888 Pittwater Road, Dee Why

Construction Noise and Vibration Management Plan

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TABLE OF CONTENTS

1 INTRODUCTION

This report presents our assessment of the processes which will be followed in order to manage noise and vibration from the demolition, excavation and construction activities of Dee Why Town Centre Development, Dee Why.

This report is prepared in order to satisfy the requirements below:

- DA 2014/0805 – (demolition) conditions 3, and note on page 17 of 19
- DA 2015/0612 – (excavation) condition 4(i) ,47 and note on page 31 of 33

In recognition of the requirement to minimise noise and vibration emissions from the site to adjacent land uses, we have commissioned this study. The principal objective of this study is to undertake an evaluation of work to be performed during the excavation and construction phases of the project and forecast the potential impact of noise and vibration. The evaluation will be used to formulate and streamline effective regulation and mitigation measures.

The principal issues, which will be addressed in this report, are:

1. Specific activities that will be conducted and the associated noise/vibration sources,
2. Identification of all potentially affected noise/ vibration sensitive receivers,
3. The development, hours of work and excavation period,
4. The construction noise/ vibration objective specified in the conditions of consent,
5. Noise/ vibration monitoring, reporting and response procedures,
6. Assessment of potential noise/ vibration from the proposed excavation activities,
7. Contingency plans to be implemented in the event of non-compliances and/or noise complaints.

2 SITE DESCRIPTION & PROPOSED DEVELOPMENT

The proposed development located between Howard Ave and Oaks Ave, Dee Why, involves a mixed use development with the following key features:

- Three level basement;
- Medium rise residential towers and landscaped terraces; and
- Tower lift cores; and

Site investigation indicates that the nearest noise / vibration receivers are:

- **Residential Receiver 1:** Adjacent to Howard Avenue to the north of the project site is a multistorey mixed use development located at 12 Howard Avenue.
- **Residential Receiver 2:** Bounding the project site to the south-west is a multistorey residential development located at 10 Oaks Avenue
- **Residential Receiver 3:** Bounding the project site to the east is a multistorey residential development located at 23 Howard Avenue
- **Commercial Receiver 4:** To the south-east of the project site are the nearest commercial developments at 30-34 Oaks Avenue

This is further detailed in the aerial photo below in Figure 1.

Primary noise producing construction activities associated with the site as follows:

- Demolition
- Excavation
- Auger piling
- Construction

An aerial photo of the site and surrounding development is shown below.

Figure 1: SiteAerial Photograph

Unattended Background Noise Measurement

3 HOURS OF OPERATION

Development application DA2015/0612 Condition 4 states the following:

Building construction and delivery of material hours are restricted to:

- 7.00 am to 5.00 pm inclusive Monday to Friday,
- 8.00 am to 1.00 pm inclusive on Saturday,
- No work on Sundays and Public Holidays.

Demolition and excavation works are restricted to:

- 8.00 am to 5.00 pm Monday to Friday only.

4 EXISTING BACKGROUND NOISE LEVELS

Two unattended background noise monitors have been setup around the project site to record the existing background noise levels with detailed locations below:

- Location 1: This noise monitor was located to the west of the project site between the 5th and 11th December 2014.
- Location 2: This noise monitor was located on the eastern side of the project site between the 8th and 15th February 2016. It is noted that this monitoring was conducting during civil works of the development, and as such only background noise levels outside of construction hours were used in determining the background noise level (between 5pm-6pm)

Equipment used consisted of two Acoustic Research Laboratories Pty Ltd noise loggers. The loggers were programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode. There were no significant periods of adverse weather conditions during the measurement period.

The results of the monitoring are summarised in the following table.

Table 1 – Measured Rating Background Noise Level

Location	Time of Day	Rating Background Noise Level dB(A) L_{90}
Location 1	7am-6pm	50
Location 2*	7am-6pm	50

*Noise levels are taken only between 5pm-6pm outside of construction hours, and used to determine the day time background noise level.

5 CONSTRUCTION NOISE AND VIBRATION OBJECTIVES

5.1 NOISE

Noise associated with the demolition, excavation and construction activities on the site will be assessed in conjunction with the requirements below.

5.1.1 Requirements by Council

DA2014/0805 Condition 3h: All sound producing plant, equipment, machinery or fittings will not exceed more than 5dB(A) above the background level when measured from any property boundary and will comply with the Environment Protection Authority's NSW Industrial Noise Policy.

DA2015/0612 Condition 4i: All sound producing plant, equipment, machinery or fittings and the use will not exceed more than 5dB (A) above the background level when measured from any property boundary and/or habitable room(s) consistent with the Environment Protection Authority's NSW Industrial Noise Policy and/or Protection of the Environment Operations Act 1997

5.1.2 To Residential Noise Receivers

The applicable guidelines and standards are:

- *"Interim Construction Noise Guideline". This guideline nominates acceptable levels of noise emissions above the background noise level. For major construction projects within the recommended standard hours the guideline recommends a noise level of 10 dB(A) above the background.*

5.1.3 To Commercial receivers

The DECCW - interim construction noise guideline sets out specific noise goals for commercial land use.

"4.1.3 Commercial and industrial premises

Due to broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories. The external noise levels should be assessed at the most affected occupied point of the premises:

- *Industrial premises: external $L_{Aeq(15min)}$ 75dB(A)*
- *Offices, retail outlets: external $L_{Aeq(15min)}$ 70dB(A)*
- *Other businesses that may be very sensitive to noise, where the noise level is project specific as discussed below.*

The proponent should assess construction noise levels for the project, and consult with occupants of commercial and industrial premises prior to lodging an application where required.

During construction, the proponent should regularly update the occupants of the commercial and industrial premises regarding noise levels and hours of work."

5.1.4 Requirements of Australian Standard AS2436-1981

- *Australian Standard 2436-1981 "Guide to Noise Control on Construction Maintenance and Demolition Site". In particular, the requirements stipulated in Section 3 of the standard will be followed.*

Section 3 of AS 2436 states that care shall be taken in applying criteria that normally would be used to regulate noise emitted from industrial, commercial and residential premises to construction, particularly for those activities which are transitory and of short duration. For the control and regulation of noise from construction sites AS2436 nominates the following:

- That a reasonable suitable noise criterion is established.
- That all practicable measures be taken on the treatment site to regulate noise emissions, including, the siting of potentially noisy static processes on parts of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours if required.
- The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the building site.

Based on these the following procedure will be used to assess noise emissions:

- Predict noise levels produced by typical construction activities at the sensitive receivers.
- If noise levels exceed noise goal at sensitive receiver locations, investigate and implement all practical and cost effective techniques to limit noise emissions.
- If the noise goal is still exceeded after applying all practical engineering controls to limit noise emissions, investigate management and other techniques to mitigate noise emissions.

5.1.5 Summarised Noise Emission Goal

Noise emission goal have been summarised below based on the requirements above and background noise data collected on site.

Table 2 –Noise Emission Goal

Noise Receivers	Noise Emission Goal
Residential Receivers 1, 2 and 3	"Background + 10" = 60dB(A)L_{eq}
Commercial Receiver 4	70dB(A) L_{eq}

If the noise goal is still exceeded after applying all practical engineering controls to limit noise emissions, investigate management and other techniques to mitigate noise emissions.

5.2 VIBRATION

Vibration associated with the demolition, excavation and construction activities on the site will be assessed in conjunction with the following guidelines.

5.2.1 Recommended Vibration Criteria

Vibration caused by construction at any residence or structure outside the subject site must be limited to:

- *For structural damage vibration, German Standard DIN 4150-3 Structural Vibration: Effects of Vibration on Structures; and*
- *For human exposure to vibration, the evaluation criteria presented in the British Standard BS 6472:1992 Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80Hz) for low probability of adverse comment*

These limits apply unless otherwise approved in the Construction Noise and Vibration Management Plan.

5.2.2 Vibration Damage Limits

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 2.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 3 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			**Plane of Floor of Uppermost Storey**
		< 10Hz	**10Hz to 50Hz**	**50Hz to 100Hz**	**All Frequencies**
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

5.2.3 Assessing Amenity

Environmental Protection Authority NSW "Assessing Vibration: A Technical Guideline" (Feb 2006) is based on the guidelines contained in BS 6472:1992. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline should be adopted to assess and regulate vibration within the excavation/construction site.

Table 4 – EPA Recommended Vibration Criteria

		RMS acceleration (m/s^2)		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices		0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices		0.64	1.28	13.0	26.0	18.0	36.0
Workshops		0.64	1.28	13.0	26.0	18.0	36.0

5.2.4 Recommended Vibration Limits

Table 5 –Recommended Vibration Limit

Vibration Receiver	Recommended Vibration Limits PPV (mm/s)
Residential	5
Commercial	20

6 NOISE EMISSION ASSESSMENT

Predictions of noise levels from likely construction activities at the sensitive receivers identified have been made of the construction processes with the potential to produce significant noise.

It is noted that:

- Many of the noise sources are present over a small period of the day or may be present for a few days with a significant intervening period before the activity occurs again.
- The distance between the noise source and the receiver.

The A-weighted sound power levels for all the component parts of the above-described activities are outlined in the table below.

Table 6 - Sound Power Levels of the Proposed Equipment

CONSTRUCTION ACTIVITY	EQUIPMENT /PROCESS	SOUND POWER LEVEL - dB(A)
Demolition	Long Rigid Truck	108
	Bobcat	105
	30 Ton Excavator	110
	Impact drill	105
	Angle grinders	105
	Electric Saw	102
Piling Works	Contiguous Piling	110
Excavation	Excavator (with hydraulic hammer)	114
	Bobcat	105
Construction	Angle Grinders	105
	Electric Saw	102
	Drilling	95
	Hammering	110
	Concrete Vibrator	100
	Cement Mixing Truck	105
	Concrete Pumps	105

The noise levels presented in the above table are derived from the following sources, namely:

- On-site measurements
- Table A1 of Australian Standard 2436-2010
- Data held by this office from other similar studies.

