

**19-23 ROSALIND STREET, CAMMERAY
ACOUSTIC REPORT
FOR
PERIFA ROSALIND DEVELOPMENT PTY LTD
(PERIFA)**



West & Associates
PTY LTD

Prepared by:

ABN 12 003 731 851
*Building Services and
Acoustic Engineers
Suite A, 39 Smith Ave.
ALLAMBIE NSW 2100
Ph: (02) 9905 3733
Fax: (02) 9905 9889
Mobile: 0403 994 595
Email: joel.west@waapl.com.au
Web: www.waapl.com.au*



West & Associates
P T Y L T D

Document Details

Detail	Reference
Project Title	19-23 ROSALIND STREET, CAMMERAY
Job Reference	2298/8
File Reference	26025
Prepared For	PERIFA ROSALIND DEVELOPMENT PTY LTD (PERIFA)
Address	19-23 ROSALIND STREET, CAMMERAY
Attention	Lachlan Miles
Email	[lachlan.miles@perifa.com.au]

Document Control

Revision	Date	Prepared	Checked	Authorized
Issue A	29 January 2026	Joel West	Warwick West	Warwick West

Warwick West; *W West*

Director West & Associates Pty. Ltd. ,MIEAust, CPEng, NER APEA Engineer IntPE Aust, BE, Grad. Dip. Arch. Acou. UNSW MAAS, Reg Engineer Dept FairTrading;2025 & 3278,

Joel West; *Joel West*

Director West & Associates Pty. Ltd. ,AffilM IEAust, Grad. Dip. Eng

Disclaimer:

West and Ass. P/L Intellectual Property: The contents of this report, in its entirety remains the intellectual property of West and Associates. Pty Ltd and the Client only has license to use the material for purpose it was prepared. The material must not be reproduced by a third party without our written approval.

The material contained herein is for acoustic purposes only and no claims or guarantees are given relating to design, construction, fire, structural integrity build-ability, fit for purpose, waterproofing and the like.

This report is the property of the Client and in preparing this report we are relying on the information submitted by them and our agreed services. If that information is subsequently determined to be incorrect, then our observations and conclusions may change.

Our service is to test the material you advised to be used at your site. We are not suppliers or installers of materials nominated in the report and cannot give any warranties for others or their products or workmanship.

We have prepared this report in accordance with usual care of the consulting profession, however no other warranties are made as to the data and conclusions expressed in this report, to the extent permitted by law.

**19-23 ROSALIND STREET, CAMMERAY
ACOUSTIC REPORT
FOR**

PERIFA ROSALIND DEVELOPMENT PTY LTD (PERIFA)

Contents

1. EXECITIVE SUMMARY	1
1. PROJECT DESCRIPTION	2
1.1. REPORT TO SUPPORT DEVELOPMENT APPLICATION	2
1.2. SEARS REPORTING	3
1.3. REFERENCE DOCUMENTATION	3
1.4. DESCRIPTION OF THE SITE	3
1.5. CLOSEST SENSITIVE RECEIVERS	6
1.6. DISTRICT BACKGROUND NOISE	7
1.7. TRAFFIC NOISE AT PROJECT LOCATON	7
1.8. COMMERCIAL AREA NOISE AT PROJECT LOCATION	7
1.9. PROPOSED HOURS OF OPERATION	7
1.9.1. Residential	7
1.9.2. Commercial	7
2. NOISE CRITERIA	7
2.1. NOISE & VIBRATION CRITERIA FOR SITE	7
2.1.1. EPA's Noise Affected Criteria	7
2.1.2. Compliance with the Code AS 2436-2010	8
2.1.3. Noise Guide For Local Government -Offensive Noise	8
2.1.4. Vibration From Excavation & Construction	9
2.2. NORTH SYDNEY COUNCIL DCP	9
2.3. NOISE POLICY FOR INDUSTRY	12
2.4. CODE AS2107	12
2.5. COMPLIANCE WITH THE BUILDING CODE OF AUSTRALIA	12
3. NOISE MEASUREMENTS	12

3.1.	DISTRICT BACKGROUND NOISE MONITORING LOCATION AND TIME	12
3.1.1.	Monitoring Instrumentation	13
3.1.2.	Monitoring, Calibration and Calculation Procedures	13
3.1.3.	Environmental Conditions During Monitoring	13
3.1.4.	Logger Settings	13
3.2.	BACKGROUND NOISE RESULTS	14
3.2.1.	Background Noise Single Figure Results	14
4.	NOISE POLICY FOR INDUSTRY	14
4.1.	EXTERNAL NOISE LEVEL DETERMINATION IN ACCORDANCE WITH NOISE POLICY FOR INDUSTRY 2017 - NOISE TRIGGER LEVEL	14
4.1.1.	Single Figure Results	14
4.1.2.	Project Trigger Noise Level for this Project	15
5.	DEMOLITION AND CONSTRUCTION	15
5.1.	SCOPE OF DEMOLISHING & EXCAVATION WORKS	15
5.2.	NOISE AFFECTED CRITERIA	16
5.3.	CONSTRUCTION STAGES	17
5.4.	CONSTRUCTION HOURS	17
5.5.	CONSTRUCTION TRAFFIC NOISE	17
5.6.	CONSTRUCTION VIBRATION	18
6.	PREDICTED NOISE & VIBRATION LEVELS & IMPACT AT SENSITIVE RECEIVERS – DEMOLITION AND CONSTRUCTION	18
6.1.	PREDICTED APPLIANCE NOISE LEVELS	18
6.2.	PREDICTED APPLIANCE VIBRATION LEVELS	18
6.3.	PREDICTED NOISE LEVELS DURING CONSTRUCTION	19
7.	PREPARATION OF CONSTRUCTION TIME TABLE	21
8.	DETERMINATION OF CONSTRUCTION REQUIREMENTS	21
8.1.	CALCULATIONS OF BUILDING ATTENUATION WORKS USING AS 3671	21
8.2.	EXTERNAL BUILDING DESIGN REQUIREMENTS	22
8.3.	VENTILATION TO BEDROOMS AND HABITABLE	23

9.	NOISE FROM PROPOSED DEVELOPMENT	23
9.1.	SOURCES OF NOISE FROM SITE	23
9.1.1.	Mechanical Services Noise	23
9.1.2.	Vehicle Noise	23
9.1.3.	Communal Open Space	23
9.1.4.	Commercial Lot	24
9.2.	MECHANICAL SERVICES NOISE LEVELS	24
9.2.1.	Internal Noise levels from Building Plant	24
9.2.2.	External Noise levels from Building Plant	24
9.3.	VEHICLE NOISE	24
9.3.1.	Vehicle Noise Generally	24
9.3.2.	Vehicle Noise At Closest Sensitive Receivers	24
9.4.	COMMUNAL OPEN SPACE	24
9.4.1.	Communal Open Space Noise Spectrum	24
9.4.2.	Communal Open Space Noise On Closest Sensitive Receivers	25
9.5.	COMMERCIAL LOT	26
10.	CONSTRUCTION NOISE AND VIBRATION MITIGATION	26
10.1.	RESOLVING NOISE & VIBRATION COMPLAINT ISSUES	26
10.2.	UNRESOLVED NOISE AND VIBRATION COMPLAINT ISSUES	26
10.3.	EXCAVATION AND CONSTRUCTION NOISE MONITORING	27
10.3.1.	Excavation And Construction Vibration Monitoring	27
11.	OPERATIONAL NOISE EMISSION STATEMENT	27
12.	TRANSPORT NOISE IMPACT STATEMENT	28
13.	CONCLUSION	28
APPENDIX 1	PLOT OF BACKGROUND NOISE, FRONT OF SITE	
APPENDIX 2	PLOT OF BACKGROUND NOISE, REAR OF SITE	
APPENDIX 3	GEOTECH REPORT	

