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Langston Markets - 12-22 Langston Place, Epping

Environmental Noise Assessment

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1 INTRODUCTION

This report has been prepared to assess environmental noise impacts associated with the proposed operation of a new temporary local market within 'The Langston,' a mixed-use development located at 12-22 Langston Place, Epping.

Noise impacts assessed within this report include:

- Noise from operational activity from patrons and stall holders, and non-amplified music.
- Noise from vehicle movements for setting up/packing up stalls.

The subject site and local context are indicated in Figures 1 and 2.

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

2 REFERENCED DOCUMENTS

2.1 BACKGROUND INFORMATION USED

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

- Market Layout Zones Plan, provided by Reactivate Consulting.
- Issued for Information Revision B architectural drawings, provided by Architectus, dated 28/02/2019.

2.2 PLANNING GUIDELINES

The following planning instruments and guidelines have been used in the assessment:

- Hornsby Shire Council – '*Hornsby Development Control Plan 2013 (DCP)'*.
- NSW EPA – '*Noise Guide for Local Government*.'
- NSW Environmental Protection Authority (EPA) – 'Noise Policy for Industry (NPI) 2017'.

3 SITE DESCRIPTION AND THE PROPOSAL

The subject site is located on the ground floor within the public domain space of the currently-in-development '*The Langston,'* a mixed-use development located at 12-22 Langston Place, Epping. The proposed markets are to be located on the shared area at ground level between the Residential Towers 2 and 3. This area is to be accessed via the southern end of Chambers Court and is currently used as a set-down/pick up area and short-term parking. The proposal to include temporary local market stalls consists of the following:

- A fortnightly event incorporating approximately 50 stalls.
- Set up will include a bump-in period between 8am and 8.45am and a bump-out period between 1pm and 1.45pm.
- The proposed event is to operate between the hours of 9am and 1pm on Sundays.
- Nominated to this office is an expected capacity of between 500 and 800 patrons over the course of the 4-hour period.
- Proposed is the incorporation of non-amplified music performance.

See figure 1 below for an indicative site plan provided to this office.

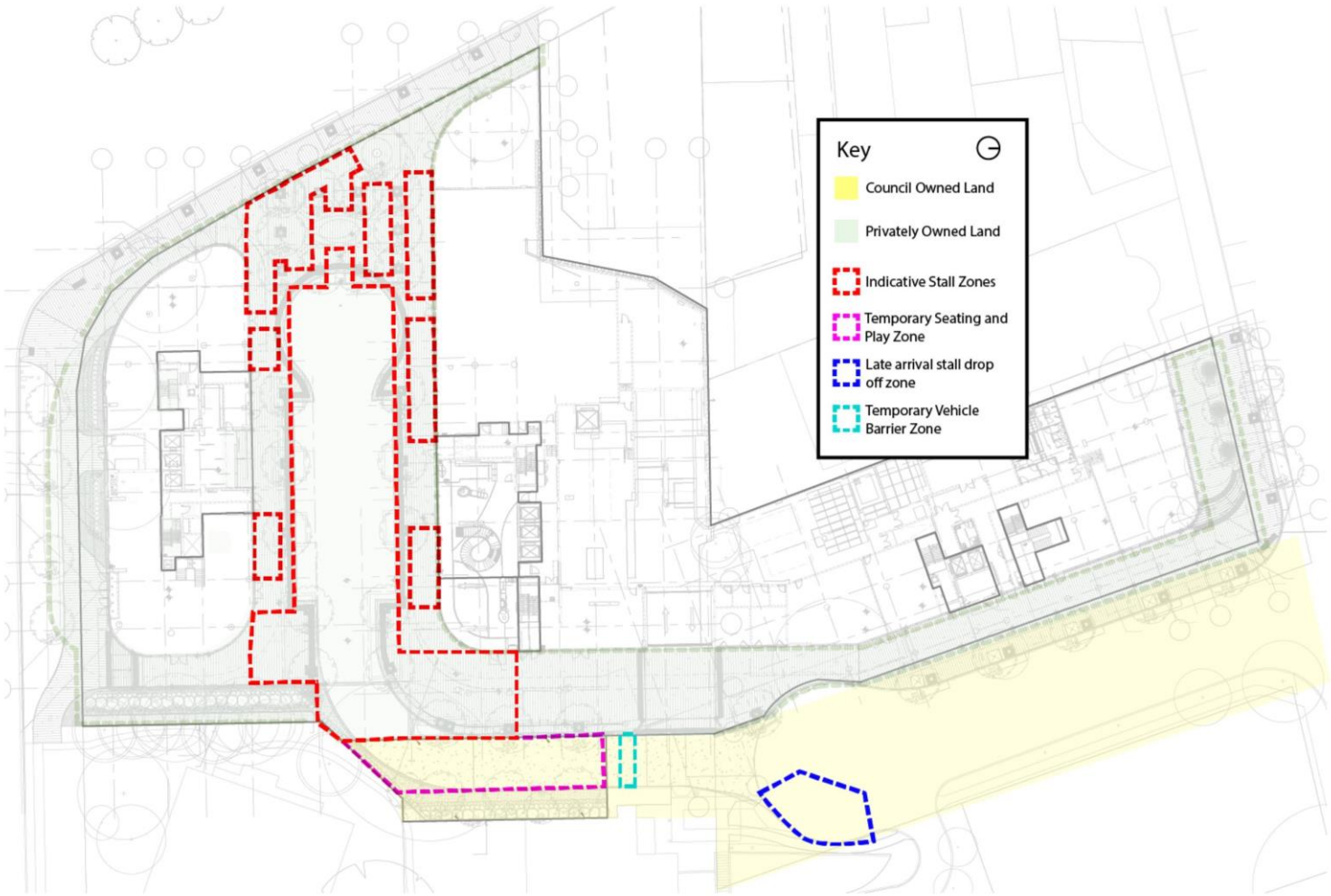


Figure 1: Indicative Site Plan

3.1 NEAREST SENSITIVE RECEIVERS

The following table lists the nearest sensitive receivers surrounding the site. An aerial photo of the site indicating nearby noise sensitive receivers and measurement locations is presented in Figure 2.

Table 1 – Nearest Sensitive Receivers

Receiver (Refer Figure 2)	Land Use	Comment
R1	Residential	Apartments above the proposed market locations, on Level 1 of Towers 1, 2 and 3 of 12-22 Langston Place, Epping.
R2		Three storey residential buildings located on Smith Street, directly to the south-east of the proposed market locations.
C1	Commercial	Retail tenancies maintained upon the ground floor of 'The Langston,' surrounding the proposed market locations.
C2		'Epping Leisure and Learning Centre,' a community centre located to the east of the proposed market locations.
C3		Various retail tenancies located to the west of the proposed market location.

An aerial photo of the site indicating nearby noise sensitive receivers and measurement locations is presented in Figure 2.

Figure 2: Site Map with Nearest Sensitive Receivers and Monitoring Location (Sourced from Bing Maps)

4 EXISTING BACKGROUND NOISE LEVELS

Unattended noise monitoring has previously been undertaken by this office for the Development Application for 12-22 Langston Place, Epping and will be used for the purposes of this assessment (Ref: 20190302.2/0705A/R1/SN)

Figure 2 above shows the monitoring location used.

The following table summarises the rating background noise levels determined for the day period as defined in the NPfI.

Table 2 – NPfI Rating Background Noise Levels

Location	Rating Background Noise Level (dB(A) L_{90})*
	Day (7am – 6pm)
12-22 Langston Place, Epping	58

5 NOISE EMISSION OBJECTIVES

A noise emission assessment has been carried out to quantify the potential level of noise from market operation, and compare the predicted levels to the existing ambient environment. An assessment of the potential acoustic impact from market operation has been compared to relevant guidelines.

This assessment will review noise emissions associated with the following:

- Operational noise from patrons/stall holders within the market, and non-amplified music.
- Noise from vehicle movements during bump-in and bump-out periods.

5.1 NOISE OBJECTIVES

The noise emission assessment has been assessed in accordance with the following documents:

- Hornsby Shire Council – 'Hornsby Development Control Plan 2013'.
- NSW EPA – '*Noise Guide for Local Government*.'
- NSW Environmental Protection Authority (EPA) – 'Noise Policy for Industry (NPI) 2017' (For vehicle movements)

5.1.1 Recreational/Entertainment Noise Discussion

Typically, the intention of a noise control is to avoid noise levels which would be considered "offensive" to the typical person.

However, different noise sources have a different probability of causing disturbance, even if the actual noise level is the same. For example, the chance of disturbance cause by mechanical plant creating a noise level of 50dB(A) is likely to be higher than if that same noise level was created by vocal noise from recreational activities.

For proposed uses which do not have a specific or formalised noise criteria, discussion of appropriate assessment methods will be provided. We note that the EPA Noise Policy for Industry noise trigger levels are not applicable to recreational developments or activities and is hence not applicable to operational noise associated with the markets. They are primarily intended to assess noise emissions from industrial/commercial developments and mechanical plant operational noise. In our experience, it is common in the assessment of noise generated by community facilities that compliance with specific acoustic guidelines is not required (and for facilities located adjacent to residential properties, it may not generally be achievable).

An outline of relevant acoustic criteria is presented below.

5.1.2 Hornsby Shire Council – 'Hornsby Development Control Plan 2013'

The Hornsby Development Control Plan 2013 states the following with regards to noise emissions from noise generating developments:

"*Noise generating developments should be accompanied by an acoustic report that demonstrates the development is sited and designed to:*

- *Minimise the effect of noise and vibration on surrounding land uses, and*
- *Comply with relevant State Government and council guidelines."*

As this DCP does not quantify any acoustic objectives; this assessment will adopt NSW EPA guidance for noise objectives.

