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264-268 Pennant Hills Road, Carlingford - DA Acoustic Assessment

1 INTRODUCTION

This report presents our DA acoustic review for the proposed aged care facility at 264-268 Pennant Hills Road, Carlingford. General calculations have been carried out in order to show what future acoustic treatments and constructions may need to be adopted in order to meet standard criteria set out in Section 4.1.

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2 SITE ANALYSIS

The proposed site is located at 264-268 Pennant Hills Road, Carlingford. The site is bounded to the north by Pennant Hills Road which carries a high volume of traffic. To the east is Martins Lane which carries a low volume of traffic used by local residents. South of the project site are the existing residential properties and that have street frontage to Homelands Avenue. West of the proposed site are the existing residential properties.

Detailed site map and noise measurement locations refer to Figure below.



3 NOISE MEASUREMENTS

3.1 UNATTENDED NOISE MONITORING

Unattended noise monitoring for both background and traffic noise along Pennant Hills Road has been conducted. Monitoring was undertaken from the 8th to 18th December 2014. Please see below.

3.1.1 Unattended Background Noise Monitoring

Background noise data has been graphed in Appendix B of this report. Detailed rating background noise levels during each time period have been processed based on requirements of NSW EPA Industrial Noise Policy and summarised below.

Table 1 –Rating Background Noise Levels

Location	Time of Day	Measured Noise Level
See Figure 1	7am - 6pm (Day)	36 dB(A) _{L90}
	6pm - 10pm (Evening)	35 dB(A) _{L90}
	10pm – 7am (Night)	32dB(A) _{L90}

3.1.2 Unattended Traffic Noise Measurements

Traffic noise levels have been processed based on requirements of NSW Road Noise Policy and NSW SEPP. Results have been summarised below.

Table 2 –Unattended Traffic Noise Monitoring Results

Location	Time of Day	Measured Noise Level
See Figure 1 4m from the kerb Full view of traffic	7am - 10pm (Day)	71dB(A) _{Leq(15hour)}
	10pm – 7am (Night)	69dB(A) _{Leq(9hour)}

3.2 ATTENDED NOISE MEASUREMENT

3.2.1 Attended Traffic Measurement

An attended traffic noise measurement has been conducted along Pennant Hills Road during peak hour traffic, 4:30pm – 5:30pm on Monday 8th December 2014

Table 3 –Manned Traffic Noise Measurement Results

Location	Time of Day	Measured Noise Level
See Figure 1 3m from kerb Full view of traffic	4:30pm-5:30pm	72dB(A) _{Leq}

4 TRAFFIC NOISE INTRUSION ASSESSMENT

In this section we will discuss the following;

- Traffic noise intrusion into the proposed development.
- Acoustic treatments that will need to be considered.

4.1 INTERNAL NOISE CRITERIA

4.1.1 Internal Traffic Noise Criteria

This section will be acoustic criteria which will be adopted for the project based on the site location.

4.1.1.1 Parramatta City Council DCP

Part 3 – Development Principles

“3.3.4 Acoustic Amenity

Residential Development

C.1 Internal habitable rooms of dwellings affected by high levels of external noise are to be designed to achieve internal noise levels of no greater than 50dBA.”

4.1.1.2 AS2107 “Acoustics – Recommended Design Sound Levels & Reverberation Times for Building Interiors”

AS2107-2000: 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 AS2107-2000, gives the following maximum internal noise levels for commercial buildings and residential buildings near major roads;

Table 4 – Recommended Design Sound Level

Space /Activity Type	Recommended Maximum Design Sound Level dB(A) _{Leq}
Living Areas	45dB(A) _{Leq (15hour)}
Sleeping Areas	40dB(A) _{Leq (9hour)}

4.1.1.3 NSW Department of Planning's 'Development near Rail Corridors and 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 Lea 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."*

4.1.1.4 SEPP (Infrastructure) 2007

As Pennant Hills Road which is classified as carrying in excess of 40,000 vehicles a day it is mandatory for the internal noise levels to be compliant with the following criteria.

"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 Lea 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.

(4) In this clause, "freeway", "tollway" and "transit way" have the same meanings as they have in the Roads Act 1993."

4.1.1.5 Internal Noise Criteria Summary

Table below list the acoustic criteria for the internal noise levels which will be adopted for this project.

Table 5 – Summary of Internal Noise Level Criteria

Space	Noise Level
Bedrooms	35dB(A) _{Leq(9hour)}
Habitable Spaces	40dB(A) _{Leq(15hour)}

4.2 ACOUSTIC TREATMENTS REQUIRED

4.2.1 Recommended Glazing Construction

Measurements which have been conducted along Pennant Hills Road for have been noted to be significantly high. As it is mandatory for any building which is built on Pennant Hills Road to be compliant with the SEPP (Infrastructure) 2007 with the requirements of point 102 the following construction measures should be adopted.

The proposed 15m setback for the northern façade will allow a lower noise level facing this façade. As detailed floor plans /elevations are not available at this stage the noise intrusion calculations have been carried out based on dimension of typical rooms of similar projects by this office. The following acoustic treatments are recommended for glazing systems.

Option 1

Bedrooms: full height glazing with only 1.5m width for bedrooms.

Living Rooms: full glazing (full height and width) façade.

Option 2

Bedrooms: full glazing (full height and width) for Bedrooms.

Living Rooms: full glazing (full height and width).

The required glazing constructions for each option is shown in Tables below. All Calculations have been made with the assumptions that all bedrooms are carpeted and a room size of 3m x 4m x 2.7m. All living rooms are 4m x 7m x 2.7m.

Table 6 – Option 1– Required Glazing

Room	Glazing Thickness	Seals
Bedrooms	12.38mm Laminate	Yes
Living Rooms	12.38mm Laminate	Yes

Table 7 –Option 2 (full glazing)– Required Glazing

Room	Glazing Thickness	Seals
Bedrooms	6.38mm Laminate + 100mm Air gap + 6.38mm Laminate	Yes
Living Room	12.38mm Laminate	Yes

4.2.2 Façade Wall Structure

The façade wall structure also has two options, see below.

Option 1 –

Masonry Brick Construction. This will not require acoustic upgrading.

Option 2 –

Light weight wall structure. If a light weight wall structure is used along the north, east and west façades, the system will be required to adopt the following construction.

Table 8 – Light Weight Façade Wall Structure

Room	Construction
Bedroom	2 x 9mm Fibre Cement Sheeting + 150mm Steel Stud + 2 x 16mm Plasterboard
Living Room	2 x 9mm Fibre Cement Sheeting + 92mm Steel Stud + 2 x 13mm Plasterboard

4.2.3 Roof Structure

The roof structure also has two options please see below.

Option 1 –

The concrete roof structure. This will not require acoustic upgrading.

Option 2 –

Light weight roof structure. If a light weight roof structure is used along the north, east and west of the roof the system will be required to adopt the following construction.

Table 9 – Light Weight Roof Structure

Room	Construction
Bedroom	1 x 0.5mm Steel Sheeting + 250mm Air gap with insulation (minimum) + 2 x 13mm Plasterboard
Living Room	

4.2.4 Ventilation Requirements

As the project site is facing high traffic noise levels from Pennant Hills Rd, alternate ventilation will need to be considered for the rooms which are located on the north, east and west facades of the project site. Noise levels which are predicted with windows and doors open are greater than the allowed maximum for internal noise levels. To ensure compliance they will be required to remain shut (still operable), meaning that natural ventilation through these apartments is not applicable. Mechanical ventilation or air conditioning system is recommended to the project buildings.

5 EXTERNAL NOISE EMISSION CRITERIA.

This section will be the acoustic criteria which will be adopted for this project based on its location for all noise emissions which are generated from the project site.

5.1 NSW EPA INDUSTRIAL NOISE POLICY

In the absence of any relevant noise emission criteria stipulated in the Parramatta City Council DCP for residential flat buildings, the adoption of the NSW Industrial Noise Policy will be adopted.

The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source.

5.1.1 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_e descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

5.1.2 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 Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table below provides the recommended maximum noise levels for the suburban residential receivers for the day, evening and night periods. 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; and
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

Table 10 - EPA – Amenity Noise Levels

Type of Receiver	Time of day	Allowable Noise Emission dB(A) L_e
Residential (Suburban)	Day	60
	Evening	50
	Night	45

5.1.3 Protection of the Environment Operations Act Regulation

Protection of the Environmental Operations regulation limits the noise levels associated within the operation of domestic air conditioning criteria during night time periods which is presented below:

Protection of the Environmental Operations (Noise Control) Regulation 2000-Sect 52

52 Air Conditioners

(1) A person must not cause or permit an air conditioner to be used on residential premises in such a manner that it emits noise that can be heard within a habitable room in any other residential premises (regardless of whether any door or window to that room is open):

(a) Before 8 am or after 10 pm on any Saturday, Sunday or public holiday, or

(b) Before 7 am or after 10 pm on any other day.

5.2 SUMMARY OF EXTERNAL NOISE EMISSION CRITERIA

The following table shows the criteria which will be adopted for noise emission.

Table 11 –Summary of Noise Emission Criteria

Time of Day	Measured Rating Background Noise Level dB(A)L ₉₀	Criteria dB(A)L _{eq}
Day (7am-6pm)	36	41
Evening (6pm-10pm)	35	40
Day (10pm-7am)	32	37

6 CONCLUSION

Traffic and background noise measurements have been conducted around and on the property at 264-268 Pennant Hills Road, Carlingford. Provided indicative acoustic treatments in Section 4.2 of this report, the internal noise levels will satisfy the requirements of Parramatta City Council DCP, NSW SEPP and Australian Standard AS2107-2000.

External noise emission criteria has been setup in Section 5 of this report based on the requirements of NSW EPA INP. Detailed plant noise controls will be determined at CC stage.

