MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

23-25 Charles Street, Liverpool

DA Acoustic Assessment

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

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

Project ID	20201206.1
Document Title	DA Acoustic Assessment
Attention To	Hume Community Housing

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	26/11/2020	20201206.1/2611A/R0/MB	MB		AW

TABLE OF CONTENTS

1 INTRODUCTION

Acoustic Logic has been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed residential development to be located at 23-25 Charles Street, Liverpool.

This document addresses noise impacts associated with the following:

- Noise intrusion to project site from adjacent roadways; and
- Noise emissions from mechanical plant to service the project site.

ALC have utilised the following documents and regulations in the noise assessment of the development:

- The Liverpool Development Control Plan (2008);
- NSW Environmental Protection Authority (EPA) Document – *'Noise Policy for Industry (NPfI) 2017*.
- NSW Department of Planning and Environment's document – *'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007'*.
- NSW Department of Planning – *'Developments near Rail Corridors or Busy Roads – Interim Guideline'*.
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*.

This assessment has been conducted based on the architectural drawings provided by *IDraft Architects* for this project dated 20th October 2020 for pre DA Rev 2.

2 SITE DESCRIPTION

The proposed development comprises of 1 level of car parking on the ground level with 7 levels of residential units above. In total, there are 23 residential apartments proposed to be constructed on this site.

Investigation has been conducted in regards to the existing properties and noise impacts surrounding the proposed development, which is detailed below:

- Charles Street bounding the site the east and Mill Road bounding the site to the north. Both of which comprise of low to moderate traffic levels.
- Hume Highway approximately 80 meters to the west of the site.
- Existing commercial tenancies to the west of the site along Hume Highway.
- Existing residential tenancies surrounding the site to the north, east and south.
- Proposed future residential tenancy to the west of the site along Mill Road.

The nearest noise receivers around the site include:

- **R1 –** Existing multi-storey residential apartment building located to the north of the site at 43-45 Mill Road, Liverpool.
- **R2 –** Existing single dwelling tenancies located to the east of the site at 18 Mill Road and 32 Charles Street, Liverpool.
- **R3 –** Existing single dwelling tenancies located to the south of the site at 27 Charles Street, Liverpool.
- **R4 –** Future multi-storey residential apartment building located to the west of the site at 26-30 Mill Road, Liverpool.

A site map, measurement location description and surrounding receivers are presented in the figure below.

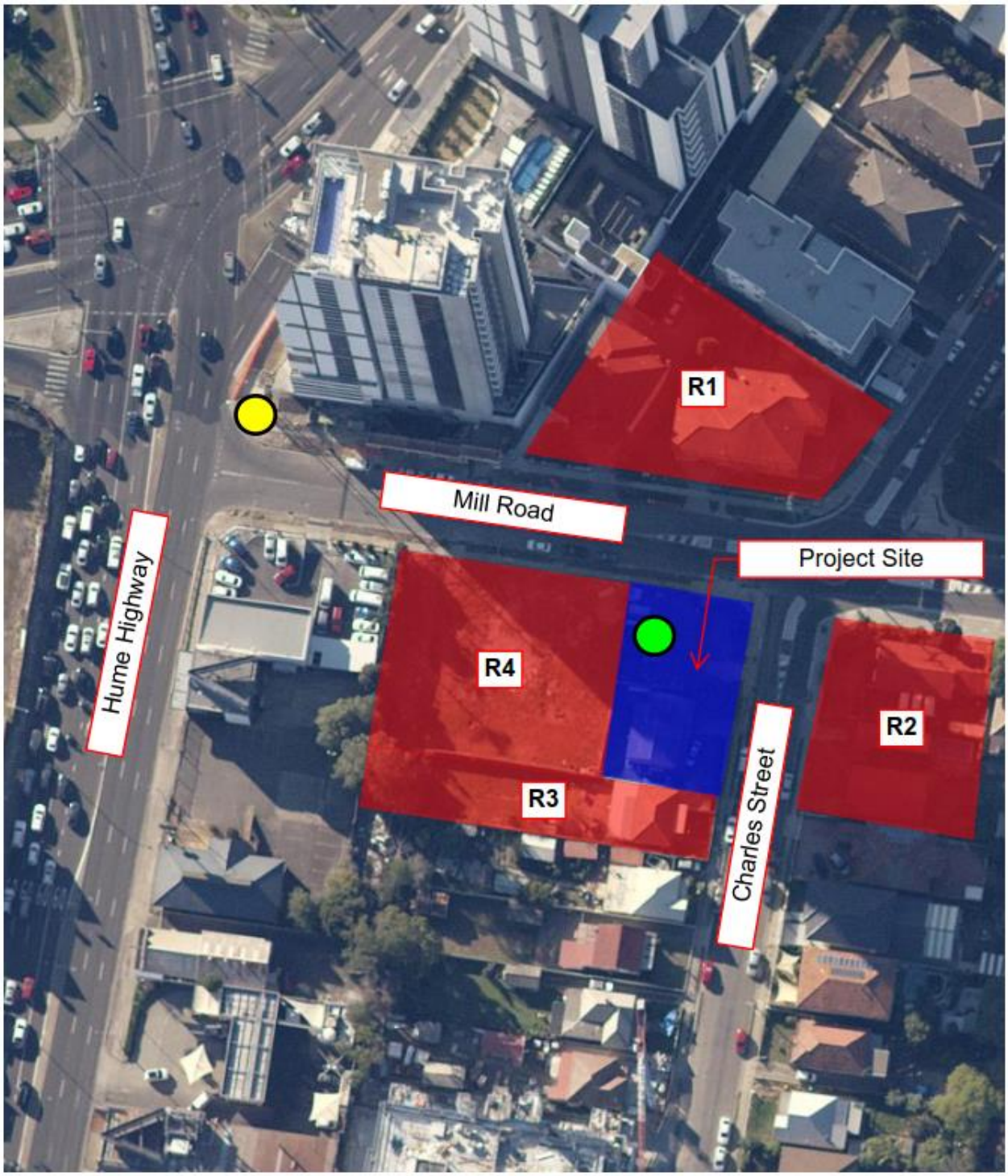


Figure 1 - Site Map

Attended Noise Measurements

Unattended Noise Monitoring Location

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 highest measured sound pressure level 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 4-1.

4.1.1 Measurement Position

One unattended noise monitor was located within the rear yard of 25 Charles Street. Refer to Figure 1 for detailed location.

4.1.2 Measurement Period

Unattended noise monitoring was conducted from 10th of November 2020 to 19th of November 2020. Attended noise measurements were undertaken between the hours of 9:00am and 9:30am on 19th of November 2020.

4.1.3 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.

4.1.4 Summarised Rating Background Noise Levels

Summarised rating background noise levels for the project site and immediate surroundings are presented below.

Table 4-1 – Measured Noise Levels

Time of day	Rating Background Noise Level dB(A)$_{L90(Period)}$
Day (7am – 6pm)	51
Evening (6pm – 10pm)	49
Night (10pm – 7am)	41

On review of the monitoring data, the measured L_{90} noise levels during high wind speed days do not increase background noise levels significantly as periods with little to no wind. This demonstrates that even though wind speeds measured at Liverpool weather station exceed EPA guidelines, either:

- The wind speed on site at this time was significantly lower than at Liverpool weather station, and/or
- The wind on site was not sufficiently consistent to increase background noise levels compared to calm periods.