19-23 ROSALIND STREET, CAMMERAY
ACOUSTIC REPORT
FOR
PERIFA ROSALIND DEVELOPMENT PTY LTD (PERIFA)

CONSULTANT DECLARATION

PROJECT DETAILS	
PROJECT NAME	
Application number	SSD-96505456
Address of subject land	19-23 Rosalind Street, Cammeray
Lot / DP	SP4657, SP5218 and SP16181
APPLICANT DETAILS	
Applicant name	Perifa Rosalind Development Pty Ltd
Applicant address	Level 7/111 Elizabeth Street, Sydney
REPORT DETAILS	
Name of report this declaration relates	Acoustic Report
Report reference no.	26025
Report date	29 January 2026
Company name (inc. ABN / ACN)	12 003 731 851
Author name	Joel West & Warwick West
Author qualifications	Joel West: AffilM IEAust, Grad. Dip. Eng. Warwick West: MIEAust, CPEng, NER APEA Engineer IntPE Aust, BE, Grad. Dip. Arch. Acou. UNSW MAAS, Reg Engineer Dept FairTrading;2025 & 3278,
Author address	39 Smith Ave, Allambie Heights
DECLARATION BY CONSULTANT	
Name	Warwick West
Registration no.	2210
Organisation registered with	AAS
Declaration	The undersigned declares that 26025:

PROJECT DETAILS

- has been prepared in accordance with the following policy, guidelines, or legislative requirements:
 - Environmental Protection Agency (EPA) published the Interim Construction Noise Guideline 2009
 - AS 2436; 2010- 'Guide to noise and vibration control on construction, demolition and maintenance sites'
 - Noise Guide for Local Government 2010;
 - DECC&W (EPA) publication "Assessing Vibration-a technical guideline" -2006
 - North Sydney City Council DCP
 - Noise Policy For Industry 2017
 - AS 2107, 2016, titled 'Acoustics, Recommended design sound levels and reverberation times for building interiors'
 - NCC/BCA 2022
- contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the acoustic report relates;
- does not contain information that is false or misleading;
- identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project;
- identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the acoustic report relates;
- contains a consolidated summary of the proposed or necessary mitigation measures

Signature

19-23 ROSALIND STREET, CAMMERAY
ACOUSTIC REPORT
FOR
PERIFA ROSALIND DEVELOPMENT PTY LTD (PERIFA)

1.EXECITIVE SUMMARY

This acoustic report has been prepared by West & Associates Pty Ltd on behalf of Perifa Rosalind Development Pty Ltd (Perifa) to assess the potential environmental impacts that could arise from the construction of a seniors housing development (the development) at 19-23 Rosalind Street, Cammeray (the site). This report supports the assessment of the proposed development under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Based on the information assessed within this report it has been determined that the demolition, excavation and construction will meet requirements within the EPA Construction Noise Guideline.

Typically, the biggest impact of noise and vibration is rock breaking and drilling during the excavation stage which would be carried out at ground level.

The proposed development involves the demolition of the existing buildings located on site, bulk earthworks of the site & major excavation for multiple basement levels to the maximum depth of approximately 10m below ground level. As stated within the Geotech report the majority of this fill would be Sandstone.

We note that during the use of ground level excavation and the use of the rock saw we recommend that part of the Demolition & Construction Noise Management Plan is to include respite periods restricting overall hours, this may include periods in which the equipment is not to be used in between periods of use. In addition to this the equipment could also be used during late morning through to early afternoon periods.

We believe the site can easily achieve acoustic compliance with all relative standards and regulations. Due to the overall quiet nature of the area there are no acoustic requirements or recommendations for the architectural structure.

From our review we can confirm that no mechanical supply of outside air is required and glazing requirements can be met with standard 6.38Lam glass.

We do note that during the CC stage specific attention must be paid to the mechanical ventilation system to ensure compliance with RBL+5dB(A).

Based on our assessments carried out within this acoustic report we expect the development of this project to be able to be suitably built in a method that is in full compliance with the criteria set out by the following codes and regulations;

- AS 2436; 2010- 'Guide to noise and vibration control on construction, demolition and maintenance sites'
- Environmental Protection Agency (EPA) Interim Construction Noise Guideline 2009
- Noise Guide to Local Government
- Noise Policy for Industry 2017
- North Sydney Council DCP
- SEARS guideline

1.PROJECT DESCRIPTION

1.1.REPORT TO SUPPORT DEVELOPMENT APPLICATION

This acoustic report has been prepared by West & Associates Pty Ltd on behalf of Perifa Rosalind Development Pty Ltd (Perifa) to assess the potential environmental impacts that could arise from the construction of a seniors housing development (the development) at 19-23 Rosalind Street, Cammeray (the site). This report supports the assessment of the proposed development under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Industry specific SEARs were issued on 17 October 2025 for the development. Development for the purposes of seniors housing with an Estimated Development Cost (EDC) of more than \$30 million and includes a residential care facility is state significant development under Schedule 1, Section 28 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). The proposed development has an EDC exceeding \$30 million and includes a residential care facility component. Accordingly, it is considered State Significant Development.

This report has been prepared to assess the site for the use as a residential development and its acoustic impacts on the surrounding area including the acoustic impact onto the proposed development.

The report is aimed at addressing noise from the district and noise created at site by occupant use and mechanical services plant at the closest sensitive receiver locations.

In addition to the above the scope of work is to document a Demolition, Excavation & Construction Noise & Vibration Management Plan (**Noise & Vibration Management Plan**) for the proposed works at site as required by the Client.

This report has been prepared as a noise management tool identifying and discussing the following:

- a) Background and Description of site and works and the identification of sensitive receivers
- b) Identification of activities being carried out and predict level of construction noise & vibration
- c) Determine Noise and Vibration Criteria
- d) Noise & vibration monitoring method to be used during construction, reporting and response
- e) Assessment of construction noise and vibration levels during construction and predict impact on sensitive receivers
- f) Mitigation deployed to reduce impact
- g) Construction Management Plan including timetable, respite periods and frequency
- h) Community consulting
- i) Contingency Plan to record complaints, assessment of non compliance and register to record complaints and remedial action taken

This report is for the exclusive use of our Client. No warranties are expressed or inferred to third parties. No part of this report shall be relied upon by other parties without the written permission of West and Associates Pty Ltd.

West and Associates Pty Ltd disclaim all responsibility to the Client and others for matters outside the agreed scope of work.

