MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

Barker College - Junior School Stairs

Construction Noise and Vibration Management Plan

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 98 145 324 714
www.acousticlogic.com.au

Project ID	20250537.1
Document Title	Construction Noise and Vibration Management
Attention To	Blue Group Projects Pty Ltd

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	3/06/2025	20250537.1/0306A/R0/WY	WY		WY

TABLE OF CONTENTS

1 INTRODUCTION

Acoustic Logic has been engaged to prepare a construction noise and vibration management plan for the proposed works at Barker College - Junior School Stairs.

The principal objective of this study is to undertake an evaluation of works/activities to be performed during the demolition, excavation and construction of the project and forecast the potential impacts of noise and vibration. This assessment will be used to formulate and streamline effective regulation and mitigation measures.

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

- Identification of the noise and vibration standards which will be applicable to this project
- Identification of potentially impacted nearby development
- Identify likely sources of noise and vibration generation and predicted noise levels at nearby development; and
- Formulation of a strategy to comply with the standards identified and mitigation treatments in the event that compliance is not achievable.

Provided all measures outlined in this report are fully implemented, noise and vibration impacts associated with the construction of the development site will be strictly controlled, and the impact on the surrounding environment minimised.

2 SITE DESCRIPTION

Construction works anticipated are as follows for Stage 1a works:

- 1-2 days of demolition of existing stairs with a 5T excavator with machine mounted hydraulic drill
- Excavation of soil
- 1 delivery of bricks
- Two concrete pours
- General intermittent construction noise.

Investigation has been carried out by this office in regards to the existing properties and noise impacts surrounding the proposed development, which is detailed below:

- Existing residential blocks to the surrounding the site
- Existing commercial receivers to the north and east, and
- Existing educational facilities to the south outside the development envelope.

The nearest noise receivers around the site include:

- **R1:** Residential Receiver 1 – Residential receivers to the north at 65 Pacific Highway
- **R2:** Residential Receiver 2 – Residential receivers to the east at 7-33 Unwin Road and 2A-26 Yardley Avenue
- **R3:** Residential Receiver 3 – Residential receiver to the south at 30 Unwin Road
- **R4:** Residential Receiver 4 – Residential receivers to the south at 31-31A Clarke Road and 4-12 Marillian Avenue
- **R5:** Residential Receiver 5 – Residential receivers to the west at 14-26 College Crescent
- **C1:** Commercial Receiver 1 – Commercial receivers to the north along Pacific Highway
- **C2:** Commercial Receiver 2 – Commercial receiver to the east at 1A Clarke Road, and
- **E1:** Educational/ Active Recreational Receiver 1 – Unwin Park and St Leo's College Recreational Centre to the south east at 1 Clarke Road and 37-63 Unwin Road.

It is noted that **R1** is heavily affected by traffic noise from Pacific Highway. As such, compliance to receivers **R2-R5** will ensure compliance to **R1**.

A site map, measurement description and surrounding receivers are presented in Figure 1 below.

Figure 1 – Project Site
Source: NSW Six Maps

Barker College Development Envelope
Project Site Stage 1
Residential Receivers
Commercial Receivers
Educational/ Active Recreational Receivers
Unattended Noise Monitors
Attended Measurements

3 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-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 principal measurement parameters are used, namely L_{10}, L_{90} and L_{eq}. The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} 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 L_{90} 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 L_{90} 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 L_{90} level.

The L_{eq} 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. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

4 ENVIRONMENTAL NOISE SURVEY

Attended noise measurements were conducted at the project site and at relevant residential receivers surrounding the project site to ascertain the local background noise level. These measurements were conducted for the approved SSDA Acoustic Assessment.

Summarised measured background noise levels for the project site and immediate surroundings are presented below.

