

Brentwood - 28 Glebe St, Parramatta

Development Application

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1 INTRODUCTION

Acoustic Logic have been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed aged care development located at 28 Glebe Street, Parramatta.

The document addresses noise impacts associated with the following:

- Noise intrusion from external sources
- Noise emissions from mechanical plant to service the project site (in principle)

This office has utilised the following documents and regulations in the noise assessment of the development;

- Parramatta Development Control Plan (DCP) 2011
- Australian Standard AS2107:2016 – Recommended Design Sound Levels and Reverberation Times for Building Interiors; and
- NSW Department of Environment and Heritage, Environmental Protection Agency document – *Noise Policy for Industry* (NPI) 2017

This assessment has been conducted based on the architectural drawings provided by Group GSA dated 4th of May 2021, issue H.

2 SITE DESCRIPTION

The proposed development comprises the following;

- 23 space ground floor carpark with driveway from Glebe Street;
- 108 units spread over level one to level three.

Acoustic Investigation has been carried out by this office in regards to the existing properties and noise impacts surrounding the proposed development, which is detailed below:

- **R1: Residential Receiver 1** – Existing neighbouring residential dwellings to the East on Glebe St and King St.
- **R2: Residential Receiver 2** – Existing neighbouring residential receivers to the North on King St
- **R3: Residential Receiver 3** – Existing neighbouring residential dwellings to the west on Glebe St and Marsden St

A site map, measurement description and surrounding receivers are presented below



Unattended Noise Monitor

Figure 1 – Site Map
(Sourced SixMapsNSW)



Residential Receiver

3 NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principle measurement parameters are used, namely L_{10} , L_{90} and L_{eq} . The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

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

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

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15 minute period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

The L_{max} parameter represents the loudest noise event during a measurement period.

4 AMBIENT NOISE SURVEY

NSW EPA's Rating Background Noise Level (RBL) assessment procedure requires determination of background noise level for each day (the ABL) then the median of the individual days as set out for the entire monitoring period.

Appendices in this report present results of unattended noise monitoring conducted at the project site. Weather affected data was excluded from the assessment. The processed RBL (lowest 10th percentile noise levels during operation time period) are presented in Table 1.

4.1 MEASUREMENT POSITION

One unattended noise monitor was placed near the western boundary of the site. Refer to Figure 1 for a detailed location.

4.2 MEASUREMENT PERIOD

Unattended noise monitoring was conducted from Friday the 12th of February to Tuesday the 2nd of March 2021 to ensure that the subsequent calculations adhered to the NSW EPA Noise Policy for Industry (NPI) 2017 guidelines.

4.3 MEASUREMENT EQUIPMENT

Equipment used consisted of an Acoustic Research Laboratories Pty Ltd noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Noise logger data is provided in Appendix 1.

4.4 SUMMARISED RATING BACKGROUND NOISE LEVELS

Summarised rating background noise levels for the project site and immediate surroundings are presented below. Weather affected data has been excluded where required by Fact Sheets A and B of NSW EPA Noise Policy for Industry guidelines.

Table 1 - Measured Background Noise Levels

Time of day	Rating Background Noise Level dB(A)L₉₀(Period)
Day (7am – 6pm)	48
Evening (6pm – 10pm)	45
Night (10pm – 7am)	41

Table 2 – Measured Environmental Noise Levels

Time of day	Environmental Noise Level, worst 1 hour dB(A)L_{eq}(1 hour)
Day (7am – 10pm)	59
Night (10pm – 7am)	49

5 NOISE INTRUSION ASSESSMENT

The major external noise sources intruding into the proposed development will be vehicle movements from Glebe Street. Noise intrusion into the development will be addressed in accordance with the requirements of the following.

5.1 INTERNAL NOISE CRITERIA

5.1.1 Parramatta Development Control Plan (DCP) 2011

The Parramatta Council DCP does not state any relevant internal noise level criteria for aged-care facilities, therefore we will refer to the recommended internal noise levels presented in AS2107:2016.

5.1.2 Australian and New Zealand AS/NZS 2107:2016 '*Recommended design sound levels and reverberation times for building interiors*'

AS2107:2016: Recommended design sound levels and reverberation times for building interiors specifies allowable internal noise levels for internal spaces within various buildings. Table 1, in Section 5 of AS2107:2016, gives the following maximum internal noise levels for aged-care facilities.

Table 3 - Recommended Design Sound Levels

Space /Activity Type	Recommended Design Sound Levels
Common Areas (e.g. foyer, lobby)	45-50 dB(A) _{Leq(when in use)}
Living Areas (e.g. common lounges)	35-45 dB(A) _{Leq(when in use)}
Sleeping areas (night time)	35-40 dB(A) _{Leq(night time)}
Work areas (e.g. concierge, administration)	35-45 dB(A) _{Leq(when in use)}

For the purpose of this assessment we will adopt the lower value in each range.

5.2 RECOMMENDED CONSTRUCTIONS

Assessment of façade requirements to achieve required indoor noise levels has been undertaken. Dimensions of rooms, setbacks from roadways, window openings and floor areas have been used.

5.2.1 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-lon 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. The recommended constructions are detailed in Table 4.

Table 4 - Glazing Thickness Requirements for New Elements

Site	Space	Glazing Construction	Acoustic Seals
28 Glebe Street, Parramatta	Bedrooms facing Glebe Street	6.38mm laminate	Yes
	All other bedrooms and areas	6mm float	Yes

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 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 5 for all areas. 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 5 - Minimum R_w of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w of Installed Window
6.38mm Laminate	31
6mm Float	29

Note: Façade constructions to be reviewed at CC stage based on construction drawings. The glazing types listed above are indicative and for authority approvals purposes only.

5.2.2 External Roof/Ceiling Construction

External roof construction will be constructed from masonry (concrete) elements, therefore; no acoustic upgrading is required. In the event that any penetrations are required thru the external skin, an acoustic sealant should be used to minimise all gaps.

5.2.3 External Wall Construction

New external walls will be constructed from masonry elements therefore, no further acoustic upgrading. In the event that any penetrations are required thru the external skin, an acoustic sealant should be used to minimise all gaps.

5.2.4 Entry Doors

All external entry doors shall have glazing thicknesses equal to those recommended in Section 5.2.1 and are to have Raven RP10 to the top and sides and Raven RP38 to the underside of a swing door.

Note that mohair seals in windows and doors are not acceptable where acoustic seals are required.

5.2.5 Mechanical Ventilation

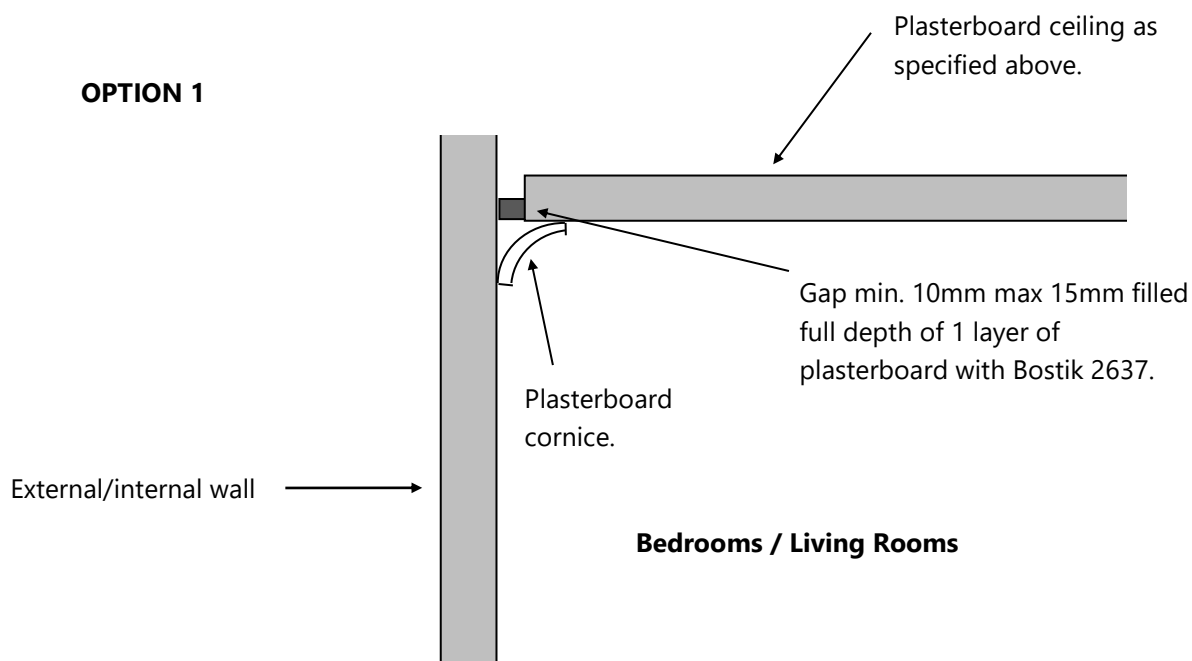
AS2021:2015 requires the installation of ventilation or air conditioning system where aircraft noise exposure exceeds ANEF 25. As internal noise levels cannot be achieved with windows open it is required that an in **all areas** to have alternative outside air supply system or air conditioning be installed. These should be in accordance with AS1668.2 requirements.

Any mechanical ventilation system that is installed should be acoustically designed such that the acoustic performance of the recommended constructions is not reduced by any duct or pipe penetrating the wall/ceiling/roof. Noise emitted to the property boundaries by any ventilation system shall comply with Council requirements.

5.2.6 Plasterboard Corner Details

The recommended plasterboard ceiling/wall corner construction options over the rooms are shown below.

