

Woolworths Rose Bay

Noise Impact Assessment

Project ID	20220072.1
Document Title	Noise Impact Assessment
Attention To	Woolworths Group Limited ABN 88 000 014 675

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	18/02/2022	20220072.1/1802A/R0/RG	RG		
1	1/03/2022	20220072.1/0103A/R1/RG	RG		GW

TABLE OF CONTENTS

1	INTRODUCTION	5
2	SITE DESCRIPTION	6
3	AMBIENT NOISE MONITORING	8
3.1	NOISE DESCRIPTORS	8
3.2	UNATTENDED LONG TERM NOISE MONITORING	9
3.2.1	Equipment Used.....	9
3.2.2	Locations Monitored.....	9
3.2.3	Calculated Noise Levels.....	9
3.3	ATTENDED SHORT TERM NOISE MONITORING	11
3.3.1	Equipment Used.....	11
3.3.2	Measurement Location.....	11
3.3.3	Measurement Period.....	11
3.3.4	Results.....	11
3.4	ASSESSMENT TRAFFIC NOISE LEVELS	11
4	EXTERNAL NOISE INTRUSION ASSESSMENT	12
4.1	NOISE INTRUSION CRITERIA	12
4.1.1	Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015' 12	
4.1.2	State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007	12
4.1.3	NSW Department of Planning – <i>Development near Rail Corridors or Busy Roads – Interim Guideline</i>	13
4.1.4	Summarised Internal Noise Criteria.....	14
5	NOISE INTRUSION ANALYSIS	14
5.1	INDICATIVE COMPLYING CONSTRUCTIONS	14
5.1.1	Glazed Windows and Doors	14
5.1.1	Roof/Ceiling Construction	15
5.1.2	External Wall Construction	15
5.1.3	Ventilation Requirements.....	15
6	NOISE EMISSION ASSESSMENT	16
6.1	NOISE EMISSION CRITERIA	16
6.1.1	Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015' 16	
6.1.2	EPA Noise Policy for Industry (NPfI)	16
6.1.3	Summarised Noise Emission Criteria.....	18
7	NOISE EMISSION ASSESSMENT	19
7.1	NOISE EMISSION FROM LOADING DOCK AND CAR PARK	19
7.1.1	Noise sources associated with use of site.....	19
7.1.2	Predicted Noise Emissions from the Loading Dock	19
7.1.3	Predicted Noise Emissions from the Carpark.....	20
7.1.4	Communal Open Space	20
7.2	RECOMMENDATIONS	21
7.2.1	Loading Dock.....	21
7.2.2	Carpark	21
7.2.3	Communal Open Space	22
7.3	NOISE FROM MECHANICAL PLANT	23
8	CONCLUSION	23
9	APPENDIX ONE – UNATTENDED NOISE MONITORING DATA	24

9.1	NOISE MONITOR 1	25
9.2	NOISE MONITOR 2	33

1 INTRODUCTION

The following report has been prepared to assess potential noise impacts associated with the proposed Woolworths mixed use development to be located at 488-492 Old South Head Road & 30 Albemarle Avenue, Rose Bay.

This report addresses noise impacts associated with the following:

- Traffic noise intrusion from Old South Head Road
- Loading Dock Operation
- Mechanical Plant (in principle)

Acoustic Logic have utilised the following documents and regulations in the assessment of traffic noise intrusion into the development:

- Woollahra Municipal Council- *'Woollahra Development Control Plan (DCPs) 2015'*.
- NSW Department of Planning and Environment's document – *'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007'*.
- NSW Department of Planning – Development near Rail Corridors or Busy Roads – Interim Guideline.

Acoustic Logic have utilised the following documents and regulations in the assessment of noise emissions from the development:

- Woollahra Municipal Council- *'Woollahra Development Control Plan (DCPs) 2015'*.
- NSW Environmental Protection Authority (EPA) document – *'Noise Policy for Industry (NPfI) 2017'*.

This assessment has been conducted using the PBD Architects preliminary plans dated 27th of January 2022.

2 SITE DESCRIPTION

The site is located at 488-492 Old South Head Road and 30 Albemarle Avenue, Rose Bay. The proposed development will include the construction of a four-storey building with three levels of basement car parking. The site will consist of two storeys of supermarket use, and two-three storeys of residential use.

For the purposes of this assessment, the operating hours of the supermarket have been assumed to be from 7am-10pm daily, with loading dock deliveries to occur between 7am-7pm. These hours are consistent with current neighbouring supermarkets and are subject to change in the future at the development application stage.

Onsite acoustic investigation has been carried out by this office on the surrounding acoustic environments. The predominate noise source affecting the development is Old South Head Road, in the east direction of the site and Albemarle Avenue, adjoining the site to the south.

The nearest noise receivers around the project site include:

- **Receiver 1** – Neighbouring residential dwelling at 28 Albemarle Avenue to the west.
- **Receiver 2** – Neighbouring three-storey residential flat building at 494-496 Old South Head Road to the north.
- **Receiver 3** – Residential dwellings across Albemarle Avenue to the South

A site map featuring the nearest sensitive receiver and measurement locations are presented in Figure 1 below.



Figure 1 – Site Map
(Sourced SIX Maps NSW)

 Residential receiver

 Unattended noise monitor
 Attended noise measurement

3 AMBIENT NOISE MONITORING

Monitoring has been undertaken to obtain the following data:

- Background noise levels at the surrounding residential properties.
- Traffic noise levels.

Figure 1 above shows the monitoring locations used.

3.1 NOISE DESCRIPTORS

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15 minute measurement interval is typically utilised. Noise levels are monitored continuously during this period, and then statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters obtained from the data are:

L_{eq} - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. **L_{eq}** is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of time-varying noise sources (such as traffic noise).

L₉₀ – This is commonly used as a measure of the background noise level as it represents the noise level heard in the typical, quiet periods during the measurement interval. The **L₉₀** parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the **L₉₀** level.

L₁₀ is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event, and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

L₁ is sometimes used in place of **L_{max}** to represent a typical noise level from a number of high level, short term noise events.

3.2 UNATTENDED LONG TERM NOISE MONITORING

3.2.1 Equipment Used

Unattended noise monitoring was conducted using a Rion NL-42 (Type 2) noise monitor.

The monitoring was continuous, with statistical noise levels recorded at 15-minute intervals throughout the monitoring period. Measurements were taken on "A" frequency weighting and fast time response.

All monitoring equipment used retains current calibration - either manufacturers' calibration or NATA certified calibration. The monitors were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

3.2.2 Locations Monitored

Noise monitoring was conducted in two locations on the site.

Location 1 - One monitor was located towards the rear of the site at 488-492 Old South Head Road. The site was surrounded with 3m tall hoarding at the time of monitoring, as such, this monitor was partially shielded from traffic noise and will be used to represent the background noise levels at surrounding receivers.

Location 2 - The second monitoring location was at the front of the site facing Old South Head Road, approximately 3m from the kerb with full view of the road. This location will be used to assess traffic noise impacts on the residential component of the development.

3.2.3 Calculated Noise Levels

Ambient, assessment and rating background levels have been determined from the long term, unattended noise monitoring data based on the methodology in the Noise Policy for Industry Fact Sheet B. Appendix 1 contains the data collected, and the periods identified as being affected by adverse weather conditions or extraneous noise (as defined by INP Fact Sheet B).

Weather data was obtained from records provided by the Bureau of Meteorology for the weather station located at Sydney Harbour (Wedding Cake West).

The NPfI day, evening and night periods are:

- Day - period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
- Evening - the period from 6 pm to 10 pm
- Night - the remaining periods

Representative traffic noise levels have been calculated using the guidelines in the EPA Road Noise Policy.

3.2.3.1 Background Noise Levels

The following tables summarise the assessment background noise levels (ABL) for each location. Where no ABL is indicated, that period was affected by adverse weather or other extraneous noise and excluded from the ABL calculation.

Table 1 – NPfl Assessment Background Noise Levels

Location	Date	ABL		
		Day	Evening	Night
1	Thursday 27 January 2022	0	45	35
	Friday 28 January 2022	49	46	34
	Saturday 29 January 2022	47	45	33
	Sunday 30 January 2022	43	44	36
	Monday 31 January 2022	48	44	33
	Tuesday 01 February 2022	49	43	41
	Wednesday 02 February 2022	53	46	38
	RBL	48	45	35

The following table summarises the rating background noise levels determined for the day, evening and night periods as defined in the NPfl.

Table 2 – NPfl Rating Background Noise Levels

Location	Assessment Background Noise Level (dB(A) L ₉₀)*		
	Day	Evening	Night
1	48	45	35

3.2.3.2 Ambient Noise Levels – ISEPP/DNRCBR Noise Impact Assessment

The data for the day and night periods as defined in the ISEPP have been processed using the guidelines in the EPA Road Noise Policy to determine the ambient noise levels at the monitoring locations.

Table 3 – ISEPP/DNRCBR Ambient Noise

Location	Traffic Noise Level (dB(A) L _{eq,period})*	
	Day (7am to 10pm)	Night (10pm to 7am)
2 Old South Head Road	68	63

3.3 ATTENDED SHORT TERM NOISE MONITORING

3.3.1 Equipment Used

Attended noise monitoring was conducted using a Norsonic N-140 Type 1 sound level meter

All monitoring equipment used retains current calibration - either manufacturers' calibration or NATA certified calibration. The monitors were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

3.3.2 Measurement Location

Attended traffic noise measurements were taken on both Old South Head Road and Albemarle Avenue. Both attended measurements were taken 2m from the respective road, with a 180° view of the road.

3.3.3 Measurement Period

Attended noise measurements were undertaken between the hours of 5:00pm and 6:00pm on Thursday 25th March 2021.

3.3.4 Results

Table 4 - Attended Traffic Noise Measurements

Location	Time of Measurement	Measured Noise Level dB(A)_{Leq}
488-492 Old South Head Road 2m from kerb 180° view of the road	5:30pm - 6:00pm Thursday 27th January 2022.	66
30 Albemarle Avenue 2m from kerb 180° view of the road		61

3.4 ASSESSMENT TRAFFIC NOISE LEVELS

The predicted noise levels at the two façades of the proposed development due to traffic noise are presented in the table below and are based on the attended noise measurements, the daytime/night-time unattended noise monitoring, and noise reduction due to height and distance.

Table 5 – Summarised Predicted Traffic Noise Levels

Location	Daytime (7am-10pm) dB(A)_{Leq} (15hour)	Night-time (10pm-7am) dB(A)_{Leq} (9hour)
Level 3, Old South Head Road Facade	67	62
Level 2, Albemarle Avenue Facade	62	57

4 EXTERNAL NOISE INTRUSION ASSESSMENT

Site investigation indicates that the major external noise sources around the project site is traffic noise from Old South Head Road and Albemarle Avenue. Noise intrusion from this source will be assessed in accordance with criteria nominated in Section 4.1 below.

4.1 NOISE INTRUSION CRITERIA

A noise intrusion assessment has been conducted based off the requirements of the following acoustic noise criteria/standards:

- Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015'.
- NSW Department of Planning and Environment's document – 'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007'.
- NSW Department of Planning – Development near Rail Corridors or Busy Roads – Interim Guideline.

4.1.1 Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015'

The Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015' does not provide any acoustic controls or objectives relating to noise intrusion. Therefore, this assessment will adopt the criteria based on the relevant Australian Standards presented below.

4.1.2 State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007

Clause 102

- (1) *This clause applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transit way or any other road with an annual average daily traffic volume of more than 20,000 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.*
- (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 LAeq levels are not exceeded:*
 - (a) *in any bedroom in the building--35 dB(A) at any time between 10 pm and 7 am,*
 - (b) *anywhere else in the building (other than a garage, kitchen, bathroom or hallway) --40 dB(A) at any time.*

Based on Clause 102 item 1, it is expected that the stretch of the Old South Head Road is a road carrying an annual average daily traffic volume of more than 20,000. Therefore, the project site will be assessed based on the requirements of Clause 102 item 3 above.



Figure 2: Sepp Traffic Volume Map

4.1.3 NSW Department of Planning – Development near Rail Corridors or Busy Roads – Interim Guideline

Section 3.5 of the NSW Department of Planning’s ‘Development near Rail Corridors and Busy Roads (Interim Guideline)’ states:

“The following provides an overall summary of the assessment procedure to meet the requirements of clauses 87 and 102 of the Infrastructure SEPP. The procedure covers noise at developments for both Road and Rail.

- *If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:*
 - *in any bedroom in the building: 35dB(A) at any time 10pm-7am*
 - *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time.”*

Section 3.6 of the NSW Department of Planning’s ‘Development near Rail Corridors and Busy Roads (Interim Guideline)’ specifies the following noise descriptors for the assessment of traffic noise:

- Day (7am to 10pm) - L_{eq} (15 hour)
- Night (10pm to 7am) - L_{eq} (9 hour)

The guideline also provides guidance on the assessment of natural ventilation. The allowable internal noise goal is permitted to be 10 dB(A) higher than when the windows are closed (i.e. – allowable level in bedrooms becomes 45 dB(A), and 50 dB(A) in living rooms). Where noise levels would exceed this, the NSW Planning guideline recommends that a ventilation system be provided to achieve the ventilation requirements of the BCA with windows closed. We note that where the ‘open window/door’ scenario cannot be achieved, this does not necessarily mean that there cannot be operable elements on these façades, only that internal noise level requirements will only be met when they are closed.

4.1.4 Summarised Internal Noise Criteria

Based on the above, the selected internal noise criteria for each space are summarised below.

Table 6 - Summarised Internal Noise Criteria

Space /Activity Type	Internal Noise Requirement
Sleeping Areas	35 dB(A) _{Leq(9hour)}
Living Areas	40 dB(A) _{Leq(15hour)}

5 NOISE INTRUSION ANALYSIS

Traffic noise intrusion into the proposed development was assessed using the measured noise levels presented in Table 5.