1.2. SEARS REPORTING

Item	SEARS Requirement	Relevant Section of Report
10.0	Noise and Vibration Provide a noise and vibration impact assessment prepared in accordance with the relevant NSW Environment Protection Authority (EPA) guidelines. The assessment must detail construction and operational noise and vibration impacts on nearby sensitive receivers and structures and outline the proposed management	6. DEMOLITION AND CONSTRUCTION 7. PREDICTED NOISE & VIBRATION LEVELS & IMPACT AT SENSITIVE RECEIVERS – DEMOLITION AND CONSTRUCTION 8. PREPERATION OF CONSTRUCTION TIMETABLE 9. DETERMINATION OF CONSTRUCTION REQUIREMENTS

1.3. REFERENCE DOCUMENTATION

The report is based on the details given in the following set of documents:

1. Architectural Drawings, Project 19-23 Rosalind Street, Cammeray Dated: January 2026
2. Elite Geosciences Geotech report #2025181

1.4. DESCRIPTION OF THE SITE

The site is located at 19–23 Rosalind Street, Cammeray within the North Sydney Local Government Area (LGA). It comprises three (3) allotments legally described as SP4657, SP5218 and SP16181, and occupies a total area of approximately 4,100m². A site aerial showing each allotment is provided at **Figure 1**. Each respective lot currently comprises a three (3) storey residential flat building with the two (2) of the rear buildings situated on battleaxe allotments connected to Rosalind Street.

The proposed development includes the construction of a new seniors housing development and comprises the following works:

- Site preparation works including demolition of three (3) existing residential flat buildings and associated parking facilities as well as bulk excavation;

- Construction of two (2), five (5) and six (6) storey buildings, Building A and B respectively, comprising the following:
 - Building A:
 - 7 x 2-bedroom ILUs;
 - 11 x 3-bedroom ILUs; and
 - Internal communal space for use by residents.
 - Building B:
 - 11 x 2-bedroom ILUs;
 - 20 x 3-bedroom ILUs;
 - Two (2) residential care facility beds and residential care hub; and
 - Internal communal facilities for use by all residents comprising a cinema, private dining room, gymnasium and pool.
- Communal open space and associated landscaping;
- Construction of two (2) basement levels to facilitate car parking accessible via Rosalind Street;
- Ground Level neighbourhood shop located in Building A;
- Extension and augmentation of utility infrastructure as required.

For a detailed project description refer to the Environmental Impact Statement prepared by Colliers Urban Planning.

The site also contains a proposed small retail component being a neighbourhood shop defined as a premises to be used for the purposes of selling general merchandise for the day-to-day needs of people who live or work in the local area on the ground level facing Rosalind Street

The existing front of the site is shown in the photo below.



Photo of site; 19-23 Rosalind Street, Cammeray

The existing site and surrounding area can be seen in the Google Aerial Photos below:



Figure 1 Site aerial – Logging Locations
Source: Nearmap/Colliers Urban Planning

CLOSEST SENSITIVE RECEIVER 1

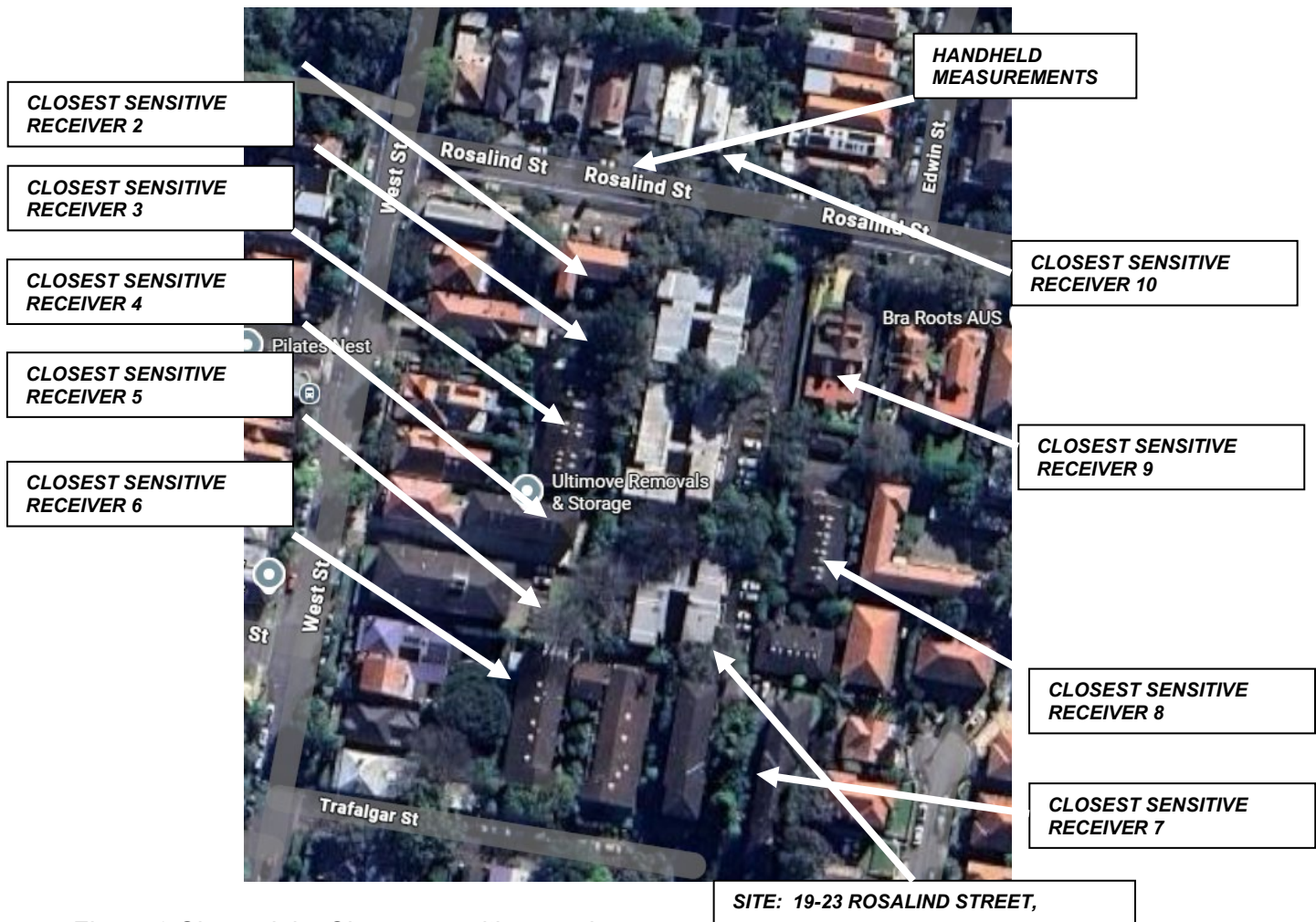


Figure 2 Site aerial – Closest sensitive receivers

Source: Google Maps

1.5. CLOSEST SENSITIVE RECEIVERS

The site currently sits in a predominately residential with surrounding residential properties in the area. The closest residential sensitive receivers have been identified below and shown on the Google aerial photo above.

The neighbouring closest sensitive receiver has been identified below:

- Location #1, Existing Residential Receivers – 15 Rosalind Street
- Location #2, Existing Residential Receivers – 201a West Street
- Location #3, Existing Residential Receivers – 199 West Street
- Location #4, Existing Residential Receivers – 191 West Street
- Location #5, Existing Residential Receivers – 187 West Street
- Location #6, Existing Residential Receivers – 2 Trafalgar Street
- Location #7, Existing Residential Receivers – 6-8 Trafalgar Street
- Location #8, Existing Residential Receivers – 29A Rosalind Street
- Location #9, Existing Residential Receivers – 27-29 Rosalind Street
- Location #10, Existing Residential Receivers – 18 Rosalind Street and adjacent properties

1.6.DISTRICT BACKGROUND NOISE

District background noise in the immediate location of the proposed site is dominated by road traffic noise from Rosalind Street, Warringah Freeway & Miller Street. The site would also be subject to various mechanical services noise production such as air conditioning and ventilation. The exact locations of these are unknown however we do expect to be present within the surrounding areas.

