ACOUSTIC LOGIC

DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

128 Andrews Road, Penrith

Noise Impact Assessment

SYDNEY
A: 9 Sarah St
MASCOT 2020
T: (02) 8339 8000

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343

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1 INTRODUCTION

Acoustic Logic Consultancy has been engaged to undertake an assessment of the proposed warehouse development to be located at 128 Andrews Road, Penrith.

The proposed works include development of a shared easement from Andrews Road for access to the site, construction of a large format (50, 000 m^2) warehouse and ancillary office, and parking provisions for staff on site. This assessment covers noise generated by the operational activities proposed at the warehousing location.

In this report, we will:

- Identify nearby noise sensitive receivers and operational noise sources with the potential to adversely impact nearby development.
- Identify relevant Penrith City Council and Environmental Protection Agency (EPA) acoustic criteria applicable to the development.
- Identify operational and construction noise sources and predict operational noise emissions and assess them against acoustic criteria.
- If necessary, determine building and/or management controls necessary to ensure ongoing compliance with noise emission goals.

This report is based on drawings by Watson Young (drawing number: 18161-SK01, Rev P1, dated 25.10.2018 – attached Appendix Two), as well as information provided to this office by the proposed tenant regarding likely future operation of the site.

2 SITE DESCRIPTION AND PROPOSED WORKS

The proposed warehouse is to be located in currently vacant land located at 128 Andrews Road, Penrith. The proposed site is bounded by industrial development, with nearest residential development approximately 500m to the east.

The proposed development consists of the construction of a bottle manufacturing/sorting warehouse and associated facilities, namely:

- A 50, 000 sqm high bay warehouse;
- Access roads on the eastern side of the development, including communications box and automatic gates.
- Loading docks to service loading and unloading of articulated trucks;
- An ancillary office attached to the warehouse;
- Truck hardstand and parking area;
- On grade passenger vehicle parking.

The warehouse operation is proposed to operate twenty four hours per day.

Vehicular access to the proposed warehouse is via a proposed easement, to extend along the eastern boundary of the development.

Development in the vicinity of 128 Andrews Road is as follows:

- The site is currently surrounded by existing industrial development. Industrial zone surrounding site is bounded by Andrews Road and Castlereagh Road;
- Sports fields to the east of the development;
- Residential development in the vicinity of the proposed warehouse development is as follows:
    - The nearest residential development (R1) lies approximately 500m to the east and consists of a variety of single and multi story single dwelling homes. Properties have direct line of sight to the proposed site through bushland.
    - The next nearest residential properties are located along Andrews road (R2), approximately 650m to the north east of the warehouse and 300m from nearest point of the proposed easement.

The primary existing noise source in the vicinity of the site is environmental noise from surrounding bushland, and distant noise from existing industrial development.

Refer to Figure 1 for site layout and measurement locations.

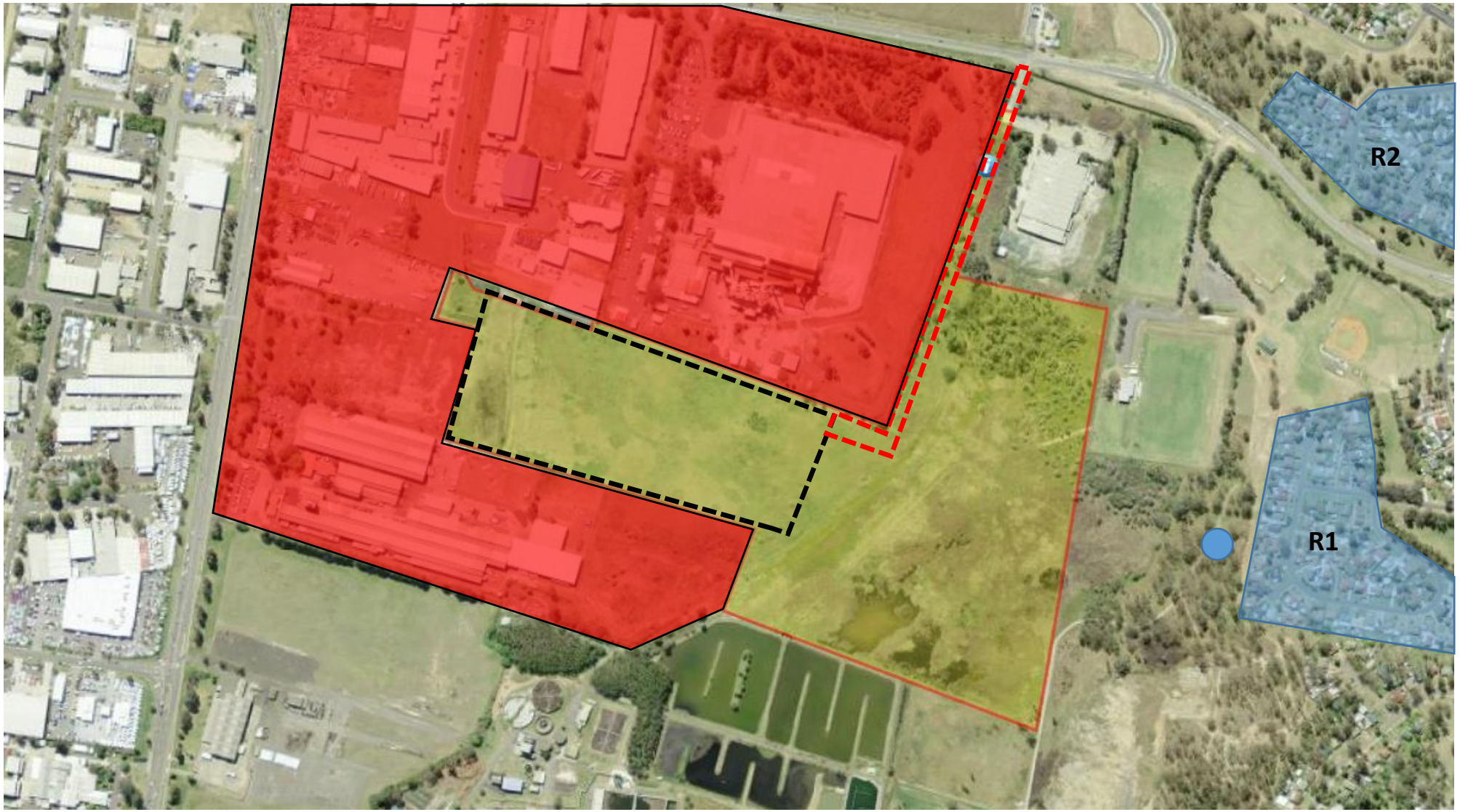


Figure 1 - Site Description and Measurement Location
Source: NSW SixMaps

Project Site

Residential Receivers

Industrial Receivers

Unattended Noise Monitor

Approximate Location of Warehouse

Proposed Access Easement

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_{Max}, L_{90} and L_{eq}.

The L_{90} measurement parameter is a statistical level that represent the average minimum noise levels (quietest 10%), over the measurement intervals.

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 traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

L_{Max} level represents is the loudest noise event during a measurement period, and is used in the assessment of sleep disturbance for intermittent peak noise events at night time.

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.

4.1.1 Measurement Position

One unattended noise monitor was located at the eastern boundary of nearest residential receivers approximately 500m to the east of the proposed warehouse development. Refer to Figure 1 for detailed location.

4.1.2 Measurement Period

Unattended noise monitoring was conducted from Monday 8th of October 2018 to 17th of October 2018.