Calculations were undertaken considering the orientation of windows, barrier effects (*where applicable*), the total area of glazing, facade transmission loss and room sound absorption characteristics. In this way, the likely interior noise levels can be predicted. Calculations have been based on an assumed general room sizes with full height glazing on the façade. A full assessment of all treatments recommended within this report is to be conducted during detailed design to ensure that the criteria determined within this report is met.

5.1 INDICATIVE COMPLYING CONSTRUCTIONS

5.1.1 Glazed Windows and Doors

The following constructions are recommended to comply with the project noise objectives. 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-Ion type acoustic seals. **(Mohair Seals are unacceptable).**

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.

Table 7 – Indicative Glazing Constructions

Facade	Glazing Construction	Acoustic Seals
Old South Head Road	10.38mm laminate	Yes
Albemarle	6.38mm laminate	Yes

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

In addition to complying with the minimum scheduled glazing thickness, 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 Table 8 below. Where nominated, 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 8 - Minimum R_w of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w of Installed Window	Acoustic Seals
6.38mm laminate	31	Yes
10.38mm laminate	35	Yes

5.1.1 Roof/Ceiling Construction

The external roof construction is currently proposed to be made of concrete and does not need any further acoustic treatment. In the event that any penetrations are required through the external skin, an acoustic grade sealant should be used to minimise all gaps.

5.1.2 External Wall Construction

External walls constructed from concrete/masonry elements will not require any acoustic upgrading to achieve the acoustic requirements. In the event that any penetrations are required through the external skin, an acoustic grade sealant should be used to minimise all gaps.

5.1.3 Ventilation Requirements

With respect to natural ventilation of the dwelling, the NSW Department of Planning document "Development near Busy Roads and Rail Corridors - Interim Guideline" dictates that:

"If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."

With windows open, the allowable internal noise goal is permitted to be 10dB(A) higher than when the windows are closed (i.e. – allowable level in bedrooms becomes 45dB(A), and 50dB(A) in living rooms). Where noise levels would exceed this, the NSW Planning guideline recommends that a ventilation system be provided to achieve the ventilation requirements of the BCA with windows closed. As such, we note that windows on all facades are required to be closed in order to achieve required noise levels. **These windows are permitted to be operable.**

Any supplementary ventilation system or façade opening proposed to be installed to provide ventilation to apartments should be acoustically designed to ensure that the internal noise level requirements are achieved. In the event mechanically assisted ventilation is utilised, it should be acoustically designed so that internal noise levels within apartments are appropriate, and any external noise emissions to surrounding noise sensitive receivers is within the requirements detailed in Section 6.1 of this report.

6 NOISE EMISSION ASSESSMENT

A noise emission assessment has been carried out to ensure noise emitted from the use of the site is in accordance with the requirements listed below.

6.1 NOISE EMISSION CRITERIA

The noise emissions from the project site shall comply with the requirements of the following:

- Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015'.
- NSW Environmental Protection Authority (EPA) document – 'Noise Policy for Industry (NPfl) 2017'.

Detailed requirements from the documents above have been discussed below.

6.1.1 Woollahra Municipal Council- 'Woollahra Development Control Plan (DCPs) 2015'

Woollahra Council Development Control Plan 2015 generally limits external noise emissions from mechanical plant and equipment to Background + 5dB(A) L_{eq} (15min), with the exception of air-conditioning condensers which are limited to Background + 0dB(A) L_{eq} (15min).

6.1.2 EPA Noise Policy for Industry (NPfl)

The EPA NPfl provides guidelines for assessing noise impacts from developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The NPfl has two requirements which must both be complied with, namely the intrusiveness and amenity criteria.

6.1.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor do not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Background noise levels adopted are presented in Section 3.2. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 7 - NPfl Intrusiveness Criteria

Receiver	Time of day	Background Noise Level dB(A) L_{90} (Period)	Project Intrusiveness Noise Level dB(A) L_{eq} (15minute)
Residential	Day (7:00am-6:00pm)	48	53
	Evening (6:00pm-10:00pm)	45	50
	Night (10:00pm-7:00am)	35	40

6.1.2.2 Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The NSW EPA Noise Policy for Industry (2017) sets out acceptable noise levels for various localities. Table 2.2 on page 11 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface. Table 2.3 on page 12 categorises descriptors to help determine which receiver category applies. Based on this table, nearby residential receivers are categorised as urban.

For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

The project amenity noise level is calculated by taking the recommended amenity noise level (as presented in table 2.2 of the policy), subtracting 5dB(A) and then adding 3dB(A) to convert from $L_{Aeq, period}$ to a $L_{Aeq, 15\text{ minute}}$ descriptor. The project amenity noise level criteria are presented in the table below.

Table 8 - NPfl Project Amenity Criteria

Type of Receiver	Time of Day	Recommended Amenity Noise Level dB(A)$L_{Aeq(period)}$	Project Amenity Noise Level dB(A)$L_{eq(15min)}$
Residential (Urban)	Day (7:00am-6:00pm)	60	58
	Evening (6:00pm-10:00pm)	50	48
	Night (10:00pm-7:00am)	45	43

6.1.3 Summarised Noise Emission Criteria

Summary for noise emission criteria for all plant associated with the development has been summarised below.

Table 9 - Summary of Noise Emission Criteria

Receiver	Time of day	Project Intrusiveness Noise Level dB(A)_{Leq(15minute)}	Project Amenity Noise Level dB(A)_{Leq(15min)}	Woollahra Municipal Council DCP BG + 5dB(A) requirement (Mech excl. condensers)	Woollahra Municipal Council DCP BG + 0dB(A) requirement (Condensers)
Residential Receivers	Day (7:00am-6:00pm)	53	58	53	48
	Evening (6:00pm-10:00pm)	50	48	50	45
	Night (10:00pm-7:00am)	40	43	40	35

7 NOISE EMISSION ASSESSMENT

7.1 NOISE EMISSION FROM LOADING DOCK AND CAR PARK

7.1.1 Noise sources associated with use of site

The following noise data was obtained by this office for operation of similar projects:

Table 9 – Sound Power Levels Associated with Proposed Loading Dock and Carpark

Noise Source	Sound Power Level
MRV Slowly Manoeuvring to Loading Dock	100 dB(A) L_{eq}
Truck Engine Start	100dB(A) L_{max}
Truck Door Close	95dB(A) L_{max}
Truck Air Brake	114 dB(A) L_{max}
Car moving at 10km/h	84dB(A) L_{eq}

7.1.2 Predicted Noise Emissions from the Loading Dock

A loading dock for the site is proposed to be located near the western boundary of the site on Albemarle Avenue. Medium rigid vehicles (MRV) are proposed to enter the loading dock from Albemarle Avenue and will rotate internally via a turntable to load/unload and will exit back onto Albemarle Avenue.

In this assessment we have assumed delivery times can occur from 7am to 7pm. As such, noise emission predictions have been assessed against the most stringent criteria within this timeframe, being the evening period (6pm-10pm). The assessment has been based on a maximum of two truck movements in a 15minute interval (e.g., one entry and one exit). Noise emissions have been predicted to the nearest surrounding receivers based on the noise levels identified in Table 9 above and the recommendations in section 7.1.2.

Table 10 -Average Loading Dock Noise Emissions

Receiver	Predicted Noise Level	Criteria	Comment
R1	40dB(A) $L_{eq(15min)}$	$\leq 48dB(A) L_{eq(15min)}$ (NPI Evening Amenity Criteria)	Achieves noise emission objectives
R3	47dB(A) $L_{eq(15min)}$	$\leq 48dB(A) L_{eq(15min)}$ (NPI Evening Amenity Criteria)	Achieves noise emission objectives

7.1.3 Predicted Noise Emissions from the Carpark

The main car park entrance/exit is located on Albemarle Avenue. The carpark has a capacity of approximately 91 spaces with 70 car spaces for retail and 21 residential parking spaces. For the purpose of this assessment, we have assumed there will be a total of 190 car movements (the capacity of car park entering and exiting) in a worst one-hour period. Typically, peak hour periods occur during the daytime however, noise emissions have been predicted to the nearest residential receiver against the Evening criteria to represent a worst-case scenario. This assessment is based on the noise levels identified in Table 9 and the recommendations in section 7.2.2.

Table 11 -Carpark Peak Use Noise Emissions

Receiver	Predicted Noise Level	Criteria	Comment
R1	46dB(A) $L_{eq(15min)}$	$\leq 48\text{dB(A)} L_{eq(15min)}$ (NPI Evening Amenity Criteria)	Achieves noise emission objectives
R3	45dB(A) $L_{eq(15min)}$	$\leq 48\text{dB(A)} L_{eq(15min)}$ (NPI Evening Amenity Criteria)	Achieves noise emission objectives

7.1.4 Communal Open Space

There is a proposed outdoor communal open space for the development located on level 3 of the building. This space will be open to use for residents of the building.

Noise generated from use of the communal open space has been assessed to the nearest residences on either side of the development. The main noise source from this area would be from resident speech. The sound pressure level used in this assessment is of a person speaking loudly at 75dB(A) L_{eq} as defined in the AAAC. One in two persons have been assumed to be talking at any one time.

Noise emissions have been predicted at the closest residential receiver, being the third storey units at 494-496 Old South Head Road. Predictions are based on the recommendations in Section 7.2.3 below.

Table 12 -Communal Open Space

Receiver	Predicted Noise Level	Criteria	Comment
R2	46dB(A) $L_{eq(15min)}$	$\leq 48\text{dB(A)} L_{eq(15min)}$ (NPI Evening Amenity Criteria)	Achieves noise emission objectives

7.2 RECOMMENDATIONS

Noise emission from operation of project site has been analysed and the following acoustic treatments are recommended to ensure that the external noise emissions comply with the criteria in Section 5. The following recommendations apply.

7.2.1 Loading Dock

- Trucks should turn off engines during loading/unloading activities.
- The underside of the ceiling in the loading dock area should incorporate absorptive lining equal to NRC 0.7.

7.2.2 Carpark

- The western wall of the carpark entrance should be constructed with sheet metal, capped and lapped timber, perpex, glass, or other solid non-perforated material with a maximum 50mm gap at the bottom for water drainage (if necessary). See figure 3 below.

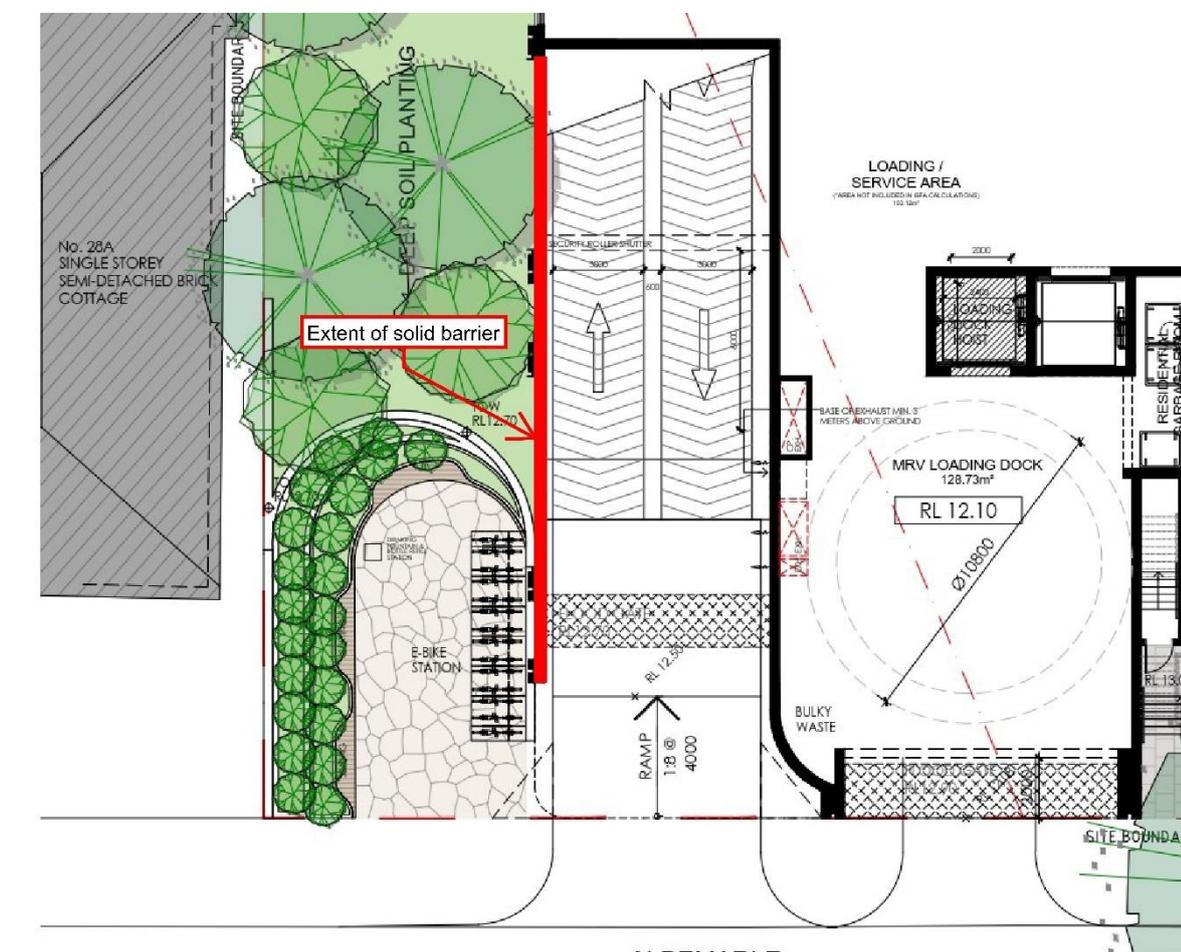


Figure 3 – Carpark Entrance Acoustic Barrier

7.2.3 Communal Open Space

- The outdoor communal area should be off limits between 10pm and 7am.
- No music is allowed at any time.
- An acoustic barrier is required between the communal open space and the neighbouring building at 494-496 Old South Head Road.
 - The barrier should be 2.8m high from the floor of the communal space (reach RL 23.60).
 - The barrier should span the length of the interface between the communal space and the building at 494-496 Old South Head Road plus an additional 3m on the western end. (See figure 4 Below)
 - The barrier should be constructed with sheet metal, capped and lapped timber, perpex, glass, or other solid non-perforated material with a 50mm gap at the bottom for water drainage (If necessary).