Table 4-1 – Measured Noise Levels

Receiver	Time of day	Background Noise Level dB(A) $L_{90(Period)}$
R1	Day (7am – 6pm)	46
R2		44
R3		40
R4 & R5		51

5 SSD COUNCIL CONDITIONS OF CONSENT

5.1 B10

Prior to the issue of any relevant construction certificate, the Applicant must submit evidence to the Certifier that:

(a) a detailed assessment of mechanical plant and equipment with compliance with the relevant project noise trigger levels as recommended in the SSDA Acoustic Assessment – Concept Approval and Stage 1 Works prepared by Acoustic Logic Pty Ltd dated 25 October 2023 must be undertaken by a suitably qualified person; and

(b) the noise mitigation recommendations for the mechanical plant and equipment and material workroom (as relevant) in the SSDA Acoustic Assessment – Concept Approval and Stage 1 Works prepared by Acoustic Logic Pty Ltd dated 25 October 2023 as updated the by the detailed assessment of the mechanical plant and equipment required by condition B10(a) have been incorporated into the design to ensure the development will not exceed the predicted noise emission levels at receivers identified in the SSDA Acoustic Assessment – Concept Approval and Stage 1 Works prepared by Acoustic Logic Pty Ltd dated 25 October 2023.

AL notes that condition B10 does not relate to the construction of the stairs. As such, compliance with condition C14 shall provide sufficient documentation for construction certification.

5.2 C14

The Construction Noise and Vibration Management Sub-Plan (CNVMSP) must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced noise expert;

(b) be generally consistent with the recommendations of the SSDA Acoustic Assessment – Concept Approval and Stage 1 Works prepared by Acoustic Logic Pty Ltd dated 25 October 2023;

(c) describe procedures for achieving the noise management levels in Section 8 of the SSDA Acoustic Assessment – Concept Approval and Stage 1 Works prepared by Acoustic Logic Pty Ltd dated 25 October 2023;

(d) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;

(e) include strategies that have been developed with the community for managing high noise generating works;

(f) describe the community consultation undertaken to develop the strategies in condition Schedule 3 condition C14(e);

(g) include a complaints management system that would be implemented for the duration of the construction; and

(h) include a program during noise intensive works to monitor and report on the impacts and environmental performance of the development to and the effectiveness of the management measures required in Schedule 3 condition C11.

AL notes that a *Community Communication Strategy* has been prepared by Urbis detailing formats of communication with surrounding receivers. If complaints are raised during any given period, the Builder shall take all feasible and reasonable steps to ensure concerns are adequately addressed.

5.3 D4-D7 (CONSTRUCTION HOURS)

Construction Hours

D4. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7am and 6pm, Mondays to Fridays inclusive; and

(b) between 8am and 1pm, Saturdays.

No work may be carried out on Sundays or public holidays.

D5. Construction activities may be undertaken outside of the hours in Schedule 3 condition D4 if required:

(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or

(c) where the works are inaudible at the nearest sensitive receivers; or

(d) where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.

D6. Notification of such construction activities as referenced in Schedule 3 condition D5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

D7. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours, unless other methods of noise management are specified and approved in the CNVMSP required by Schedule 2 condition C14:

(a) 9am to 12pm, Monday to Friday;

(b) 2pm to 5pm, Monday to Friday; and

(c) 9am to 12pm, Saturday.

Construction works during the above conditioned standard hours have been assessed with reference to the standard hours noise management levels (background + 10 dB(A)) in the NSW DECC Interim Construction Noise Guideline.

Vibration objectives will be assessed to management levels defined in Section 6.2.

6 CONSTRUCTION NOISE AND VIBRATION OBJECTIVES

6.1 NOISE OBJECTIVES

Noise associated with construction activities on the site will be assessed in conjunction with the following documents and guidelines:

- NSW DECC Interim Construction Noise Guideline (2009); and
- Australian Standard 2436-2010 "*Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*".