5.1.3 NSW EPA Noise Guide for Local Government

Noise from the use of community recreational activity is not typically regulated to a numerical limit. Further, the impact of any noise source must be considered in relation to the surrounding noise environment (i.e. the prevailing ambient and background noise levels which will determine its intrusiveness or audibility).

With regard to large outdoor entertainment/recreational events, the Noise Guide for Local Government states the following:

> "*There are no hard and fast rules to apply when developing noise limits for these types of events, and what is appropriate will depend upon the particular circumstances. Typically, unless the venue is very remote, it is not possible to establish noise limits that prevent annoyance at every residence. However, noise limits can prevent the noise levels from being any higher than necessary. The impact on the residents is not just a function of the noise level but is also a function of, for example:*
>
> - *The length of the event.*
> - *The commencement and finishing times.*
> - *The number of similar events held per year.*
>
> *These can all be juggled and need to be considered collectively when establishing the noise limit. Therefore, the length of the event and commencement and finishing times etc. that were originally proposed may need to be revisited. The impact on residents needs to be weighed up against the cultural, social, and economic needs/expectations of the broader community to determine if the venue is suitable and if the event should proceed."*

The Noise Guide for Local Government provides guidance to local councils to assist in the management of noise. With regard to public entertainment facilities similar to the proposed, the framework for noise control recommends that assessment of noise impact be made with reference to the offensive noise test. The application of this test is summarised below and assessed within Section 6.5:

- The loudness of the noise, especially compared with other noise in the area.
- The characteristics of the noise.
- The time and duration of the noise.
- Whether the noise is typical for the area.
- How often the noise occurs.
- The number of people affected by the noise.

5.1.4 NSW EPA Noise Policy for Industry (NPfI) 2017 (For Vehicle Movements During Bump-In/Bump-Out)

The NSW EPA Noise Policy for Industry (NPfI) 2017, has two criteria which need to be satisfied: namely the Intrusiveness noise level criteria and the Project amenity noise level criteria. The project noise trigger level is then established based on the lower of the intrusiveness and project amenity levels.

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

5.1.4.1 Intrusiveness Noise Level Criteria

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).

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

Table 3 – Intrusiveness Noise Level Criteria

Location	Period/Time	Intrusiveness Noise Level Criteria dB(A)$L_{Aeq(15min)}$
Nearby Residences – Urban Receivers	Day (7am-6pm)	63

5.1.4.2 Project Amenity Noise Level Criteria

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 sets out acceptable noise levels for various localities. Table 2.2 on page 11 of the policy indicates 3 categories to distinguish different residential areas. They are rural, suburban, urban. This site is categorised by urban receivers.

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 $L_{Aeq,\ 15\ minute}$ descriptor. The project amenity noise level criteria are presented in the table below.

Table 4 – Project Amenity Noise Level Criteria

Location	Period/Time	Project Amenity Noise Level Criteria dB(A)$L_{Aeq(15min)}$
Nearby Residences – Urban Receivers	Day (7am-6pm)	58
Nearby Commercial Receivers	When in Use	63

5.1.5 Summary of Vehicle Movement Noise Emission Criteria

Table 5 provides a summary of the relevant noise emission criteria for vehicle movements during bump-in/bump-out periods for the proposed markets.

Table 5 – Summary of Vehicle Movement Noise Emission Criteria

Location	Period/Time	Project Trigger Noise Level dB(A)$L_{Aeq(15min)}$
R1 and R2	Day (7am-6pm)	58
C1, C2 ad C3	When in use	63

6 NOISE EMISSION ASSESSMENT

Operational noise emissions are assessed below. The assessment includes the following noise sources:

- Noise emissions from patron activity and acoustic non-amplified music performance.
- Noise emissions from vehicle movements during bump-in/bump-out periods.

SoundPLAN Noise Modelling has been used to assess operational noise levels from the proposed markets.

6.1 INFORMATION/ASSUMPTIONS

The following information/assumptions have been utilised in the assessment of operational noise.

6.1.1 Patron Noise and Non-Amplified Music Performance

- Market operational activity is limited to the proposed time period (9am-1pm).
- The event is to have an expected capacity of between 500 and 800 people over the course of the 4-hour period. For the sake of a conservative assessment methodology, AL has assumed that all 800 people are simultaneously in attendance at a given point in time, and are evenly distributed throughout the space
    - We note that the maximum number of 800 people attending the market is cumulative over the course of the 4 hour operation.
    - Given the majority of people would be likely to stay at the markets for a shorter period of time than this, or only to attend a small number of stalls (rather than the entire market operation), this assumption is considered to be conservative, or to represent a reasonable worst-case scenario.
    - For regular market operations, it likely that there would be less than 800 patron at a given point in time, and as such the predicted noise levels are likely to be higher than those typically experienced.
- Patron noise is subject to 1 in 3 patrons talking at any one time. A sound power level of 75dB(A)L_{eq} was used for patron voice levels for this assessment, which is consistent with a 'raised voice', and typically used for the assessment of licensed venues.
    - Whilst we would expect that a number of patrons would be speaking in a raised voice, it is likely that people attending the market would also be speaking with moderate or casual vocal levels. Again, this represents a conservative assessment, or represents a reasonable worst-case scenario.
- Non-amplified music has been modelled based upon acoustic guitar and non-amplified vocal measurements previously collated by this office and has been modelled to a Sound Power Level of 85dB(A) L_{eq}.
- There is to be no PA announcement speakers operated for use during the proposed event.
- The recommendations outlined within Section 7 of this report are implemented.

6.1.2 Vehicle Movements for Bump-In/Bump-Out Period

- Vehicle movements will occur in the Chambers Court shared area between residential Towers 2 and 3 during the bump-in and bump-out periods and hence will be assessed.
- A traffic management plan was not available at the time of undertaking the assessment, and as such is based on the assumption that in a worst 15-minute period, a third of the 50 stalls will have one vehicle move both in and out to bump-in and bump-out the market stalls. This would inherently mean that over the course of the 45-minute bump-in/bump-out period, all 50 stalls would have one vehicle enter and exit the public domain space for market stall set-up/pack-down. This equates to a total of 34 vehicle movements within a given 15-minute period (Rounded up for the sake of a conservative assessment).

- Vehicle movements have been calculated based on the assumption that cars entering or exiting will be driving at 10km/h.
- Each car has a sound power level of 84dB(A) (Typical in the experience of this office for cars driving at 10km/h).
- As the late drop-off market stall indicative location is maintained on a public road (Chamber's Court), vehicles dropping off stalls in the late zone have not been included as part of this assessment.
- AL assumes bump-in and bump-out to only occur during the time periods nominated to this office.
- The recommendations outlined within Section 7 of this report are implemented.

SoundPLAN noise modelling has been conducted based on the information/assumptions presented within Section 6.1, to predict noise emissions to surrounding sensitive receivers due to site operation.

6.2 SOUNDPLAN MODELLING

Noise levels have been predicted at the receiver locations using SoundPlan™ 8.0 modelling software implementing the ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation standard.

Noise enhancing meteorological effects have been adopted as recommended by the NPfI, noting that the ISO 9613 modelling approach assumes that all receivers are 'downwind' (i.e., that noise enhancing wind conditions are in effect at all times).

Ground absorption was conservatively calculated with a ground factor of 0 for all areas surrounding the site exclusive of any localised greenery and lawns, which have been modelled with a ground factor of 0.6, as recommended in *Engineering Noise Control* (Bies & Hanson).

In line with Factsheet C of the NPfI, penalties for annoying noise characteristics should be applied at the receiver, where applicable. Based on the predicted noise levels, no penalty should be applied (either for tonality, intermittency, or otherwise).

6.3 PATRON ACTIVITY AND NON-AMPLIFIED MUSIC NOISE MODEL

Figure's 3 to 5 present the results of the predictive operational noise modelling, and results are summarised in Table 6.