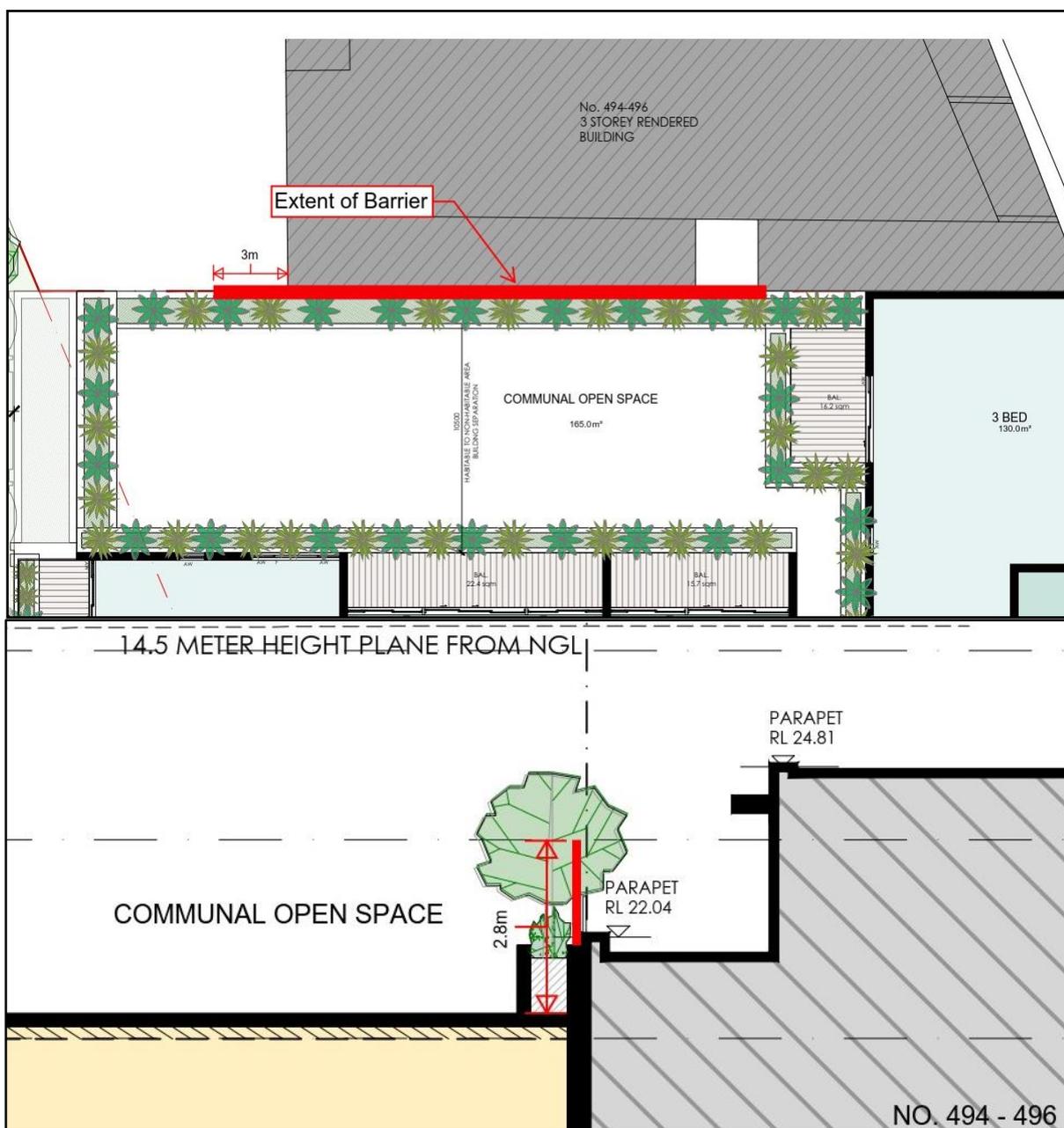


Figure 5 – Communal Open Space Acoustic Barrier

7.3 NOISE FROM MECHANICAL PLANT

Detailed plant selection has not been undertaken at this stage, as plant selections have not been determined. Detailed acoustic review should be undertaken at DA or 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.

8 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the proposed mixed use development at 488-492 Old South Head Road & 30 Albemarle Avenue, Rose Bay.

Internal noise criteria for external noise impacts have been formulated with reference to the following documents:

- Woollahra Municipal Council- *'Woollahra Development Control Plan (DCPs) 2015'*.
- NSW Department of Planning and Environment's document – *'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007'*.
- NSW Department of Planning – *Development near Rail Corridors or Busy Roads – Interim Guideline*.

External noise emissions criteria have been setup in this report to satisfy the requirements from the following documents:

- Woollahra Municipal Council- *'Woollahra Development Control Plan (DCPs) 2015'*.
- NSW Environmental Protection Authority (EPA) document – *'Noise Policy for Industry (NPfI) 2017'*.

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

Yours faithfully,

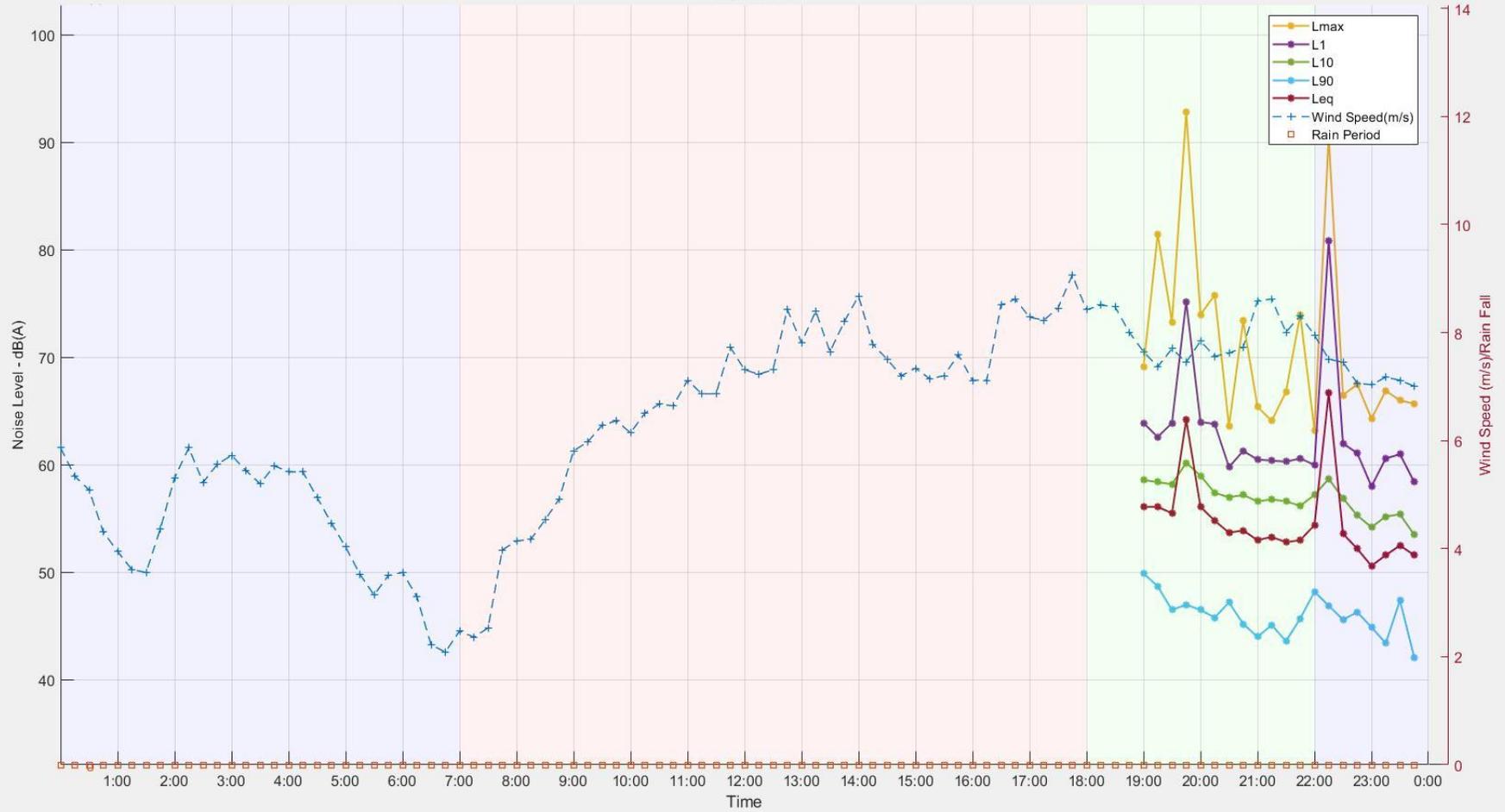


Acoustic Logic Pty Ltd
Ruben Ghannoum

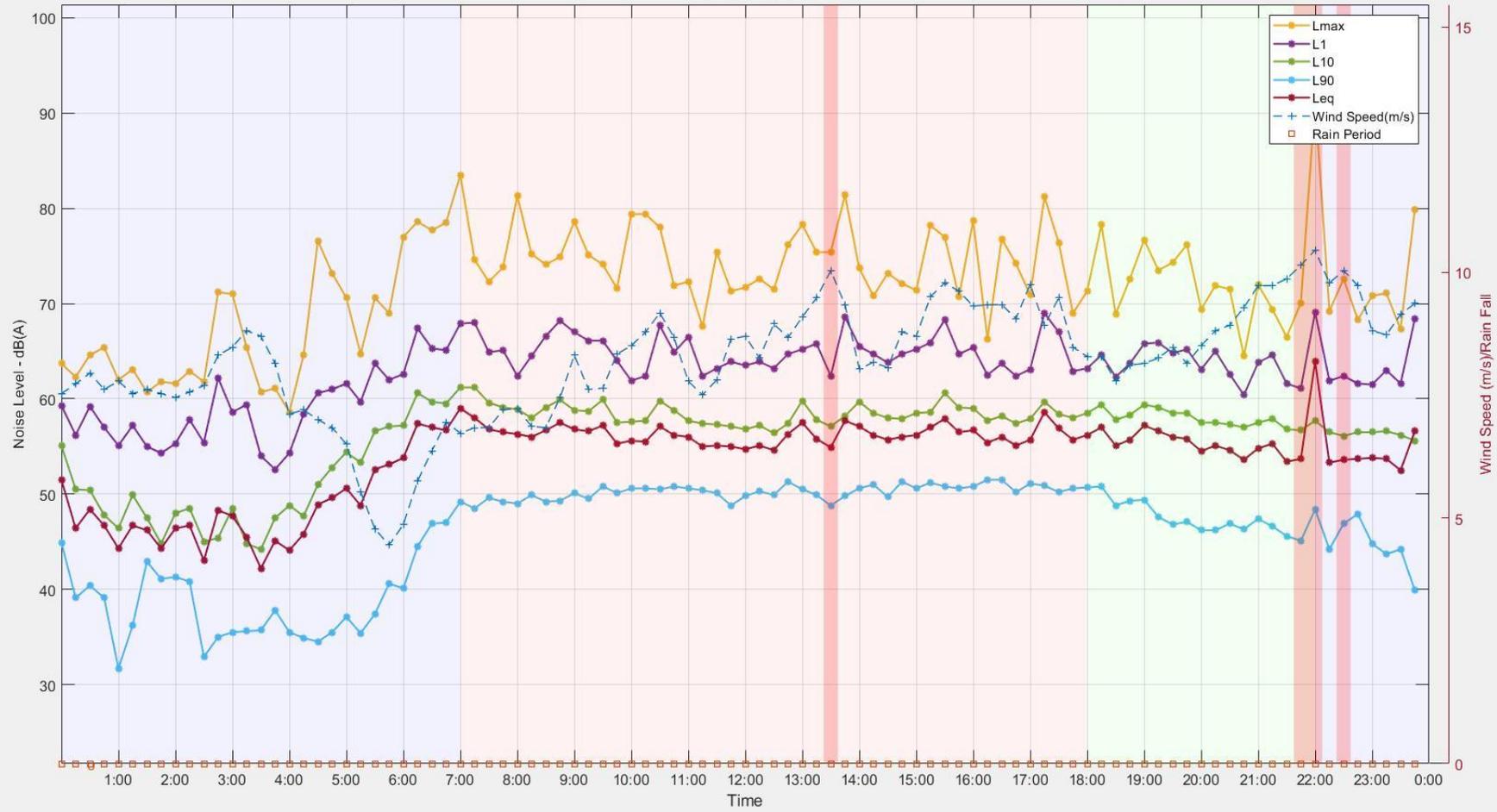
9 APPENDIX ONE – UNATTENDED NOISE MONITORING DATA