6.1.1 NSW DECC Interim Construction Noise Guideline (2009)

The EPA Interim Construction Noise Guideline (ICNG) assessment requires:

- Determination of noise management levels (based on ambient noise monitoring);
- Review of operational noise levels at nearby development; and
- If necessary, recommendation of noise controls strategies in the event that compliance with noise emission management levels is not possible.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *"Noise affected" level. Where construction noise is predicted to exceed the "noise affected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise affected level". For residential properties, the "noise affected" level occurs when construction noise exceeds ambient levels by more than 10dB(A)Leq(15min).*
- *"Highly noise affected level". Where noise emissions are such that nearby properties are "highly noise affected", noise controls such as respite periods should be considered. For residential properties, the "highly noise affected" level occurs when construction noise exceeds 75dB(A)Leq(15min) at nearby residences.*

In addition to the above management levels for residential receivers, the ICNG nominates a Management Level of 70dB(A) $L_{eq(15min)}$ at commercial receiver facades (typical office, retail). And a Management Level of RBL + 5 dB(A) for any work done outside of standard hours.

A summary of the above recommended noise levels from the ICNG is presented below.

Table 6-1 – Noise Emission Goal at Residential Property Boundaries

Location	"Noise Affected" Level - dB(A)$L_{eq(15min)}$ Standard Hours	"Highly Noise Affected" Level - dB(A)$L_{eq(15min)}$
R2 residents	54 externally at façade	75
R3 residents	50 externally at façade	
R4 & R5 residents	61 externally at façade	

Where noise from the construction works is above the "noise affected" level, the proponent shall apply any feasible and reasonable work practices to minimise noise. The "noise affected level is representative of a level where there may be some community reaction to noise.

If noise emissions are likely to exceed 75 dB(A)$L_{eq(15min)\ "highly\ noise\ affected"}$ at the boundary of surrounding affected residential receivers, the receiver is deemed to be "highly noise affected". The "highly noise affected" level is representative of a level where strong community reaction to noise is expected. Introduction of management controls such as scheduling of noisy periods, or respite periods is then recommended. Refer to Section 8 for specific recommendations.

Section 4.1.2 and 4.1.3 of the EPA Interim Construction Noise Guideline also nominates management levels for other sensitive land uses (other than residences). Criteria relevant to this assessment is detailed below.

Table 6-2 – Noise Emission Goal at Commercial/Sensitive Property Boundaries

Location	"Noise Affected" Level – dB(A)$L_{eq(15min)}$ Standard Hours
Surrounding Active Recreational Receivers	65 externally
Surrounding Commercial Receivers	70 externally at façade
Classrooms at schools and other educational institutions	45 internally

It is noted that the ICNG noise management levels apply to receivers outside the development. As the closest afterschool care and classrooms are owned by the proponent (Barker College), any management of noise and vibration with these buildings will be liaised directly with representatives of the proponent.

6.1.2 Australian Standard AS2436:2010 "*Guide to Noise Control on Construction, Maintenance and Demolition Sites*"

The Australian Standard AS2436 states that where all reasonable and available measures have been taken to reduce construction noise, mitigation strategies may be put in place to reduce levels noise levels to within a reasonable and acceptable level.

For the control and regulation of noise from construction sites, AS2436:1981 nominates the following:

a. That reasonable suitable noise criterion is established,

b. That all practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes to locations of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours, and

c. The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the construction site.

The guideline reflects on feasible and reasonable mitigation strategies, management controls and public liaising in the effort to reach realistic comprises between construction sites and potential noise affected receivers.

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

- Predict noise levels produced by typical construction activities at the sensitive receivers.
- Adopt management conditions as per AS2436 in the event of a non-compliance.

6.2 VIBRATION OBJECTIVES

Vibration caused by construction at any residence or structure outside the subject site will be assessed with reference to:

- For structural damage vibration, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*; and
- For human exposure to vibration, Department of Environment and Conservation NSW "Assessing Vibration: A Technical Guideline" (Feb 2006) is based on the guidelines contained in BS 6472:1992 *Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80Hz)* for low probability of adverse comment.

The criteria and the application of this standard are discussed in separate sections below.

6.2.1 Structure Borne Vibrations

German Standard DIN 4150-3 (1999-02) provides a guideline for acceptable levels of vibration velocity in building foundations, to assess the effects of vibration on structures. The table give guidance on the maximum accepted values of velocity at the foundation and in the plane of the highest floor of various types of buildings, to prevent any structural damage.

