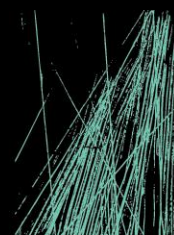




NOISE IMPACT ASSESSMENT FOR DEVELOPMENT APPLICATION

STELLA MARIS COLLEGE, MANLY

ACOUSTIC SERVICES



JHA

JHASERVICES.COM

This report is prepared for the nominated recipient only and relates to the specific scope of work and agreement between JHA and the client (the recipient). It is not to be used or relied upon by any third party for any purpose.

DOCUMENT CONTROL SHEET

Project Number	210263
Project Name	Stella Maris College, Manly
Description	Noise Impact Assessment for Development Application
Key Contact	Sam Wolff-Gillings

Prepared By

Company	JHA
Address	Level 23, 101 Miller Street, North Sydney NSW 2060
Phone	61-2-9437 1000
Email	@jhaengineers.com.au
Website	www.jhaservices.com
Author	Dean Hunter
Checked	Sean Matthews
Authorised	Jorge Reverter

Revision History

Issued To	Revision and Date						
Mostyn Copper	REV	P1	A	B			
	DATE	02/12/2022	07/12/2022	16/12/2022			
	REV						
	DATE						
	REV						
	DATE						

CONTENTS

1 INTRODUCTION	4
2 DESCRIPTION OF THE PROPOSAL	5
3 SITE MEASUREMENTS	7
3.1 General	7
3.2 Unattended Noise Monitoring	7
4 RELEVANT STANDARDS AND GUIDELINES	9
4.1 Standards and Guidelines	9
4.2 Regulatory Framework	9
4.2.1 Environmental Planning and Assessment (EP&A) Act 1979	9
4.2.2 Protection of the Environmental Operation (POEO) Act 1997	9
4.3 Planning Framework	10
4.4 Operational Noise	11
4.4.1 NSW EPA Noise Policy for Industry	11
4.4.2 NSW Road Noise Policy	12
4.5 Construction Noise and Vibration	13
4.5.1 Noise Criteria	13
4.5.2 Vibration Criteria	14
5 NOISE IMPACT ASSESSMENTS	16
5.1 Overview	16
5.2 External Mechanical Plant	16
5.3 Generated Traffic	16
6 SUMMARY AND CONCLUSIONS	17
APPENDIX A: LONG TERM NOISE MONITORING	18

1 INTRODUCTION

JHA Consulting Engineers has been engaged by Mostyn Copper on behalf of Stella Maris College to provide acoustic services for the proposed change of use of 48 and 50 Eurobin Ave in Manly, NSW from residential to educational use.

A noise impact assessment has been undertaken and it is detailed in this report along with the findings and recommendations. It has been prepared as part of the Development Application to be submitted to the Northern Beaches Council.

The objectives of this acoustic assessment are:

- Identify noise sensitive receivers that will potentially be affected by the operation of the proposed change of use.
- Carry out a noise survey to determine existing ambient and background noise levels on site.
- Establish the appropriate noise level criteria in accordance with the relevant standards, guidelines and legislation for the following issues:
 - Noise emissions from external mechanical plant in the proposed development.
 - Noise emissions from traffic generated by the proposed development.
- Carry out an acoustic assessment to determine whether the relevant criteria can be achieved based on proposed operations. Where applicable, provide recommendations for any necessary acoustic control measures that will need to be incorporated into the development or use in order to ensure compliance with the relevant noise level criteria.

This report provides:

- A statement of compliance with the relevant statutory criteria for the proposed change of use for the above-mentioned address.
- Recommendations for noise mitigation measures for the proposed development in order to meet the relevant criteria when compliance is not achieved.

The following documentation has been used for the preparation of this report:

- Noise data collected on site through the use of a noise logger.
- Architectural drawings from JDH Architects.

This document and related work have been prepared following JHA Consulting Engineers Quality and Environmental Management Systems, which are based on AS/NZS ISO 9001:2015 and ISO 14001:2015 respectively.