OPTION 1



OPTION 2

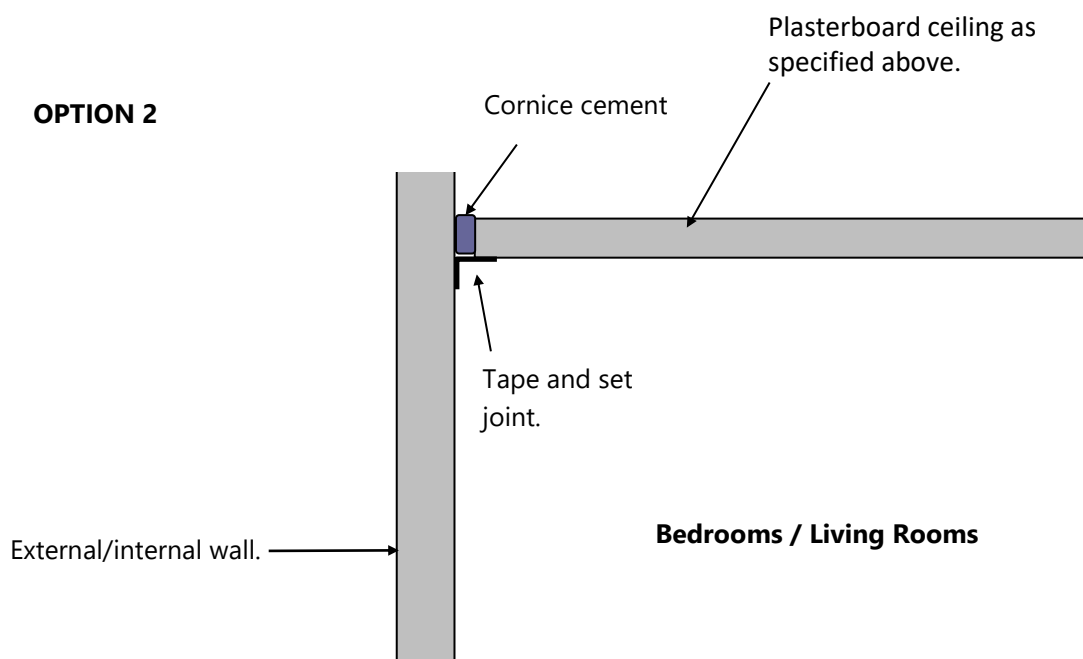


Figure 2 – Plasterboard Corner Options

6 NOISE EMISSIONS ASSESSMENT

Noise emission goals have been developed for the assessment of noise emitted from base building mechanical plant.

The noise emission from the site shall comply with the requirements of the following documents:

- Parramatta Council Development Control Plan (DCP) 2011;
- NSW Department of Environment and Heritage, Environment Protection Authority (EPA) – *Noise Policy for Industry (NPfI) 2017*.

6.1 PARRAMATTA DEVELOPMENT CONTROL PLAN (DCP) 2011

The Parramatta Council DCP does not state any relevant numerical controls for noise emissions, therefore we will refer to the EPA Noise Policy for Industry 2017 noise emission guidelines.

6.2 NSW EPA NOISE POLICY FOR INDUSTRY (NPFI) 2017

The EPA NPI has two criteria which both are required to be satisfied, namely Intrusiveness and amenity. The NPI sets out acceptable noise levels for various localities. The policy indicates four categories to assess the appropriate noise level at a site. They are rural, suburban, urban and urban/industrial interface. Under the policy the nearest residential receivers would be assessed against the suburban criteria.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

6.2.1 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 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 Table 8. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 6 - Project Intrusiveness Criterion

Time of day	Rating background noise level (dB[A])	Project Intrusiveness Noise Level (LAeq,15min dB[A])
Day	48	53
Evening	45	50
Night	41	46

6.2.2 Project 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 EPA's NPfI sets out acceptable noise levels for various localities. The recommended noise amenity area is based upon the measured background noise levels at the sensitive receiver. Based on the measured background noise levels detailed in Table 1, the Noise Policy for Industry suggests the adoption of the 'urban' categorisation.

The NPfI requires project amenity noise levels to be calculated in the following manner;

$$L_{Aeq,15min} = \text{Recommended Amenity Noise Level} - 5 \text{ dB(A)} + 3 \text{ dB(A)}$$

The amenity levels appropriate for the receivers surrounding the project site are presented in Table 9.

Table 7 - EPA Amenity Noise Levels

Type of Receiver	Time of day	Recommended Noise Level dB(A) $L_{eq}(\text{period})$	Project Amenity Noise Level dB(A) $L_{eq}(\text{period})$
Residential – Urban	Day	55	53
	Evening	45	43
	Night	40	38

The NSW EPA Noise Policy for Industry (2017) defines;

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

6.3 SUMMARY OF NOISE EMISSION GOALS

The noise emission goals for the surrounding commercial and residential receivers are summarised below.

Table 8 - Noise Emission Criteria for Residential and Commercial Receivers

Receiver Type	Time of Day	Rating background noise level dB(A)L ₉₀	Project Intrusiveness Noise Level (LAeq,15min dB[A])	Project Amenity Noise Level dB(A)L _{eq(period)}
Residential	Day	48	53	53
	Evening	45	50	43
	Night	41	46	38

The project noise emission criteria are highlighted in **bold** in the table above.

6.4 ASSESSMENT OF NOISE EMISSIONS

6.4.1 Mechanical Plant Noise

Detailed review of all external mechanical plant should be undertaken at construction certificate stage (once plant selections and locations are finalised). Acoustic treatments should be determined in order to control plant noise emissions to the nearest noise sensitive receivers.

7 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the redevelopment of the existing aged care service located at 28 Glebe Street, Belmore. Based on the information provided above we conclude the following.

Provided that the treatments set out in section 5.2 of this report are employed, internal noise levels shall comply with the requirements below:

- *Parramatta Council Development Control Plan 2012; and*
- *Australian and New Zealand AS/NZS 2107:2016 'Recommended design sound levels and reverberation times for building interiors.'*

External noise emissions criteria have been set out in section 5 in accordance with the following documents;

- *Parramatta Council Development Control Plan 2012; and*
- *NSW Environmental Protection Authority (EPA) document – 'Noise Policy for Industry (NPfI) 2017'.*

Detailed acoustic control measures for the plant servicing the proposed development will be determined at CC stage.

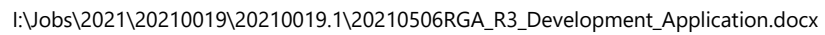
We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