The table below lists the peak particle velocity, which is the maximum absolute value of the velocity signals for the three orthogonal components. This is measured as a maximum value of any of the three orthogonal component particle velocities when 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 6-3 – 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

6.2.2 Assessing Amenity

The NSW EPA's *Assessing Vibration – a technical guideline* is based on the guidelines contained in British Standard BS 6472-1992 '*Guide to Evaluate Human Exposure to Vibration Buildings (1Hz to 80Hz*'. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline shall be adopted to assess and manage vibration from the site. Where vibration exceeds, or is likely to exceed, the recommended levels then an assessment of reasonable and feasible methods for the management of vibration shall be undertaken.

Table 6-4 – BS 6472 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	Day or night-time	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	Day or night-time	0.64	1.28	13	26	18	36
Workshops		0.64	1.23	13	26	18	36

Note 1: Continuous vibration relates to vibration that continues uninterrupted for a defined period (usually throughout the daytime or night-time), e.g. continuous construction or maintenance activity. (DECC, 2006).

Note 2: Impulsive vibration relate to vibration that builds up rapidly to a peak followed by a damped decay and that may or may not involve several cycles of vibration (depending on frequency and damping), with up to three occurrences in an assessment period, e.g. occasional loading and unloading, or dropping of heavy equipment. (DECC, 2006).

7 PROPOSED CONSTRUCTION ACTIVITIES

We have been advised of the typical equipment/processes anticipated to be used for the construction of the subject development. Noise impacts from these activities on the amenity of the surrounding identified sensitive receivers, will be predicted in this section. Typically, the most significant sources of noise or vibration generated during a construction project will be demolition, excavation, civil works (compaction, asphalting) and piling.

The A-weighted sound power levels for the expected loudest equipment/processes for each stage of development are outlined in the table below.

Table 7-1 – Proposed Construction Activities and Associated Typical Sound Power Levels

Equipment /Process	Typical Sound Power Level dB(A)
Jackhammers	121
Machine Mounted Hydraulic Drill	113
Concrete Pump Truck	108
Excavator & Trucks	107
Powered Hand Tools (Electric)	102

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

1. On-site measurements
2. Table A1 of Australian Standard 2436-2010, and
3. *Data held by this office from other similar studies.

Noise levels take into account correction factors (for tonality, intermittency where necessary).

8 NOISE AND VIBRATION ASSESSMENT

8.1 NOISE IMPACT ASSESSMENT

The predicted noise levels during excavation and construction will depend on:

- The activity undertaken.
- The distance between the work site and the receiver. For many of the work areas, the distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented below. Predictions take into account the following:

- Noise reduction as a result of distance.
- Barrier effects resulting from shielding of the surrounding buildings (where applicable).

The following predictions represent a worst-case scenario for each respective item. The highest predicted noise levels assume direct line of sight with no barrier effects (such as second storey receivers with direct line of sight to the operating construction machinery).

Table 8-1 – Predicted Noise Generation to R2 Residential Receiver

Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Jackhammer (Demolition only)	67	Exceeds 54 dB(A) Noise Management Level but under 75 dB(A) Highly Noise Affected Level (Refer to Recommendations Section 9)
Machine Mounted Hydraulic Drill (Demolition only)	59	
Concrete Pump Truck	54-74	Exceeds 54 dB(A) Noise Management Level when driving near receiver from entry driveway location on the same street but under 75 dB(A) Highly Noise Affected Level (Refer to Recommendations Section 9)
Excavator & Trucks	53-73	
Powered Hand Tools (Electric)	48	Under 54dB(A) Noise Affected Level

Table 8-2 – Predicted Noise Generation to R3 Residential Receiver

Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Jackhammer (Demolition only)	45-46	Under 50dB(A) Noise Affected Level
Machine Mounted Hydraulic Drill (Demolition only)	37-38	
Concrete Pump Truck	32-33	
Excavator & Trucks	31-32	
Powered Hand Tools (Electric)	26-27	

Table 8-3 – Predicted Noise Generation to R4 Residential Receiver

Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Jackhammer (Demolition only)	49	Under 61dB(A) Noise Affected Level
Machine Mounted Hydraulic Drill (Demolition only)	41	
Concrete Pump Truck	36	
Excavator & Trucks	35	
Powered Hand Tools (Electric)	30	