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

Yours faithfully,

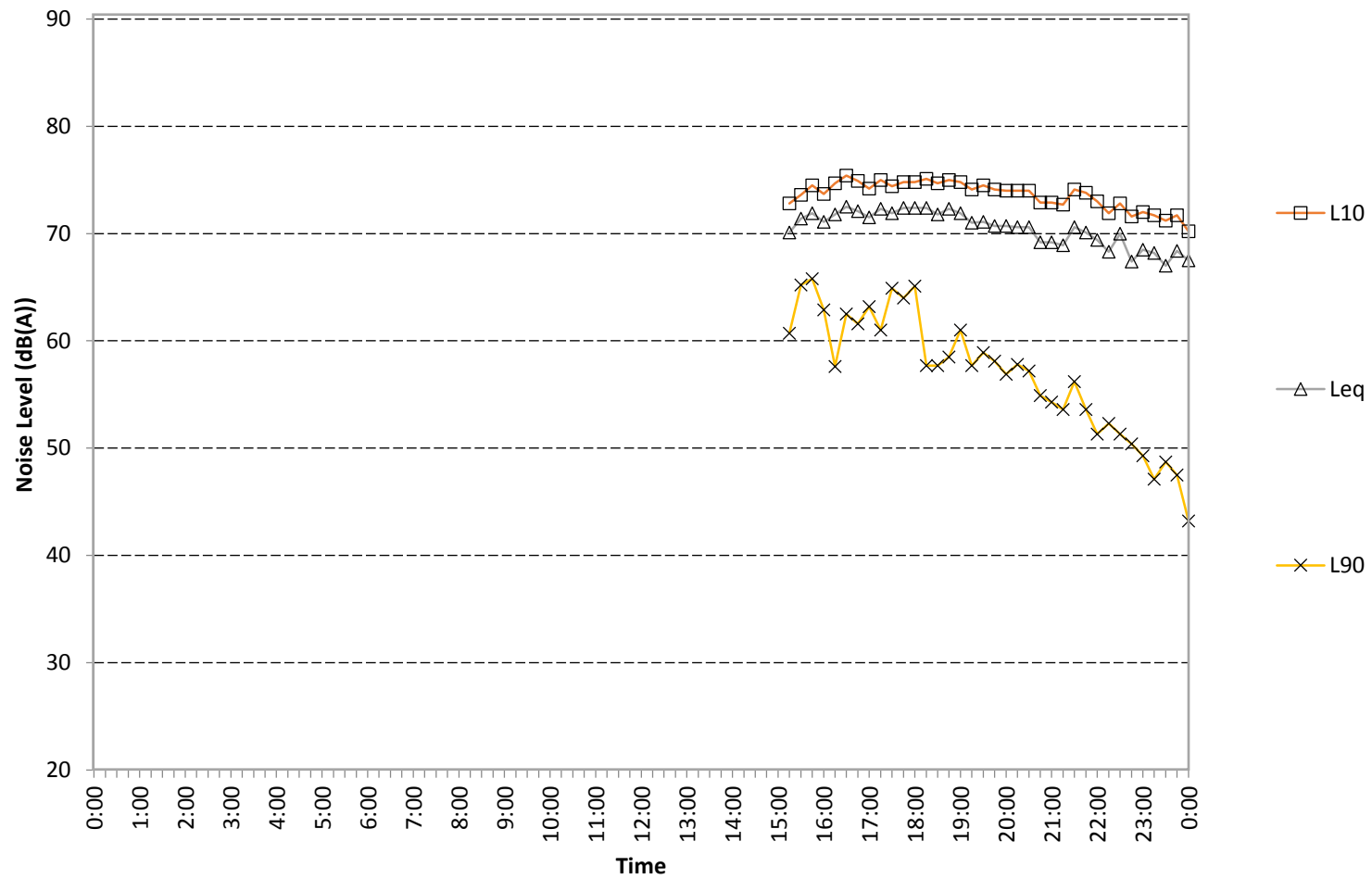
A handwritten signature in black ink, appearing to read 'M. Furlong', with a large, sweeping loop at the end.

Acoustic Logic Consultancy Pty Ltd
Matthew Furlong

APPENDIX A - UNATTENDED TRAFFIC NOISE DATA

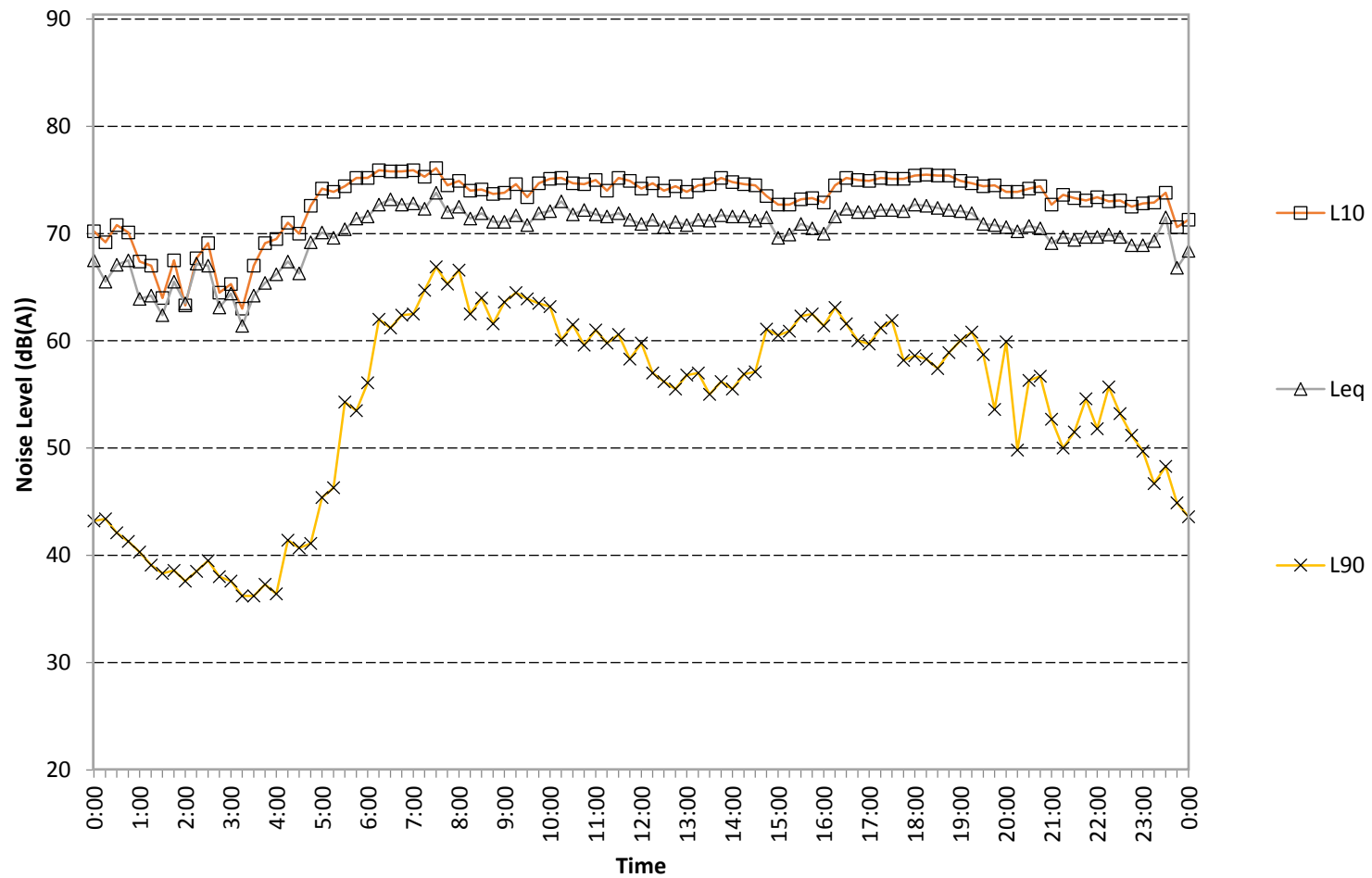
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Monday December 8, 2014



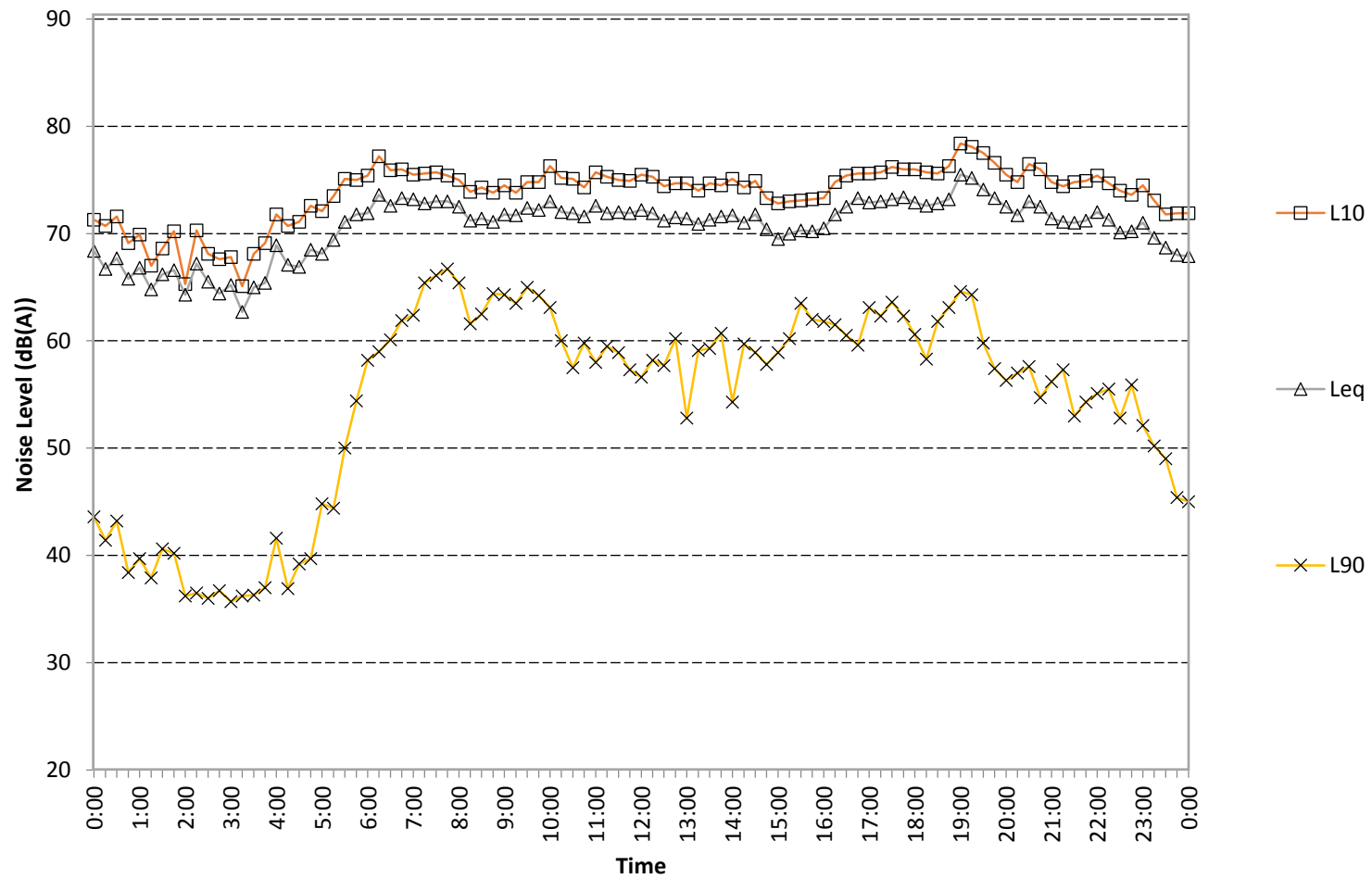
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Tuesday December 9, 2014