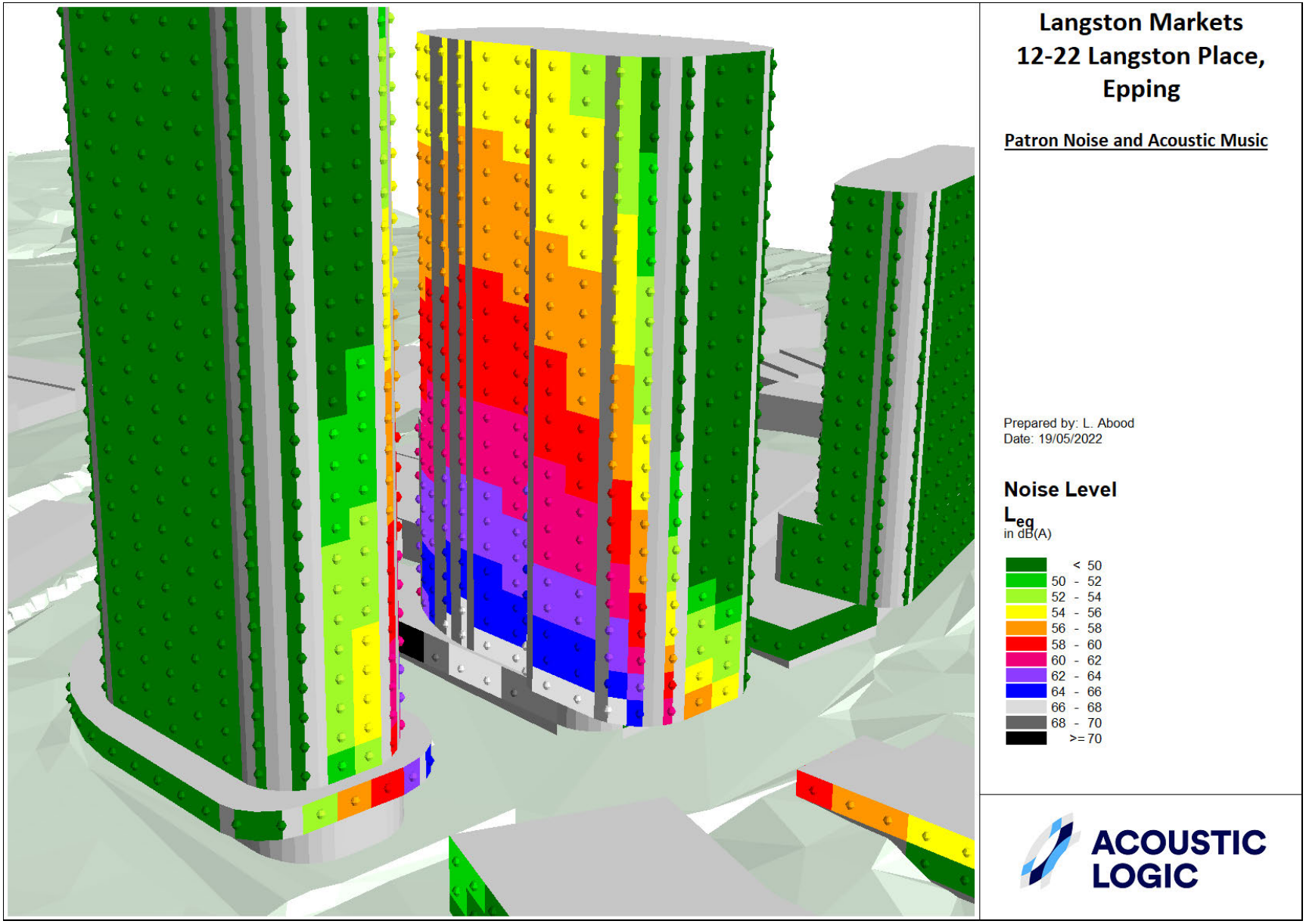


Figure 3: Langston Markets – Patron Activity R1 and C1

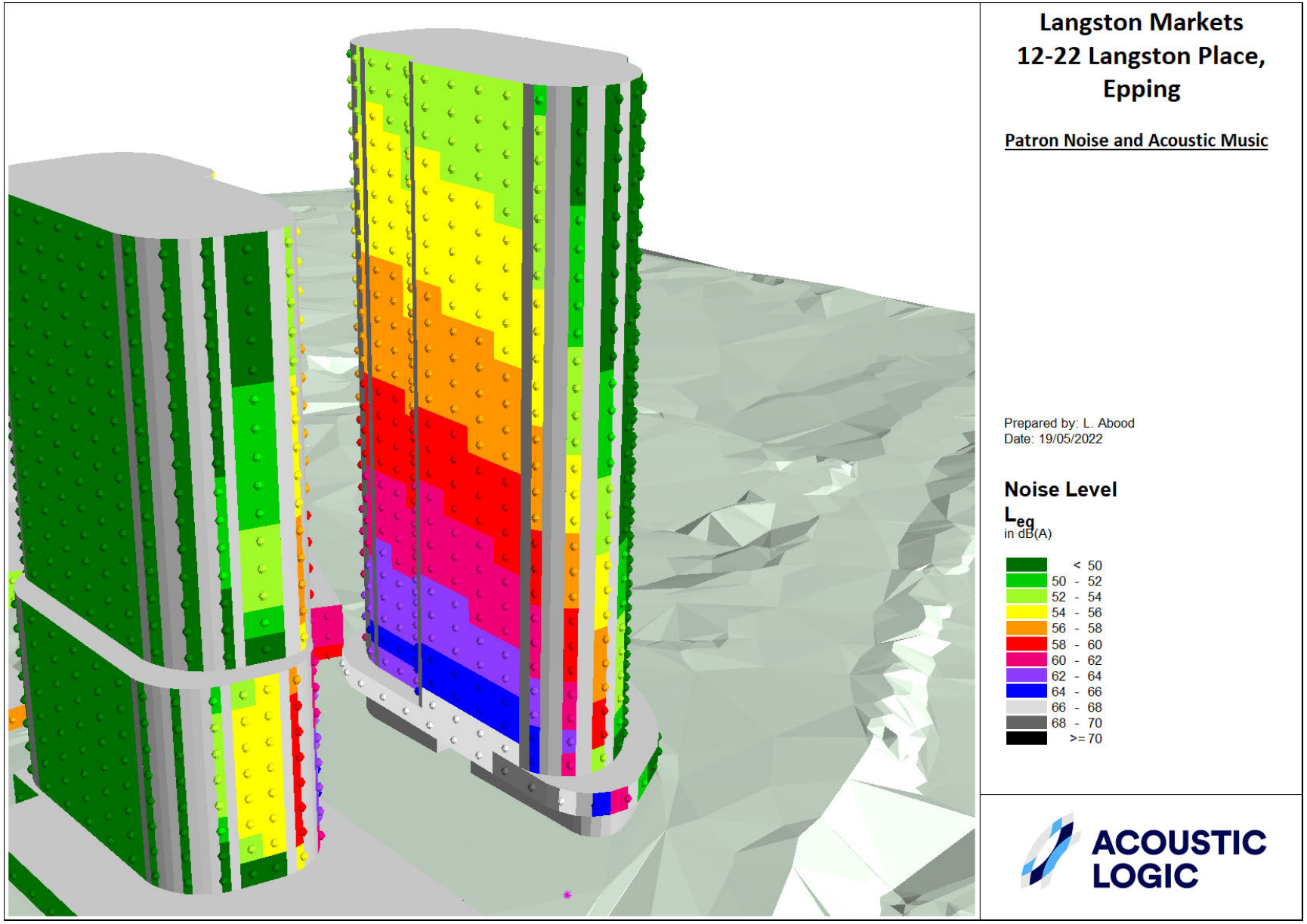


Figure 4: Langston Markets – Patron Activity R1 and C1

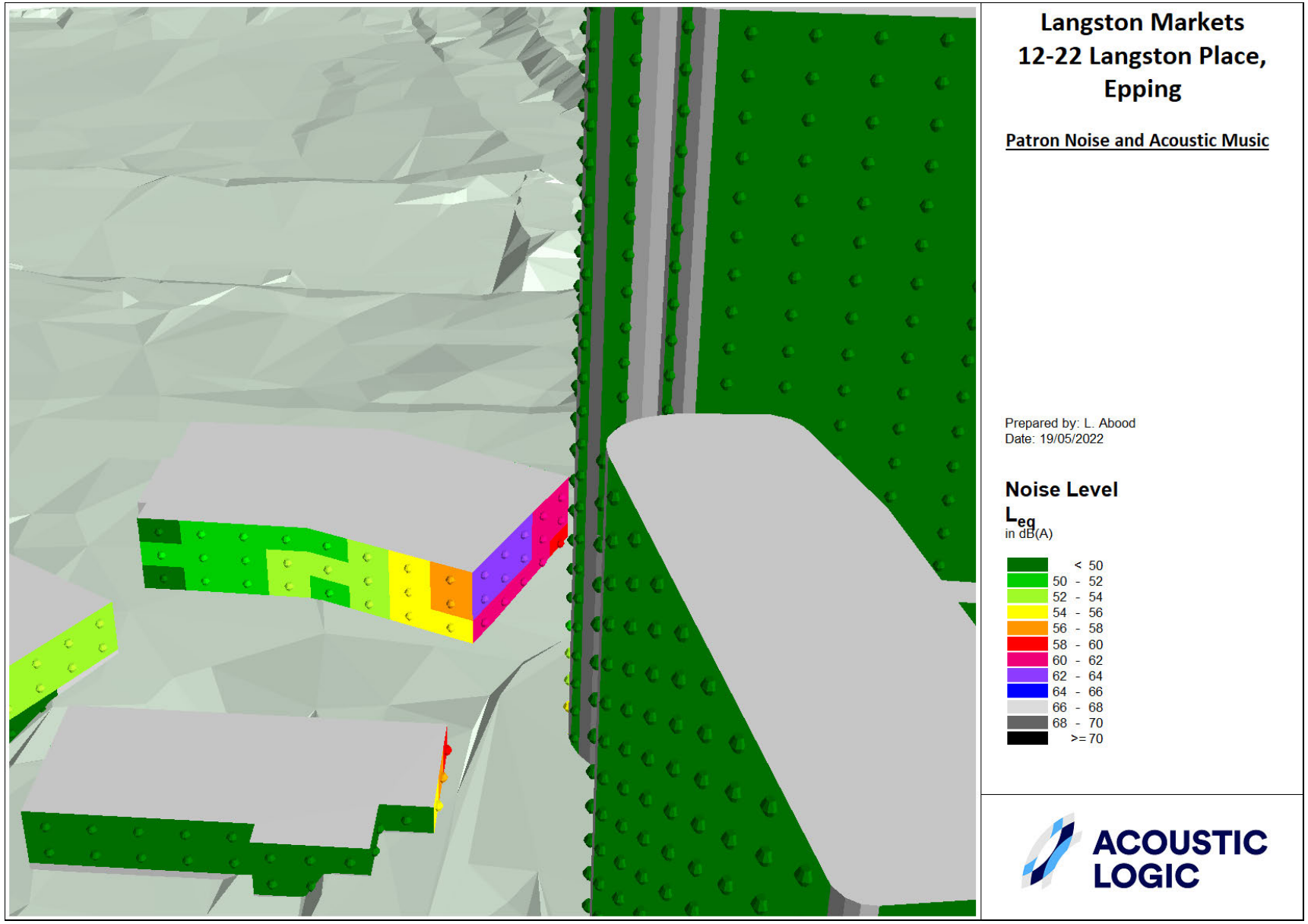


Figure 5: Langston Markets – Patron Activity R2

The table below presents the predicted external noise levels experienced at sensitive receivers within the SoundPlan model. A discussion of the potential impact from market operation is presented in Section 6.5.

