CHBP Hardware Development

Noise Impact Assessment

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8338 9888
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
11 068 954 343

The information in this document is the property of Acoustic Logic Consultancy Pty Ltd ABN 11 068 954 343 and shall be returned on demand. It is issued on the condition that, except with our written permission, it must not be reproduced, copied or communicated to any other party nor be used for any purpose other than that stated in particular enquiry, order or contract with which it is issued.

DOCUMENT CONTROL REGISTER

Project Number	2010860
Project Name	CHBP Hardware Development
Document Title	Noise Impact Assessment
Document Reference	2010860/0809A/R1/BW
Issue Type	Email
Attention To	Landcom Mr. Barney Oros

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	08/09/2010	2010860/0809A/R0/BW	BW		BW
0	25/11/2010	2010860/0809A/R1/BW	BW		BW

TABLE OF CONTENTS

1 INTRODUCTION

This report examines the potential environmental noise impact from the proposed Central Hills Business Park Hardware Development.

This report:

- Identifies appropriate noise emission assessment criteria.
- Identifies noise sources caused by proposed use of the hardware development.
- Assesses the predicted impacts against the developed criteria.
- Discusses the appropriate management and noise control measures that should be adopted to ensure that adverse impacts are not produced during the operation of the proposed facility.
- Formulate the external noise emission criteria.

This report has been prepared based on architectural plans Issued by Leffler Simes Architects dated June 2010.

Directors | Matthew Palavidis | Victor Fattoretto | Matthew Carter | Matthew Shields

Sydney | Ph 02 8338 9388 | fax 02 8338 9399 | 9 Sarah Street Mascot NSW 2020
Melbourne | Ph 03 9614 3199 | fax 03 9614 3755 | Level 7, 31 Queen Street Melbourne VIC 3000
Brisbane | Ph (07) 3211 5591 | fax (07) 3839 6194 | Level 6, North Point 231 North Quay Brisbane QLD 4000
Canberra | Ph 02 6162 9797 | fax 02 6162 9711 | Unit 14/71 Leichhardt Street Kingston ACT 2604

The information in this document is the property of Acoustic Logic Consultancy Pty Ltd a.b.n. 11 068 954 343 and shall be returned on demand. It is issued on the condition that, except with our written permission, it must not be reproduced, copied or communicated to any other party nor be used for any purpose other than that stated in particular enquiry, order or contract with which it is issued.

2 PROJECT DESCRIPTION

The proposed development includes a hardware store which will include a Garden Centre, main floor area, Trades Section, carpark and loading dock. The proposed development is detailed in figure 1 below.

2.1 POTENTIALLY MOST AFFECTED RECEIVERS

The nearest potentially affected residential properties are the existing properties (approximately 300m from the site) to the south and future residential properties which may be located (approximately 70m) to the west of the site on Camden Valley Way. All other surrounding areas to the proposed development are zoned commercial or industrial. Detailed site map and nearest noise receiver locations refer to Figure 1 below.