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 1 – Measured Noise Levels

Time of day	Rating Background Noise Level $dB(A)_{L90(Period)}$
Day (7am – 6pm)	43
Evening (6pm – 10pm)	43
Night (10pm – 7am)	43

5 NOISE EMISSION CRITERIA

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

- Penrith City Council Development Control Plan
- NSW Department of Environment and Heritage, *Environmental Protection Agency document – Noise Policy for Industry (NPI) 2017*.

5.1 PENRITH CITY COUNCIL DEVELOPMENT CONTROL PLAN

C12. Noise and Vibration

12.4. Industrial and Commercial Development

C. Controls

1) General

a) Council will not grant consent to any noise generating industrial development, commercial development or licensed premises unless it can be demonstrated that:

i) The development complies with the relevant State Government authority or agency standards and guidelines for noise, as well as any relevant Australian Standards;

ii) The development is not intrusive (as defined in the EPA's Industrial Noise Policy;;

v) The development does not adversely impact on the amenity of the area or cause sleep disturbance.

5.2 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 suburban criteria.

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

5.2.1 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 1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

5.2.2 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 Table 1, 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;

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

The amenity levels appropriate for the receivers surrounding the project site are presented in Table 2

Table 2 – EPA Amenity Noise Levels

Type of Receiver	Time of day	Recommended Noise Level dB(A)$L_{eq(period)}$	Project Amenity Noise Level dB(A)$L_{eq(period)}$
Residential – Suburban	Day	55	53
	Evening	45	43
	Night	40	38
Commercial premises	When in use	65	63
Industrial premises	When in use	70	68

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

5.2.3 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:*
>
> - *$L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
> - *L_{AFmax} 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 3 - Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A)L_{90}	Emergence Level
Residences Surrounding Site Night (10pm – 7am)	43 dB(A) L_{90}	48 dB(A)$L_{eq,\ 15min}$; 58 dB(A)L_{Fmax}

5.3 SUMMARISED NOISE EMISSION CRITERIA

Table 4 – 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	43	53	48	N/A
Evening	43	43	48	N/A
Night	43	38	48	48 dB(A)$L_{eq,\ 15min}$; 58 dB(A)L_{AFmax}

Table 5 – EPA NPI Noise Emission Criteria (Non-Residential)

Receiver	Time of Day	Amenity Criteria dB(A) L_{eq}
Commercial	When in use	63
Industrial	When in use	68

6 NOISE EMISSION ASSESSMENT

An assessment of operational noise is presented below. The following noise sources are assessed:

- Operational noise from the proposed warehouse located at 128 Andrews Road:
    - Noise from internal activities within the warehouses (use forklifts or similar for materials handling).
    - Noise from external areas (heavy vehicles and forklifts on site)
    - A preliminary assessment of noise from mechanical plant.

6.1 ON-SITE OPERATIONAL NOISE (VEHICLE INGRESS/EGRESS, MATERIALS HANDLING).

Operational noise generated on the site is assessed with reference to NSW EPA NPI relating to the development. As operation is proposed to be 24 hours per day, assessment has generally been conducted with reference to the night time criteria (most stringent).

In predicting operational noise emissions, reference has been made to the traffic report prepared for the site by Ason Group (document reference: 0670r02) as well as the following assumptions:

- That there are heavy vehicle movements on site. During a typical 15 minute period, we have assumed there will be one inbound or outbound semitrailer movement to/from the proposed warehouse. Based on the operational predictions, this represents a conservative assumption.
- It has been assumed that all trucks with enter/exit the site via the proposed access road connecting the site to Andrews Road.

This office has been advised that the following volumes of heavy vehicle movement would be expected to occur for each day of operation, as follows;

- Daytime / Evening (7am – 10pm)
    - B-Double Total Truck Movements – 10 (average of less than 1 per hour)
    - 48 Foot Single – 57 (average of less than 4 per hour)
    - 40 Foot Shipping Container – 6 (average of less than 1 per hour)
- Night Time (10pm – 7am)
    - B-Double Total Truck Movements – 4 (average of less than 1 per hour)
    - 48 Foot Single – 29 (average of less than 4 per hour)
    - 40 Foot Shipping Container – No movements are anticipated.
- Truck movements detailed above are consistent with (and in fact less than) the predicted peak night time heavy vehicle movements assumed for this assessment, i.e. two movements at the site in a 15 minute period.
- A sound power of 100-105dB(A) has been adopted for the heavy vehicle (b-double).
- Continuous operation of a forklift (sound power 94dB(A)) in the hardstand area.
- The cumulative impact of vehicle noise and the internal activity noise is taken into account.

Table 6 – Noise Emissions from Proposed Warehouse Development

Noise Source	Noise Receiver Location	Predicted Noise Level * dB(A)$L_{eq(15min}$	Compliance
Cumulative Noise from Use of Access Roadway, Internal and External Site Activity (AM/PM Peak Period Usage)	R1 Residential Receiver	35 dB(A)$L_{eq(15min)}$	Complies – Daytime criteria (48dB(A)$L_{eq(15min)}$,Table 4)
	R2 Residential Receiver	37 dB(A)$L_{eq(15min)}$	Complies – Daytime criteria (48dB(A)$L_{eq(15min)}$, Table 4)
Cumulative Noise from Use of Access Roadway, Internal and External Site Activity (Typical Night Time Usage)	R1 Residential Receiver	33 dB(A)$L_{eq(15min)}$	Complies – Night time criteria (38dB(A)$L_{eq(15min)}$, Table 4)
	R2 Residential Receiver	35 dB(A)$L_{eq(15min)}$	Complies – Night time criteria (38dB(A)$L_{eq(15min)}$, Table 4)

Analysis of noise emissions indicates that operational usage of the warehouse will be compliant with requirements relating to the development, even during the night time period.

6.1.1 Transient Noise Events (Sleep Arousal)

Noise events occurring between 10pm and 7am should be assessed for potential sleep disturbance impacts on nearby residents.

The primary potential noise source will be the use of the pneumatic valve which engages when a truck stops. Based on measurements conducted by this office, the sound power of this noise event is 113dB(A)$L_{Max.}$

The noise emissions at the window of the nearest residences are presented below. Predictions take into account distance correction only.

Table 7 – Sleep Arousal Assessment (Truck Air-brake)

Noise Source	Receiver Location	Predicted Noise Level	Noise Limit	Compliance
Truck Air Brake	Receiver 1	51 dB(A)L_{max}	58 dB(A)L_{max}	Complies.
Truck Air Brake	Receiver 2	54 dB(A)L_{max}	58 dB(A)L_{max}	Complies.
Truck Leaving Site (Intersection of Andrews Road)	Receiver 1	48 dB(A)L_{max}	58 dB(A)L_{max}	Complies.
	Receiver 1	42 dB(A)L_{max}	58 dB(A)L_{max}	Complies.

Noise emissions from typical peak noise events are compliant with NSW EPA noise emission requirements. On this basis, use of the site between 10pm and 7am is compliant with noise emission requirements detailed in Section 5.2.3.

6.1.2 Mechanical Plant

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 levels detailed in Table 4

Compliance with noise emission requirements will be achievable with appropriate acoustic treatment. It is unlikely that any large externally located equipment (even if used at night) will require acoustic treatment.