Table 6 –External Noise Levels for Sensitive Receivers due to Patron Noise

Receiver	Predicted Noise Levels (dB(A) $L_{eq(15min)}$)
R1	<50-68
R2	<50-64
C1	<50-69
C2	<50-60

6.4 VEHCILE MOVEMENT NOISE MODEL

Figure's 6 to 8 present the results of the predictive operational noise modelling, and results are summarised in Table 7.

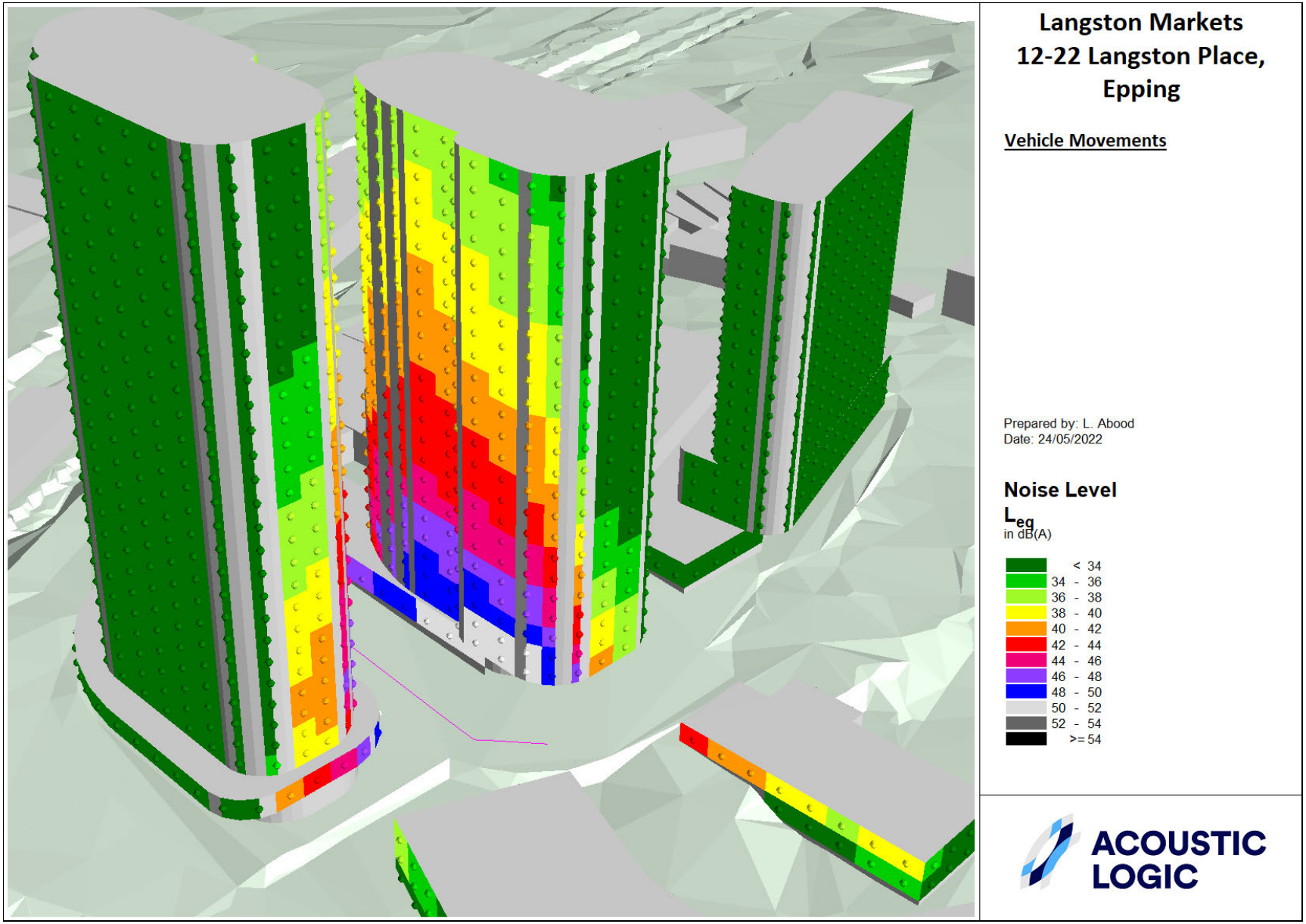


Figure 6: Langston Markets – Vehicle Movements R1 and C1

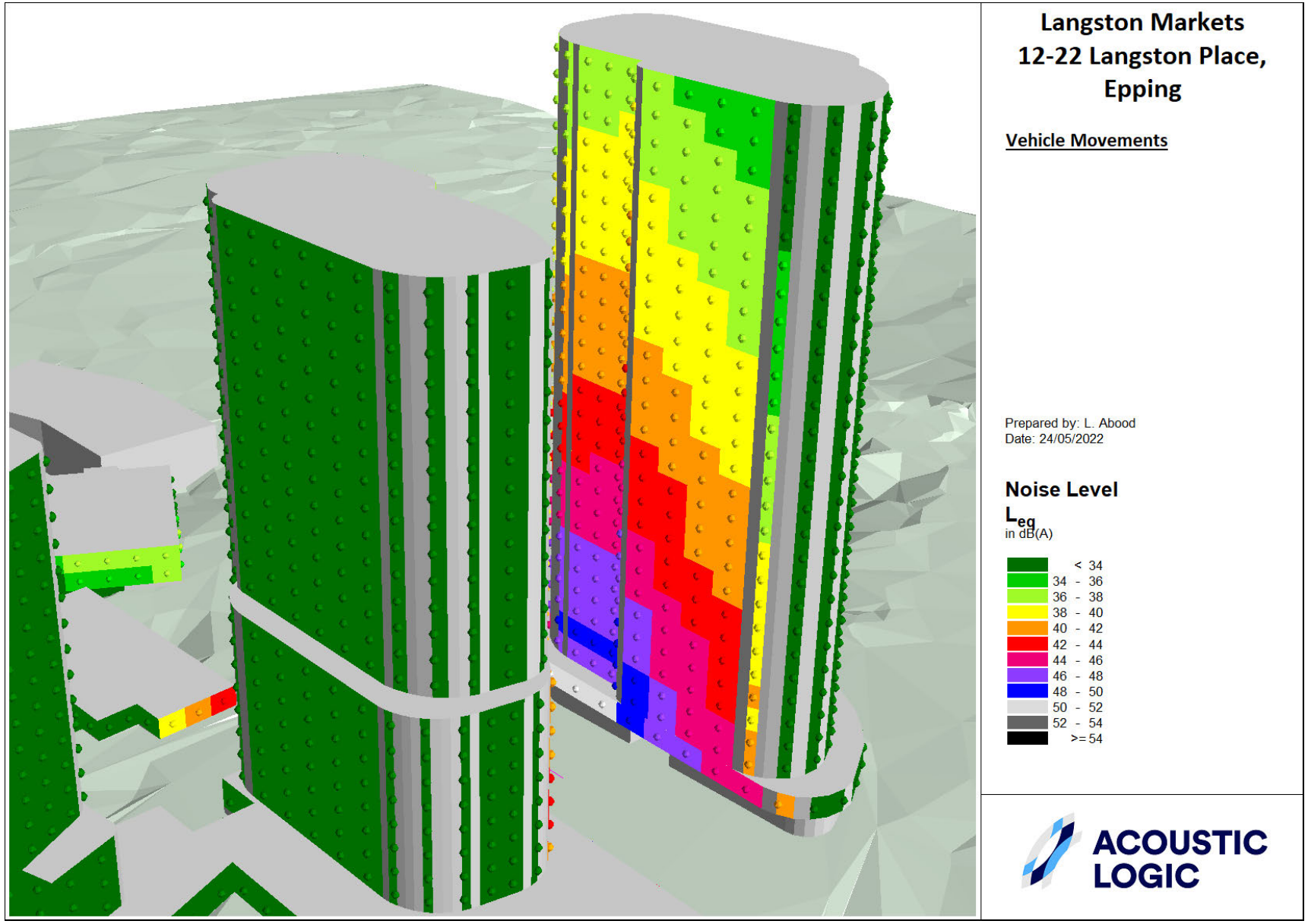


Figure 7: Langston Markets – Vehicle Movements R1 and C1

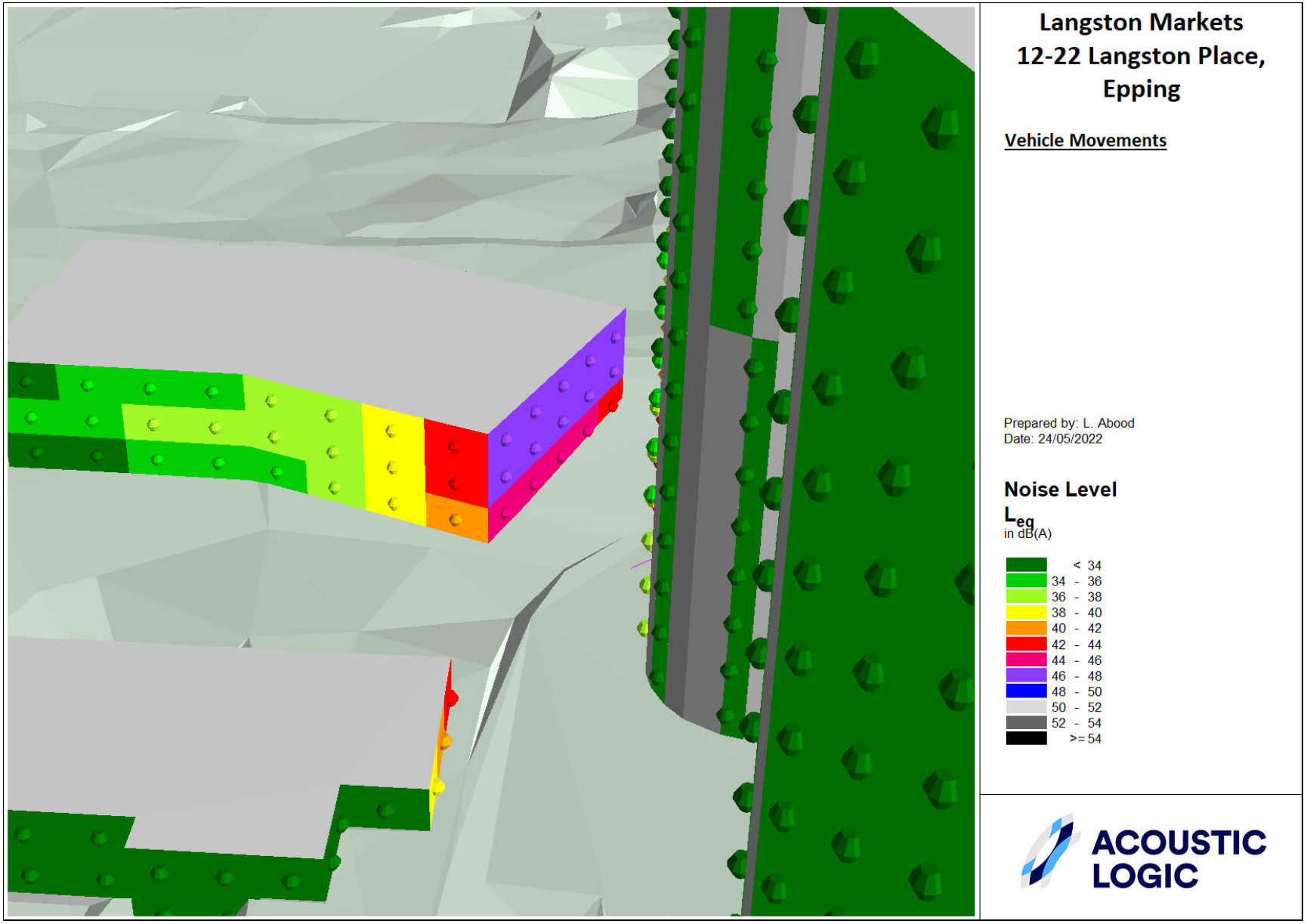


Figure 8: Langston Markets – Vehicle Movements R2

The table below presents the predicted external noise levels experienced at sensitive receivers within the SoundPlan model.

Table 7 –External Noise Levels for Sensitive Receivers due to Vehicle Movements

Receiver	Predicted Noise Levels (dB(A) $L_{eq(period)}$)	Project Noise Trigger Level (dB(A) L_{eq}	Comment
R1	<34-52	≤ 58	Below NPfI Project Noise Trigger Level
R2	<34-48		
C1	<34-50	≤ 63	
C2	<34-42		

6.5 DISCUSSION OF PATRON NOISE

The potential impacts have been reviewed using the Offensive Noise Test outlined within the NSW EPA Noise Guide for Local Government, presented in Section 5.1.3 of this report for the operational noise impacts of the markets:

- **The loudness of the noise, especially when compared with other noise in the area.** – The loudness of the noise is inherently assessed through intrusiveness objectives, or an assessment level of BG+5dB(A). The location of the Langston development is surrounded by various sources of high environmental noise, namely two different roadways carrying high volumes of traffic (Epping Road and Beecroft Road,) as well as the T9 Rail corridor. As such, the acoustic environment and corresponding background noise level associated with the assessment location are high, noting a measured background noise level of 58dB(A) during the monitoring period.

  The highest predicted external noise level experienced by any of the surrounding residential receivers is background +10dB(A) for the first floor on facades facing towards the market stalls for Towers 2 and 3 for the development. Noise levels of background + 10dB(A) or greater are experienced up to the 2nd level of the southern façade for Tower 2, and the northern façade for Tower 3. Noise levels of background + 5dB(A) or greater are experienced up to the 9th level of the southern façade for Tower 2, and the northern façade for Tower 3, as well as the western façade of the western-most building within R2. Acoustic Logic notes that the noise levels presented within this assessment are an absolute worst case, whereby the entire expected capacity across the 4-hour event have been modelled as concurrent attendance.

  Noise levels of background + 5 dB(A) would be considered a low level of impact, and background + 10 dB(A) a moderate level of impact.

- **The characteristics of the noise** – The characteristics of the noise are to be vocal noise and noises relevant to active recreation, noise types which are not typically considered to be sources of offensive noise, as discussed in Section 5.1.1.
- **The time and duration of the noise** – The proposed market operation is only to operate for four hours during daytime hours on Sundays on a fortnightly basis.