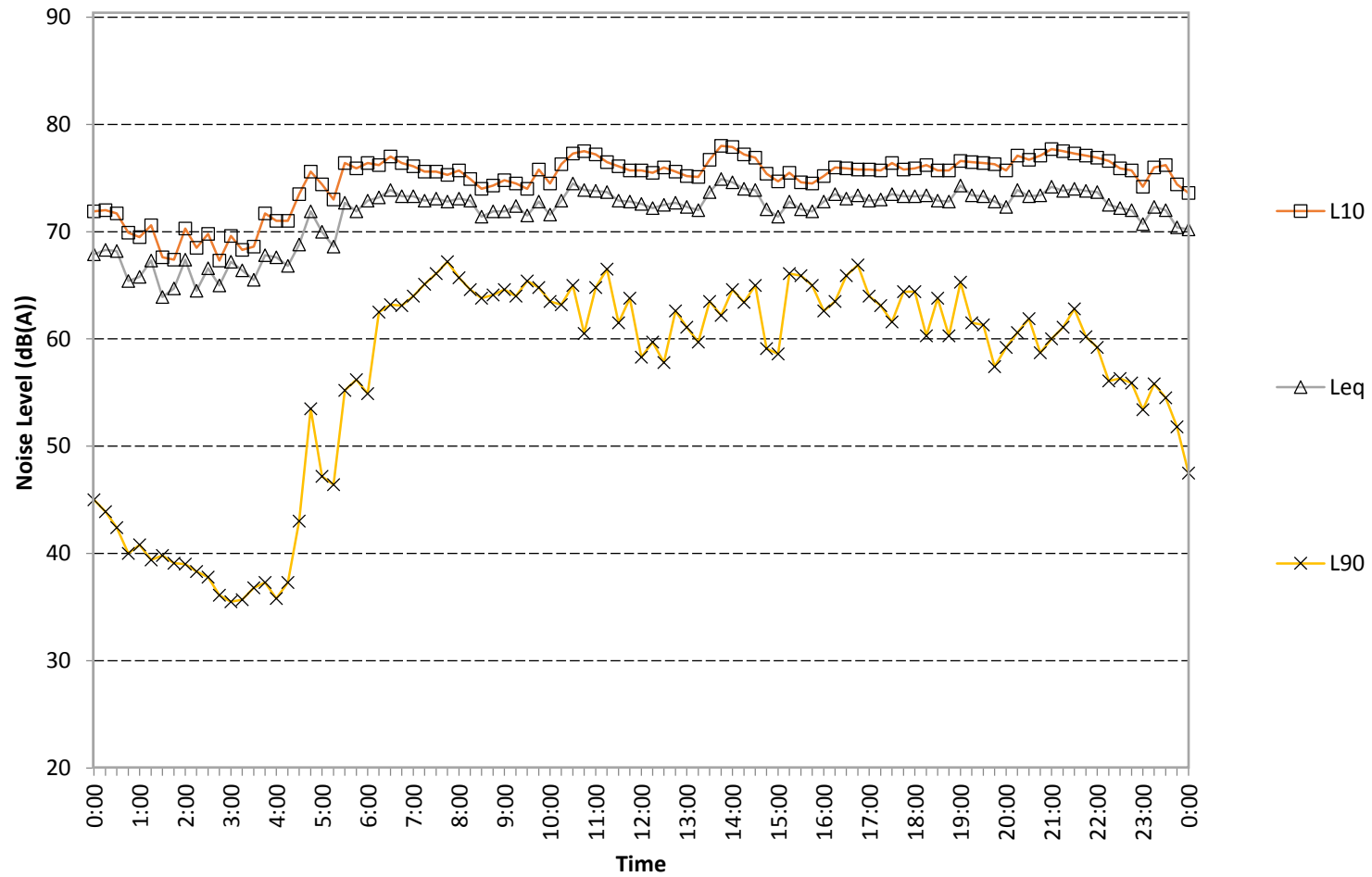
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Wednesday December 10, 2014



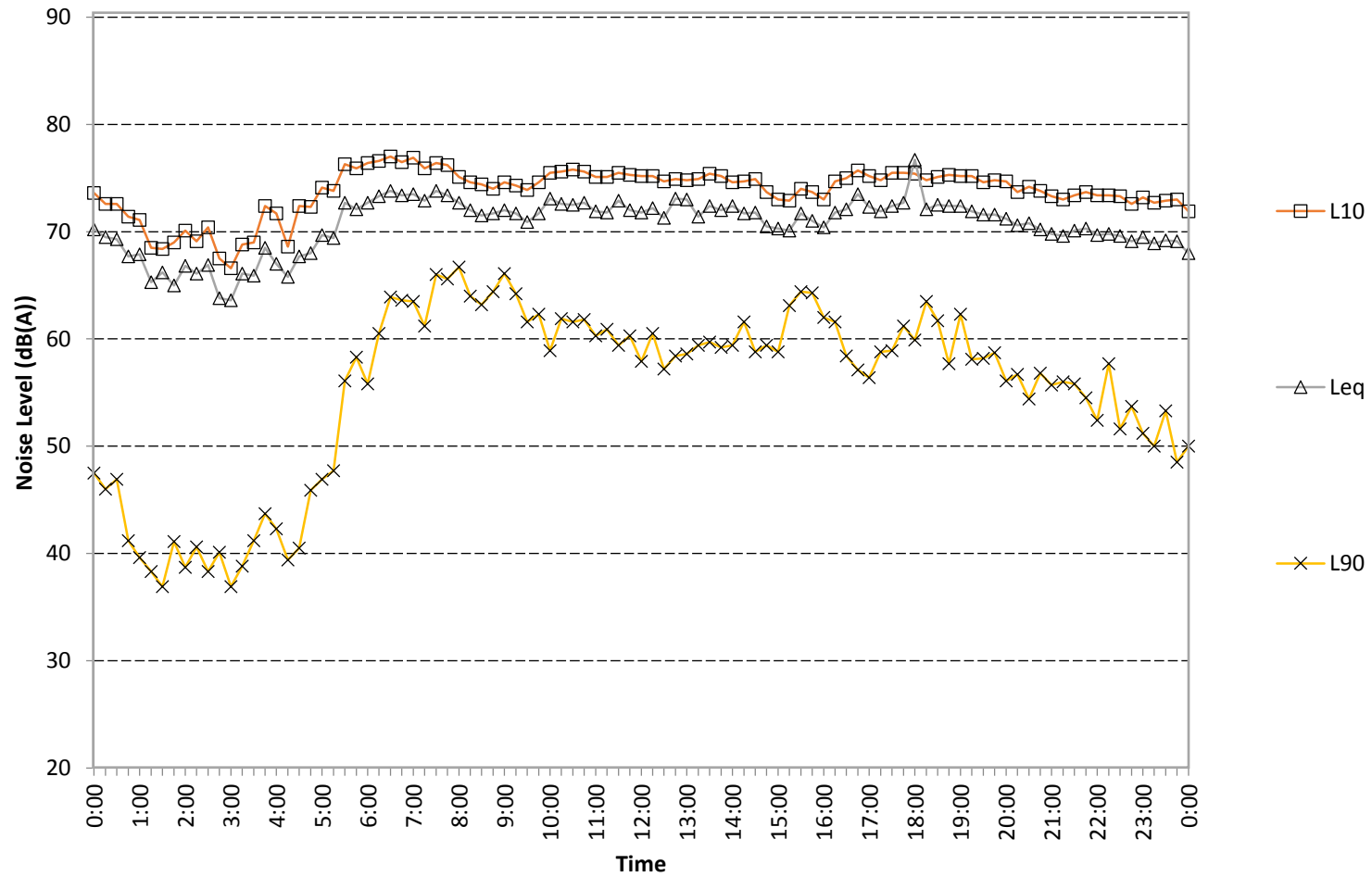
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Thursday December 11, 2014



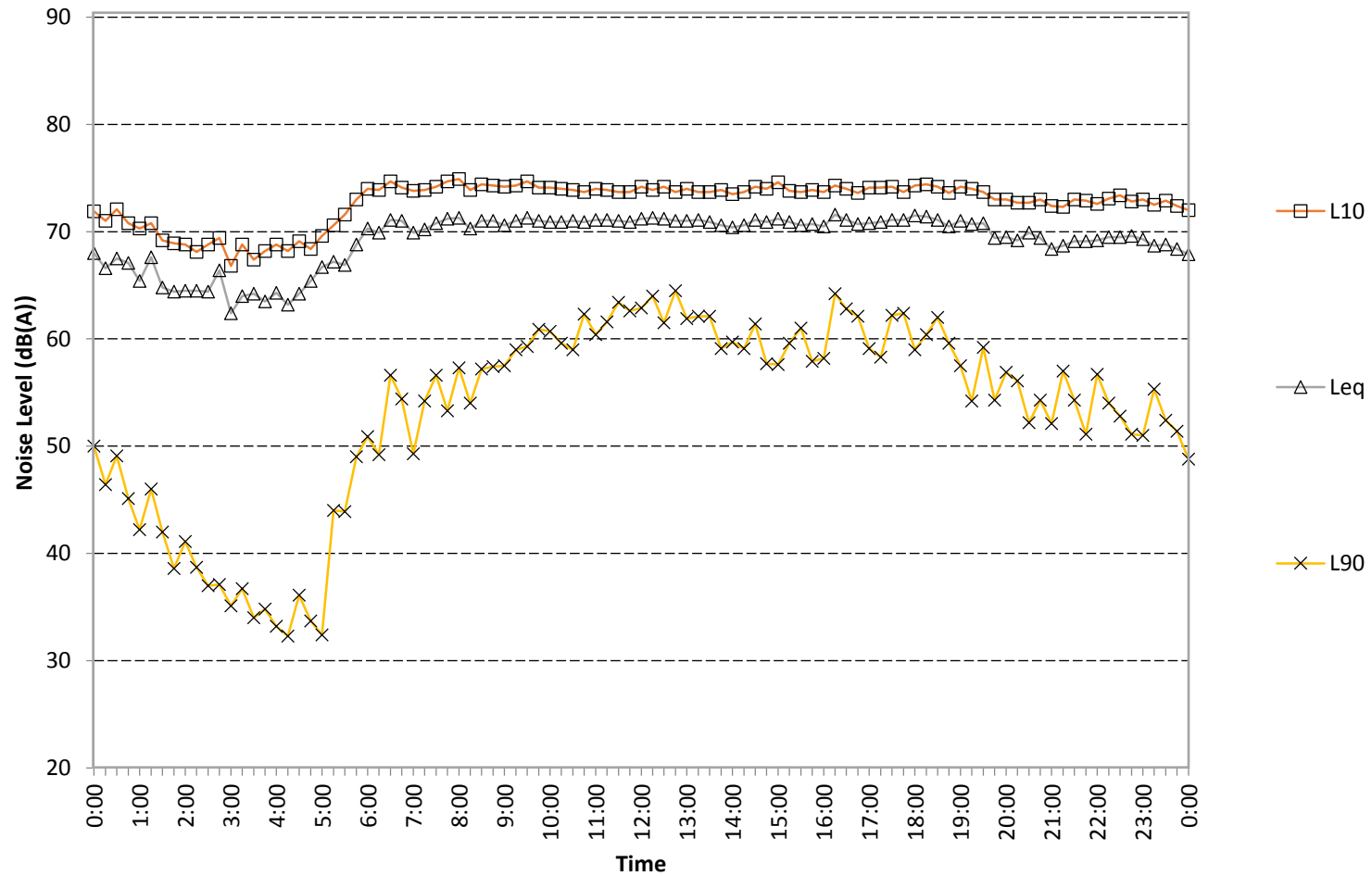
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Friday December 12, 2014