We note:

- Primary external mechanical plant is likely to consist of air-conditioner condensers serving office areas and smoke exhaust fans.
- Condensers serving office areas will typically have a sound pressure level of no more than 65dB(A) at 1m distance, and will not require any form of acoustic treatment to ensure compliant noise emissions.
- Typical exhaust fans used for the purpose of ventilation will not require acoustic treatment provided that they have a sound pressure level of no more than 70 dB(A) at 3m distance. In the event that fans exceed this noise level, acoustic treatment to the fan discharge (internally lined ducting or acoustic attenuator) will be required.

7 DISCUSSION/RECOMMENDATIONS

Acoustic analysis indicates that:

- To ensure ongoing compliance with operational noise requirements;
    - Between 10pm and 7am - It is assumed that on average there would not be more than 2 truck movements to the site in a 15 minute period.
    - If a diesel forklift is required for the purpose of large container movement, it is recommended that this only occur between the hours of 7am – 10pm
- Detailed review of any proposed external mechanical plant should be undertaken at CC stage (once equipment selections are known). Given the distance from the site to nearby residences, it is unlikely that any form of acoustic treatment will be needed, however this should be confirmed once equipment selections are finalised.

8 CONCLUSION

Noise emissions associated with the proposed use of 128 Andrews Road, Penrith as a warehousing facility has been undertaken with reference to the following documents;

- Penrith City Council Development Control Plan
- NSW EPA Noise Policy for Industry

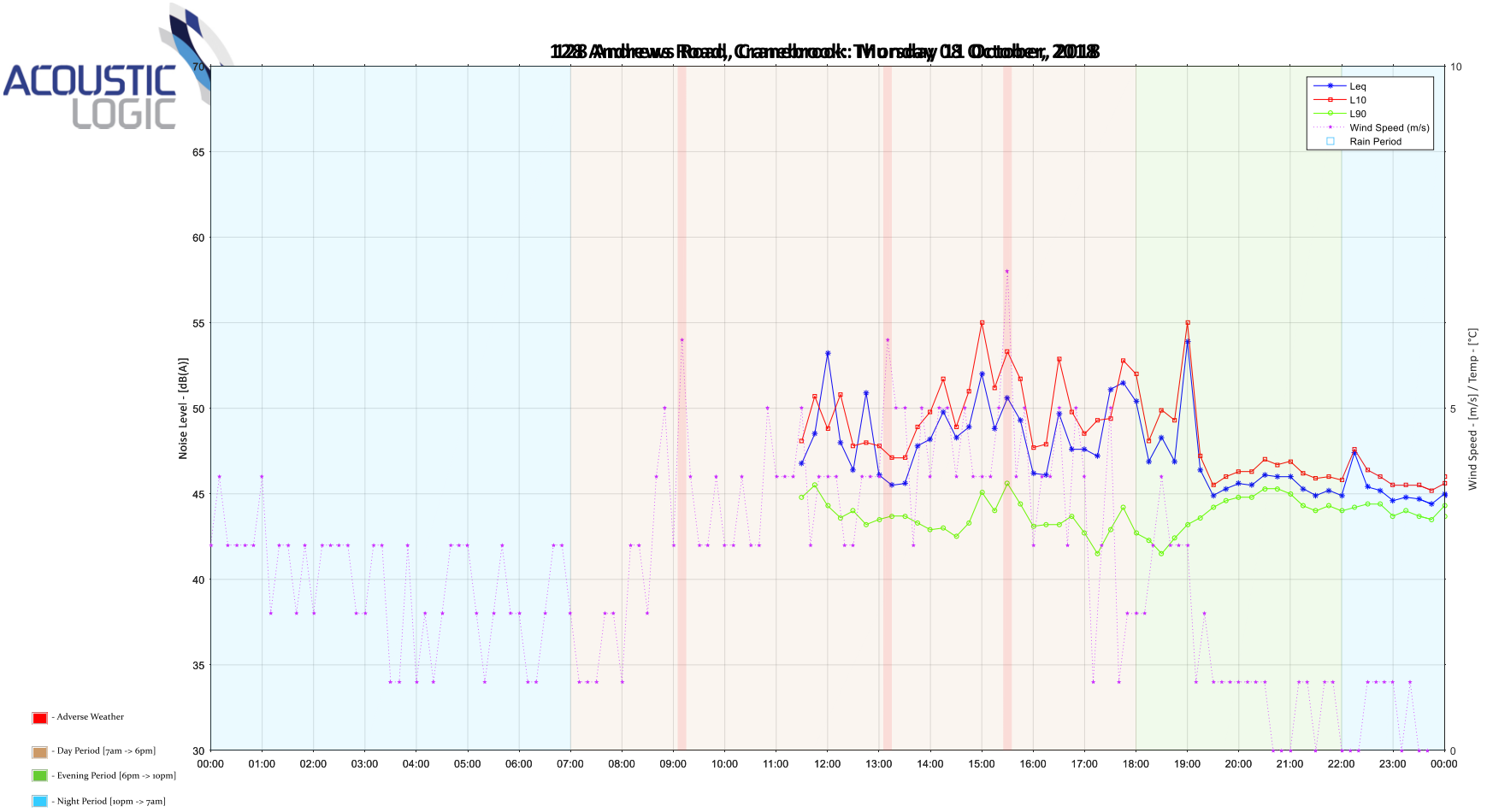
An analysis of typical operational noise (vehicle, mechanical plant/equipment) indicates that the proposed use of the site as a warehousing facility will be compliant with noise emission requirements provided that the recommendations in Section 7 of this report are adopted.

Please contact us if you have any queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Alex Washer

