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20160433.3/1308A/R0/TT

13/08/2018

DesignInc Sydney Pty Limited
Level 12
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NORTH SYDNEY NSW 2060

ATTN: TIM GARRY

Lindfield Learning Village - Response to EPA Queries

1 INTRODUCTION

This letter has been prepared in response to issues with respect to acoustics raised by the EPA in their letter of 26/7/2018.

The EPA letter raises issues with respect to our acoustic assessment for the site (Noise Impact Assessment ref 20160433.2/0303A/R6/HP dated 13/6/2018 (the Noise Impact Assessment).

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2 BACKGROUND NOISE MONITORING.

EPA recommendation was:

> The proponent be required –
>
> (a) to undertake background noise monitoring, including provision of a 'week's worth' of valid monitoring data, in accordance with the guidance material in chapter 3 and appendix B to the New South Wales Industrial Noise Policy, and
>
> (b) to submit a revised noise impact assessment, including daily logger graphs for each of the monitoring locations.

While we believe that the original noise logging locations in the Noise Impact Assessment are reasonable in that they were as close as practicable to the nearest residences (Dunstan Grove and Tubbs View apartments) without being impacted by local plant noise in those apartments (car park ventilation and toilet exhausts). While comment was made by the EPA that the logging may have been impacted by intermittent noise form the use of the site for filming during the noise monitoring period, intermittent activity noise will not impact the Rating Background Noise Level (which looks only at the quietest 10% of the time).

However, additional background noise monitoring is being conducted, with loggers placed adjacent to the eastern façade of the Dunstan Grove apartments (the quietest side) and the eastern façade of the Tubbs View apartments (facing the school). Being located at the nearest noise sensitive development, the logging must be considered strictly in accordance with EPA recommended practice. See Appendix 1 for monitor locations. On site observation indicated that the logger position was not impacted by any local noise source (car park ventilation or similar) that would make the measurement inappropriate for determining the Rating Background Noise Level).

The noise levels recorded by the two sets of data are generally consistent. The levels recorded for the second period at Tubbs View are slightly lower, as the new logger location was placed on the down sloping embankment between the car park and the Tubbs View apartments, and so is more shielded from general environmental noise in the area, making for extremely conservative assessment.

The acoustic advice with respect to plant and equipment in the following sections has been determined based on the 2018 logging data.

Table 1 - Unattended Rating Background Noise Monitoring Results

Location	Time of Day	Rating Background Noise Level dB(A)L_{90}	
		Original Logging Data (2016)	Additional Logging Data (2018)
Dunstan Grove	Day (7am – 6pm)	42	42
	Evening (6pm – 10pm)	41	40
	Night (10pm – 6am)	39	38
Tubbs View	Day (7am – 6pm)	44	40
	Evening (6pm – 10pm)	42	39
	Night (10pm – 6am)	38	35

Table 2 – Noise Emission Goals

Location	Time of Day	Noise Emission Goals	
		Intrusiveness – dB(A)$L_{eq(15min)}$	Project Amenity B(A)$L_{eq(15min)}$
Dunstan Grove	Day (7am – 6pm)	47	53
	Evening (6pm – 10pm)	45	43
	Night (10pm – 6am)	43	38
Tubbs View	Day (7am – 6pm)	45	53
	Evening (6pm – 10pm)	44	43
	Night (10pm – 6am)	40	38

3 OPERATIONAL NOISE

It appears that the EPA support the recommendations in the Noise Impact Assessment relating to the gymnasium, outdoor areas, functions in the auditorium and the car park are to be adopted.

The outstanding issues related to plant and equipment noise and school bell noise. The EPA has required a quantitative noise emission assessment, which is presented below.

3.1 MECHANICAL PLANT NOISE AND PUBLIC ADDRESS SYSTEM

At the time of writing the Noise Impact Assessment, there was no significant detail available about proposed plant and equipment (and their prospective noise levels) nor any PA/bell system. We now have sufficient information to respond to this query.

3.1.1 Plant Noise

Primary external plant item locations are identified in the aerial photo in Appendix 1. We have also relieved on proposed plant selections by Erbas (drawings M302 and 303, with key equipment items and noise levels discussed below)

We note:

- Auditorium Smoke Exhaust (auditorium roof, 80dB(A) at 3m distance)
    - These fans are located approximately 50m from the Dunstan Grove residences.
    - These plant items would typically be used only in event of fire emergency, and as such, do not require acoustic treatment.
    - In the even that these fans are operated outside of fire mode (ie – in relief mode), the fans are to operate at no more than 25Hz. If required to operate at more than 25Hz, acoustically lined ducting (1.5m long, 50m internally lined) is recommended to the fan discharge.
- Laboratory fume cupboard fans (45dB(A) at 3m distance).
    - These fans are located approximately 47m from the Dunstan Grove residences.
    - These fans should operate only during school hours.
    - The noise level from these fans will be less than 25dB(A) at the residences, and easily compliant with the 47dB(A) daytime noise limit at the Dunstan Grove apartments.
- Woodwork room extraction system (70dB(A) sound power).
    - This system is located inside a plant room, 90m from the Tubbs View apartments.
    - Provided that the doors to the plant room are solid, and kept closed, noise radiated from the unit casing will be below 30dB(A) at the residences, and easily compliant with the 45dB(A) daytime noise limit at the Tubbs View apartments.
    - The discharge ducting of the fan system should have 50mm internal lining.

- Kitchen Exhaust Fan (56dB(A) at 3m distance).
    - This system is located on the roof of the gym/science building, 50m from the Dunstan Grove apartments.
    - This fan should operate only during school hours.
    - The noise level from these fans will be less than 36dB(A) at the residences, and easily compliant with the 45dB(A) daytime noise limit.
- Packaged A/c systems (various locations – refer to Appendix 1).
    - A typical fan sound power level for these units is 90dB(A).
    - Typically, the case radiated noise from these units is low, with the main source of external noise emission being the outside air intake and relief/exhaust air ducting.
    - Provided that a minimum of 1m of 75mm thick internally lined ducting is incorporated on any outside air or exhaust air ducting, noise from the packaged air handling units will be less than 40dB(A) at the nearest residences, and compliant with daytime and evening noise emission goals.
    - In the event that case radiated sound power data for any unit (inclusive of outside air/exhaust air openings) is less than 80dB(A), no further acoustic treatment to the outside air/exhaust air ducting would be required.
- Toilet Exhaust Fans:
    - TEF-A3.1 (Gym/Science Building Roof Top – 67dB(A) at 3m distance).
    - Being located 50m from Dunstan Grove residences, it is recommended that a minimum of 1.5m of 50mm internally lined discharge ducting is incorporated on the fan outlet.
    - Remaining fans (TEF B7.2, B7.3, D8.1) have noise levels of no more than 57dB(A) at 3m, and are located further away from residences and do not required additional acoustic treatment.

3.1.2 School Bell/PA System

School bell and PA are not proposed to be dedicated systems, but done through the EWIS (smoke warning) speaker system.

These speakers are generally located in internal areas, and as such, will not produce offensive noise to nearby development.

The only external speakers currently proposed are on the roof top play ground (Level 7, zone D – marked in Appendix 1, approximately 100m from the Tubbs View apartment)s. We note:

- Noise emissions are typically assessed as 15 minute average noise levels.
- It is reasonable to assume a school bell/announcement may occur for approximately 2 minutes in a given 15 minute period.
- This being the case, an externally located speaker could generate a noise level of 75dB(A) at 5m distance (clearly audible occur the roof top area) and would be less than 40dB(A)$L_{eq(15min)}$ at the Tubbs View residences (compliant with the 45dB(A) daytime noise goal).
- Even in the event that the bell ring is tonal (which can be avoided), a tonality penalty of 5dB(A) (as is EPA practice) would be applied. The resulting noise level of 45dB(A) at the nearest residences would still be a compliant noise level.
- Given this, we recommend that the noise of any external speaker at this location be limited to 75dB(A) at 5m distance.

In the event that additional speaker positions are considered:

- These are not recommended on the western facade of the gymnasium building (immediately adjacent to the Dunstan Grove residences).
- If located externally on the eastern façade of the gymnasium building (closest to Tubbs View residences), the speaker noise level is not to exceed 70dB(A) at 5m distance.
- At other locations further south, the speaker noise level is not to exceed 75dB(A) at 5m distance.
- Non-tonal school bell should be avoided if practicable.

4 CONSTRUCTION NOISE

The EPA comment is as follows:

> The EPA emphasised in its EIS submission that its advice about the need for intra-day respite periods is "... not proposed to apply to those demolition, site preparation, bulk earthworks, construction and construction-related activities that do not generate noise with particularly annoying or intrusive characteristics."
>
> The EPA's Interim Construction Noise Guideline provides guidance on environmental best practice concerning construction noise with particularly annoying or intrusive characteristics. The EPA re-affirms its comments and recommendations concerning demolition/construction noise and the need to implement respite periods.

Where construction noise is anticipated to exceed 75dB(A)$L_{eq(15min)}$ (the Highly Noise Affected Threshold in the Interim Construction Guidelines), then the noise would reasonably be considered particularly annoying or intrusive, and respite periods are proposed in this situation.

Internal works will not result in exceedances of the 75dB)A threshold.

For external works:

- Use of a hydraulic hammer or rock saw (if any) proposed within 40m of the apartments will exceed 75dB(A).
- Use of a excavator within 15m of the apartments will exceed 75dB(A).

In the event these activities are proposed within the 40m/15m working distance referred to above, we recommend that respite periods for these activities be provided. We suggest that this involve:

- Not commencing these works prior to 8am.
- One additional respite period (one-hour duration) per provided through the rest of the day.

5 CONCLUSION

Additional noise monitoring has been conducted in order to address concerns raised by the EPA and noise emission targets marginally adjusted accordingly.

Sections 3 provide additional quantitative assessment of plant, equipment and the PA/bell system as relevant information about these items is now available. Provided that the recommendations in section 3 of the report are adopted, operational noise from plant/equipment and the PA system will meet relevant noise emission requirements.