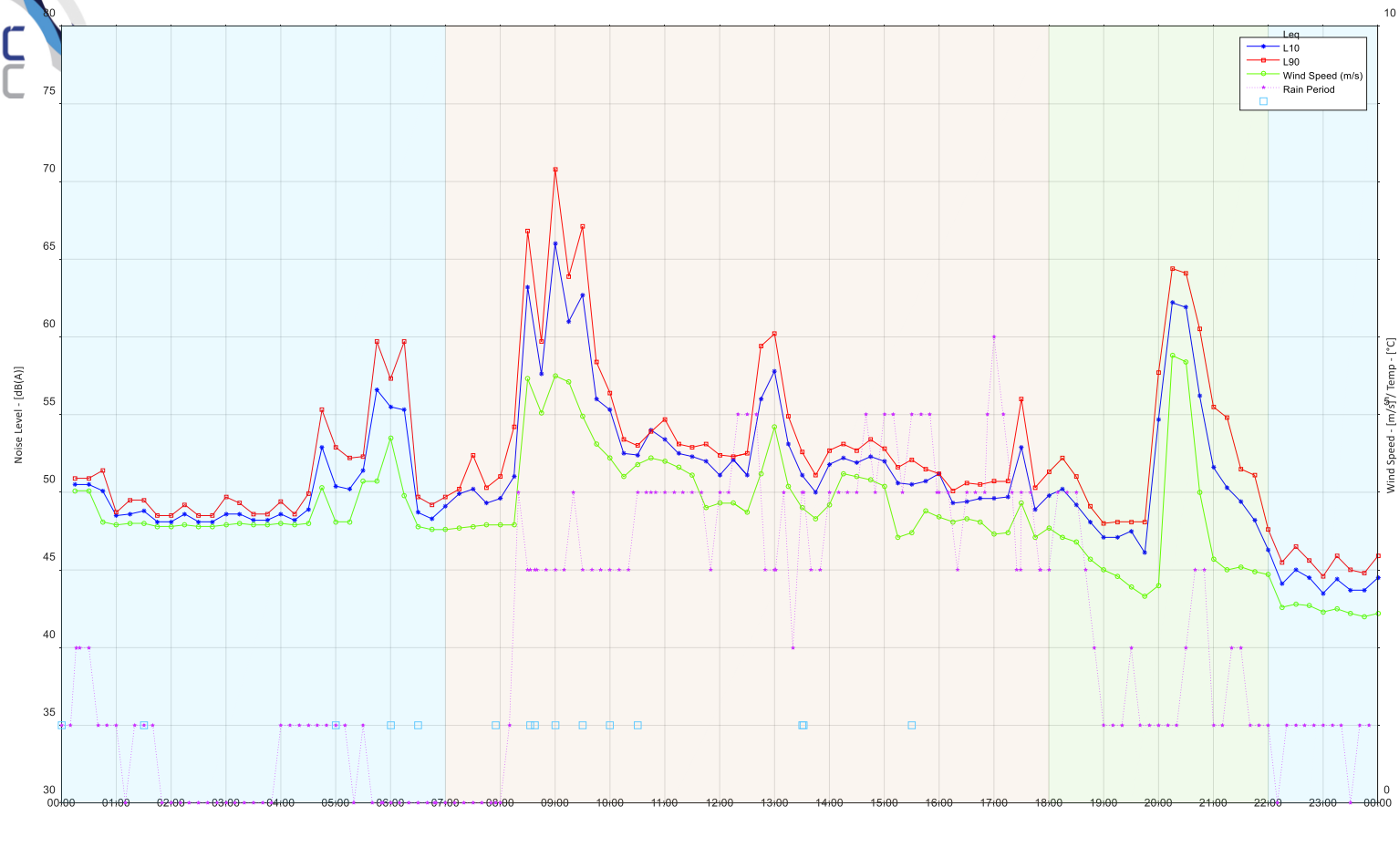


Acoustic Logic Pty Ltd
Ruben Ghannoum

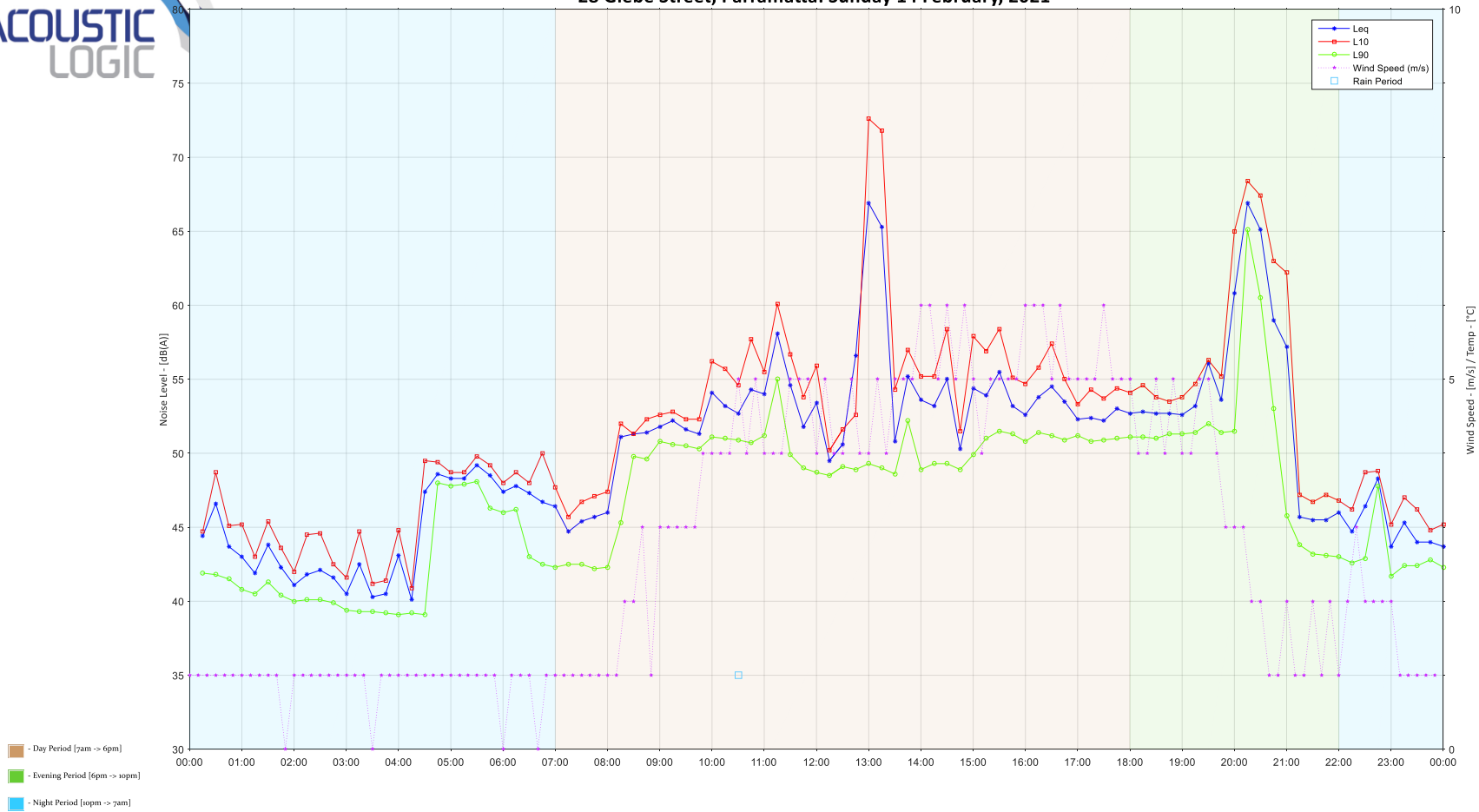
8 APPENDIX ONE – UNATTENDED NOISE MONITORING DATA



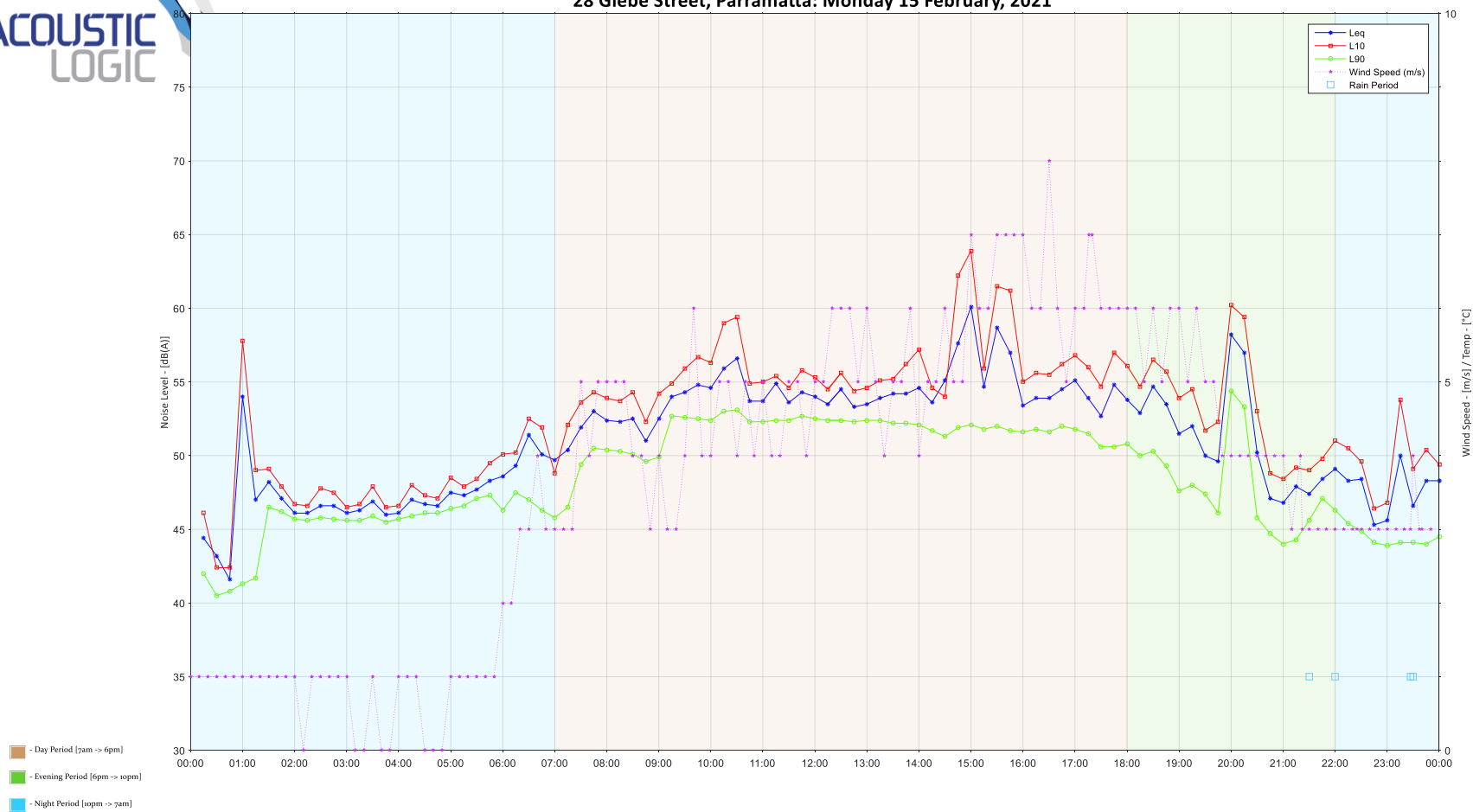
28 Glebe Street, Parramatta: Saturday 13 February, 2021



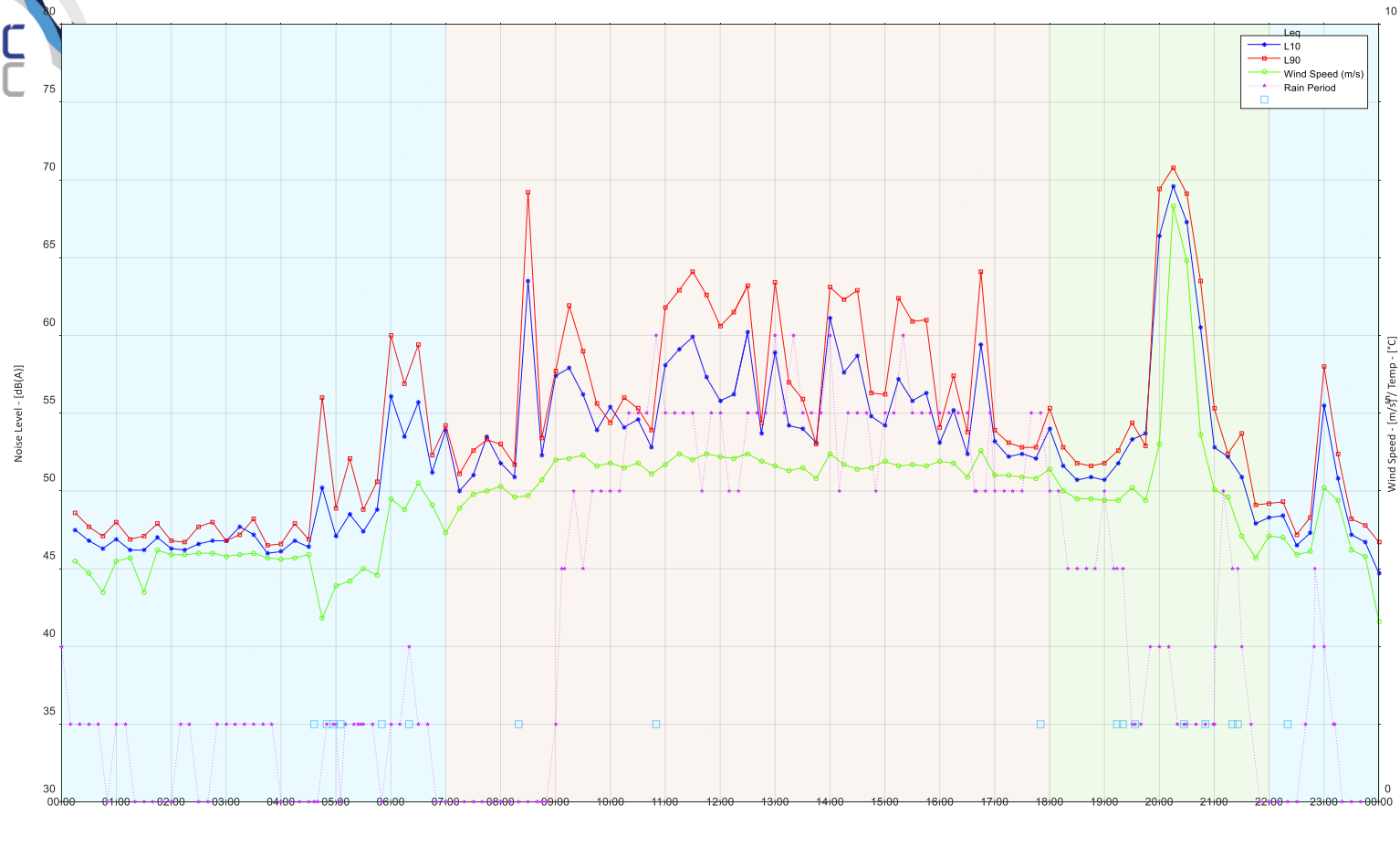
28 Glebe Street, Parramatta: Sunday 14 February, 2021