Table 8-4 – Predicted Noise Generation to R5 Residential Receiver

Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Jackhammer (Demolition only)	63-64	Exceeds 61 dB(A) Noise Management Level but under 75 dB(A) Highly Noise Affected Level (Refer to Recommendations Section 9)
Machine Mounted Hydraulic Drill (Demolition only)	55-56	Under 61dB(A) Noise Affected Level
Concrete Pump Truck	50-67	Exceeds 61 dB(A) Noise Management Level when driving near receiver from entry driveway location on the same street but under 75 dB(A) Highly Noise Affected Level (Refer to Recommendations Section 9)
Excavator & Trucks	49-66	
Powered Hand Tools (Electric)	44-45	Under 61 dB(A) Noise Affected Level

Table 8-5 – Predicted Noise Generation to C1 & C2 Commercial Receivers

Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Jackhammer (Demolition only)	56	Under 70 dB(A) Noise Affected Level
Machine Mounted Hydraulic Drill (Demolition only)	48	
Concrete Pump Truck	43-54	
Excavator & Trucks	42-53	
Powered Hand Tools (Electric)	37	

Table 8-6 – Predicted Noise Generation to E1 Educational Receiver

Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (Internal Areas)	Comment
Jackhammer (Demolition only)	42	Under 45 dB(A) Noise Management Level
Machine Mounted Hydraulic Drill (Demolition only)	34	
Concrete Pump Truck	29-31	
Excavator & Trucks	28-30	
Powered Hand Tools (Electric)	23	

8.2 GENERAL DISCUSSION

Noise

All noise predictions have been presented as external noise levels except for **E1** which has been presented as an internal noise level with a 10dB(A) reduction through a façade open for natural ventilation. Internal noise levels at all locations are expected to be 10-20 dB(A) lower dependant on the façade of each receiver. Significant shielding is affording by surrounding buildings with generalised calculations including simple shielding. It is likely that real world noise levels are lower than those predicted.

External noise level predictions to **R2** and **R5** are presented as worst-case scenarios where the closest receiver has direct line of sight to construction plant operating at the closest point of the site with respect to each individual receiver. It is noted that many residents are shielded by other residential development, which would lead to lower noise levels than those predicted in the previous section.

It is also noted that noise is elevated from trucks, excavators and concrete pump trucks only because they must enter and exit the site from designated driveways as noted in the *Construction Traffic Management Plan*.

Treatment processes are recommended as per Section 9 with further recommendations in Sections 10, 11 & 12 for processes that exceed the noise management level, noting that no exceedances of the highly noise affected level is predicted. With the implementation of the aforementioned sections, the Client demonstrates that all reasonable and feasible vibration and noise mitigation measures have been taken.

Noise from construction processes to buildings within the greater Barker College will be managed through liaison with representatives of the school to minimise impacts within the greater development, however, is not required to be assessed as part of the NSW DECC ICNG as it is part of the same greater development. For development that is located within the Barker College precinct, it is open for the proponent (Barker College) to negotiate noise goals/management strategies directly, as it is an impact within their own site, and will form part of the management plan between the proponent and builder directly.

Vibration

Vibration impacts on all receivers is expected to be compliant with the criteria in Section 6.2.

9 RECOMMENDATIONS

In light of the above, we recommend:

1. **Liaison with Barker College:** Noise from construction processes to buildings within the greater Barker College will be managed through liaison with representatives of the school and the builder directly to minimise impacts within the greater development.

2. **Quiet Work Methods/Technologies:**

    a. Materials handling/vehicles:

        i. Trucks to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours.

        ii. Avoid careless dropping of construction materials into empty trucks.

        iii. Trucks, trailers and concrete trucks (if feasible) shall turn off their engines during idling to reduce noise impacts.

        iv. Trucks are not to idle near residential receivers and are instead to drive to the work site directly.

3. **Complaints Handling:** The procedures outlined in Section 12 shall be adopted.