- **Whether the noise is typical for the area** – Operational noise from patron activity will be typical for the area once development is complete, noting the inclusion of 10 retail tenancies and associated outdoor dining areas spread across the ground floor of the three residential buildings at 'The Langston.'
- **How often the noise occurs** – The markets are proposed to operate on a fortnightly basis within a 4-hour period, a relatively small portion of time within a month period.
- **The number of people affected by the noise** – Of the number of tenants maintained within the Langston development, the number of receivers considered to be low or moderately noise affected due to the operation of the proposed market stalls is relatively small, noting that only up to the 10th level (Out of 24 and 27 levels respectively) along one façade of two of the three buildings can be considered noise affected, as well as along one façade of R2. All other facades, and all of Tower 1, are below the low level of noise impact nominated as Background + 5dB(A).

Further to the discussion, the Noise Guide for Local Government states the following with regards to operational noise impacts from large open-air patron activities:

> *"The impacts on the residents needs to be weighed up against the cultural, social and economic needs/expectations of the broader community to determine if the venue is suitable and if the event should proceed."*

The intention of the proposed markets is to provide a local service to residents of the Langston locality, as well as the wider community, and can hence be argued that the noise impacts should be considered acceptable given the cultural, social and economic benefits of the proposal.

7 RECOMMENDATIONS

The following is recommended to adhere to the noise objectives outlined within this assessment:

- The operation of the market stalls is to be in accordance with the proposed hours of operation for the site nominated to this office, namely operation between 9am and 1pm, with 8am-8.45am bump-in and 1pm-1.45pm bump-out periods.
- The market stalls are to operate to the proposed fortnightly schedule on a Sunday as to limit the impact of noise on surrounding residential receivers.
- Vehicle speeds are to be limited to 10km/h within public domain space for bump-in/bump-out.
- There is to be no more that 1 vehicle for each individual market stall drive onto public domain space during the bump-in and bump-out periods. Any additional vehicles required are to unload in the "Late arrival stall drop off zone" on Chambers Court.
- A conscientious effort should be made by individuals setting-up and packing up stalls to avoid unnecessary noise where feasible. Stall materials should be placed gently as opposed to being dropped during set-up.

8 CONCLUSION

This report presents an assessment of the acoustic impacts regarding the proposed temporary local market to operate within 'The Langston,' located at 12-22 Langston Place, Epping.

Provided the recommendations presented within Section 7 of this report are implemented, the environmental noise impacts of the proposal will be considered acceptable with the guidance outlined within the following documents:

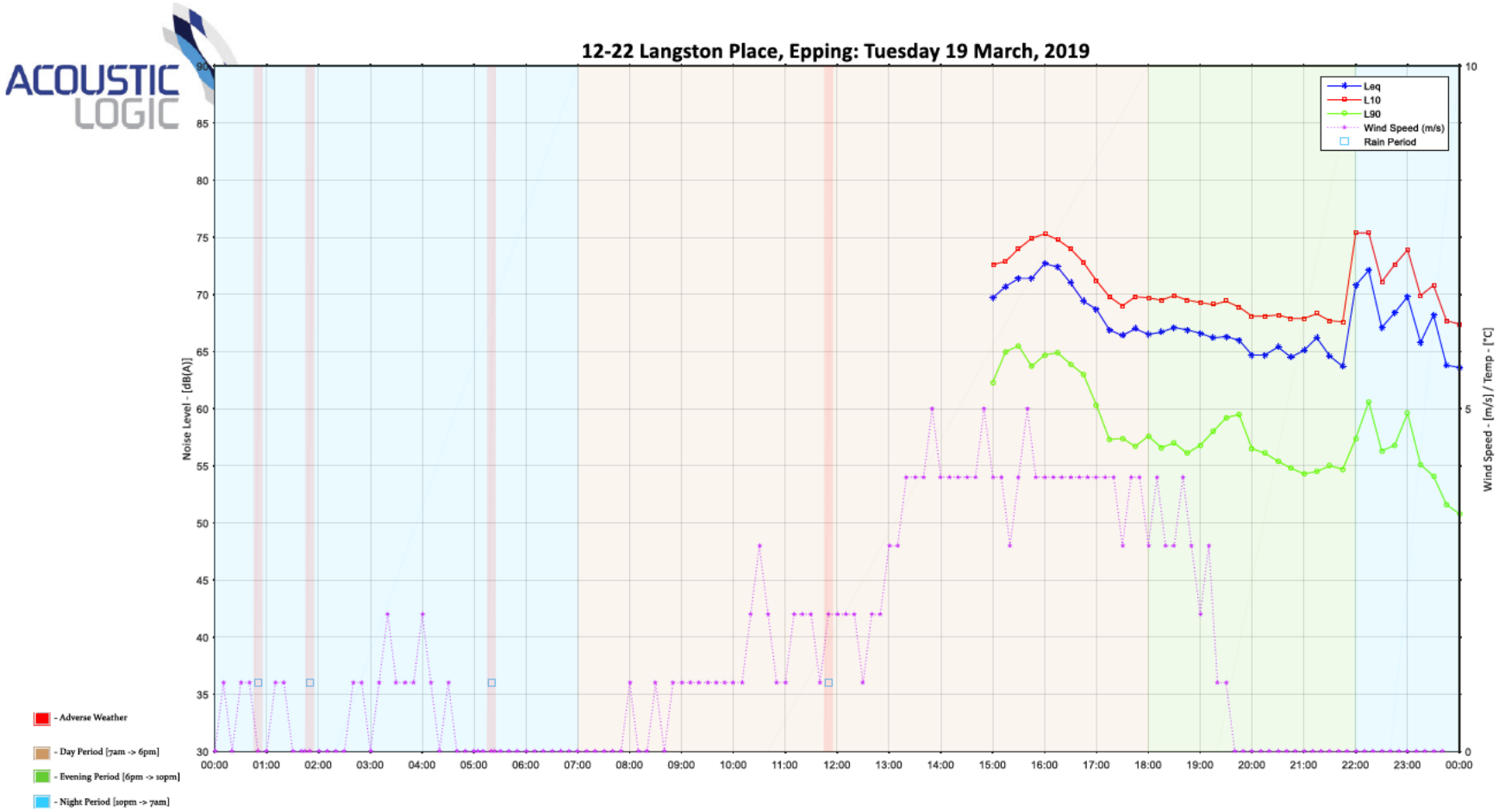
- Hornsby Shire Council – '*Hornsby Development Control Plan 2013 (DCP)*'.
- NSW EPA – '*Noise Guide for Local Government.*'
- NSW Environmental Protection Authority (EPA) – 'Noise Policy for Industry (NPI) 2017,' (For Vehicle Movements).