2 DESCRIPTION OF THE PROPOSAL

The site is located at 48 and 50 Eurobin Ave, Manly – legally known as Lot 42/DP14521 and SP12627, respectively – being located within a general residential area. Stella Maris College, the owner of the sites, is proposing to change the use from residential to educational.

The proposed change of use includes the demolition of both existing structures on the sites and the construction of 8 demountable classrooms.

The site is located within an urban residential environment, being characterised by medium levels of activity during the day. The surrounding properties are residential and educational – Stella Maris College. It is assumed that premises will operate between 8am and 4:30pm weekdays.

The noise sensitive receivers surrounding the site are a mix of residential and educational. Figure 1 shows the proposed site location (red dotted outline with yellow shadow), residential receivers (green shadow) and educational receiver (orange shadow) around the site.



Figure 1: Aerial view showing the location of the site (red dotted line with yellow shadow) and noise sensitive receivers.

It is noted that if noise impacts associated with the proposed development are controlled at the nearest noise sensitive receivers, then compliance with the recommended criteria at all noise sensitive receivers will be achieved.

A summary of the nearest sensitive receivers surrounding the site location is shown in Table 1, including the approximate distances between closest lot boundaries.

ID	Sensitive Receiver	Receiver Type	Distance (m)
01	6 Iluka Ave	Residential	< 5
02	52 Eurobin Ave Stella Maris College	Educational	< 5
03	51 Eurobin Ave	Residential	20
04	46 Eurobin Avenue	Residential	< 5

Table 1: Nearest sensitive receivers surrounding the site location plus distances.

Figure 2 shows a diagram of the proposed demountable classrooms within the site (source JDH Architects).