6.1 RESIDENTIAL RECEIVER 1: 12 HOWARD STREET

This existing multi-storey mixed use development is located to the north across from Howard Avenue. Predicted noise levels are as follows:

Table 7 - Predicted Noise Level – Residential Receiver 1

Equipment / Process	Noise Goal dB(A) $L_{eq\ (15min)}$	Predicted Level at Receiver dB(A) $L_{eq(period)}$	Exceedance	Comments
Truck	60	57	0	Compliant
Bobcat	60	57-70	0-10	Exceedances when work close to property boundary
30 Ton Excavator	60	62-75	2-15	Exceedances when work close to property boundary
Impact drill	60	57-70	0-10	Exceedances when work close to property boundary
Angle grinders	60	57-70	0-10	Exceedances when work close to property boundary
Electric Saw	60	54-67	0-7	Exceedances when work close to property boundary
Contiguous Piling	60	62-75	2-15	Exceedances when work close to property boundary
Excavator (with hydraulic hammer)	60	66-79	6-19	Exceedances when work close to property boundary
Bobcat	60	57-70	0-10	Exceedances when work close to property boundary
Angle Grinders	60	57-70	0-10	Exceedances when work close to property boundary
Electric Saw	60	54-67	0-7	Exceedances when work close to property boundary
Drilling	60	47-60	0	Compliant
Hammering	60	62-75	2-15	Exceedances when work close to property boundary
Concrete Vibrator	60	52-65	0-5	Compliant
Cement Mixing Truck	60	61	1	Marginal exceedance
Concrete Pumps	60	61	1	Marginal exceedance

When works are conducted close to the northern property boundary, exceedances are predicted – see recommendations in Section 9 and 10 below.

6.2 RESIDENTIAL RECEIVER 2: 10 OAKS AVENUE

This existing multi-storey residential development bounds the project site to the west. Windows along the eastern façade of the building will have a clear view of the construction site. Predicted noise levels to the building façade are as follows:

Table 8 - Predicted Noise Levels – Residential Receiver 2

Equipment / Process	Noise Goal dB(A) $L_{eq\ (15min)}$	Predicted Level at Receiver dB(A) $L_{eq(period)}$	Exceedance	Comments
Truck	60	57	0	Compliant
Bobcat	60	55-77	0-17	Exceedances when work close to property boundary
30 Ton Excavator	60	60-82	0-22	Exceedances when work close to property boundary
Impact drill	60	55-77	0-17	Exceedances when work close to property boundary
Angle grinders	60	55-77	0-17	Exceedances when work close to property boundary
Electric Saw	60	52-74	0-14	Exceedances when work close to property boundary
Contiguous Piling	60	60-82	0-22	Exceedances when work close to property boundary
Excavator (with hydraulic hammer)	60	64-86	4-26	Exceedances when work close to property boundary
Bobcat	60	55-77	0-17	Exceedances when work close to property boundary
Angle Grinders	60	55-77	0-17	Exceedances when work close to property boundary
Electric Saw	60	52-74	0-14	Exceedances when work close to property boundary
Drilling	60	45-67	0-7	Exceedances when work close to property boundary
Hammering	60	60-82	0-22	Exceedances when work close to property boundary
Concrete Vibrator	60	50-72	0-12	Compliant
Cement Mixing Truck	60	61	1	Marginal exceedance
Concrete Pumps	60	61	1	Marginal exceedance

When works are conducted close to the western boundary, exceedances are predicted – see recommendations in Section 9 and 10 below.

6.3 RESIDENTIAL RECEIVER 3: 23 HOWARD AVENUE

This existing multi-storey residential development bounds the project site to the east. Windows along the western façade of the building will have a clear view of the construction site. Predicted noise levels to the building façade are as follows:

Table 9 - Predicted Noise Levels – Residential Receiver 3

Equipment / Process	Noise Goal dB(A) $L_{eq\ (15min)}$	Predicted Level at Receiver dB(A) $L_{eq(period)}$	Exceedance	Comments
Truck	60	57	0	Compliant
Bobcat	60	55-77	0-17	Exceedances when work close to property boundary
30 Ton Excavator	60	60-82	0-22	Exceedances when work close to property boundary
Impact drill	60	55-77	0-17	Exceedances when work close to property boundary
Angle grinders	60	55-77	0-17	Exceedances when work close to property boundary
Electric Saw	60	52-74	0-14	Exceedances when work close to property boundary
Contiguous Piling	60	60-82	0-22	Exceedances when work close to property boundary
Excavator (with hydraulic hammer)	60	64-86	4-26	Exceedances when work close to property boundary
Bobcat	60	55-77	0-17	Exceedances when work close to property boundary
Angle Grinders	60	55-77	0-17	Exceedances when work close to property boundary
Electric Saw	60	52-74	0-14	Exceedances when work close to property boundary
Drilling	60	45-67	0-7	Exceedances when work close to property boundary
Hammering	60	60-82	0-22	Exceedances when work close to property boundary
Concrete Vibrator	60	50-72	0-12	Compliant
Cement Mixing Truck	60	61	1	Marginal exceedance
Concrete Pumps	60	61	1	Marginal exceedance

When works are conducted close to the eastern boundary, exceedances are predicted – see recommendations in Section 9 and 10 below.

6.4 COMMERCIAL RECEIVER 4: 30-34 OAKS AVENUE

This existing receiver is a two storey commercial development to the south east of the project site. Predicted noise levels to the building façade are as follows:

Table 10 - Predicted Noise Levels – Commercial

Equipment / Process	Noise Goal dB(A) $L_{eq\ (15min)}$	Predicted Level at Receiver dB(A) $L_{eq(period)}$	Exceedance	Comments
Truck	70	47	0	Compliant
Bobcat	70	42-63	0	Compliant
30 Ton Excavator	70	47-68	0	Compliant
Impact drill	70	42-63	0	Compliant
Angle grinders	70	42-63	0	Compliant
Electric Saw	70	39-60	0	Compliant
Contiguous Piling	70	47-68	0	Compliant
Excavator (with hydraulic hammer)	70	51-72	0-2	Marginal exceedance when working close to property boundary
Bobcat	70	42-63	0	Compliant
Angle Grinders	70	42-63	0	Compliant
Electric Saw	70	39-60	0	Compliant
Drilling	70	32-53	0	Compliant
Hammering	70	47-68	0	Compliant
Concrete Vibrator	70	37-58	0	Compliant
Cement Mixing Truck	70	51	0	Compliant
Concrete Pumps	70	51	0	Compliant

7 ASSESSMENT OF VIBRATION

7.1 SENSITIVE RECIEVERS

Nearest vibration receivers for the demolition/ excavation/ construction of the project site are below:

- Residential Receiver 2: 10 Oaks Avenue, bounding the property to the west
- Residential Receiver 3: 23 Howard Avenue, bounding the property to the east.

7.2 VIBRATION PRODUCING ACTIVITIES

Proposed activities that have the potential to produce significant ground vibration include:

- Demolition
- Piling and anchoring.
- Hydraulic hammering.
- Excavator working.

7.3 SAFEGUARDS TO PROTECT SENSITIVE STRUCTURES

It is impossible to predict the vibrations induced by the demolition/excavation/construction operations on site at potentially affected receivers. This is because vibration level is principally proportional to the energy impact which is unknown nature of terrain in the area (type if soil), drop weight, height etc.

An acoustic consultancy should undertake monitoring of initial demolition/excavation process when conducted near potentially affected receivers to ensure that vibration criteria set out in section 5.2 are not exceeded.

7.4 VIBRATION MONITORING

The proposed vibration monitoring equipment is two Balastronics type monitors with externally mounted geophones installed within the locations below:

- Location 1- Western boundary with geophone against the wall to 10 Oaks Avenue.
- Location 2- Eastern boundary with geophone against the wall to 23 Howard Avenue.

The monitors are proposed to be fitted with GSM modem and audible alarms for vibration exceedance. In addition, the vibration loggers will be down loaded remotely using the GSM modem.

7.4.1 Down Load of vibration logger

Down loading of the vibration logger will be conducted on a regular basis. In the event exceedence of vibration criteria or alarms occurs, down loading of logger will be conducted more frequently. Results obtained from the vibration monitor will be presented in a graph formant and will be forwarded to Meriton for review. It is proposed that reports are provided fortnightly with any exceedence in the vibration criteria reported as detailed in this report.

7.4.2 Presentation of Vibration Logger Results

A fortnightly report will be submitted to Meriton via email summarising the vibration events. The vibration exceedance of limit is recorded the report shall be submitted within 24 hours. Complete results of the continuous vibration logging will be presented in fortnight reports including graphs of collected data.

7.4.3 Persons to receive alarms

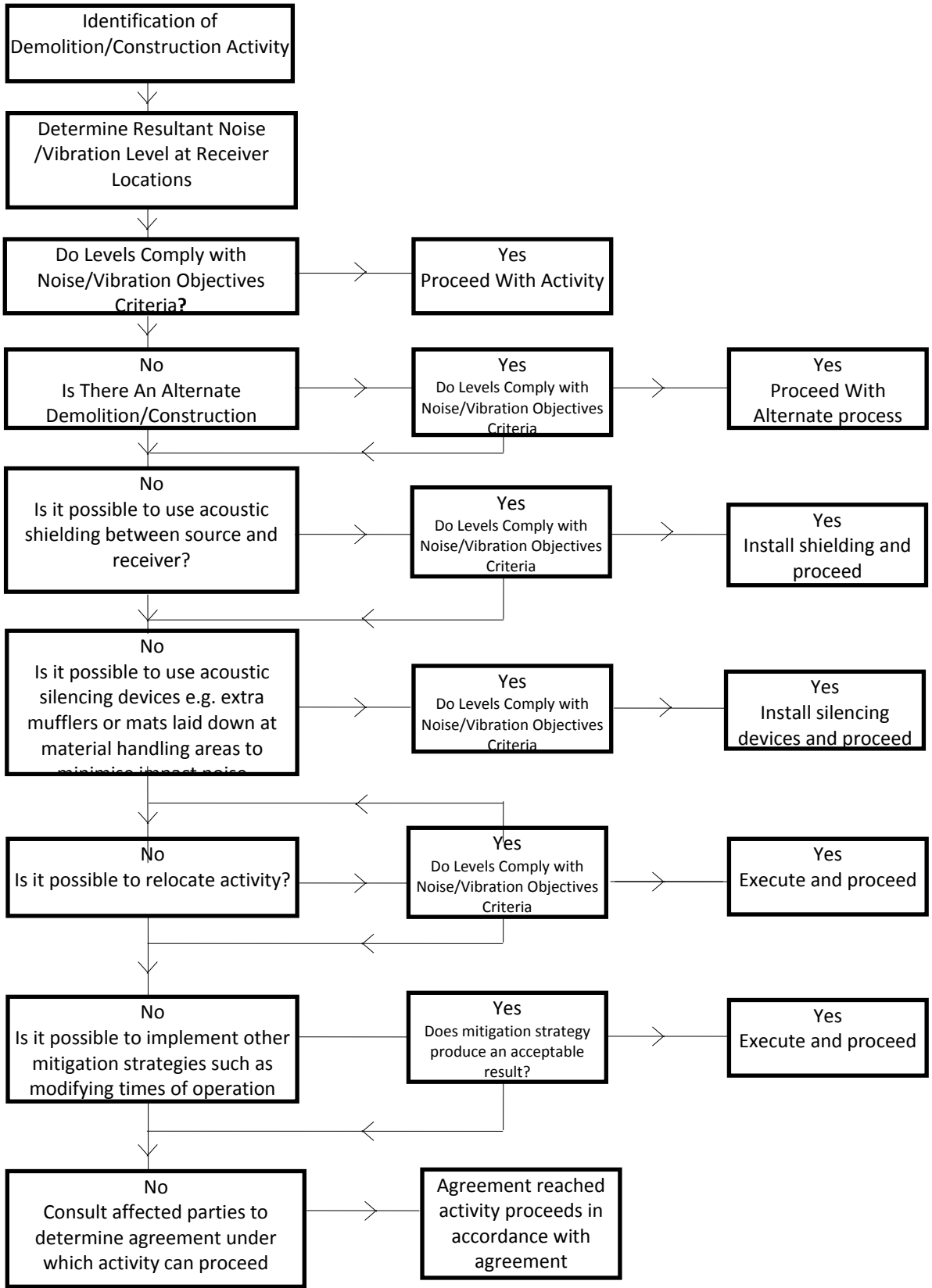
The following personnel will receive GSM alarms:

- Acoustic consultant/advisor (1 person)
- Demolition/excavation site foreman
- Main builder foreman (where applicable)
- Meriton nominated two representatives

8 ASSESSMENT METHODOLOGY AND MITIGATION METHODS

The flow chart that follows illustrates the process to be followed to minimise the impact associated with these activities.

Noise sources with the potential to exceed the criteria set out in section 5 have been identified and discussed in section 7.



9 AMELIORATIVE MEASURES

9.1 SITE SPECIFIC RECOMMENDATIONS

Site specific recommendations as follows:

9.1.1 Demolition

- Hammering: Maximum 35 ton excavator hammering is recommended to demolish the existing slab structure, with other measures such as ripping and munching to be used were possible to avoid hammering works. Detailed demolition method can be modified depending on on-site vibration monitoring results.
- It is proposed to strip out the buildings with the facades intact, as to provide shielding to surrounding receivers from the strip out process.

9.1.2 Piling and excavation

- It is recommended to utilise CFA or Bored Piling to mitigate vibration impact onto the neighbouring structure.

- Safety distance of hydraulic hammer shall be determined based on site vibration measurement results, excavation within the safety distance shall use saw cutter then rip off or use light equipment for excavation to mitigate the vibration impact to nearby vibration sensitive facilities.

9.1.3 Construction

- Concrete vibrators and concrete pumps

    - Noise from these activities is likely to result in intermittent exceedances of allowable noise levels. We therefore recommend that concrete vibrators and concrete pumps are to be limited to the recommended standard hours and be placed at a position as further away from the eastern and western property boundary as possible. This is to mitigate noise impacts exposure to the two adversely affected receivers to the west and south of the subject site.

- Other activities:

    - All other processes generally comply with noise emission goals, with some marginal exceedances. However, these activities will predominantly occur internally when the building shell is constructed and therefore an additional 20dB(A) reduction can be accounted for.

9.2 GENERAL RECOMMENDATIONS

Other noise management practices which may be adopted are discussed below. In addition, notification, reporting and complaints handling procedures should be adopted as recommended in section 10 & 11 of this report.

9.2.1 Acoustic Barrier

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

The placement of barriers at the source is generally only effective for static plant (tower cranes). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependant on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15 dB(A) can be effected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8 dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance which is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10 or 15mm plywood would be acceptable for the barriers.

9.2.2 Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

9.2.3 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

9.2.4 Treatment of Specific Equipment

In certain cases it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

9.2.5 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers.

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

9.2.6 Strategic Positioning of Processes On-Site

Where practicable, particular processes of activities can be located in particular positions on site to minimise noise to surrounding sensitive receivers.

For example, stationary plant may be positioned where direct line of sight shielding can be achieved using natural barriers or temporary screens, or may maximise the distance to the nearest sensitive receiver. This may also be applicable to the demolition of building structures where the façade closest to residential receivers is left until last to provide barrier screening for the demolition of the other parts of the building.

9.2.7 Management Training

All site managers should be made aware of noise and vibration limits, applicable control measures and methods. They should ensure that all agreed noise and vibration measures are carried out by employees and sub-contractors.

10 COMMUNITY INTERACTION AND COMPLIANTS HANDLING

10.1 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise, vibration or dust occur, immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration and dust limits, all work potentially producing vibration or dust shall cease until the exceedance is investigated.

The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- If necessary, setup vibration monitoring at the location representing the nearest affected vibration receiver, with alarm device which can inform the project manager on site if the vibration exceedance happened.
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable;

- noise measurements at the affected receiver;
- an investigation of the activities occurring at the time of the incident;
- inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

11 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process

2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.

3. Implement additional acoustic treatment in the form of localised barriers, silencers etc where practical.

4. Selecting alternative equipment/processes where practical

5. If necessary, setup noise/vibration and dust monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

Complaints associated with noise /vibration and dust generated by site activities shall be recorded on a Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the Site Manager to the general public and their contact telephone number.

12 CONCLUSION

This document presents a noise and vibration plan for demoltition/excavation/construction activities proposed to be conducted at Dee Why Town Centre, located along Pittwater Road between Howard and Oaks Avenues.

The assessment of noise and vibration indicates that:

- It is likely that parts of the demolition/excavation/construction work period will likely generate noise levels that will require additional management. Adoption of the elements of these controls will ensure that noise impacts will be minimised.

- Ground vibration goals have been set in this report to safeguard existing structures close to the project site and protect human comfort at the amenity of the project site. It's recommended that vibration be monitored during the demolition/excavation phase as to ensure that vibration goals are met.