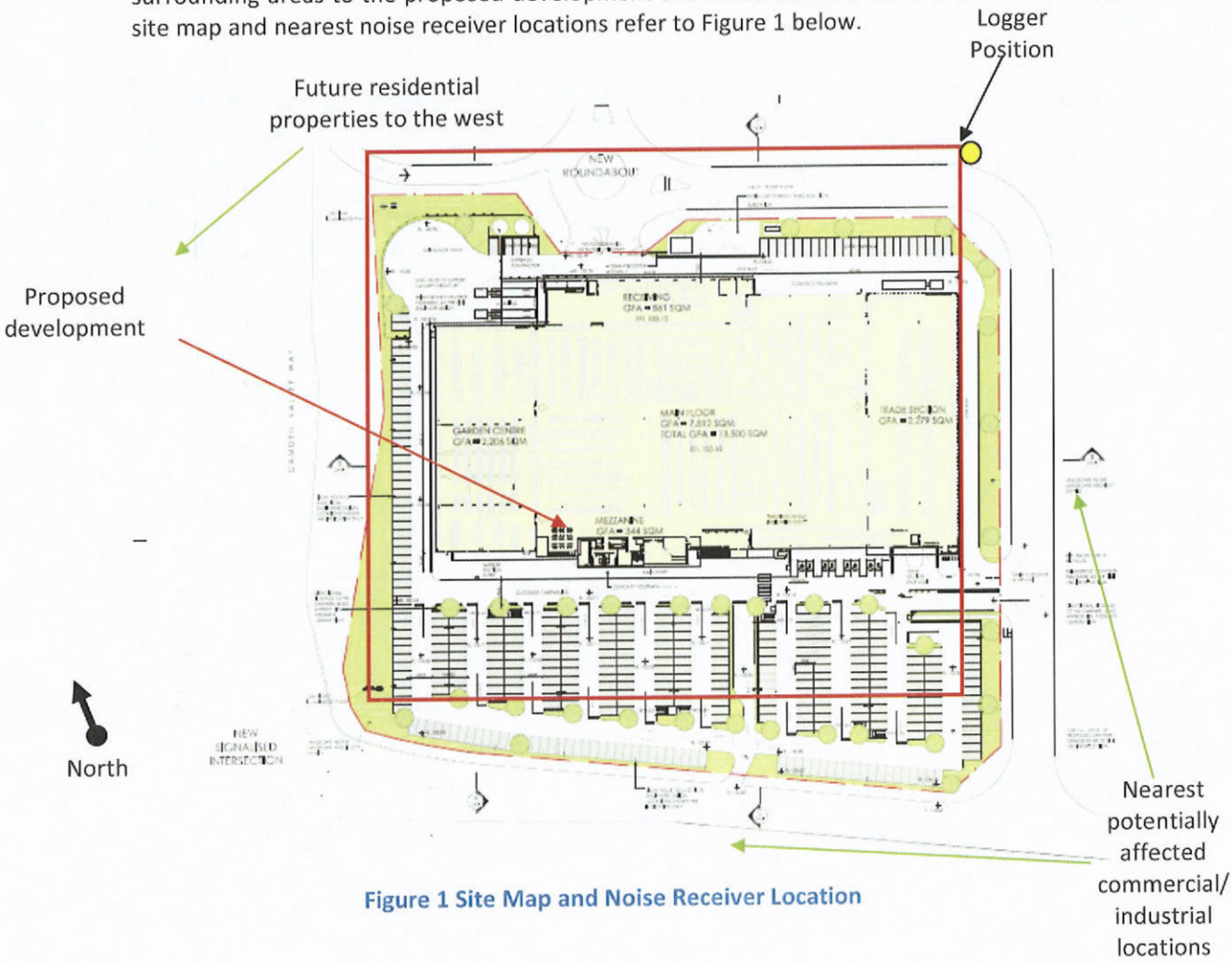


Figure 1 Site Map and Noise Receiver Location

2.2 AMBIENT NOISE MONITORING

2.2.1 Environmental 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 L10, L90 and Leq.

The L10 and L90 measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L10 parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L90 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 L90 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 L90 level.

The Leq 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. Leq 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.

2.2.2 Measurement Position and Equipment Used

Unattended noise monitoring was conducted between 24th August and 2nd September 2010 using an Acoustic Research Laboratories monitor set on A-weighted fast response mode. The monitor was calibrated before and after the measurements using a Rion Type NC-73 calibrator. No significant drift was recorded.

The monitor was installed at the site as shown in figure 1 above, the location was selected to provide indicative existing background noise levels at the nearest potentially affected residents.

2.2.3 Measured Noise Levels

Table 1 lists the representative minimum repeatable background noise level for the nearest affected receivers. Refer to Appendix for unmanned noise monitoring data.

Table 1 - Measured Background Noise Levels at Nearest Resident

Time	Background noise level L_{90} dB(A)
Day	37
Evening	36
Night	33

3 NOISE OBJECTIVES FOR CLUB ACTIVITIES

This section of the report presents the noise level criteria which this assessment has been conducted in conjunction with. The noise level criteria has been assessed in conjunction with the legislative requirements of the Department of Environment Climate Change and Water (DECCW) as detailed in this section of the report.

3.1 EXTERNAL NOISE EMISSION CRITERIA

The external noise emission from the project site shall comply with the requirements of the DECCW Industrial Noise Policy guidelines (INP). The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The DECCW Industrial Noise Policy has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion.

3.1.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at surrounding residential receivers only and requires that noise emissions measured using the Leq 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 were determined by long term, continuous noise monitoring conducted on site. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 2 - Intrusiveness Criteria (for residential receivers)

Time of day	Background Noise Level - dB(A) L_{90}	Noise Emission Objective dB(A) L_{eq}
Day	49	54
Evening	47	52
Night	42	47

3.1.2 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 DECCW'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 receivers (residential and commercial/industrial areas). They are rural, suburban, urban and urban/industrial interface. This site is directly neighboured by areas zoned as commercial/industrial with the potentially worst affected residential receivers approximately 300m from the site.

Table 8 of the policy provides the recommended ambient noise levels for the urban residential receivers and commercial/industrial 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.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

Table 3 - EPA Recommended Acceptable Amenity Noise Levels

Type of Receiver	Time of day	Recommended Acceptable Noise Level dB(A) L_{eq}
Residential	Day	55
	Evening	45
	Night	40
Commercial	When in use	65
Industrial	When in use	70

3.1.3 Sleep arousal

To minimise the potential for sleep arousal during the night time hours for 10pm to 7am the INP stipulated that the $L_{1\ (1\ minute)}$ noise level of any specific noise source should not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. The L_1 noise level is the level exceeded for 1 per cent of the time and approximates the typical maximum noise level from a particular source. Where the typical repeatable existing L_1 levels exceed the above requirement then the existing L_1 levels form the basis for, sleep disturbance criteria.

3.2 PROPOSED NOISE OBJECTIVES

Table 5 below provides a summary of our recommended assessment criteria applicable to the subjected site. The intrusiveness and amenity criteria for this project have been determined using the DECCW guidelines and measured background noise levels.

Table 4 - Noise Objectives for Nearest Residential Receiver

Receiver Type	Time of day	Measured Background Noise Level L_{90}	Intrusiveness Criteria L_{eq}	Amenity Criteria L_{eq}	Noise Emission Objective L_{eq}	Sleep Disturbance L_1 (1 Min)
Residential (Approximately 300m from the site)	Day	37	42	55	**42**	N/A
	Evening	36	41	45	**41**	N/A
	Night	33	38	40	**38**	**48**
Neighbouring commercial or Industrial*	All times of the day, evening and night	N/A	N/A	65	**65**	N/A

*Noise level criteria set as the potentially most stringent requirement based on DECCW requirements.

4 NOISE ASSESSMENT

4.1 METHODOLOGY

The main noise source in the proposed redevelopment will be associated with the carpark and loading dock associated with the development. Internal activities conducted within the future development will be significantly reduced by the building fabric and will not impact on any surrounding receivers, for this reason internal noise levels are not investigated further in this report.

The assessment of potential noise impact has been conducted to existing surrounding receivers as well as the potential residential receivers located opposite the site on Camden Valley Way.

4.2 ASSESSMENT OF LOADING DOCK ACTIVITIES

This section of the report presents the assessment of noise associated with the operation of the proposed loading dock associated with the development. The assessment was conducted in conjunction with the DECCW criteria presented in this report.

Loading dock deliveries would generally occur between 6:00am and 10:00pm Monday to Friday and 6am to 6pm Weekends and Public holidays.

The allowable daytime noise level based on DECCW criterion and background noise level measured at the site. The assessment criterion includes the following:

- Residential receivers - Day - 42 dB(A) L_{eq}
  - Evening 41 dB(A) L_{eq}
  - Night 38 dB(A) L_{eq} and 48 dB(A) L_1
- Commercial/Industrial receivers – 65 dB(A).

4.2.1 Potential Loading Dock Noise Sources

The potentially significant loading dock noise sources are listed in Table 5 below along with noise emission levels. The emission levels in Table 5 have been obtained from noise monitoring carried out at similar warehouse and retail loading dock facilities. Noise measurements were obtained using a Norsonics SA 110 sound level meter, set to fast response. The sound level meter was calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was recorded.

