amax} – The maximum or peak A-weighted noise level that occurs over the measurement period. Measured in dB.

Indoor Design Level – The recommended maximum level in dB(A) inside a building from external noise sources.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

NOISE CHARACTER, NOISE LEVEL AND ANNOYANCE

The perception of a given sound to be deemed annoying or acceptable is greatly influenced by the character of the sound and how it contrasts with the character of the background noise. A noise source may be measured to have only a marginal difference to the background noise level, but may be perceived as annoying due to the character of the noise.

Acoustic Dynamics' analysis of noise considers both the noise level and sound character in the assessment of annoyance and impact on amenity.

1 INTRODUCTION

1.1 SUMMARY & BACKGROUND INFORMATION

Acoustic Dynamics has been engaged by **Collaroy Projects Pty Ltd ATF Collaroy Projects Unit Trust** to conduct a Development Application noise assessment of the proposed mixed-use development at 1010 - 1014 Pittwater Road, Collaroy. The site is currently occupied by commercial premises.

The scope of the noise assessment involves:

- Measurement of Ambient Noise Measurements,
- Control of traffic noise at future residences on Pittwater Road,
- Review of Mechanical Services Noise Emission, and;
- Review of internal Acoustic Amenity of future residents of the development.

The following sections of this assessment detail the methodology, assessment criteria, results and acoustical recommendations..

1.2 LOCATION & DESCRIPTION OF PROPOSED COMMERCIAL PREMISES

The proposed multilevel boarding house is to be located at 1010 - 1014 Pittwater Road, Collaroy. Acoustic Dynamics understands that the subject site is classified as Class 3 under the BCA.

The site is bounded by;

- Commercial / residential immediately to the South of the Site,
- Single residential dwellings to the East of the Site
- Pittwater Road to the West, and;
- Commercial to the North of the site.

The proposed development consists of:

- Basement carpark,
- Ground Level entrance to carpark and commercial tenancies,
- Level 1 with 11 residential dwellings,
- Level 2 with 9 residential dwellings and;
- Level 3 with 2 residential dwellings.

The site is shown on the location map, aerial photo and drawings presented within **Appendix A**.

2 AMBIENT NOISE LEVELS AND CRITERIA

Acoustic Dynamics has conducted a review of local council, state government and federal legislation that is applicable to noise assessment for the subject development. The relevant sections of the legislation are presented below.

2.1 NORTHERN BEACHES COUNCIL REQUIREMENTS

The subject site exists within the Northern Beaches Council area of NSW.

Northern Beaches council utilises the Warringah Council DCP 2011 which states the following with respect to noise in Section D3.

D3 Noise

Applies to Land

This control applies to land to which Warringah Local Environmental Plan 2011 applies.

Objectives

- *To encourage innovative design solutions to improve the urban environment.*
- *To ensure that noise emission does not unreasonably diminish the amenity of the area or result in noise intrusion which would be unreasonable for occupants, users or visitors.*

Requirements

1. *Noise from combined operation of all mechanical plant and equipment must not generate noise levels that exceed the ambient background noise by more than 5dB(A) when measured in accordance with the NSW Industrial Noise Policy at the receiving boundary of residential and other noise sensitive land uses.*
   See also NSW Industrial Noise Policy Appendices
2. *Development near existing noise generating activities, such as industry and roads, is to be designed to mitigate the effect of that noise.*
3. *Waste collection and delivery vehicles are not to operate in the vicinity of residential uses between 10pm and 6am.*
4. *Where possible, locate noise sensitive rooms such as bedrooms and private open space away from noise sources. For example, locate kitchens or service areas closer to busy road frontages and bedrooms away from road frontages.*
5. *Where possible, locate noise sources away from the bedroom areas of adjoining dwellings/properties to minimise impact.*

The above objectives have been considered in developing site specific noise criteria for this development.

2.2 TRAFFIC NOISE CRITERIA

The site is subject to the requirements of the NSW State Environmental Planning Policy (Infrastructure) 2007 – (iSEPP) which requires assessment for traffic noise intrusion when an adjacent road has more than 40,000 vehicles on an average day. Clause 102 is relevant this project and are reproduced below:

102 Impact of road noise or vibration on non-road development

(1) This clause applies to development for any of the following purposes that is on land in or adjacent to a road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 40,000 vehicles (based on the traffic volume data published on the website of the RTA) and that the consent authority considers is likely to be adversely affected by road noise or vibration:

(a) a building for residential use,
(b) a place of public worship,
(c) a hospital,
(d) an educational establishment or child care centre.

The noise criteria relevant is summarised below:

(3) If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following L_{Aeq} levels are not exceeded:

(a) in any bedroom in the building – 35 dB(A) at any time between 10pm and 7am,
(b) Anywhere else in the building (other than a garage, kitchen, bathroom or hallway) – 40 dB(A) at any time.

The Interim Guideline 2008 that has been prepared by the NSW Department of Planning also provides additional information regarding the above noise criteria. In particular it clarifies the parameter to be used for day and night. During the night an $L_{Aeq(9hr)}$ is to be used and for the day $L_{Aeq(15hr)}$.

Therefore assessment is based on the above requirements with respect the day and night periods of the Interim Guideline 2008.

2.3 AMBIENT NOISE LEVELS

To establish the acoustic environment at the subject site in accordance with the guidelines of the NSW EPA's NPfI, two unattended noise loggers were deployed at the subject development site between Friday 6 May 2022 and Friday 13 May 2022. The loggers were deployed at the following locations:

- Location A – Western Facade on Pittwater Road
- Location B – Eastern Backyard

Acoustic Dynamics advises the selected locations are likely to be representative of the existing noise environment of the nearest receivers.

The results of ambient noise monitoring are presented in **Table 2.1** and **Table 2.2**.

Table 2.1 Location A - Western Facade - Summary of External Noise Levels

Time of Day	L_{A90} Rating Background Noise Level (RBL) [dB]	Measured L_{Aeq} [dB]
Day 7:00am-6:00pm[1]	55	66
Evening 6:00pm-10:00pm	52	64
Night 10:00pm-7:00am[1]	38	61

Note: 1) Day-time period starts at 8am on Sundays and public holidays.

Table 2.2 Location B - Eastern Backyard - Summary of External Noise Levels

Time of Day	L_{A90} Rating Background Noise Level (RBL) [dB]	Measured L_{Aeq} [dB]
Day 7:00am-6:00pm[1]	43	68
Evening 6:00pm-10:00pm	41	44
Night 10:00pm-7:00am[1]	33	40

Note: 1) Day-time period starts at 8am on Sundays and public holidays.

In addition, the following traffic noise levels at the western facade of the development were determined:

- Day (15 hr) L_{Aeq} 66 dB(A)
- Night (9 hr) L_{Aeq} 61 dB(A)

2.4 SUMMARY OF APPLICABLE ASSESSMENT CRITERIA

Acoustic Dynamics advises that assessment of noise emission associated with the premises must comply with the various relevant noise criteria detailed above.

Assessment of the noise emission from the use of the premises against the most stringent applicable criteria will ensure compliance with the various other relevant criteria.

Accordingly, **Table 2.3** provides a summary of the noise emission criteria applicable to the premises, which are based on long term unattended background noise measurement at Location B which is remote from traffic noise of Pittwater Road.

Table 2.3 Site Specific Applicable Criteria – All Receivers

Time of Day	Maximum Noise Emission $L_{Aeq\ (15\text{-}min)}$ [dB]
Day 7:00am-6:00pm[1]	48
Evening 6:00pm-10:00pm	46
Night 10:00pm-7:00am[1]	38

In addition, the following facade traffic noise levels were determined.

- Day (15 hr) L_{Aeq} 66 dB(A)
- Night (9 hr) L_{Aeq} 61 dB(A)

3 NOISE EMISSION LEVELS & ASSESSMENT

The following section provides an assessment of the noise emission from the use and operation of the premises located at 1010 - 1014 Pittwater Road, Collaroy against the various noise emission criteria and objectives outlined in **Section 2** above.

3.1 NOISE EMISSION TO EXTERNAL RECEIVERS

No details of mechanical plant selection have been determined at this early stage of the project. Likely sources of mechanical noise from the proposed development will be the air-conditioning condenser units located on a pad area of the NW corner of the roof.

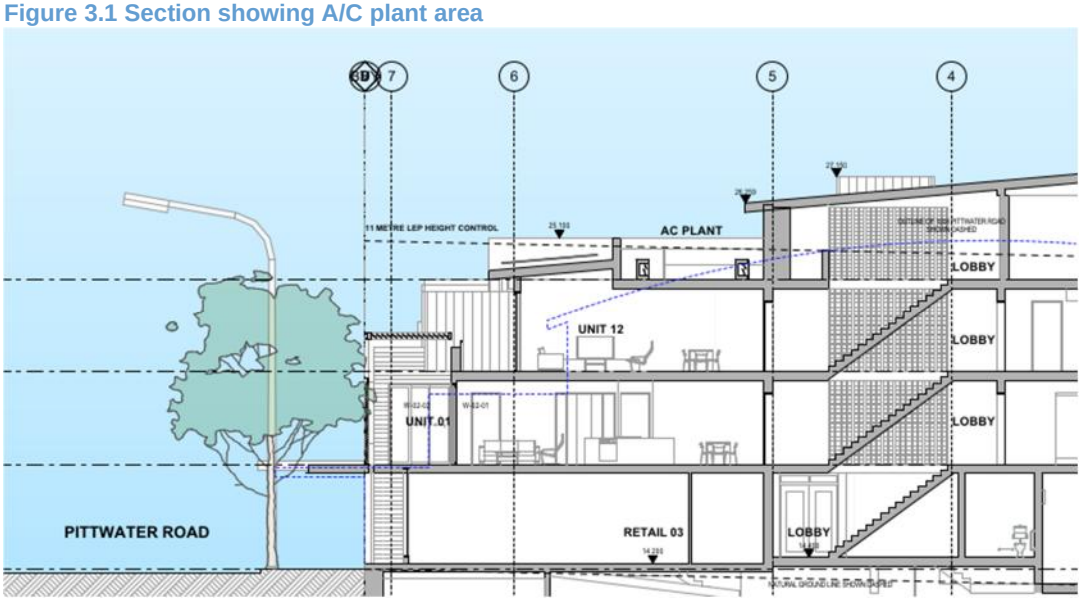
Whilst exact details of plant are not known preliminary predictions have been conducted based on the following typical noise levels of plant as follows:

- A/C Condensers 56 dB(A) at 1 m

Based on the above levels noise predictions to the nearest potentially affected residence, being the just inside the boundary of the upper-level of 1008 Pittwater Road , has been conducted based on distance, shielding from the parapet and location of plant on the roof of the development with respect to outdoor areas of 1008 Pittwater Road. Based on the above the following noise levels with all plant operating are predicted to be in the order of 35 dB(A).