Construction work that should be the subject of respite periods has been identified in section 4.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Thomas Taylor

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APPENDIX 1:
UNATTENDED NOISE MONITOR LOCATIONS

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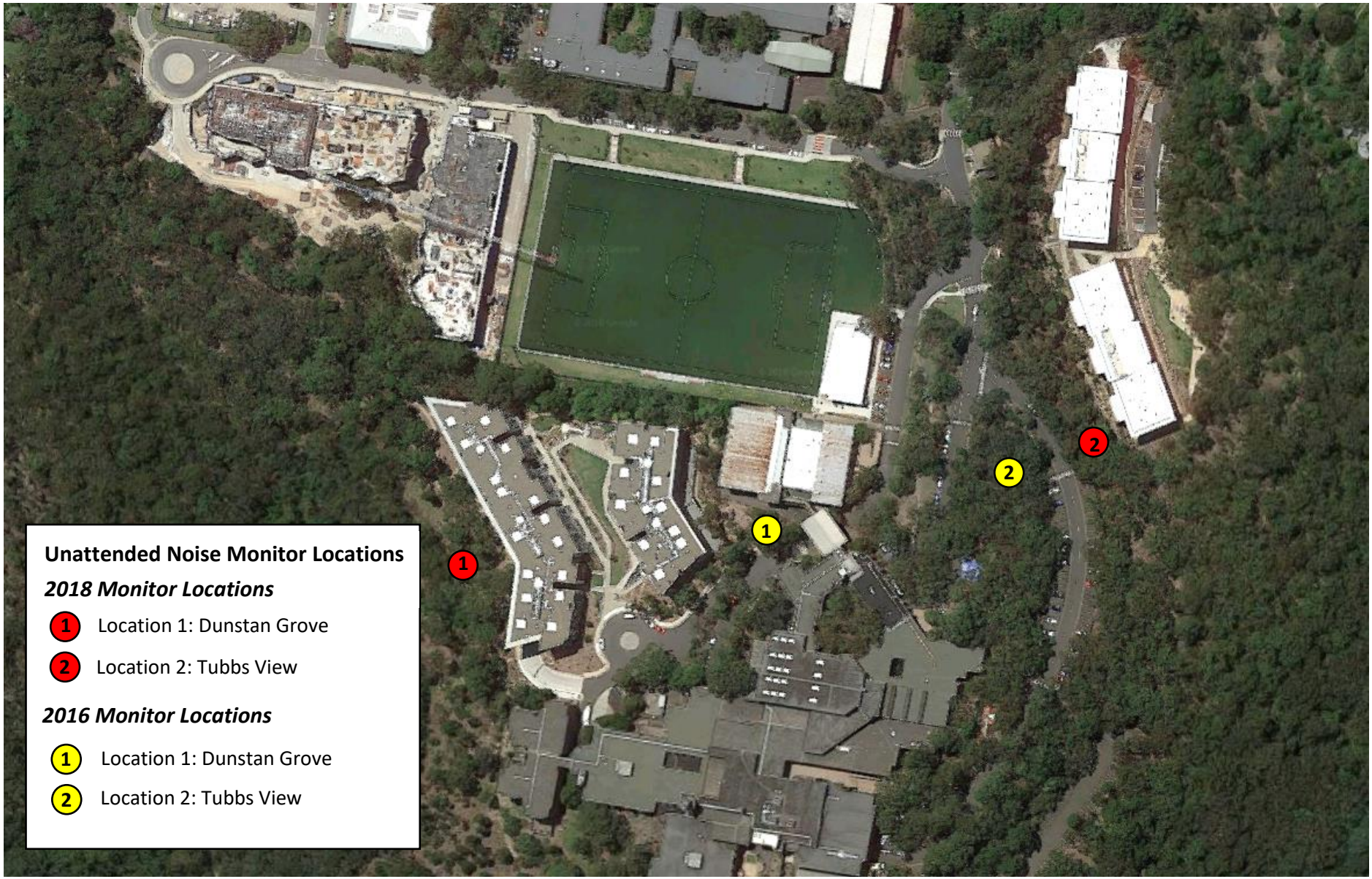

Figure 1 – Unattended Noise Monitor Locations

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APPENDIX 2:
PLANT AND EQUIPMENT LOCATIONS

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Fume Cupboard Exhaust
Woodwork – Dust Extraction Unit (inside plant room)
Kitchen Ventilation
Dunstan Grove Apartments
Tubbs View Residences
Dunstan Grove
Packaged A/C Units (Zone B)
Packaged A/C Unit (Zone D)
External EWIS speakers
Packaged A/C Unit (Zone F)
Packaged A/C Unit (Zone C)
Auditorium Smoke Exhaust Fans