Table 5 - Noise Source Emission Levels

Noise Source	Sound Emission Level dB(A) at 7m	Type of Noise Source
Small Truck Reversing alarm	75(1)	Quasi-Steady, tonal
Trucks Manoeuvring/Reversing	75	Quasi-Steady
Truck Air Brakes	89	Transient
Truck Door Closing	75	Transient
Truck Starting	72	Transient

(1) A 5 dB(A) penalty has been applied to this source to account for the tonal characteristic of noise produced.

4.2.2 Predicted Noise Levels At Most Affected Receivers

Noise levels at the worst affected receivers have been predicted based on the noise emission levels in Table 5, which are typical for this type of development.

Table 6 summaries the predicted noise levels at the nearest receivers to the development. The noise levels below assume the acoustic treatments detailed in this report are adopted.

Table 6 – Assessment of Loading Dock Noise Emissions

Location/Activity	Receiver	Predicted Noise Level at Residence $L_{eq,15min}$	Allowable Noise Level at Residence $L_{eq,15min}$
Truck Loading/Unloading(1) Loading Dock	Residential receivers	< 35dB(A) Day < 35dB(A) Evening < 35dB(A) Night	42 dB(A) Day 41 dB(A) Evening 38 dB(A) Night
	Commercial/industrial Receivers	<50 dB(A) Day <50 dB(A) Evening <50 dB(A) Night	65 dB(A) Day 65 dB(A) Evening 65 dB(A) Night

1 - These activities include activities such as the delivery truck being idle in the dock, movement of pallet trucks, operation of compactors, etc.

4.2.3 Recommended Loading Dock Development Controls

It is recommended that the following management and physical controls be implemented into the design and operation of the proposed loading dock associated with the development (the assessment has been conducted based on the basis that a maximum of two trucks will arrive and/or depart during the morning period of 6am to 7am):

1. No additional acoustic treatments or controls required to the loading dock area.

2. Operating hours for the loading docks, deliveries, garbage removals, etc to be between 6am and 10pm Monday to Friday and 6am to 6pm Weekends and public holidays.

4.3 CARPARK

1. An acoustic assessment of the proposed car park area of the development (including 375 carparking spaces) has been conducted in this report. The assessment including calculation to investigate the potential noise impacts on the receivers in conjunction with the noise level criteria detailed in this report. The investigation revealed that no additional acoustic treatments are required to the proposed carparking area to ensure compliance with the relevant criteria.

4.4 BUILDING SERVICES NOISE

As detailed building services selections have not been conducted at this time, an acoustic assessment of noise impact can not be conducted.

A detailed services noise assessment will be conducted once plant selections and services drawings have been finalised as part of the construction documentation. Based on experience with similar development acoustic treatments are both possible and practical using acoustic treatments such as lining of ductwork, acoustic silences, variable speed controllers, time switches, acoustic screens etc.

Based on previous experience compliance with criteria detailed in this report is both possible and practice and will insure noise impacting on surrounding receivers does not reduce their acoustic amenity using treatments such as lined ductwork, acoustic screens, variable speed controllers and the like.

During this assessment a preliminary review of mechanical plant was conducted and the following major plant items being identified.

1. Ventilation Equipment

   Treatment of ventilation equipment associated with the development will be effectively treated with acoustic treatments such as selection of quietest practicable plant, appropriate enclosures, silencers, internal lining of ductwork, etc.

2. Roof top Cooling Equipment

   During this report a preliminary assessment of noise associated with the operation of roof top cooling and ventilation equipment was conducted. The assessment revealed that compliance with DECCW guidelines at all times of the day or night will be acoustically possible and particle using treatments such as screening and the like.

Experience with similar projects indicates that it would be possible to achieve the DECCW requirement with appropriate treatment of the plant. This treatment would be determined in detail at the Construction Certificate stage when greater detail regarding the proposed plant would be available.

5 CONCLUSION

Noise impacts caused by the operation of the proposed Central Hills Business Park Hardware Development have been assessed in this report. The report investigates potential noise impacts from activities on the site including the store areas, loading dock and carpark areas to nearby residential, commercial and industrial properties. The assessment has been conducted in accordance with the requirements of the DECCW Industrial Noise Policy guidelines, to determine the potential for adverse impacts to occur on amenity.

Noise emissions will comply with DECCW guidelines provided that the recommendations set out in this report are implemented.