Compliance is indicated for the noise criteria with a parapet / Barrier with a recessed plant area as shown in the following figure which shows the plantroom and roofline of 1008 Pittwater Road.

Figure 3.1 Section showing A/C plant area



Mechanical plant such as air-conditioning associated with the development should be assessed at the time of detailed design and selection, having regard to nearby residential and commercial properties surrounding the development and the noise criteria detailed in **Section 2.4**.

Any noise control measures can be incorporated into the development to ensure the acoustic amenity of nearby residences is protected.

3.2 ROAD TRAFFIC NOISE ASSESSMENT

The proposed development will not generate significant traffic volumes. Therefore, no appreciable increase in traffic noise is predicted at surrounding residences.

In the case of traffic noise intrusion into future apartments calculations of internal traffic noise levels at apartments have been conducted. Preliminary internal traffic noise calculations indicate that the following glazing that is above standard glazing will be required.

- Type A – 36 (R_w+C_{tr}) – 10.5mm VLam Hush Glass with seals;
  (**NB**: A double-glazed option for Type A would be – 10mm / 12mm Gap / 6.38mm (Lam))
- Type B – 32 (R_w+C_{tr}) - 6.38 mm Laminated Glass with seals;
- Type C – Standard Glazing; and
- Louvred winter gardens facing Pittwater Road – 6.38mm laminated glass.

The following table details recommended facade constructions to control traffic noise ingress to the apartments.

Table 3.1 Recommended glazing for areas where improved glazing is required

Level	Unit	Living	Bedroom	Balcony / Winter Garden
Ground	Commercial	A[2]	N/A	N/A
1	1	A / B[3]	B[3]	B
	2	B	A / B[3]	B
	3	B	A / B[3]	B
	4	A / B[3]	B	B
	5	A / B[3]	B	B
	6	A / B[3]	B	B
	7	C	C	-
	8	C	C	-
	9	C	C	-
	10	C	C	-
	11	C	C	-
2	12	A	A	-
	13	A	A	-
	14	A	A	-
	15	A	A	-
	16	A	A	-
	17	C	C	-
	18	C	C	-
	19	C	C	-
	20	C	C	-
3	21	C	C	-
	22	C	C	-

Note 1) Window framing should not degrade the performance of the selected glazing.

2) Although not required to be specified, glazing for ground floor commercial tenancies is provided.

3) Living / bedroom window that faces the balcony that is behind louvred windows, should be 6.38mm laminated glazing with louvred windows also 6.38mm laminated glazing.

4 RECOMMENDATIONS

Acoustic Dynamics' analysis and prediction calculations indicate that predicted noise emission associated with the subject development requires implementation of the following recommendations, to ensure the amenity of the surrounding area is protected.

- Glazing as detailed in **Table 3.1** is to be installed on the project; and
- The services be reviewed at detail design to ensure appropriate noise control measures on site.

5 NOISE TRANSFER BETWEEN HABITABLE AREAS OF THE DEVELOPMENT

The details of wall and floor constructions that meet the requirements of the NCC will be determined in the detail design stage of the project. Potential measures that can be adopted include:

- Masonry and / or plasterboard walls with acoustic insulation;
- Concrete floor slabs with suspended ceiling and insulation in cavities; and
- Acoustic treatment of waste water pipe work.

6 CONCLUSION

An acoustic assessment has been undertaken for the Development Application for the proposed mixed-use development at 1010 - 1014 Pittwater Road, Collaroy.

The following findings have been determined:

- Site-specific noise emission criteria have been established for the existing and future residential areas to the North, South and East of the site. It is noted that mechanical services and plant have not been selected; however, preliminary calculations indicate compliance with all established criteria can be achieved. Where necessary standard engineering noise controls can be implemented at design stage to meet established noise criteria.

- Traffic associated the development will not adversely impact on the acoustic amenity of surrounding residences.

- Apartments facing Pittwater Road will require improved glazing to ensure that the acoustic amenity of future residences is protected. Preliminary recommendations provide options for glazing.

- No special glazing is required on all other apartments.

- Internal noise isolation requirements in accordance with the NCC will be achieved by adopting appropriate constructions.

We trust that the above information meets with your requirements and expectations. Please do not hesitate to contact us on 02 9908 1270 should you require more information.