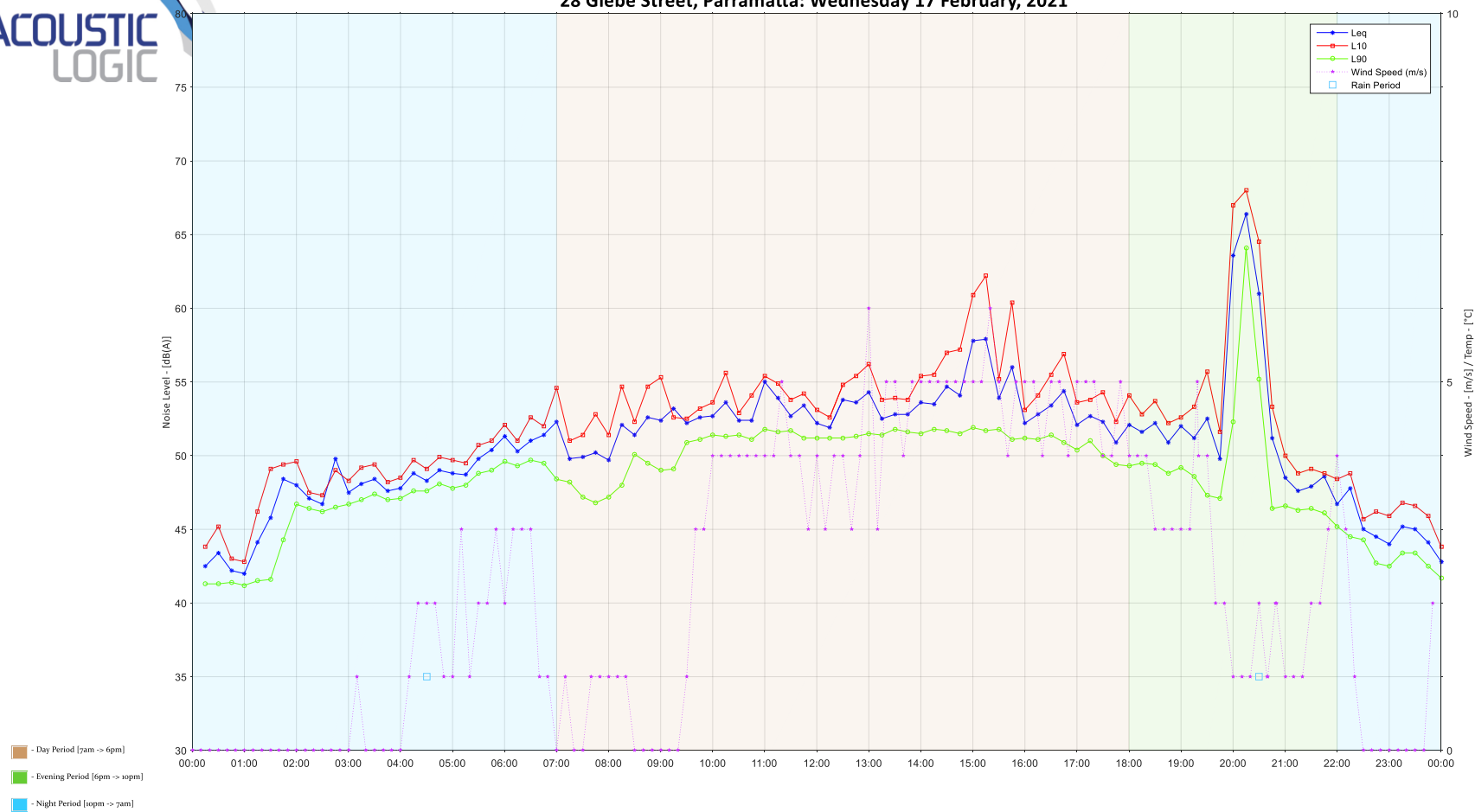
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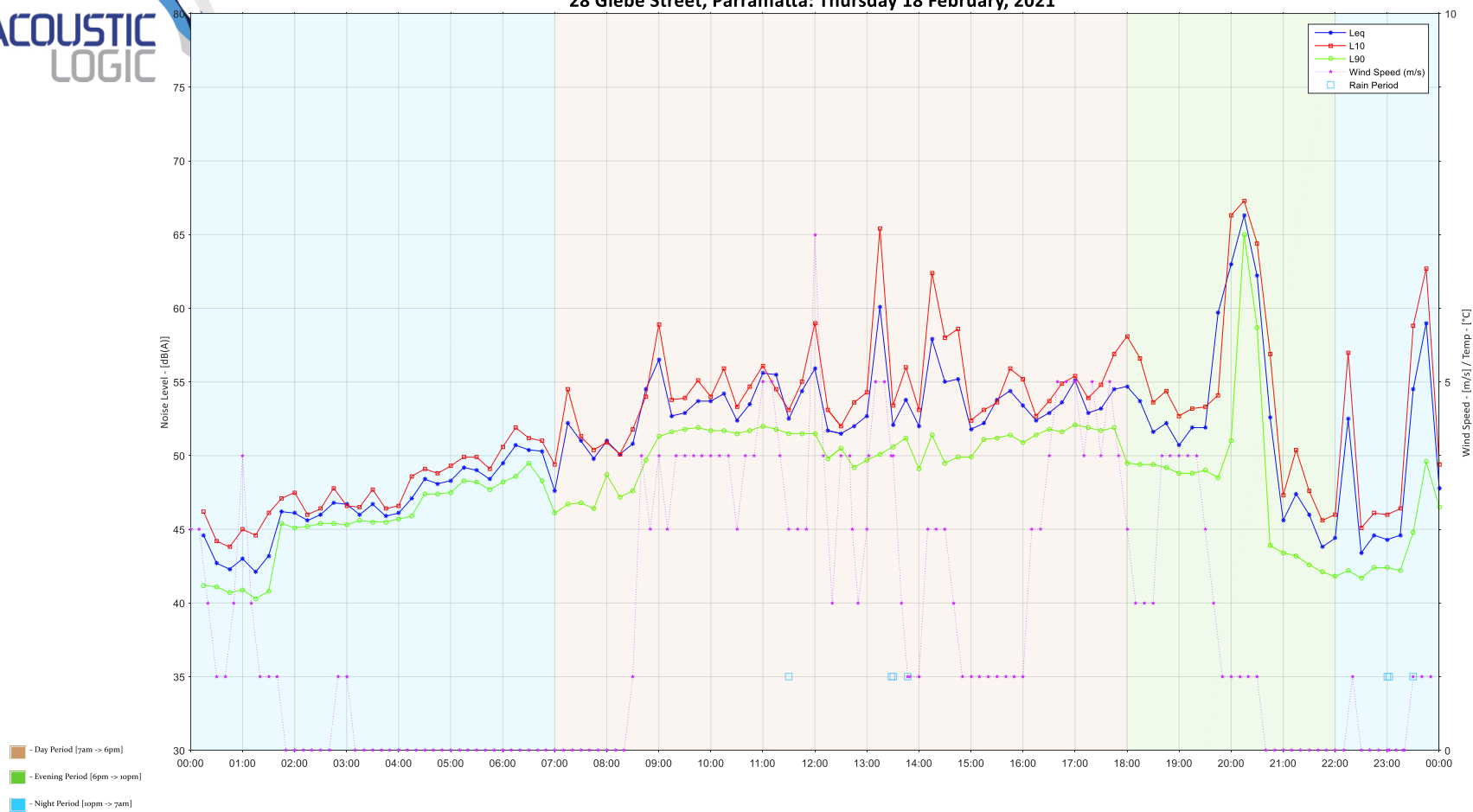
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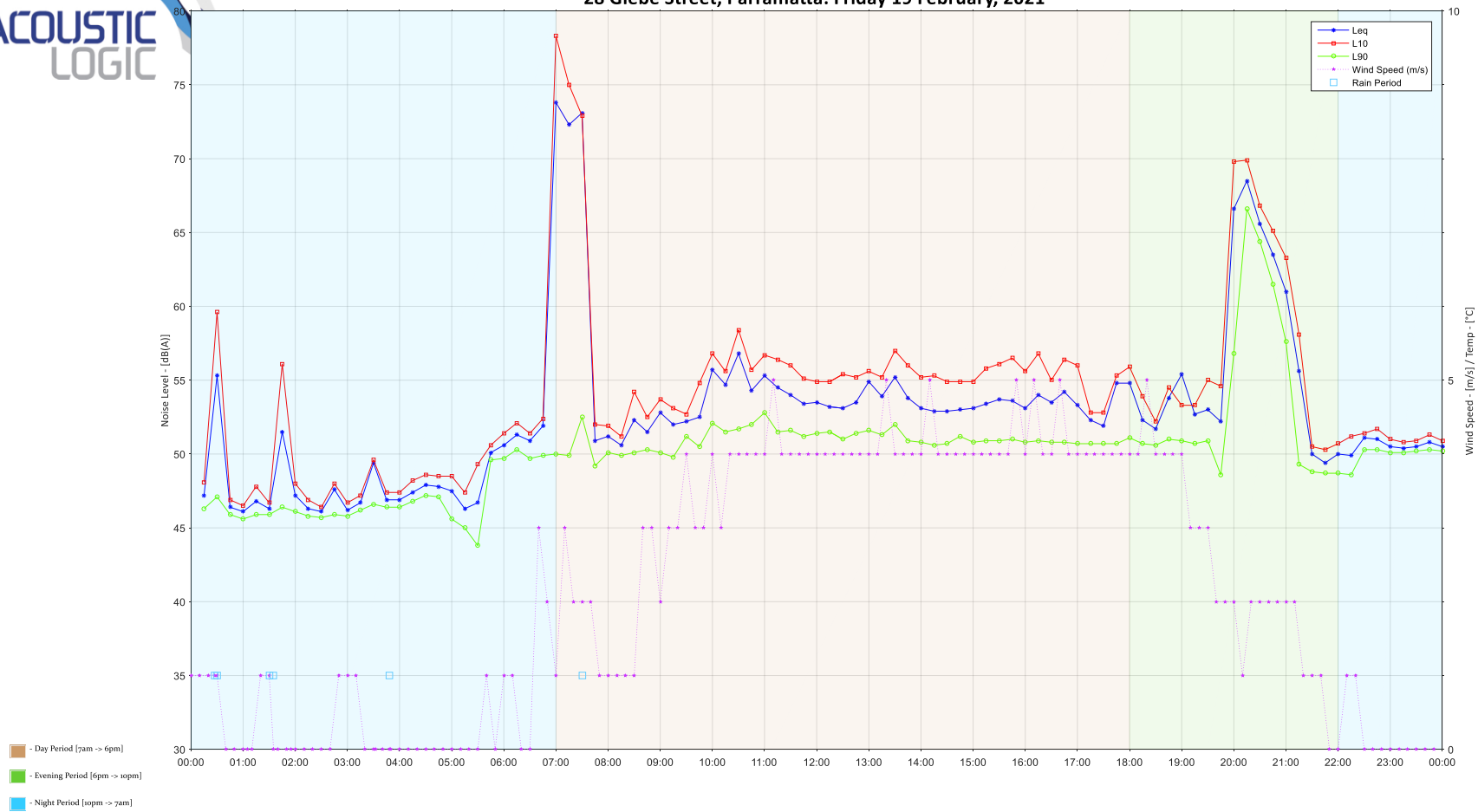
28 Glebe Street, Parramatta: Wednesday 17 February, 2021