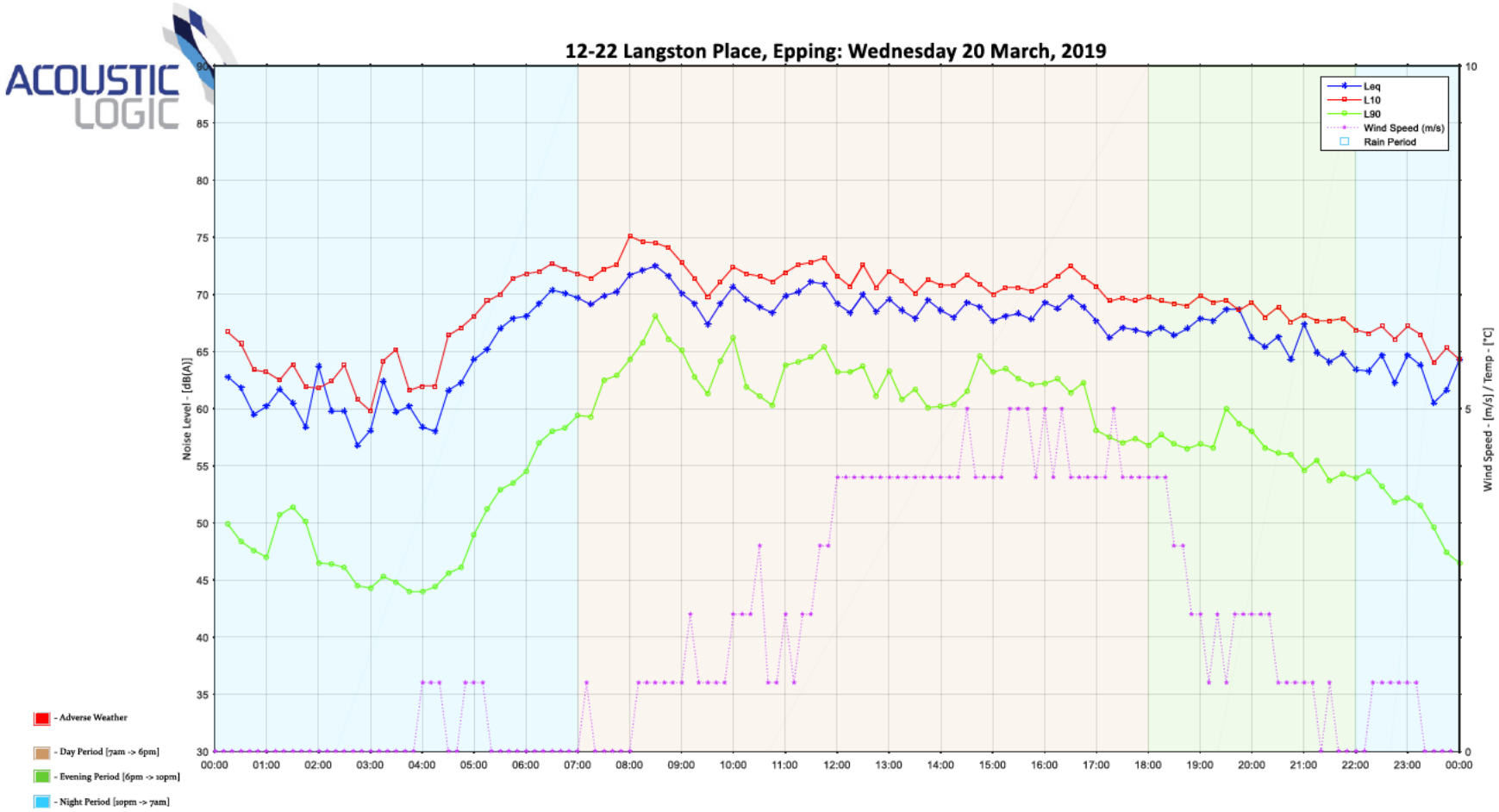
Please contact us should you have any further queries.