APPENDIX A – LOCATION AND DRAWINGS

1.1 SITE LOCATION

Figure A1 – Aerial Photo Showing Location

1.2 FLOOR PLANS

Figure A2 - Basement Plan

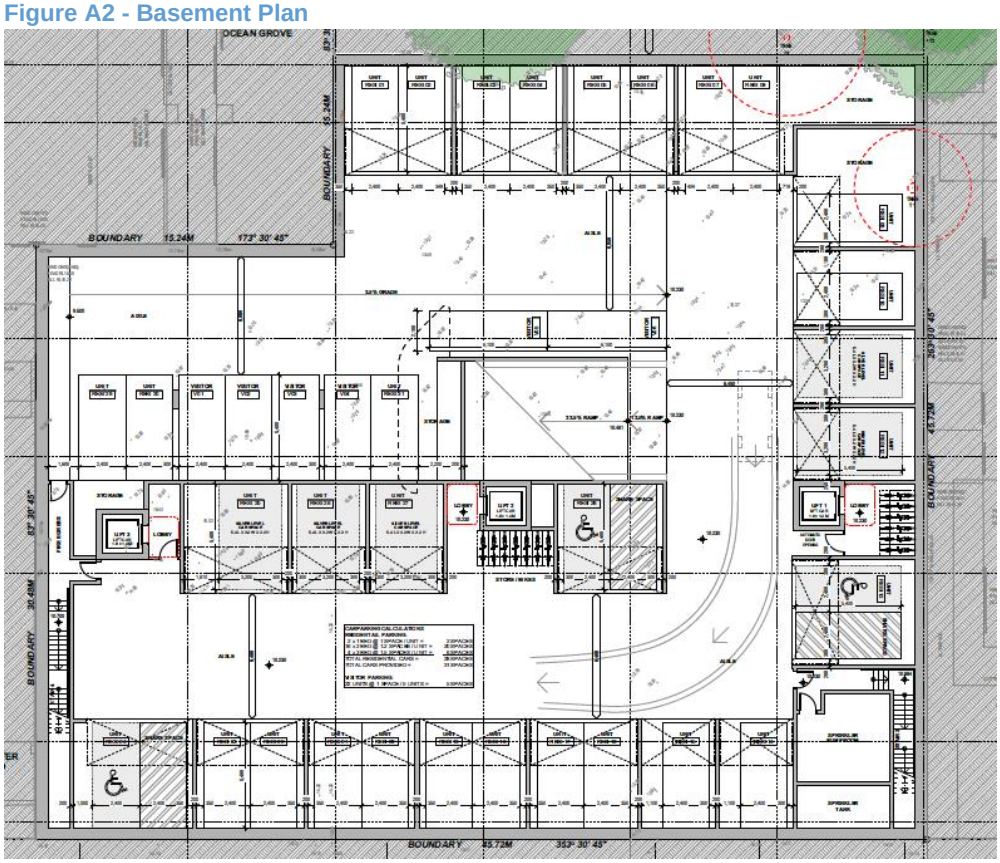


Figure A3 - Ground Floor Plan

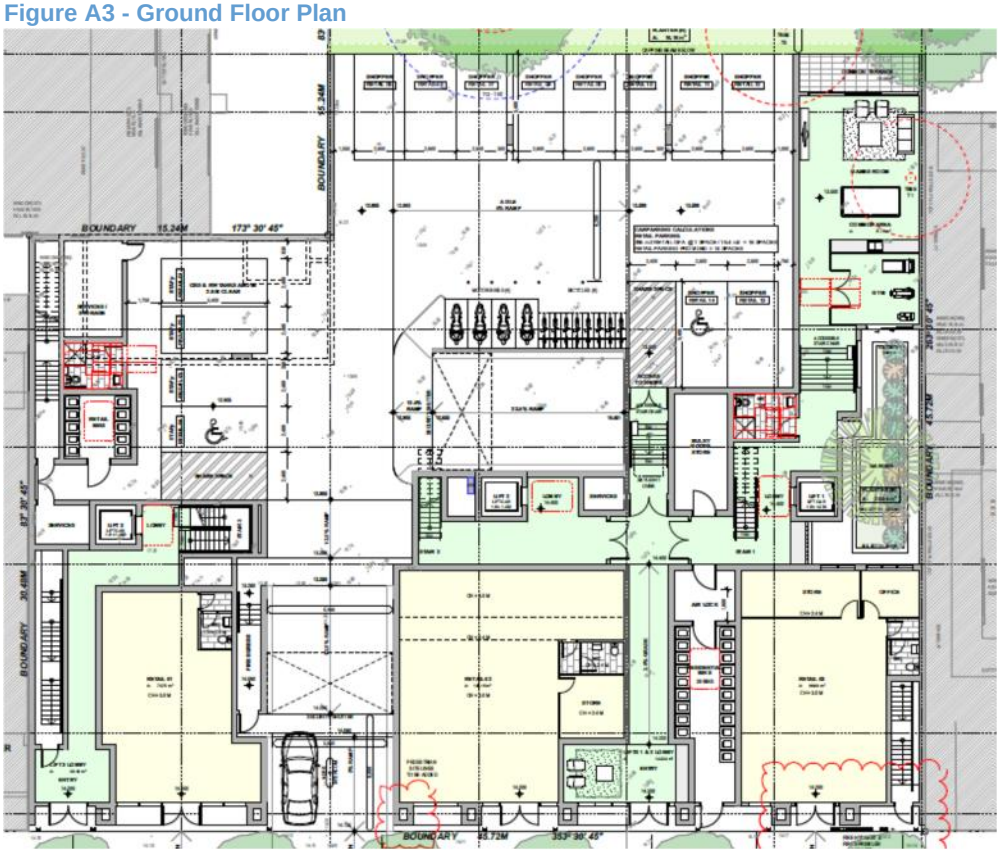


Figure A4 - Level 1 Plan