Report prepared by

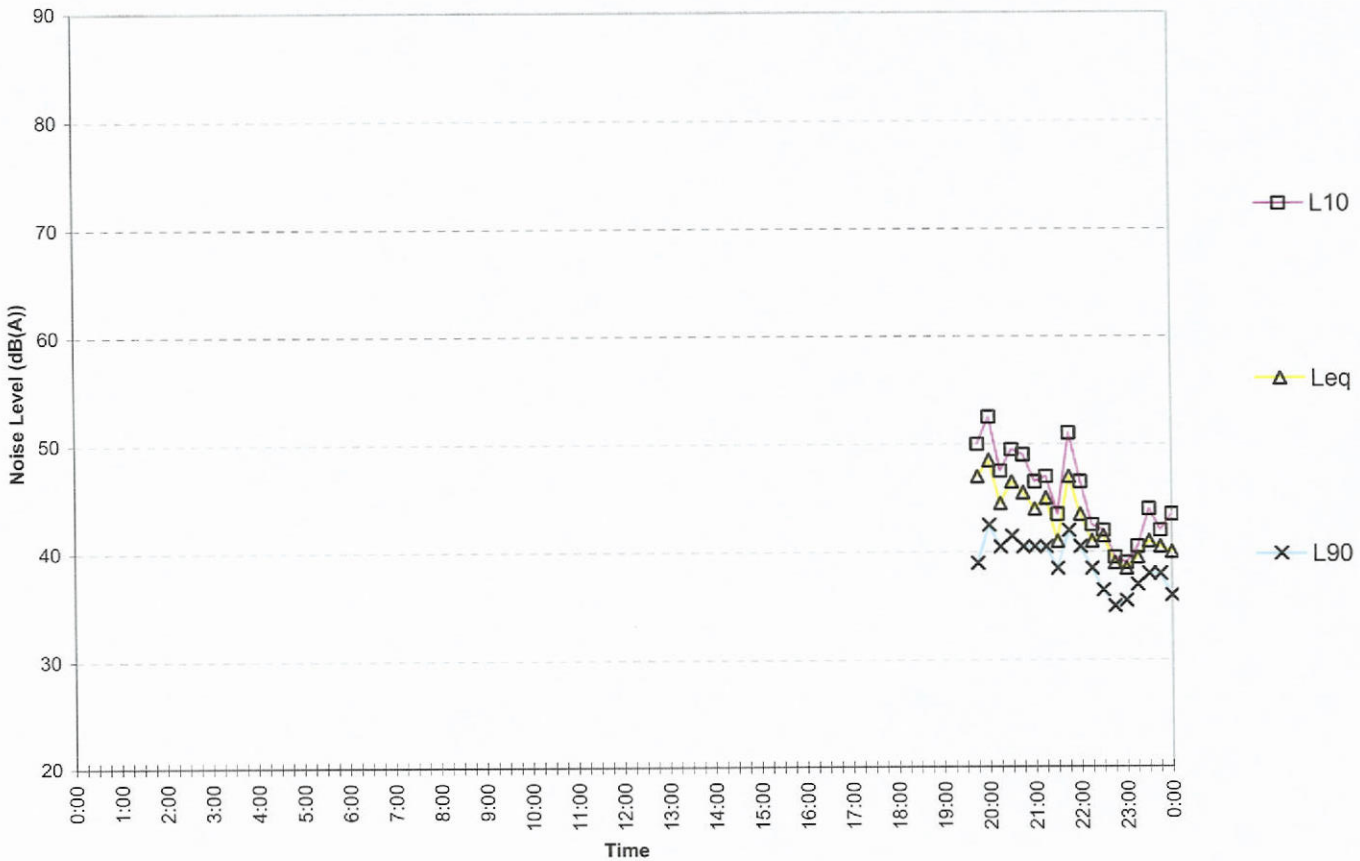
ACOUSTIC LOGIC CONSULTANCY PTY LTD
Ben White