1.7.TRAFFIC NOISE AT PROJECT LOCATON

The dominant background noise for this project is road traffic noise from Rosalind Street, with some introduction of noise from Warringah Freeway 100m to the north and Miller Street 140m to the East. Although these streets are high noise generating streets the site is shielded by multiple buildings on all sides. Due to the overall distance of 100m & 140m from these 20,000> total vehicle traffic roads we have determined that an assessment of vehicle noise per The State Environmental Planning Policy (Traffic and Infrastructure) 2021 is not required.

1.8.COMMERCIAL AREA NOISE AT PROJECT LOCATION

The site is located in a predominantly residential area with no immediate adjacent commercial properties.

1.9.PROPOSED HOURS OF OPERATION

1.9.1.Residential

The residential aspect of the site would be constant and therefore the proposed hours of operation would be 24/7.

1.9.2.Commercial

The proposed hours of operation for the commercial shop is as follows:

- Monday – Sunday: 07:00am – 03:00pm

2.NOISE CRITERIA

2.1.NOISE & VIBRATION CRITERIA FOR SITE

2.1.1.EPA's Noise Affected Criteria

The Environmental Protection Agency (EPA) published the Interim Construction Noise Guideline 2009 is a guide to the construction industry as a tool for the management of construction noise, suitable to be used with NSW Government Construction projects and suitable to be used by local governments.

This document is based on background noise levels for the area and discusses work times when certain Construction Appliances can be used, feasible and reasonable mitigation measures, the adoption of rest periods when appropriate, and addresses management for noise at residences.

The EPA's Interim Construction Noise Guidelines addresses two Management Levels which consist of Noise Affected and Highly Noise Affected as follows:

- The Noise Affected criteria is assessed as the background (or rating background Level RBL) +20dB for projects of 0 to 4 weeks
- The Noise Affected criteria is assessed as the RBL +10dB for projects of 5 to 26 weeks
- The Noise Affected criteria is assessed as the RBL +5dB for projects greater than 26 weeks or outside recommended standard hours

- The Highly Noise Affected criteria is taken as 75 dB(A) which is the level where there may be strong community reaction to noise.

This project should be complete within the 5-26 week period so the Noise Affected criteria is taken as RBL +10dB.

2.1.2. Compliance with the Code AS 2436-2010

The code AS 2436; 2010- 'Guide to noise and vibration control on construction, demolition and maintenance sites' (**AS 2436**) provides lists of typical demolition and excavation equipment noise, the details how noise and vibration can be offensive, suggests methods to better manage and reduce site and noise and predicted noise levels from the various Appliances. Appendix 1 of this code provides noise levels of some common construction plant used on sites. However, this code does not provide a noise or vibration level criteria.

2.1.3. Noise Guide For Local Government -Offensive Noise

The Noise Guide for Local Government 2010; (**NG**) provides details on how specific noise levels can be determined so as not to cause offense to the closest sensitive receivers.

The NG publication describes factors that come into play when a noise created in a local area can be regarded by the receiver as being offensive. Nature and characteristics they list in their publication to be considered **inside** a closest sensitive receiver are as follows:

- Location of noise, loudness of the noise especially
- The character of the noise compared with other noises in the area
- The time and duration of the noise
- Whether the noise is typical of the area
- How often the noise occurs
- The number of people that are affected by the noise

The NG publication states the following in Clause 2.1.2 :

"audibility in a neighbouring residence is used to determine whether noise from a certain activity that often results in neighbourhood complaints is offensive".

The NG publication requires background noise levels for assessment purposes to be determined by a sound level meter as a $L_{A90\ t=15\ min}$ descriptor for the appropriate time of the day. The NG cross references the Industrial Noise Policy which defines how single value background noise can be determined for the 3 periods of the day called the Rating Background Level (RBL), being the daily medium of the lower 1/10 percentile of the $L_{A90\ t=15\ mi}$ background noise for each period

The NG publication recommend that in most cases the level of noise impact be measured as a $L_{AEq\ t=15\ min}$ descriptor.

The NG states that offense is to be assessed inside a sensitive receivers location, ie. Indoors. Industry practice accepts there is 10 dB attenuation of noise entering an open window.

Combining these NG recommendations, the Project Specific Noise Level is to be based on the Intrusiveness Criteria. The noise level being heard inside the closest sensitive receivers is determined by using the typical appliance noise levels as given in Table 1 above (derived from AS 2436) and calculating the attenuation from the distance from site, by any sound barriers created by separating fences or building structure and attenuated by 10 dB through an open window.

2.1.4.Vibration From Excavation & Construction

DECC&W (EPA) publication "Assessing Vibration-a technical guideline" -2006. Recommends the vibration levels given in the code BS 6472-1 2008 "Evaluation of Human exposure to vibration in buildings" (updated from the previous 1992 edition) is to be adopted.

The code BS 6472:2008 requires that either ground acceleration be monitored in the 3 directions or the maximum combined particle velocity of the three directions be monitored. The code gives the conversion between these two alternatives. The code gives the method by which the monitored results can be converted into Vibration Dose Values($m/s^{1.75}$). The Code then list the level of Vibration Dose that bring certain probable reactions from occupants. These values are as shown in the following Table.

Table 1: Vibration Dose Values($m/s^{1.75}$) (from ABS6472-2008, Table 1)

Place	Low Probability of adverse comment ($m/s^{1.75}$)	Adverse comment possible ($m/s^{1.75}$)	Adverse comment probable ($m/s^{1.75}$)
Residential Building Day (16 Hrs)	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential Building Night (8 Hrs)	0.13	0.26	0.51

The threshold of perception of vibration is $0.015 m.s^{-2}$ which corresponds to a peak particle velocity of $0.5 m.s^{-1}$.

Therefore the accumulated x, y & z vibration criteria of **0.5 metres per second velocity** be adopted as the vibration criteria for site.

2.2.NORTH SYDNEY COUNCIL DCP

Within the North Sydney City Council DCP the acoustic privacy criteria for residential amenity is addressed. The primary conditions within the councils DCP that is specific for North Sydney Council is the use of Max 1Hr LAeq results and an assessment against the SEPP Traffic and Infrastructure 2021 where appropriate. We have included extracts of the DCP as follows;

1.4.3 Acoustic privacy

Objective

O1 To ensure all residents are provided with a reasonable level of acoustic privacy.

Control

P1 New dwellings shall be designed and constructed to comply with the criteria specified in Table E-1.3 for all noise intrusion from external noise sources (including mechanical services noise from within the development itself), with windows and doors closed:

TABLE E-1.3: Noise intrusion criteria from external sources		
Internal Space	Time Period	Max 1hr noise level (LAeq 1 Hour)
Living areas	Day or Night	≤ 40 dBA
Sleeping Areas	Day or Night	≤ 35 dBA

Note: Readings are to be LAeq (1hour), when measured during the noisiest 1 hour period between Day 7am to 10pm; and Night - 10pm to 7am.

P2 Where multiple dwellings are provided within the same building, the building shall be designed and constructed to comply with the requirements in Table E-1.4 regarding acoustic insulation of walls and floors.