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

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Johan Davydov

Appendix 1

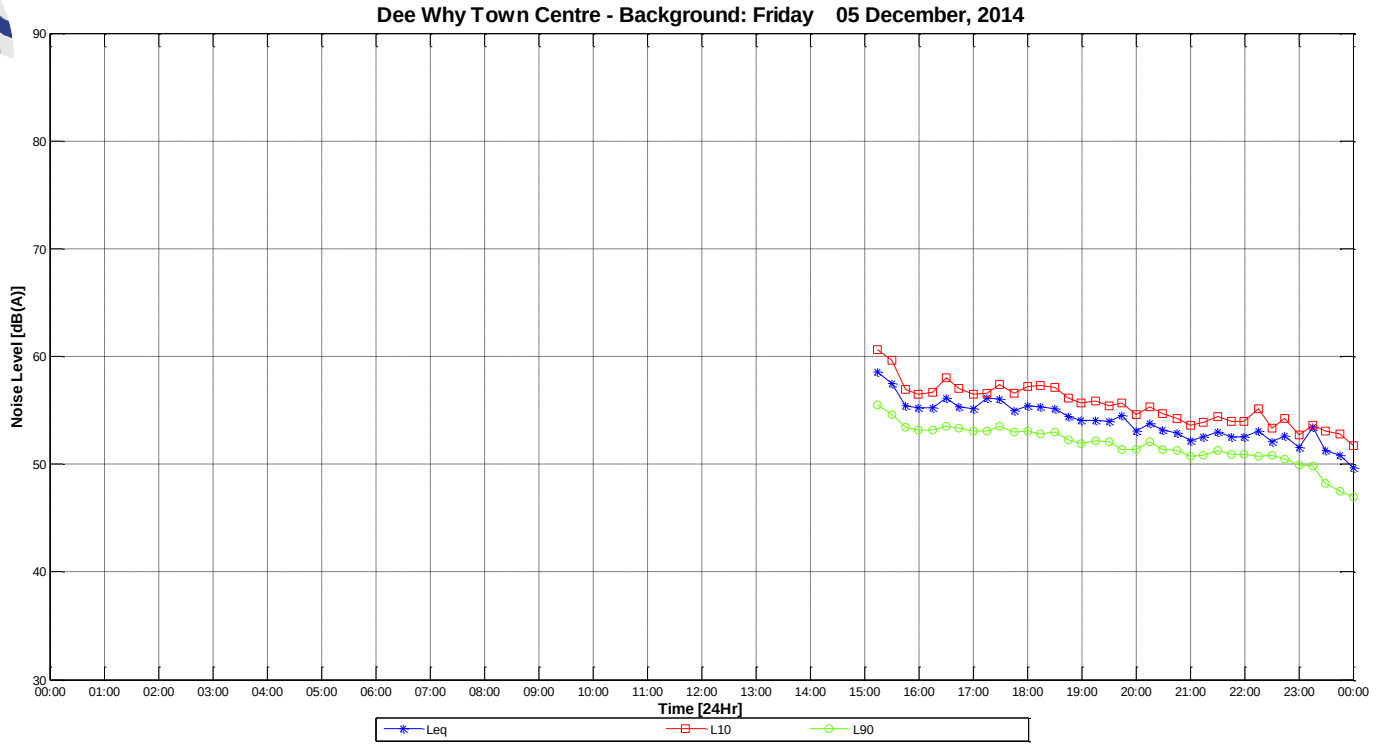
Unattended Noise Measurements

888 Pittwater Road, Dee Why

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343


Dee Why Town Centre - Background: Friday 05 December, 2014
Noise Level [dB(A)]
90
80
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00:00
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Time [24Hr]
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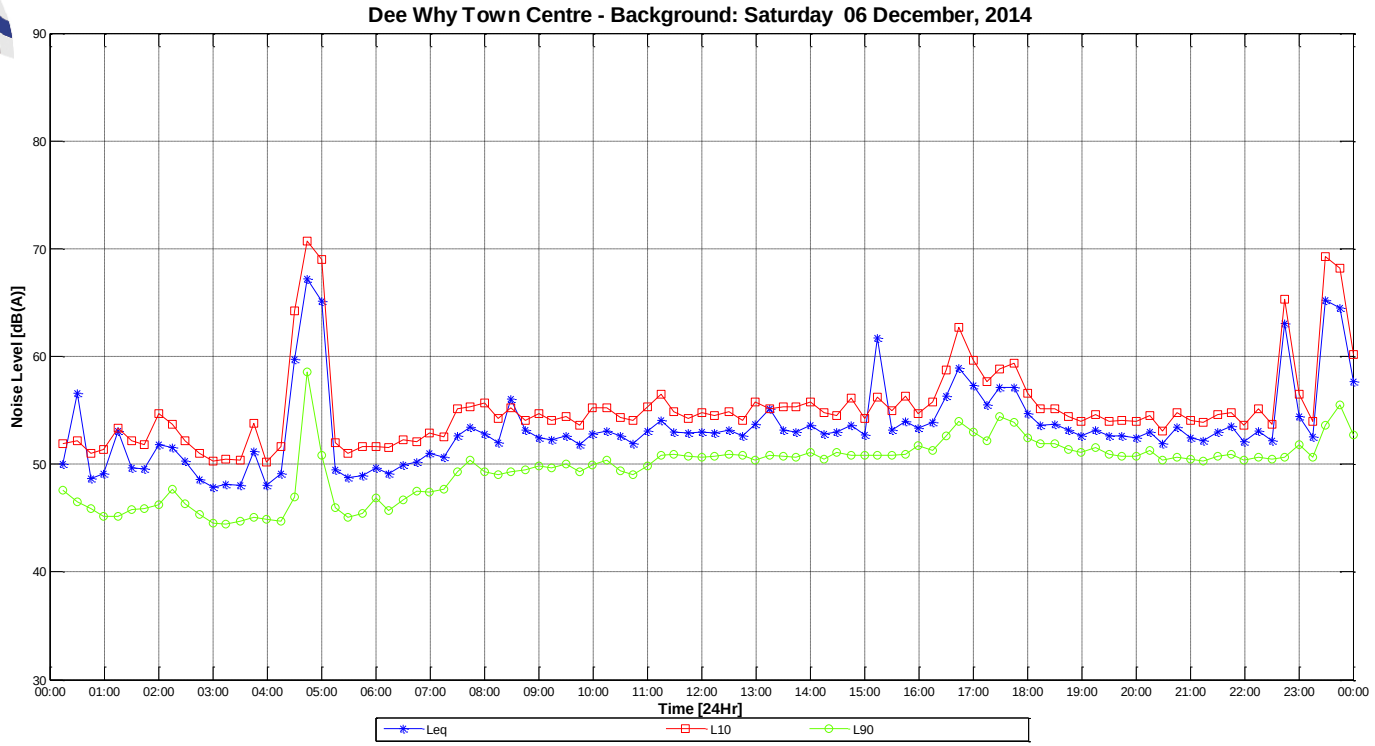
Dee Why Town Centre - Background: Saturday 06 December, 2014
Noise Level [dB(A)]
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Time [24Hr]