APPENDIX ONE – UNATTENDED NOISE MONITORING DATA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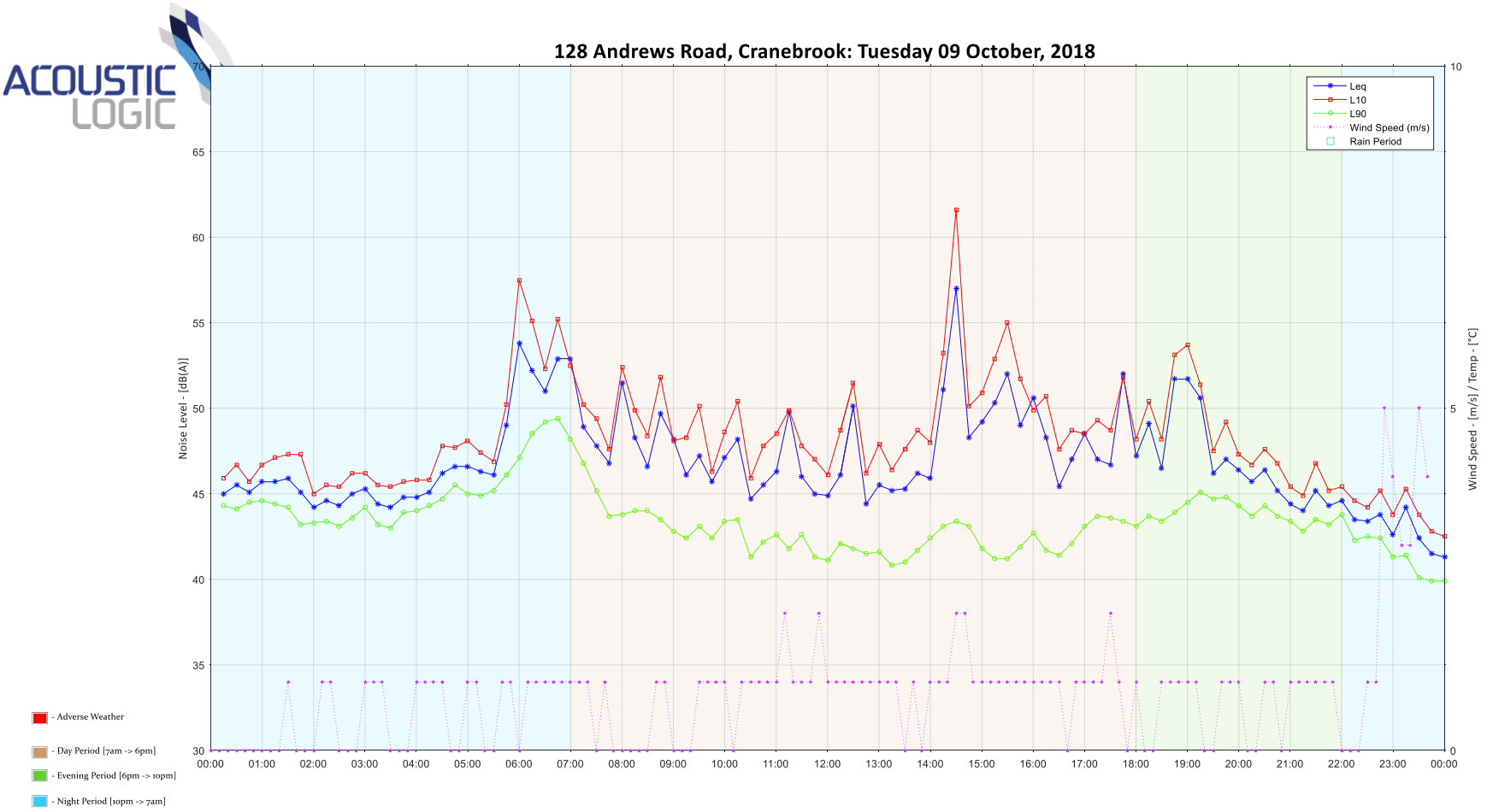
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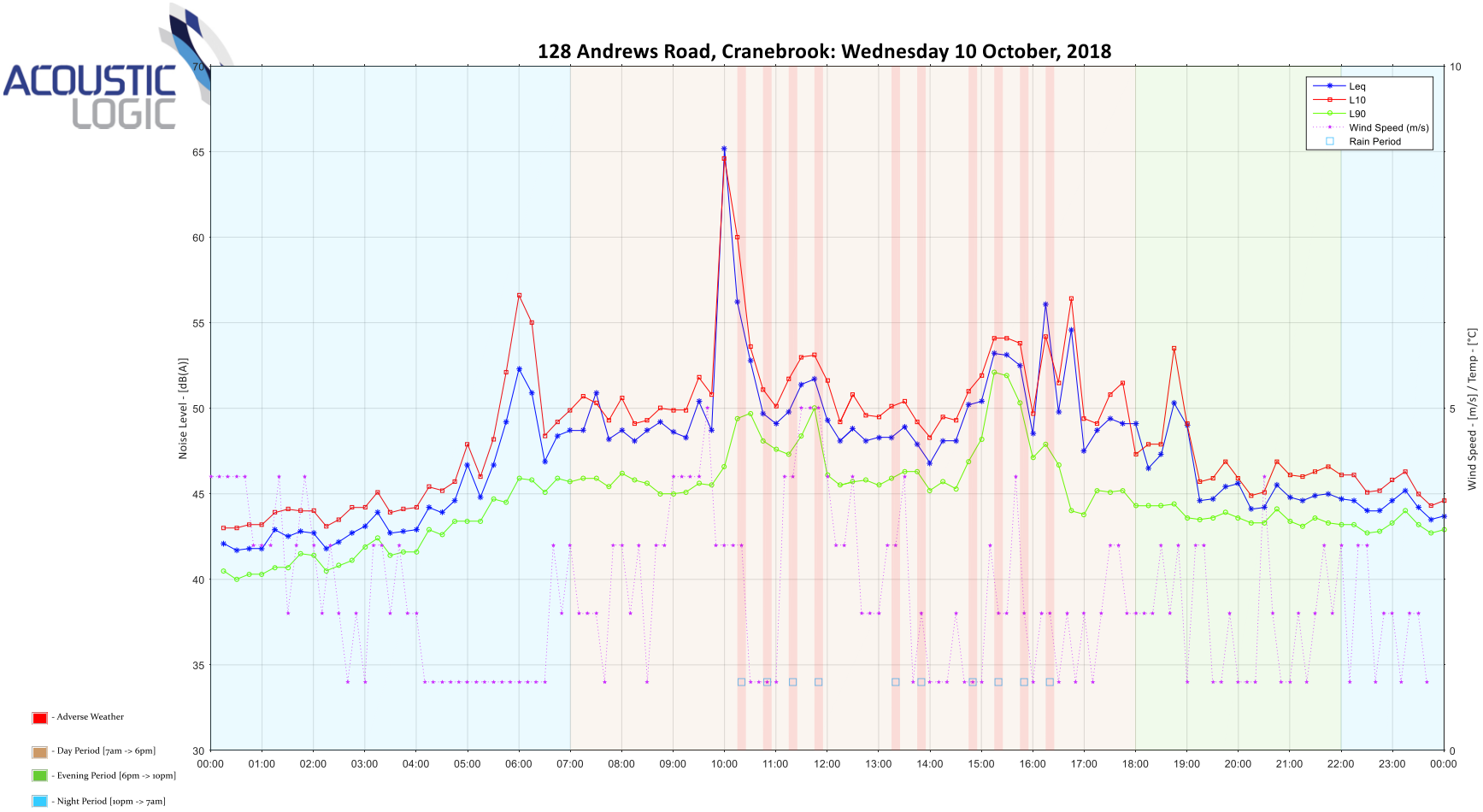
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