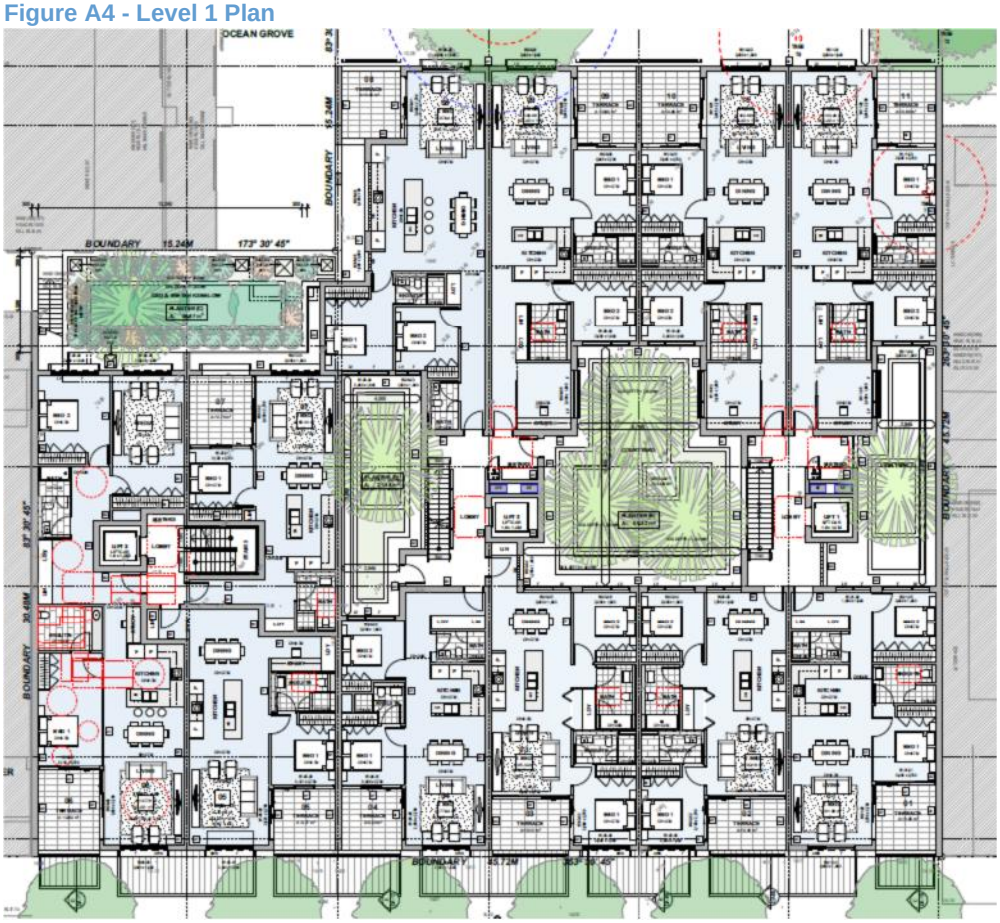


Figure A5 -Level 2 Plan

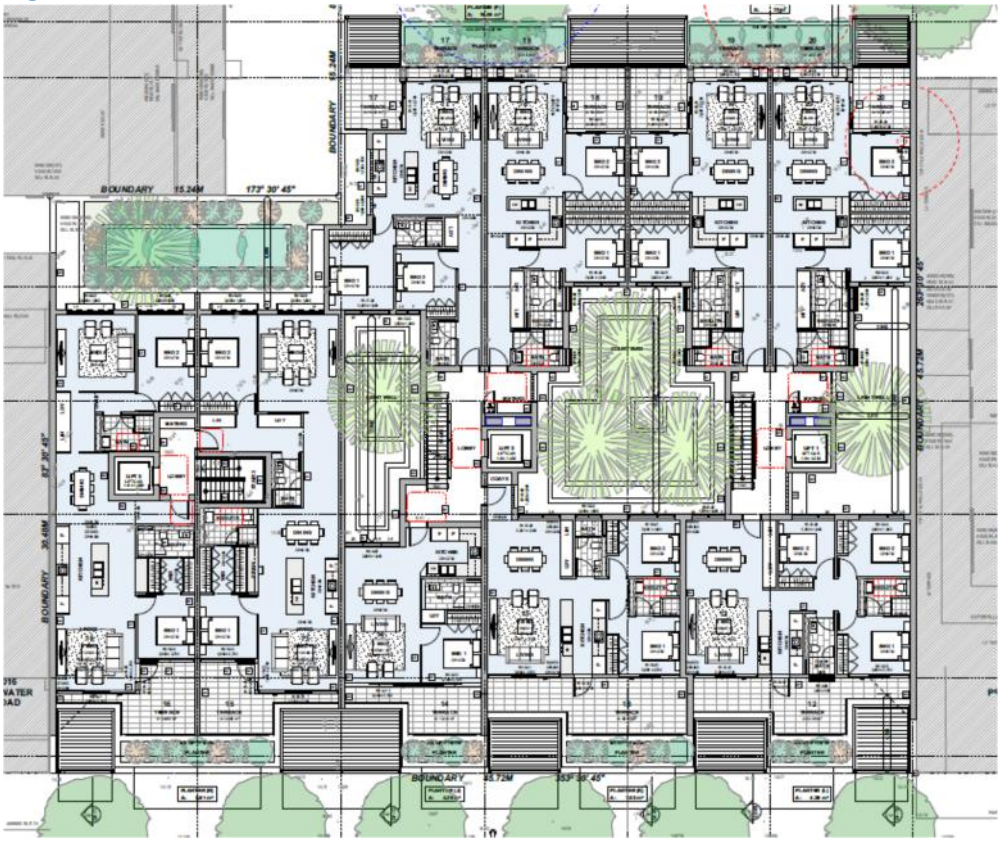


Figure A6 -Level 3 Plan

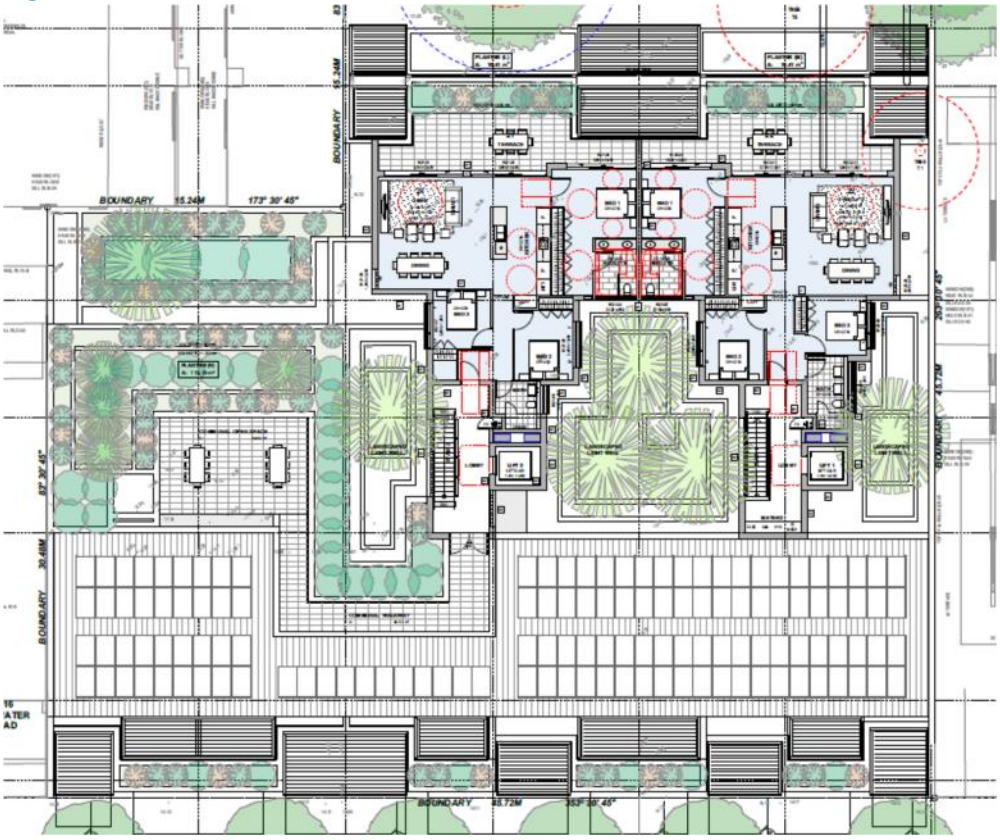
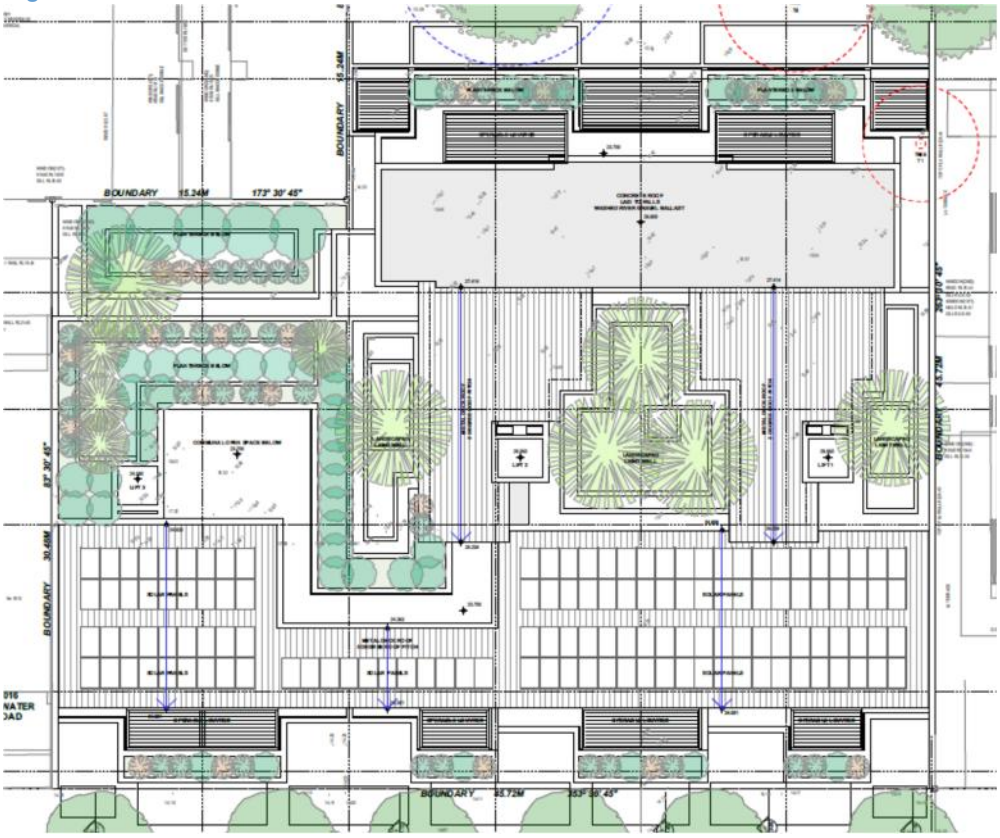
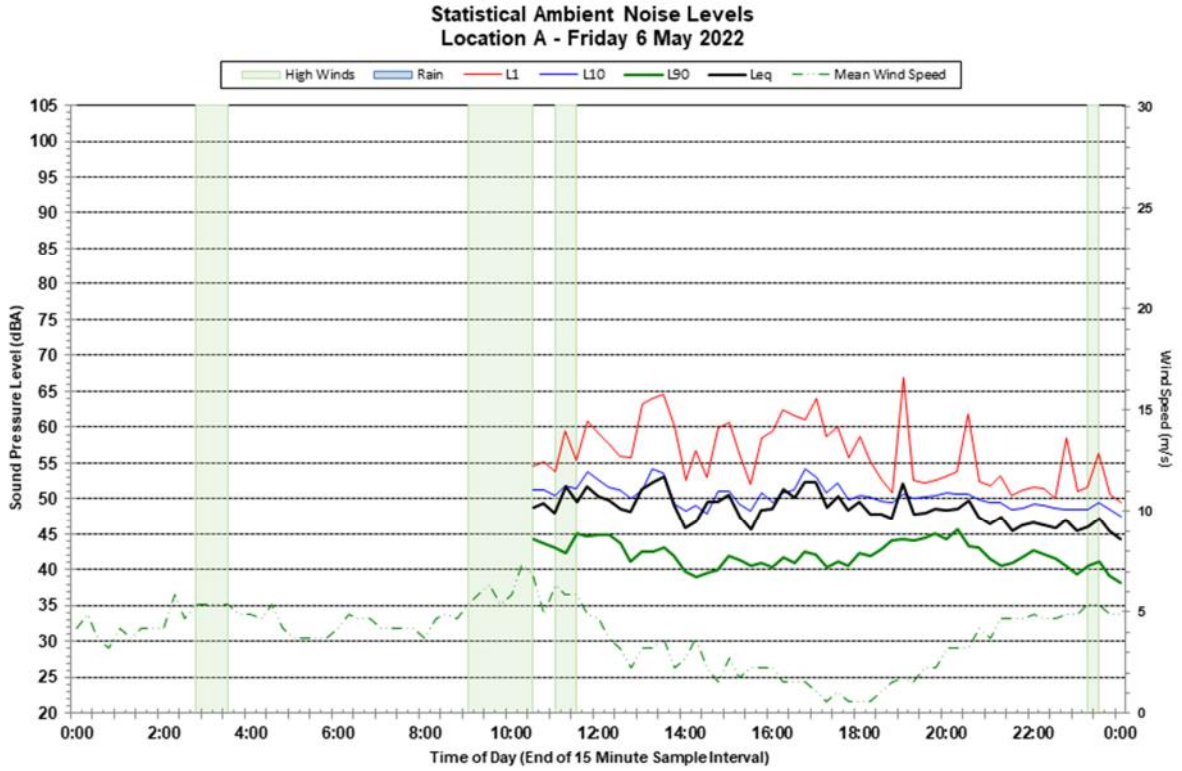