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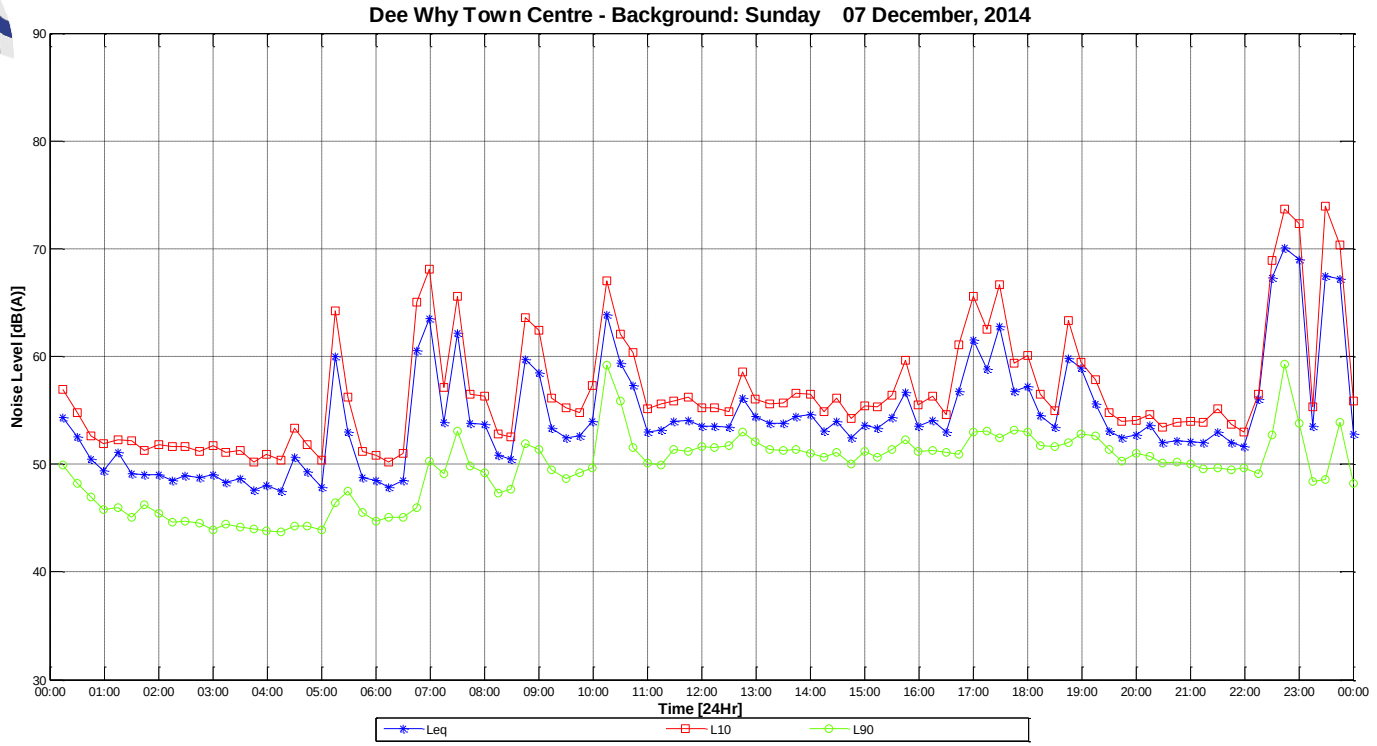
Dee Why Town Centre - Background: Sunday 07 December, 2014
Noise Level [dB(A)]
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Time [24Hr]
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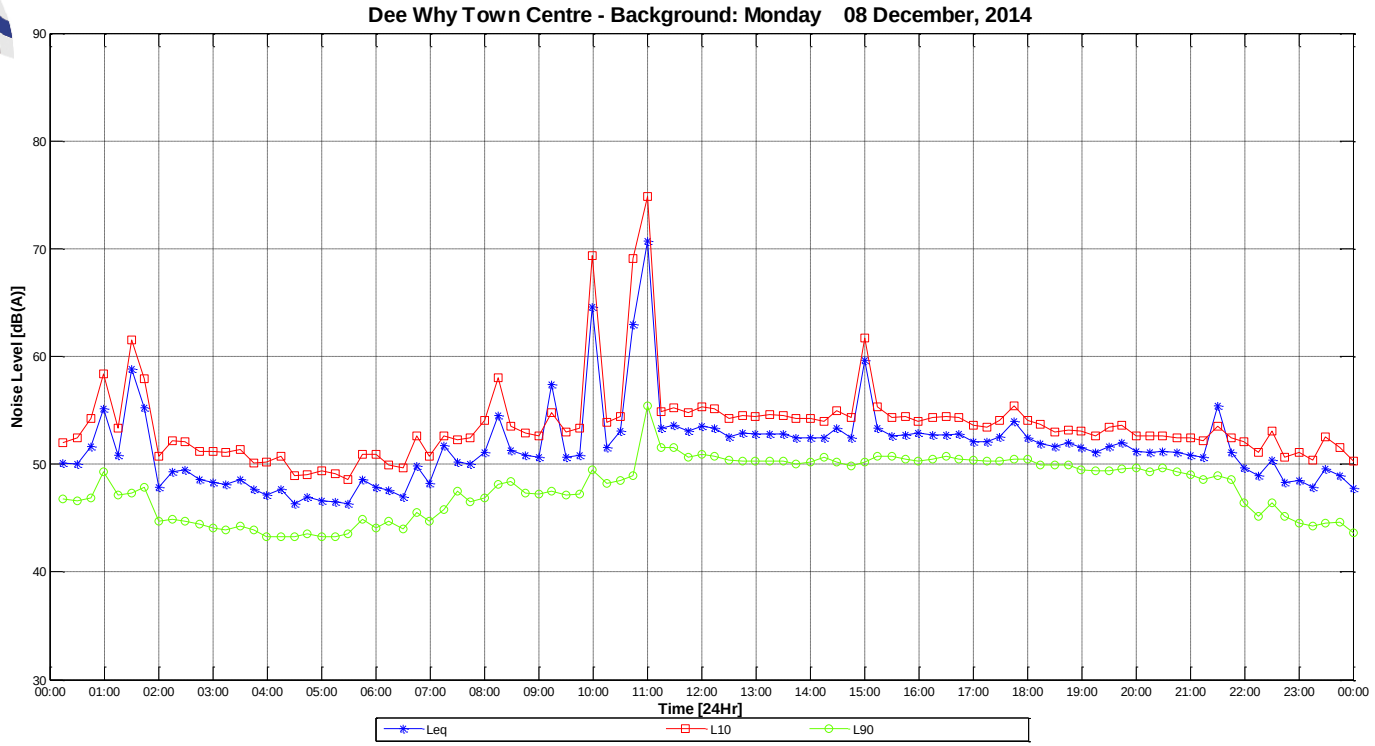
Dee Why Town Centre - Background: Monday 08 December, 2014
Noise Level [dB(A)]
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Time [24Hr]
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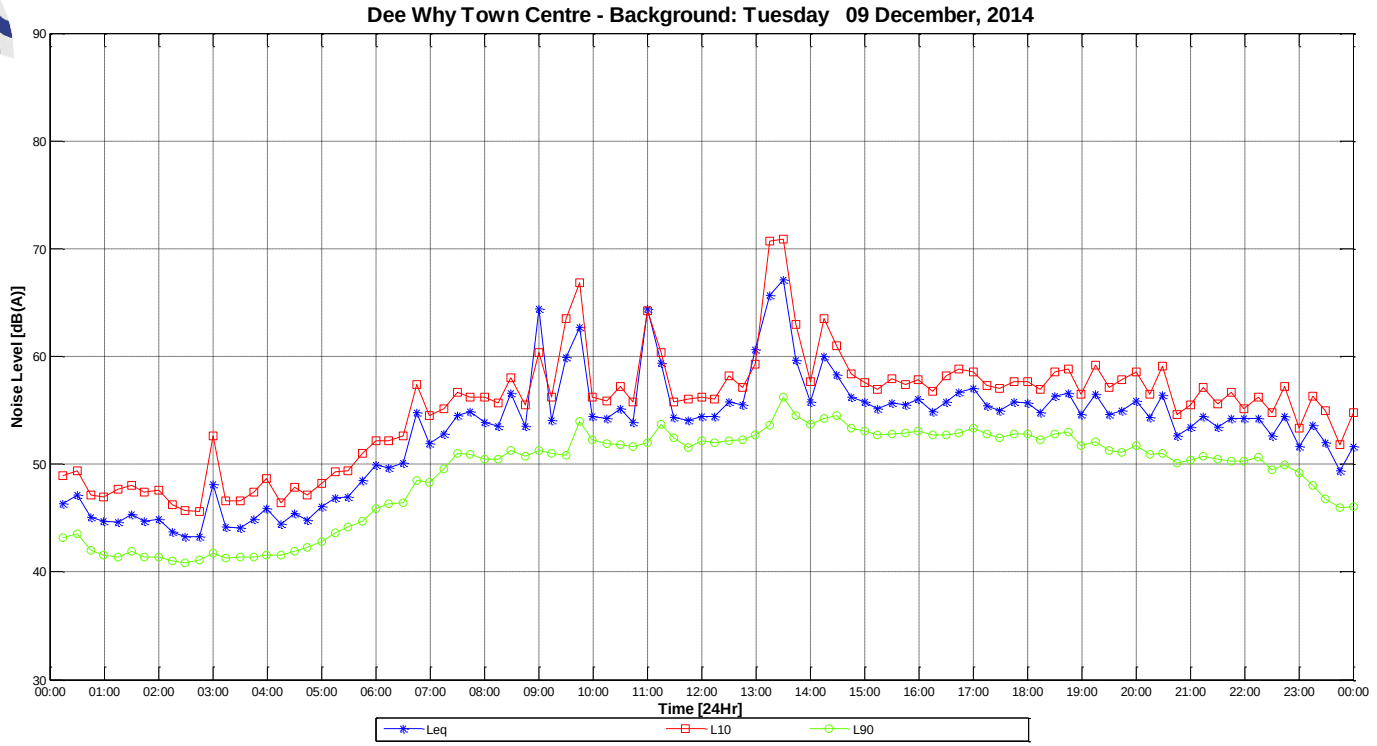
Dee Why Town Centre - Background: Tuesday 09 December, 2014
Noise Level [dB(A)]
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Time [24Hr]
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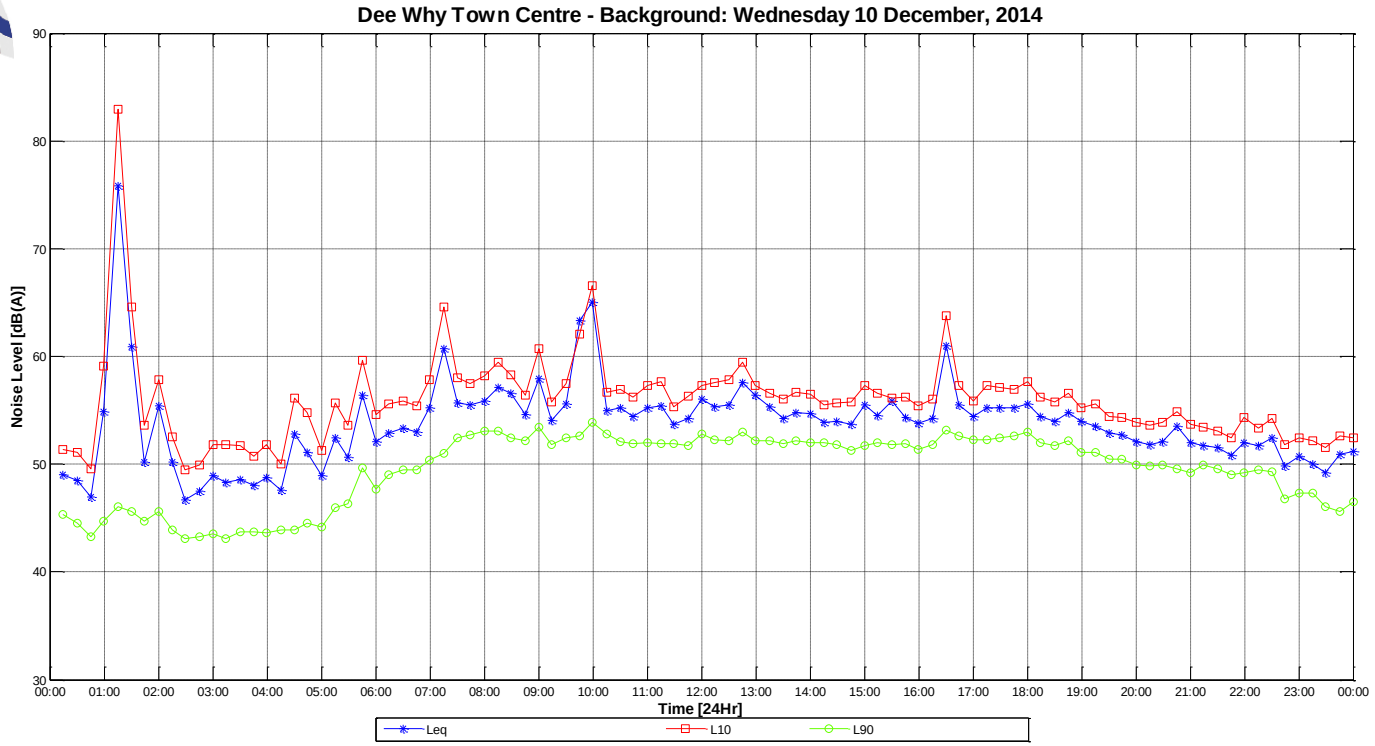