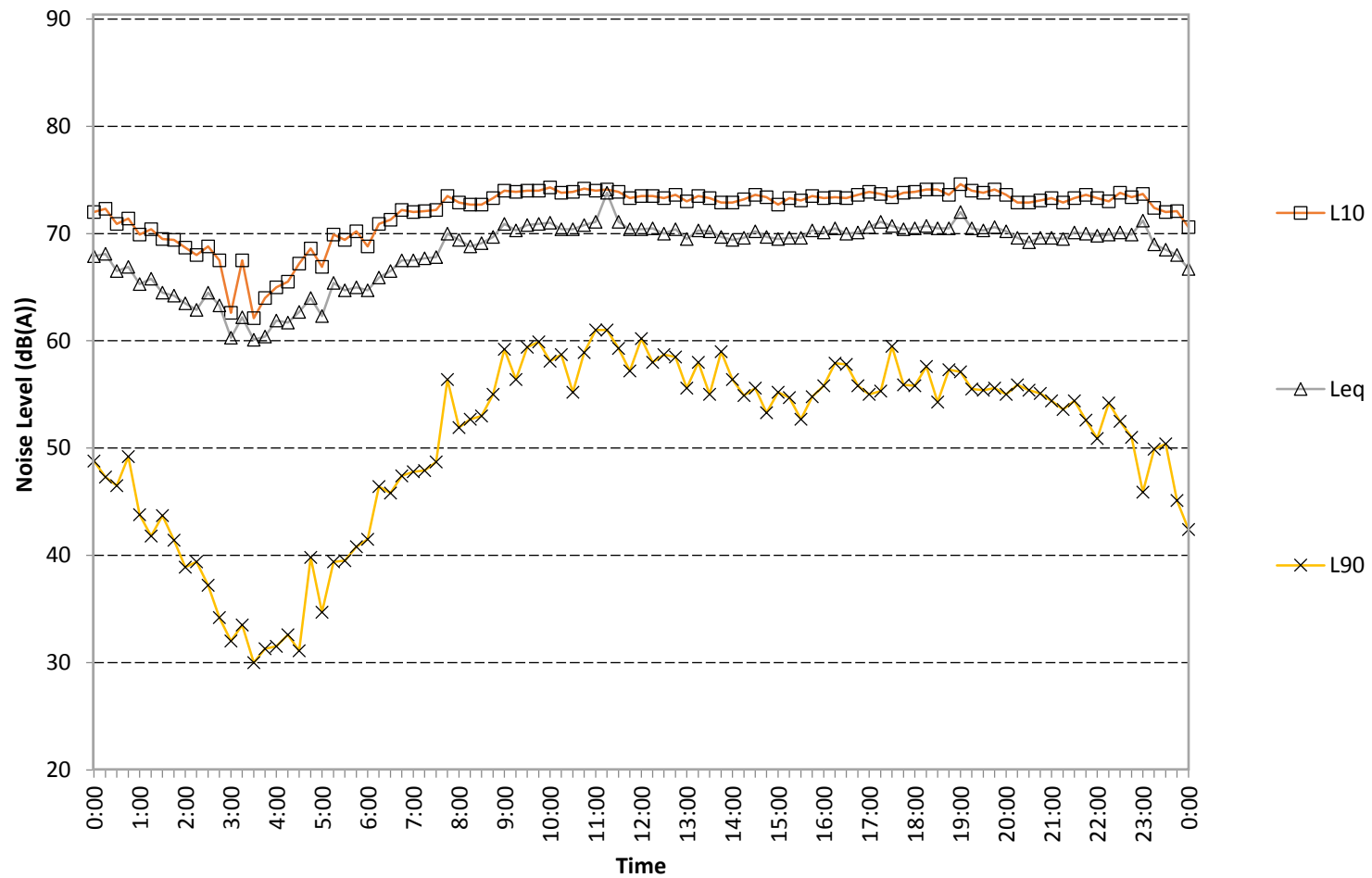
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Saturday December 13, 2014



264-268 Pennant Hills Road, Carlingford

Sunday December 14, 2014



264-268 Pennant Hills Road, Carlingford

Monday December 15, 2014



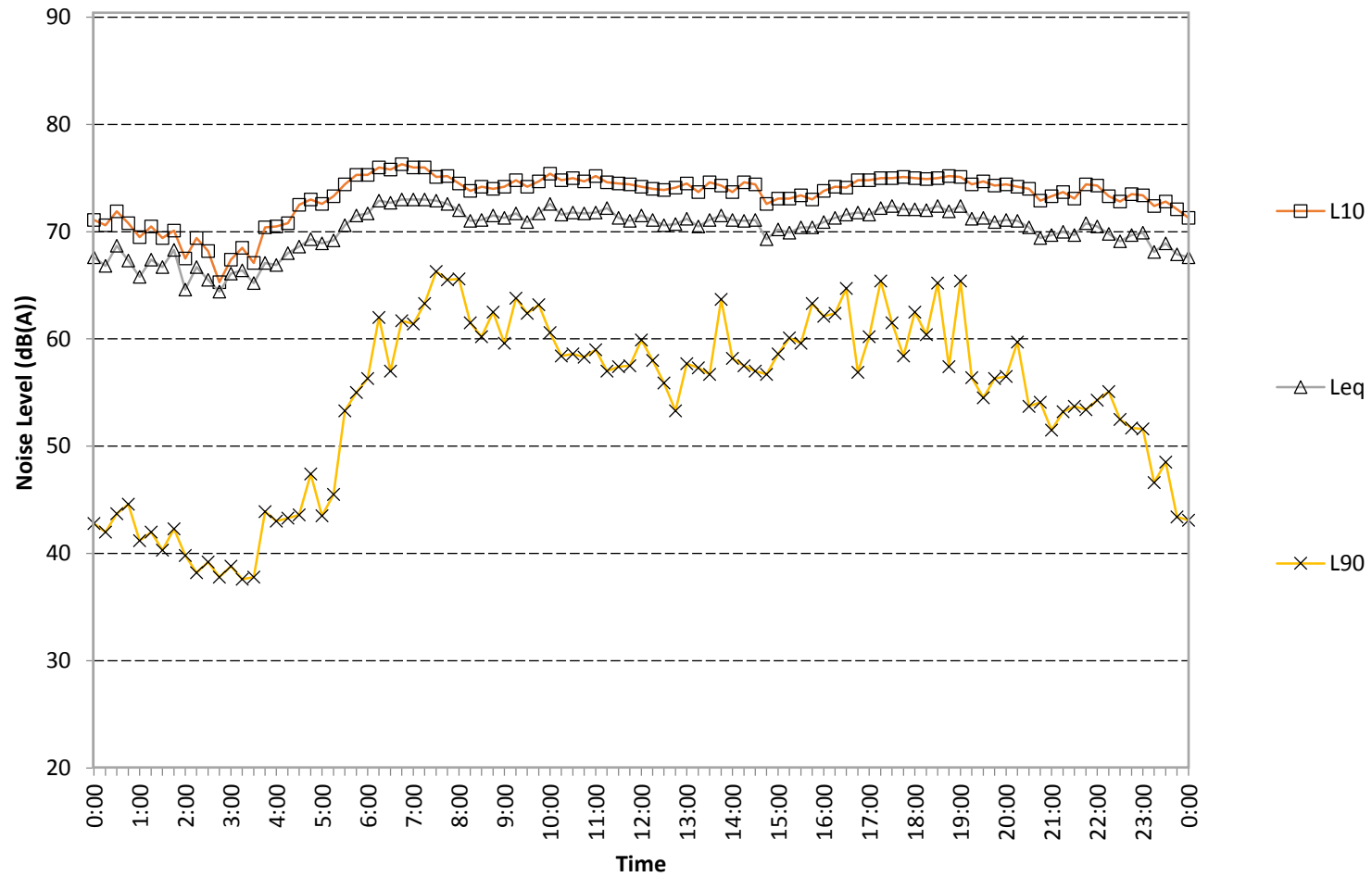
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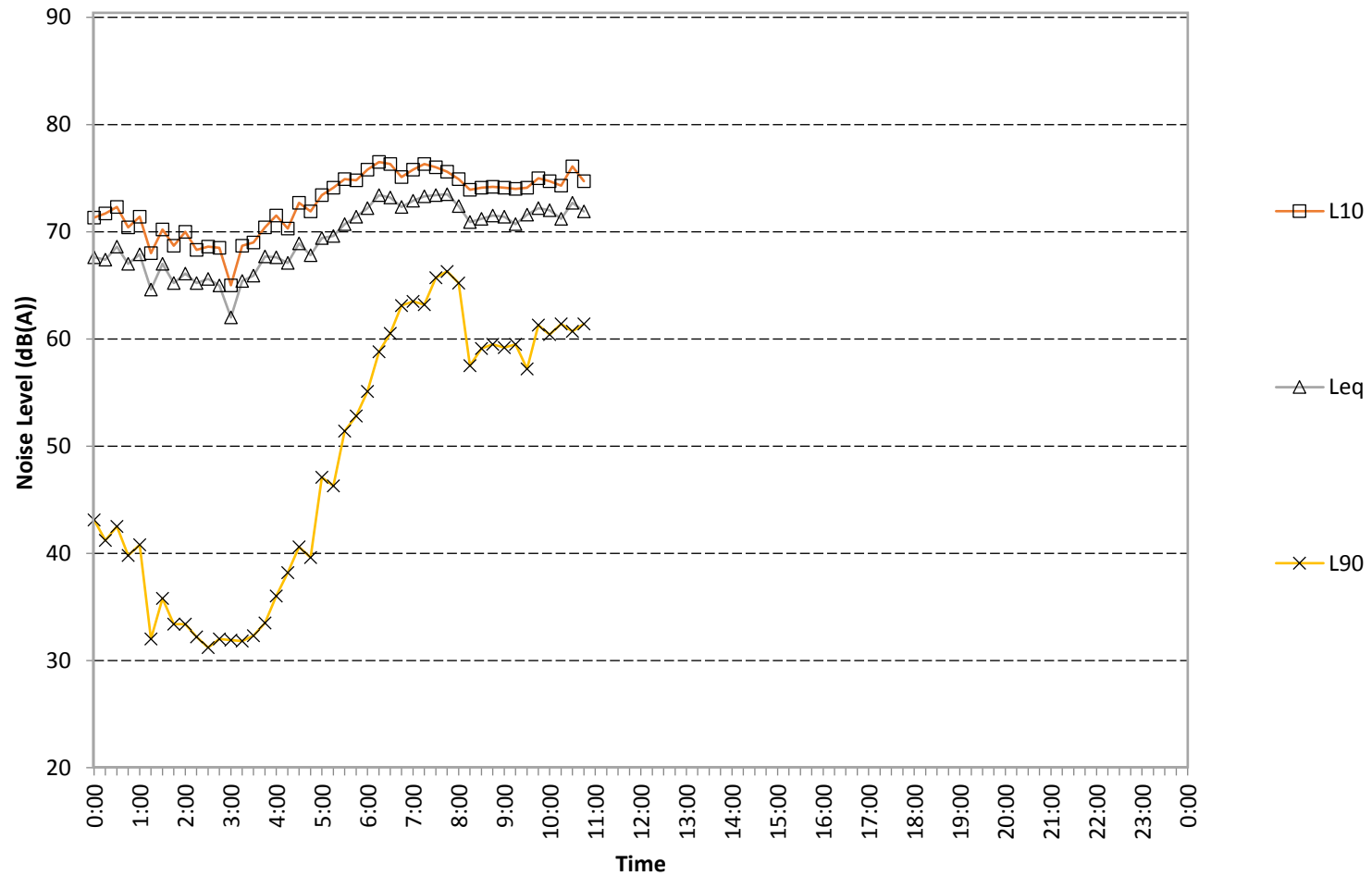
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Wednesday December 17, 2014