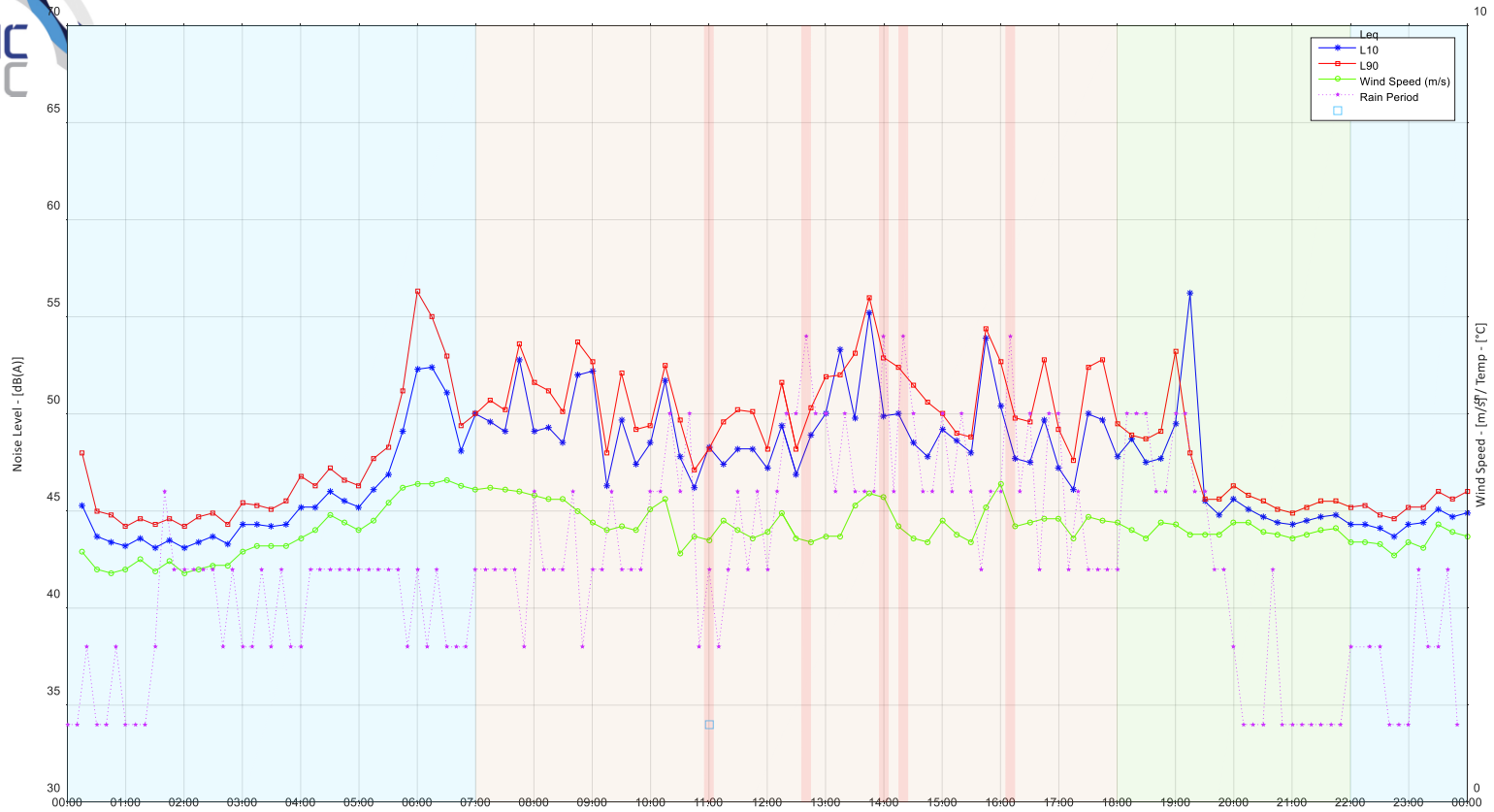
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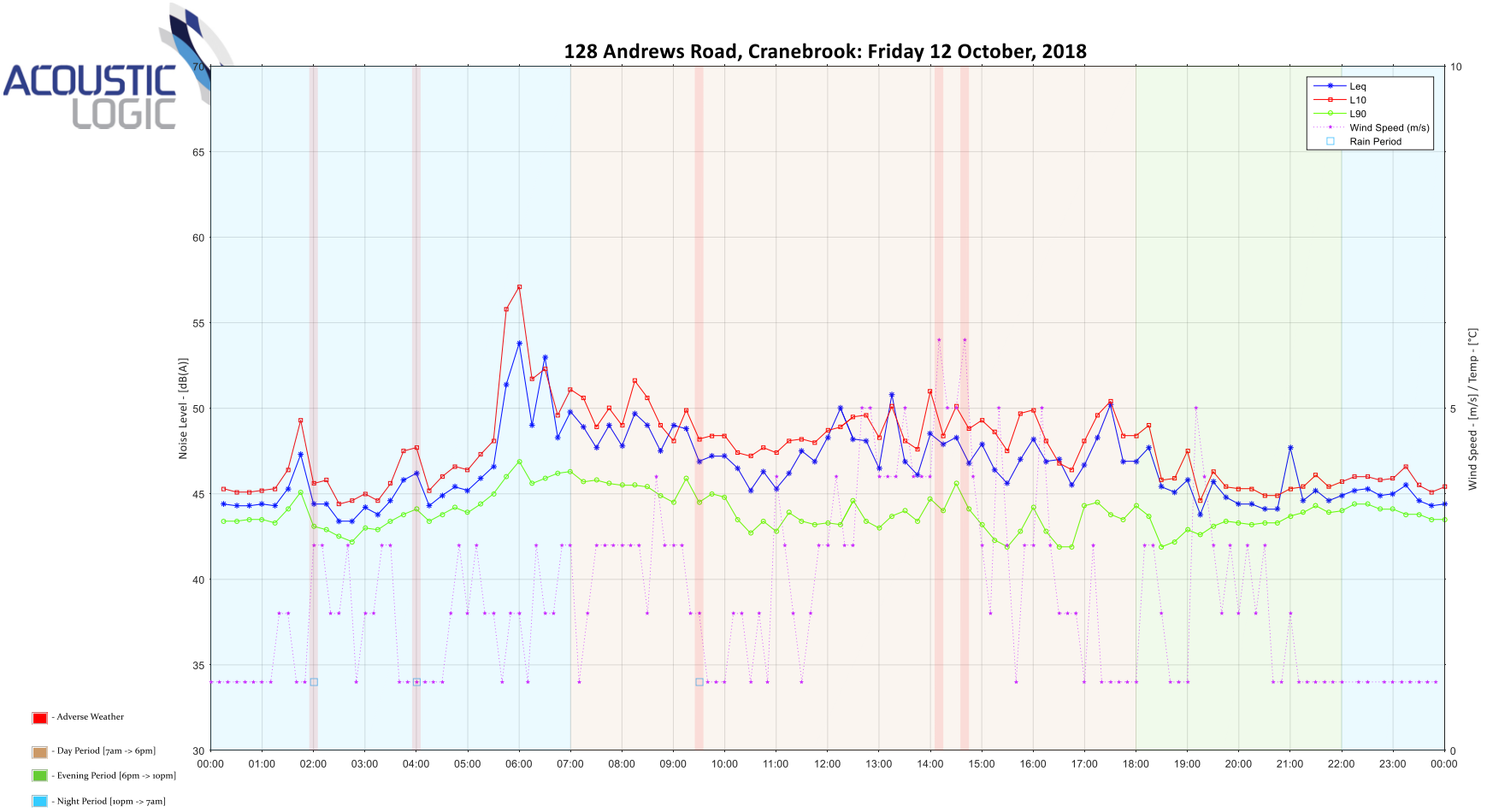
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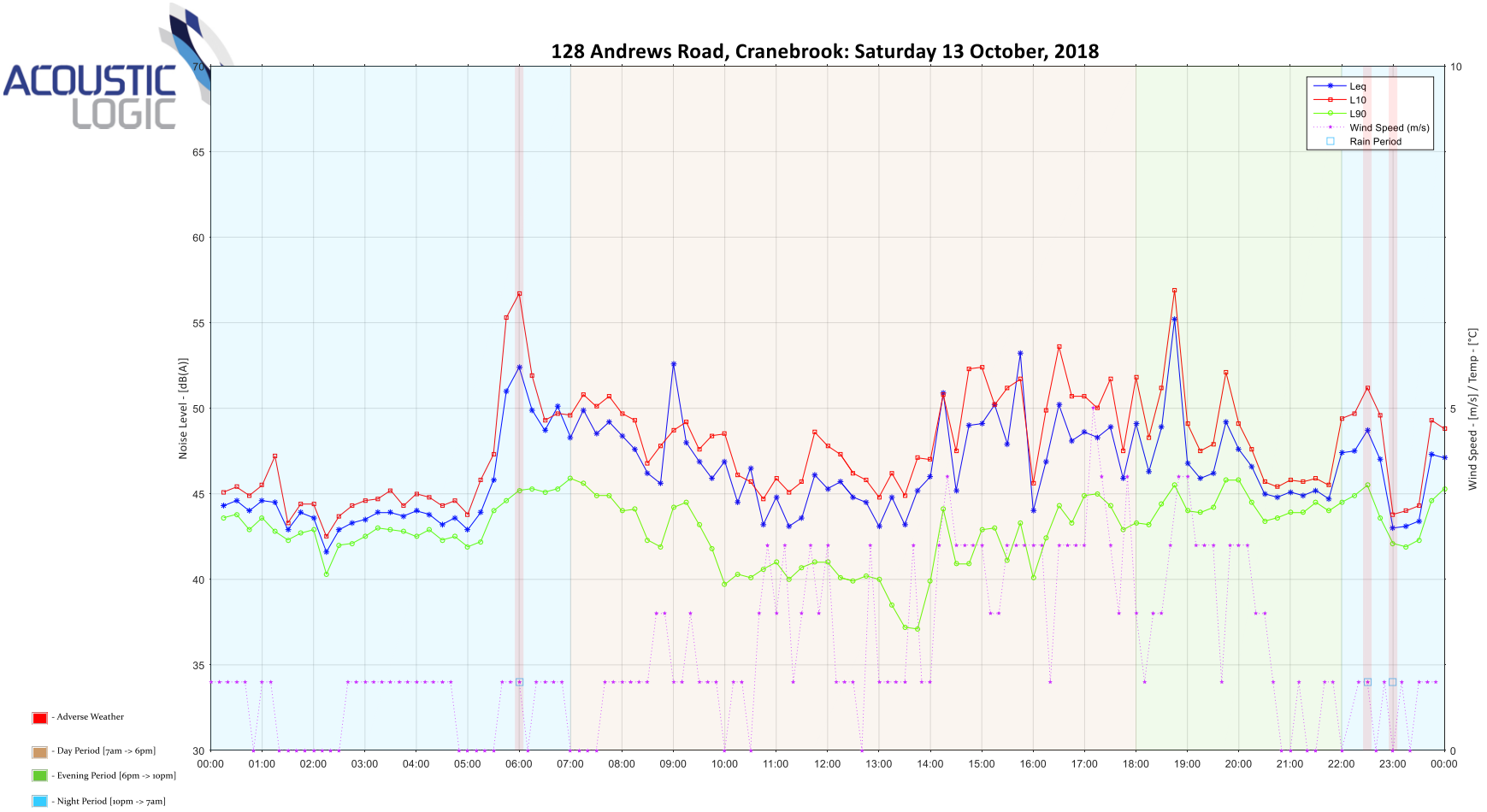
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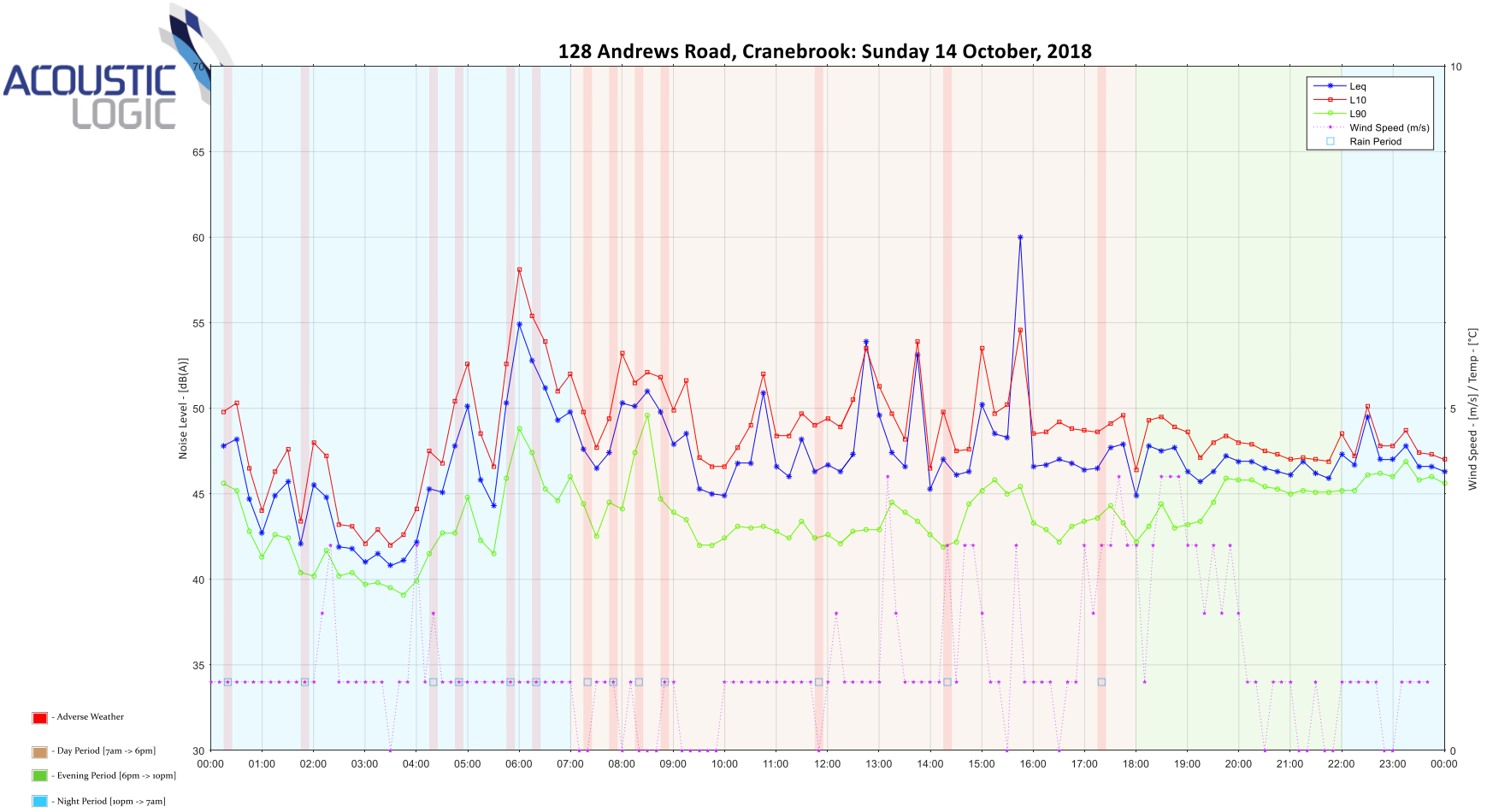