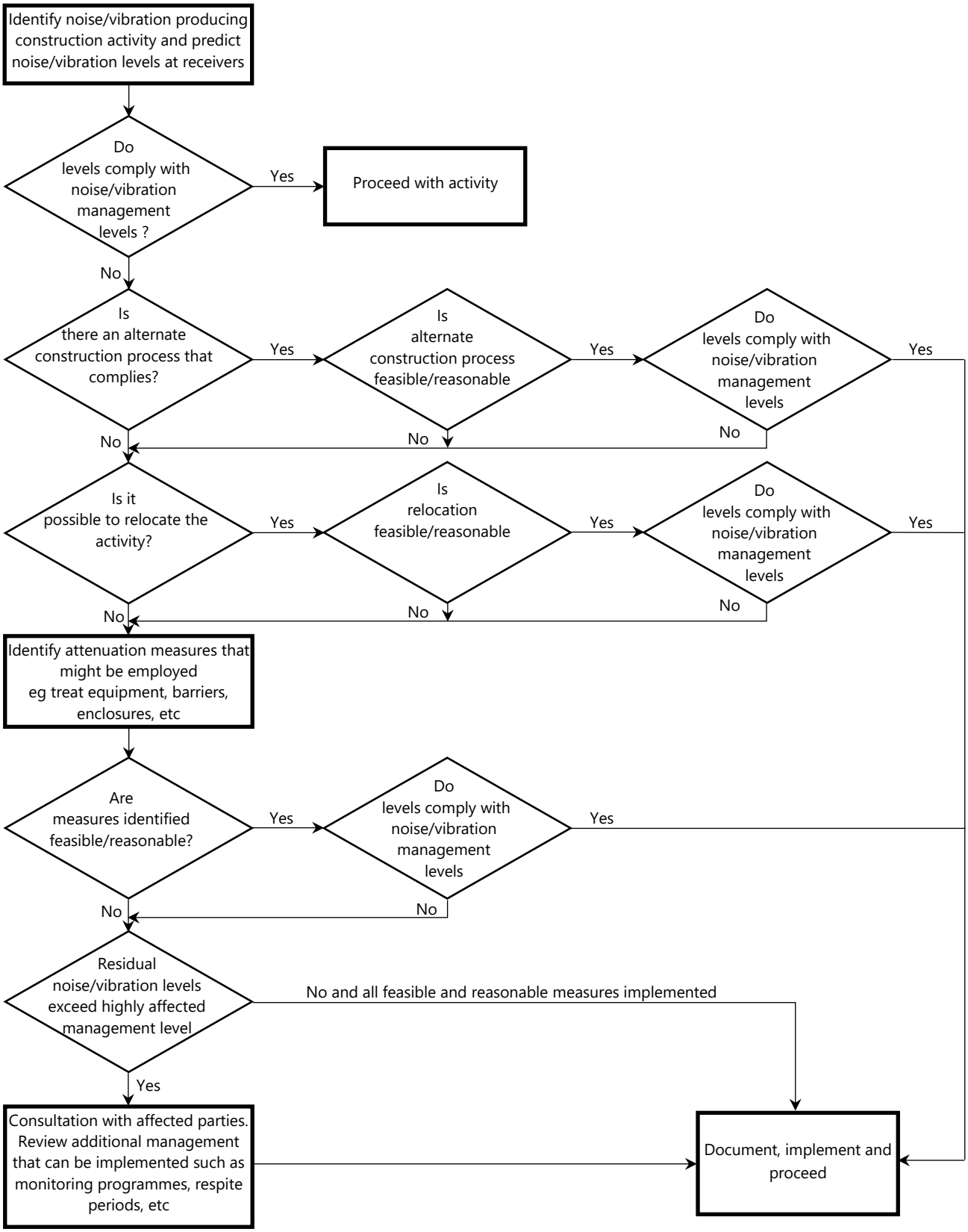
4. **Site Induction:**

    a. A copy of the Construction Noise and Vibration Management Plan is to be available to contractors. The location of the CNVMP shall be advised in any site induction.

    b. Site induction shall also detail the site contact in the event of noise complaint.