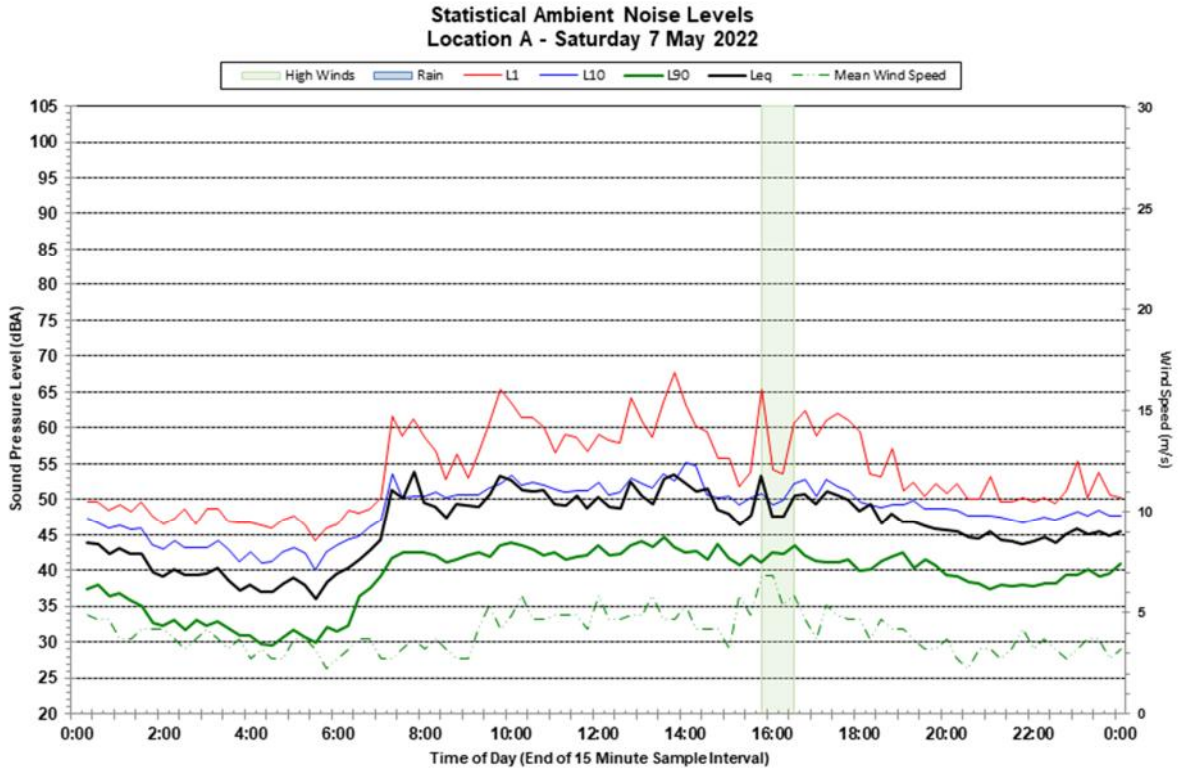
Figure A7 -Roof Plan

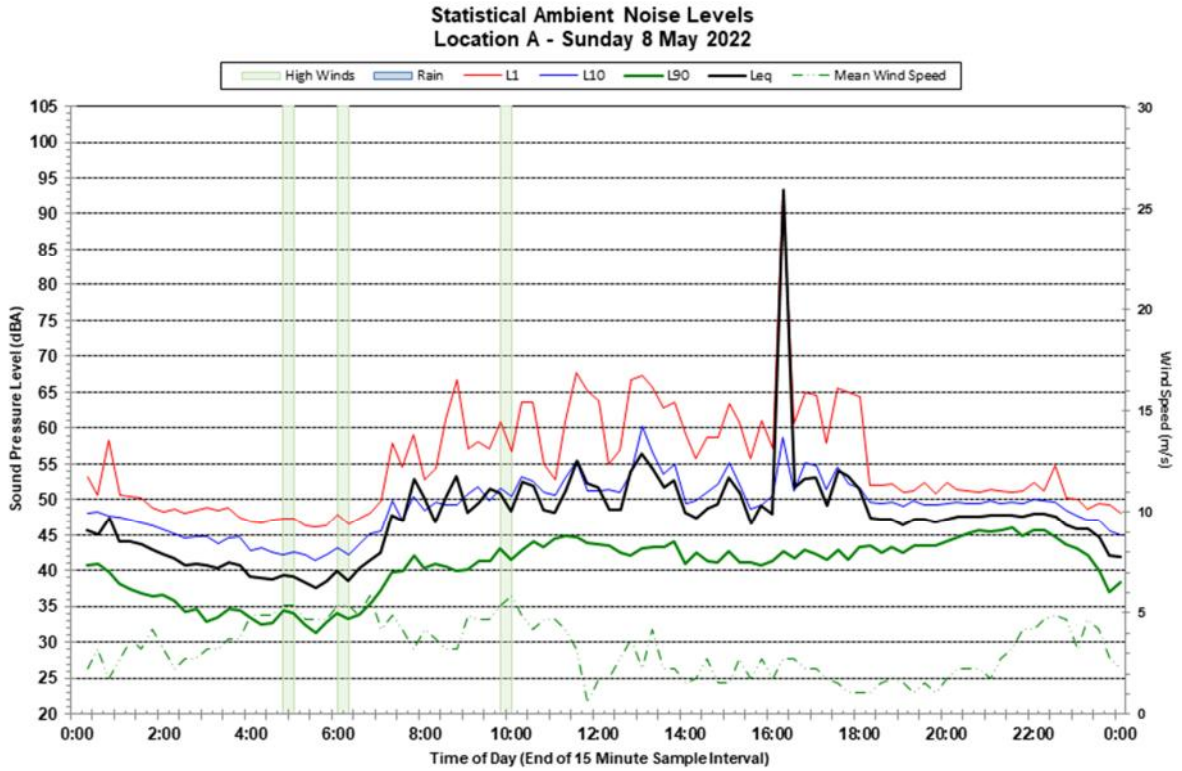


APPENDIX B – UNATTENDED NOISE LOGGER DATA

1.1 LOGGER A



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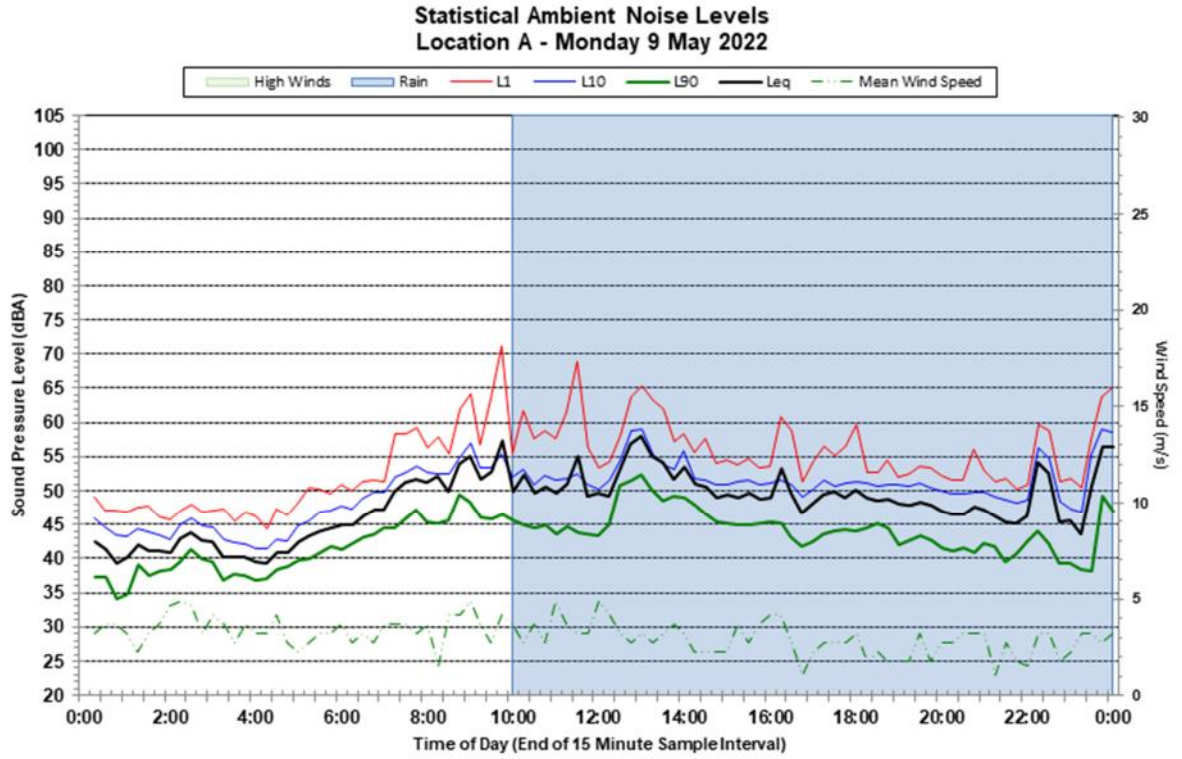
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)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L10
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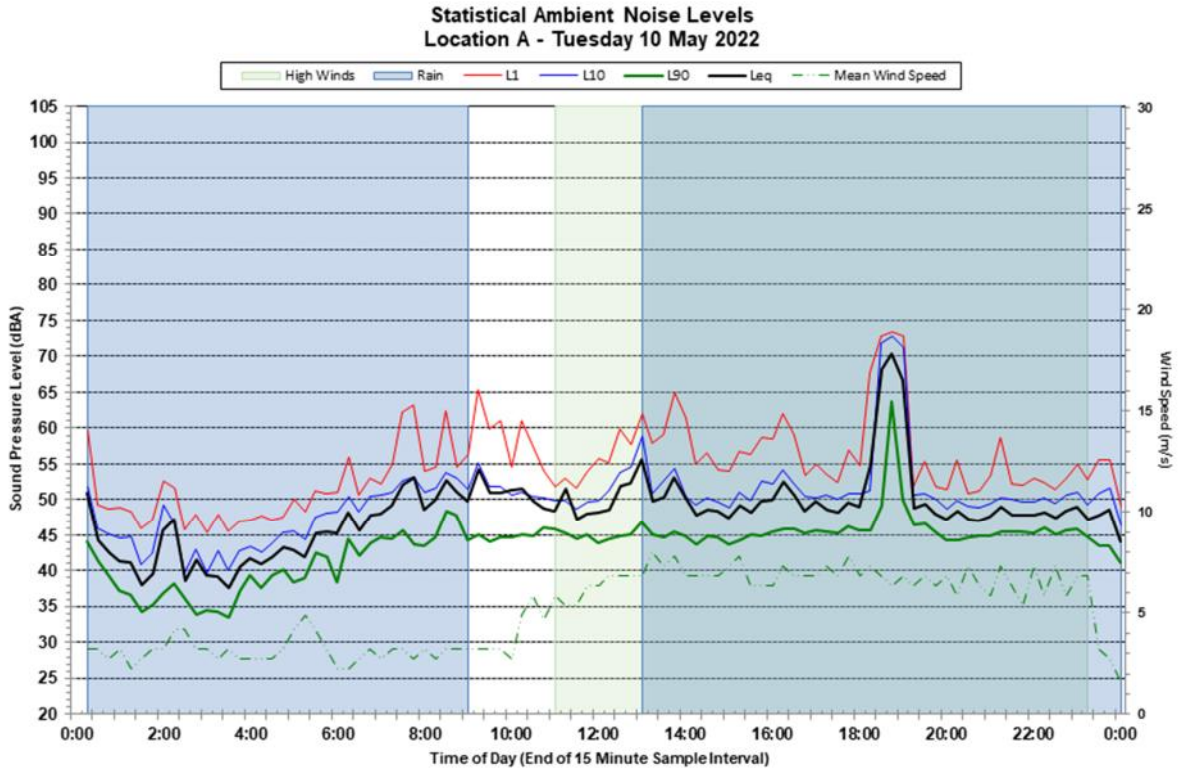
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)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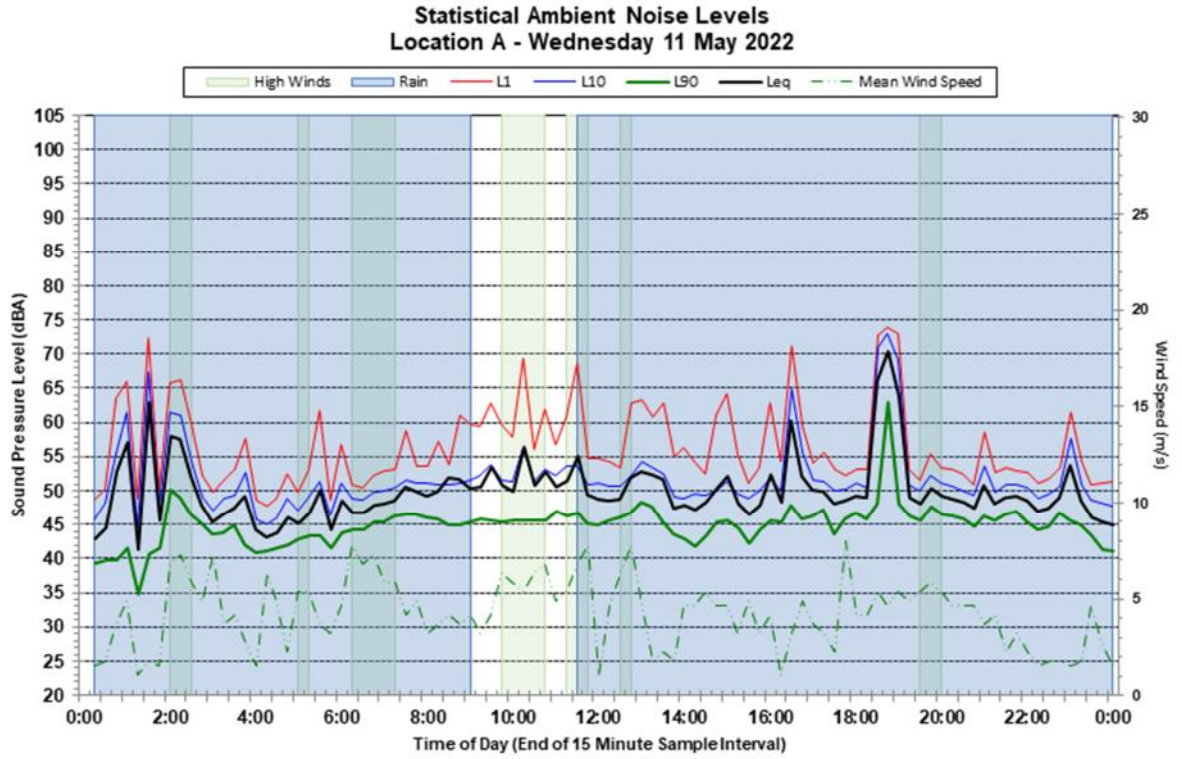