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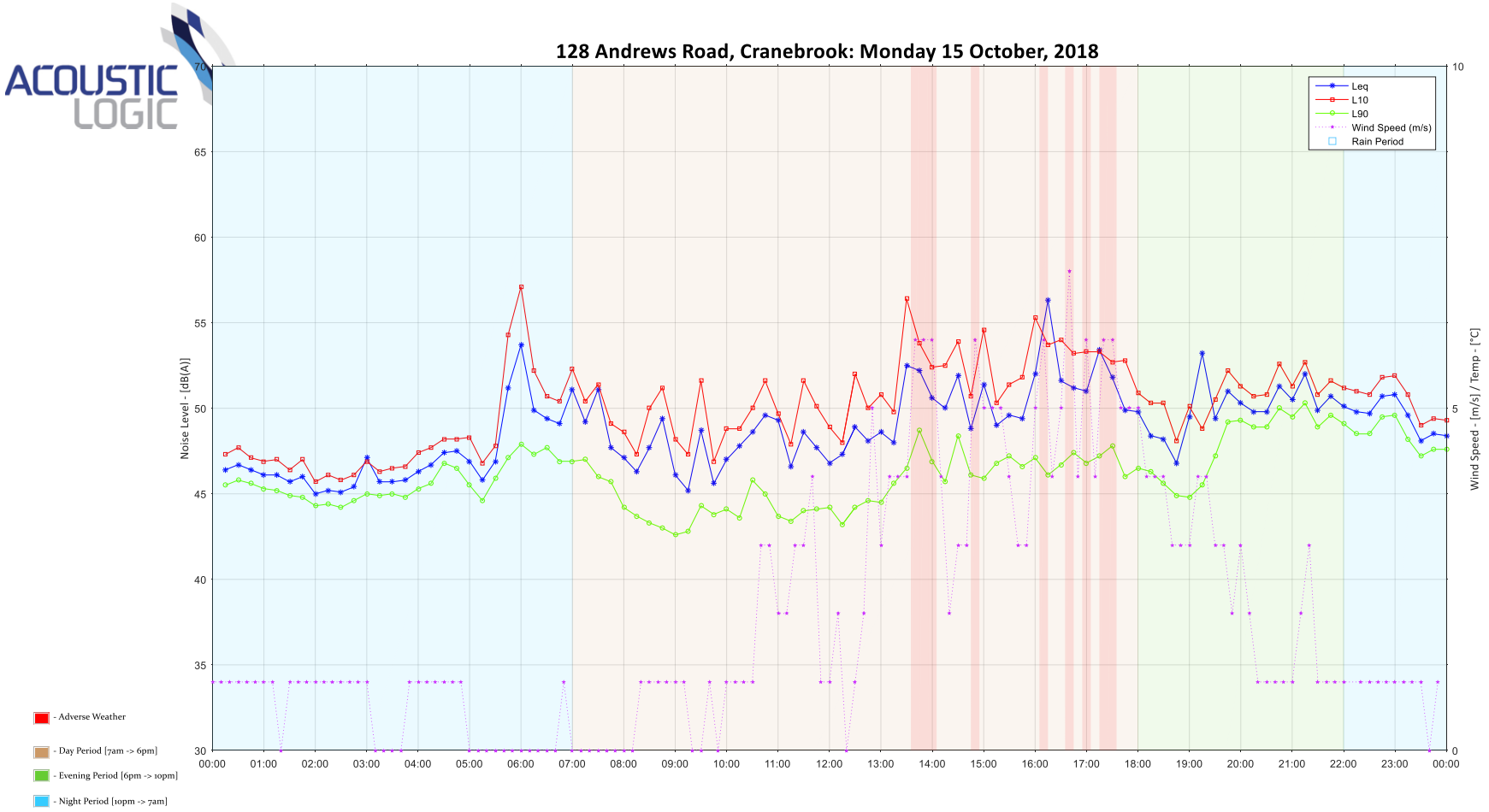
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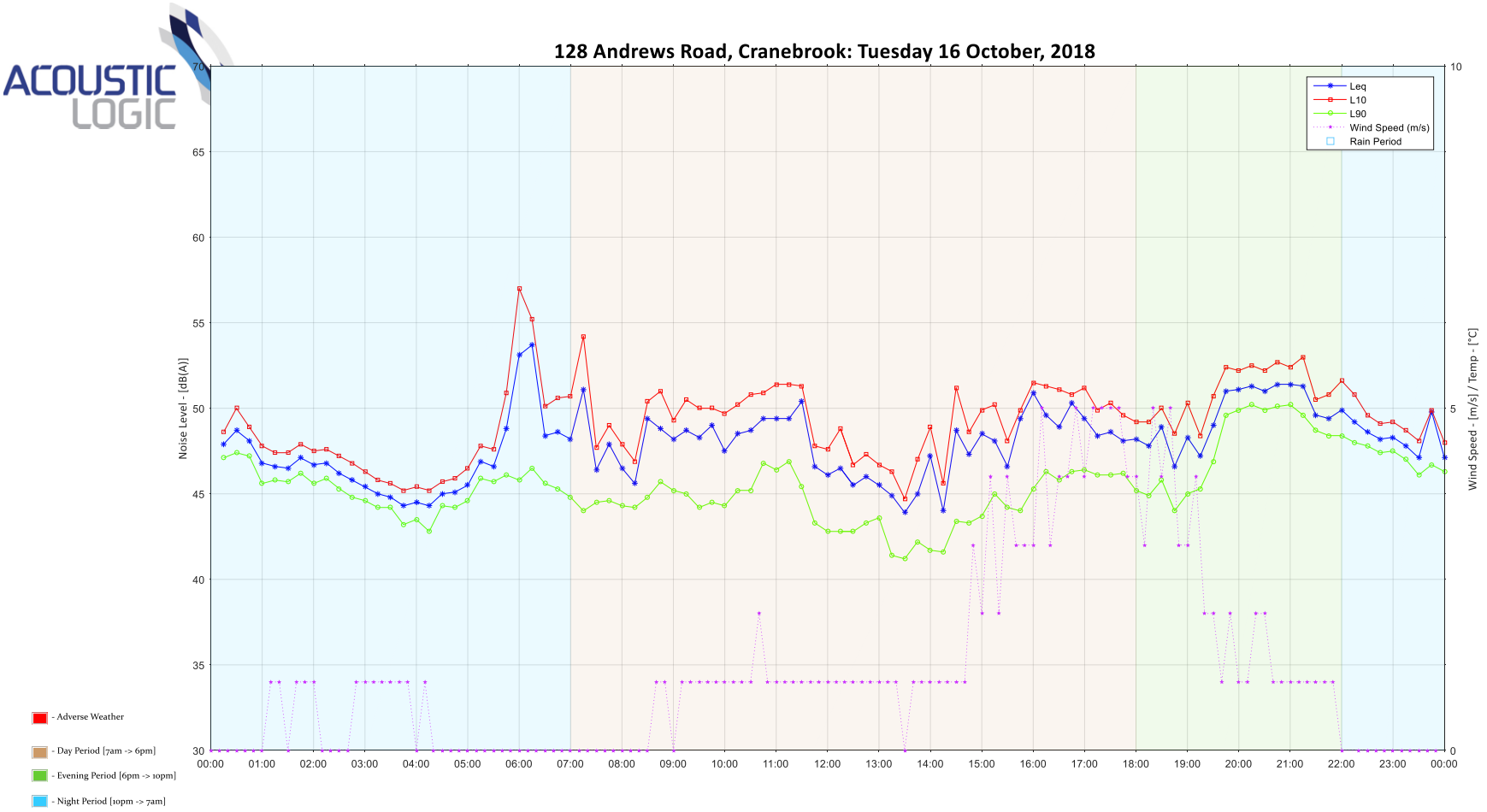
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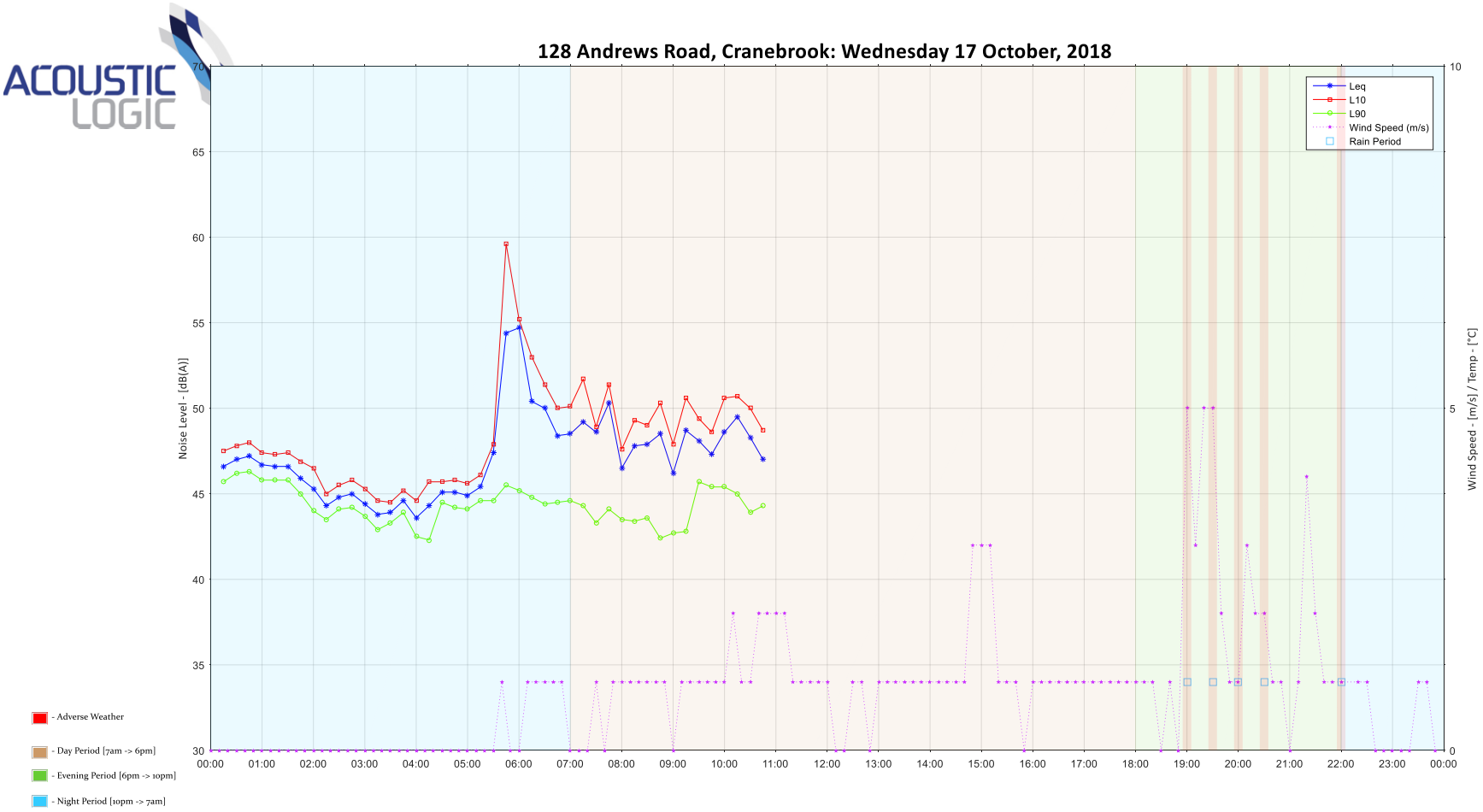