TABLE E-1.4: Internal acoustic insulation criteria	
Item	Criteria
Field Sound Reduction Index R'w of walls, floors services and ducts	BCA as amended. Except that Field Noise Reduction Index of all inter-tenancy walls shall be designed to achieve ≥R'w55 and the intent of the BCA requirements.
Field Sound Reduction Index R'w of Doors	Any door (including the effects of its frame and any edge gaps) in a wall between a dwelling and a stairwell or other internal common area shall be designed to achieve an ≥R'w28.
Impact Isolation of Floors	Where the floor of a dwelling separates a habitable room of one dwelling and a habitable room, bathroom, toilet, laundry, kitchen, plant room, stairway, public corridor, hallway and the like of a separate tenancy, the floor shall be designed to achieve a weighted standardised impact sound pressure level, L _{n'} tw not more than 55dB.

P3 An acoustic report prepared by a certified acoustic consultant must be submitted and address the requirements to P1 where the proposal involves the construction of 4 or more new dwellings.

P4 Buildings are to be designed and rooms positioned to reduce noise transmission within and between dwellings.

- P5 Bedrooms should be designed so that wardrobes provide additional sound buffering between rooms within the dwelling or between adjoining dwellings over and above the requirements in P2 above.
- P6 Windows and doors should be located away from external noise sources, or buffers used where separation cannot be achieved.
- P7 Materials with low noise penetration properties should be used where practical.
- P8 Locate bedrooms and private open spaces away from noise sources such as garages, driveways, mechanical equipment and recreation areas.
- P9 Where dwellings are located on busy roads the following construction techniques are to be considered for incorporation into the design of the development to reduce traffic noise within the dwelling:
- (a) cavity brick walls;
 - (b) double glazing;
 - (c) solid core doors;
 - (d) concrete floors; and
 - (e) recessed balconies.
- P10 Where possible, avoid the use of high brick fences on busy roads. High fences present a harsh and bland appearance to the street, obstruct views from the footpath to gardens and dwelling entries, reduce amenity for pedestrians and reduce casual surveillance of the street. Try to reduce acoustic impacts through other acoustic reduction measures.
- P11 Development on land which is on or is within 100m of a railway corridor, a road corridor for a freeway, a tollway, a transit way or any other road with an annual average daily traffic volume of more than 40,000 vehicles (based on the traffic volume data published on the website of the Transport for NSW) must consider the requirements of the DoP's *Development Near Rail Corridors and Busy Roads – Interim Guideline* (19 December 2008) in accordance with cl.s 2.100(2) and 2.120(2) of [SEPP \(Transport and Infrastructure\) 2021](#). An acoustic report may be required to be

prepared to demonstrate compliance with this Guideline and the acoustic requirements within cl.s 2.100(3) and 2.120(3) of the [SEPP \(Transport and Infrastructure\) 2021](#).

1.4.4 Vibration

Objectives

- O1 To ensure that dwellings are not unreasonably impacted upon by vibrations caused by the operation of railways and roadways.

Provisions

- P1 Development on land which is on or is within 60m of a railway corridor, or is adjacent to a road corridor for a freeway, a tollway, a transit way or any other road with an annual average daily traffic volume of more than 40,000 vehicles (based on the traffic volume data published on the website of the Transport for NSW) must consider the requirements of the DoP's *Development Near Rail Corridors and Busy Roads – Interim Guideline* (19 December 2008) in accordance with cl.s 2.100(2) and 2.120(2) of [SEPP \(Transport and Infrastructure\) 2021](#). In particular, consideration should be given to the vibration criteria contained within the NSW Environment Protection Authority's *Assessing Vibration: a technical guideline*. A vibration assessment report may be required to be prepared to demonstrate compliance with these Guidelines.

2.3. NOISE POLICY FOR INDUSTRY

The Noise Policy For Industry 2017 documents the requirements for determining the Noise Trigger Level and Sleep Disturbance.

2.4. CODE AS2107

Both the recommended indoor mechanical services sound levels and recommended internal criteria for traffic noise is nominated in the code AS 2107, 2016, titled 'Acoustics, Recommended design sound levels and reverberation times for building interiors' which is used for the areas not covered by the City's DCP as set out in the Table below:

Table 2; Recommended internal design sound levels $L_{Aeq-dB(A)}$

	AS 2107 Satisfactory ①	AS 2107 Maximum ②	Selected Req. ③
- Bedrooms	30 dB(A)	40 dB(A)	35 ③
- Living Areas	35 dB(A)	45 dB(A)	40 ③
- Toilets & Bathrooms, Hallways	45	55	55
- Car park	55	65	65

① AS 2107 Satisfactory; regarded as appropriate in areas of major roads

② AS 2107 Maximum; regarded as level where most people become dissatisfied

③ DCP Controls 35 dB(A) @ 1 Hour reputable maximum for the night period with windows closed

2.5. COMPLIANCE WITH THE BUILDING CODE OF AUSTRALIA

Compliance with the Building Code of Australia (BCA) is a statutory requirements of new residential multi occupancy buildings. F7 of the BCA/NCC 2025 titled details the "Sound Transmission and Insulation Requirements" for residential developments. Specifically addressing separating walls and floors.

The acoustic criteria for the internal walls are stated within the BCA and are listed below:

- 50 Rw+Ctr for a wall separating Sole Occupancies (Discontinuous construction required)
- 50 Rw for a wall separating Sole Occupancy with a plant room, lift shaft, stairway, public corridor, public lobby, or parts of a different classification (Discontinuous construction not required)
- 40 Rw+Ctr for a services shaft wall if adjacent to a habitable room
- 25 Rw+ Ctr for a services shaft wall if adjacent to a kitchen or non-habitable room

3. NOISE MEASUREMENTS

3.1. DISTRICT BACKGROUND NOISE MONITORING LOCATION AND TIME

Two fifteen minute continuous L_{Aeq} , L_{A90} , and L_{A1} descriptor background noise monitoring was carried out at 1.2 meters above ground level at the monitoring location 1 between 07:45 01/12/2025 and 23:45, 08/12/2025 located at the front of the proposed site and at location 2 between 13:00 10/11/2025 and 11:30, 17/11/2025 located at the front of the proposed site at.

The log of the results of background noise monitoring for the roof are shown in Appendix 1 & 2. Raw data is available upon request.

3.1.1. Monitoring Instrumentation

Noise measurement instrumentation used to log continuous district background noise in this report is an ARL, Model EL 316 (Type 1) environmental noise logger Serial No. 16-203-500. Attended site analysis of district noise was taken using a SVAN 945A sound analyser, Serial No 9418. Field calibration checks for the instruments were carried out using a Acoustic Calibrator Type Rion NC 73 Serial No. 11127967. All instruments hold current NATA calibration certificates and measurement instruments are in accordance with the requirements of AS 1259.2, Sound Level Metres, Integrating Averaging.

3.1.2. Monitoring, Calibration and Calculation Procedures

In accordance with the procedures laid out in AS 1055.1 field calibration check of the environmental noise logger was carried out immediately prior to and at completion of monitoring sessions and instrument was found to be within the specified limits.

A microphone wind-guard was in place for the full duration of the monitoring and so no correction factor required.

The 15 minute L_{Aeq} and L_{A90} , log results were down loaded and single figure L_{A90} representative values calculated using Microsoft Excel software in accordance with the procedures given in the INP for the day(7AM to 6 PM), the evening period, (6 PM to 10 PM) and the night time period, (10PM to 7 AM) and single figure L_{Aeq} over the days monitored. The Repeatable Maximum L_{Aeq} (1 Hour) day and evening log results were calculated between 6 AM to 10 PM and night log results between 10 PM and 6 AM

3.1.3. Environmental Conditions During Monitoring

Temperatures on site were between 10 to 30°C for the logging period.