9.1 NOISE MONITOR 1

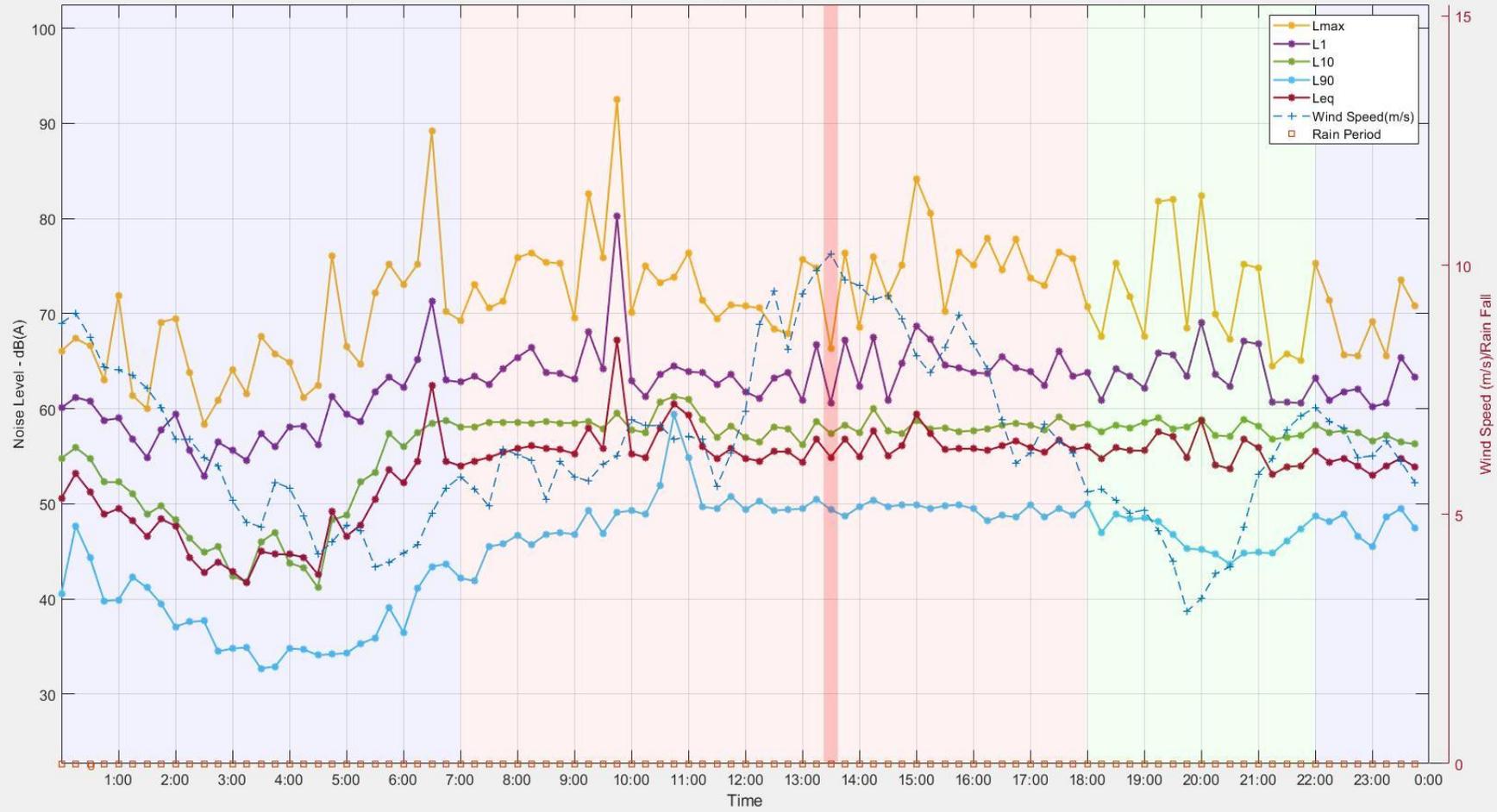
488 Old South Head Road, Rose Bay-Rear
27/01/2022



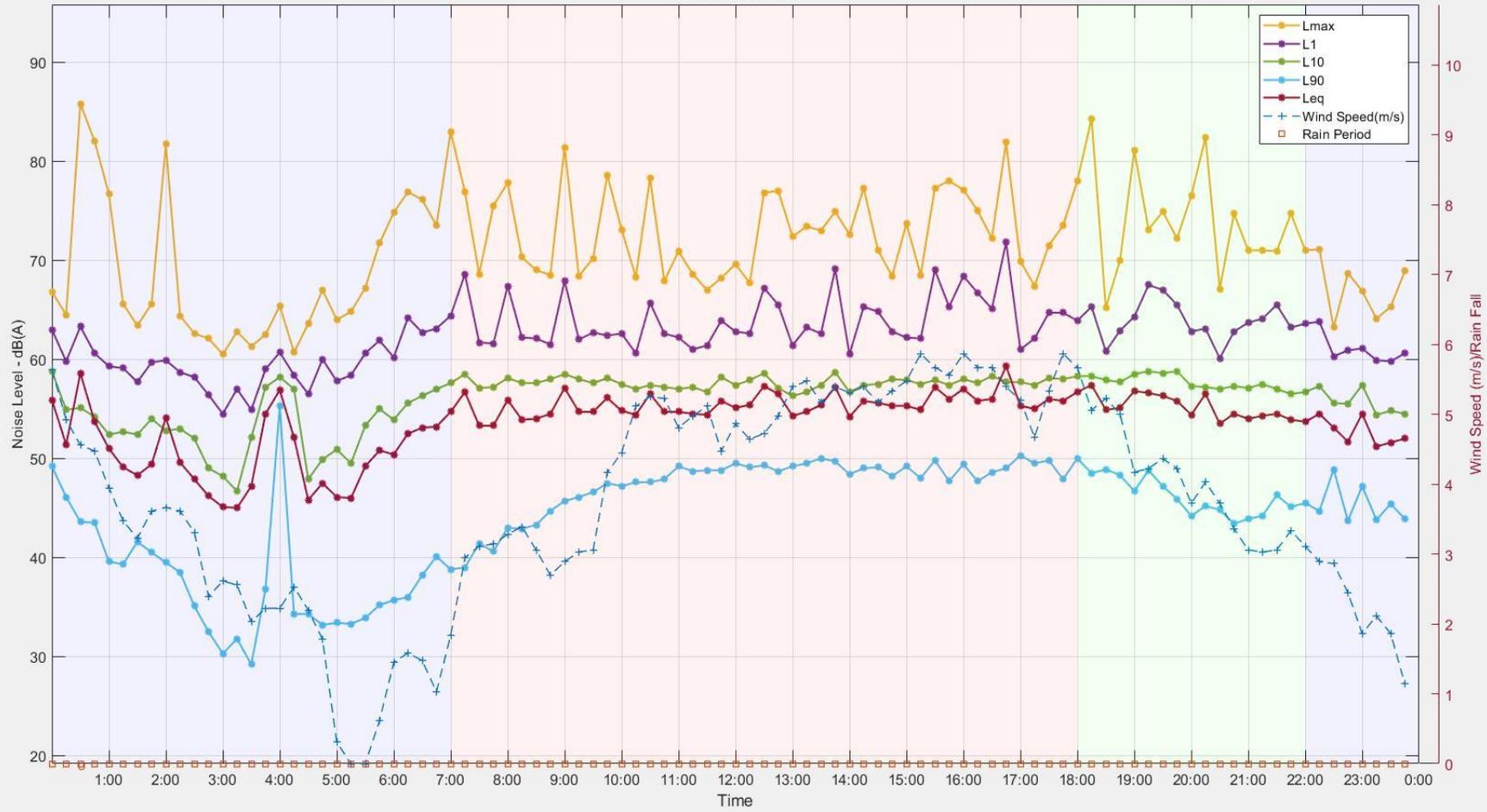
488 Old South Head Road, Rose Bay-Rear
28/01/2022



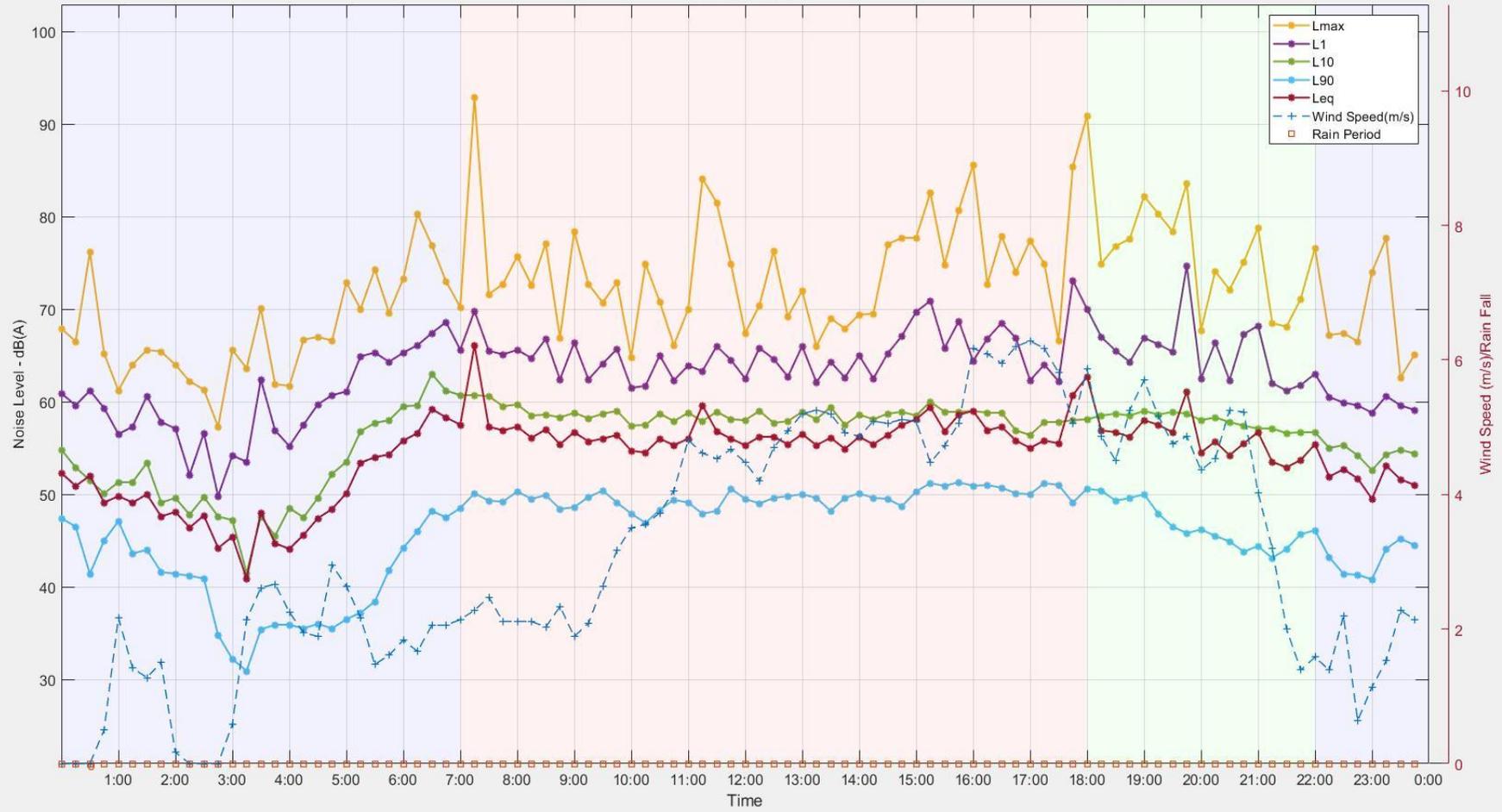
488 Old South Head Road, Rose Bay-Rear
29/01/2022



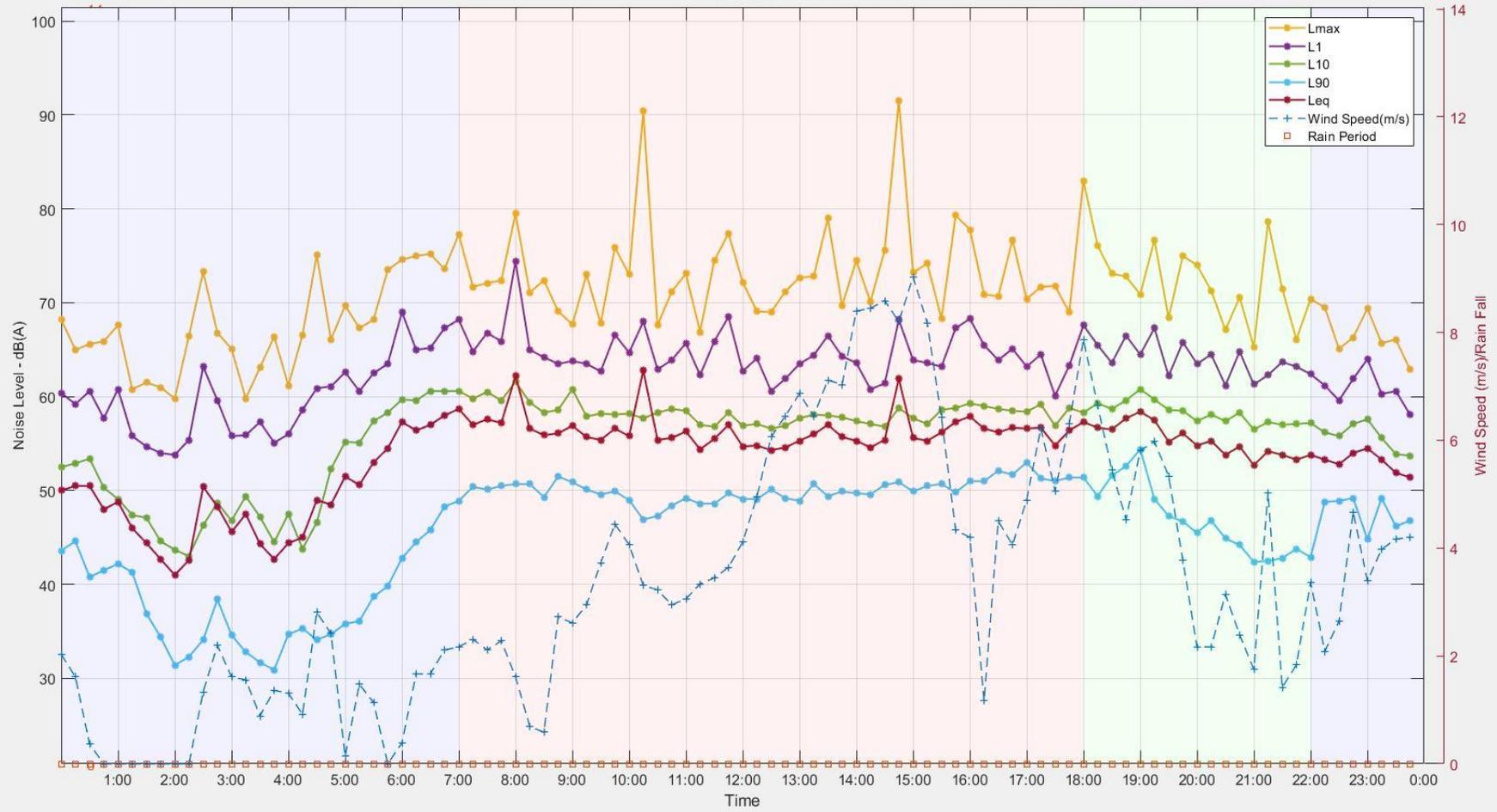
488 Old South Head Road, Rose Bay-Rear
30/01/2022