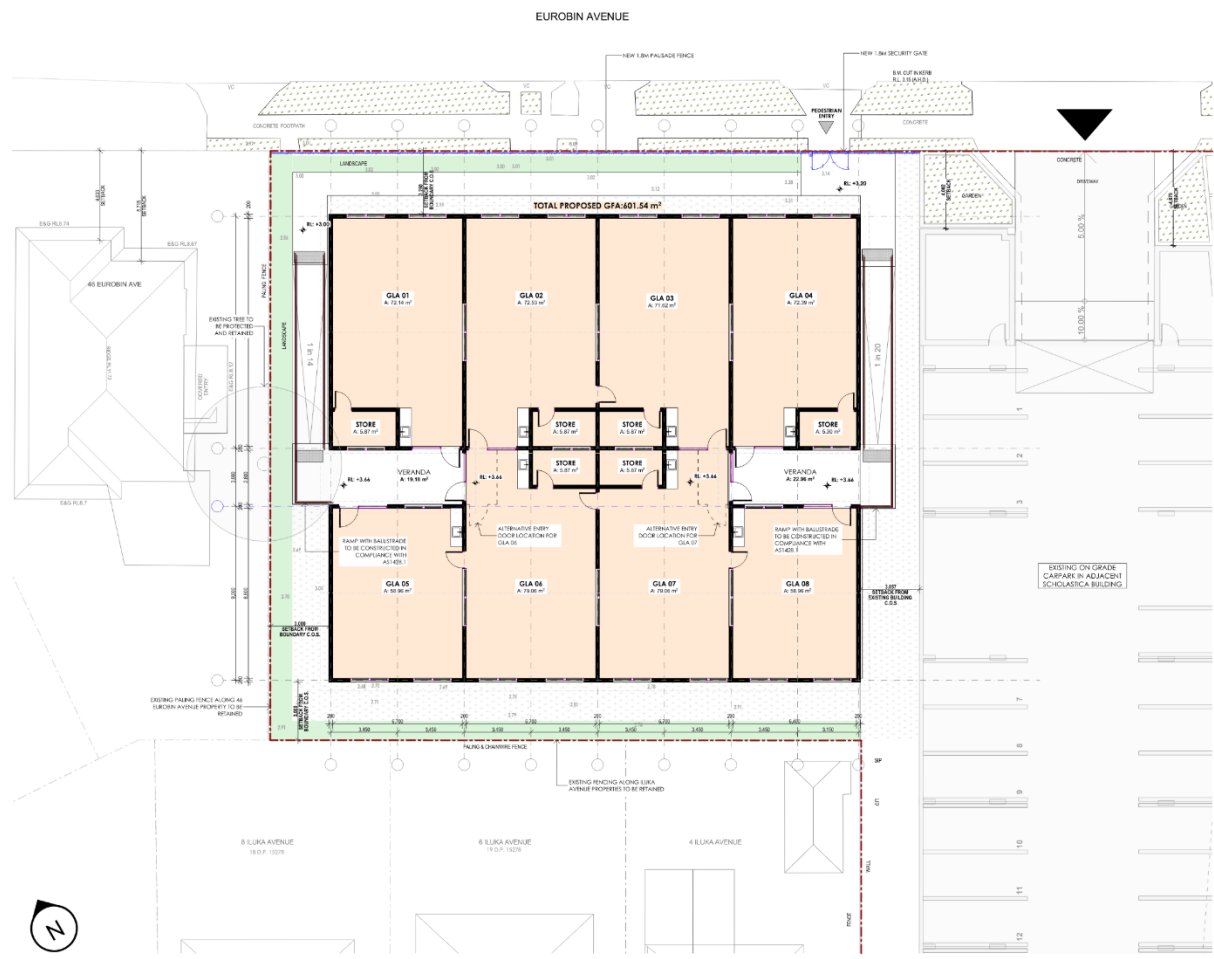


Figure 2: Proposed layout of demountable classrooms on site.

3 SITE MEASUREMENTS

3.1 GENERAL

An unattended noise survey was conducted in the location shown in Figure 3 in order to establish the ambient and background noise levels of the site and surrounds. The noise survey has been carried out in accordance with the method described in the AS/NZS 1055:2018 'Acoustics – Description and measurement of environmental noise'.



Figure 3: Noise survey monitoring location.

3.2 UNATTENDED NOISE MONITORING

Long-term noise monitoring was carried out from Monday 25th of October to Wednesday 3rd of November using a Rion NL-52 noise logger (Serial Number 01254316). The noise logger recorded L_{A1} , L_{A10} , L_{Aeq} and L_{A90} noise parameters at 15-minute intervals during the measurement period. The calibration of the noise logger was checked before and after use and no deviations were recorded.

The noise logger was located in the front yard of the site. The location was secure and considered to be representative of the typical ambient and background noise levels. The noise logger microphone was mounted 1.5 meters above the ground and a windshield was used to protect the microphone. Weather conditions were monitored during the duration of the noise survey and generally were calm and dry during the attended noise monitoring.

The detailed results of the long-term noise monitoring are presented graphically in Appendix A. As stated in the NSW NPI, any data likely to be affected by rain, wind or other extraneous noise has been excluded from the calculations (shaded in the Appendix A graphs).

The Rating Background Levels (RBLs) have been established in general accordance with the methodology described in the NSW NPI, i.e., 10th percentile background noise level (L_{A90}) for each period of each day of the ambient noise survey. The median of these levels is then presented as the RBL for each assessment period.

These RBLs are shown in Table 2, together with the ambient noise levels (L_{Aeq}) measured for each period.

Location	Rating Background Levels, dB(A)			L_{Aeq} Ambient Noise Levels, dB(A)		
	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-7am	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-7am
L1	42	39	30	51	50	45

Table 2: Results of unattended noise monitoring.

4 RELEVANT STANDARDS AND GUIDELINES

4.1 STANDARDS AND GUIDELINES

The following standards and guidelines are considered relevant to the project and have been referenced in developing the project noise level criteria.

- Regulatory Framework:
 - Environmental Planning and Assessment (EP&A) Act 1979.
 - Protection of the Environment Operations (POEO) Act 1997.
- Planning Framework:
 - Manly Local Environment Plan (M-LEP) 2013.
 - Manly Development Control Plan (M-DCP) 2013.
- Operational Noise:
 - NSW EPA Noise Policy for Industry (NPI) 2017.
 - NSW DECCW Road Noise Policy (RNP) 2011.
- Construction Noise and Vibration
 - NSW DECCW Interim Construction Noise Guideline (ICNG) 2009.
 - NSW DECC Assessing Vibration: A Technical Guideline 2006.
 - NSW Road Maritime Service (RMS) Construction Noise and Vibration Guideline 2016.
 - Australian Standard AS 2436:2010 'Acoustics – Guide to Noise Control on Construction, Maintenance & Demolition Sites'.
 - NSW EPA, Interim Construction Noise Guideline 2009.