Therefore, only periods of adverse weather that were determined to have affected the noise data have been eliminated when determining the rating background noise level at the site, which is presented above

5 EXTERNAL NOISE INTRUSION ASSESSMENT

Site investigation indicates that the major external noise sources around the project site are from traffic movements along Hume Highway, Mill Road and Charles Street.

5.1 NOISE INTRUSION CRITERIA

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

- The Liverpool Development Control Plan (2008).
- NSW Department of Planning and Environment's document – 'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007';
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*.
- NSW Department of Planning – '*Developments near Rail Corridors or Busy Roads – Interim Guideline*'

5.1.1 The Liverpool Development Control Plan (DCP) 2008

Section 3.7 of the Liverpool DCP states the following with regard to acoustic privacy, specifically in relation to noise intrusion from road and rail traffic noise:

2. Buildings having frontage to a Classified Road or a railway and impacted upon by rail or traffic related noises must incorporate the appropriate noise and vibration mitigation measures into the design in terms of the site layout, building material and design, orientation of the buildings and location of sleeping and recreation areas.

As this control does not detail a specific noise level criteria, relevant Australian Standards and guidelines will be used to assess road and rail traffic noise intrusion into the development, further described in the following sections.

5.1.2 NSW Department of Planning and Environment – *'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007'*

RTA Map No. 14 of the traffic volume maps referenced by the SEPP (INFRASTRUCTURE) on the RTA website (see below), classifies the section of Botany Road where the development is located adjacent to, as a road where a noise intrusion assessment is recommended under clause 102 of the SEPP Infrastructure 2007. See RTA average annual daily road traffic volume map number 14 and the approximate location of the site below.

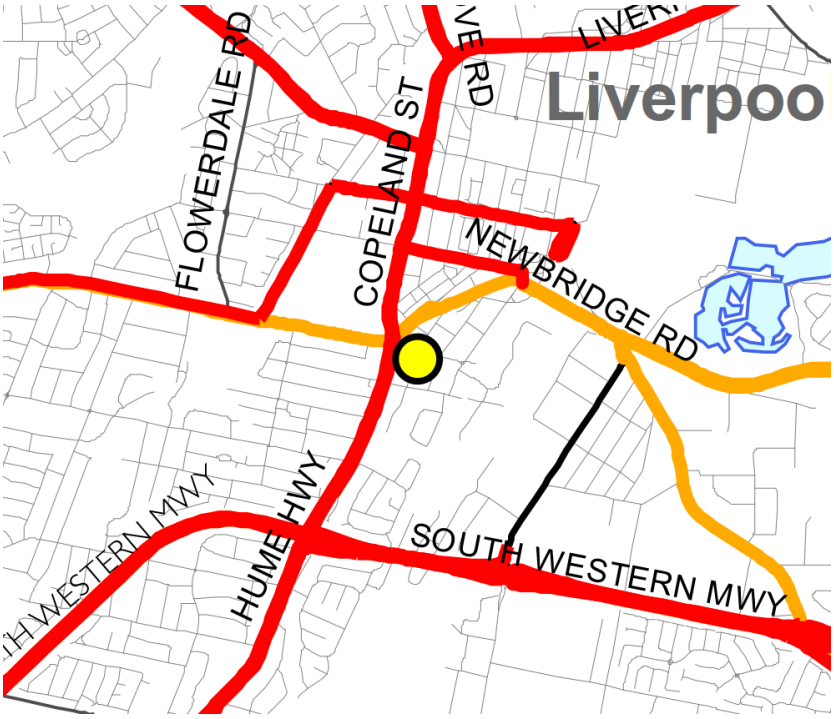


Figure 2: RTA Map No. 14 and Approximate Location of Proposed Development

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

(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.

5.1.3 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."*

5.1.4 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 residential and commercial buildings. Table 1, in Section 5 of AS2107:2016, gives the following maximum internal noise levels for commercial buildings and residential buildings near major roads.

Table 5-1 – Recommended Design Sound Levels

Space /Activity Type	Recommended Design Sound Levels
Sleeping Areas	35-40 dB(A)$L_{eq(10pm-7am)}$
Living Areas	35-45 dB(A)$L_{eq(anytime)}$

5.1.5 Summarised External Noise Intrusion Criteria

The internal noise criteria adopted for each internal space is therefore summarised below based on the relevant State, Council and Australian Standard requirements.

Table 5-2 – Adopted Internal Noise Levels

Space /Activity Type	Internal Noise Requirement (SEPP)
Sleeping Areas/Studio Apartments	35dB(A)$L_{Aeq(9\ hour)}$
Other Habitable Areas	40dB(A)$L_{Aeq(15\ hour)}$

6 EXTERNAL NOISE MEASUREMENTS

This section of the report details noise measurements conducted at the site to establish surrounding environmental noise levels impacting the development.

6.1.1 Measurement Equipment

Attended short term measurements of traffic noise were undertaken by this office to supplement the unattended noise monitoring. Measurements were conducted using a Norsonic 140 Sound Analyser. The analyser was set to fast response and calibrated before and after the measurements using a Norsonic Sound Calibrator type 1251. No significant drift was noted.

6.1.2 Measurement Location

Attended measurements were taken along Hume Highway adjacent to the western boundary 80m from the site (see Figure 1 for detailed location). The sound level meter had an unobstructed view of traffic and was approximately 7m from the kerb.

6.1.3 Measurement Period

Attended noise measurements were undertaken between the hours of 9:00am and 10:00am on 19th of November 2020.

6.1.4 Summarised External Noise Levels

The following noise levels have been established based on attended measurements and noise monitoring.

Table 6-1 – Measured Traffic Noise Levels

Location	Time of Day	Noise Level
Hume Highway 7m from kerb	Daytime 7am – 10pm	67 dB(A) $L_{eq\ (15hr)}$
	Night Time 10pm – 7am	63 dB(A) $L_{eq\ (9hr)}$

6.2 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.

6.2.1 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 6-2.

Table 6-2 - Recommended Glazing Construction

Room	Facade	Glazing Thickness	Acoustic Seals
All Living Rooms	All Facades	6.38mm Laminated	Yes
All Bedrooms	All Facades	6.38mm Laminated	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 6-3 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 6-3 - Minimum R_w of Glazing Assembly (with Acoustic Seals)

Glazing Assembly	Minimum R_w of Installed Window
6.38mm Laminated	31

6.2.2 External Roof/Ceiling

Roofs constructed from masonry/concrete elements will not require upgrading to achieve acoustic requirements. In the event that a lightweight roof construction was proposed, it is to be reviewed as part of the detailed design of the project to ensure internal noise levels are achieved. Any penetrations required through the external skin are to be sealed with an acoustic grade sealant should be used to minimise all gaps.

6.2.3 External Walls

External wall constructions from concrete elements are acoustically acceptable. In the event that lightweight external wall constructions are proposed they are to be reviewed as part of the detailed design of the project to ensure internal noise levels are achieved. Any penetrations required through the external skin are to be sealed with an acoustic grade sealant should be used to minimise all gaps.

6.2.4 Mechanical Ventilation

With respect to natural ventilation of a 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) $L_{eq(9hr)}$, and 50dB(A) $L_{eq(15hr)}$ in living rooms).

- All spaces along the north, south and east facades will be able to achieve the required internal noise levels with windows or doors open to allow for natural ventilation.