Wind Speed at was monitored at Sydney Harbour being the closest BOM weather observation centre. The results of the log indicated that at no time during the logging period did the local wind speed exceed the maximum level of 5 M/S. Metrological data including temperature, barometric pressure, wind speed at site were not outside the recommendations of AS 1055 and INP and so the L_{A90} and L_{Aeq} measurements are considered valid

The resulting L_{A90} log averages over the period monitored was then used to determine the Intrusiveness Criteria. The resulting L_{Aeq} log averages over the period monitored was then calculated and used to determine the Amenity Criteria. The Project Specific Noise Level for the site was determined as the lesser of the Intrusiveness and Amenity Criteria.

3.1.4. Logger Settings

The settings of the environmental noise logger is shown in the Table below:

Table 3; Noise Logger Settings

Acoustic Research Laboratories Pty Ltd - Type 1 Environmental Noise Logger	Logger Settings
Frequency Weighting	A
Time Averaging	Fast
Statistical Interval	15 minute
Pre-measurement Reference	94
Post-measurement Reference	93.6
Engineering Units	dB SPL

3.2.BACKGROUND NOISE RESULTS

3.2.1.Background Noise Single Figure Results

Analysis of the 15 minute L_{A90} and L_{Aeq} results were carried out using Microsoft EXCEL according to the requirements of the INP and the single figure RBL and the site noise from road traffic results for each period are shown in the table below:

Table 4; Single Figure RBL's and Site Noise for Project

NOISE DETAILS/Period times	Day (0700 to 1800)	Evening (1800 to 2200)	Night (2200 to 0700)
Location 1 RBL L_{A90} 15 min	45.2	44.6	32.6
Location 1 Leq 15 min period log average Noise	52.0	50.5	46.1
Location 2 RBL L_{A90} 15 min	40.0	40.1	33.0
Location 2 Leq 15 min period log average Noise	54.8	48.2	43.6

Table 5: Summary of Traffic Noise For Each Facade

Road Traffic Noise Monitored L_{Aeq} , -	Day L_{Aeq} , T=15hr	Night L_{Aeq} , T=9hr
Road Traffic Noise North Facade L_{Aeq} ,	53.4	46.1
Road Traffic Noise South Facade L_{Aeq} ,	52.7	43.6

4.NOISE POLICY FOR INDUSTRY

4.1.EXTERNAL NOISE LEVEL DETERMINATION IN ACCORDANCE WITH NOISE POLICY FOR INDUSTRY 2017 - NOISE TRIGGER LEVEL

4.1.1.Single Figure Results

The Noise Policy for Industry 2017(NPFI) requires:

- Intrusiveness Criteria be determined by calculating the Rated Background Levels (RBL) over the days monitored. We used the 5 days of 15 minute noise logging at site found in Appendix 1 to determine the background, the L_{A90} background noise logged result reflected a reliable background level. Being measured adjacent to Closest Sensitive Receiver #1.
- The Project Trigger Noise Level or external noise criteria for the project is determined as the lesser of the Intrusiveness and Amenity Criteria for the site for each period of the day.

Table 6; Noise Monitoring Results - Location 1

Period times	Day (0700 to 1800)	Evening (1800 to 2200)	Night (2200 to 0700)
Location RBL L_{A90} 15 min. ①	45.2	44.6	32.6
Location Intrusiveness Criteria L_{Aeq} 15 min RBL + 5	50	50	38
Project Amenity Noise Level at Closest Sensitive receivers L_{Aeq} 15 min, (SubUrban Table 2.2 NPFI)	55	45	40
Selected Project Trigger Level	55	45	40

Project Trigger adjacent to closest residence	55	45	40
L _A Eq 15 min, day period Local Road Traffic	55-5+3=53 ^②	45-5+3=43 ^②	40-5+3=38 ^②
Industrial Noise Trigger Level(PSNL) L _A Eq 15 min =stricter of Intrusiveness and Amenity Criteria R	50	43	38

① RBL at Boundary LA90 T=15 min from Appendix 1 results

② Site Noise, Additional 3 dB added to L_AEq T=15 min measured value from Appendix 1 results

Table 7; Noise Monitoring Results - Location 2

Period times	Day (0700 to 1800)	Evening (1800 to 2200)	Night (2200 to 0700)
Location RBL L _A 90 15 min- ^①	40.0	40.1	33.0
Location Intrusiveness Criteria L _A Eq 15 min RBL + 5	45	45	38
Project Amenity Noise Level at Closest Sensitive receivers L _A Eq 15 min, (SubUrban Table 2.2 NPFI)	55	45	40
Selected Project Trigger Level	55	45	40
Project Trigger adjacent to closest residence	55	45	40
L _A Eq 15 min, day period Local Road Traffic	55-5+3=53 ^②	45-5+3=43 ^②	40-5+3=38 ^②
Industrial Noise Trigger Level(PSNL) L _A Eq 15 min =stricter of Intrusiveness and Amenity Criteria R	45	43	38

① RBL at Boundary LA90 T=15 min from Appendix 1 results

② Site Noise, Additional 3 dB added to L_AEq T=15 min measured value from Appendix 1 results

4.1.2. Project Trigger Noise Level for this Project

The PTNL for the front of site based on unattended noise logging over the period is therefore taken as **50 dB(A)** in the day period, **43 dB(A)** in the evening period and **38 dB(A)** in the night period which are required to be measured as a L_AEq, t=15 min descriptor.

The PTNL for the rear of site based on unattended noise logging over the period is therefore taken as **45 dB(A)** in the day period, **43 dB(A)** in the evening period and **38 dB(A)** in the night period which are required to be measured as a L_AEq, t=15 min descriptor.

5. DEMOLITION AND CONSTRUCTION

5.1. SCOPE OF DEMOLISHING & EXCAVATION WORKS

The proposed development involves the demolition of the existing buildings located on site, bulk earthworks of the site & major excavation for multiple basement levels to the maximum depth of approximately 10m below ground level. As stated within the Geotech report the majority of this fill would be Sandstone.

Based on the expected architectural designs It is expected that the proposed two (2) levels basement will reach the Finished Floor Level (FFL) at RL 77.4m and estimated Bulk Excavation Level (BEL) at approximately RL77m, up 9.26m deep of excavations.

The Geotech testing we would expect the general excavation to consist of land levelling with deep excavation to approximately 10m below existing ground level. We have assessed the noise produced on site during the site preparation and excavation of the proposed works to be as follows:

- Front end loader shall be used to clear residual sand, mulch to bedrock
- Major excavation works which may include some rock breaking as Geotech report documents sandstone between 1.5m through to 10m depth

Based on the Geotechnical Log shown within Attachment 3 we have reviewed the materials at the expected depth of excavation.

5.2. NOISE AFFECTED CRITERIA

The construction works shall be carried out within in the day period (7 AM -5 PM) only so no after hours construction criteria need be determined.