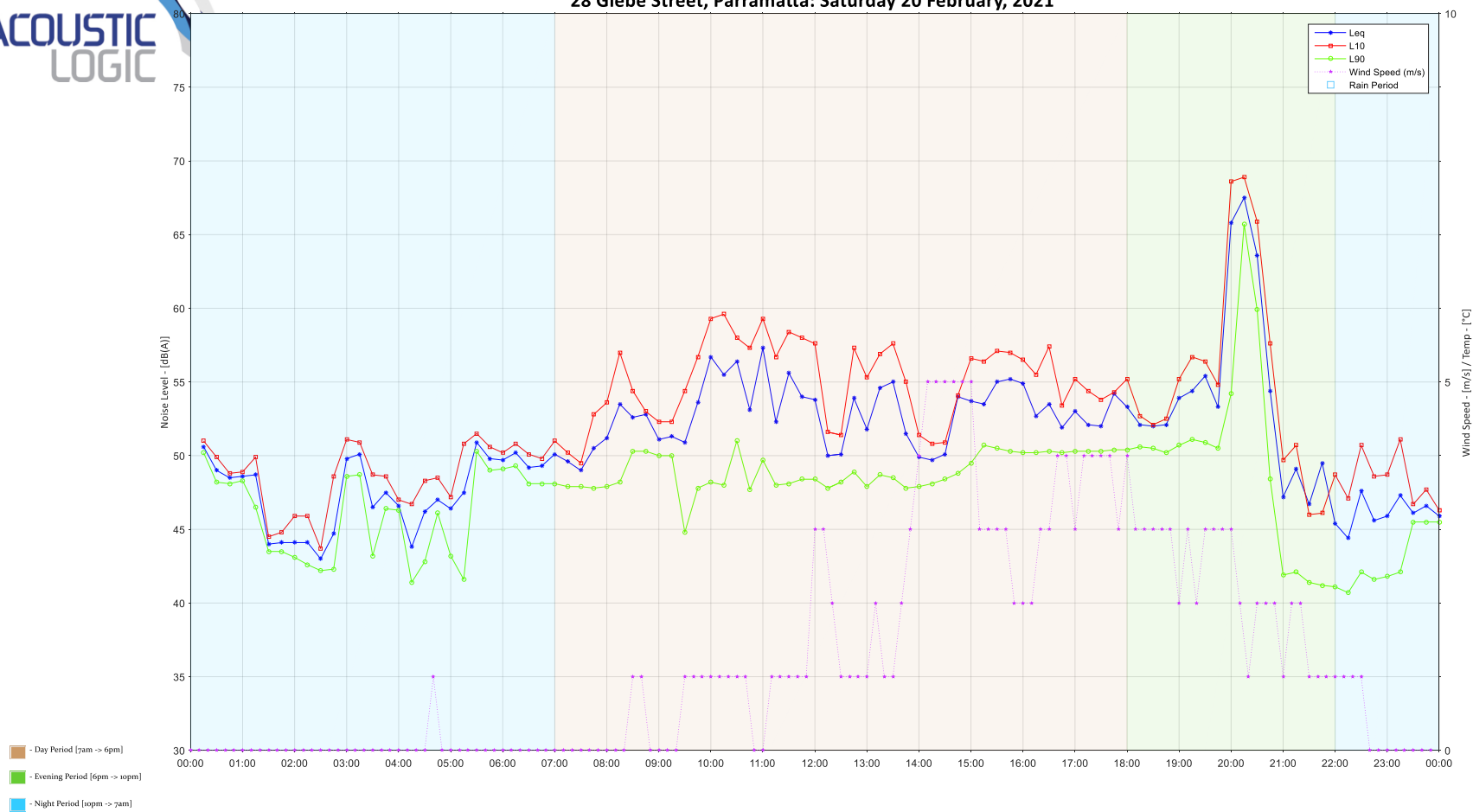
28 Glebe Street, Parramatta: Thursday 18 February, 2021



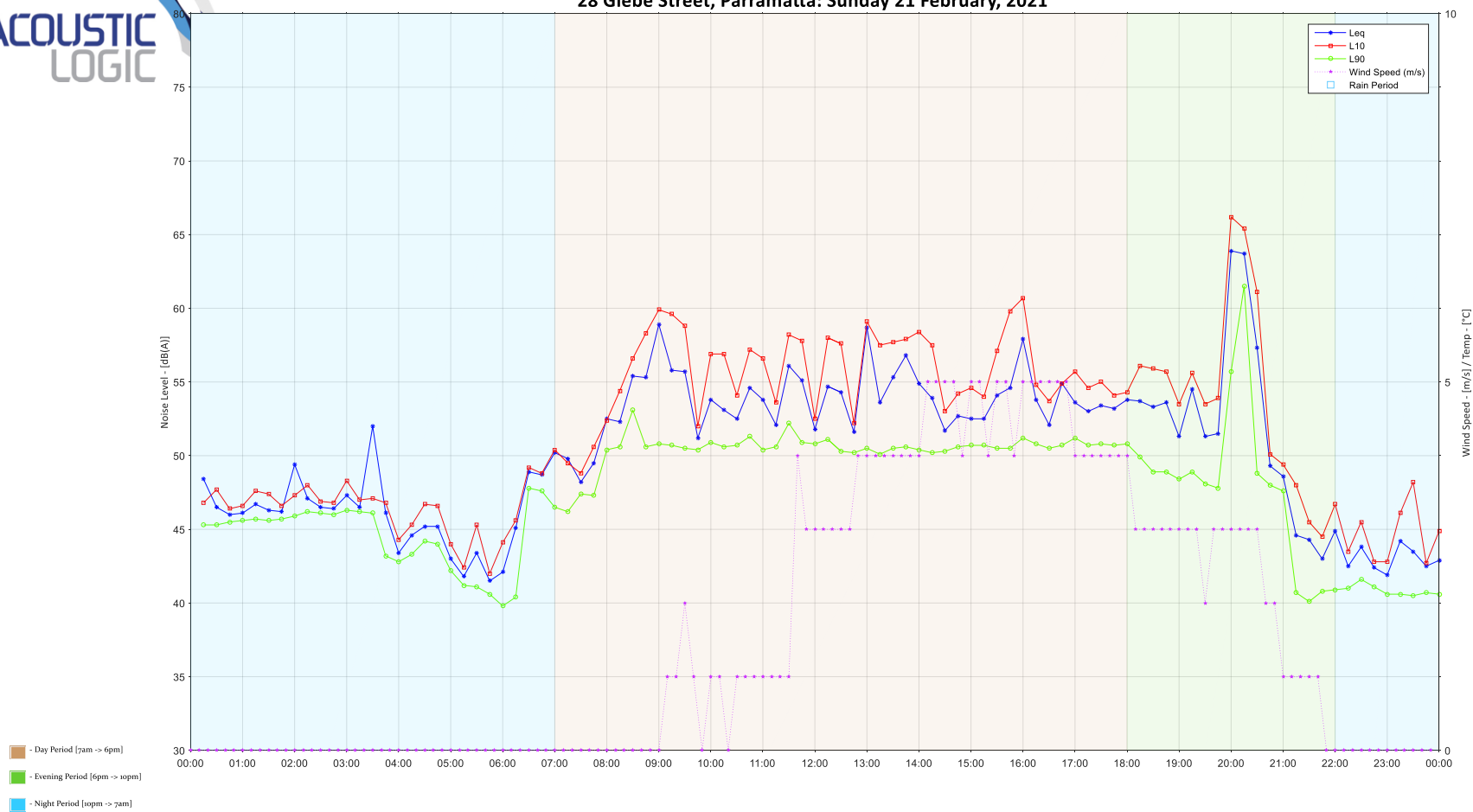
28 Glebe Street, Parramatta: Friday 19 February, 2021