Dee Why Town Centre - Background: Wednesday 10 December, 2014
Noise Level [dB(A)]
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Time [24Hr]
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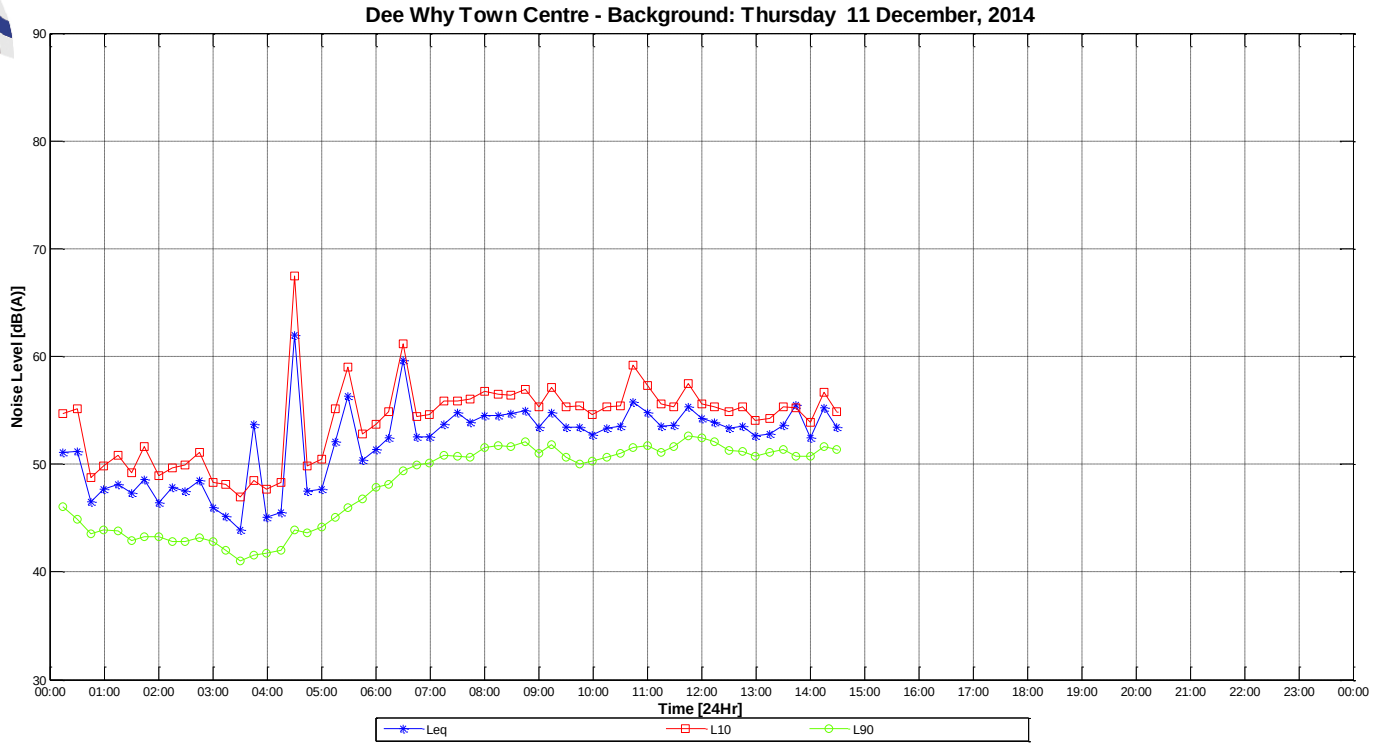
Dee Why Town Centre - Background: Thursday 11 December, 2014
Noise Level [dB(A)]
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Time [24Hr]
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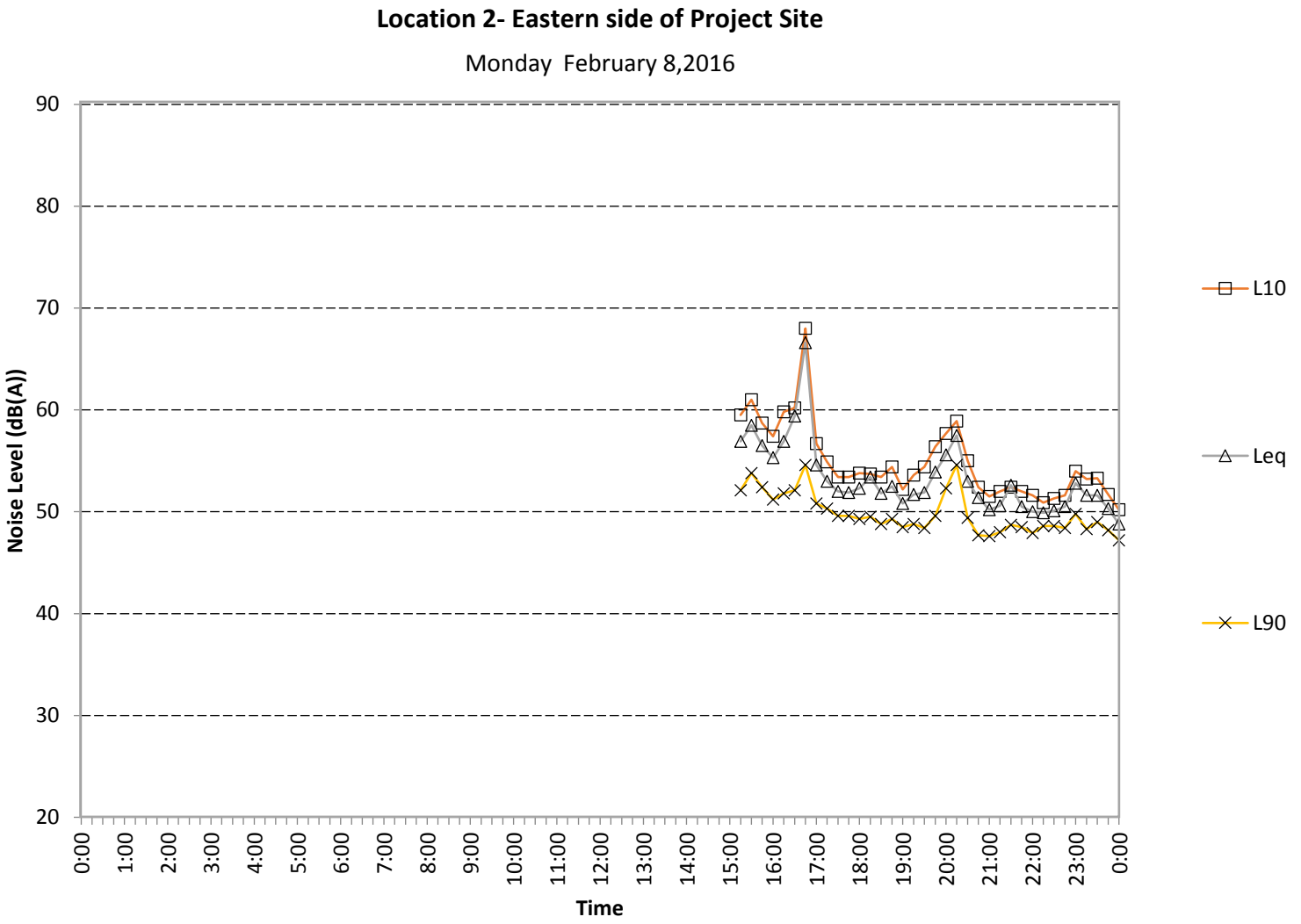
Location 2- Eastern side of Project Site
Monday February 8,2016
Noise Level (dB(A))
90
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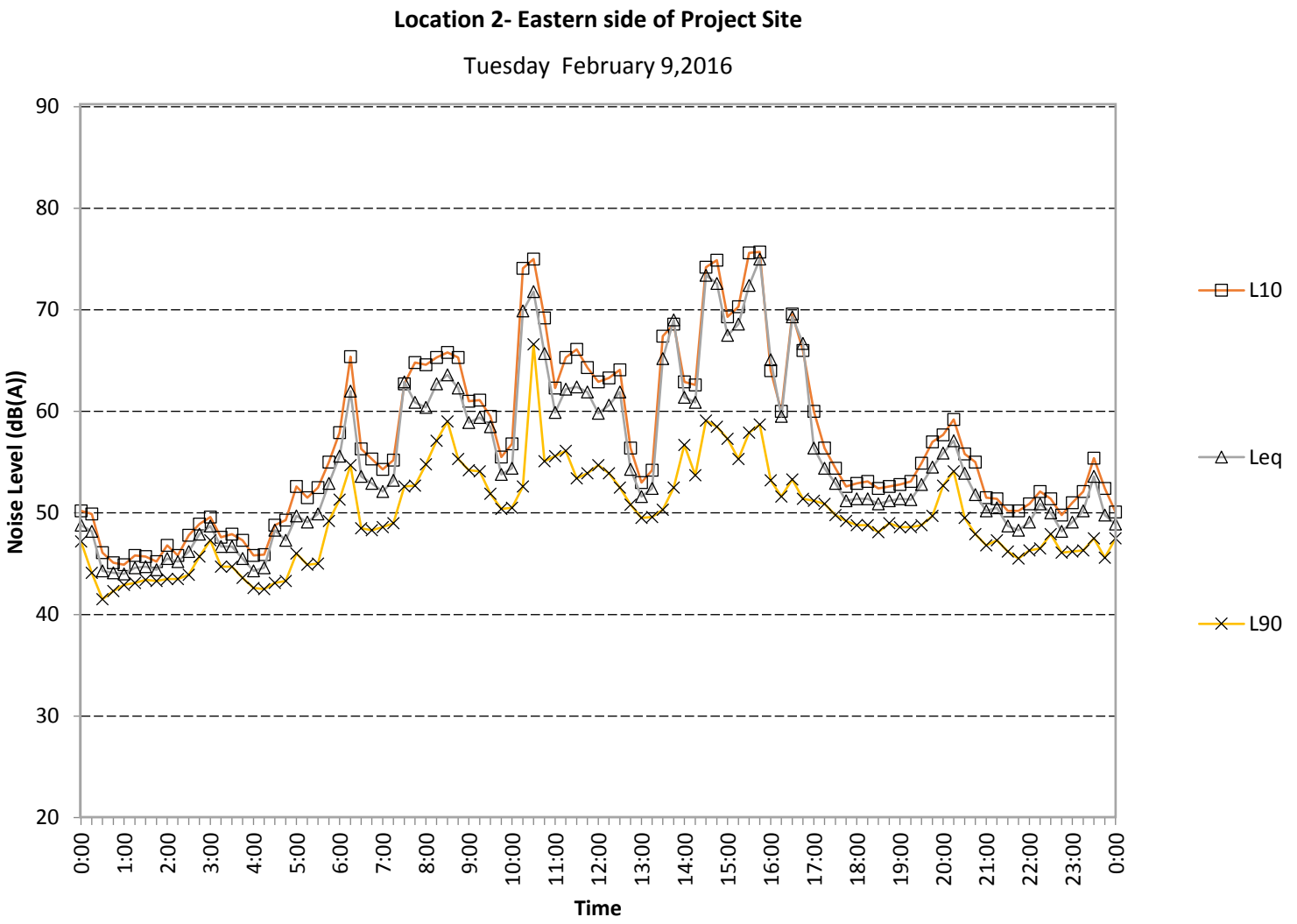
Location 2- Eastern side of Project Site
Tuesday February 9,2016
Noise Level (dB(A))