4.2 REGULATORY FRAMEWORK

4.2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT (EP&A) ACT 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the regulation framework for the protection of the environment in New South Wales. The Act is relevantly about planning matters and ensuring that “environmental impact” associated with the proposed development is properly considered and reasonable before granting development consent to develop.

The assessment of “environmental impact” relies upon the use of acceptable noise criteria which either may be defined in a Development Control Plan, or derived from principles using guidelines like NSW EPA NPI or Noise Guideline for Local Government (NGLG 2013).

4.2.2 PROTECTION OF THE ENVIRONMENTAL OPERATION (POEO) ACT 1997

The Protection of the Environment Operations (POEO) Act 1997 has the objective to protect, restore and enhance the quality of NSW environment. Abatement of noise pollution is underpinned by the definition of “offensive noise” as follows:

“(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations."

4.3 PLANNING FRAMEWORK

Relevant Planning Documents of Northern Beaches Council Legislation have been reviewed for any noise requirement or criteria. The planning framework for the project has been found in the Manly planning documents.

The Manly Local Environmental Plan (M-LEP 2013) sets the Land Zoning as shown in Figure 4; as per information extracted from the M-LEP map 5150_COM_LZN_003_010_20180713. The site is categorised as General Residential (R1) next to Educational (SP2).

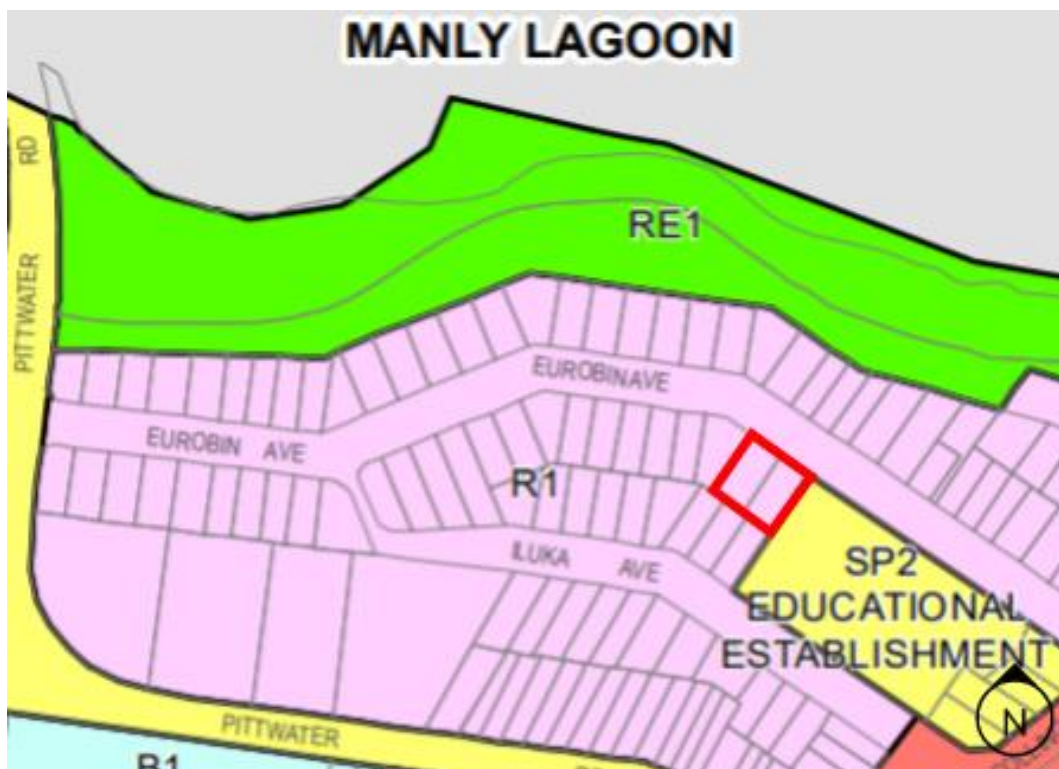


Figure 4: Landzoning of the site (red outline) and surrounds.