- All spaces along the west façade with a direct line of sight to Hume Highway will not be able to achieve the required internal noise levels with windows or doors open for natural ventilation.

If a supplementary ventilation system is proposed to be installed should be acoustically designed to ensure that the acoustic performance of the acoustic treatments outlined above is not reduced and does not exceed noise emission criteria to nearby properties.

7 NOISE EMISSION ASSESSMENT

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

- The Liverpool Development Control Plan (DCP) 2013.
- NSW EPA Noise Policy for Industry.

7.1 THE LIVERPOOL DEVELOPMENT CONTROL PLAN (DCP) 2008

As this control does not detail a specific noise level criteria, the following standard will be used to assess noise emissions from the development.

7.2 NSW EPA NOISE POLICY FOR INDUSTRY (NPI) 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 urban criteria.

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

7.2.1 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 Section 4. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

7.2.2 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 NPI 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 Section 4, the Noise Policy for Industry suggests the adoption of the 'suburban' categorisation.

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

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

Surrounding receivers are zoned as R4. The amenity levels appropriate for the receivers surrounding the site are presented in Table 7-1.

Table 7-1 – EPA Amenity Noise Levels

Type of Receiver	Time of day	Project Amenity Noise Level dB(A)$L_{eq(15\ minute)}$
Residential – Urban	Day	58
	Evening	48
	Night	43

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

7.2.3 Sleep Arousal Criteria

The Noise Policy for Industry recommends the following noise limits to mitigate sleeping disturbance:

Where the subject development / premises night -time noise levels at a residential location exceed:

- *$L_{eq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
- *L_{Fmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,*

a detailed maximum noise level even assessment should be undertaken.

Table 7-2 – Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A)L_{90}	Emergence Level
Residences Surrounding Site Night (10pm – 7am)	41 dB(A) L_{90}	46 dB(A)$L_{eq,\ 15min}$; 56 dB(A)L_{Fmax}

7.3 SUMMARISED NOISE EMISSION CRITERIA

Table 7-3 – EPA NPI Noise Emission Criteria (Residents Surrounding Project Site)

Time Period	Assessment Background Noise Level dB(A)L_{90}	Project Amenity Criteria dB(A) L_{eq}	Intrusiveness Criteria $L_{eq(15min)}$	NPI Criteria for Sleep Disturbance
Day	51	58	**56**	N/A
Evening	49	**48**	54	N/A
Night	41	**43**	46	**46 dB(A)$L_{eq,\ 15min}$; 56 dB(A)L_{Fmax}**

The project noise trigger levels are indicated by the bolded values in the table above.

8 NOISE EMISSION ASSESSMENT

8.1 NOISE FROM MECHANICAL PLANT WITHIN PROPOSED SITE GENERALLY

Detailed plant selection and location has not been undertaken at this stage. Satisfactory levels will be achievable through appropriate plant selection, location and if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures.

Noise emissions from all mechanical services to the closest residential receiver should comply with the requirements of Section 6.3.

Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels.

9 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the development to be located at 23-25 Charles Street, Liverpool.

Provided that the recommendations presented in Section 5.3 are implemented, internal noise levels for the development will comply with the acoustic requirements of the following documents:

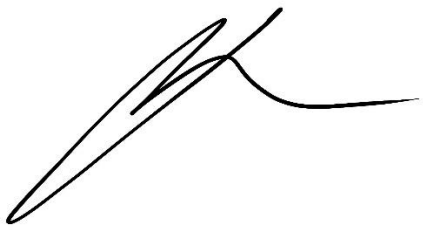
- The Liverpool Development Control Plan (2008);
- NSW Department of Planning and Environment's document – 'State Environmental Planning Policy (SEPP) (INFRASTRUCTURE) 2007';
- NSW Department of Planning – 'Developments near Rail Corridors or Busy Roads – Interim Guideline'; and
- Australian Standard AS2107:2016 – '*Recommended Design Sound Levels and Reverberation Times for Building Interiors.*'

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

- The Liverpool Development Control Plan (DCP) 2013.
- NSW EPA Noise Policy for Industry.

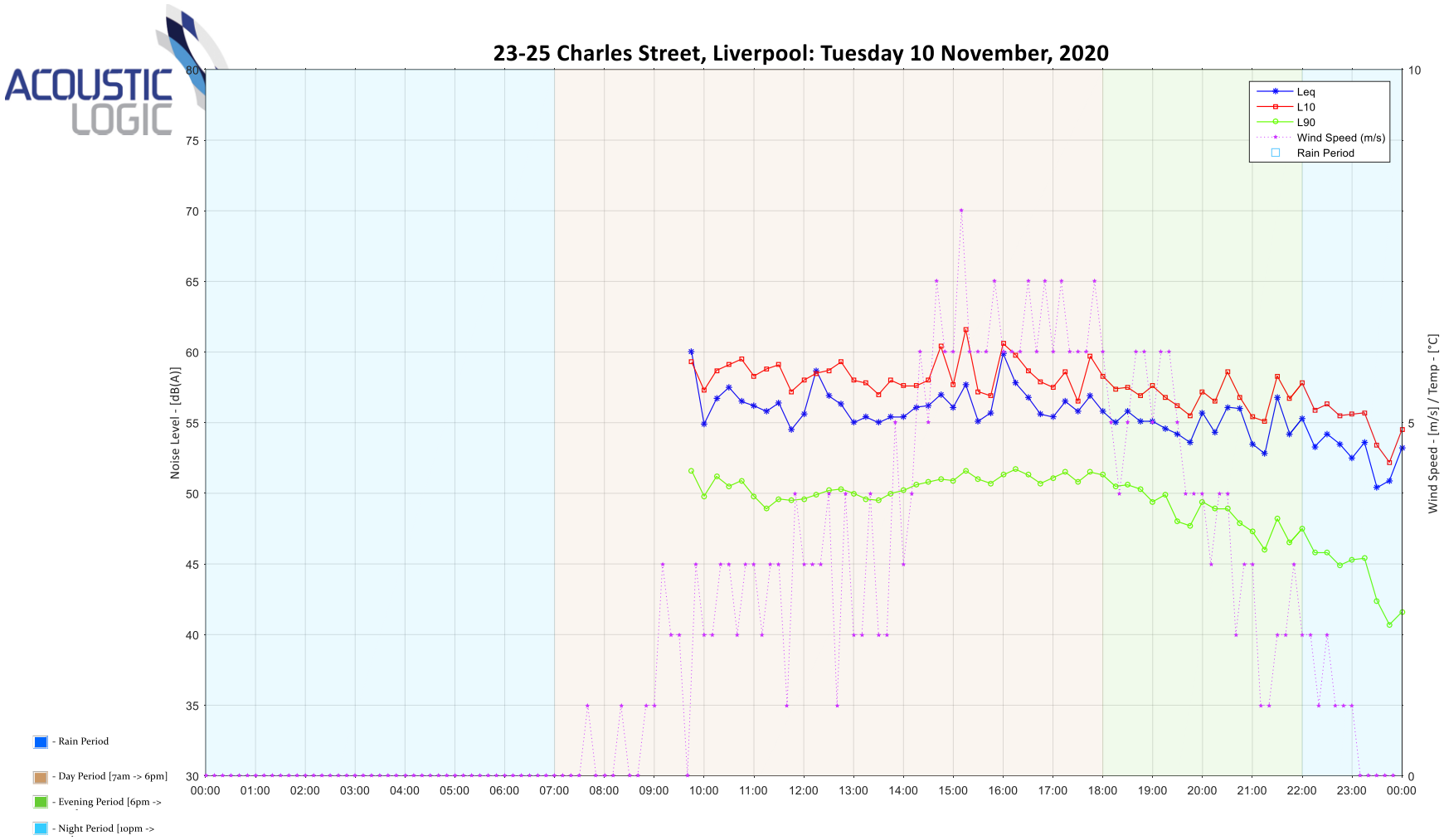
We trust this information is satisfactory. Please contact us should you have any further queries.