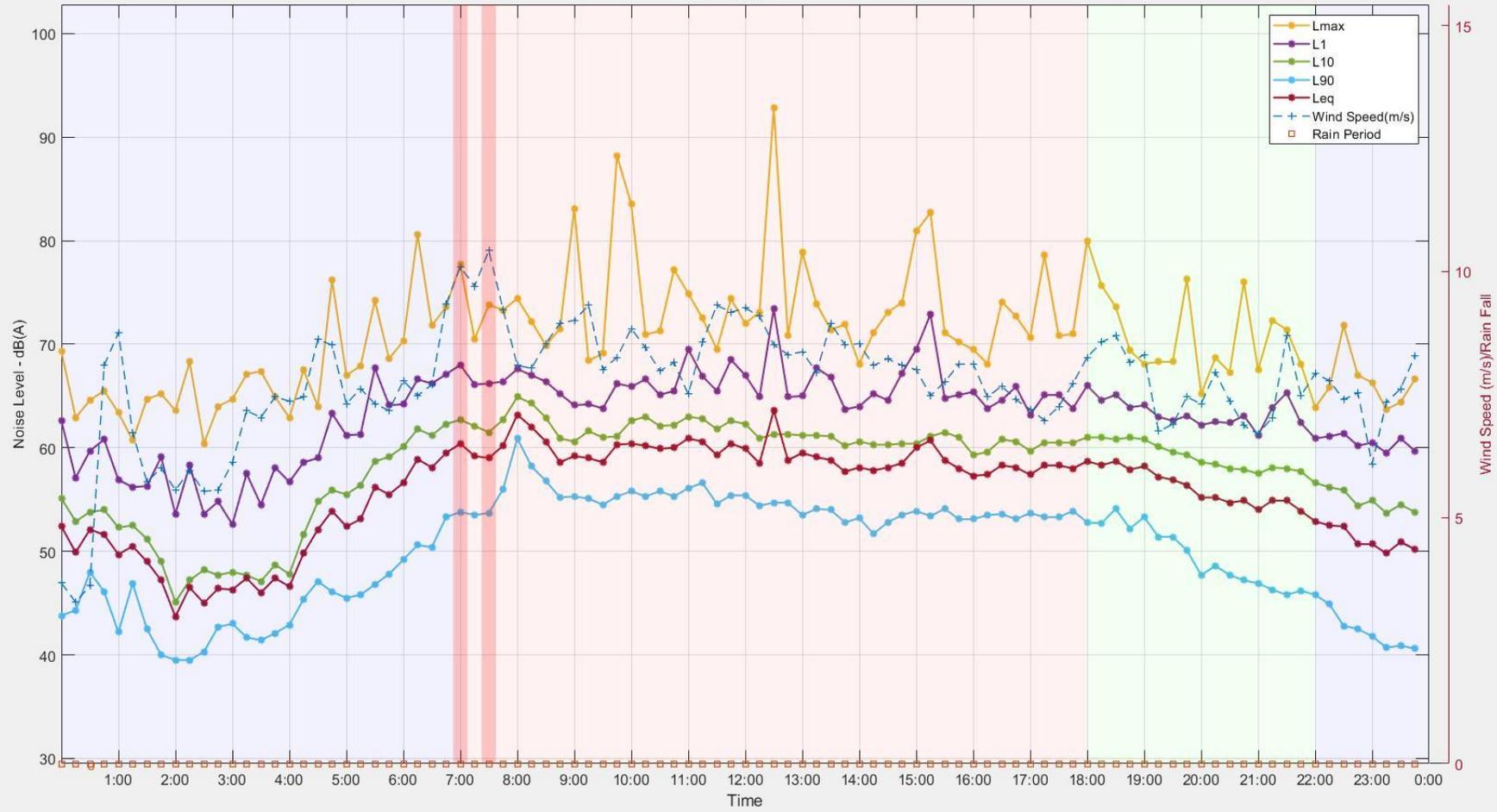
488 Old South Head Road, Rose Bay-Rear
31/01/2022



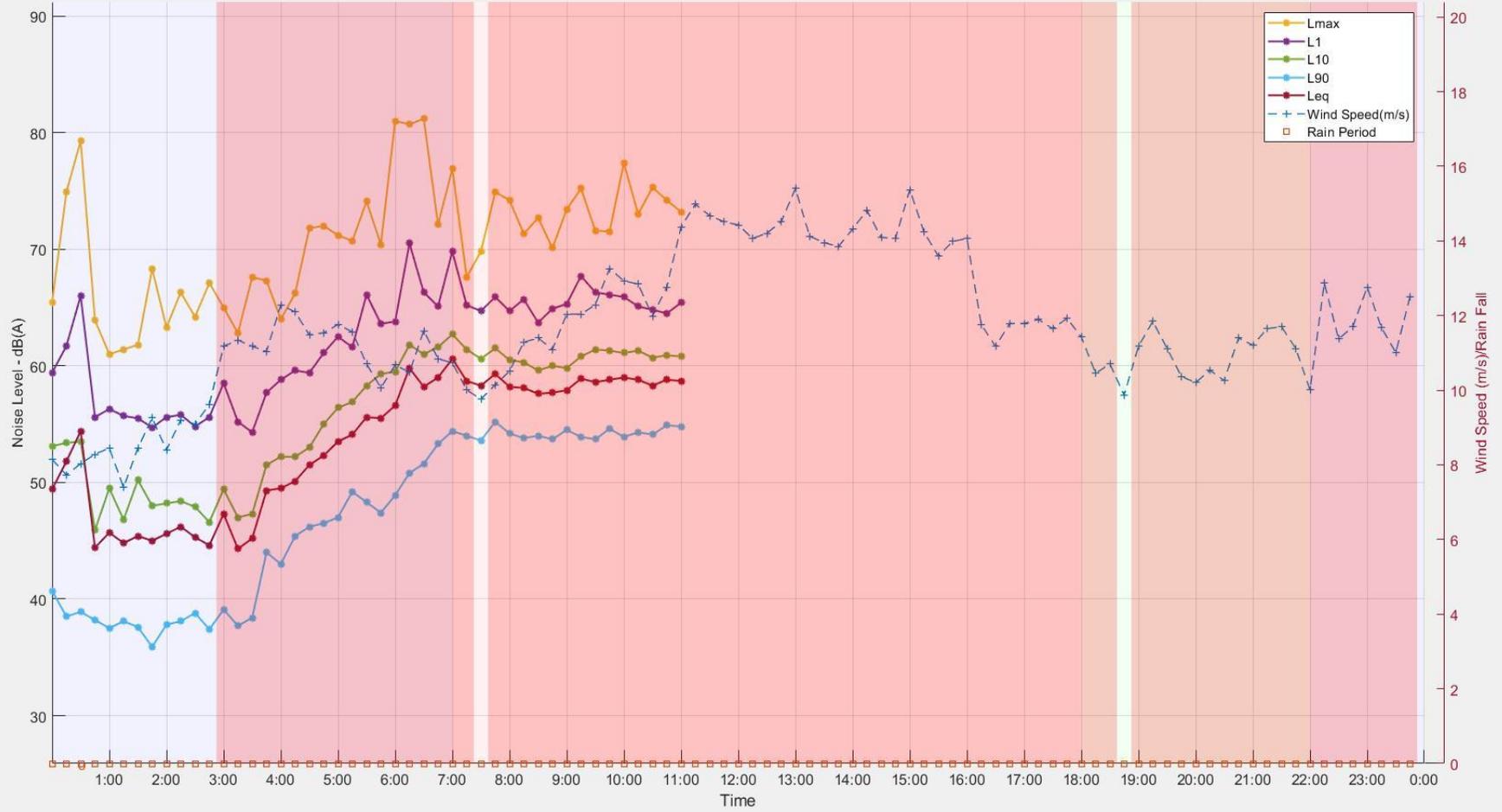
488 Old South Head Road, Rose Bay-Rear
1/02/2022



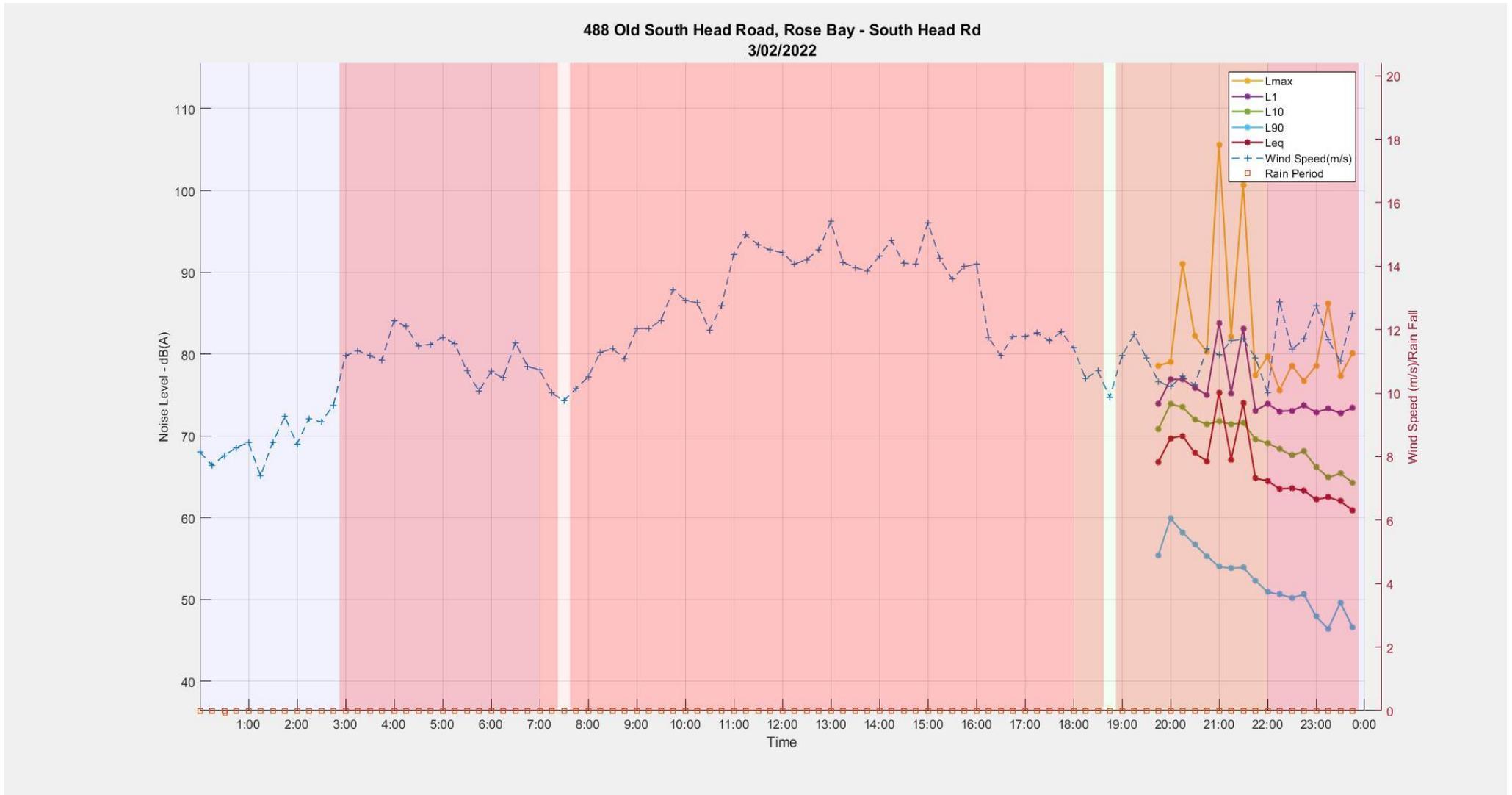
488 Old South Head Road, Rose Bay-Rear
2/02/2022