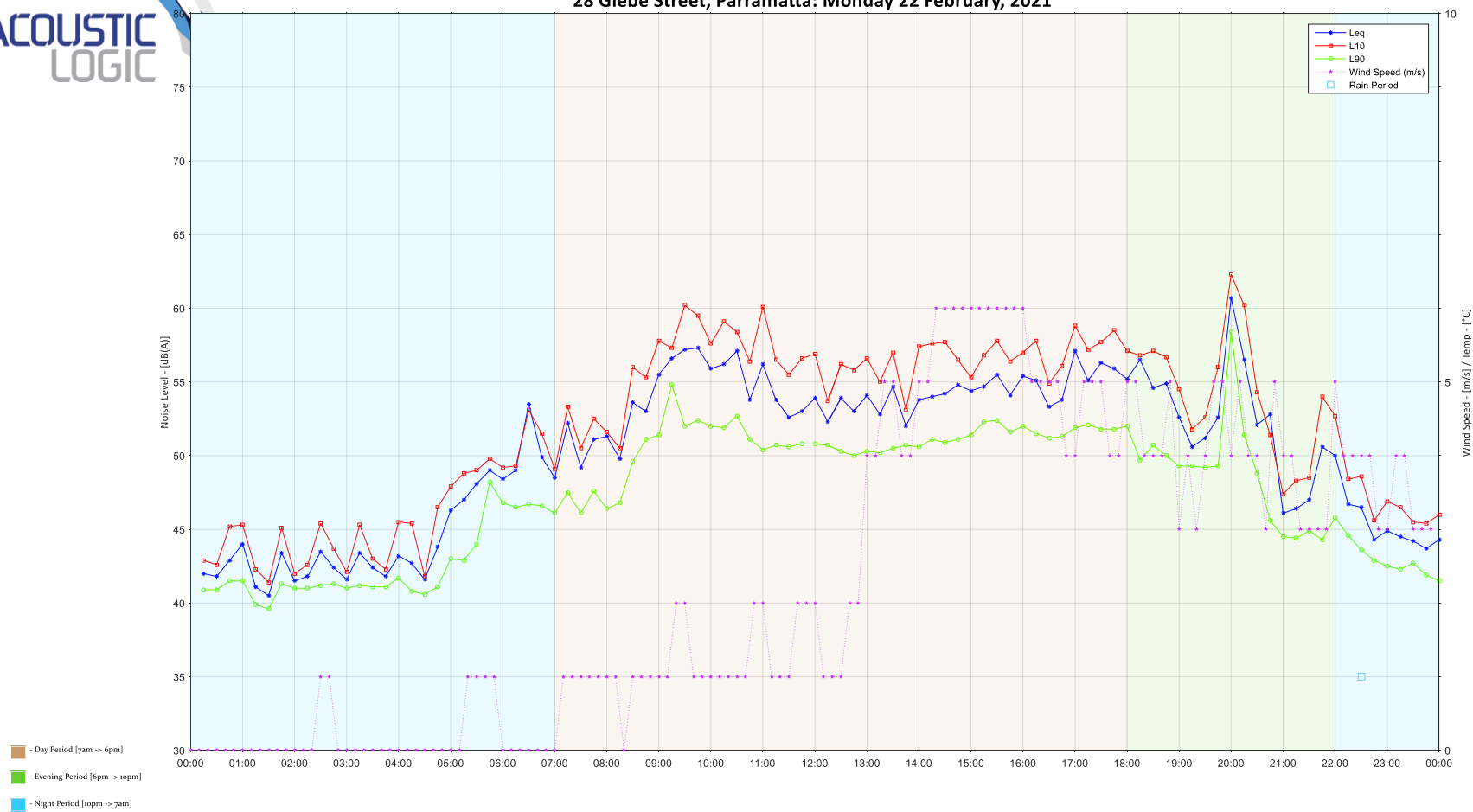
28 Glebe Street, Parramatta: Saturday 20 February, 2021



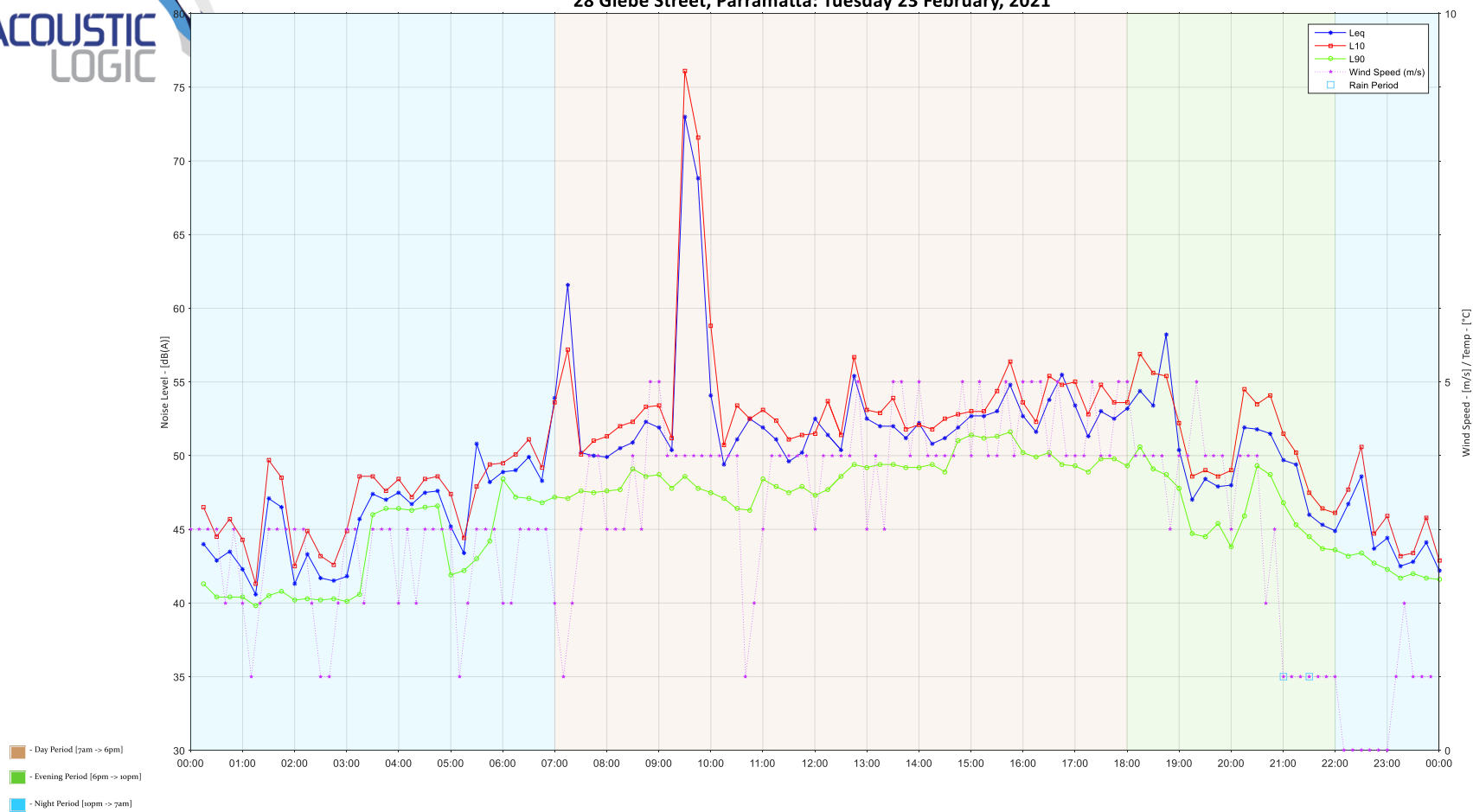
28 Glebe Street, Parramatta: Sunday 21 February, 2021