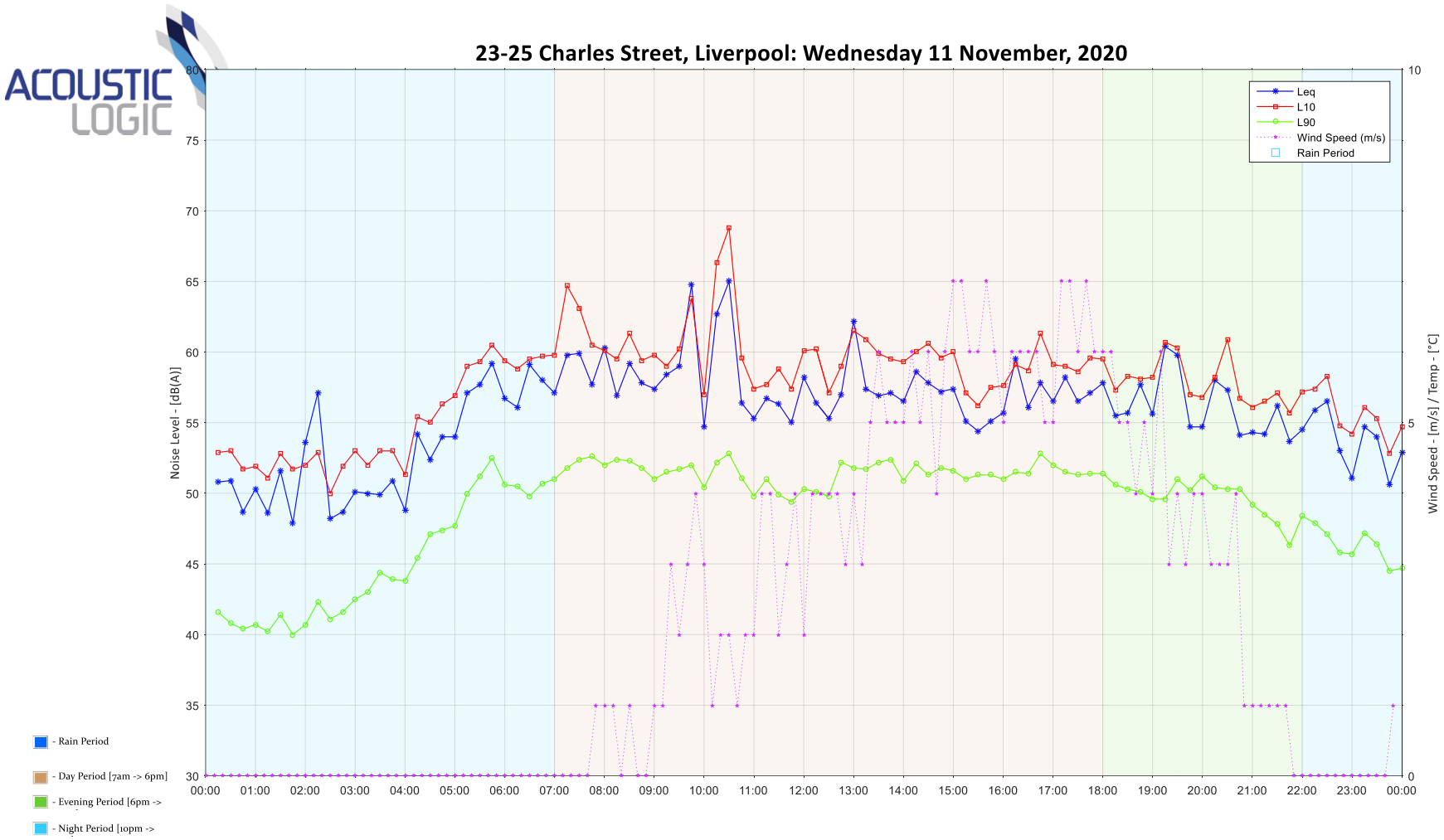
Yours faithfully,

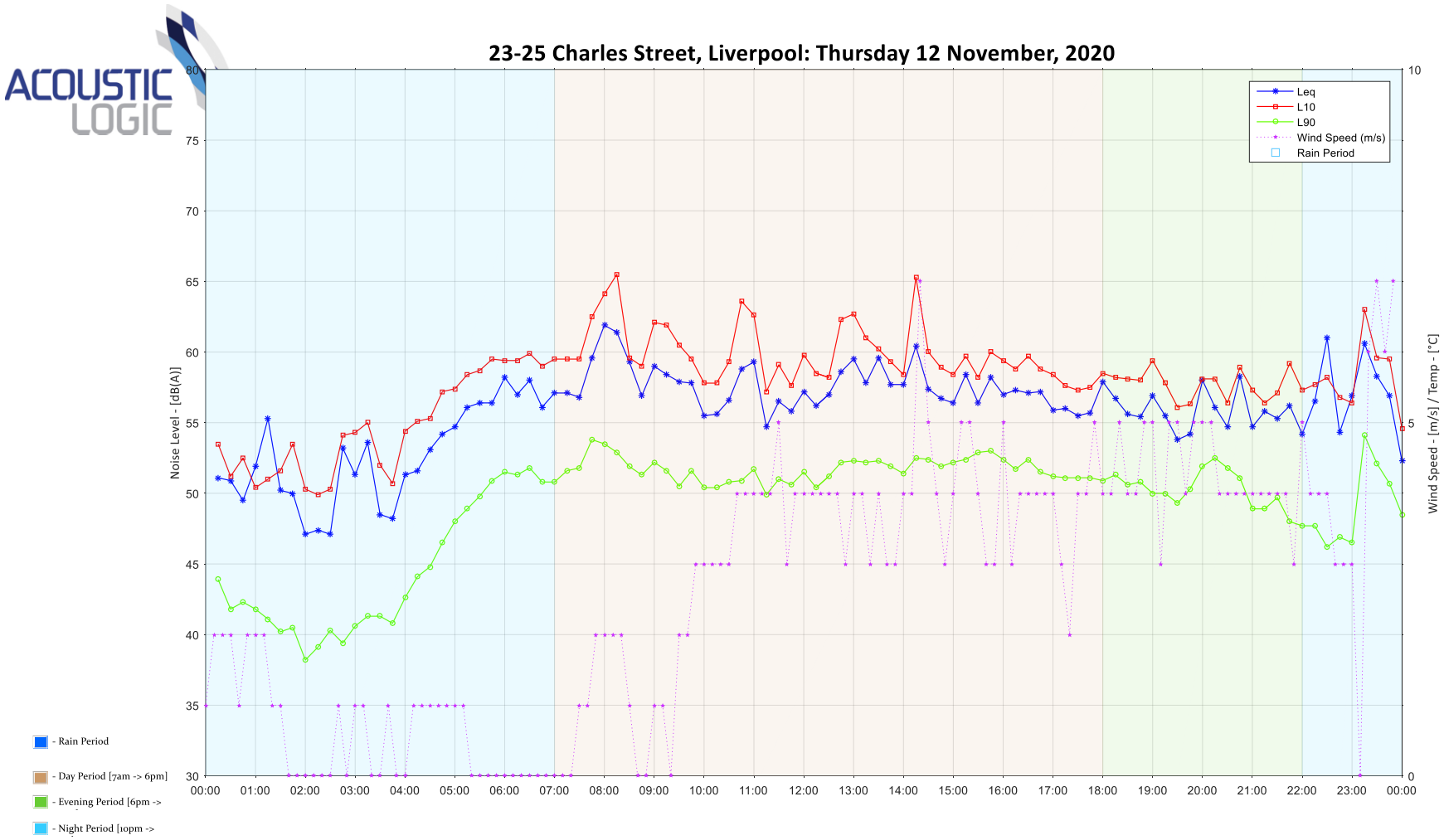


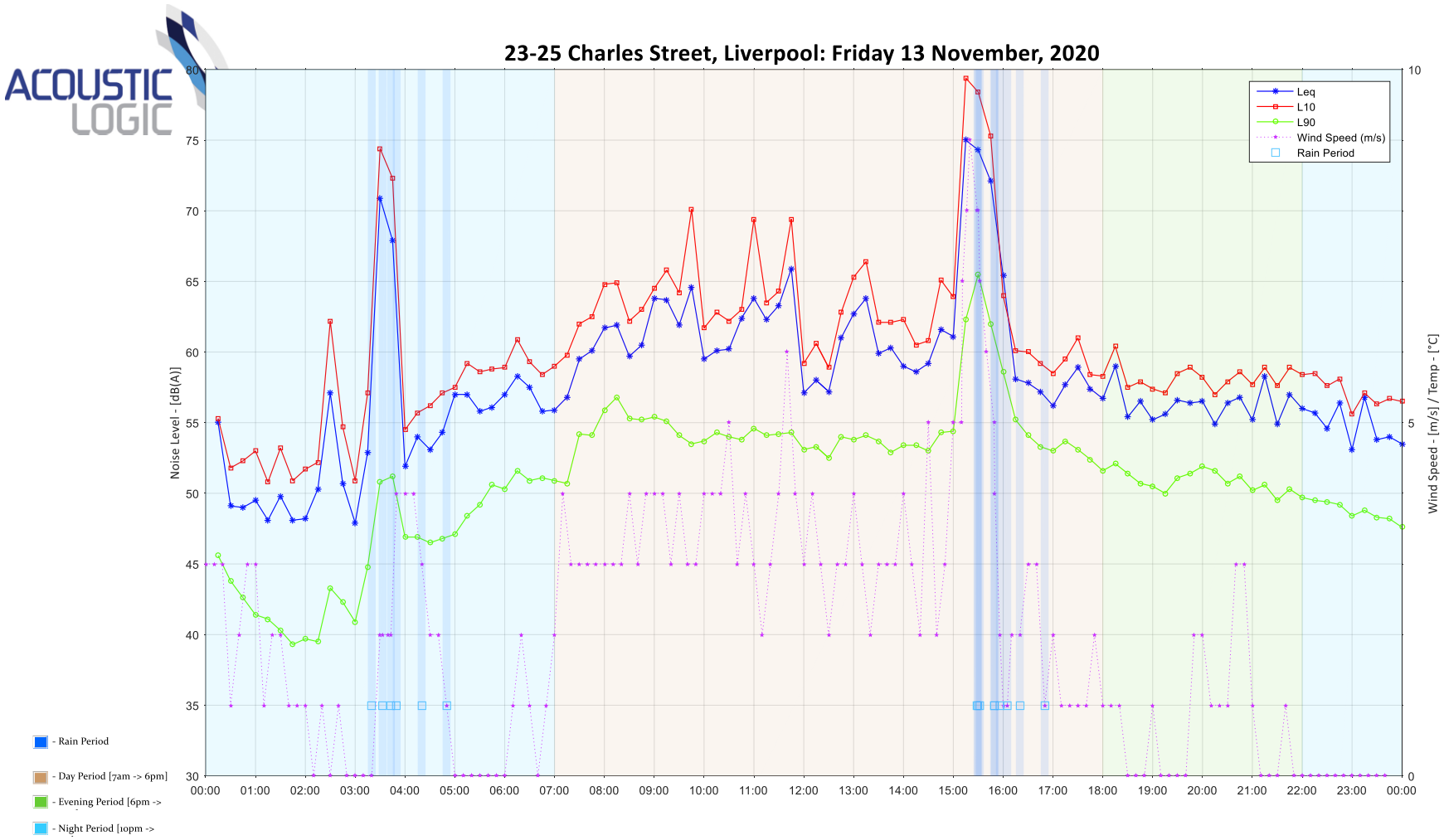
Acoustic Logic Pty Ltd
Myck Bambalan