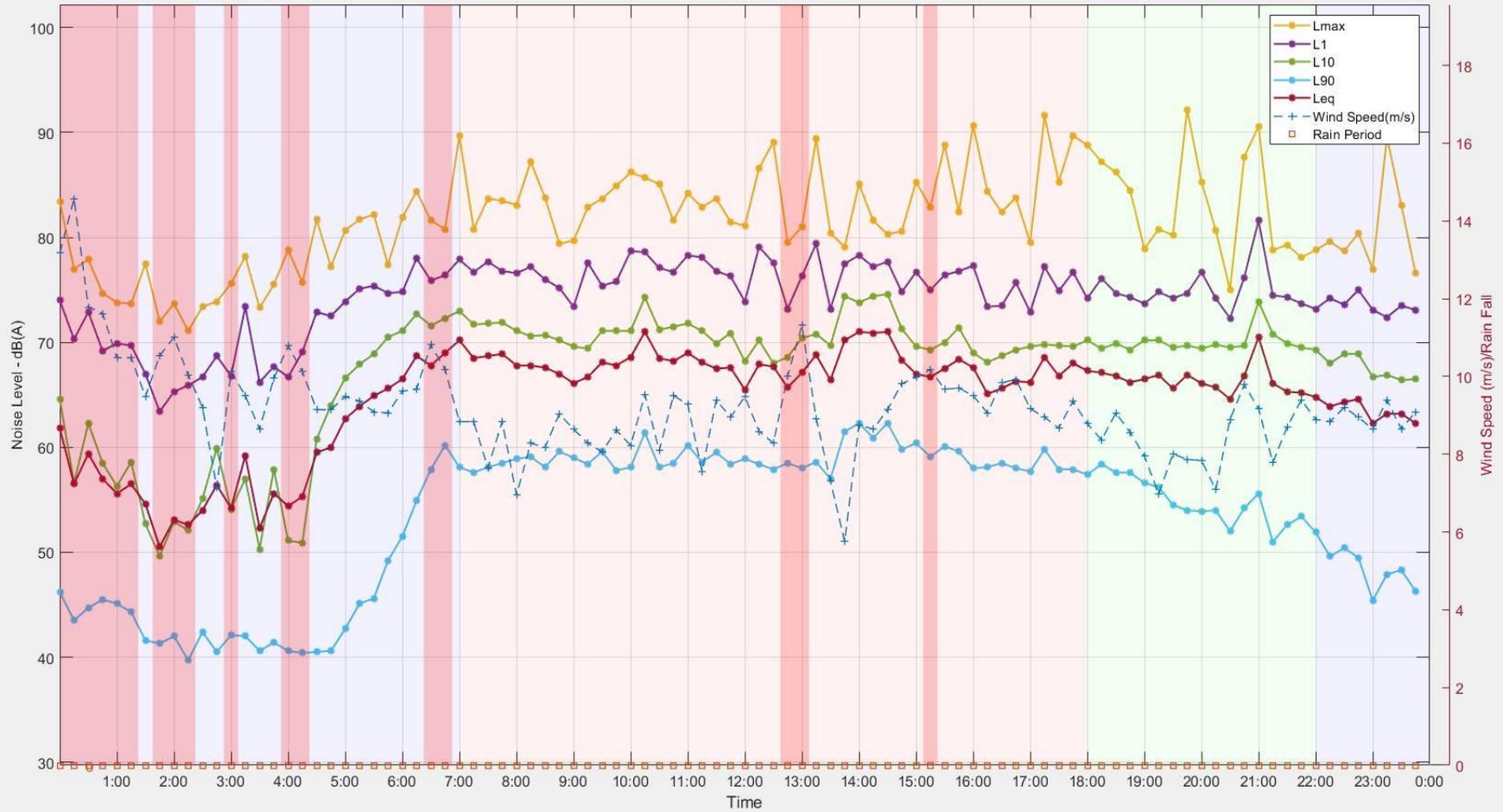
488 Old South Head Road, Rose Bay-Rear
3/02/2022



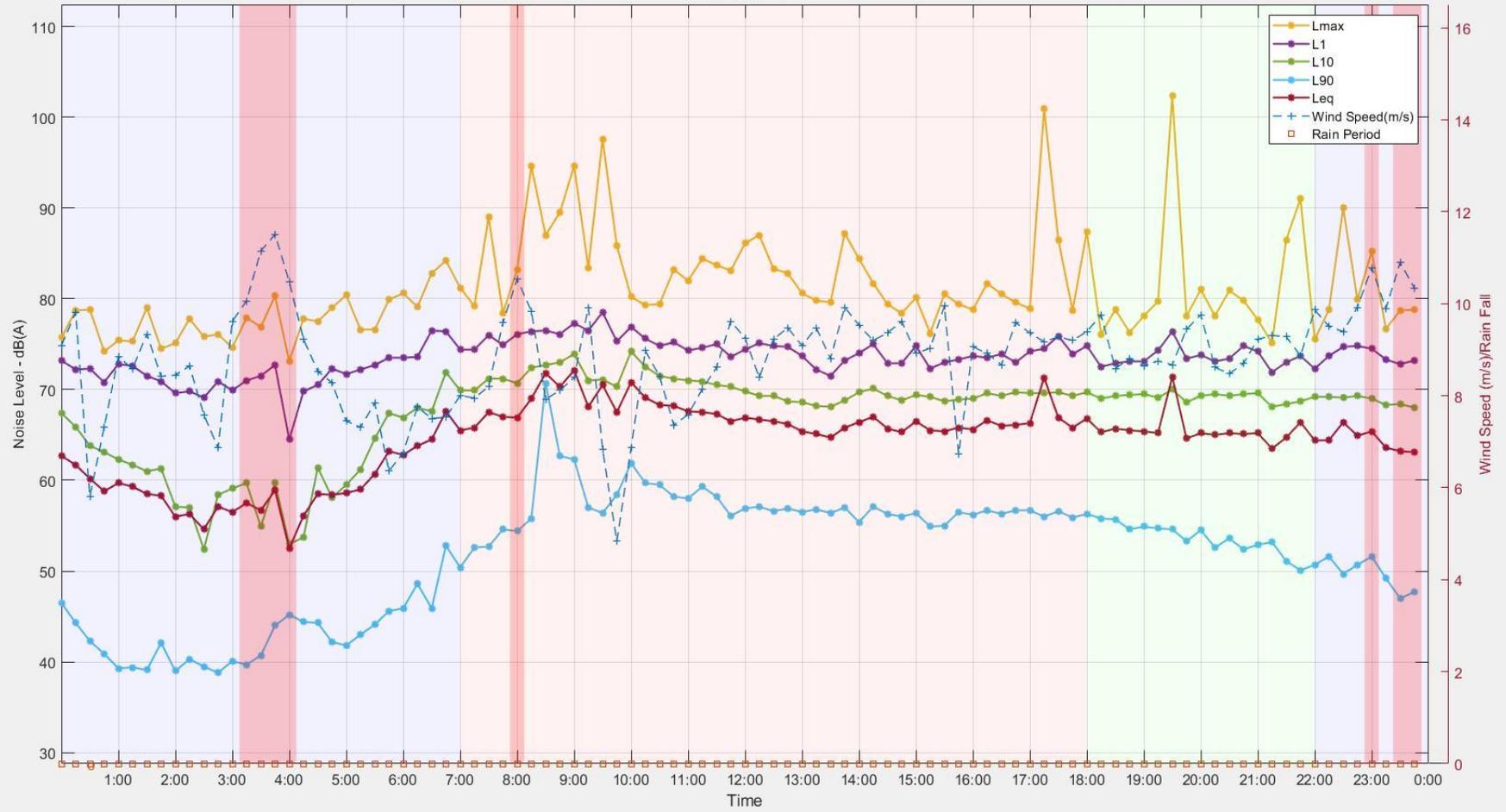
9.2 NOISE MONITOR 2



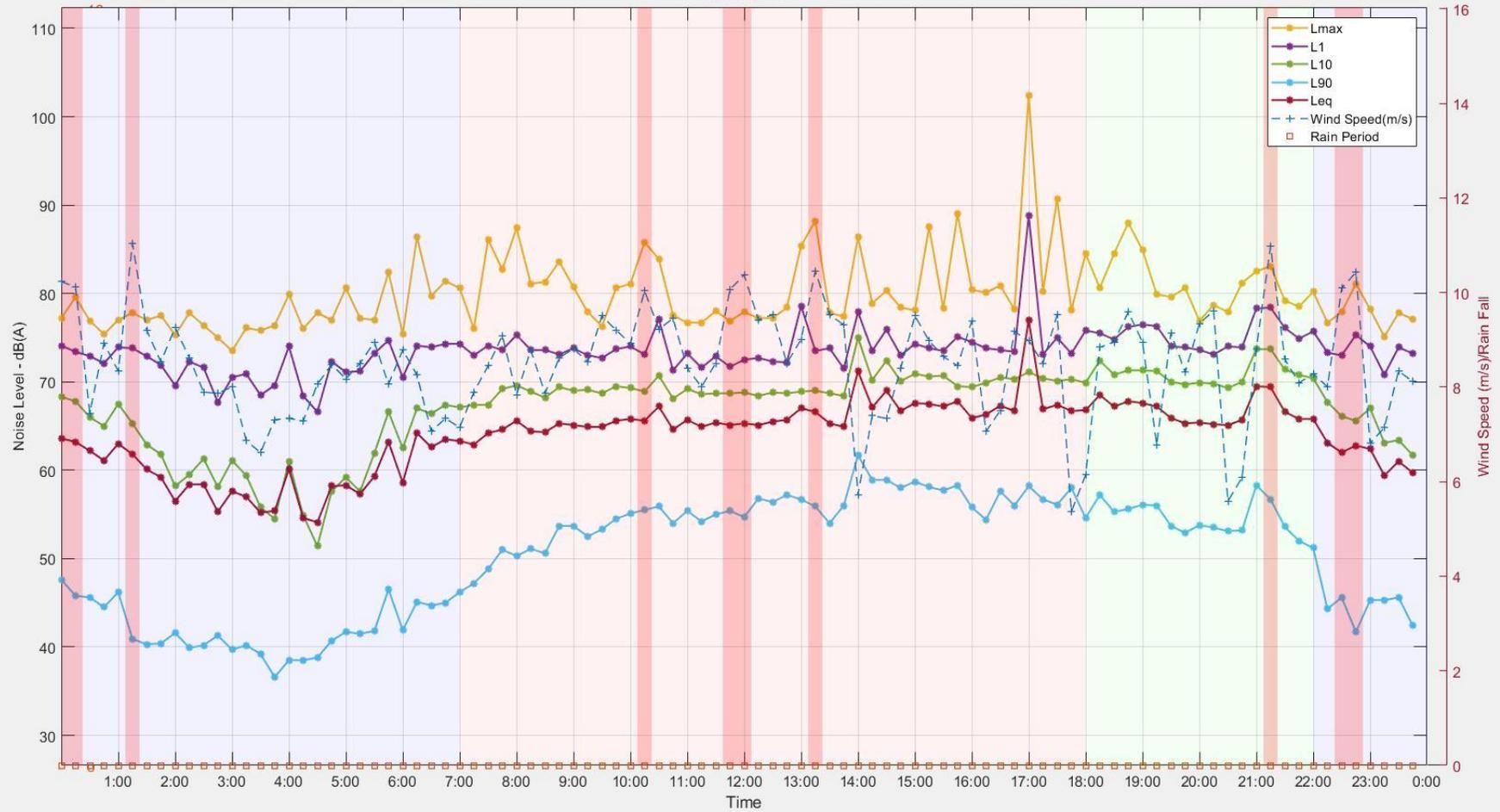
488 Old South Head Road, Rose Bay - South Head Rd
4/02/2022



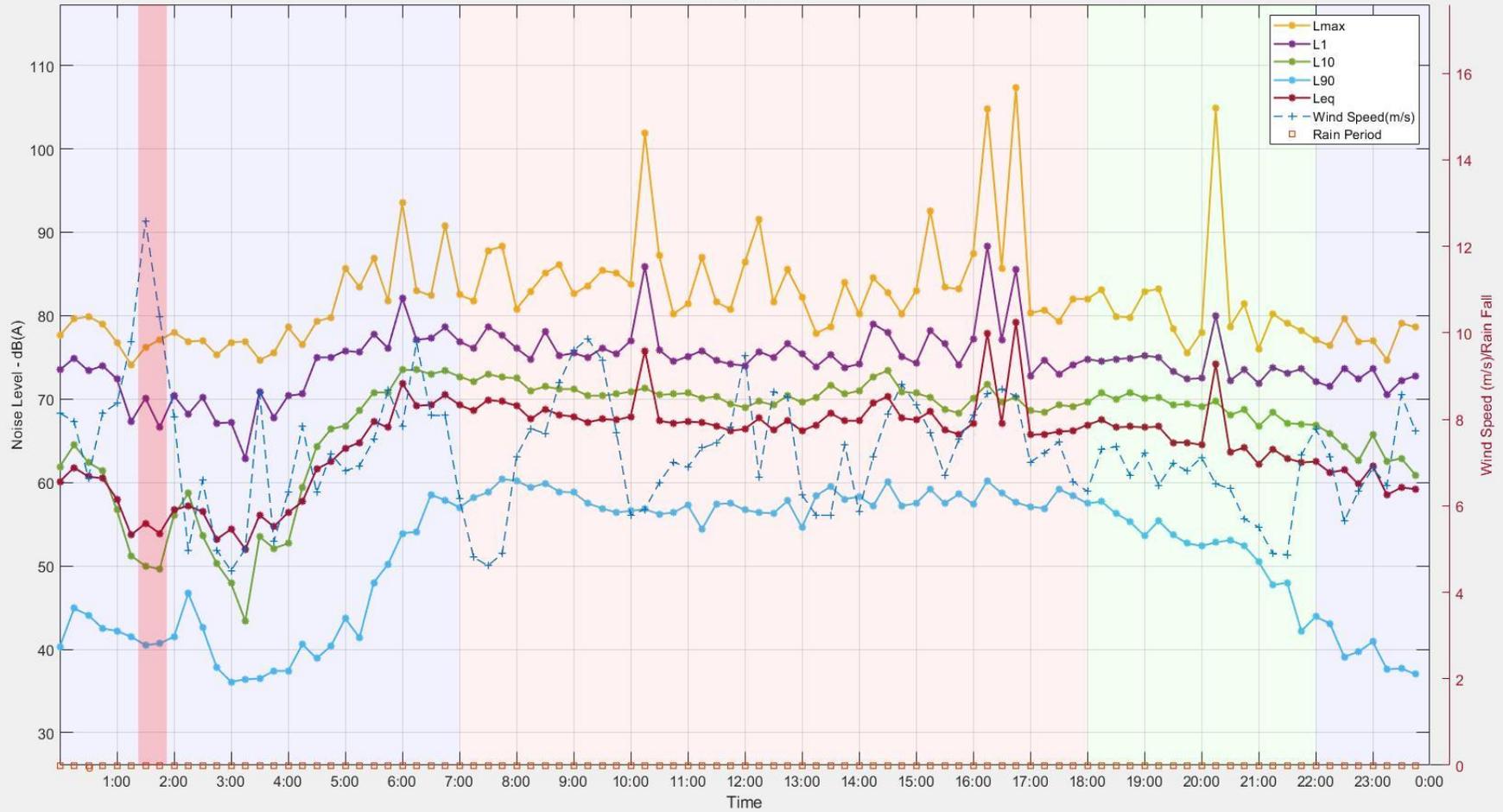
488 Old South Head Road, Rose Bay - South Head Rd
5/02/2022