Noise management level assessment has been based off the following table;

Table 8: Predicted Appliance Noise Levels for Project

Time Of Day	Noise Management Level LAeq(15minute)	Application
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	“Noise Affected Level” RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. <ul style="list-style-type: none"> • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
Outside recommended standard hours	Noise affected RBL + 5 dB	<ul style="list-style-type: none"> • A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is

		more than 5 dB above the noise affected level, the proponent should negotiate with the community.
	“Highly Noise Affected Level” 75 dBA	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <ul style="list-style-type: none"> Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: <ol style="list-style-type: none"> Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Noise Affected Criteria as recommended by the EPA’s Interim Construction Noise Guideline for the standard construction hours is therefore $45+10=55$ **dB(A)** for the front area of site and $40+10=50$ **dB(A)** for the rear.

5.3. CONSTRUCTION STAGES

The detailed construction stages, such as demolition, excavation etc documenting each different stage are to be provided by the developer.

5.4. CONSTRUCTION HOURS

The detailed construction hours are to be provided by the developer during the appropriate stages.

5.5. CONSTRUCTION TRAFFIC NOISE

We would expect overall construction based traffic noise to consist of work vehicles and heavy vehicles. These types of vehicles are consistent with local traffic around the immediate area and therefore we do not expect them to cause any adverse affects to the overall project trigger noise levels as defined with the Noise Policy for Industry.

5.6.CONSTRUCTION VIBRATION

The Geotech report shows sandstone present in the areas to be excavated for basement car parking. Due to this we would expect some level of vibration from rock breaking and excavating.

6.PREDICTED NOISE & VIBRATION LEVELS & IMPACT AT SENSITIVE RECEIVERS – DEMOLITION AND CONSTRUCTION

6.1.PREDICTED APPLIANCE NOISE LEVELS

The listing of appliances understood to be required to be used at site, their grouping according to AS 2436 which includes a table giving typical noise level at 10 metres of excavation and construction appliances. The appropriate appliance used on this site and their sound levels are shown in the following table:

Table 9: Predicted Appliance Noise Levels for Project

Appliance Description	dB(A) ave15 min @ 10 M
5 cm Front End Loader	72 dB(A)①
Crane	77 dB(A)②
Excavator	79 dB(A)②
Piling	83 dB(A)②
Concrete Agitator truck	76 dB(A)②
Concrete pump truck	80 dB(A)②
Hand Held Tools	74 dB(A)②
20 Ton truck, with or without dog	72 dB(A) @ 7m①
10 Tonne Excavator with Rock Saw	85 dB(A) @ 3m①

① Determined from library of previous site measurements

② AS 2436-2010; Guide to noise and vibration control on construction, demolition and maintenance sites

6.2.PREDICTED APPLIANCE VIBRATION LEVELS

We have assessed the transmission of vibration produced on site at the closest sensitive receivers (who are the immediate adjacent neighbours) and have determined that vibration will be minimal to non existing.

The Geotech report has confirmed at the maximum depth is medium sandstone, due to this to reduce vibration through rock breaking we believe an excavator with a rock saw will be used to cut out sections, predominantly at the boundary to reduce the transfer of vibration. By using the rock saws on the perimeter boundary lines during the progress of excavation other equipment such as rock breakers/hammers would not be required so close to the neighbour.

We therefore predict there will be no source of vibration outside criteria transmitted past the boundary of this site during construction.

6.3.PREDICTED NOISE LEVELS DURING CONSTRUCTION

Table above lists the predicted sound pressure levels that would be generated by the appliances used during the demolition and construction phases of the project in the centre of the project site.

We have calculated the expected sound pressure (noise) levels of the various demolition and construction equipment that is expected to be used at each of the closest sensitive receiver's internal rooms and the results shown in the following table.

Due to the nature of demolition, excavation & construction various equipment is likely to be situated at various distances from the boundary. Some equipment might be necessary to be approximately 5m all the way to the centre point of the site which is approximately 20-25m from any boundary. For the purpose of this report we have calculated noise levels at a mid point between the two extremes being ~12m from the boundary.

We have calculated the exceedance being the predicted noise level minus the Noise Affected Criteria and results also shown in the table below;

Table 10: Predicted Appliance Noise Levels at closest sensitive receivers

Appliance Description	Noise level dB(A) ave15 min @ 10 M	Noise Affected Criteria ③	Predicted dB(A) ave 15 min at Closest Sensitive Receiver	Exceedance ave 15 min at Closest Sensitive Receiver
5 cm Front End Loader at ground level	72 dB(A)①	55-50 dB(A)	68dB(A)	13-18dB(A)
5 cm Front End Loader at maximum depth excavation level	72 dB(A)①	55-50 dB(A)	57dB(A)	2-7dB(A)
Crane constructed at approximately 20m height	77 dB(A)②	55-50 dB(A)	65dB(A)	10-15dB(A)
Excavator at ground level	79 dB(A)②	55-50 dB(A)	75dB(A)	20-25dB(A)
Excavator at maximum depth excavation level	79 dB(A)②	55-50 dB(A)	64dB(A)	9-14dB(A)

Piling at maximum depth excavation level	83 dB(A)②	55-50 dB(A)	68dB(A)	13-18dB(A)
Concrete Agitator truck	76 dB(A)②	55-50 dB(A)	71dB(A)	16-21dB(A)
Concrete pump truck	80 dB(A)②	55-50 dB(A)	74dB(A)	19-24dB(A)
Hand Held Tools	74 dB(A)②	55-50 dB(A)	69dB(A)	14-19dB(A)
20 Ton truck, with or without dog	72 dB(A) @ 7m①	55-50 dB(A)	65dB(A)	10-15dB(A)
10 Tonne Excavator with Rock Saw at ground level	85 dB(A) @ 3m①	55-50 dB(A)	71dB(A)	16-21dB(A)
10 Tonne Excavator with Rock Saw at ground level at maximum depth excavation level	85 dB(A) @ 3m①	55-50 dB(A)	60dB(A)	5-10dB(A)

Per the above assessment we have made the following comments;

- Works indicatively predicted to be above the Noise Management Level (RBL + 10 dB(A)) when performed closed to the residential receiver.
- Works will generally be below the noise management levels to the residential receiver when the construction is being carried out at the centre of the site and the building shell is complete with internal works.
- Some limited works will be at the Highly Noise Affected Level of 75 dB(A) during peak standard construction hours when performed close to the boundary.

Within the Interim construction noise guideline the following is stated for highly noise affected levels;

The highly noise affected level represents the point above which there may be strong community reaction to noise.

Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:

1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences
2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times

We note that during the use of ground level excavation and the use of the rock saw we recommend that part of the Demolition & Construction Noise Management Plan is to include respite periods restricting overall hours, this may include periods in which the equipment is not to be used in between periods of use. In addition to this the equipment could also be used during late morning through to early afternoon periods.

We note that from the calculated noise levels produce by noisy operations of the demolition, excavation and construction of this project, the Highly Affected limit of 75 dB(A) is not reached at any sensitive receiver but some calculations show that some plant is approaching the criteria.

- ① Library of Noise
- ② AS 2436-2010; Guide to noise and vibration control on construction, demolition and maintenance sites
- ③ EPA's Noise Affected Criteria

7. PREPARATION OF CONSTRUCTION TIME TABLE

The Principal Contractor is recommended to complete the noise management plan that construction program, itemising the start and finish dates of each of the following major building stages. This program need not be the full building program as it is designed to be distributed to the immediate neighbours both beside and behind the site to provide them an idea of how long the noise will continue for each section of work.

8. DETERMINATION OF CONSTRUCTION REQUIREMENTS

8.1. CALCULATIONS OF BUILDING ATTENUATION WORKS USING AS 3671

The calculation method to determine the attenuation of facade elements is given in AS 3671; 1989 which uses the 9 hour log average for the night period.