APPENDIX 1 – UNATTENDED NOISE MONITORING DATA

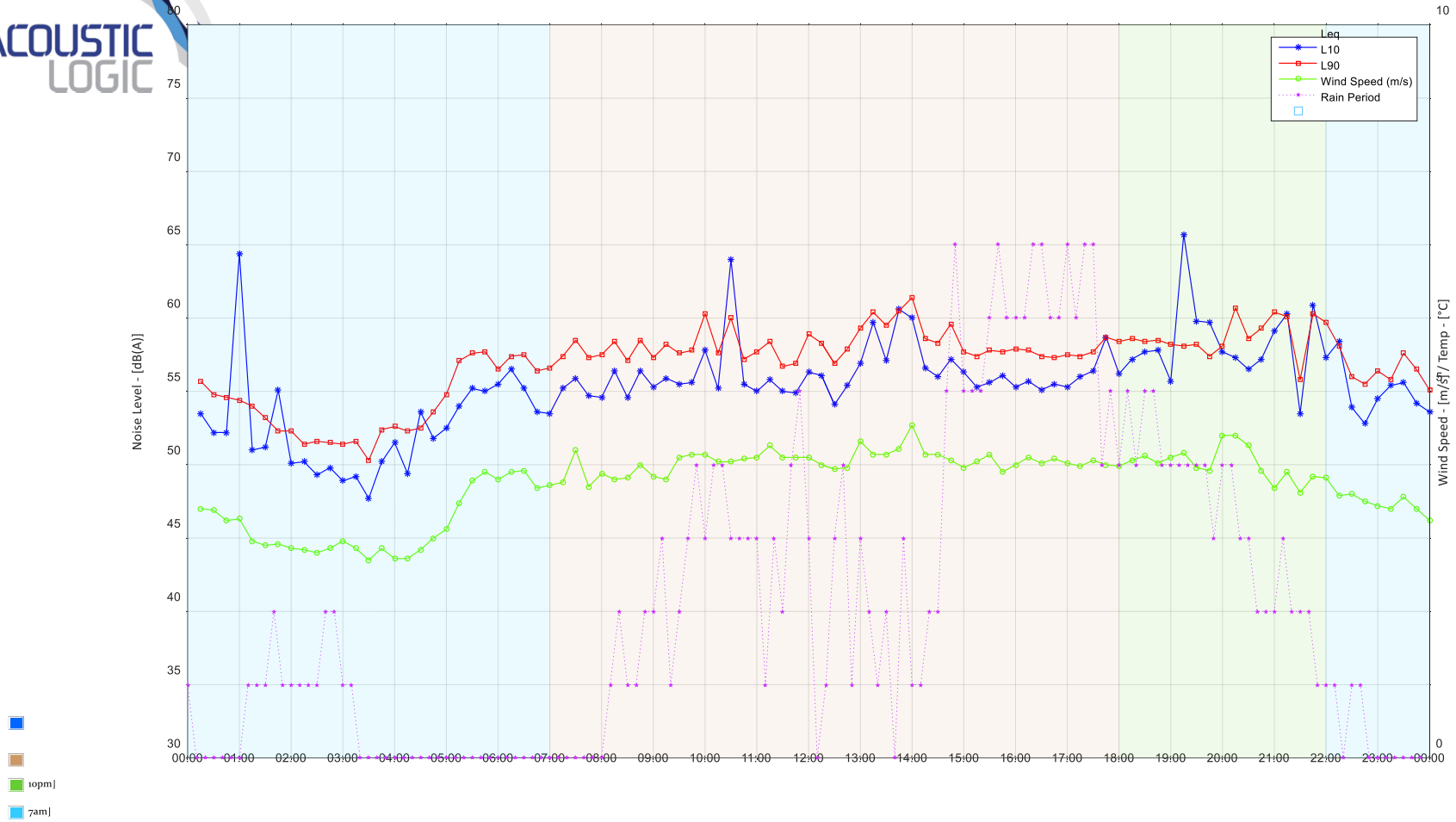

23-25 Charles Street, Liverpool: Tuesday 10 November, 2020
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