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APPENDIX 3:
UNATTENDED NOISE MONITORING DATA

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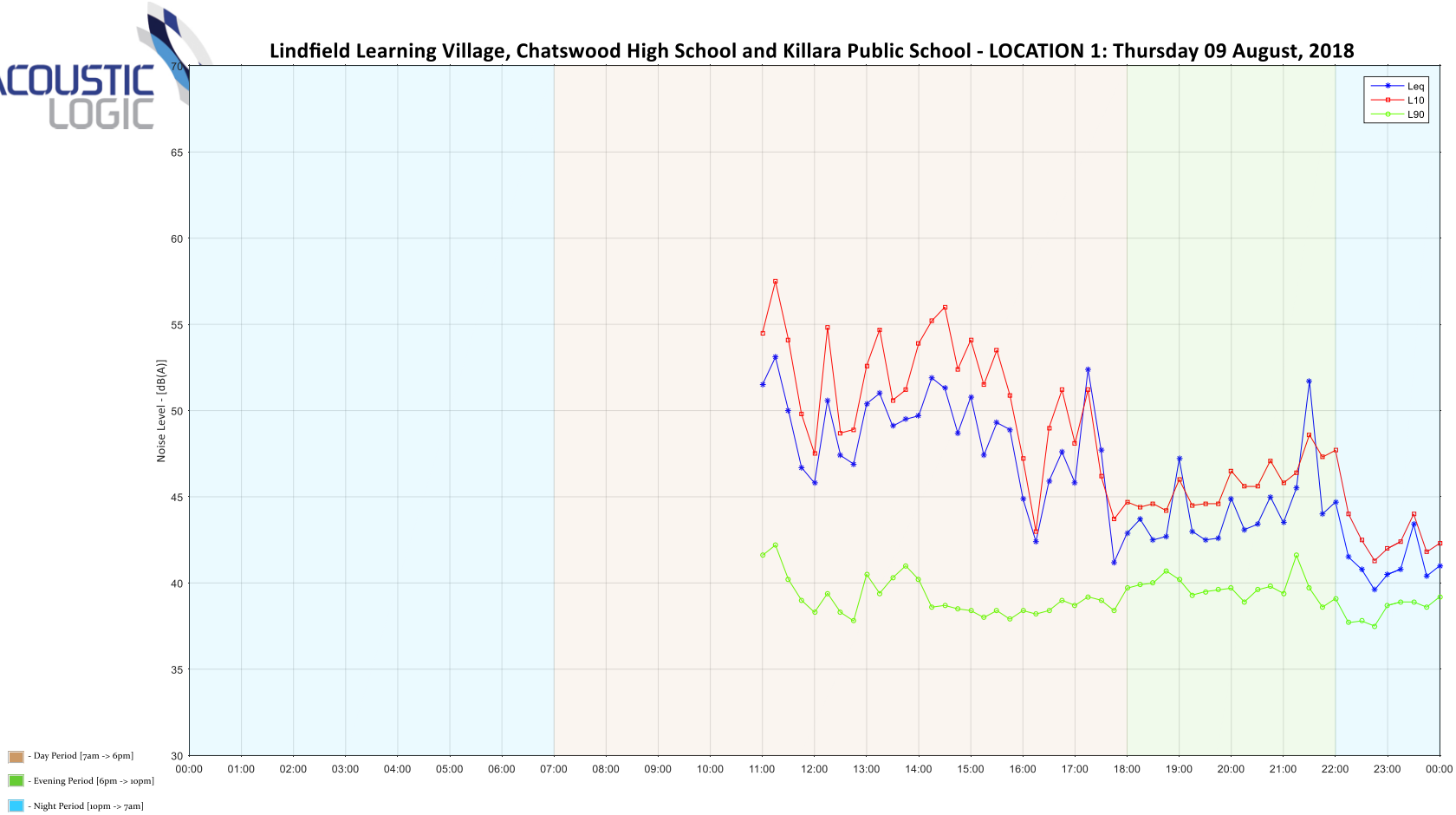
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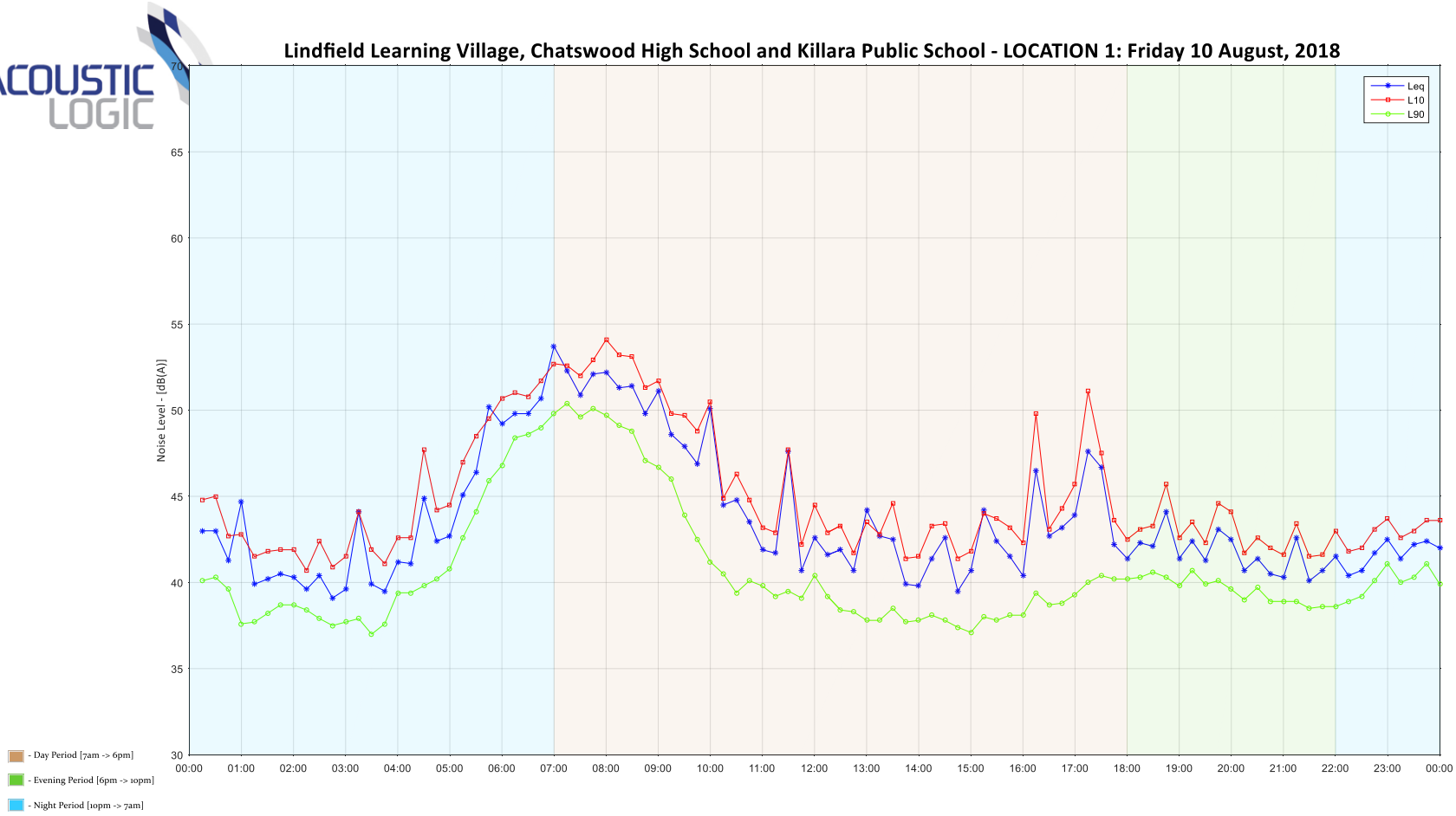
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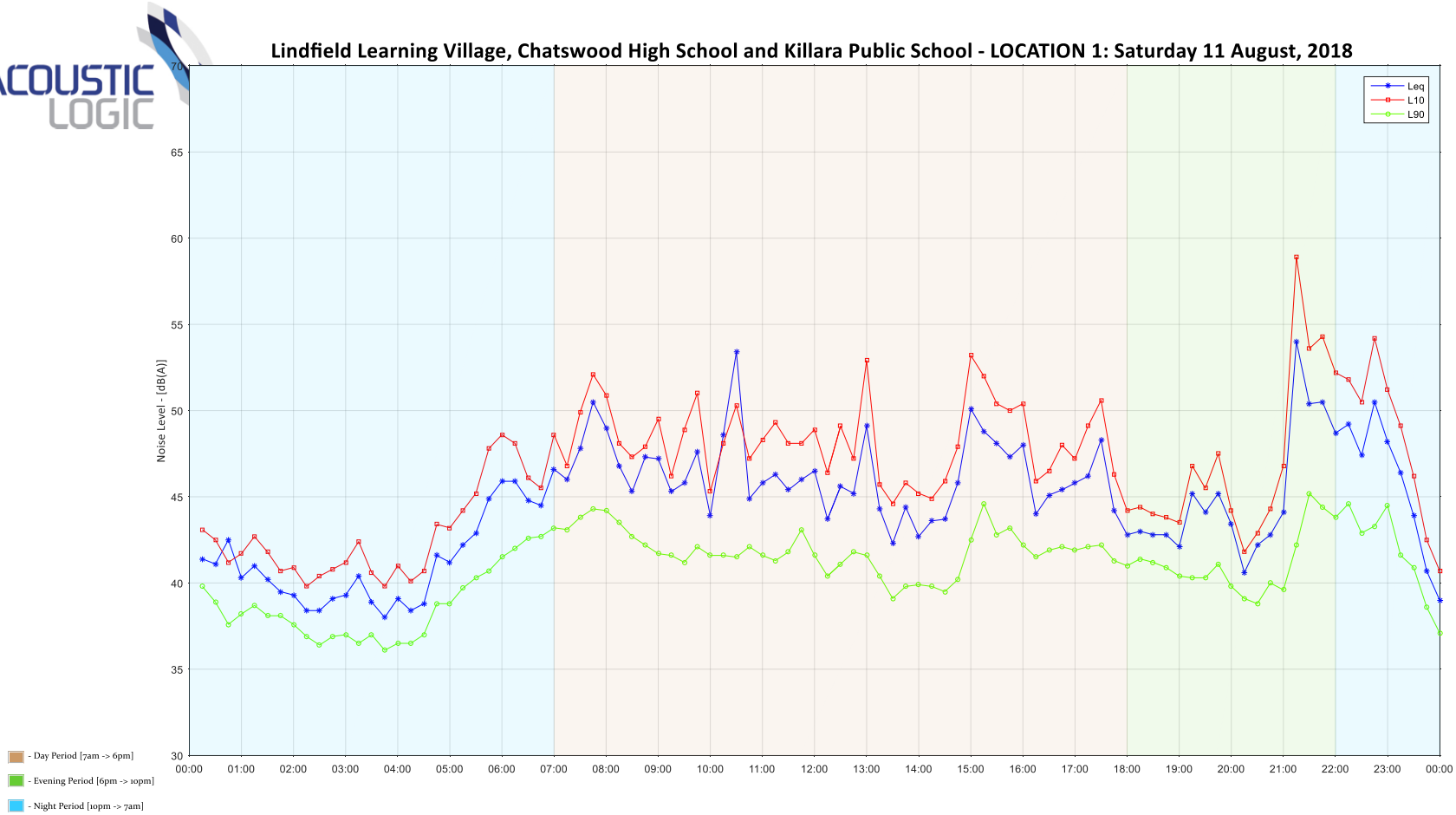
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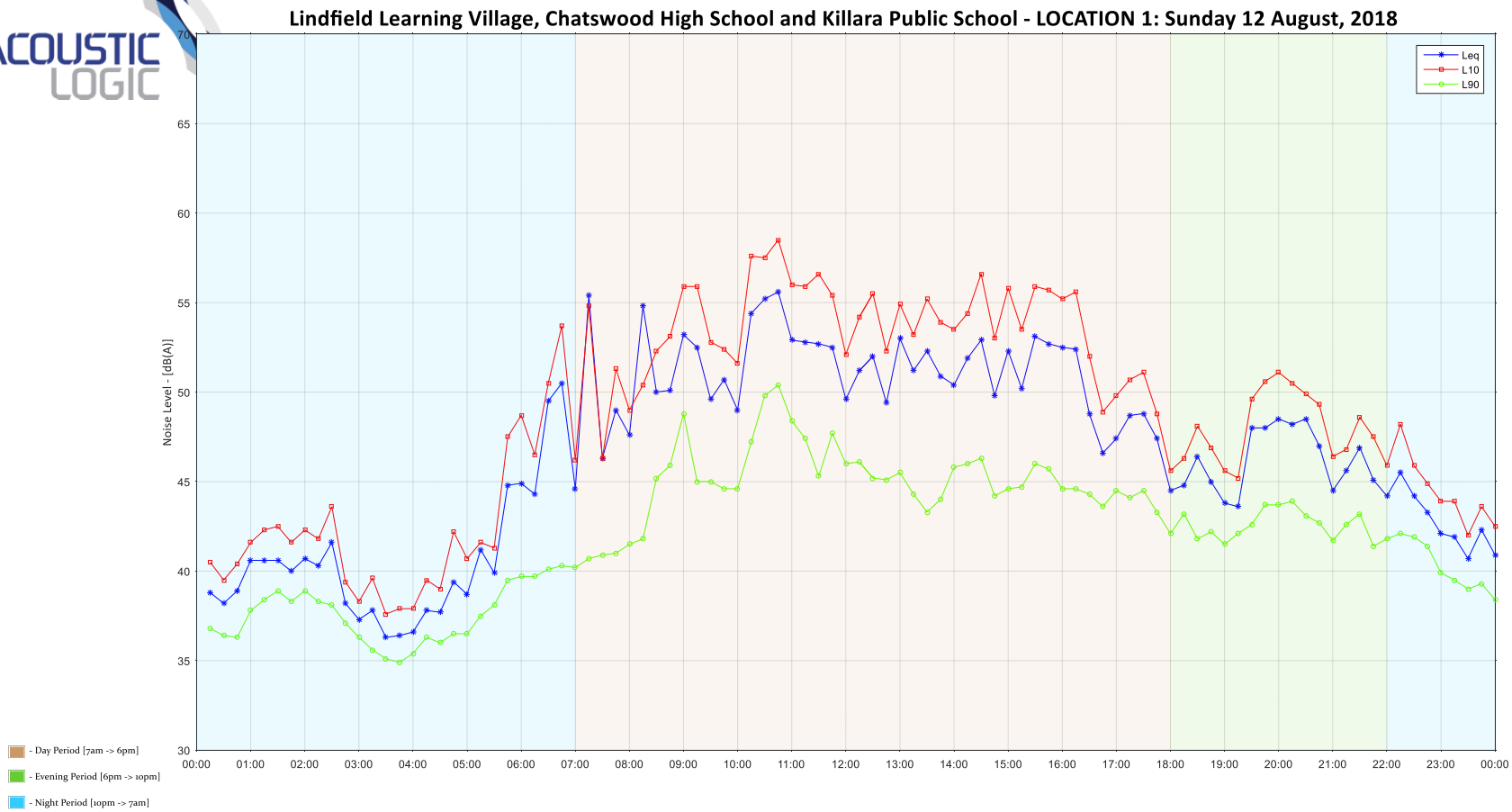