Appendix A

Unattended Noise Monitoring

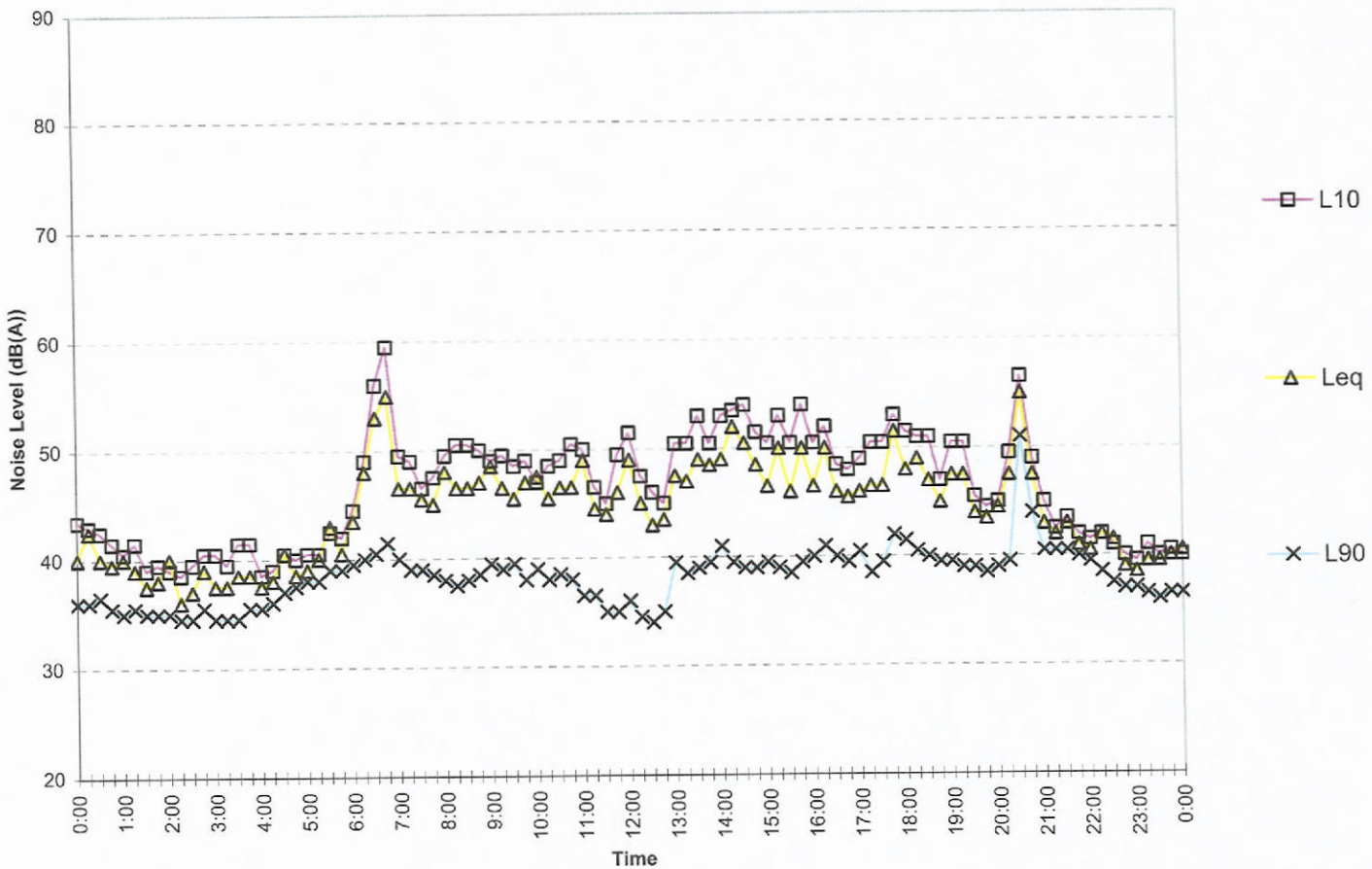
CHBP - Hardware Development

Tuesday August 24,2010



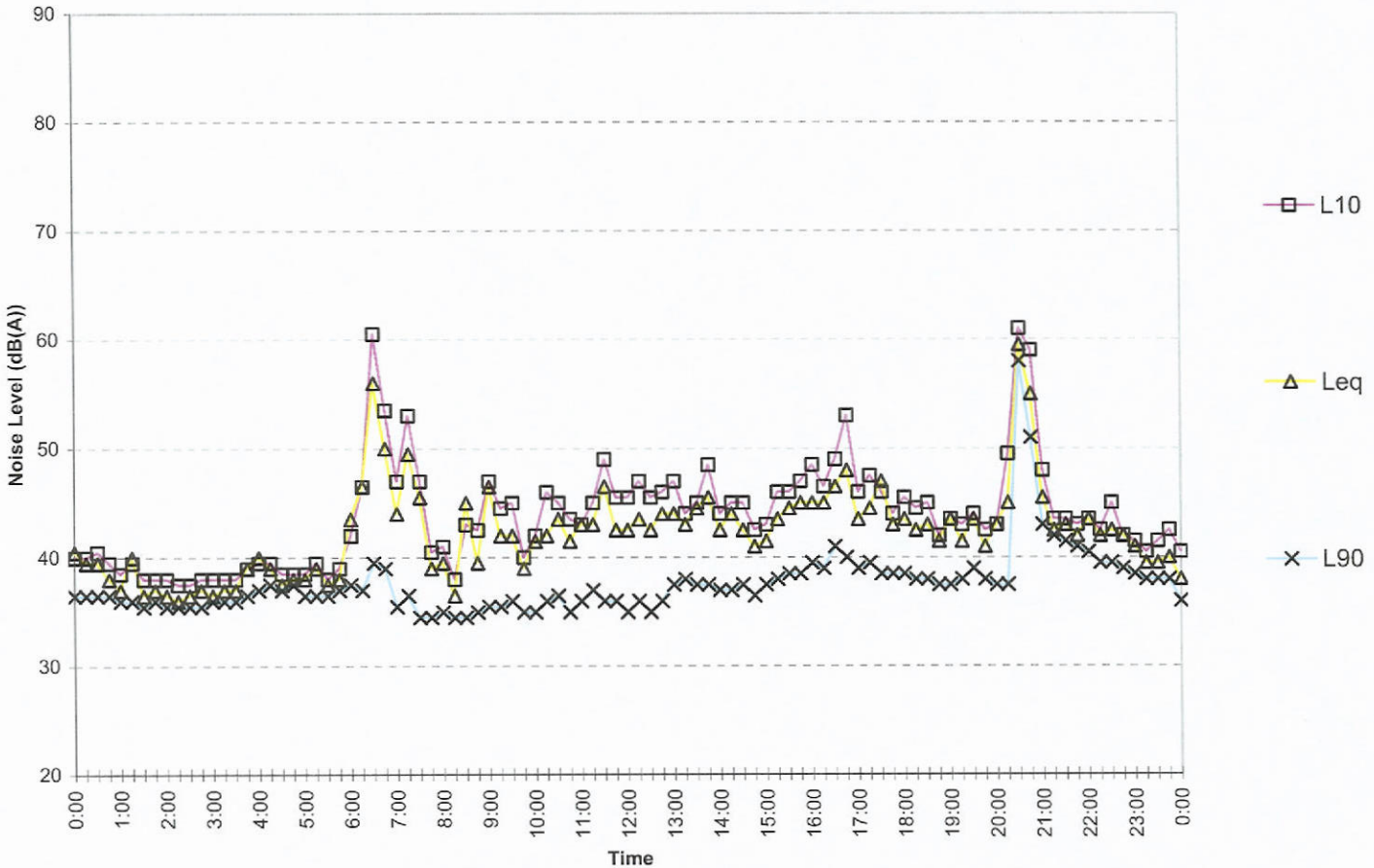
CHBP - Hardware Development