264-268 Pennant Hills Road, Carlingford

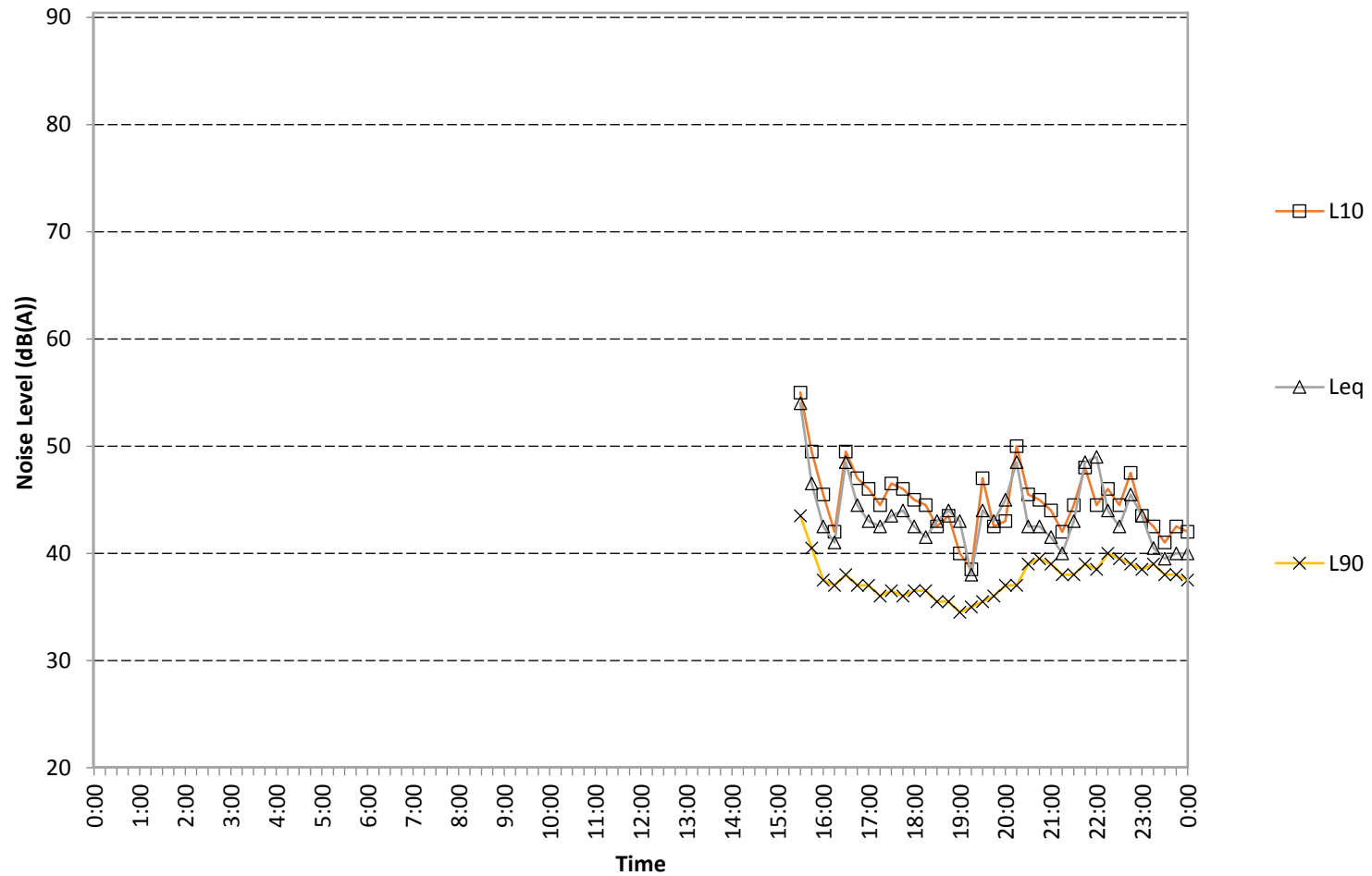
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APPENDIX B - UNATTENDED BACKGROUND NOISE DATA

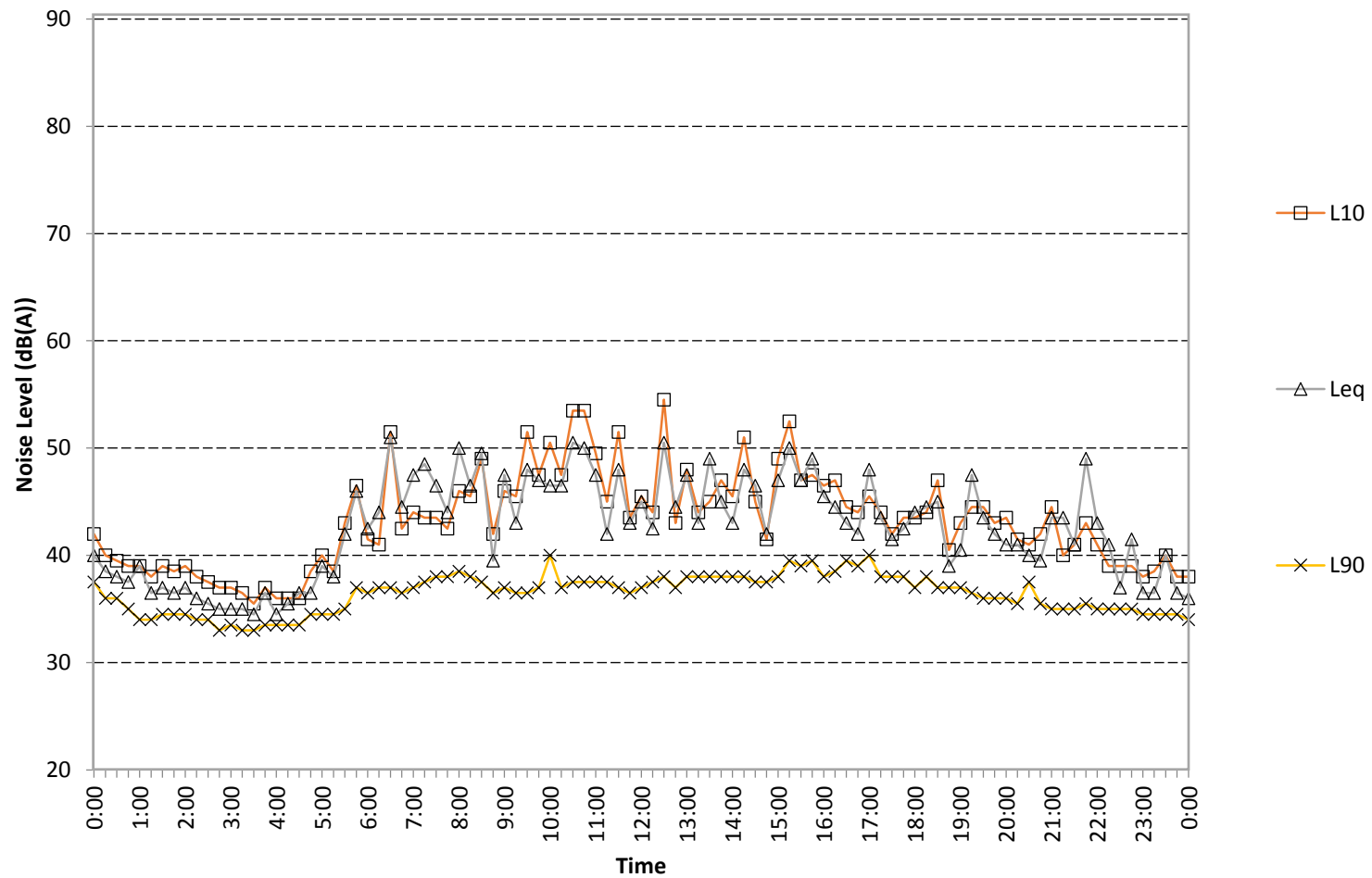
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Monday December 8, 2014