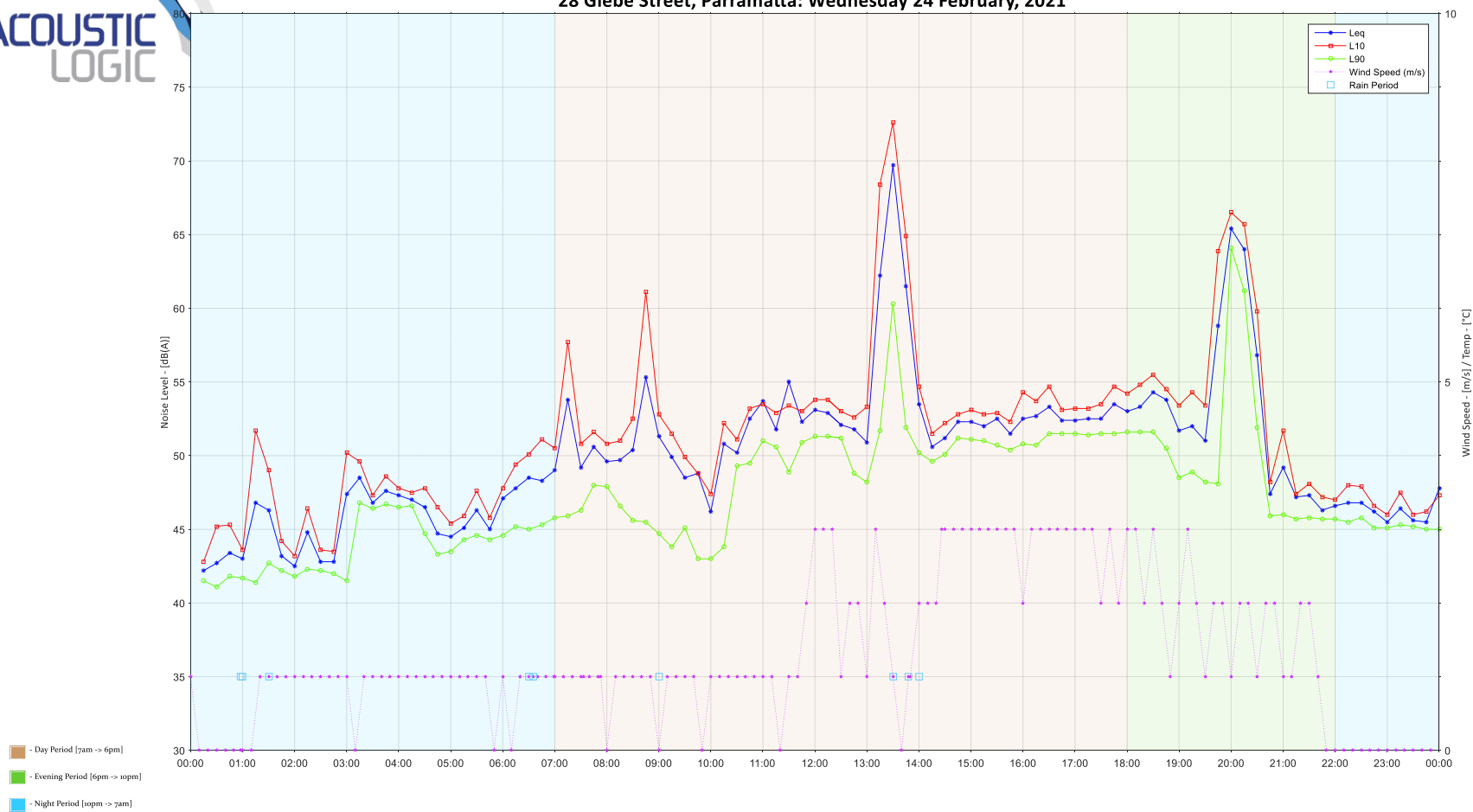
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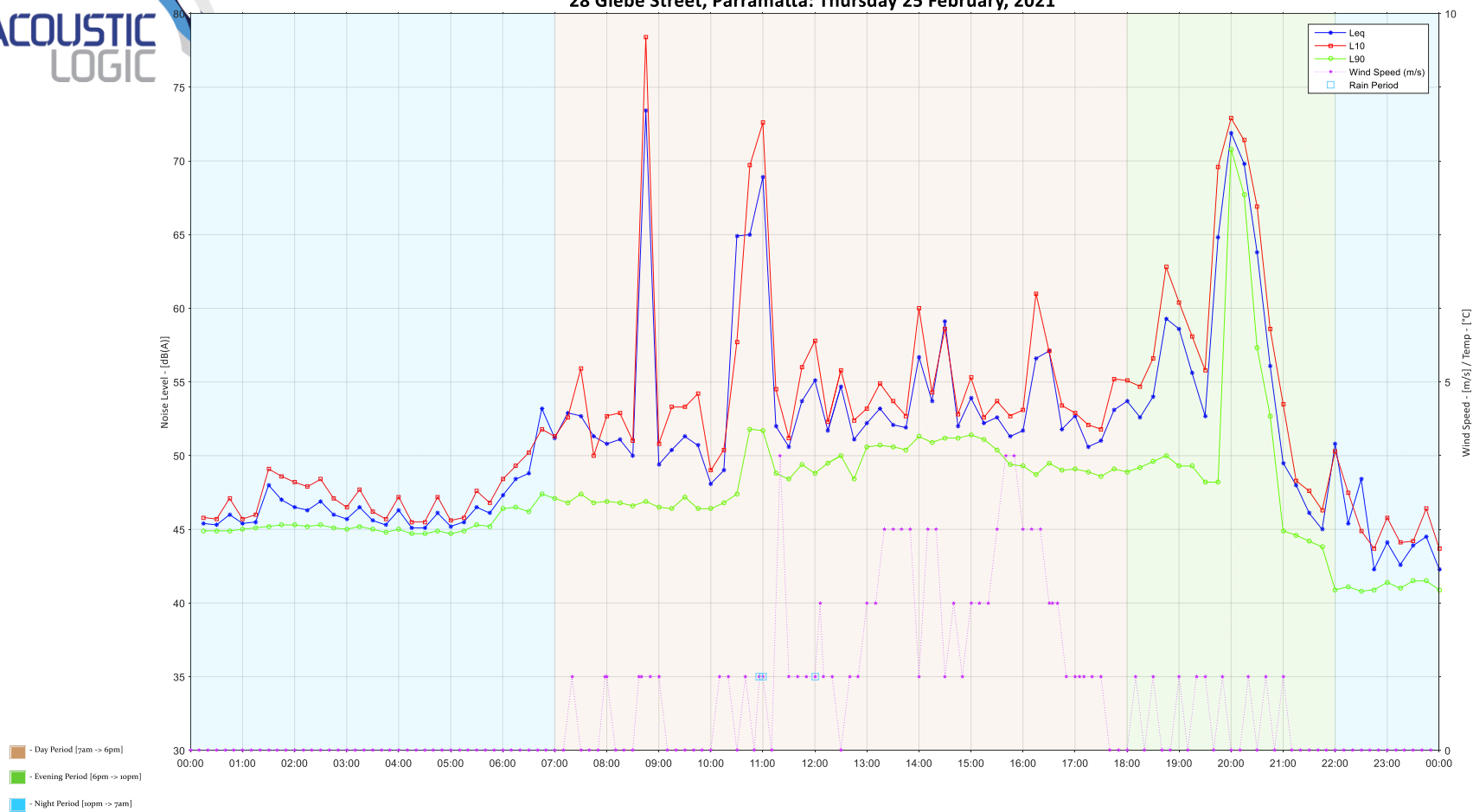
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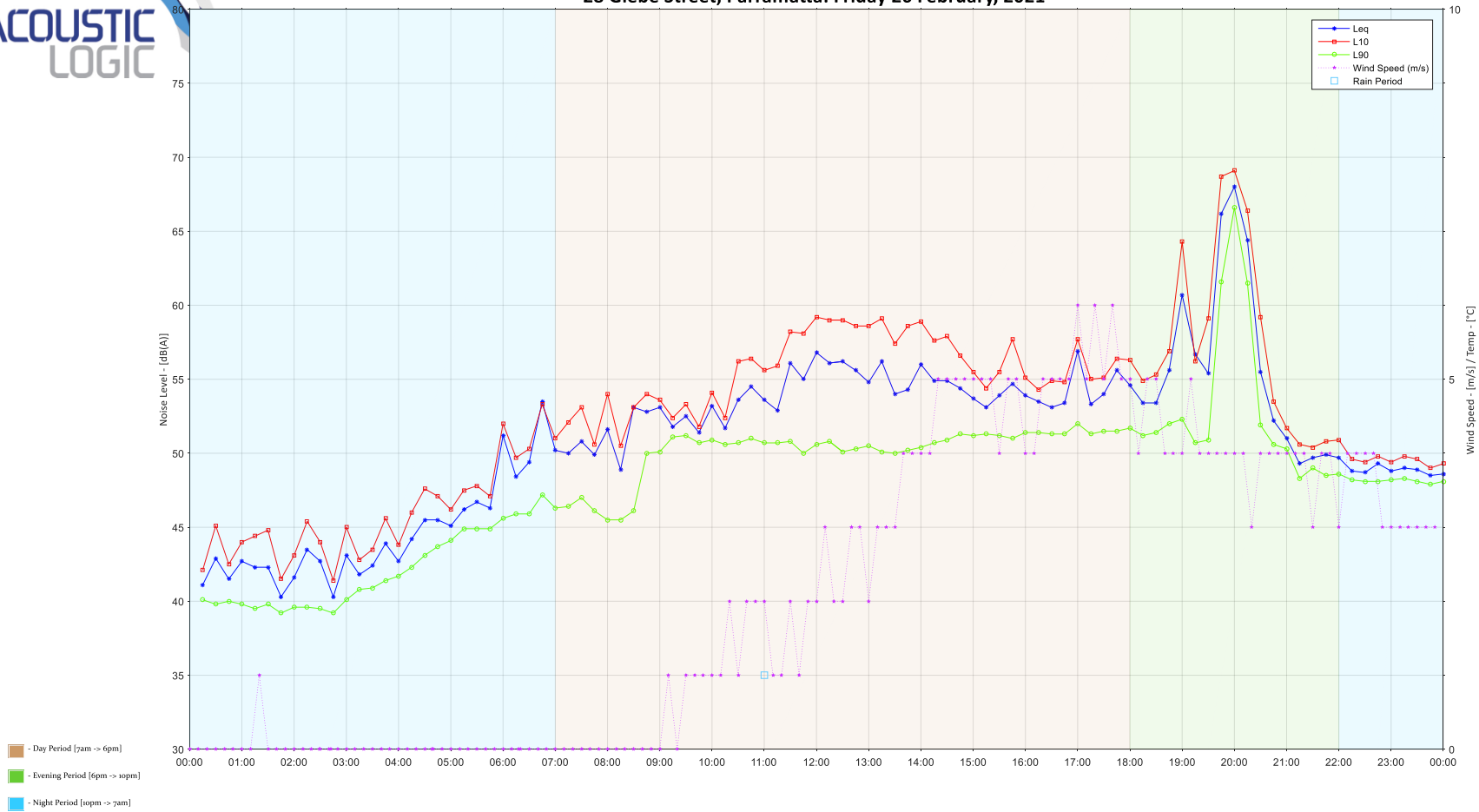
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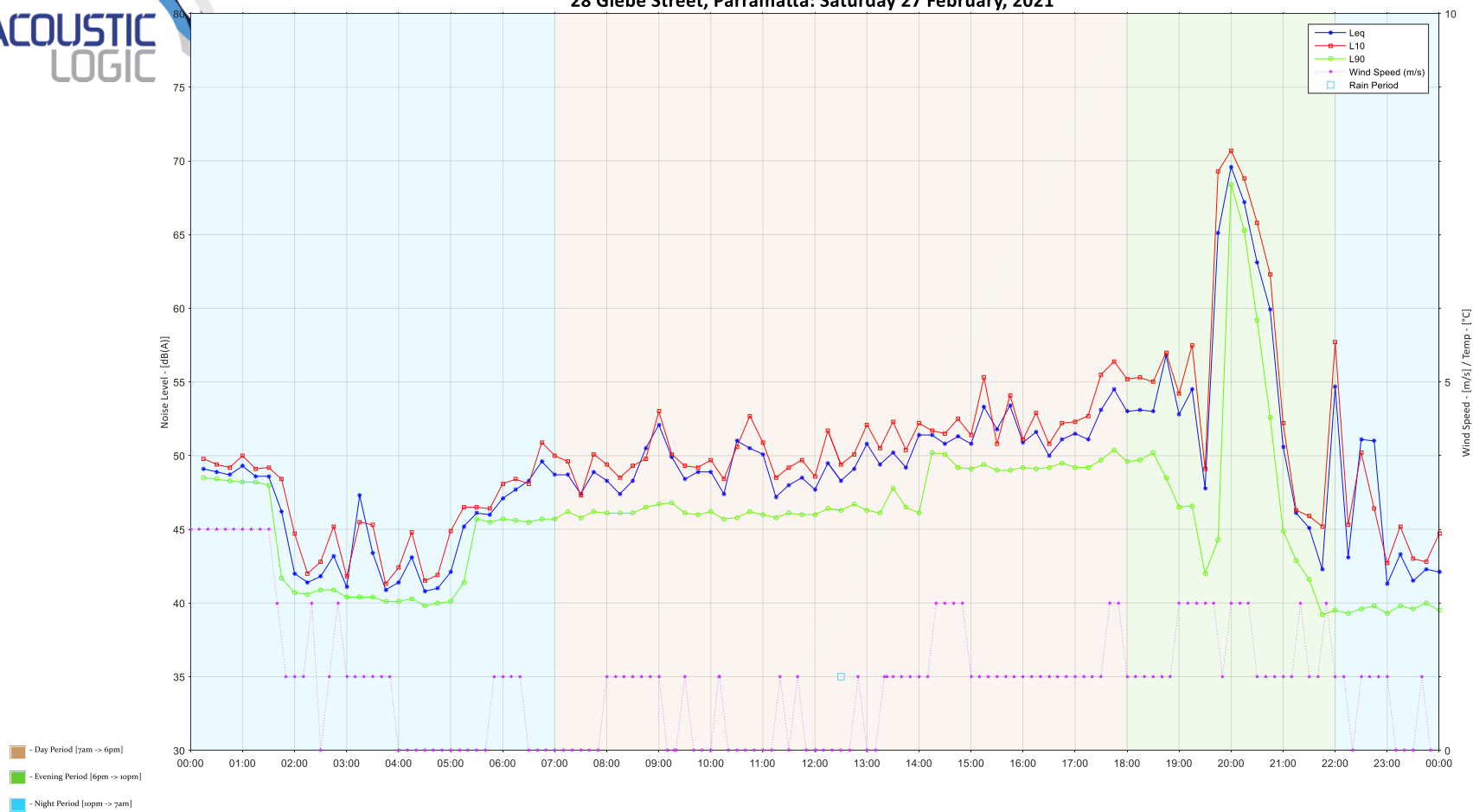