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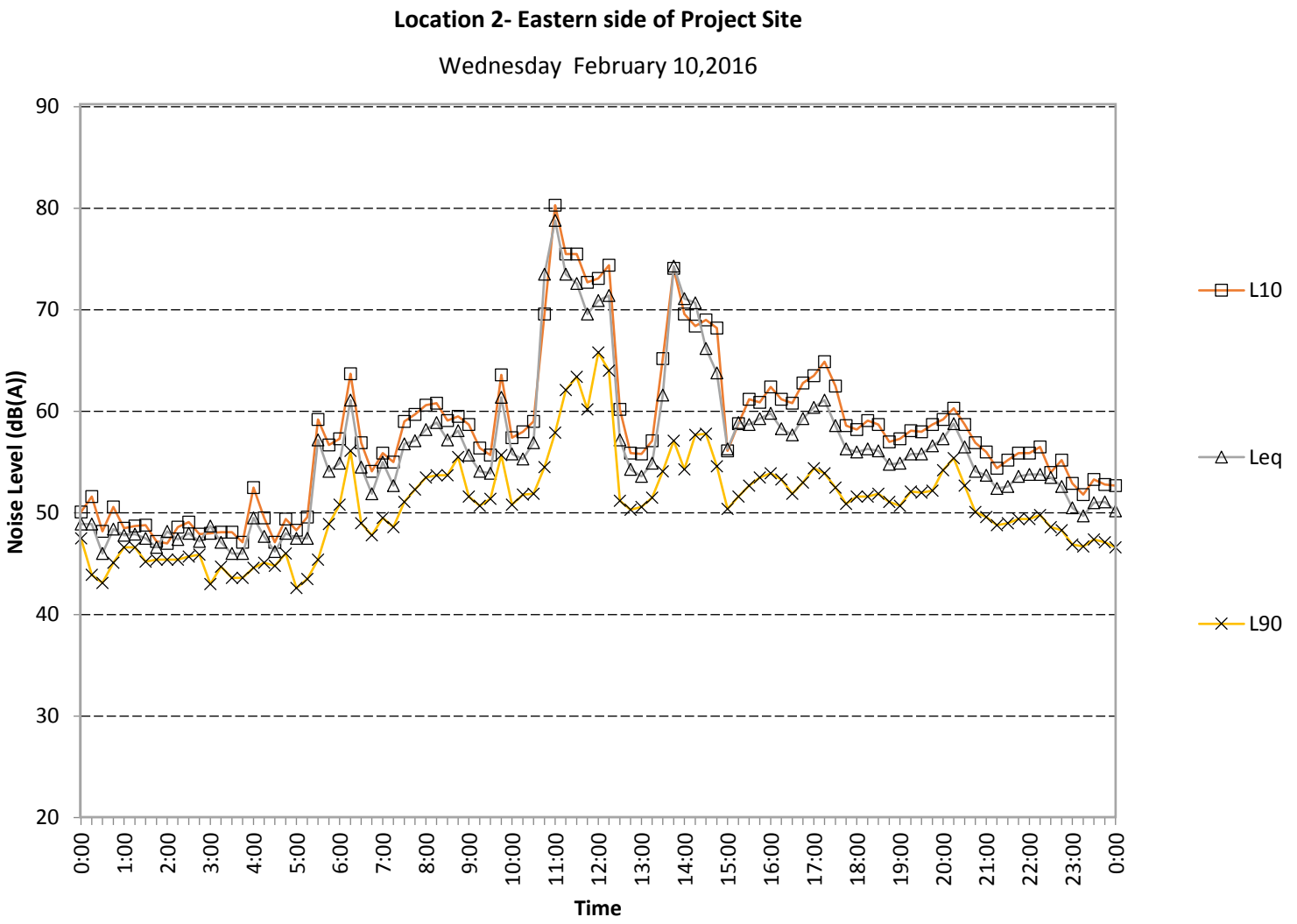
Location 2- Eastern side of Project Site
Wednesday February 10,2016
Noise Level (dB(A))
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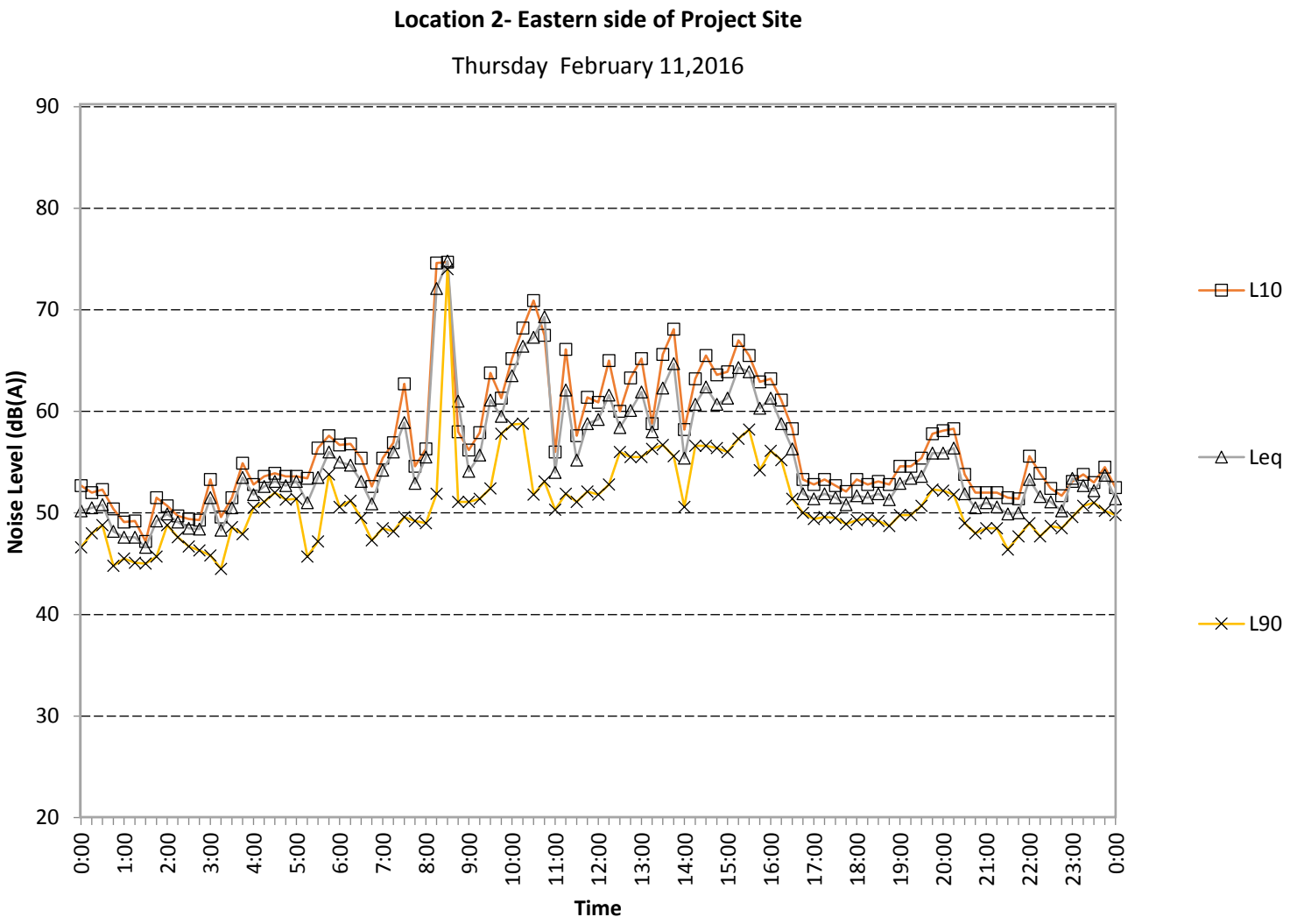
Location 2- Eastern side of Project Site
Thursday February 11,2016
Noise Level (dB(A))
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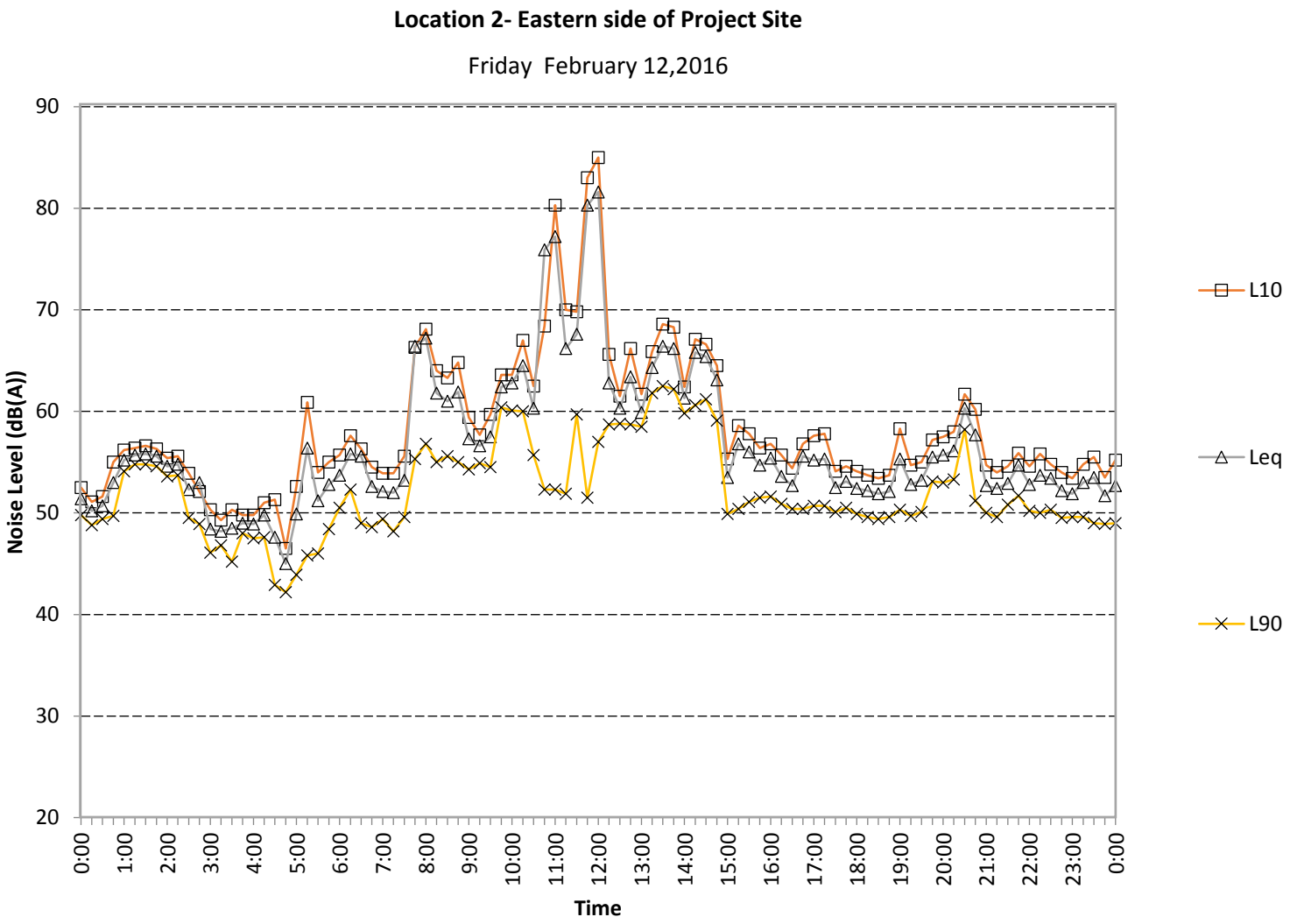
Location 2- Eastern side of Project Site
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Noise Level (dB(A))
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Time
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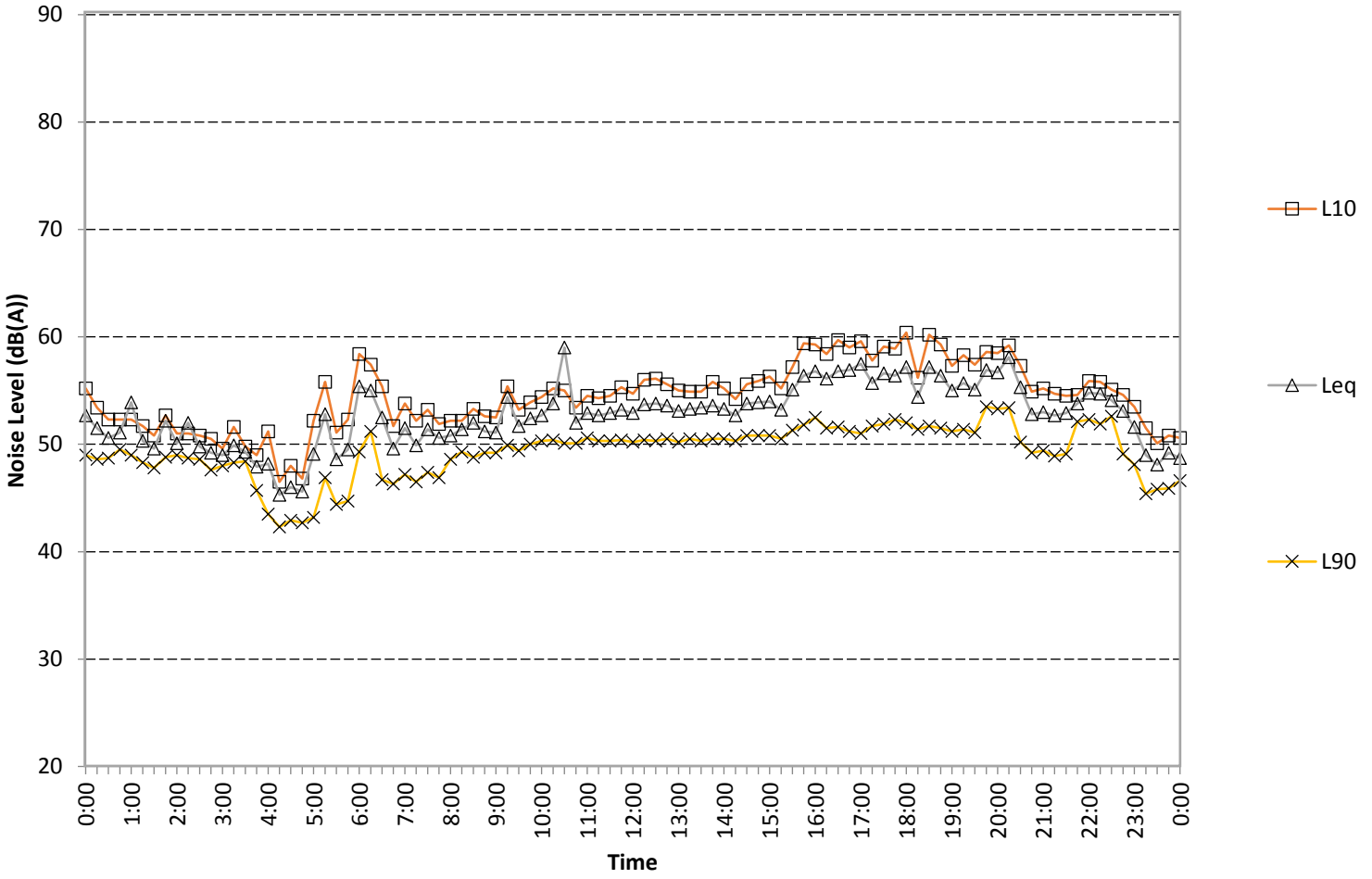
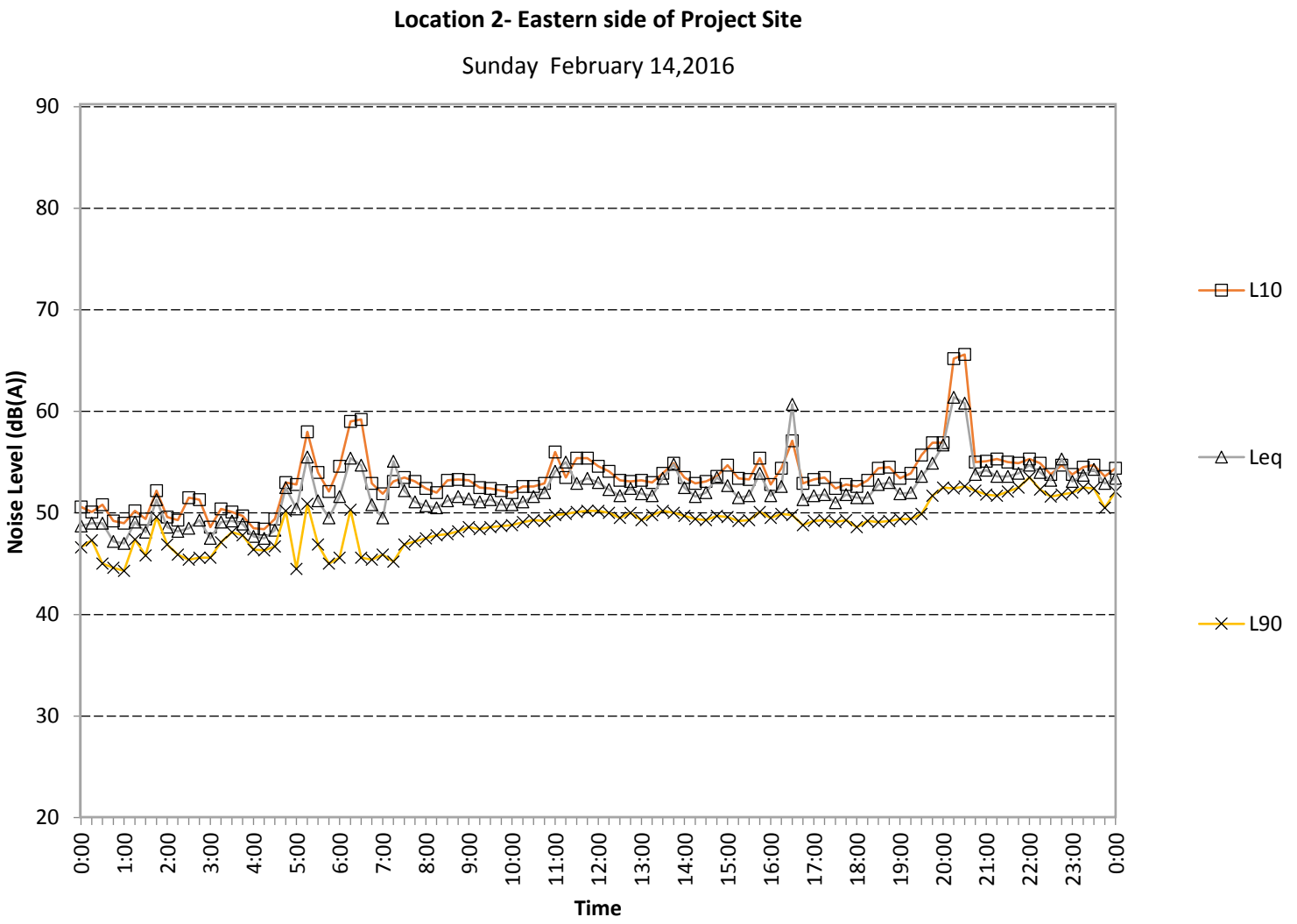
Location 2- Eastern side of Project Site