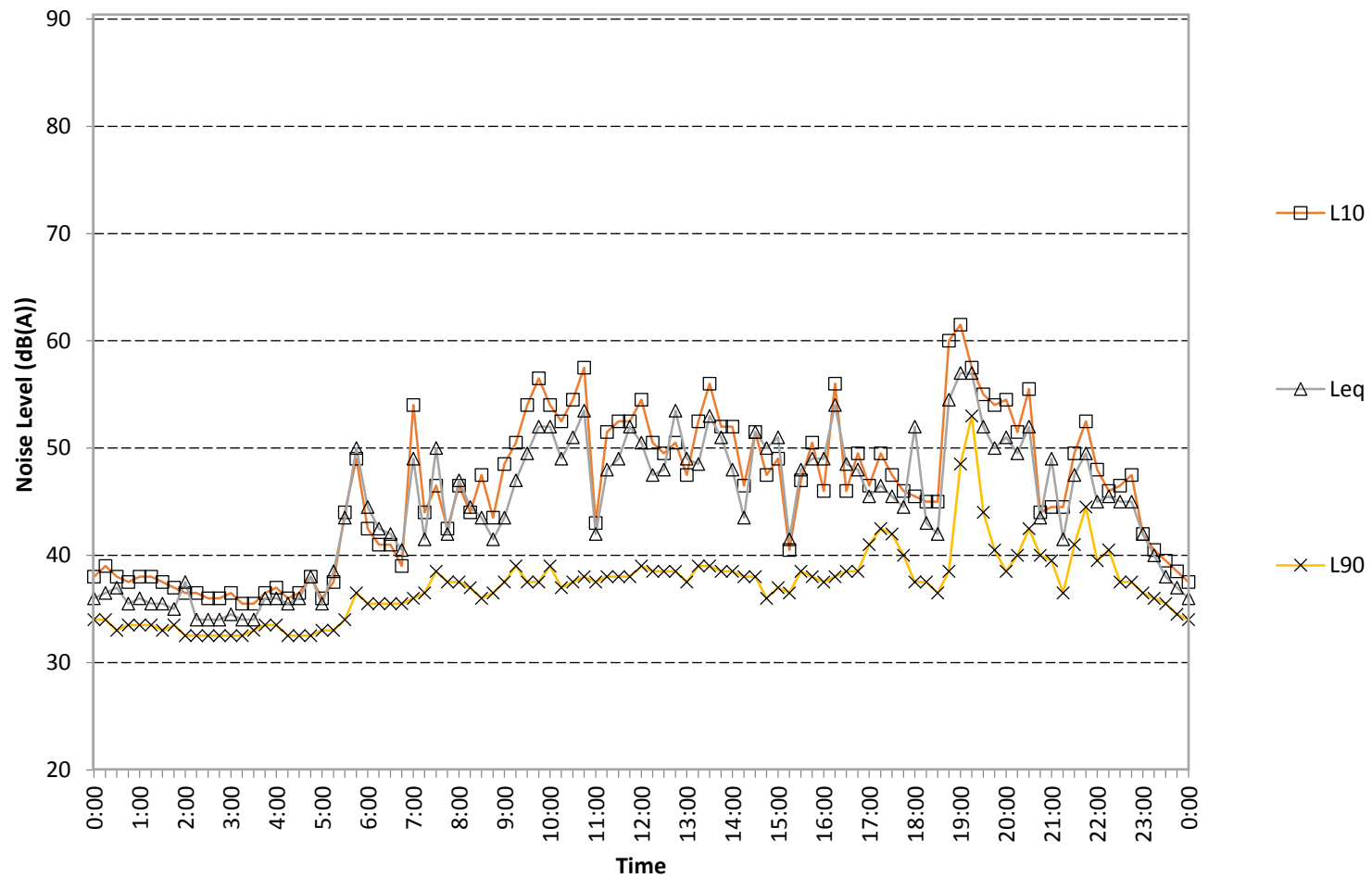
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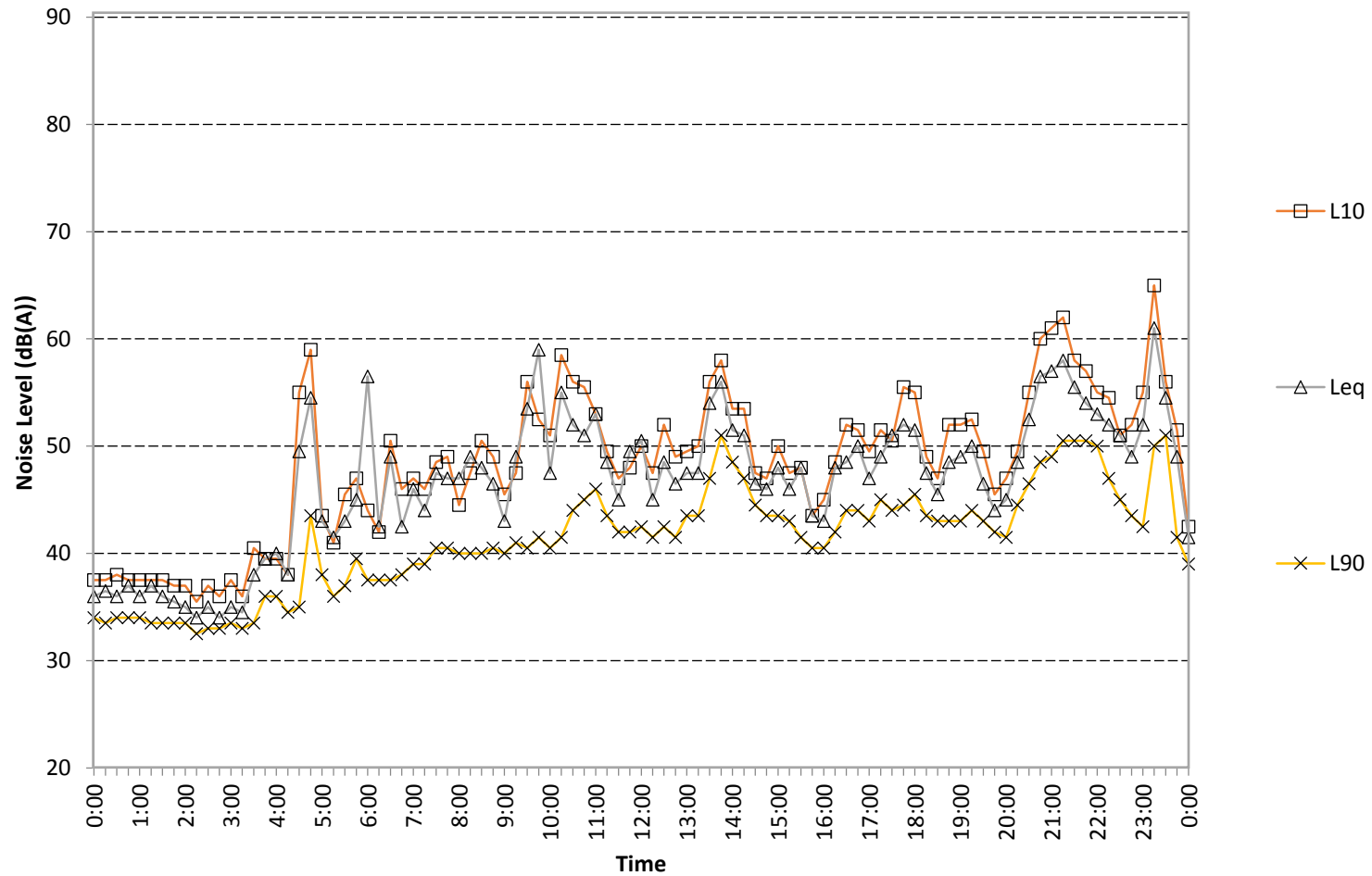
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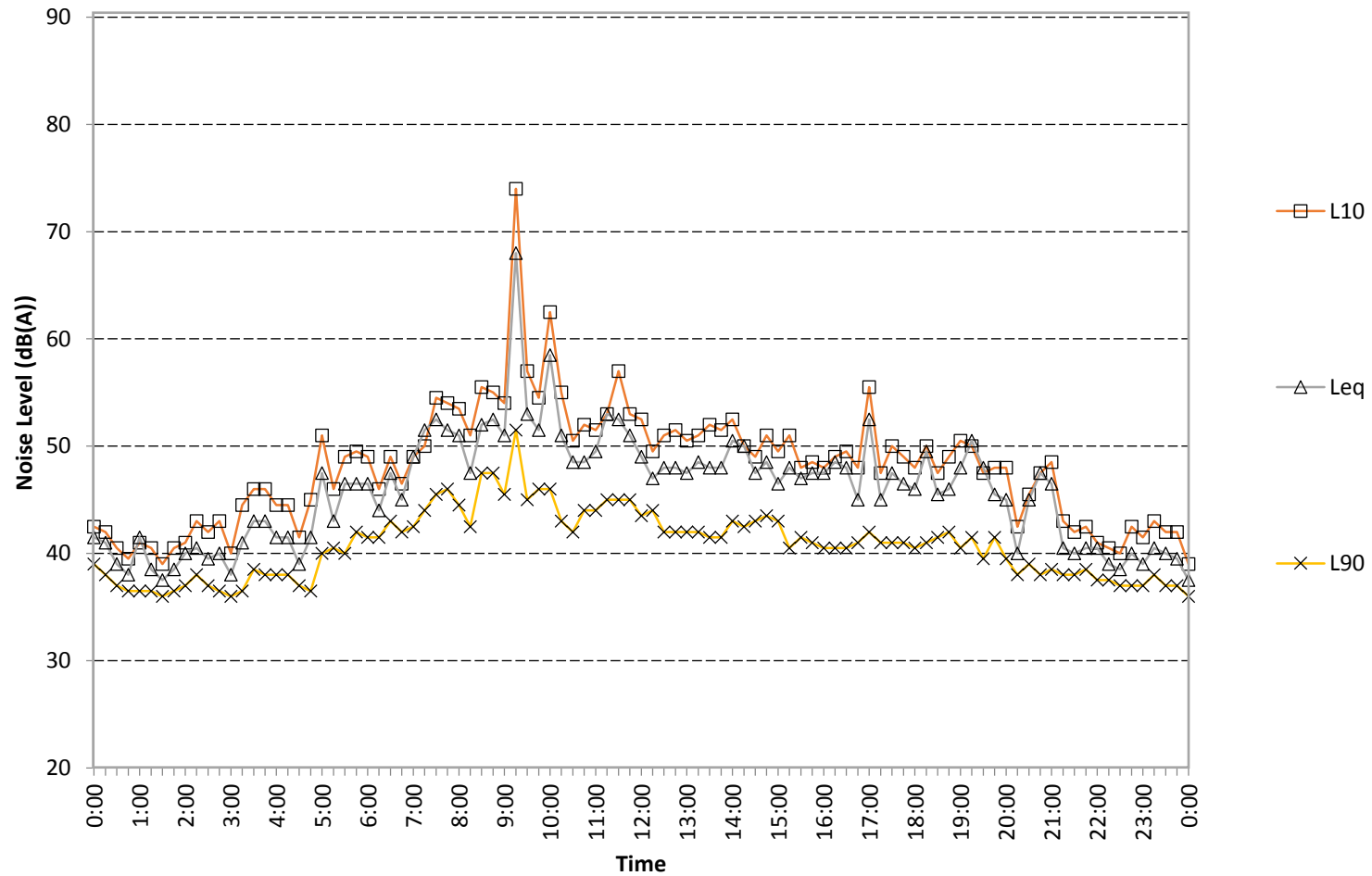
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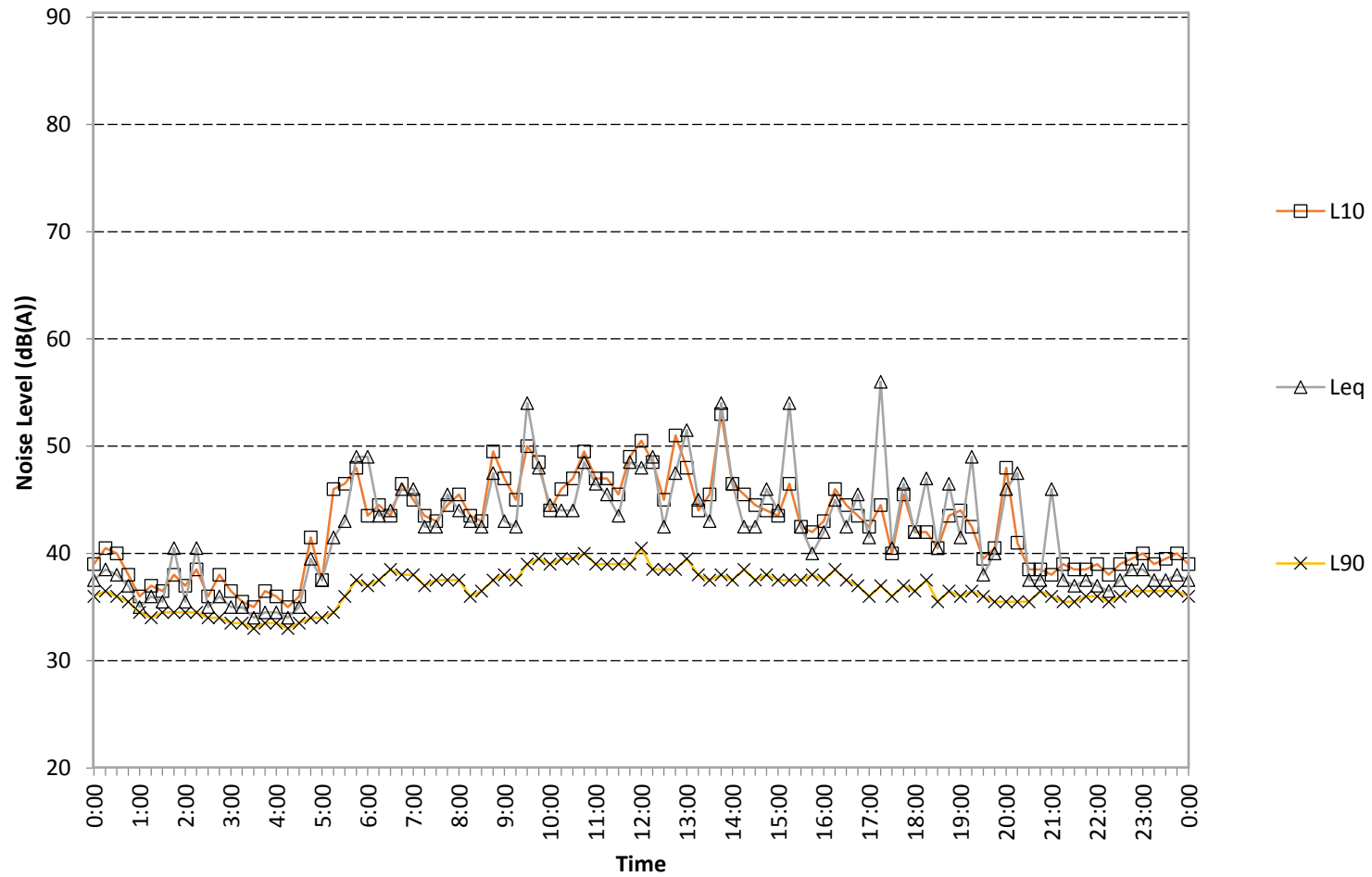
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Friday December 12, 2014