The Manly Development Control Plan (M-DCP 2013) has been reviewed for any relevant noise requirements or criteria for the proposed development. There are no specific noise level criteria, but rather sections of the M-DCP 2013 provide general planning strategies.

4.4 OPERATIONAL NOISE

4.4.1 NSW EPA NOISE POLICY FOR INDUSTRY

The NSW EPA Noise Policy for Industry 2017 assesses noise from industrial noise sources – scheduled under the POEO. Mechanical noise from the development shall be addressed following the recommendations in the NSW NPI.

The assessment is carried out based on the existing ambient and background noise levels addressing the following:

- *Intrusiveness Criteria*, to control intrusive noise into nearby sensitive receivers.
- *Amenity Criteria*, to maintain the noise level amenity for particular land uses.

These criteria are established for each assessment period (day, evening and night) and the more stringent sets the Project Noise Trigger Level (PNTL's).

4.4.1.1 Intrusiveness Criteria

The NSW NPI defines the intrusiveness criterion as follows:

"The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold."

Based on the intrusiveness criterion definition and the estimated background noise levels on site, Table 3 shows the intrusiveness criteria for the noise sensitive receivers.

Indicative Noise Amenity Area	Period	Measured Rating Background Level, dB(A)	Intrusiveness Criteria, dB(A)
General Residential (R1)	Day	42	47
	Evening	39	44
	Night	30	35

Table 3: Determination of the intrusiveness criteria for residential noise sensitive receivers.

4.4.1.2 Amenity Criteria

The NSW NPI states the following to define the amenity criteria:

"To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance."

Based on the amenity criteria definition and the land zoning, Table 4 shows the amenity criteria for the noise sensitive receivers.

<i>Indicative Noise Amenity Area</i>	<i>Period</i>	<i>Recommended Amenity Noise Level ($L_{Aeq, period}$), dB(A)</i>	<i>Amenity Criterion ($L_{Aeq, 15min}$), dB(A)</i>
<i>General Residential (R1)</i>	Day	60	58 (60-5+3)
	Evening	50	48 (50-5+3)
	Night	45	43 (45-5+3)
<i>Educational - External</i>	When in use – External	45*	43 (45-5+3)

Table 4: Determination of the amenity criterion for noise sensitive receivers. Note *: recommended amenity noise level has been increased 10dB for external noise level.

4.4.1.3 Project Noise Trigger Levels

The PNTL's are shown in Table 5 and have been obtained in accordance with the requirements of the NSW NPI. These shall be assessed to the most affected point on or within the noise sensitive receiver boundary.

<i>Indicative Noise Amenity Area</i>	<i>Period</i>	<i>Intrusiveness Criterion</i>	<i>Amenity Criterion</i>
<i>General Residential (R1)</i>	Day	47	58
	Evening	44	48
	Night	35	43
<i>Educational</i>	When in use	---	43

Table 5: Determination of PNTL's (light grey highlight) for noise sensitive receivers.

4.4.2 NSW ROAD NOISE POLICY

The NSW DECC Road Noise Policy (RNP) establishes criteria for traffic noise from:

- Existing road.
- New road projects.
- Road development projects.
- New traffic generated by developments.

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2dB above the existing noise levels. An increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

In cases where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria.

4.5 CONSTRUCTION NOISE AND VIBRATION

4.5.1 NOISE CRITERIA

The ICNG suggest construction noise management levels that may minimise the likelihood of annoyance being caused to noise sensitive residential receivers depending on the duration of works. The management levels for long-term duration works are as follows:

- Within recommended standard hours.

The $L_{Aeq,15min}$ level measured at the most exposed boundary of any affected residential receiver when the construction site is in operation must not exceed the background noise level by more than 10dB(A). This noise level represents the point above which there may be some community reaction to noise.