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
00:00

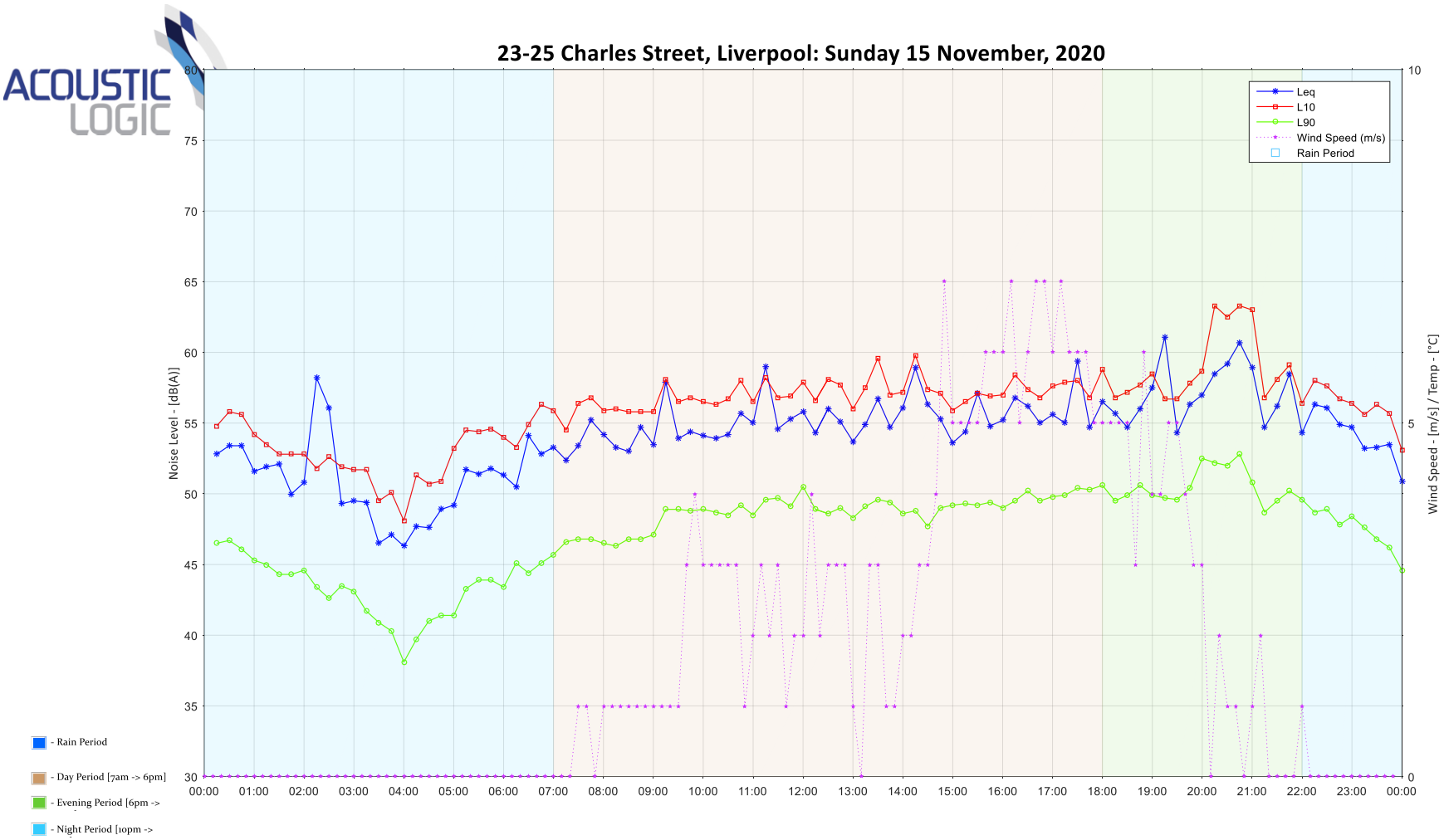

23-25 Charles Street, Liverpool: Wednesday 11 November, 2020
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]