Saturday February 13,2016




Location 2- Eastern side of Project Site
Sunday February 14,2016
Noise Level (dB(A))
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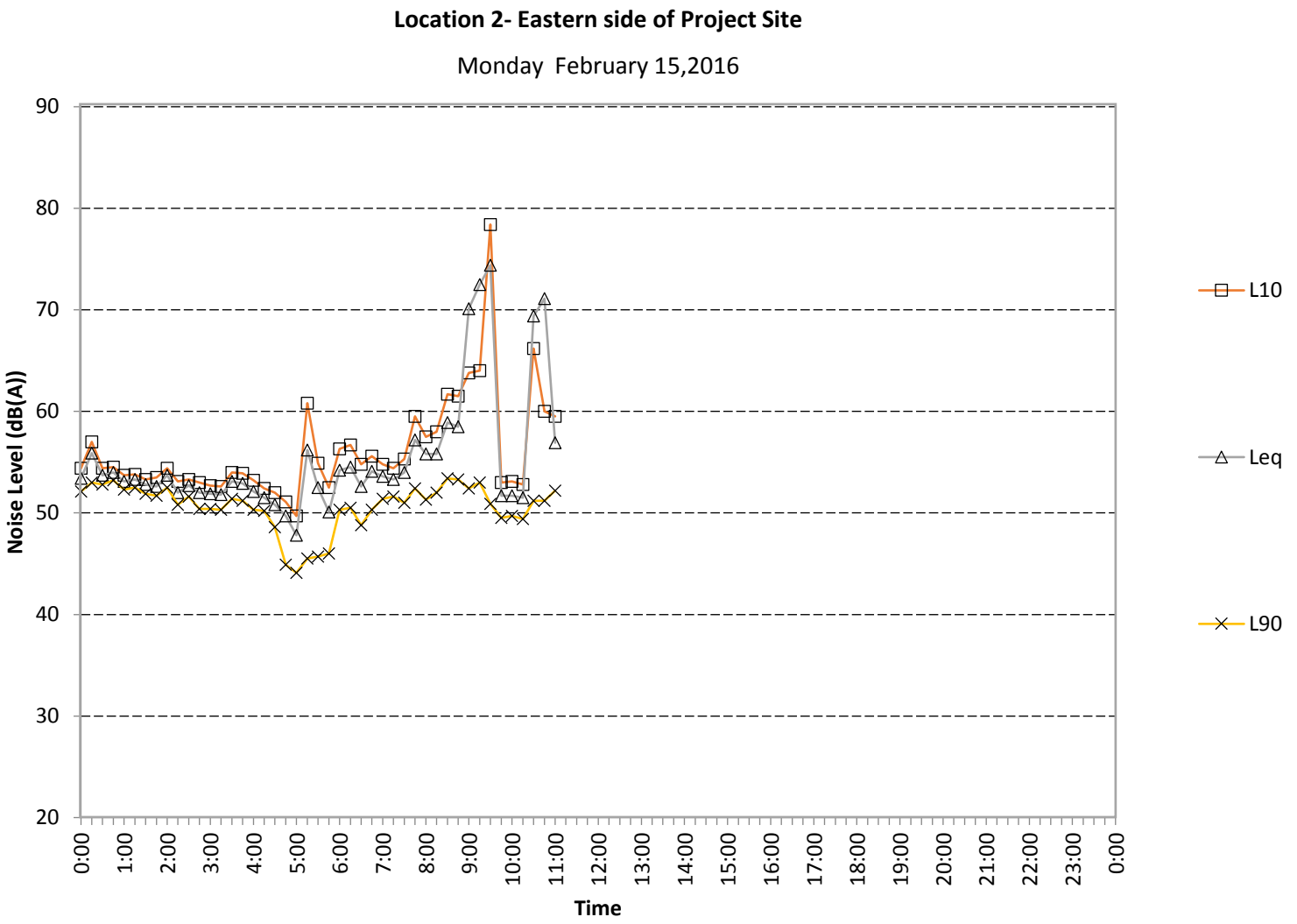
Location 2- Eastern side of Project Site
Monday February 15,2016
Noise Level (dB(A))
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Time
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