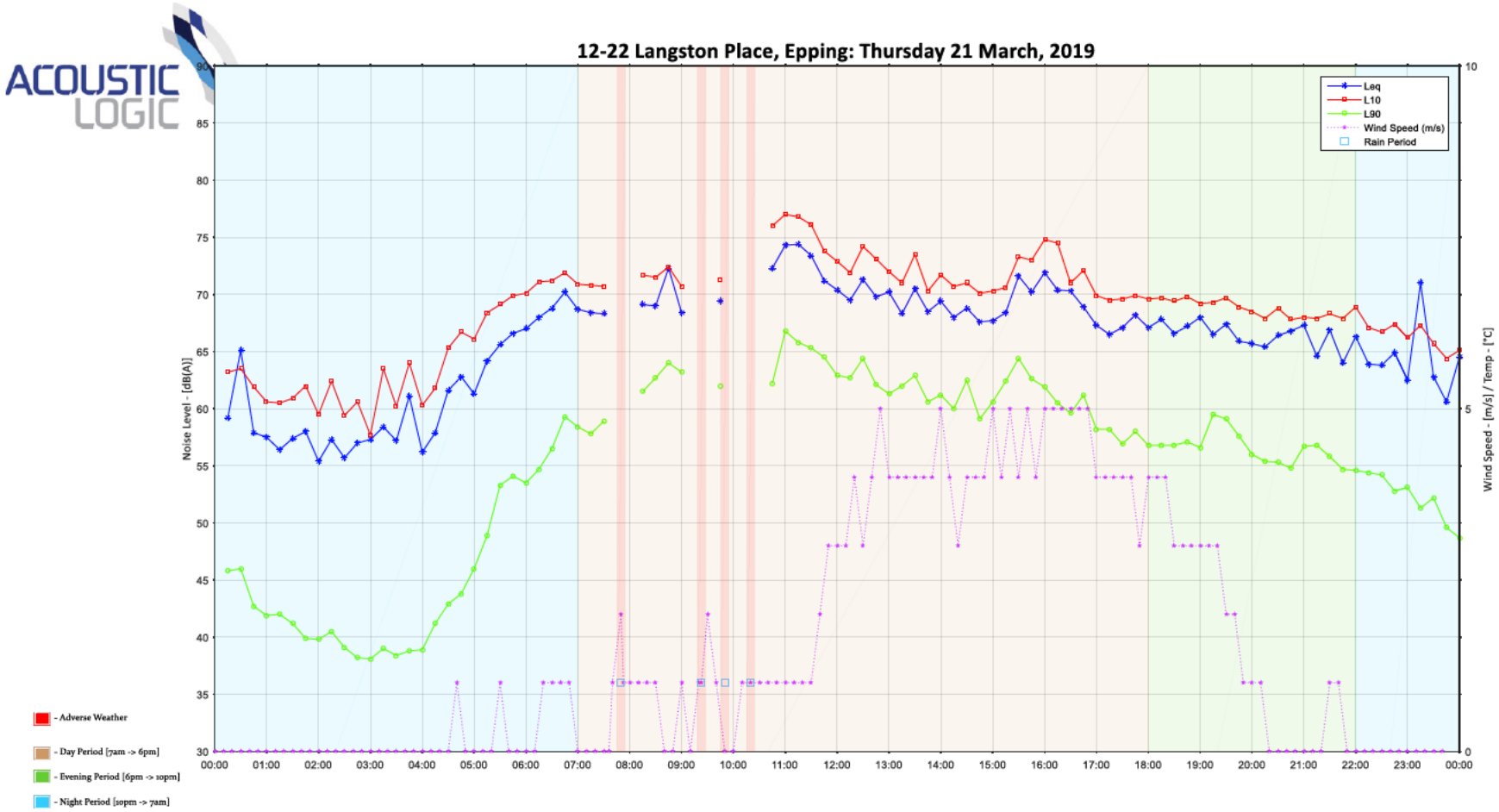
Yours faithfully,

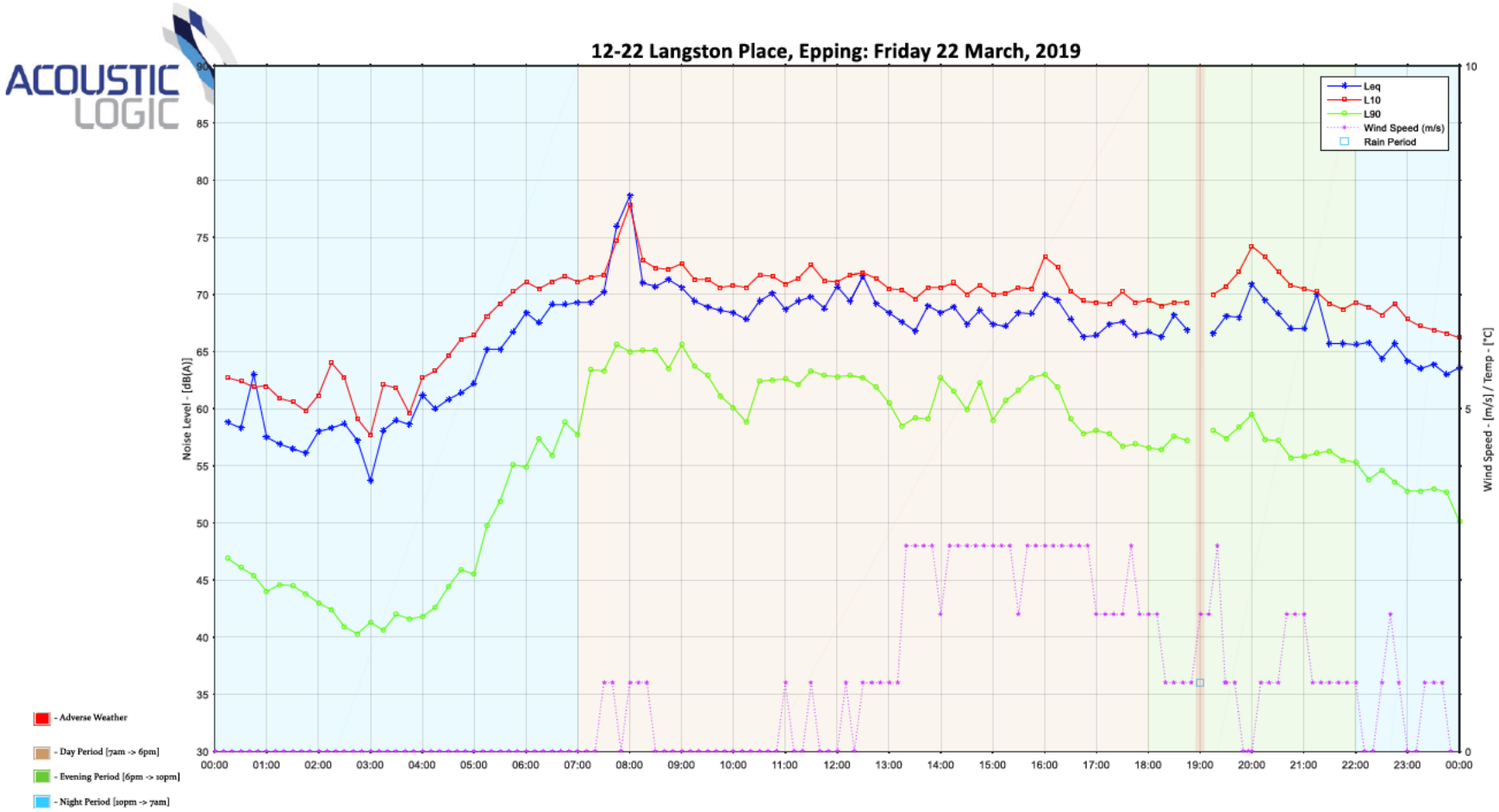
Acoustic Logic Pty Ltd
Lachlan Abood

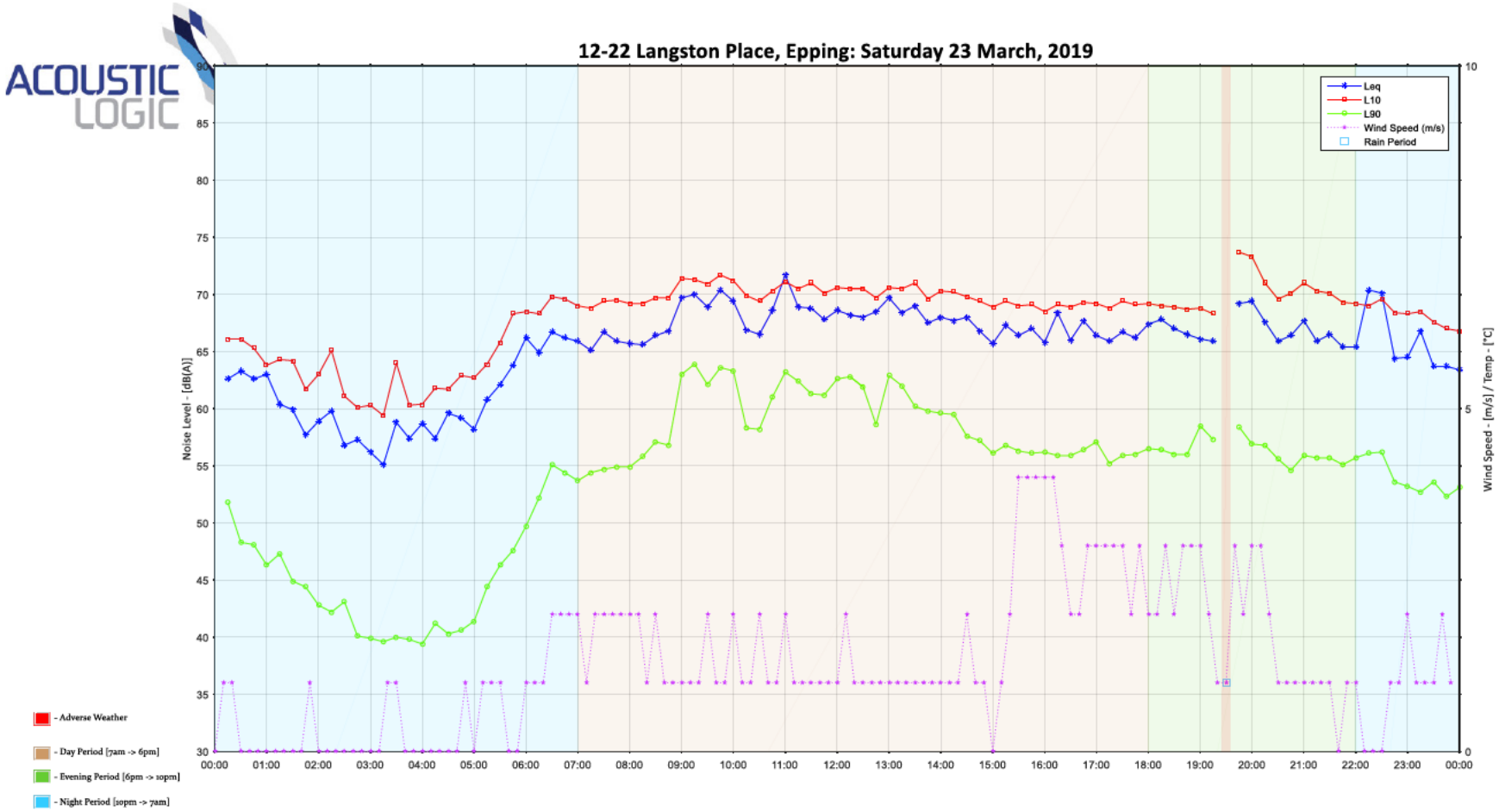
APPENDIX 1 – UNATTENDED MONITORING DATA

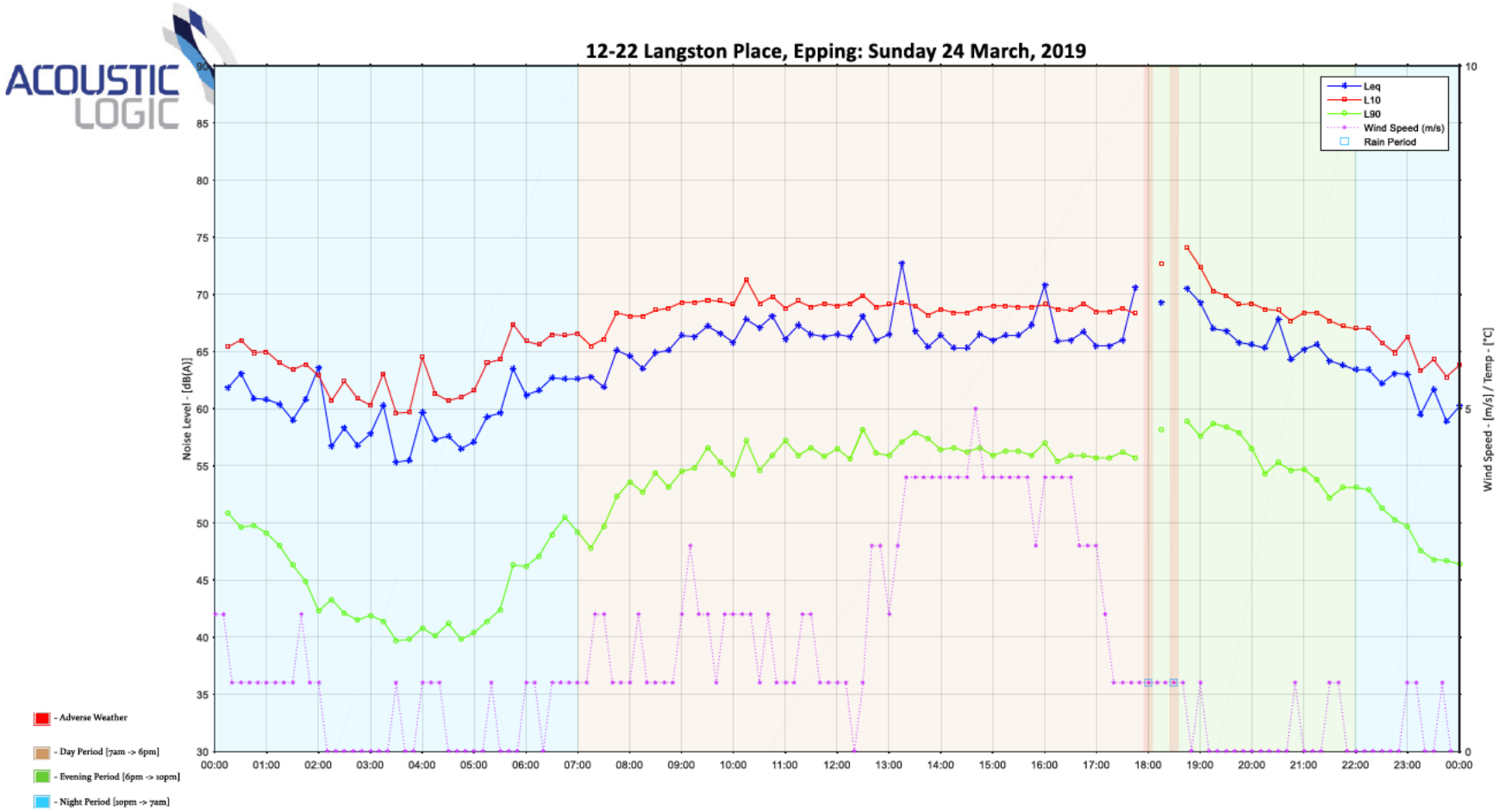

12-22 Langston Place, Epping: Tuesday 19 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


12-22 Langston Place, Epping: Wednesday 20 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

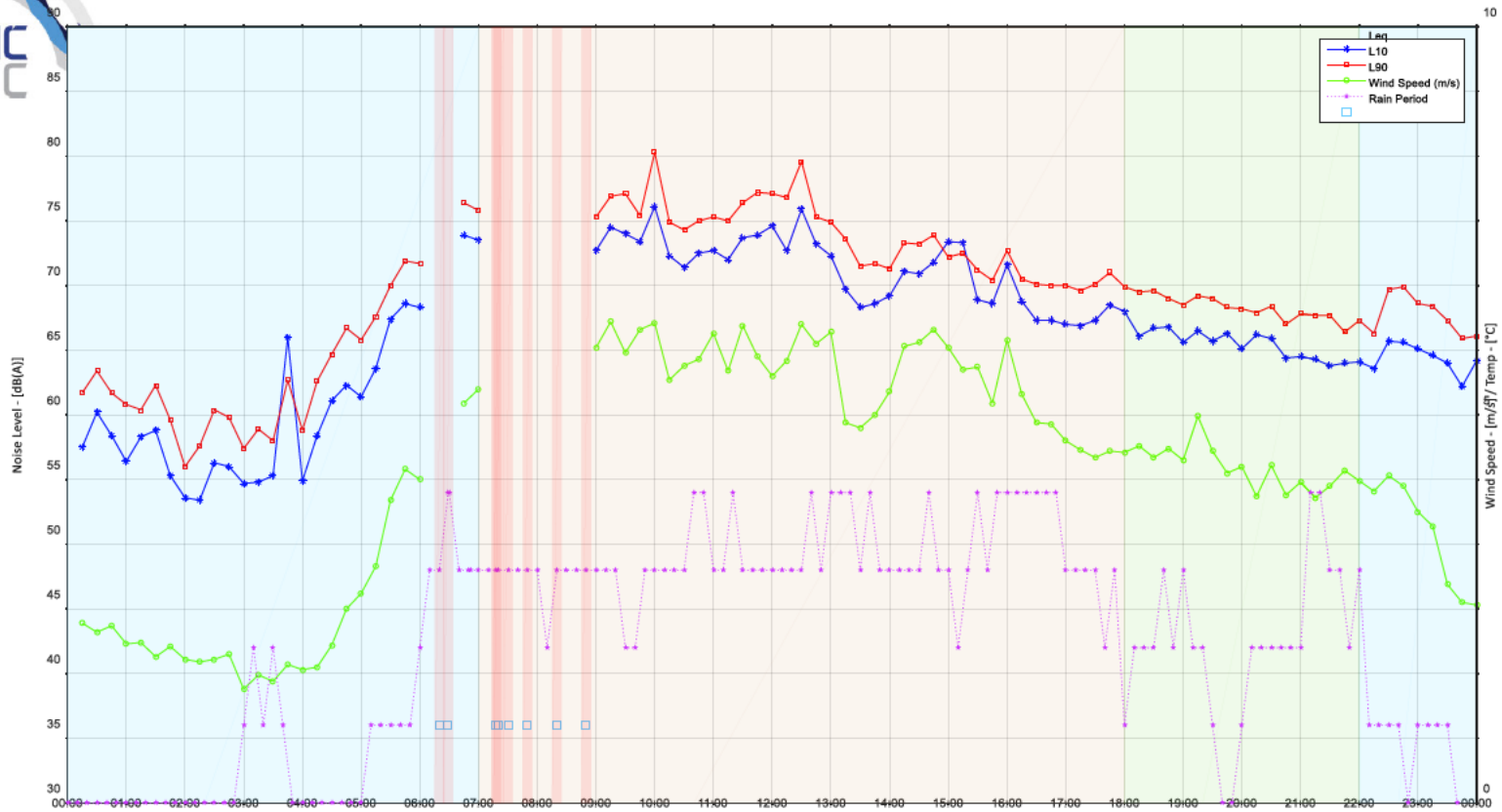