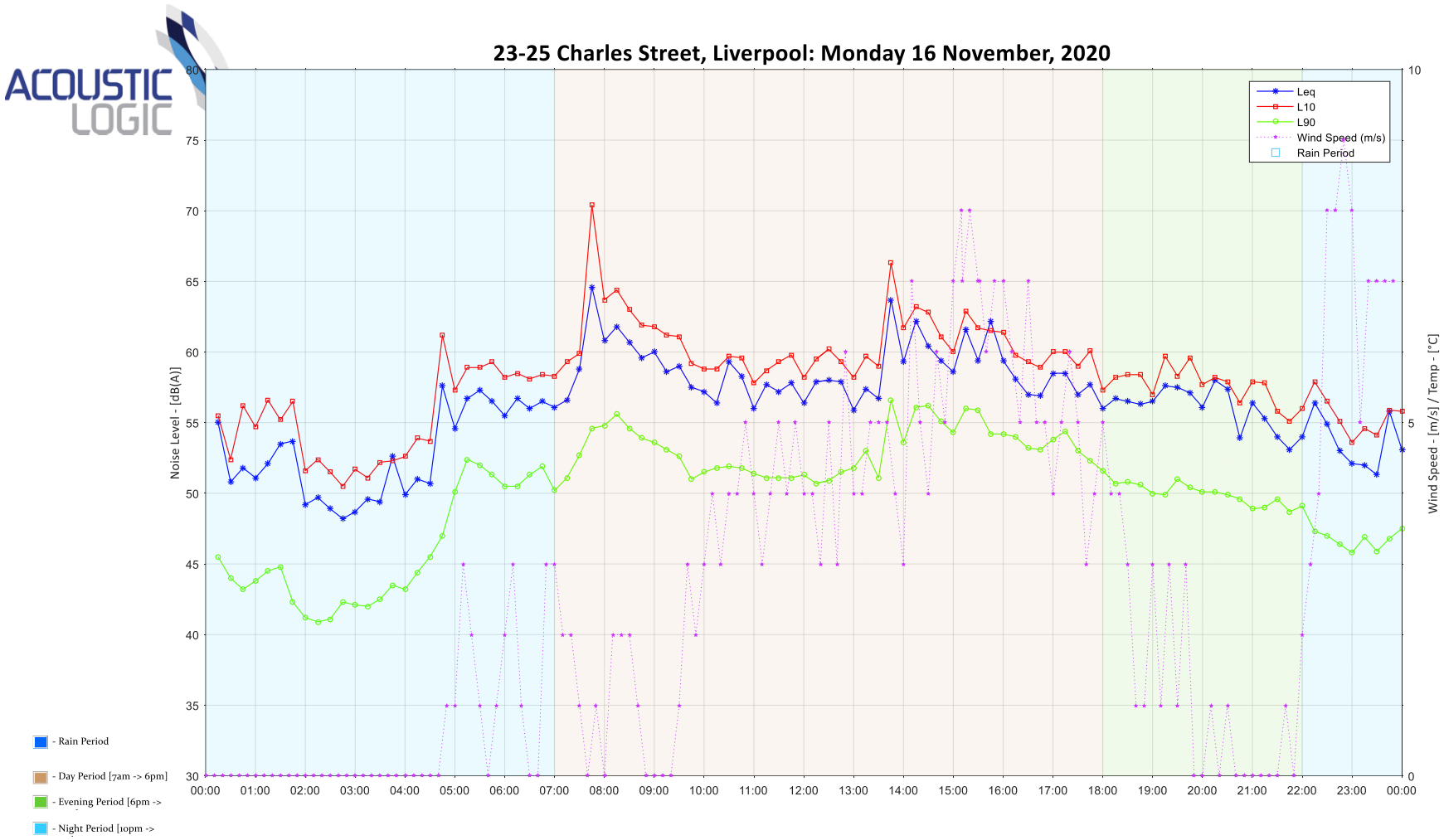

23-25 Charles Street, Liverpool: Thursday 12 November, 2020
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]

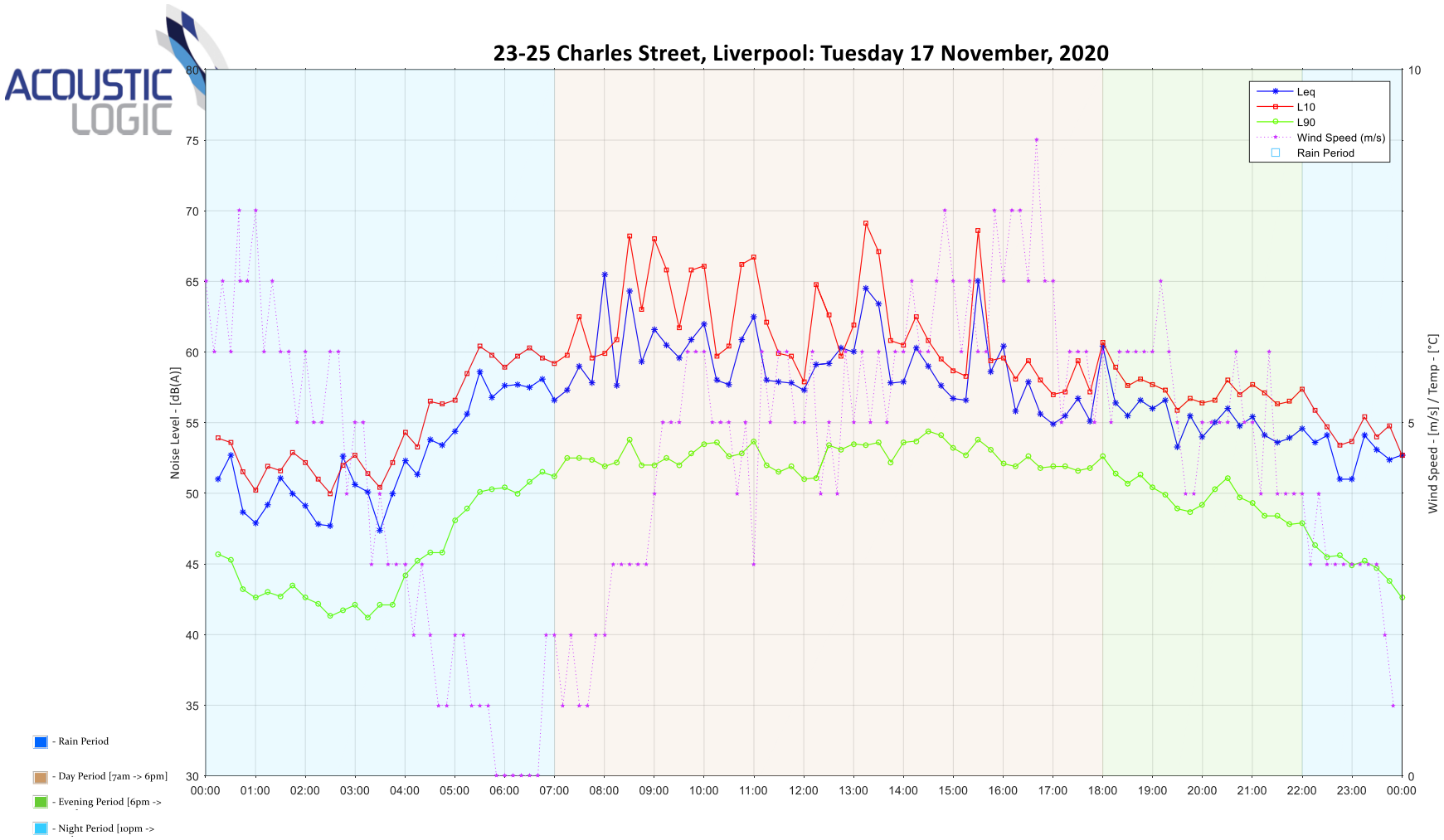

23-25 Charles Street, Liverpool: Friday 13 November, 2020
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]