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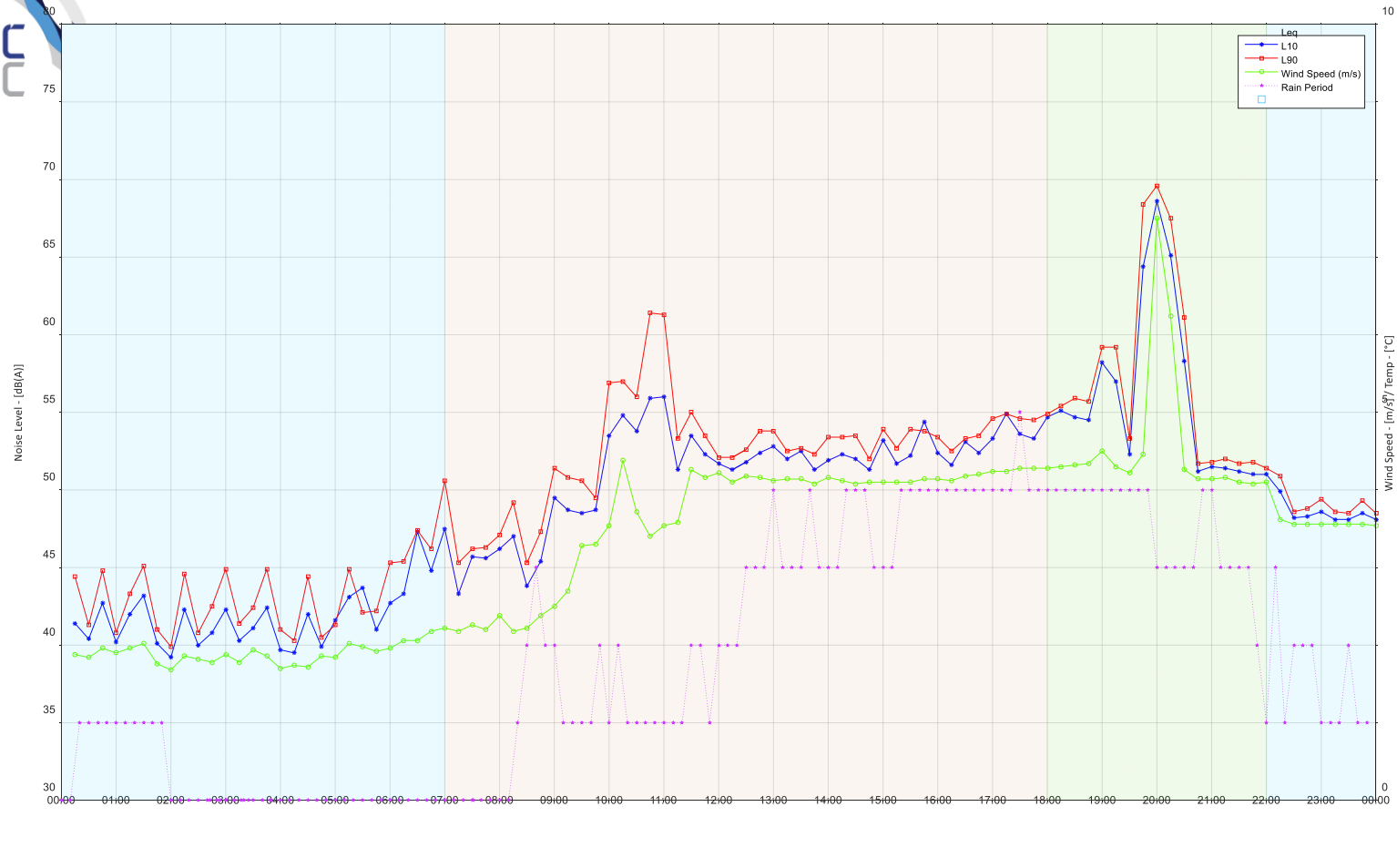
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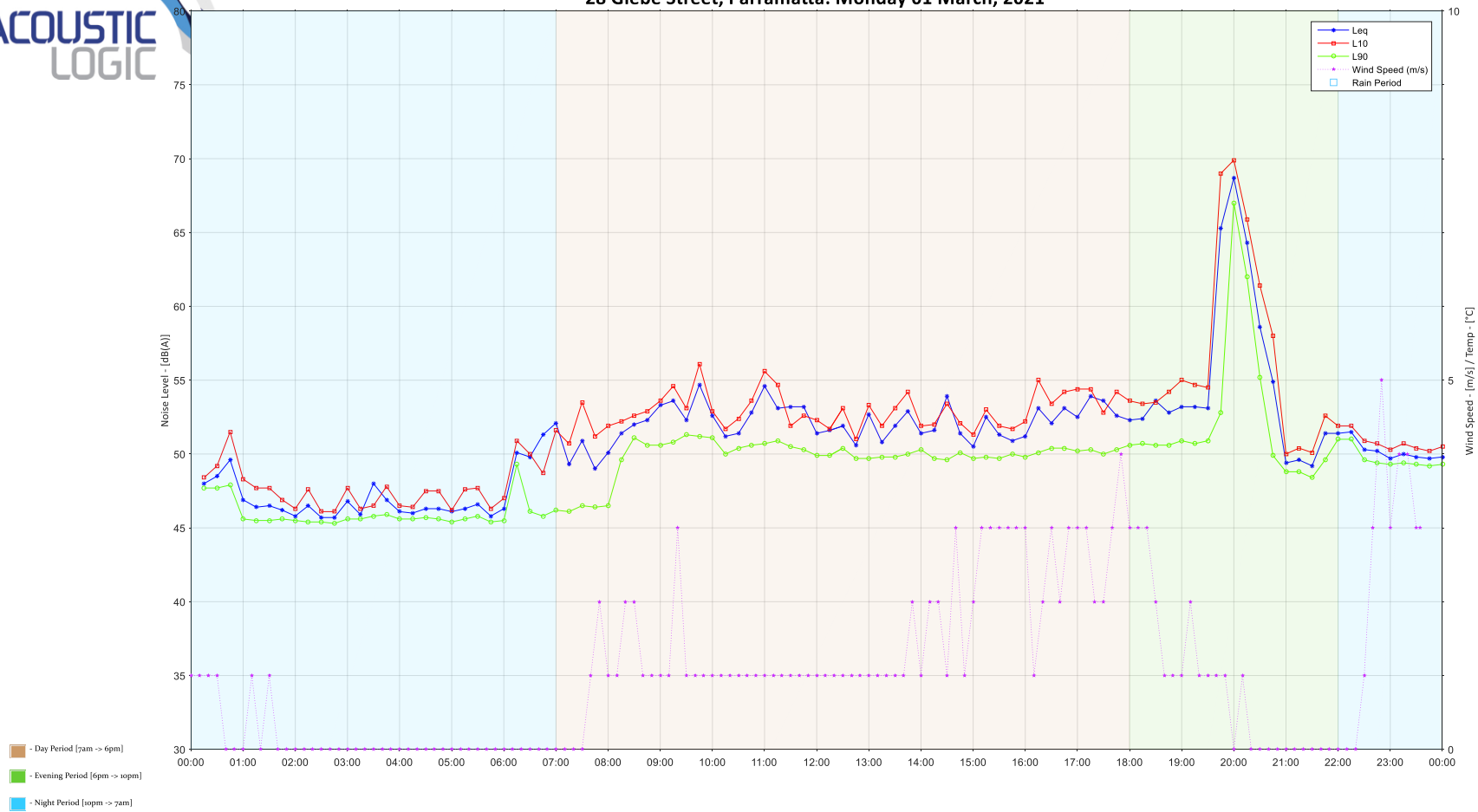
28 Glebe Street, Parramatta: Saturday 27 February, 2021



28 Glebe Street, Parramatta: Sunday 28 February, 2021



28 Glebe Street, Parramatta: Monday 01 March, 2021



28 Glebe Street, Parramatta: Tuesday 02 March, 2021