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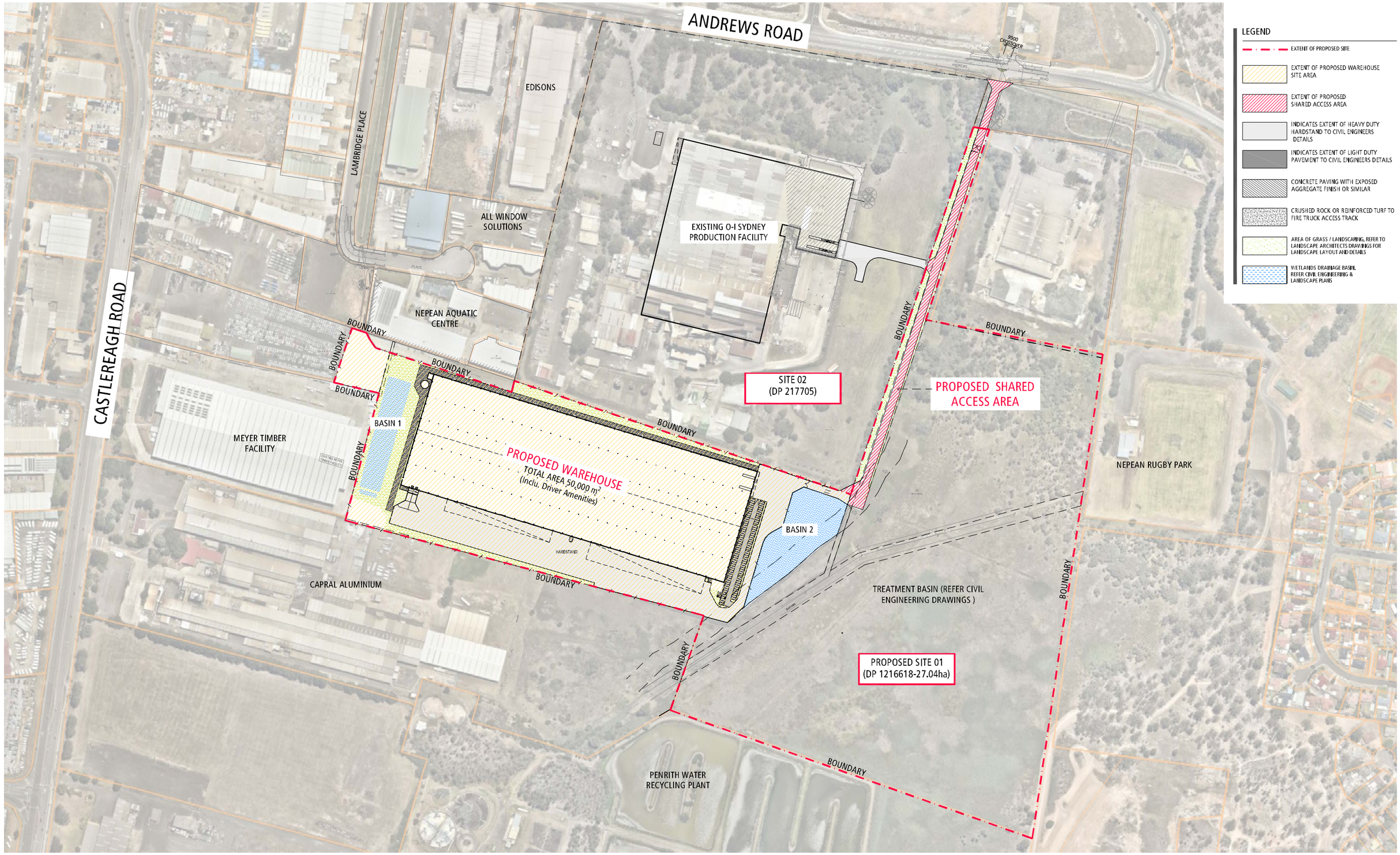
APPENDIX TWO – SITE PLAN



NO.	DATE:	REVISION:	BY	CHK
P1	25.10.2018	PRELIMINARY ISSUE	UW	SA

Watson Young Architects Pty Ltd 8 Grattan Street Prahran Victoria 3181 Australia
ACN: 111398700 T 03 9516 8555 Info@watsonyoung.com.au www.watsonyoung.com.au

PROJECT:
Proposed Warehouse Development
128 Andrews Road,Penrith NSW

TITLE:
MASTER PLAN

DATE: October, 2018
DRAWN BY: UW
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watson young