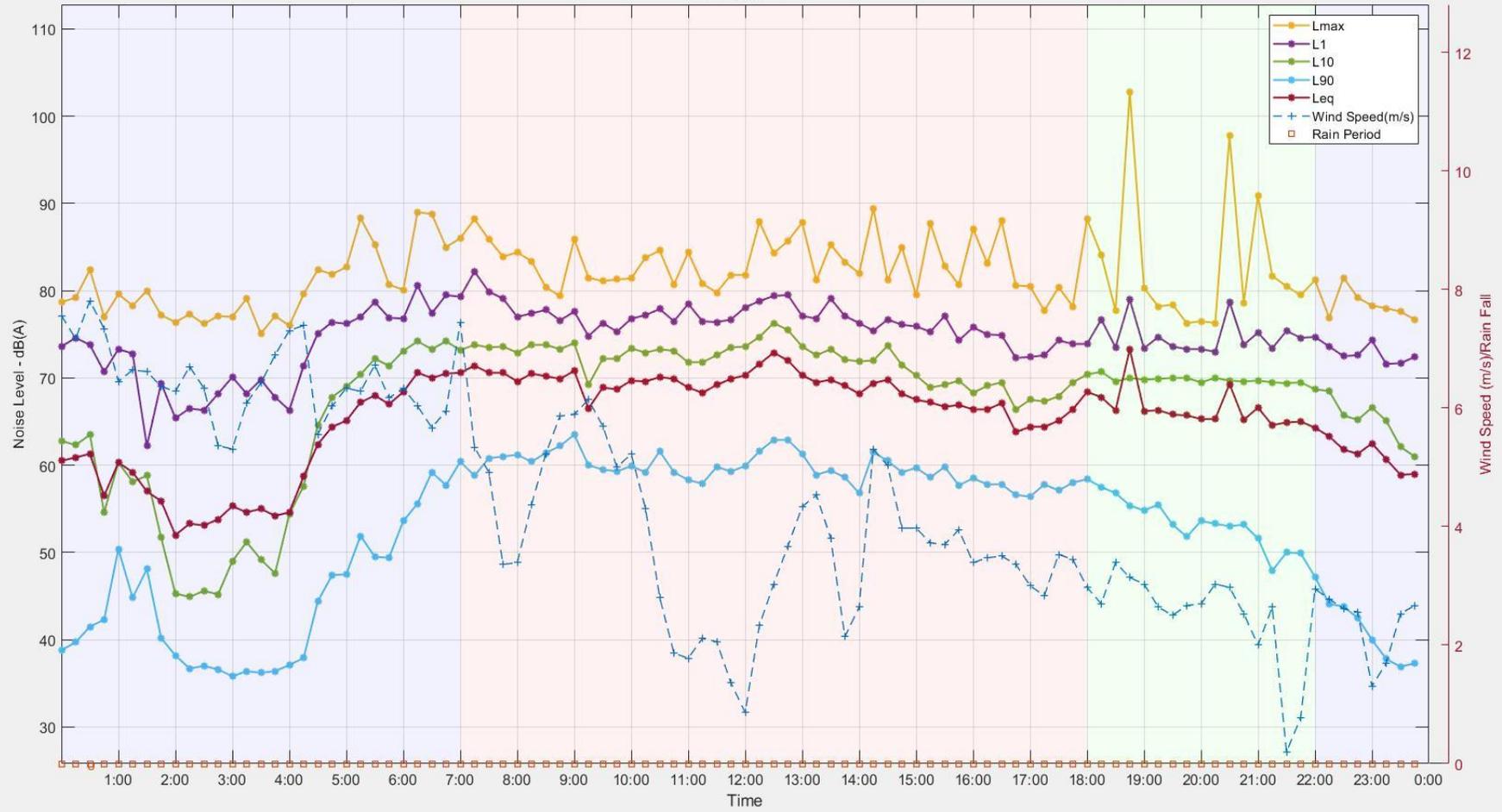
488 Old South Head Road, Rose Bay - South Head Rd
6/02/2022



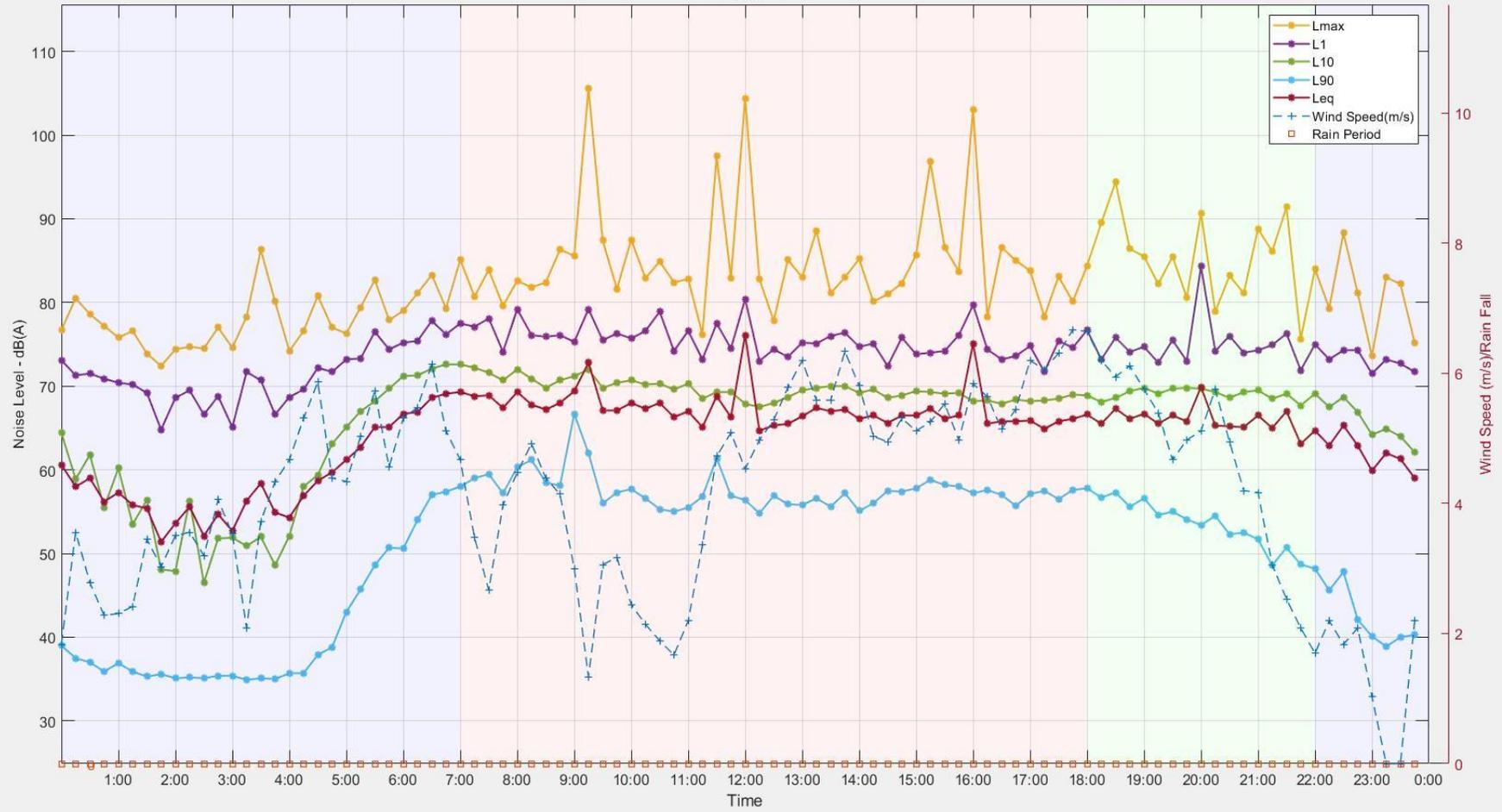
488 Old South Head Road, Rose Bay - South Head Rd
7/02/2022



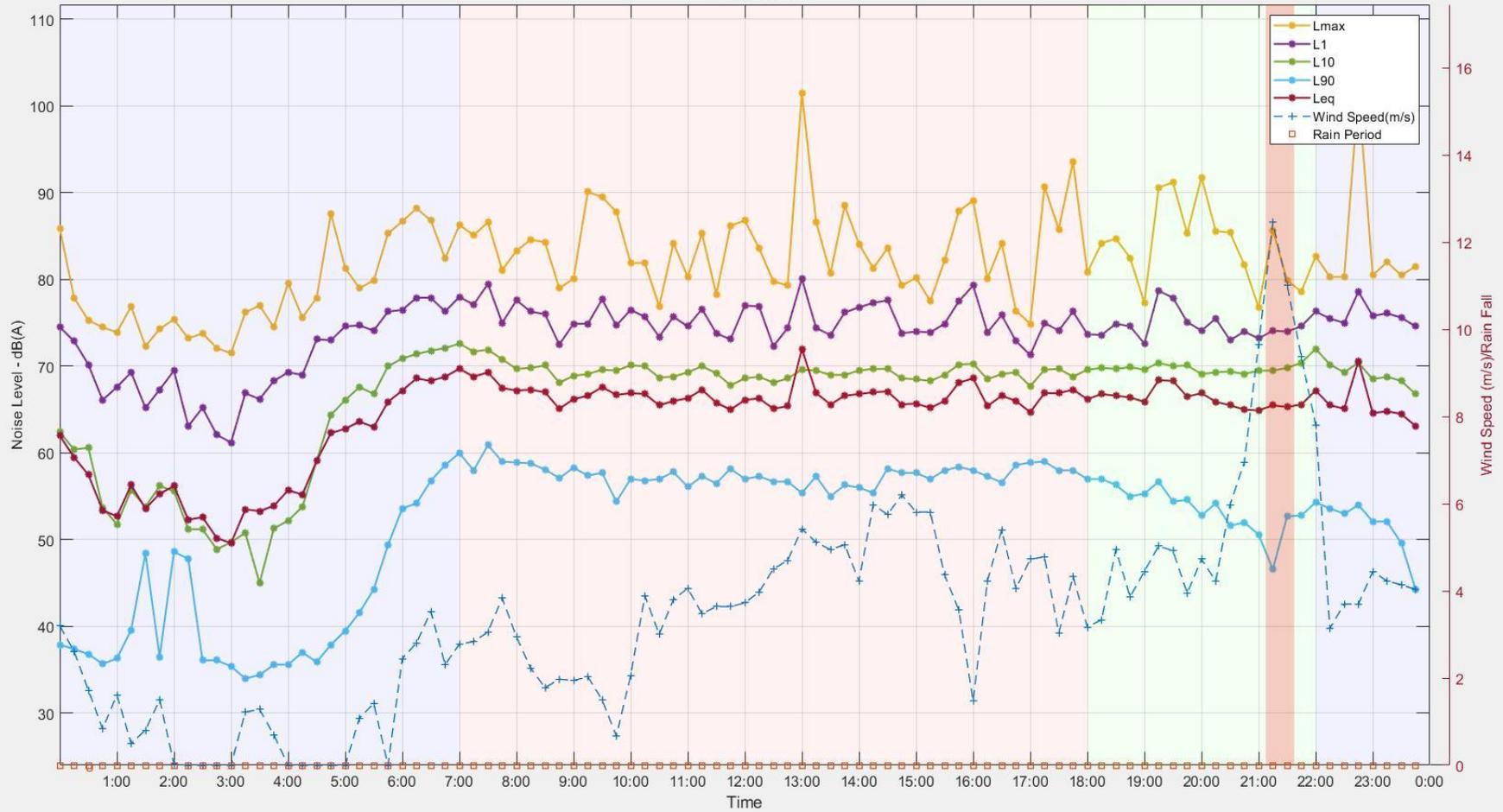
488 Old South Head Road, Rose Bay - South Head Rd
8/02/2022