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)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Sound Pressure Level (dBA)
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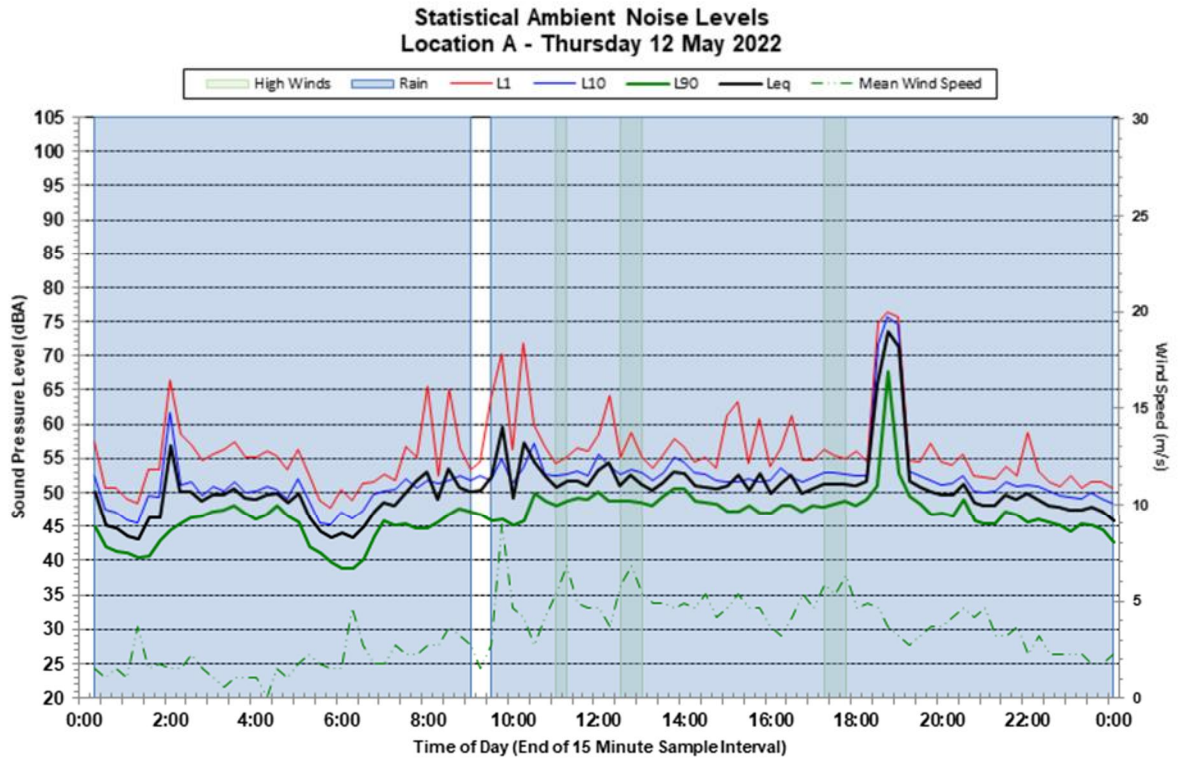
Time of Day (End of 15 Minute Sample Interval)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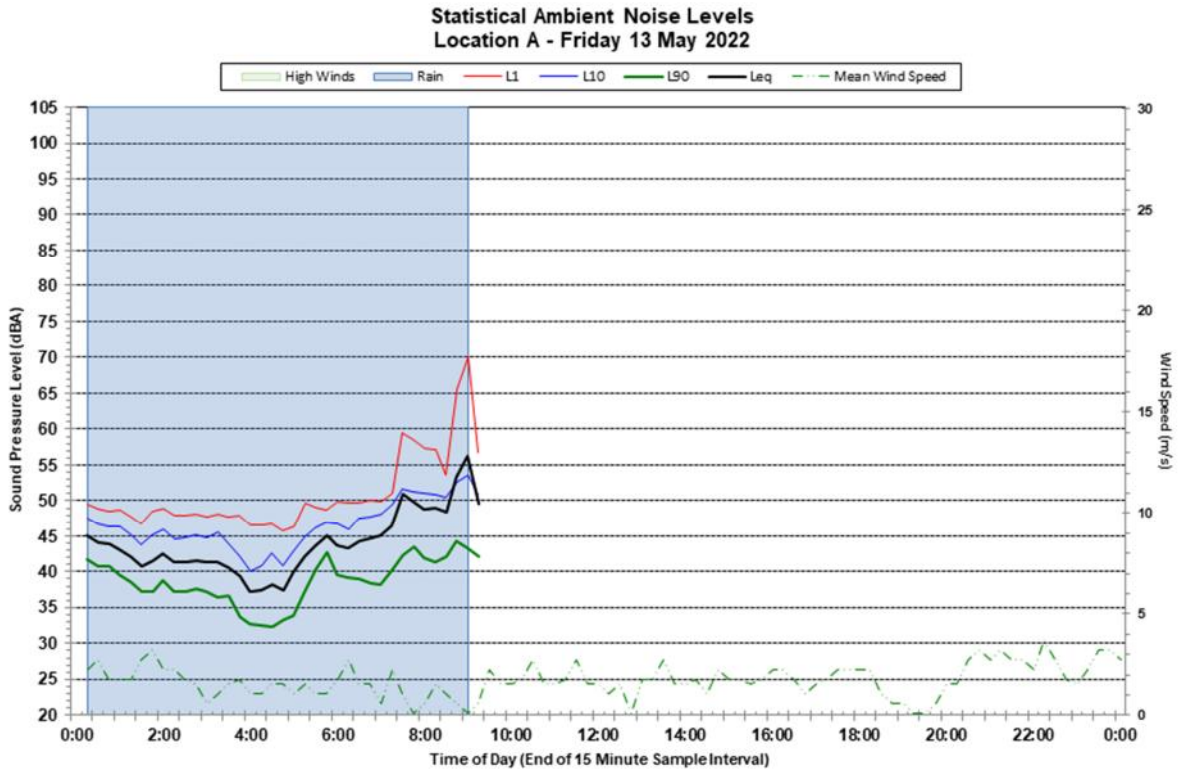
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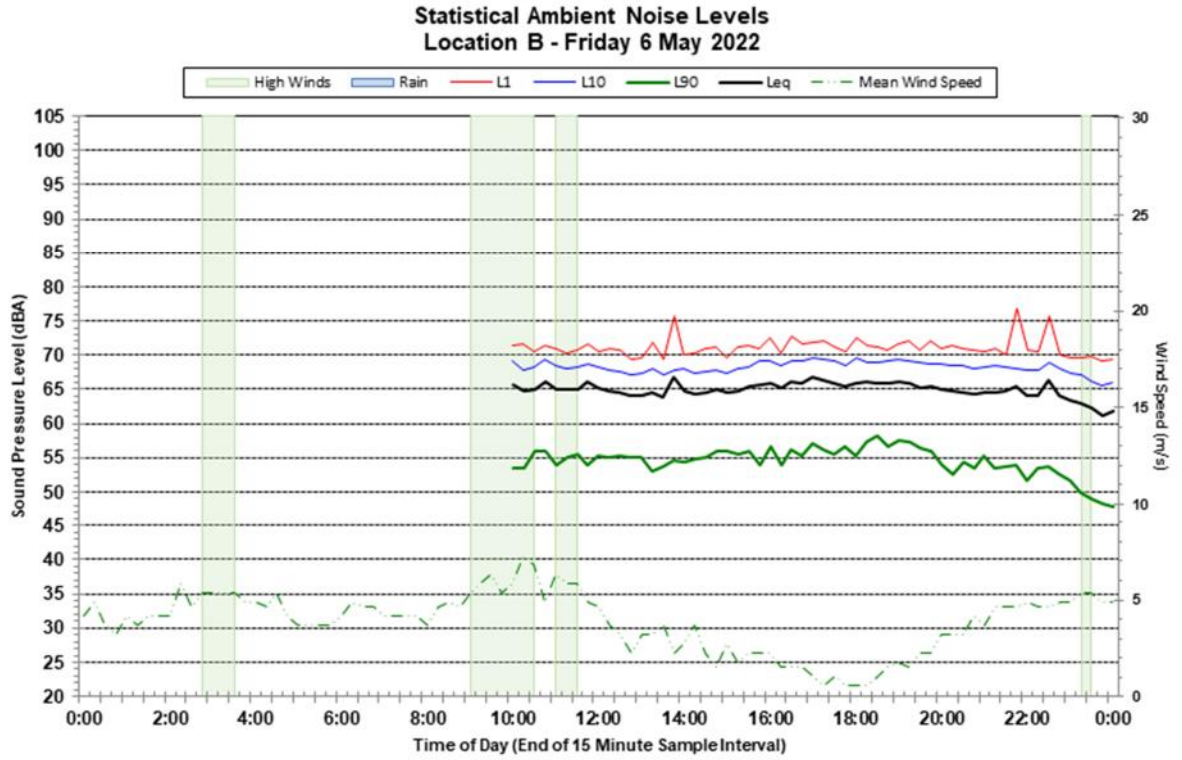
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)