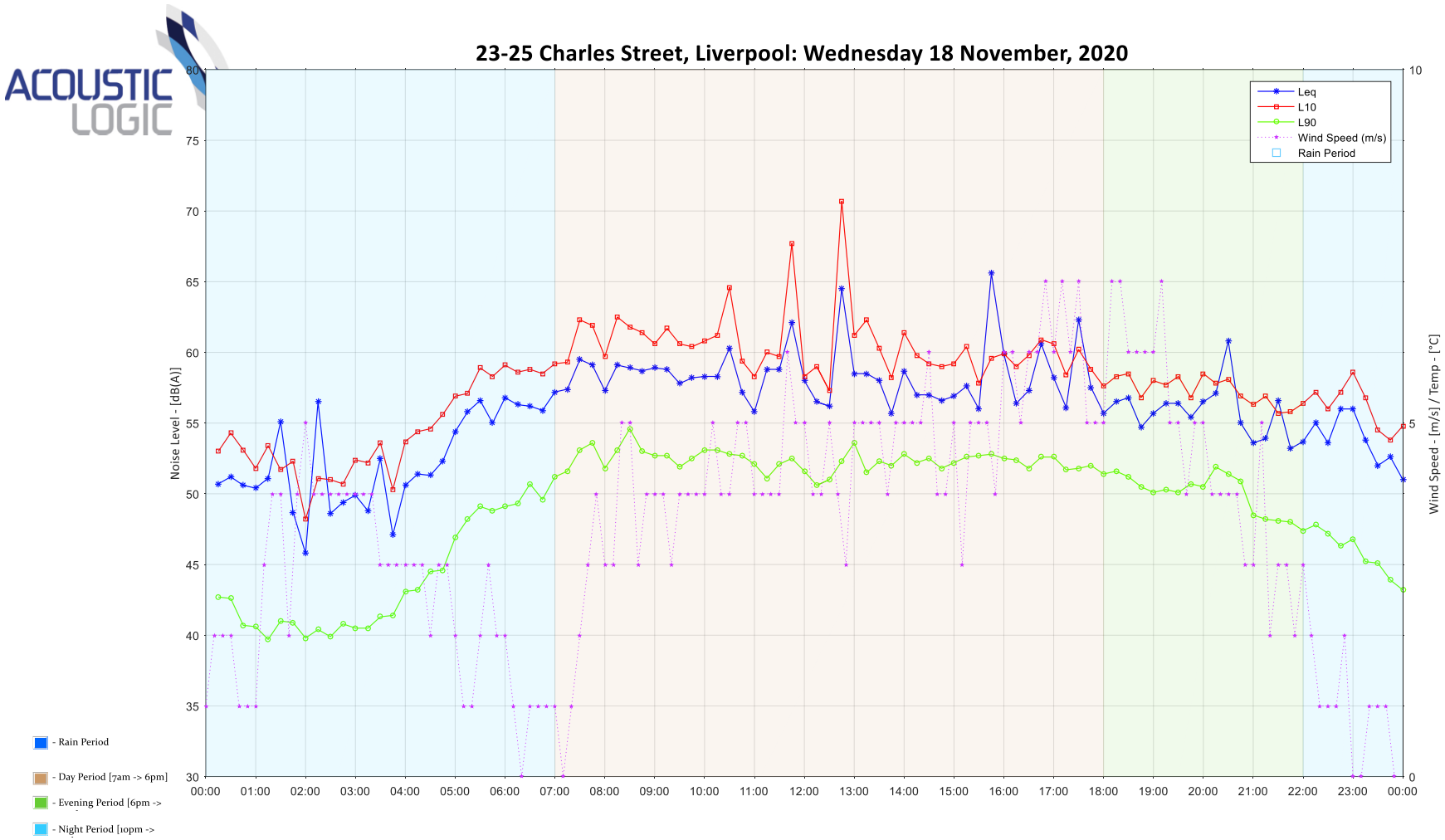
23-25 Charles Street, Liverpool: Saturday 14 November, 2020

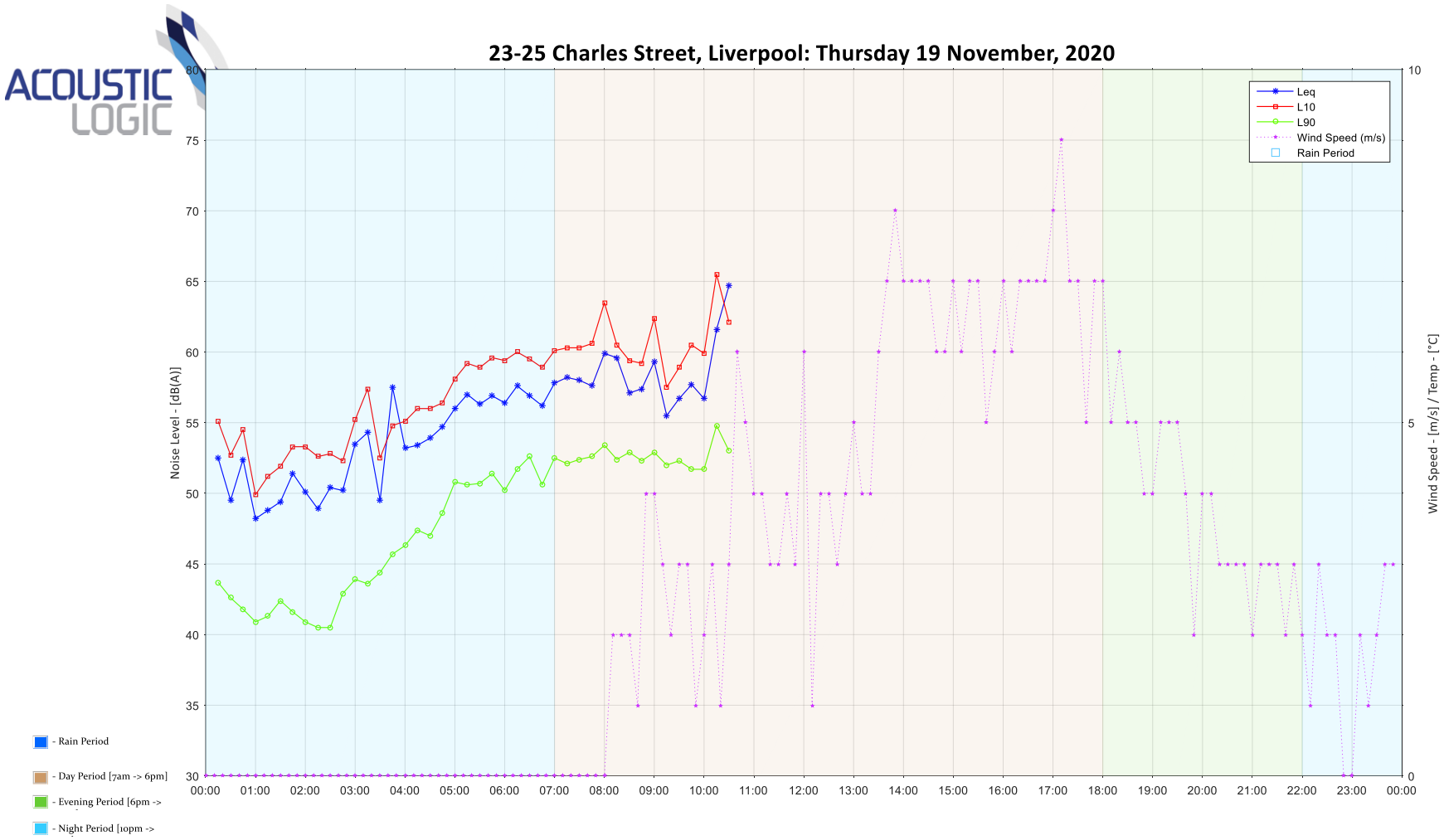



23-25 Charles Street, Liverpool: Sunday 15 November, 2020
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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
00:00


23-25 Charles Street, Liverpool: Monday 16 November, 2020
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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
00:00
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]


23-25 Charles Street, Liverpool: Tuesday 17 November, 2020
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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
00:00


23-25 Charles Street, Liverpool: Wednesday 18 November, 2020
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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
00:00
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]


23-25 Charles Street, Liverpool: Thursday 19 November, 2020
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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
00:00
- Rain Period
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->