However, in the case of a highly noise affected area, the construction noise level ($L_{Aeq,15min}$) at the most exposed boundary of any affected residential receiver when the construction site is in operation should not exceed 75dB(A). This level represents the point above which there may be strong community reaction to noise.

- Outside recommended standard hours.

The $L_{Aeq,15min}$ level measured at the most exposed boundary of any affected residential receiver when the construction site is in operation must not exceed the background level by more than 5dB(A). It is noted that a strong justification is required for works outside the recommended standard hours.

In order to establish the airborne construction noise criteria, noise levels from the unattended noise monitoring have been used for the noise sensitive receivers – refer to Section 2. Table 6 below summarises the airborne construction noise criteria for most the affected noise sensitive receivers surrounding the development site.

Sensitive Receiver		Airborne Construction Noise Criteria, L_{Aeq} dB(A)	
		Within Standard Hours	Outside Standard Hours
Residential	Noise affected / External	RBL + 10	RBL + 5
	Highly noise affected / External	75	N/A

Table 6: ICNG construction airborne noise criteria for noise sensitive receivers surrounding the site.

Table 7 summaries the airborne construction noise criteria for educational facilities surrounding the development site.

Land Use	Management Level, L_{Aeq} dB(A)
Educational Institutions	Internal Noise Level 45dB(A)
	External Noise Level 55dB(A)

Table 7: ICNG construction airborne noise criteria for educational.

Where reference is made to an internal noise level, an external noise level 10dB above the internal noise levels are applied which should achieve the internal noise level where a window is adequately opened to provide natural ventilation.

The ICNG recommends internal ground-borne noise maximum levels at residences affected by nearby construction activities. Ground-borne noise is noise generated by vibration transmitted through the ground into a structure and can be more noticeable than airborne noise for some sensitive receivers. The ground-borne noise levels presented below from the ICNG are for residential receivers during evening and night-time periods only, as the objective is to protect the amenity and sleep of people when they are at home.

- Evening: $L_{Aeq,15min}$ 40dB(A) (internal)
- Night: $L_{Aeq,15min}$ 35dB(A) (internal)

The internal noise levels are assessed at the centre of the most affected habitable room.

4.5.2 VIBRATION CRITERIA

4.5.2.1 Structural Building Damage

Ground vibration from construction activities can damage surrounding buildings or structures. For occupied buildings, the vibration criteria given in previous section for Human Comfort shall generally form the limiting vibration criteria for the Project.

For unoccupied buildings, or during periods where the buildings are unoccupied, the vibration criteria for building damage suggested by German Standard DIN 4150.3:2016 'Vibration in Buildings – Effects on Structures' are to be adopted. Guideline values from DIN 4150.3:2016 are presented in Table 8.

Structural type	Vibration velocity, mm/s (Peak Particle Velocity - PPV)				
	Foundation			Plane of floor uppermost full storey in horizontal direction	Floor slabs, vertical direction
	1Hz to 10Hz	10Hz to 50Hz	50Hz to 100Hz	All frequencies	All frequencies
Type 1: Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
Type 2: Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
Type 3: Structures that because of their particular sensitivity to vibration, cannot be classified under Type 1 and 2 and are of great intrinsic value (e.g. heritage buildings)	3	3 to 8	8 to 10	8	20

Table 8: DIN 4150.3:2016 Guideline values of vibration velocity (PPV) for evaluating the effects of short-term vibration.

4.5.2.2 Human Comfort

The Department of Environment and Climate Change (DECC) developed the document 'Assessing Vibration: A Technical Guideline' in February 2006 to assist in preventing people from exposure to excessive vibration levels within buildings. It is based on the guidelines contained in BS 6472.1:2008 'Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting'.

The guideline does not address vibration induced damage to structures or structure-borne noise effects. Vibration and its associated effects are usually classified as continuous (with magnitudes varying or remaining constant with time), impulsive (such as shocks) or intermittent (with the magnitude of each event being either constant or varying with time). Vibration criteria for continuous and impulsive vibration are presented in Table 9 below, in terms of vibration velocity levels.