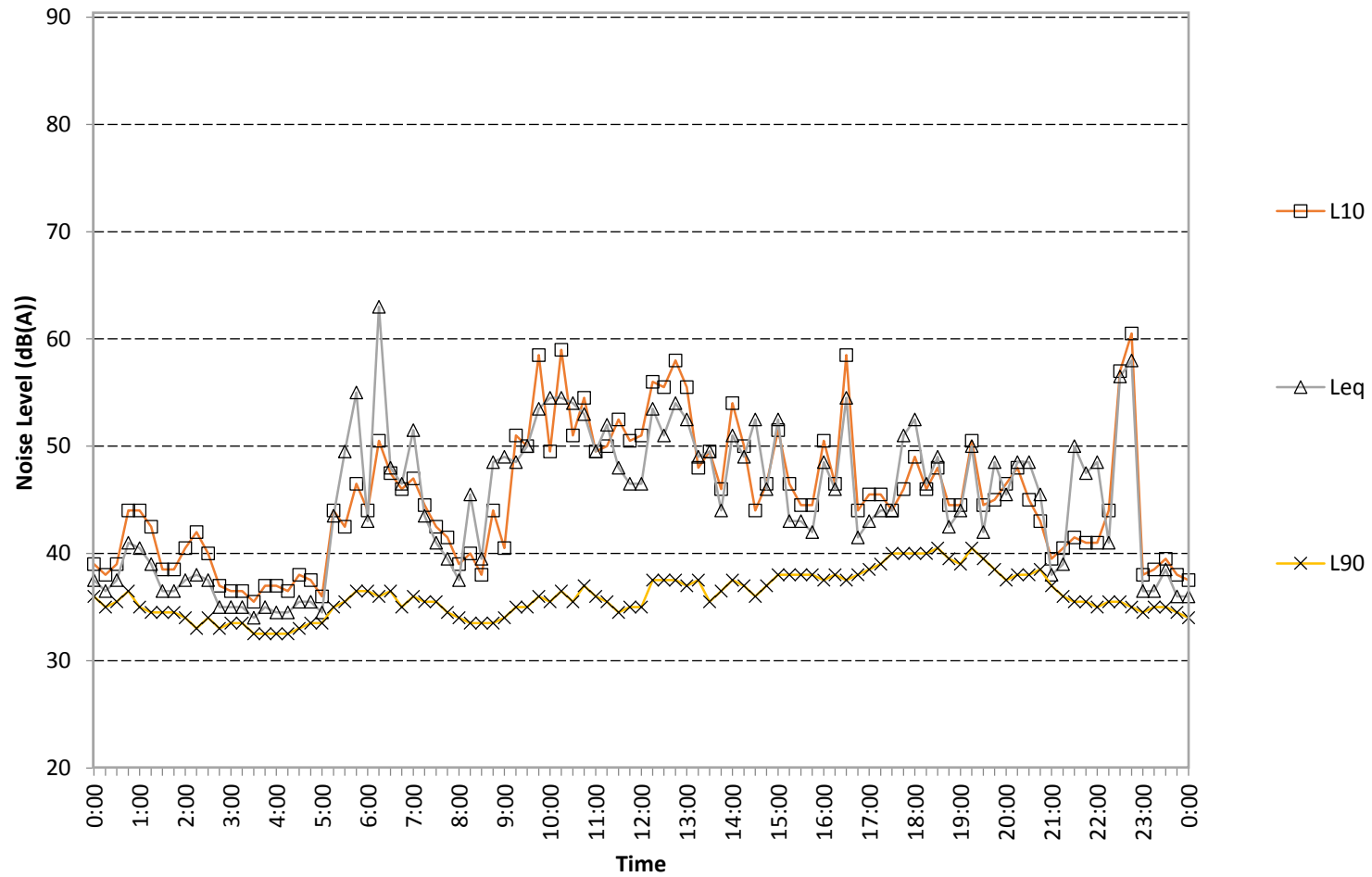
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Saturday December 13, 2014