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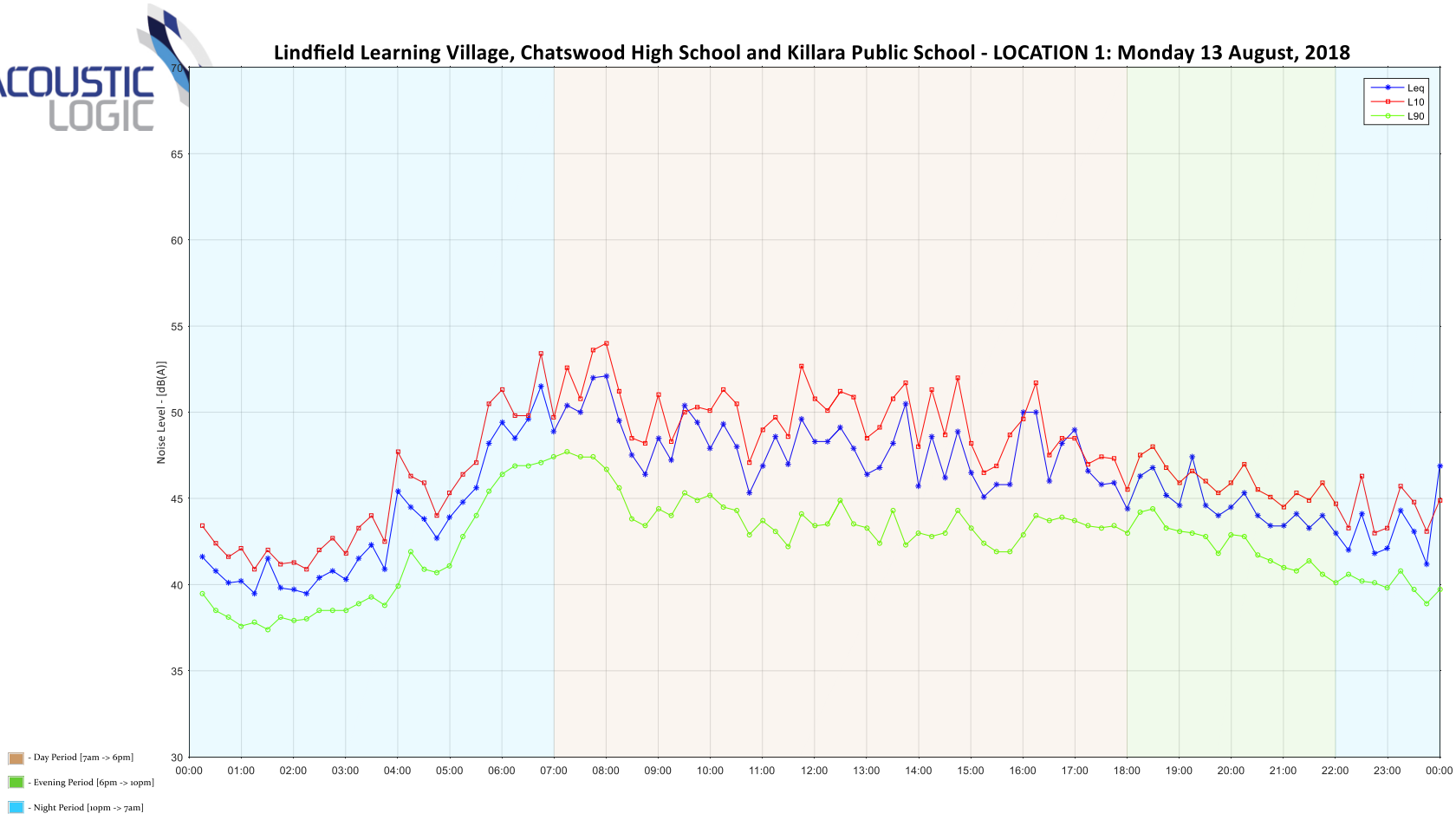
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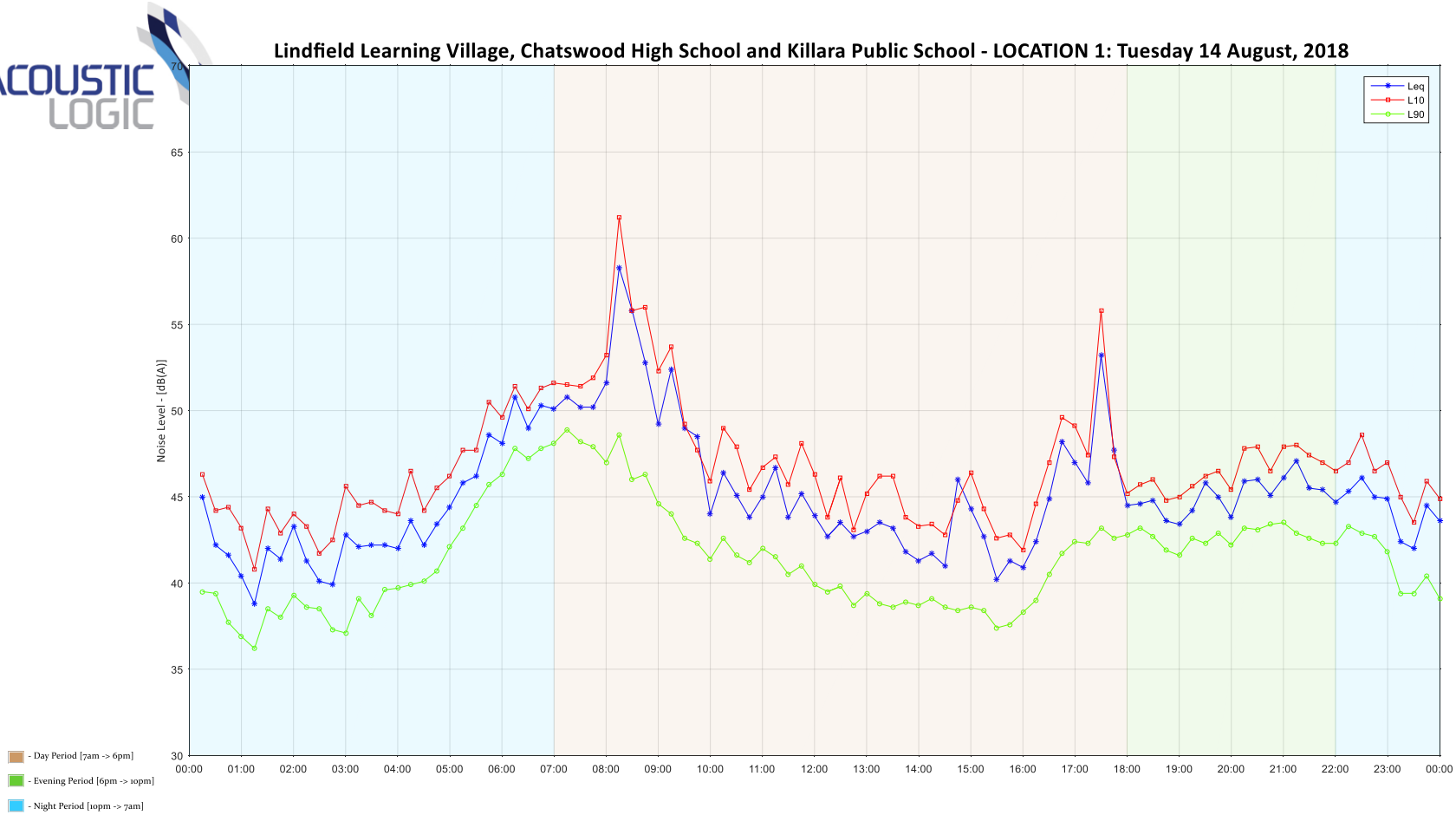
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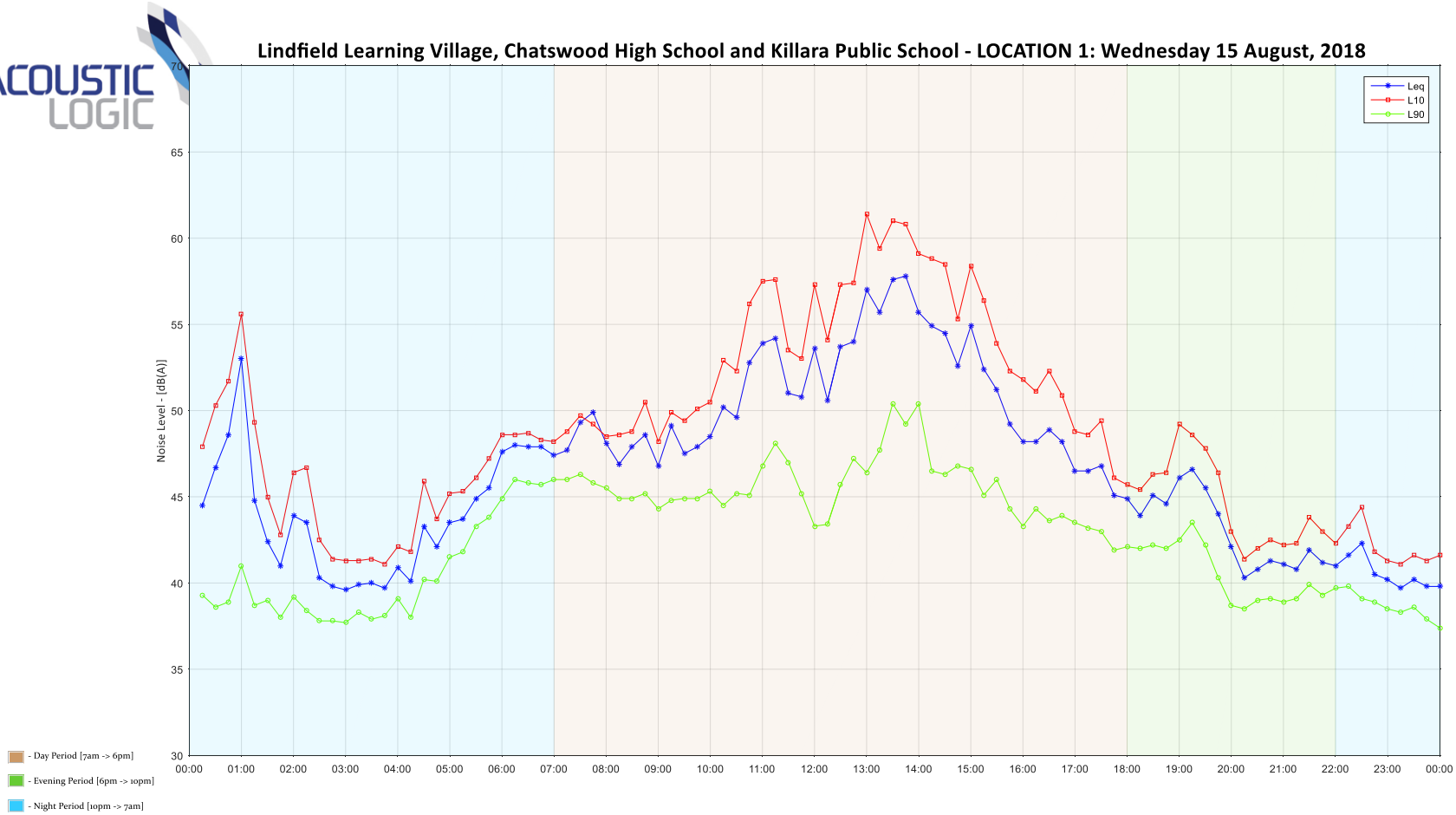
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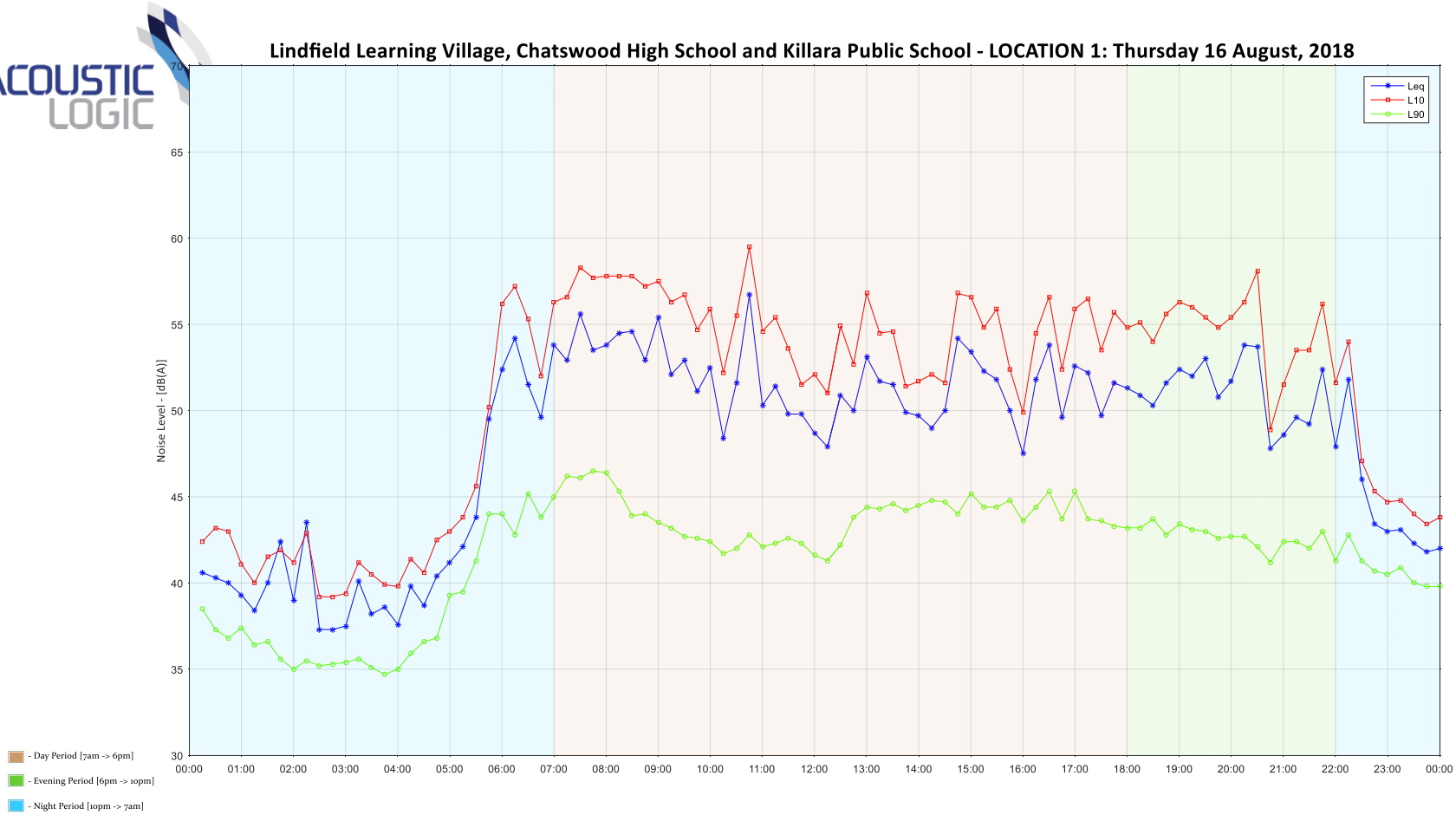
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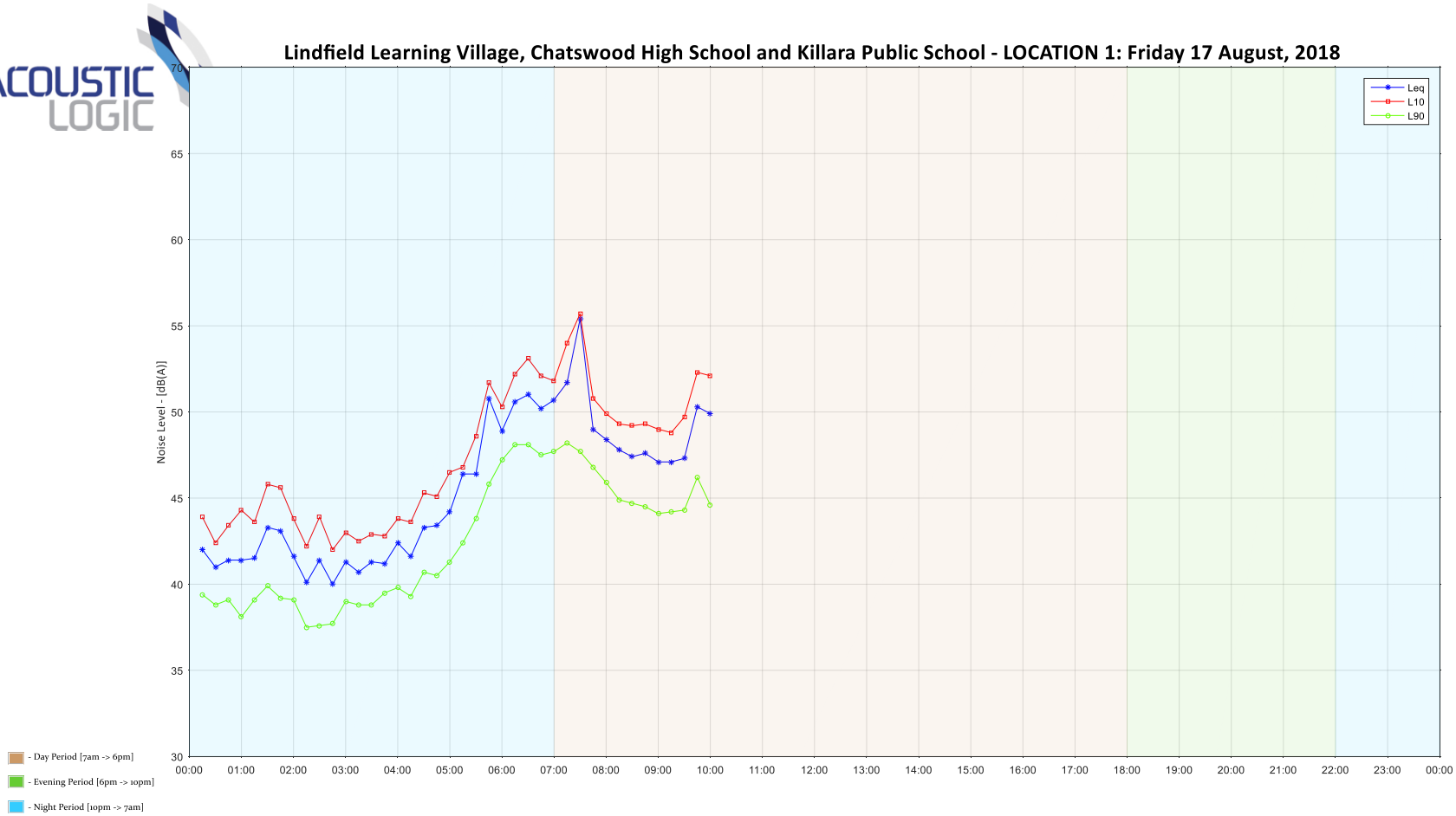
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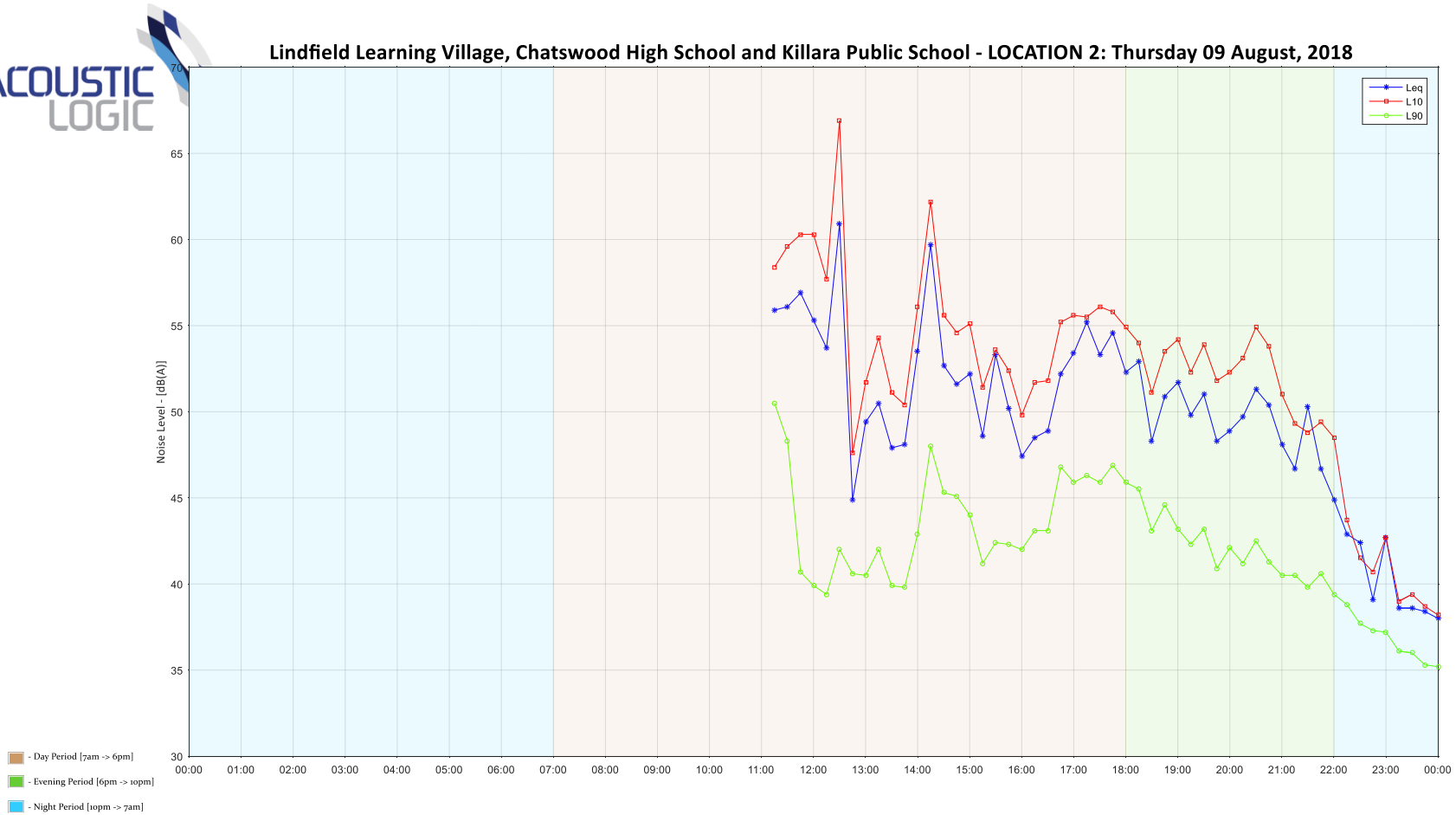
Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Thursday 09 August, 2018
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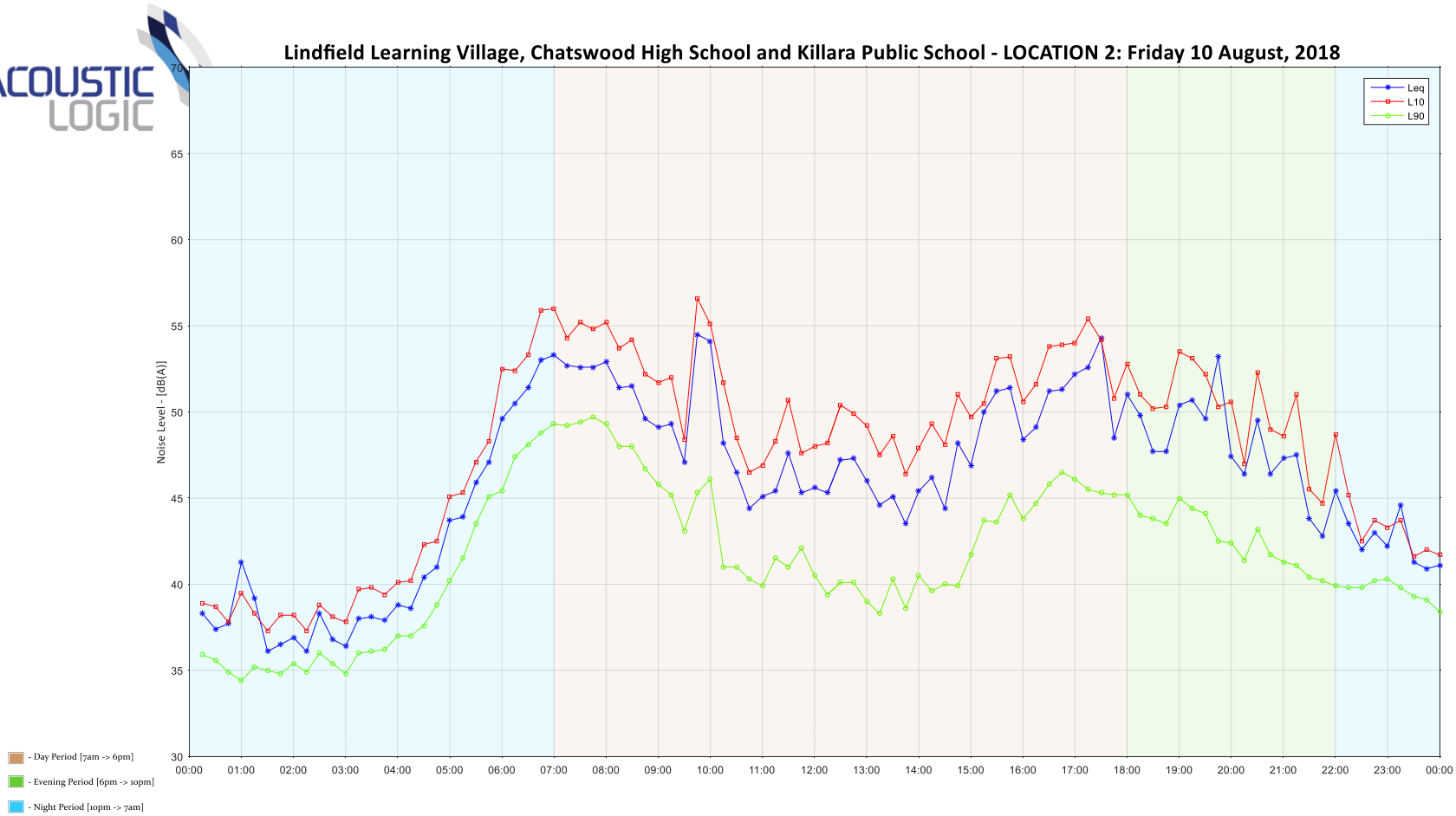
Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Friday 10 August, 2018
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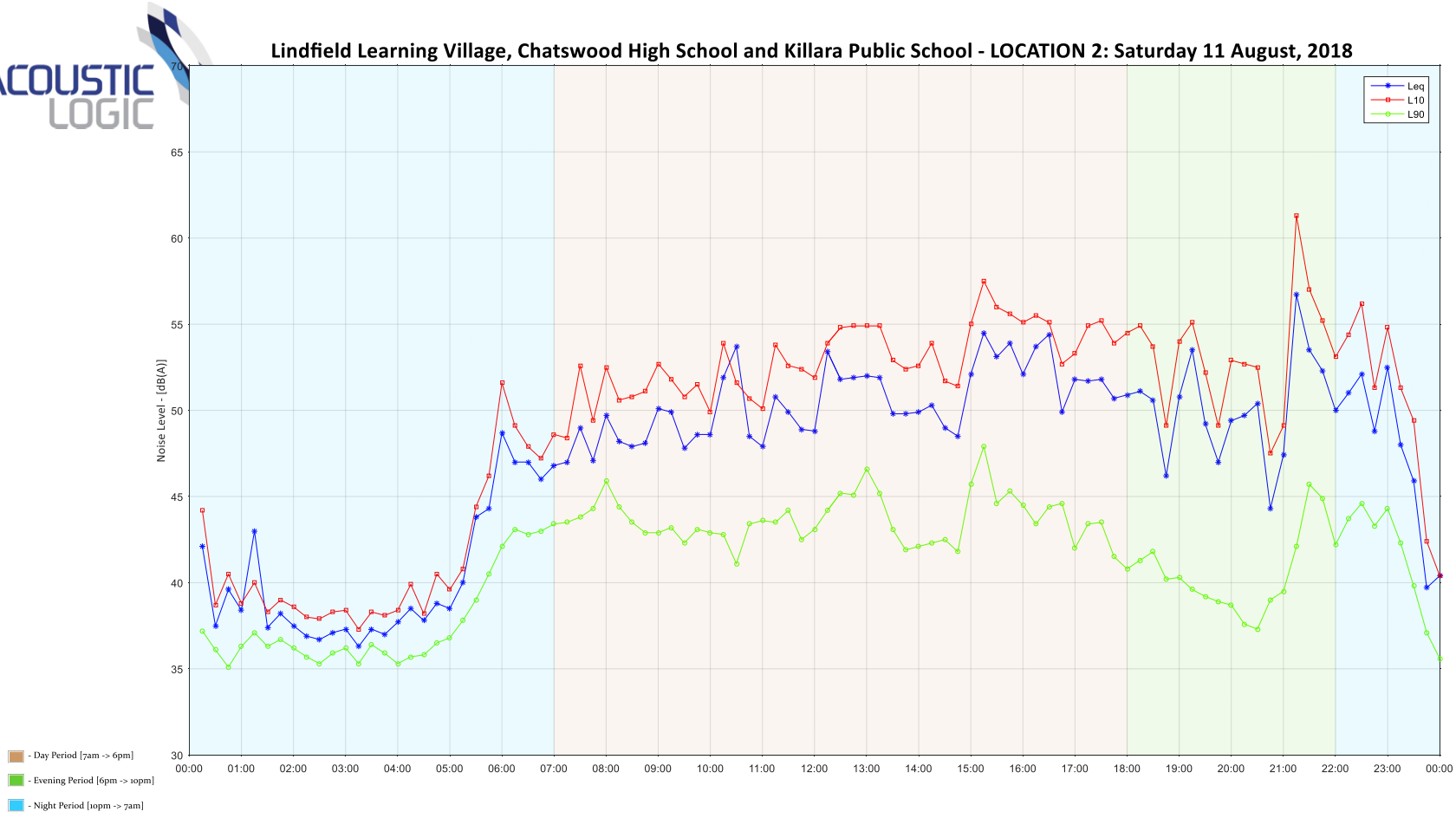
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Saturday 11 August, 2018
Leq
L10
L90
Noise Level - [dB(A)]
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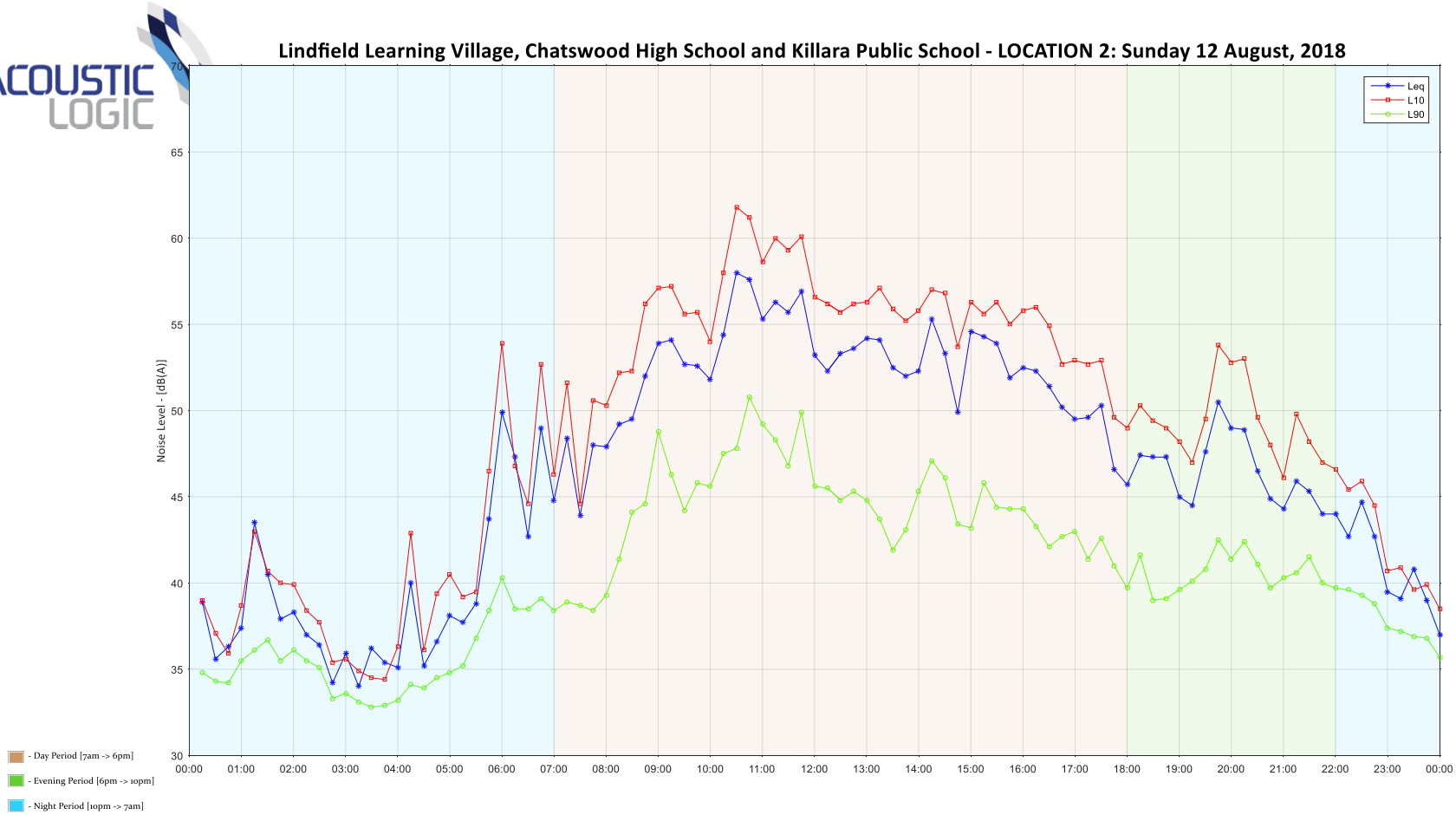