Place	Time	r.m.s. velocity, mm/s [dB ref 10 ⁻⁶ mm/s]			
		Continuous Vibration		Impulsive Vibration	
		Preferred	Maximum	Preferred	Maximum
Residences	Day-time	0.20 [106 dB]	0.40 [112 dB]	6.00 [136 dB]	12.00 [142 dB]
	Night-time	0.14 [103 dB]	0.28 [109 dB]	2.00 [126 dB]	4.00 [132 dB]
Offices, schools, educational and worship	When in use	0.40 [112 dB]	0.80 [118 dB]	13.00 [142 dB]	26.00 [148 dB]

Table 9: Continuous and impulsive vibration criteria applicable to the site.

When assessing intermittent vibration comprising a number of events, the Vibration Dose Value (VDV) it is recommended to be used. Table 10 shows the acceptable VDV values for intermittent vibration.

Place	Time	Vibration Dose Values, m/s ^{1.75}	
		Preferred	Maximum
Residences	Day-time	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational and worship	When in use	0.40	0.80

Table 10: Intermittent vibration criteria applicable to the site.

5 NOISE IMPACT ASSESSMENTS

5.1 OVERVIEW

Noise emissions from the proposed change of use have the potential to impact on existing noise sensitive receivers. For the purpose of these noise impact assessments, the noise sources are assumed as follows:

- Noise emissions from external mechanical plant.
- Noise emissions from generated traffic.

5.2 EXTERNAL MECHANICAL PLANT

Noise from the proposed development mechanical plant should be controlled to ensure external noise emissions are not intrusive and do not impact on the amenity of the sensitive receivers.

At this stage, the proposed mechanical plant selections have not been made. Therefore, an acoustic assessment of the impacts of the plant to the nearest noise sensitive receivers cannot be completed. It is anticipated that the mechanical services will be able to comply with the noise emissions requirements during the day time operation of the demountables. An acoustic assessment of all mechanical plant shall be carried out during design stages in order to confirm any noise control measures if required to achieve NSW EPA NPI noise level criteria.

5.3 GENERATED TRAFFIC

There is no provision for additional car parking in the proposed development. Therefore, no increase is expected to the existing traffic levels in the area.

As noted in Section 4.6.2, when considering land use development and the impact on sensitive land uses the NSW Road Noise Policy (RNP) states that an increase up to 2dB in relation to existing noise levels is anticipated to be insignificant. Therefore, it can be stated that there will be no significant increase in road traffic noise as a result of the proposed development, and as such it is expected to meet the NSW RNP recommendations.

6 SUMMARY AND CONCLUSIONS

A noise impact assessment has been carried out for the proposed change of use of 48 and 50 Eurobin Ave in Manly. This report has been prepared as part of the Development Application for Northern Beaches Council.

This report presents the results of the noise survey carried out on site, establishes relevant noise level criteria and details the acoustic assessment.

An ambient and background noise survey has been undertaken at the existing site to establish the appropriate noise criteria in accordance with the relevant guidelines. The noise assessment has adopted methodology from relevant guidelines, standards and legislation to assess noise impact.

At this stage, the proposed mechanical plant selections have not been made. Therefore, an acoustic assessment of the impacts of the plant to the nearest noise sensitive receivers cannot be completed. Acoustic assessment of the proposed mechanical plant should continue throughout the design stages of this project and any noise control measures implemented if required to achieve NSW EPA NPI noise level criteria.

There is no provision for additional car parking in the proposed development. Therefore, no increase is expected to the existing traffic levels in the area and traffic noise associated with the development is expected to meet the NSW RNP recommendations.

The information presented in this report shall be reviewed if any modifications to the features of the development specified in this report occur, including and not restricted to selection of mechanical plant, modifications to the building and introduction of any additional noise sources.

Even though no assessment can be considered as being thorough enough to preclude all potential environmental impacts, based on the information presented in this report, it can be stated that relevant objectives will be satisfied and therefore approval is recommended to be granted.

APPENDIX A: LONG TERM NOISE MONITORING