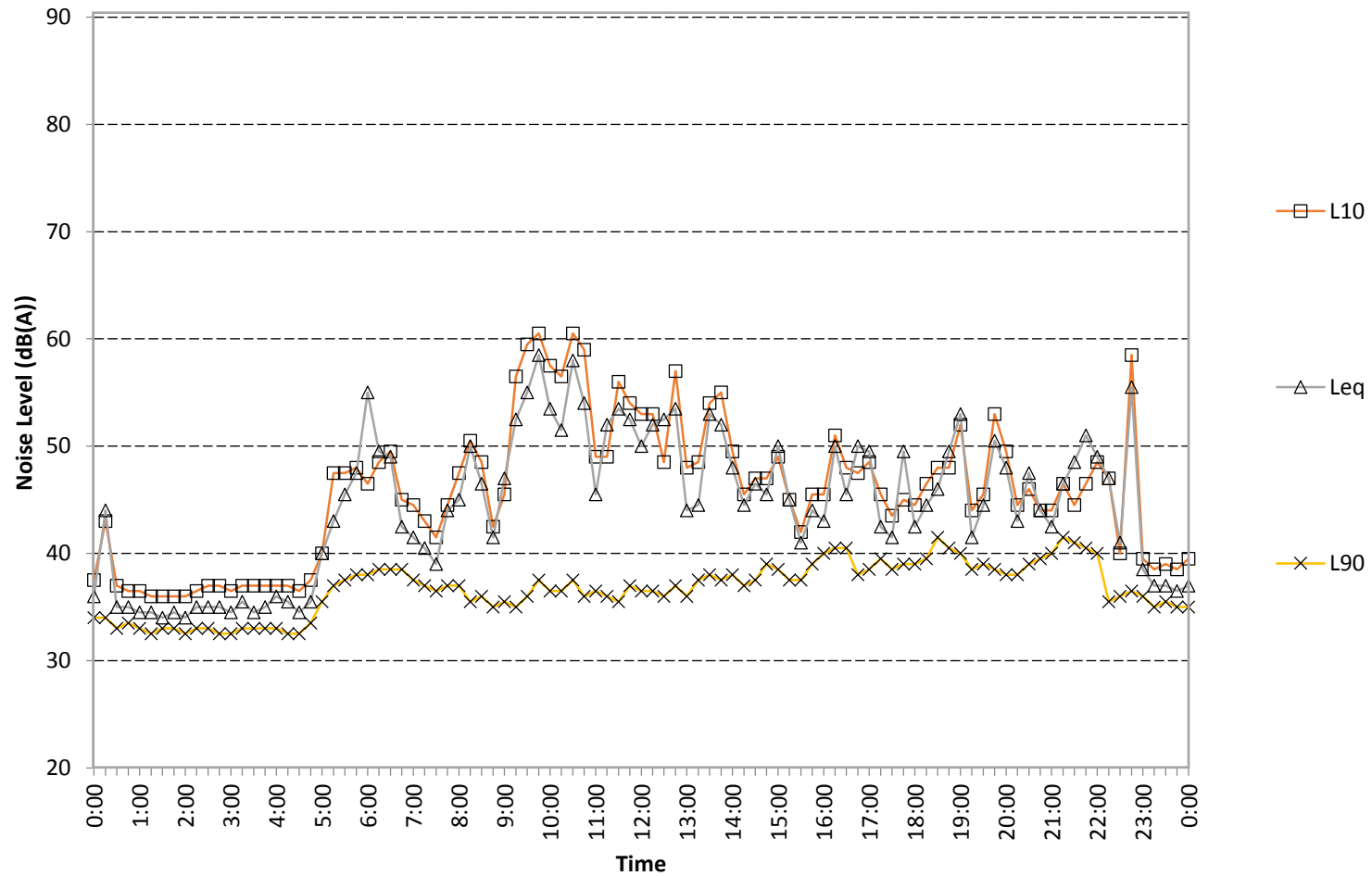
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Sunday December 14, 2014



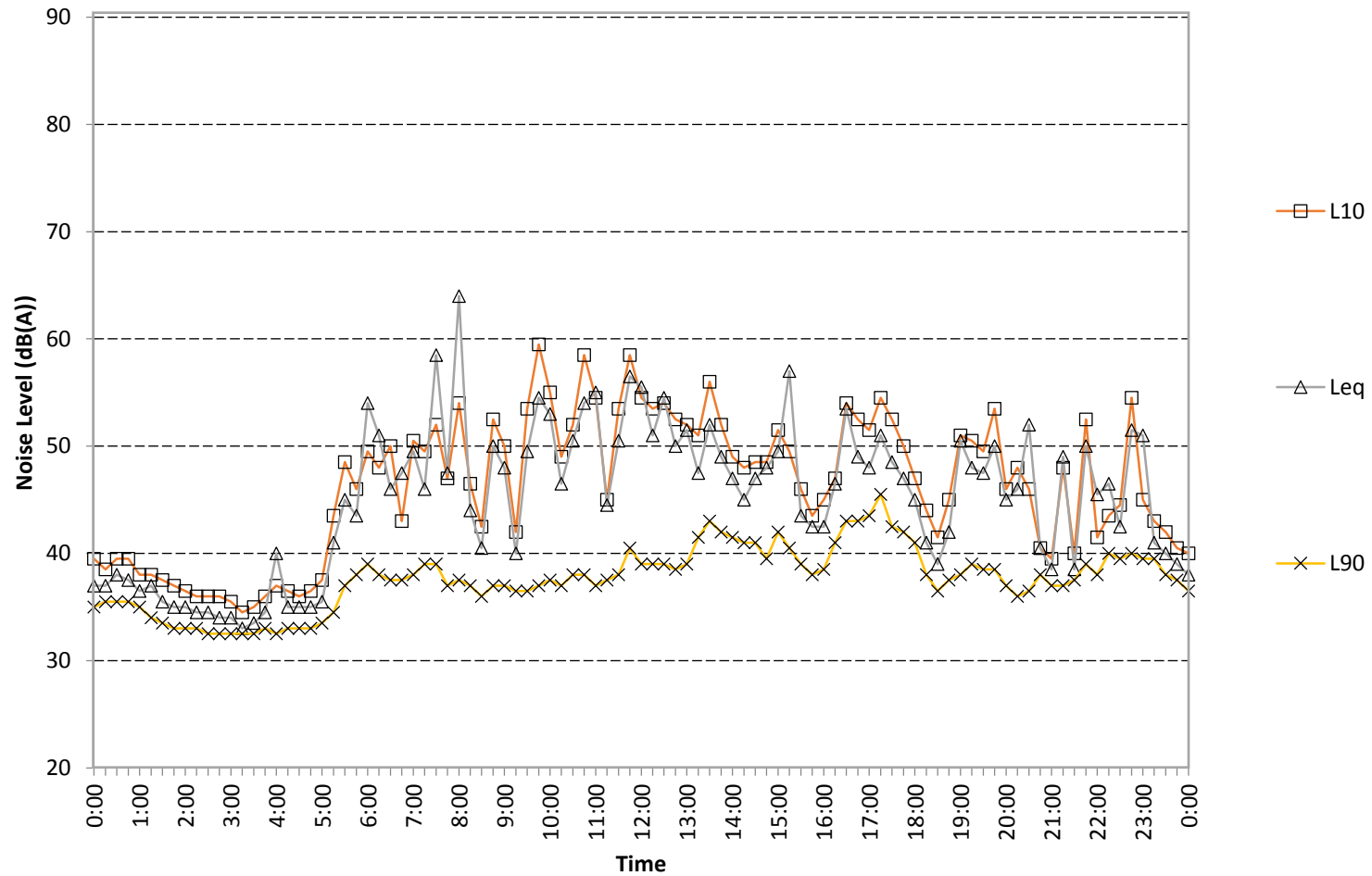
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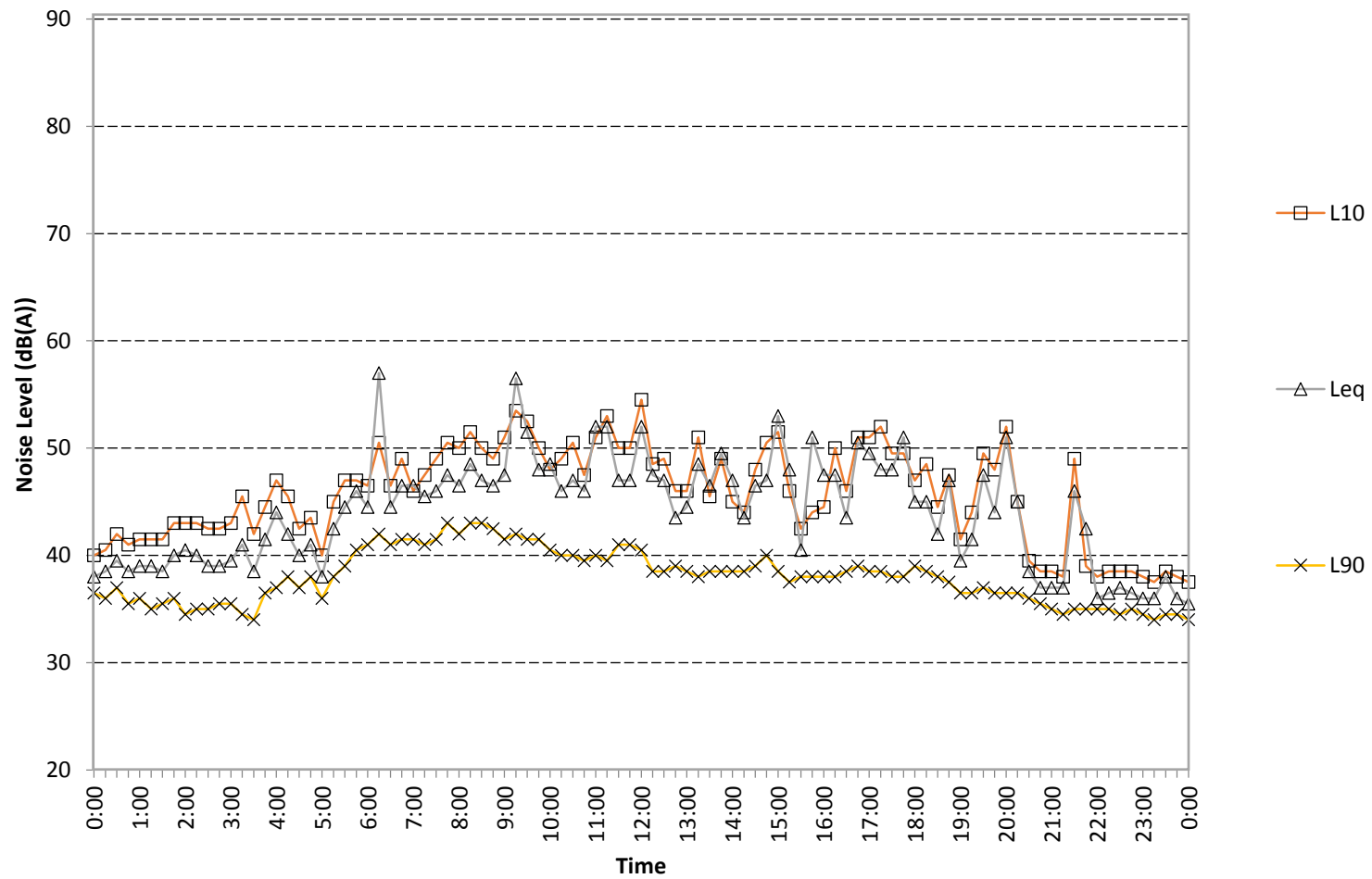
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Tuesday December 16, 2014



264-268 Pennant Hills Road, Carlingford

Wednesday December 17, 2014



264-268 Pennant Hills Road, Carlingford

Thursday December 18, 2014