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Sunday 12 August, 2018
Leq
L10
L90
Noise Level - [dB(A)]
70
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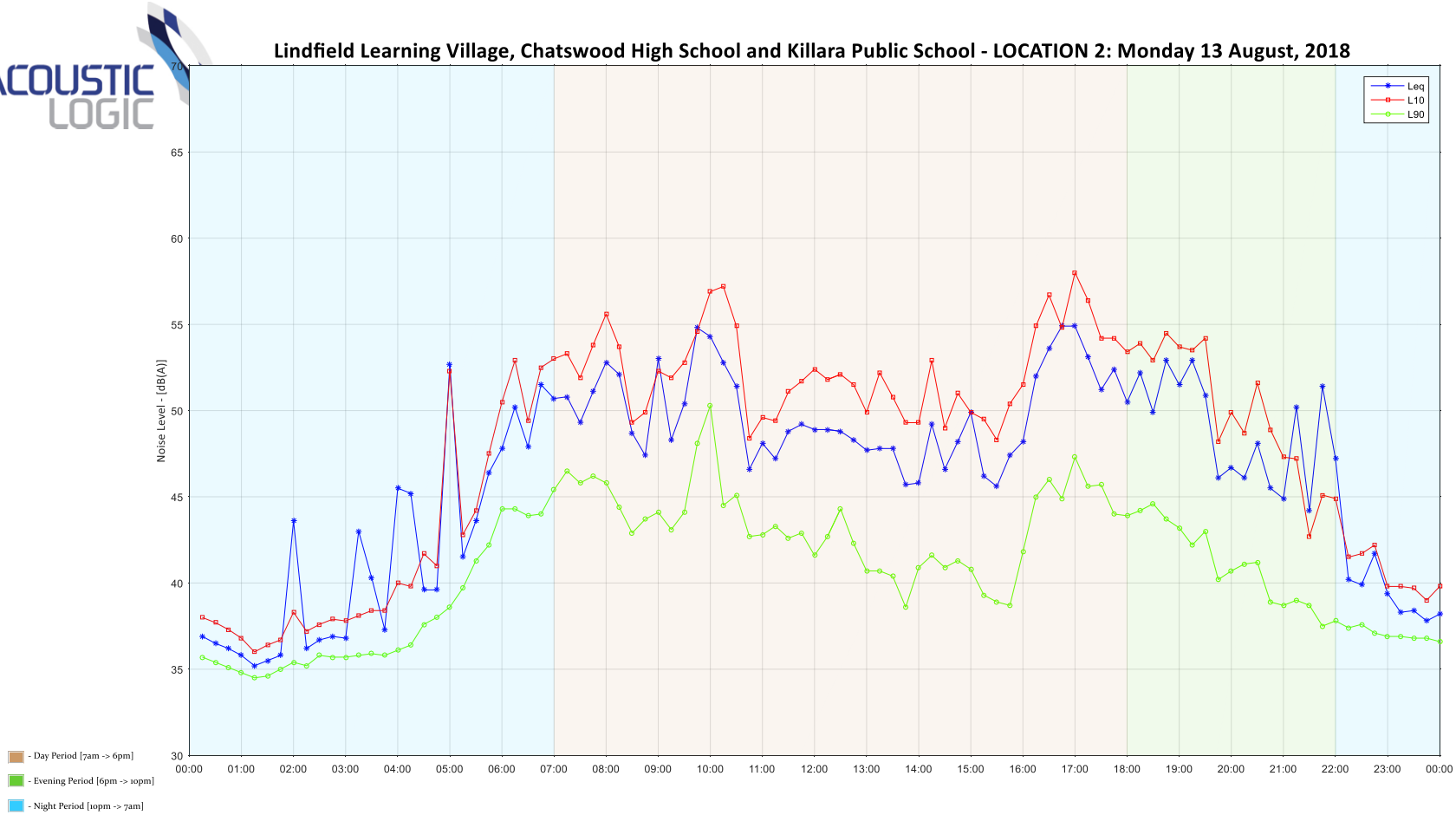
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Monday 13 August, 2018
Leq
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L90
Noise Level - [dB(A)]
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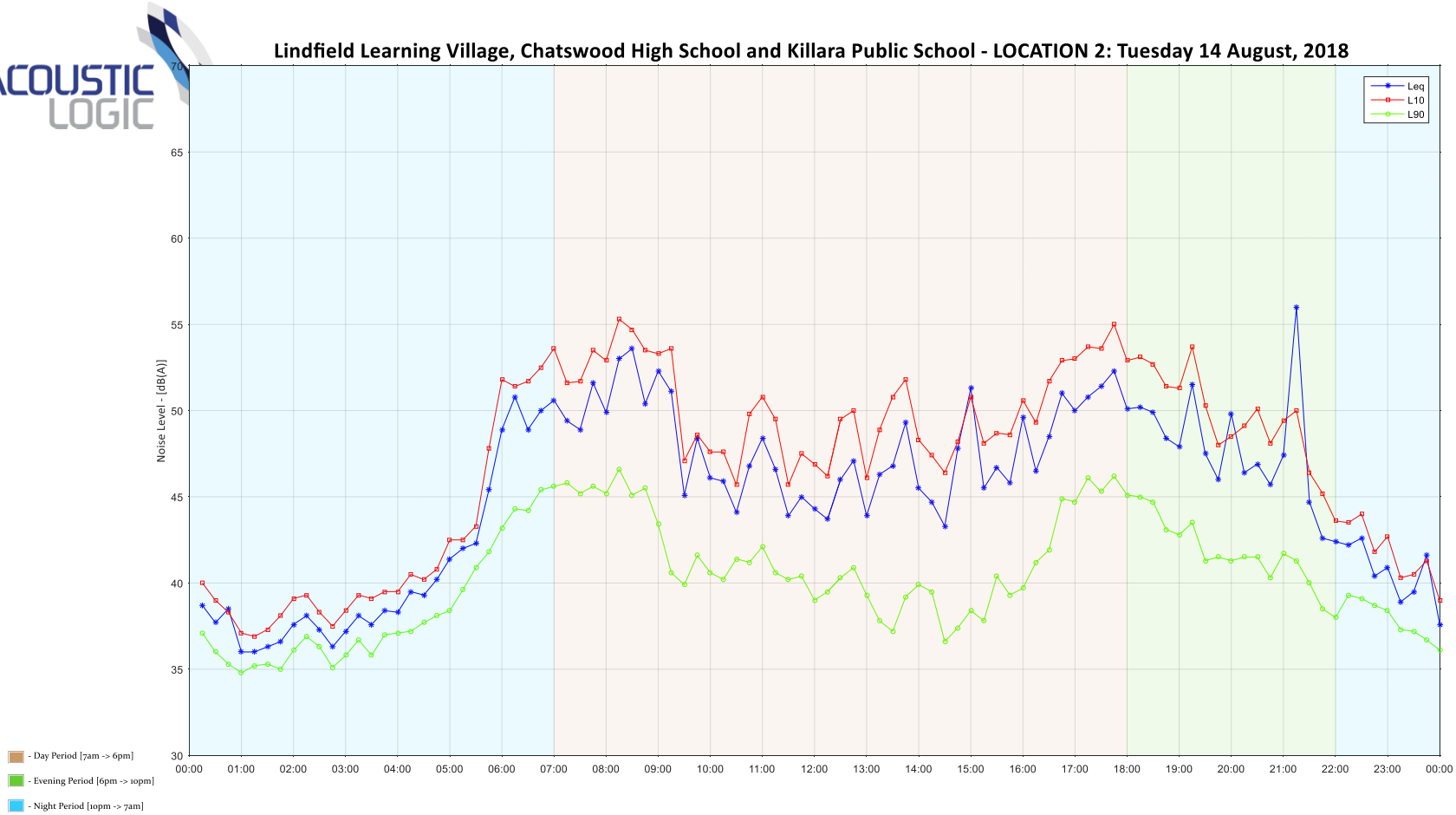