Wednesday August 25,2010



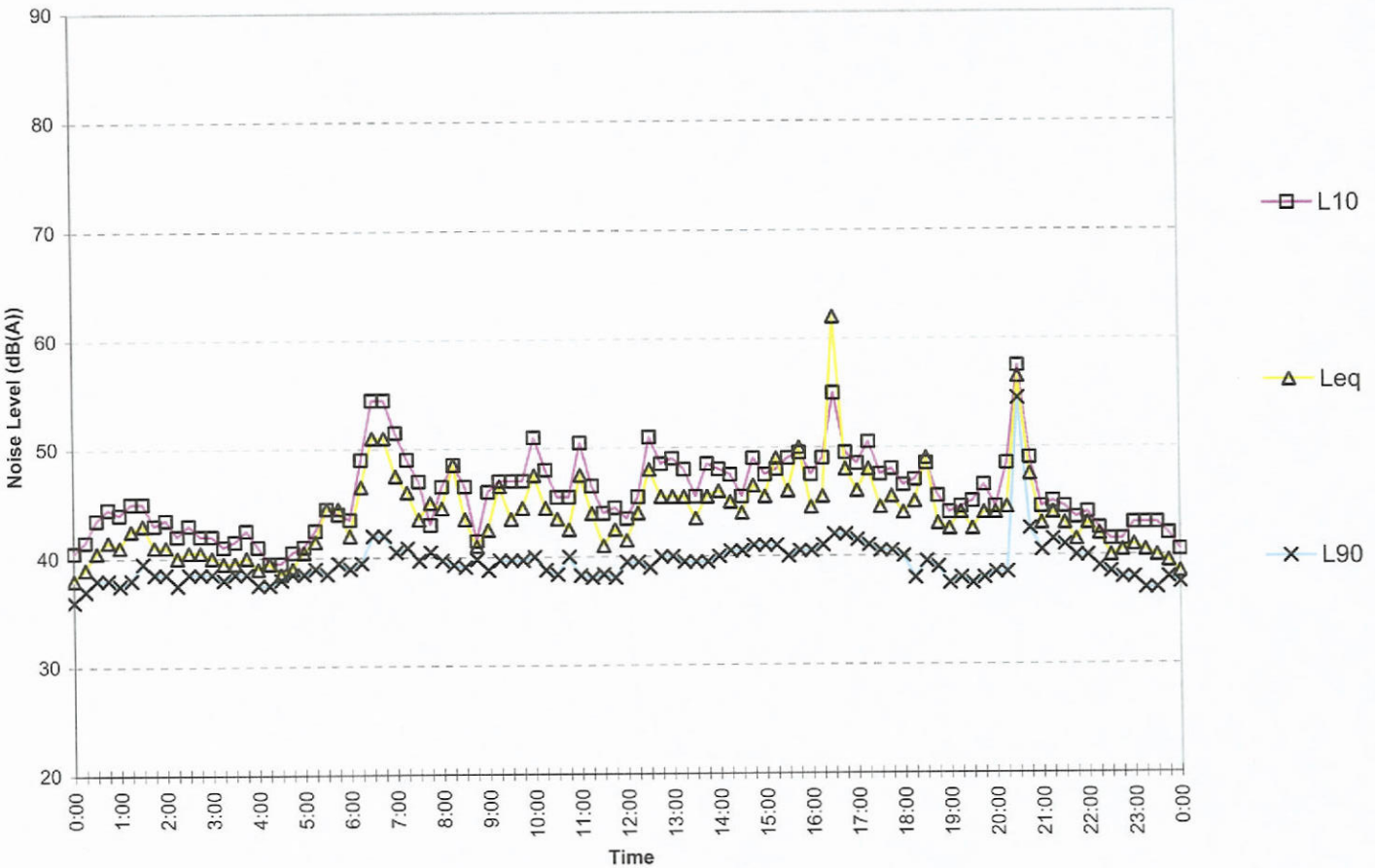
CHBP - Hardware Development

Thursday August 26,2010



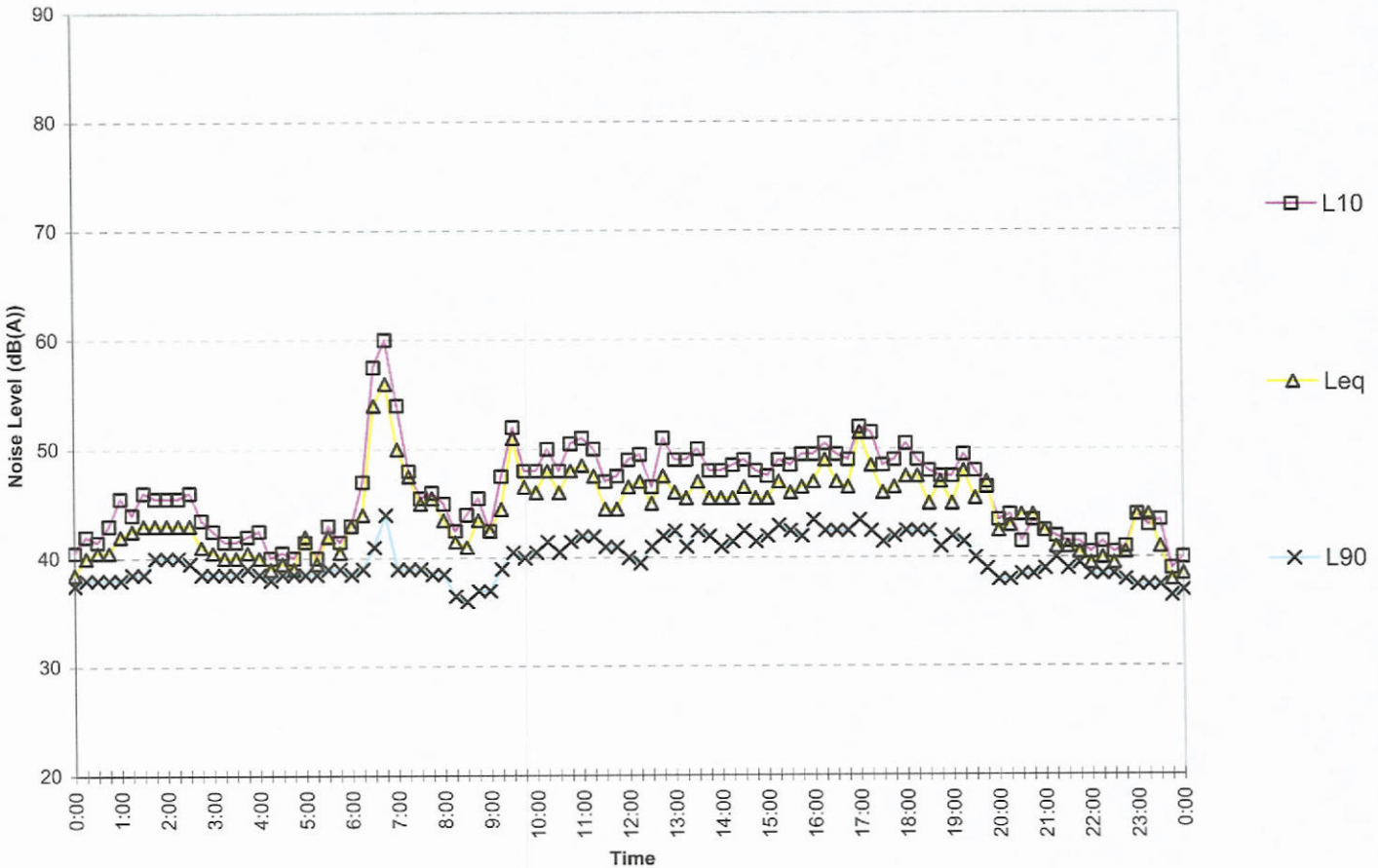
CHBP - Hardware Development

Friday August 27,2010