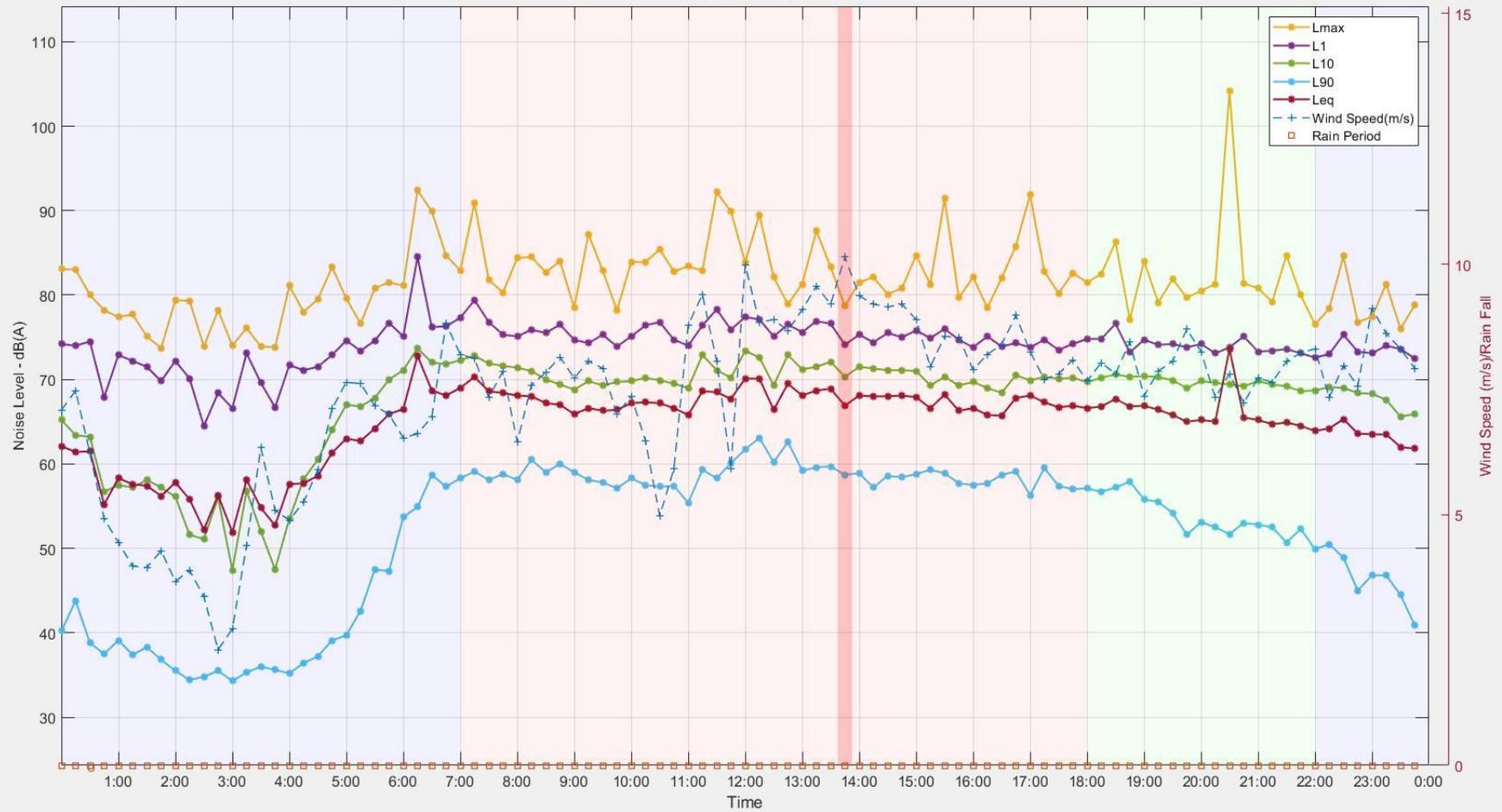
488 Old South Head Road, Rose Bay - South Head Rd
9/02/2022



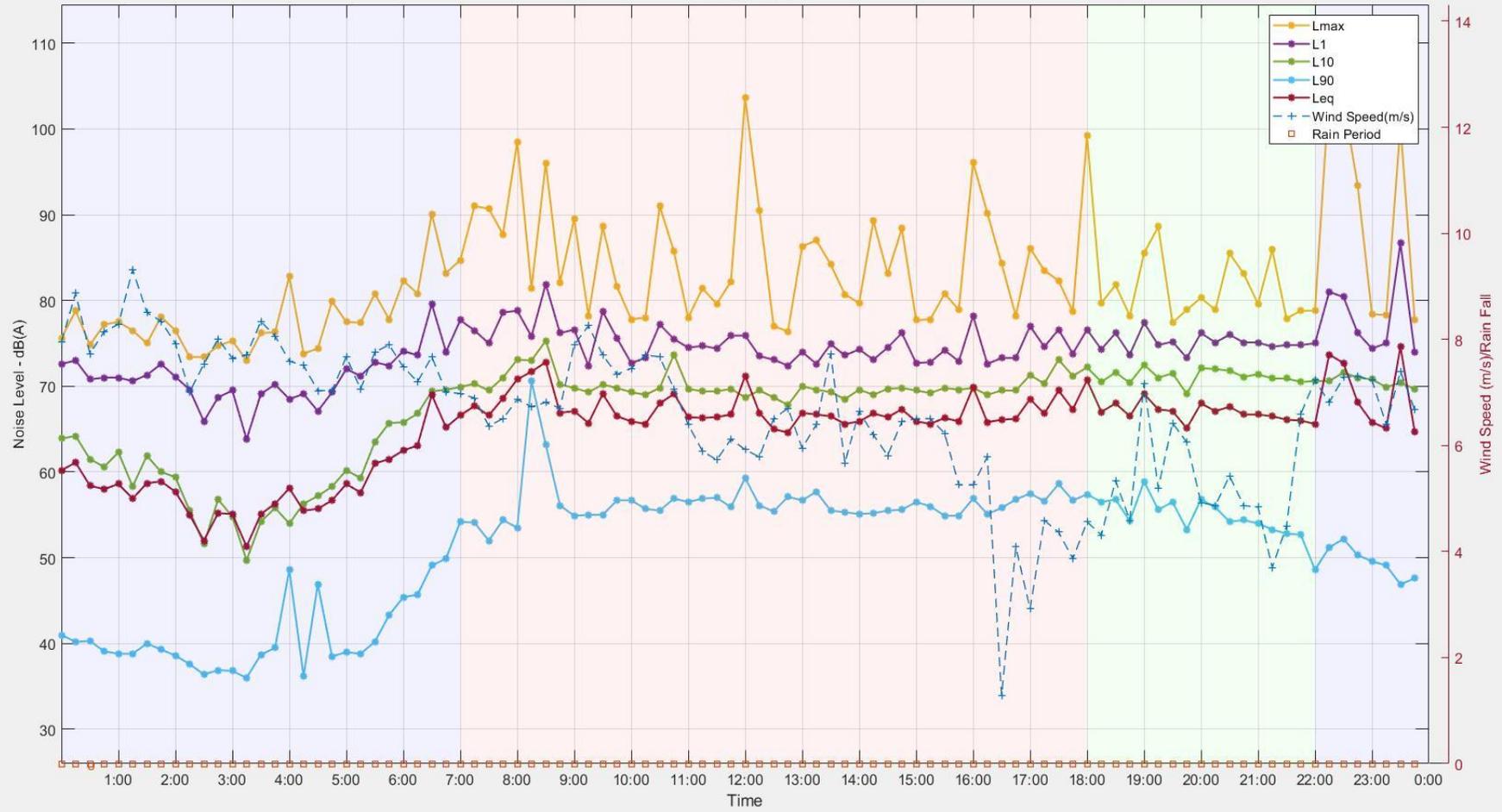
488 Old South Head Road, Rose Bay - South Head Rd
10/02/2022



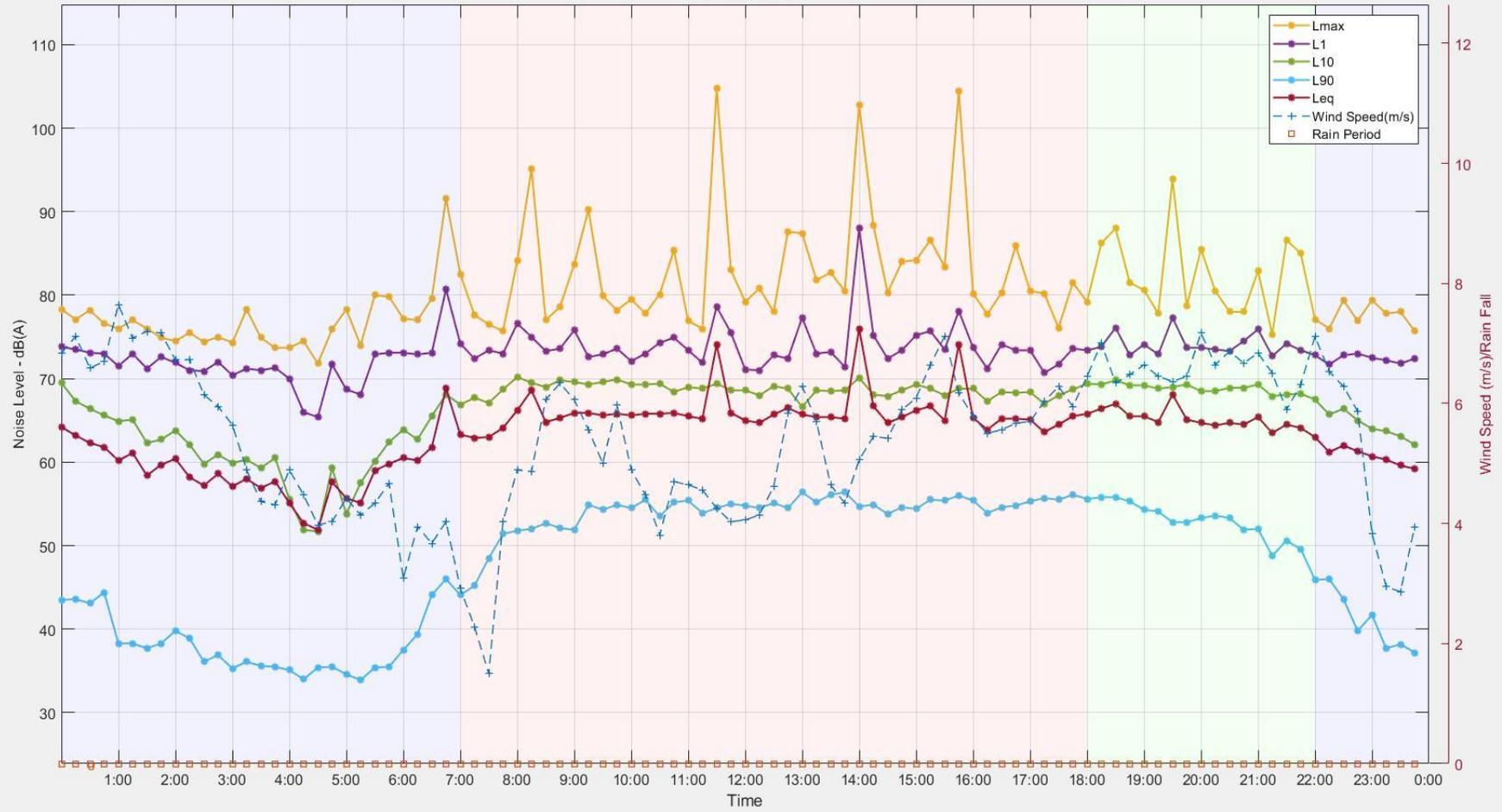
488 Old South Head Road, Rose Bay - South Head Rd
11/02/2022



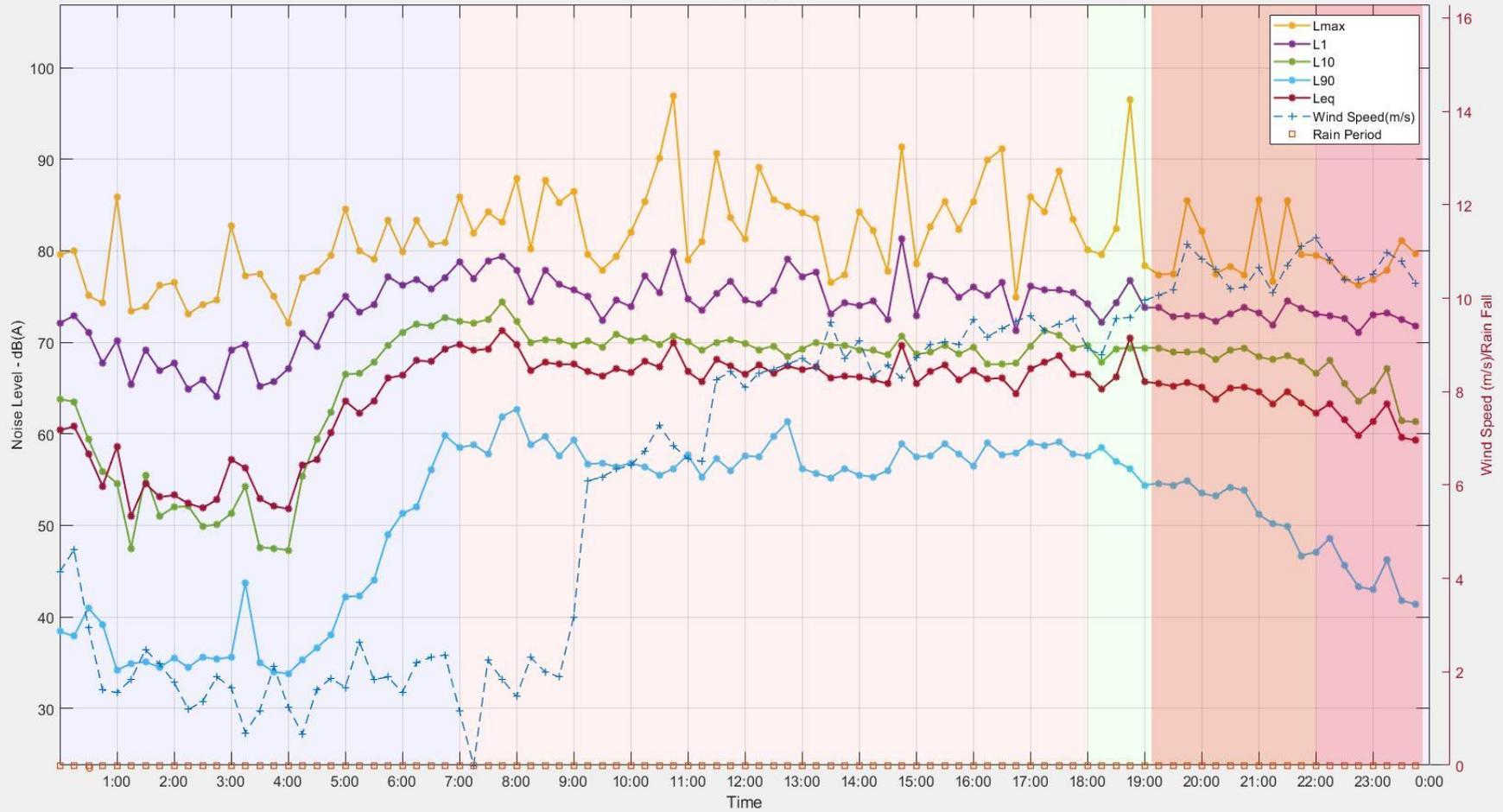
488 Old South Head Road, Rose Bay - South Head Rd
12/02/2022



488 Old South Head Road, Rose Bay - South Head Rd
13/02/2022



488 Old South Head Road, Rose Bay - South Head Rd
14/02/2022



488 Old South Head Road, Rose Bay - South Head Rd
15/02/2022