12-22 Langston Place, Epping: Thursday 21 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

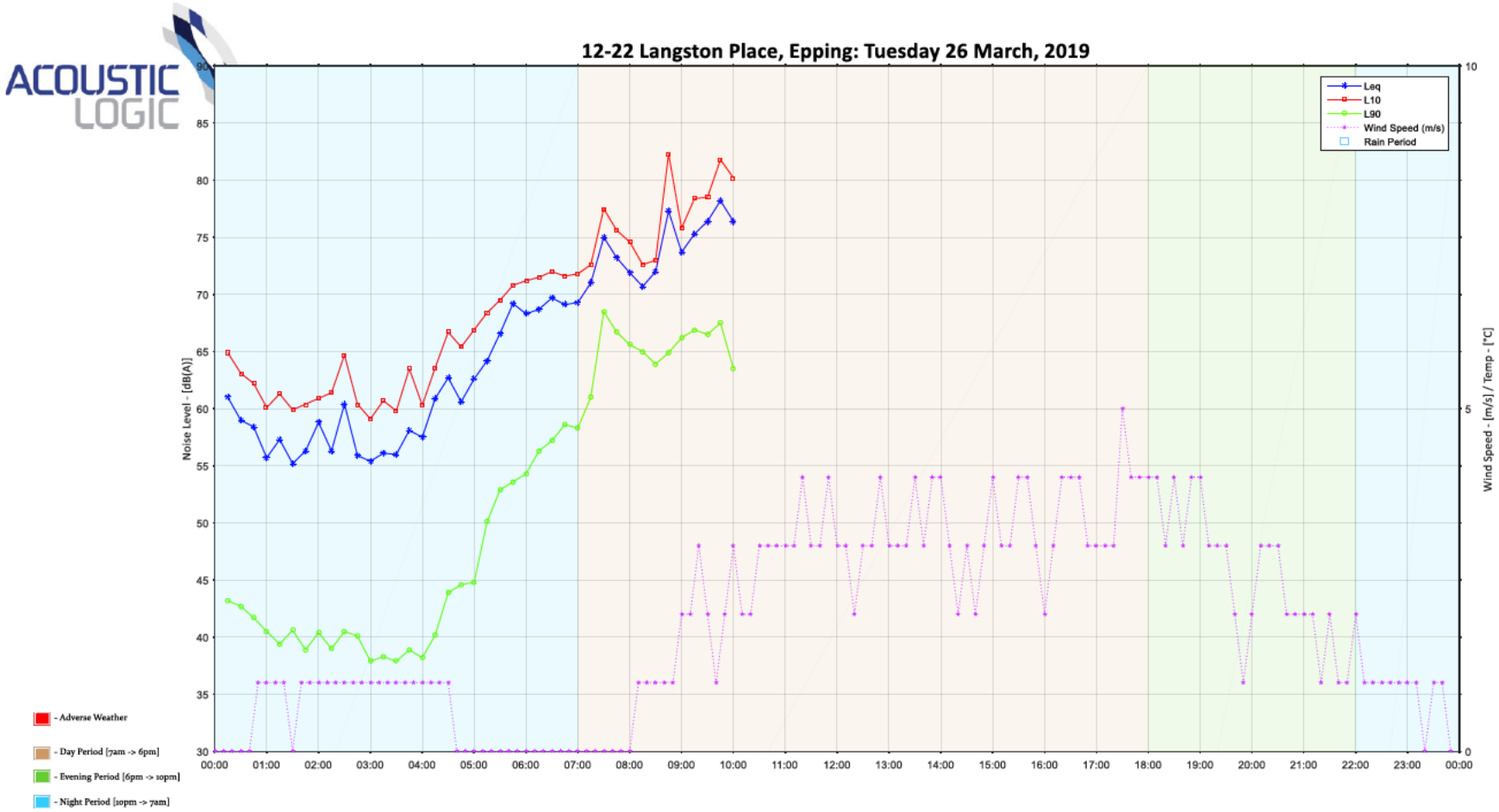

12-22 Langston Place, Epping: Friday 22 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


12-22 Langston Place, Epping: Saturday 23 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


12-22 Langston Place, Epping: Sunday 24 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

12-22 Langston Place, Epping: Monday 25 March, 2019




12-22 Langston Place, Epping: Tuesday 26 March, 2019
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]