1.2 LOGGER B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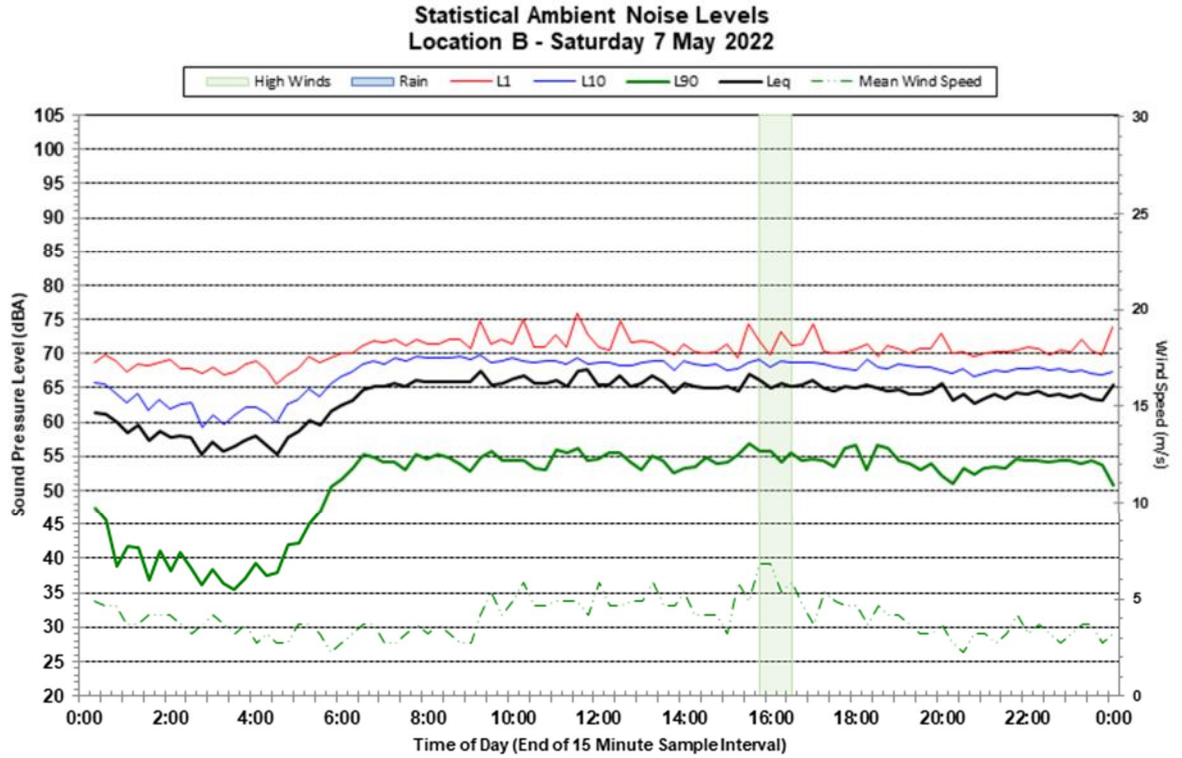
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)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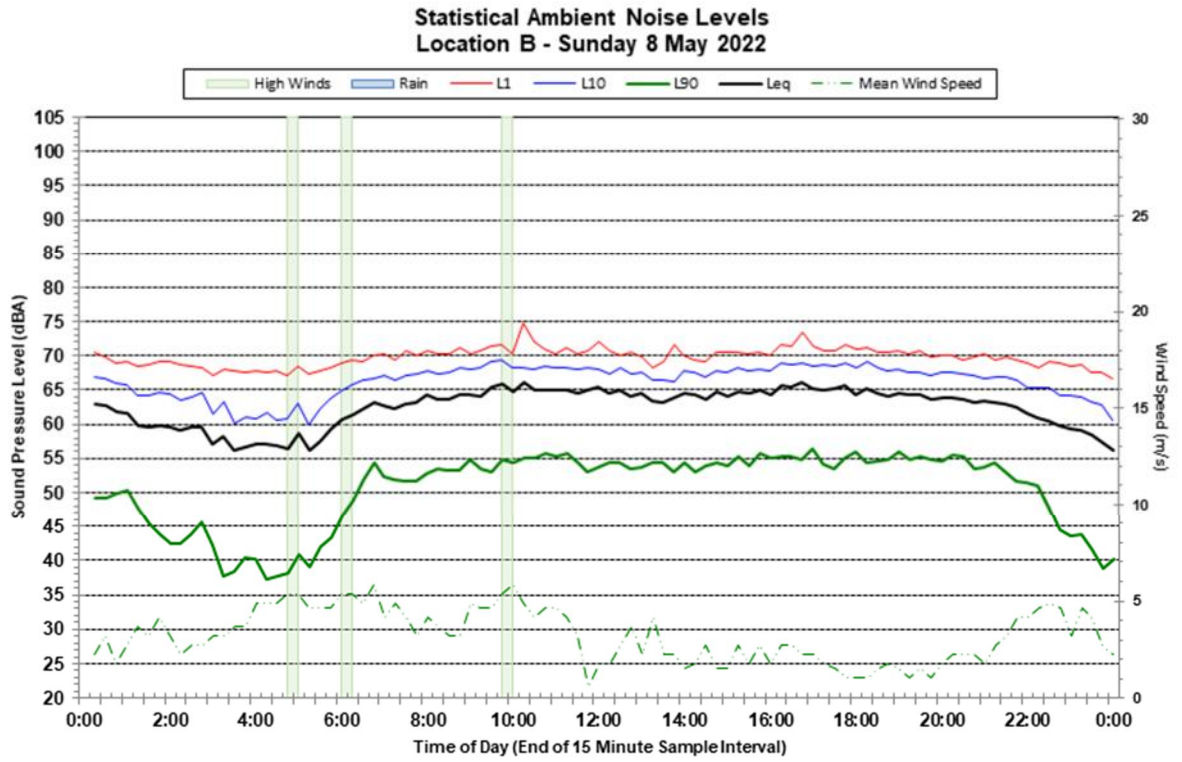
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)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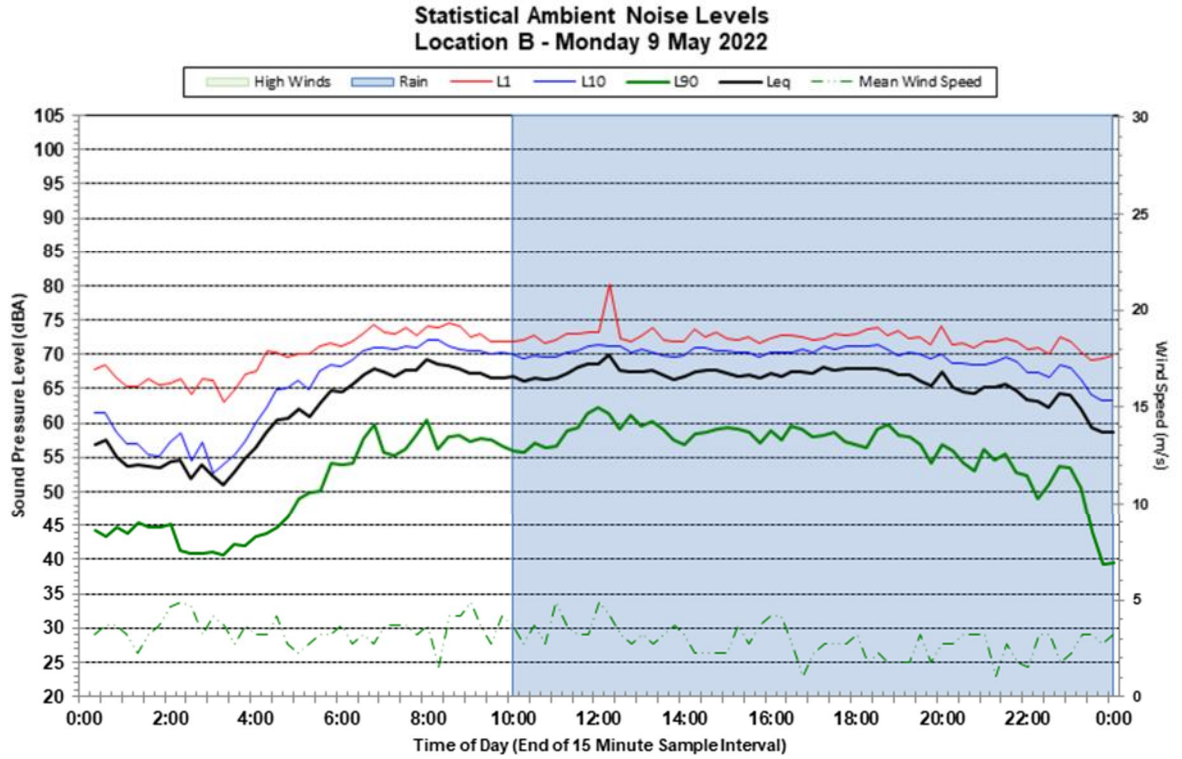
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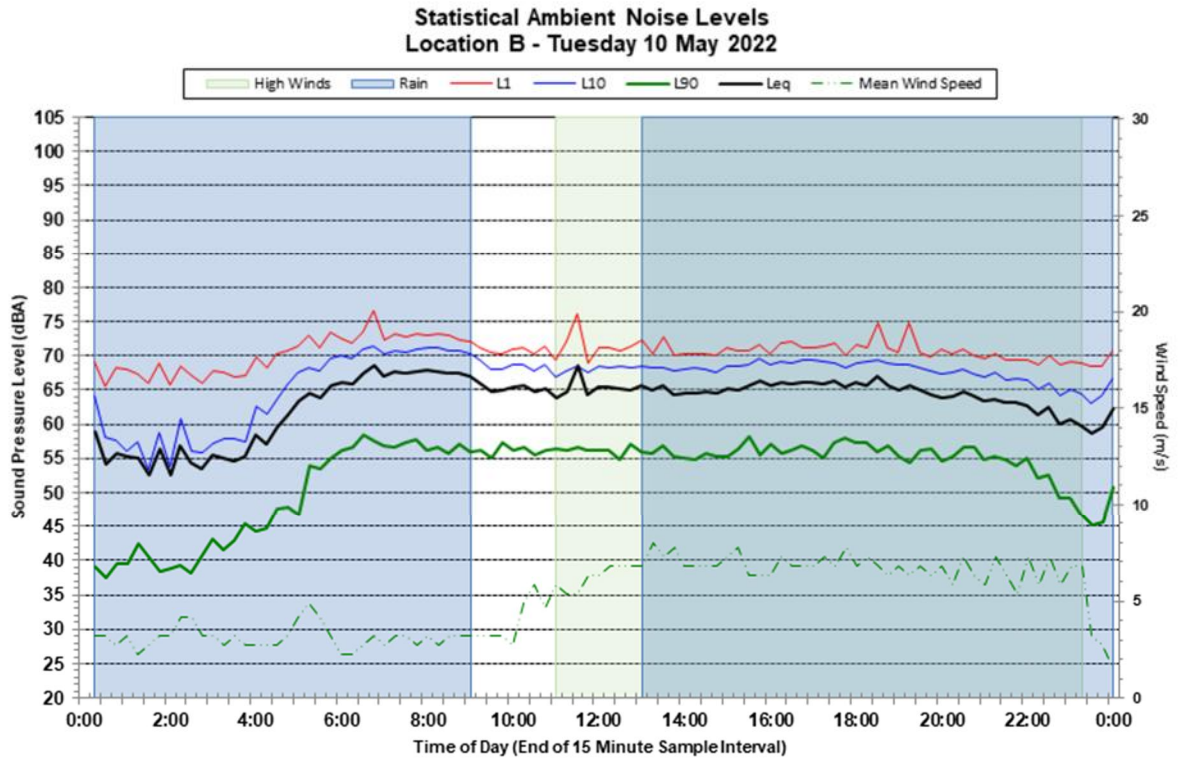