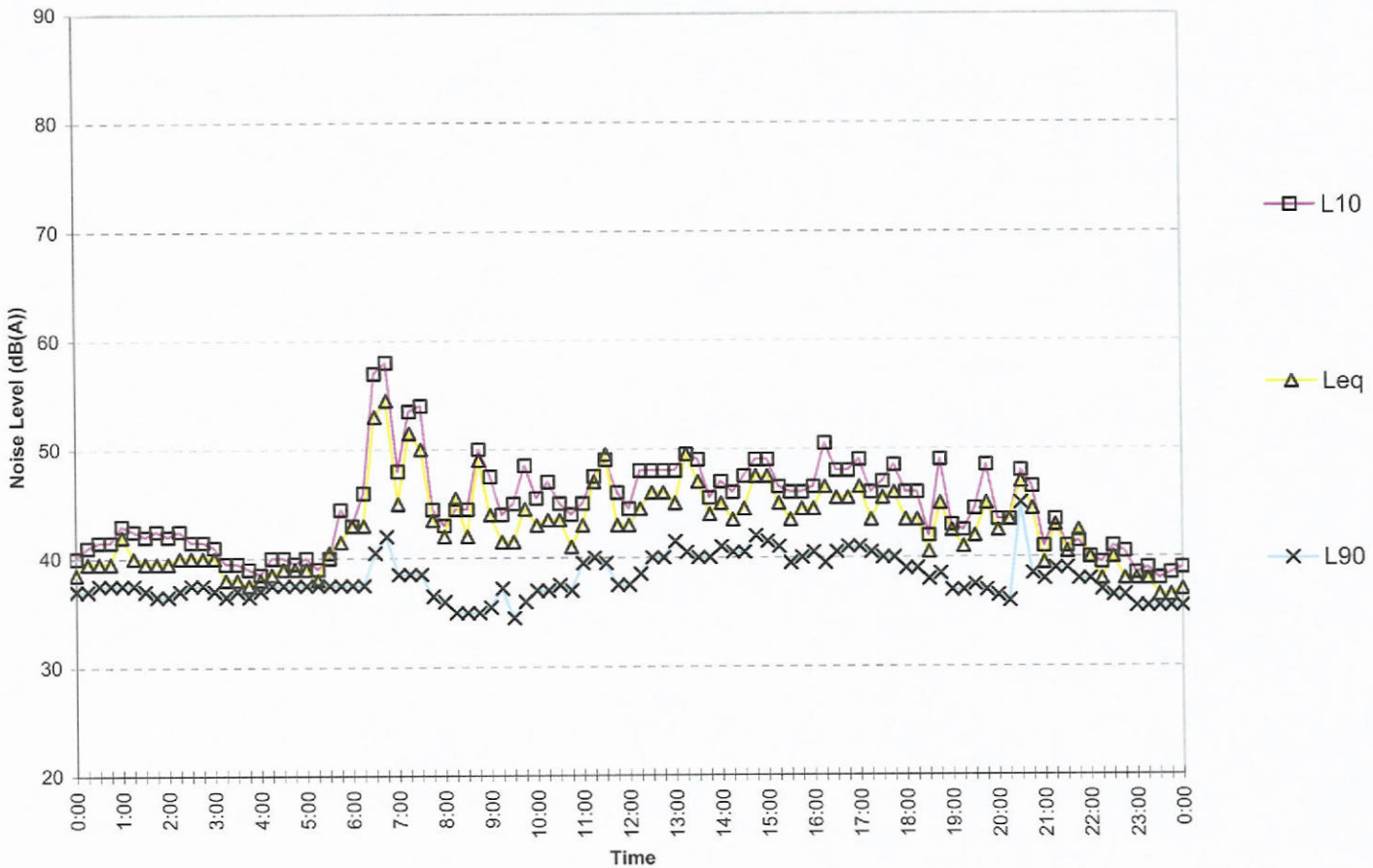
CHBP - Hardware Development

Saturday August 28,2010



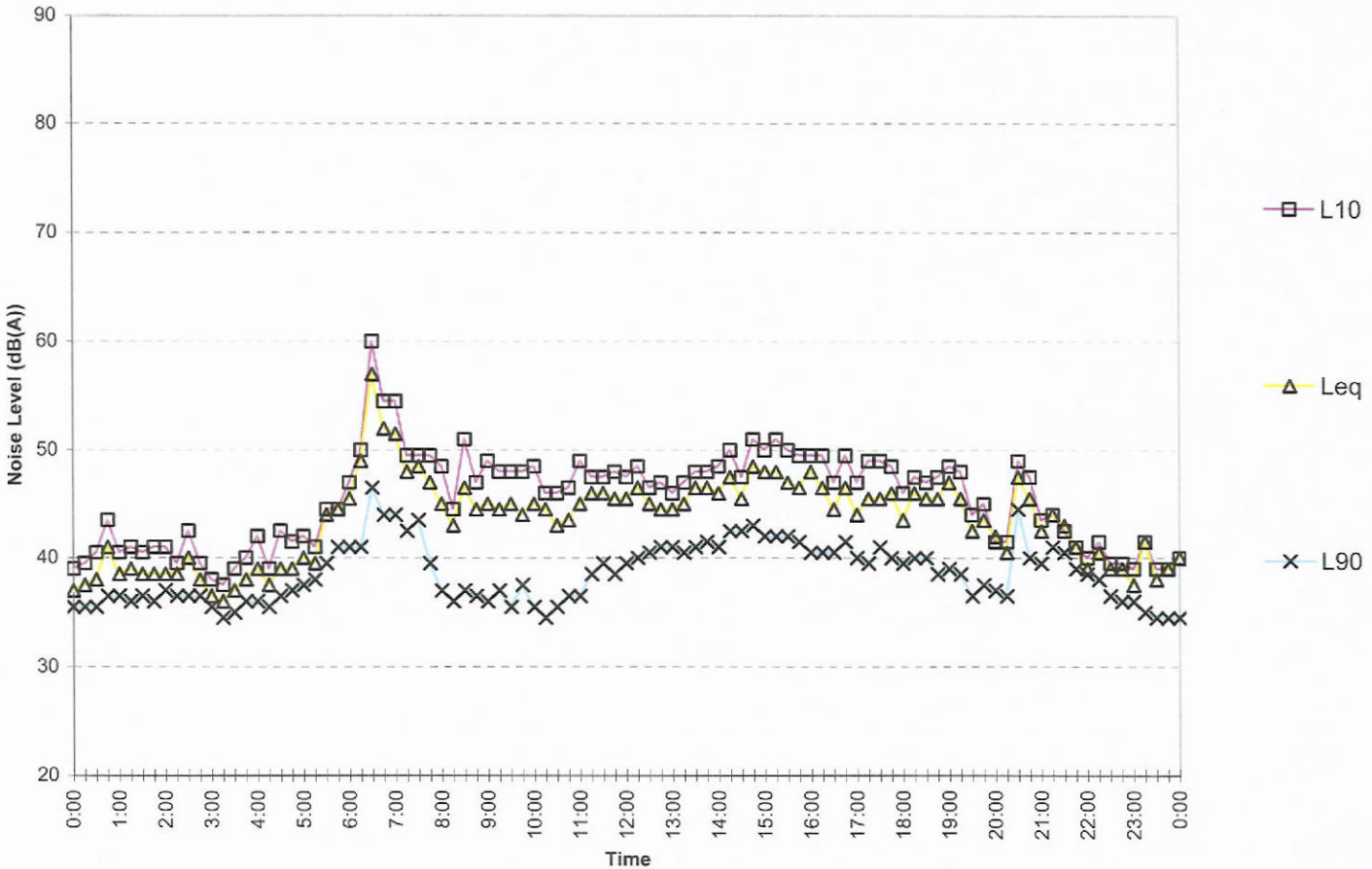
CHBP - Hardware Development

Sunday August 29,2010



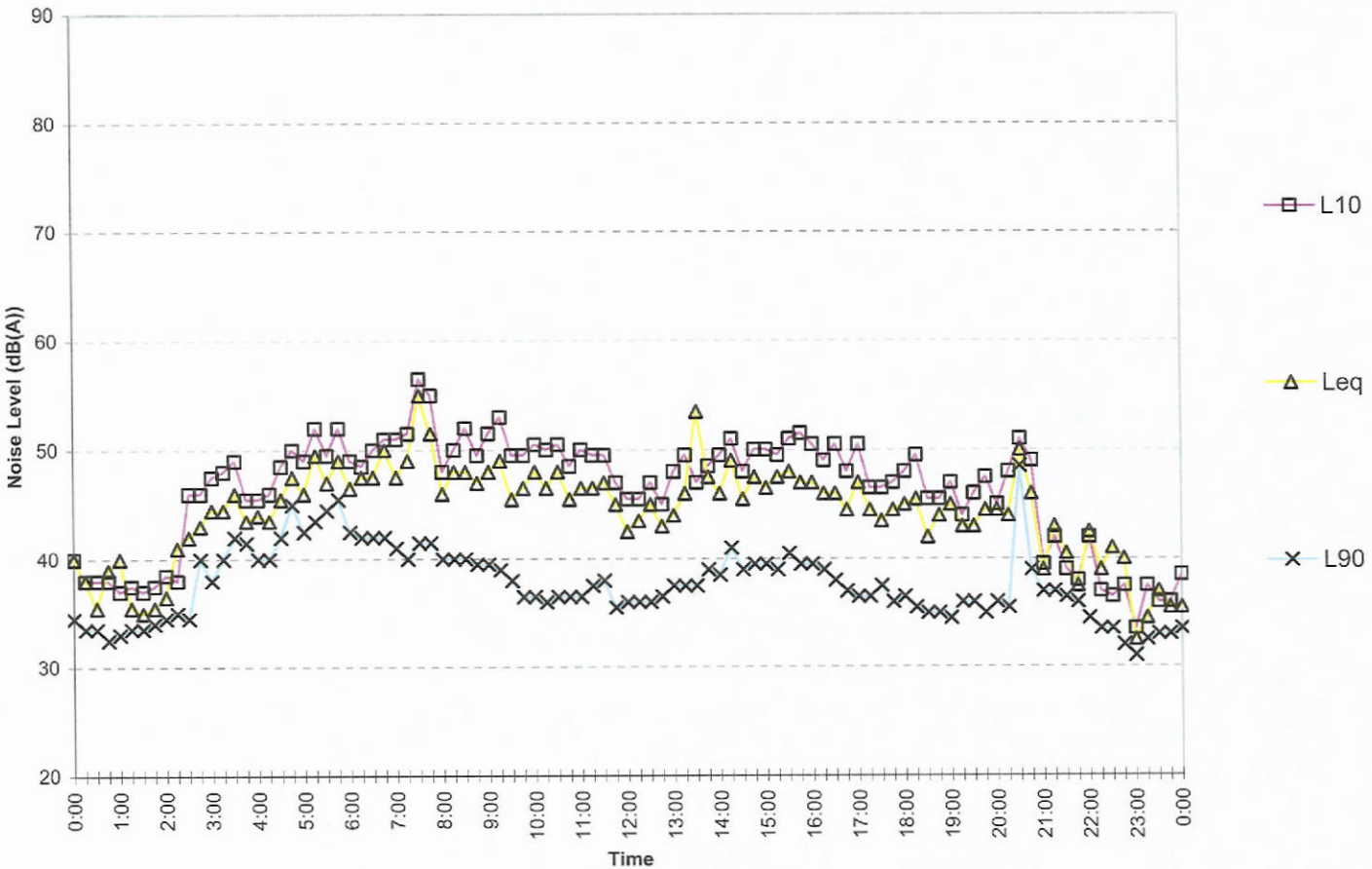
CHBP - Hardware Development

Monday August 30, 2010



CHBP - Hardware Development

Tuesday August 31,2010



CHBP - Hardware Development

Wednesday September 1,2010

CHBP - Hardware Development

Thursday September 2,2010