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Tuesday 14 August, 2018
Leq
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Noise Level - [dB(A)]
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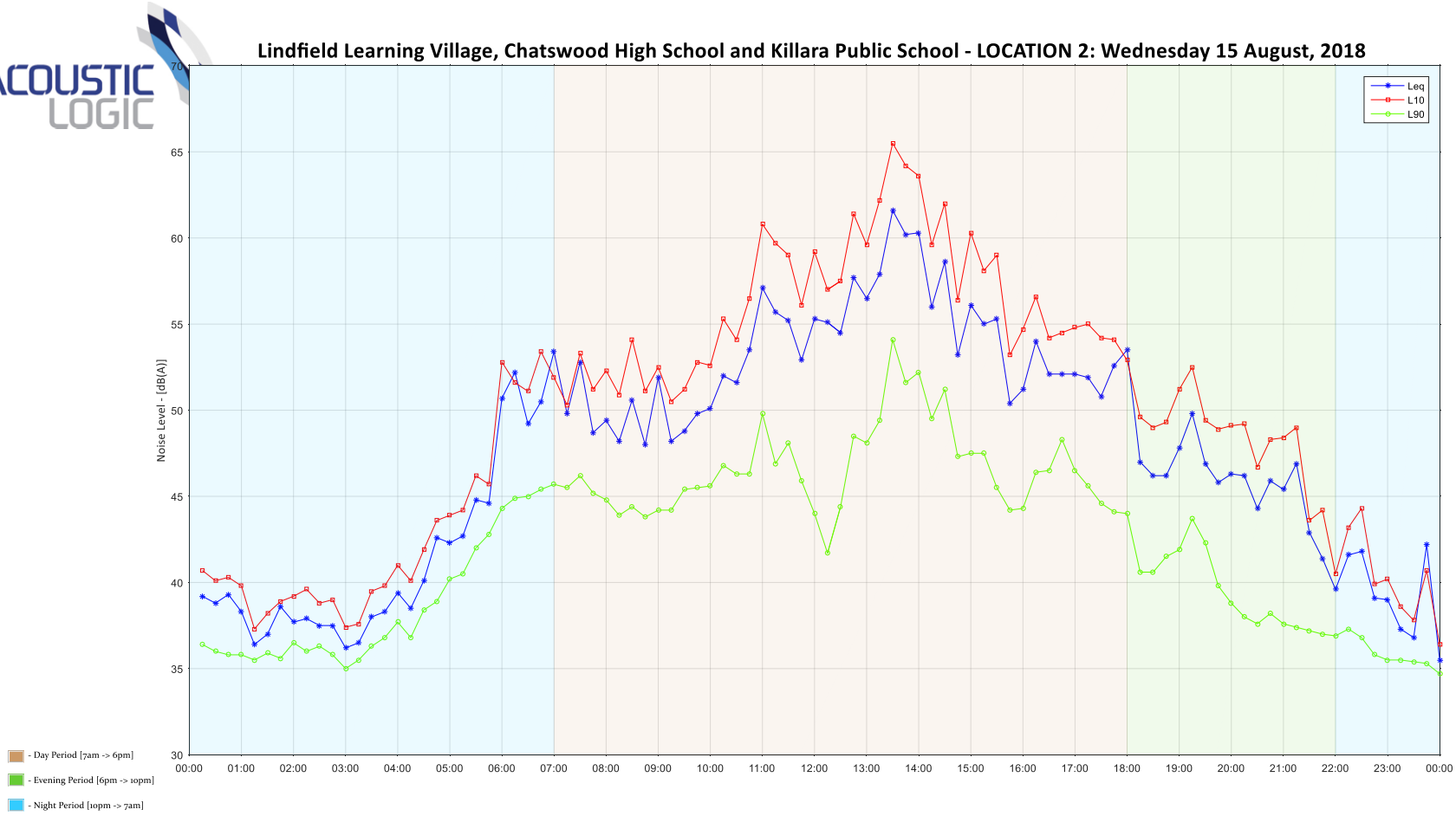
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Wednesday 15 August, 2018
Leq
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Noise Level - [dB(A)]
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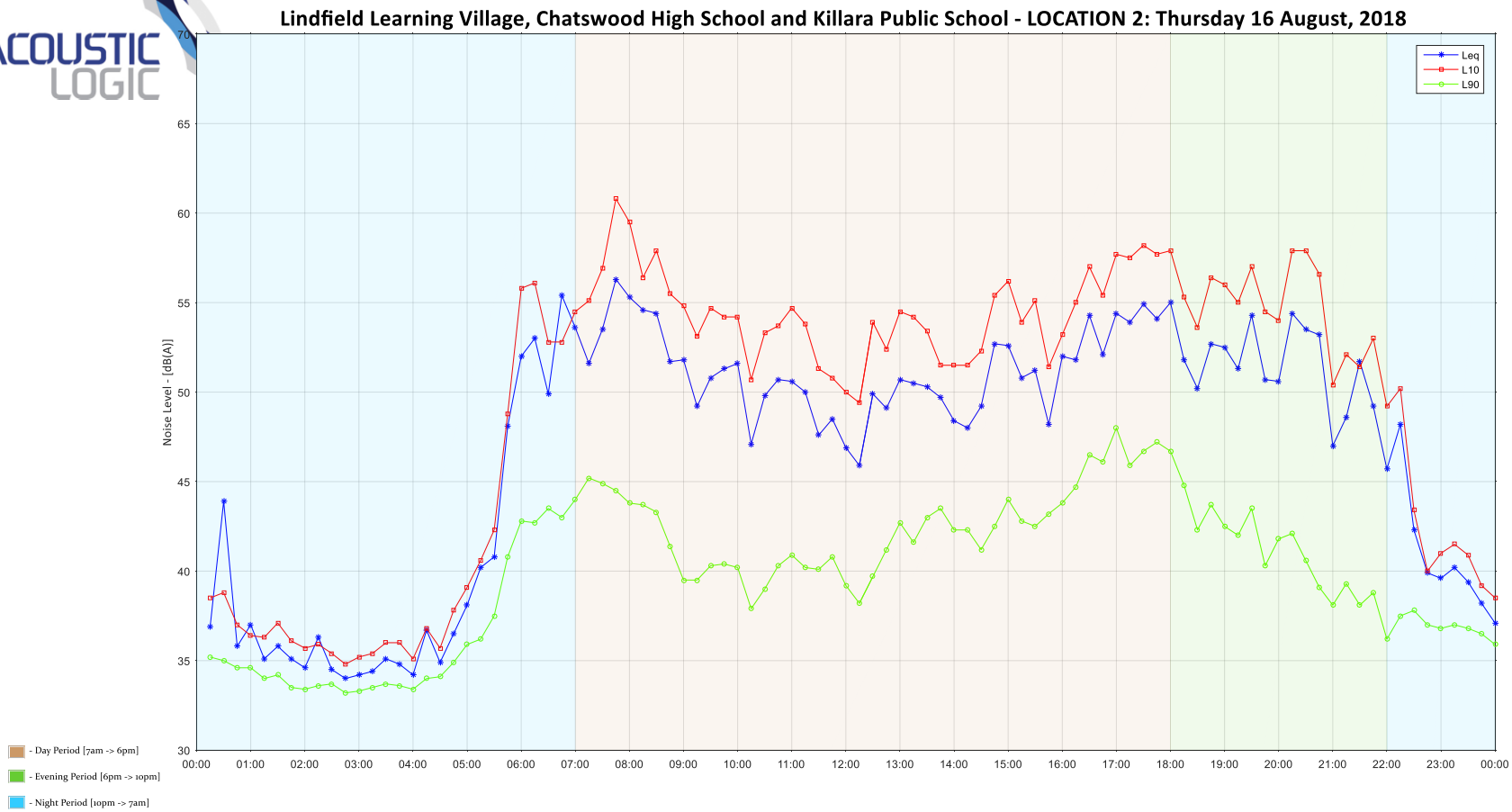