10 CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PROCEDURAL STEPS

The flow chart presented below illustrates the process that shall be followed in assessing construction activities.



11 ADDITIONAL NOISE AND VIBRATION CONTROL METHODS

In the event of complaints, there are a number of noise mitigation strategies available which can be considered.

The determination of appropriate noise control measures shall be dependent on the particular activities and construction appliances. This section provides an outline of available methods.

11.1 SELECTION OF ALTERNATE APPLIANCE OR PROCESS

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance.

11.2 ACOUSTIC BARRIER

Given the position of adjacent development, it is unlikely that noise screens will provide significant acoustic benefit for residential receivers, but will provide noticeable improvement for those on ground level.

The placement of barriers at the source is generally only effective for static plant. 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 dependent 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 15dB(A) can be affected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(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 shall have a noise reduction performance that is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10mm or 15mm thick plywood (radiata plywood) would be acceptable for the barriers.

11.3 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).

11.4 TREATMENT OF SPECIFIC EQUIPMENT

In certain cases, it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

11.5 ESTABLISHMENT OF SITE PRACTICES

This involves the formulation of work practices to reduce noise generation. A more detailed management plan will be developed for this project in accordance to the construction methodology outlining work procedures and methods for minimising noise.

11.6 COMBINATION OF METHODS

In some cases, it may be necessary that two or more control measures be implemented to minimise noise.

12 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

12.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise management programme to work effectively, continuous communication is required between all parties, which may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation process is to:

- Inform and educate the groups about the project and the noise controls being implemented
- Increase understanding of all acoustic issues related to the project and options available
- Identify group concerns generated by the project, so that they can be addressed, and
- Ensure that concerned individuals or groups are aware of and have access to a Constructions Complaints Register which will be used to address any construction noise related problems shall they arise.

Community consultation is recommended prior to any works commencing on site, with letterbox notifications to all identified surrounding sensitive receivers (refer Section 2). This will include a construction management plan detailing the proposed works on site and duration of each stage.

12.2 DEALING WITH COMPLAINTS

If a noise or vibration complaint is received, the complaint will be investigated by the builder with the complainant to ascertain the nature of the complaint and issues that led to complaint. The complaint handling process will be detailed to residents via the letter to the community as described in Section 9.

- How surrounding residents will be informed of the complaint handling process, including a contact phone number for the reporting of noise and vibration complaints
- The investigation process to be undertaken, and
- How the investigation outcome will be communicated to the complainant.

A record will be made of all complaints including details of the investigation and response actions taken and confirmation copies of these records will be provided to Hornsby Shire Council and the PCA upon request.

If a noise complaint is received the complaint shall be recorded on a Noise Complaint Form. The complaint form shall 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
- Summary of feedback to the complainant.

Shall ongoing complaints of excessive noise or vibration criteria occur, immediate measures will 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 limits all work potentially producing vibration will cease until the exceedance is investigated.

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

A permanent register of complaints shall be held. All complaints received shall be fully investigated and reported to management. The complainant shall also be notified of the results and actions arising from the investigation.

The investigation of a complaint will 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 shall be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees shall be carried out.

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

12.3 REPORTING REQUIREMENTS

The following will be kept on site:

1. A register of complaints received/communication with the local community will be maintained and kept on site with information as detailed in this report.
2. Where noise/vibration complaints require noise/vibration monitoring, results from monitoring will be retained on site at all times.
3. Any noise exceedances occurring including the actions taken and results of follow up monitoring.
4. A report detailing complaints received and actions taken will be presented to the construction liaison committee.

12.4 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.

13 CONCLUSION

A construction noise and vibration assessment has been undertaken of the proposed construction works to be undertaken for Barker College - Junior School Stairs. Potential noise and vibration impacts on nearby developments have been assessed.

Provided that the mitigation techniques and vibration monitoring recommended in Sections 9, 10, 11 & 12 of this report are adopted, noise and vibration impacts on the adjacent buildings are expected to be acceptable.

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

Yours faithfully,

Acoustic Logic Pty Ltd
Weber Yeh