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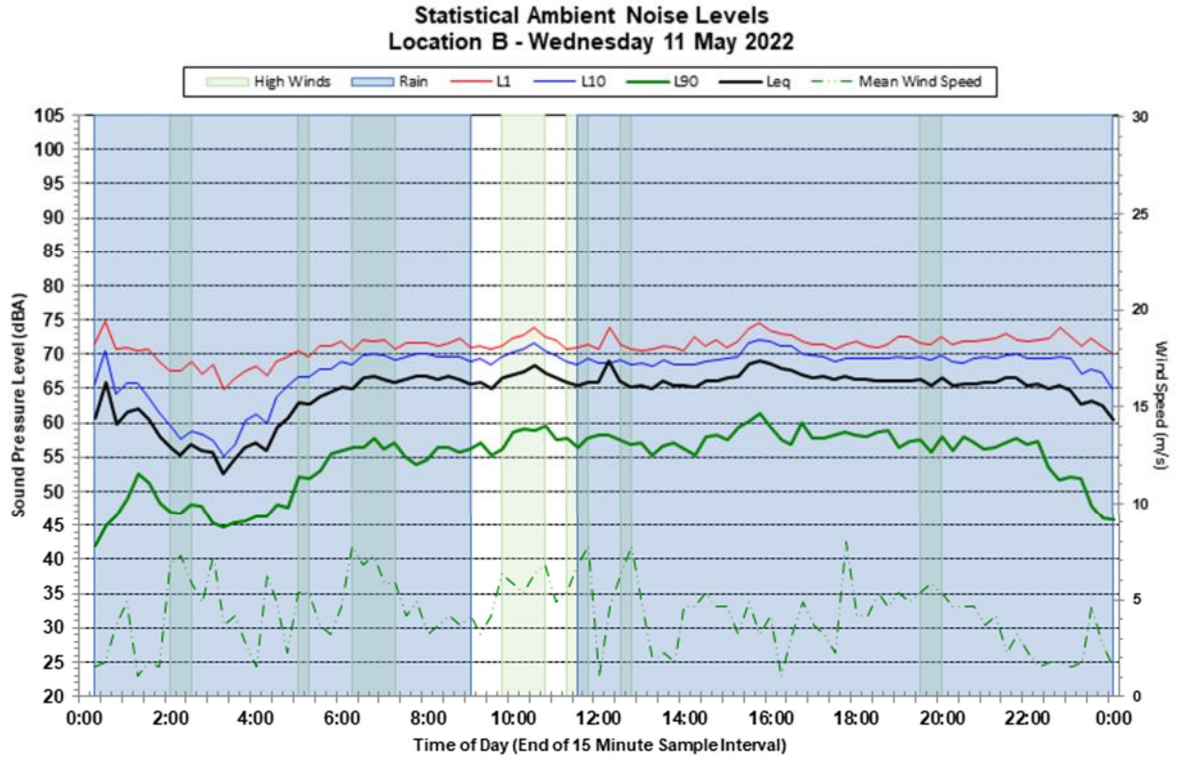
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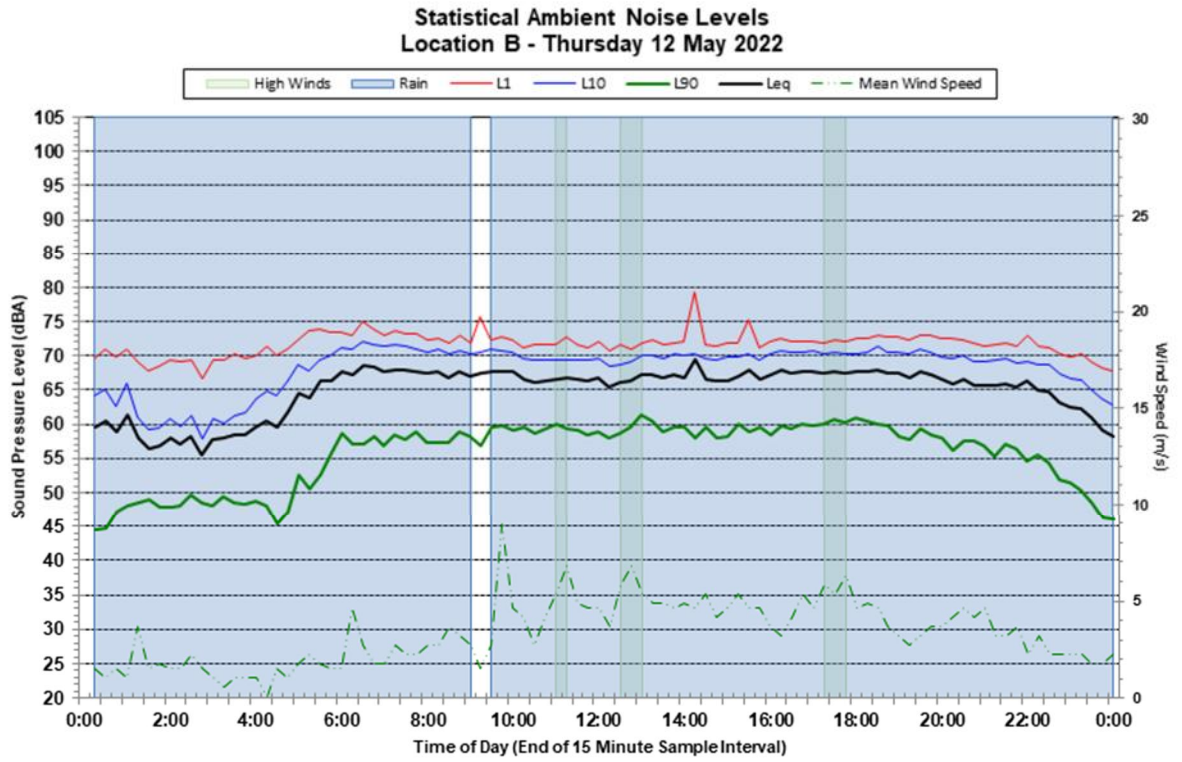
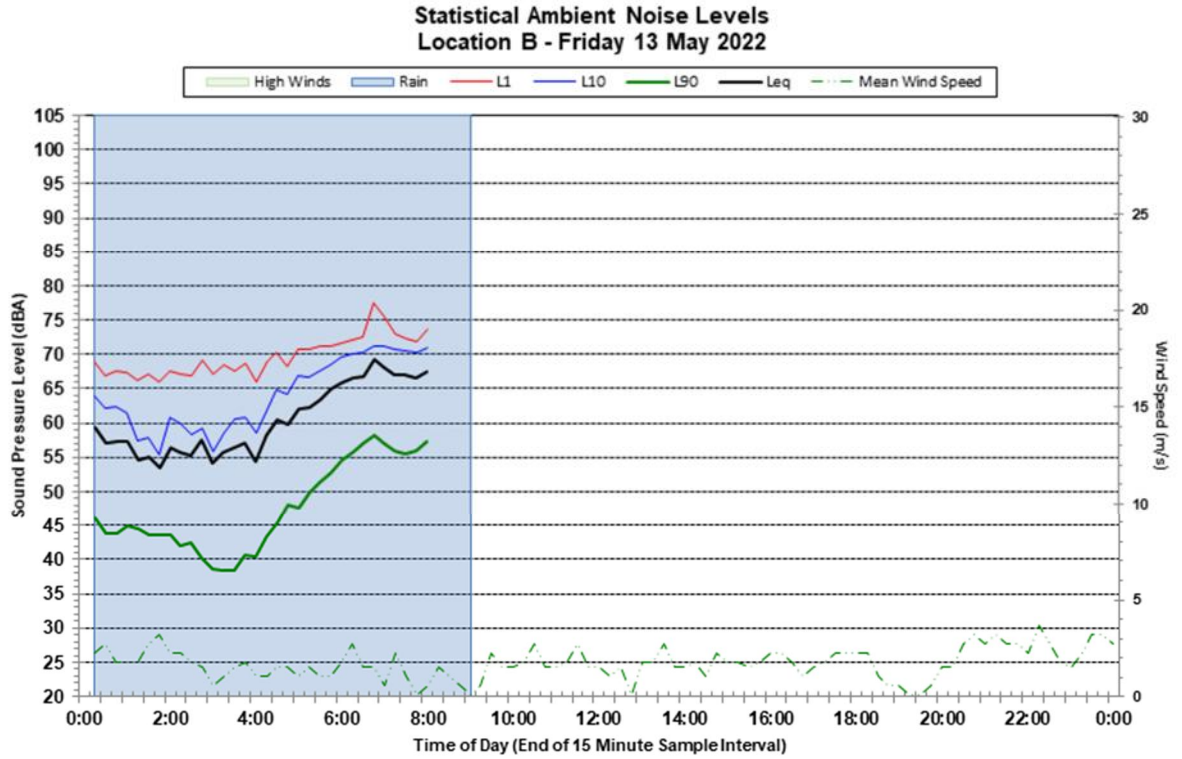
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Location B - Thursday 12 May 2022
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Location B - Friday 13 May 2022
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)