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Thursday 16 August, 2018
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Noise Level - [dB(A)]
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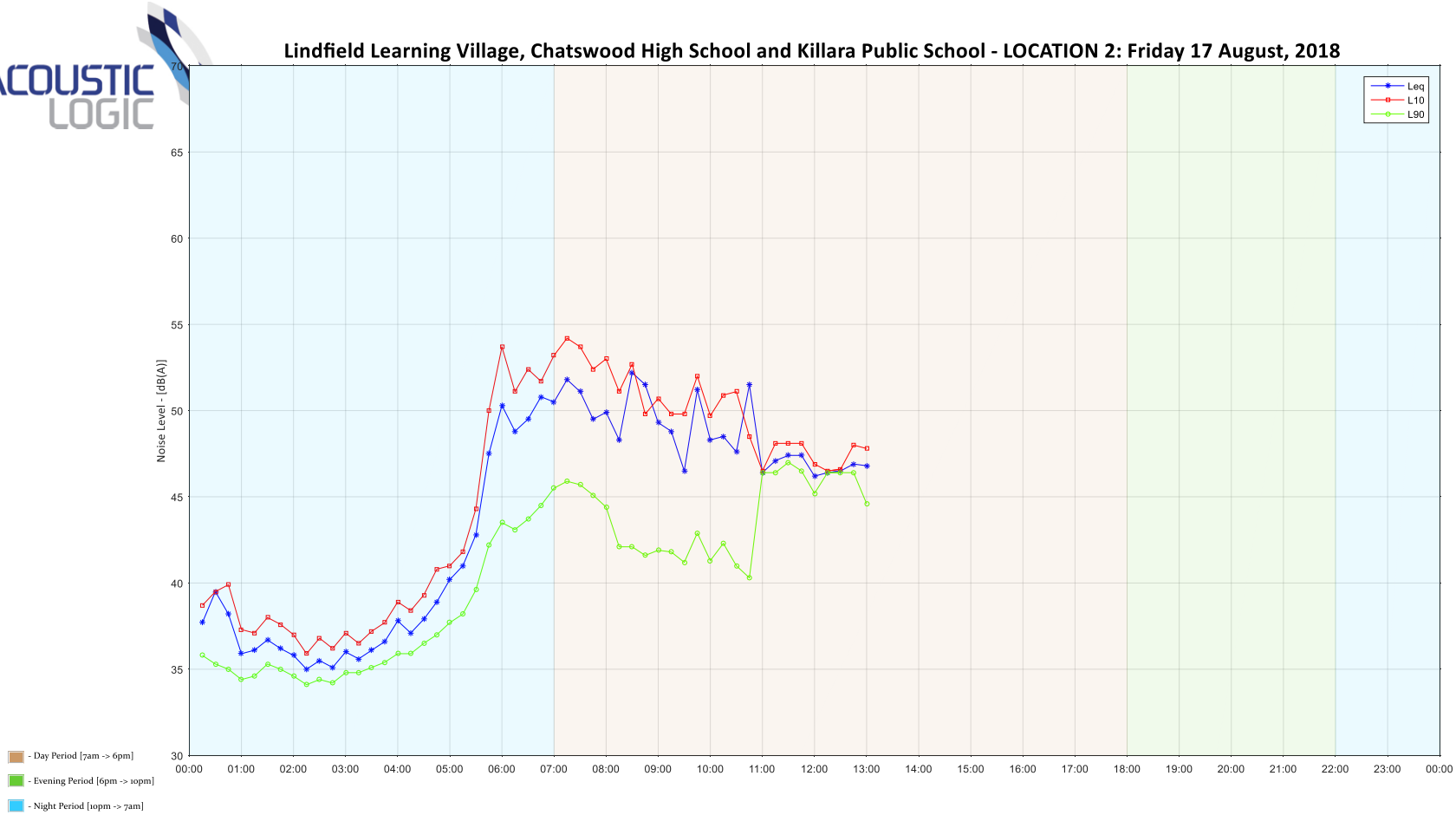
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Lindfield Learning Village, Chatswood High School and Killara Public School - LOCATION 2: Friday 17 August, 2018
Noise Level - [dB(A)]
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- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]