However, we note that within the Council DCP 1 Hour Max is required for assessment.

Code AS 3671 defines Road Traffic Noise Reduction (TNR) as the difference between the appropriate $L_{Aeq, T}$ monitored and the appropriate internal or "receiving" room background level L_{Arec} and values for this site are shown in the Table below:

Table 11; Noise Reduction Determination L_{Aeq} -dB(A)

Face, Location & Use of Space in the Building	$L_{Aeq, T}$ ①	L_{Arec} ②	TNR (①-②)	Construction Category ③
Front Half of site All bedroom Facades	53 dB(A)	35 dB(A)	18	Category 2
Front Half of site habitable facades	53 dB(A)	40dB(A)	13	Category 2
Rear Half of site All bedroom Facades	53 dB(A)	35 dB(A)	18	Category 2

Rear Half of site habitable facades	53 dB(A)	40dB(A)	13	Category 2
-------------------------------------	----------	---------	----	------------

- ① Night period 1Hr LAeq value
- ② Recommended internal level from DCP
- ③ Construction 1, 2, & 3 Categories defined in AS 3671 as, Category 1 is TRN=< 10, Category 2 is TRN>10 ,<=25 and Category 3 TNR >25, <=35, Category 4 > 36

8.2.EXTERNAL BUILDING DESIGN REQUIREMENTS

Using the above Traffic Noise Reduction figures we have calculated the Rw requirements for construction on each facade including window requirements.

Table 12; Calculated Traffic Noise Wall Attenuation for each Facade

Face, Location all levels & Use of Space in the Building	TNR	TNAc Requirement	Rw equivalent
Front Half of site All bedroom Facades	18	18	24
Front Half of site habitable facades	13	13	19
Rear Half of site All bedroom Facades	18	18	24
Rear Half of site habitable facades	13	13	19

Table 13; Calculated Window & Sliding Door Attenuation

Face, Location all levels & Use of Space in the Building	TNR	TNAc Requirement	Rw equivalent
Front Half of site All bedroom Facades	18	20	26
Front Half of site habitable facades	13	15	21
Rear Half of site All bedroom Facades	18	20	26
Rear Half of site habitable facades	13	15	21

Using the above calculated required attenuation figures we have nominated possible complying construction combinations.

We note that the below combinations have been prepared as an example and the project is not required to use the exact nominated combinations. The only criteria for construction combinations is the calculated Rw attenuation addressed above. Different manufacturers will have different frame systems which may result in varying attenuation levels. It is important that all attributes of the glazing system be incorporated into the final installed product such as;

- Appropriate framing to achieve required attenuation
- Appropriate level of glass thickness
- Appropriate sealing of glazing joins such as rubber seals
- Appropriate sealing around the frame of the window

Table 14; Example Complying Combinations AWS WHITEPAPER ACOUSTIC DETAILS

Item	Combination	Combination Attenuation	Required Attenuation
------	-------------	-------------------------	----------------------

Fixed Glazing	6.38mm Lam Glass in frame.	32Rw	21-26Rw
Awning Windows	6.38mm Lam Glass in frame. (ATF1211)	34Rw	21-26Rw
Sliding Windows	6.38mm Lam Glass in frame. (ATF813)	32Rw	21-26Rw
Sliding Door	6.38mm Lam Glass in frame. (ATF792)	30Rw	21-26Rw
Roof	CSR 6402	41Rw	21-26Rw

We recommend that during the construction stage our acoustic report is provided to the window manufacturer to ensure that the installed products meet the calculated attenuation.

We note that we recommend rubber seals to be installed on all windows.

8.3. VENTILATION TO BEDROOMS AND HABITABLE

We have used the 9hr log average for the night period being 43.6dB(A) to determine applicable internal noise levels. From our calculations applying distance from site of measurement and 10Rw for an open window we have determined that the internal noise levels will comply with 35dB(A) per AS2107. Therefore, no requirement for mechanical supply of outside air is required and the building can be naturally ventilated.

9. NOISE FROM PROPOSED DEVELOPMENT

9.1. SOURCES OF NOISE FROM SITE

9.1.1. Mechanical Services Noise

Mechanical Services that may be generated at site will include the following:

- Mechanical ventilation for underground ground park & services rooms
- Air Conditioning with outdoor air /ventilation
- Unit ventilation

9.1.2. Vehicle Noise

As the site contains a car park we would expect some vehicle noise present on site as residents arrive and leave. We note that cars entering and leaving the driveway will have to drive slower at approximately 10-20km/h to navigate the driveway, instead of local traffic at 50km/h. The resulting noise by vehicles is reduced as tyre noise is less in addition to engine noise also being less. Cars can generally coast at 10-20 when entering the drive way where as 50km/h the engine would be under load and revving.

9.1.3. Communal Open Space

The architectural plans show various communal open spaces such as the following;

- Lower ground internal communal open spaces
- Lower ground external communal open space
- Ground floor internal communal open space
- Ground floor external communal open space

9.1.4. Commercial Lot

The site contains a proposed small retail component being a neighbourhood shop defined as a premises to be used for the purposes of selling general merchandise for the day-to-day needs of people who live or work in the local area on the ground level facing Rosalind Street

9.2. MECHANICAL SERVICES NOISE LEVELS

9.2.1. Internal Noise levels from Building Plant

The DA drawings do not include any details of the proposed internal mechanical Services proposed to be installed. Therefore the internal noise levels produced by the mechanical services plant on site that includes the bathroom exhaust fans, air conditioning units /ventilation fans shall comply with the levels given for the nominated spaces as listed in Table 1.

9.2.2. External Noise levels from Building Plant

The DA drawings indicate two plant areas for each building on their respective roof's. The plans show spaced out air cooled condensers likely for serving each individual lot rather than a variable refrigerant volume system. These are typically around 55dB(A) @1m. Combined they will eventually plateau out at around 64dB(A) @1m. Due to the overall distance from the plant on each roof to the boundary we would likely expect compliance with the relevant criteria being 5dB(A) above background during the day and evening and then inaudible inside closest sensitive receivers during the night period. We recommend that during the CC stage a review is carried out on the final confirmed mechanical services drawings.

9.3. VEHICLE NOISE

9.3.1. Vehicle Noise Generally

The premises will have vehicles arriving and leaving the site however as the vehicles have to travel slower than general traffic in the area to enter and leave the drive way the expected vehicle noise is not to exceed existing background noise levels.

9.3.2. Vehicle Noise At Closest Sensitive Receivers

In order to assess the impact vehicle noise will have on closest sensitive receivers we have carried out the following assessment;

Table 15: Summary of Vehicle Noise Intrusion for surrounding properties

Noise Source	Closest Sensitive Receiver	Noise Level	Noise Level at Closest Sensitive Receiver	PSNL Day/ Evening/ Night	Compliance
2 Car's moving slowly	Receiver 1	48.8dB(A) @ 2m	<35dB(A)	46 / 43 / 38 dB(A)	Yes/Yes/Yes
2 Car's moving slowly	Receiver 2	48.8dB(A) @ 2m	<35dB(A)	46 / 43 / 38 dB(A)	Yes/Yes/Yes

9.4. COMMUNAL OPEN SPACE

9.4.1. Communal Open Space Noise Spectrum

This has been based off previously measured communal open space noise with approximately 40 people talking.

The noise spectrum of the communal open space noise has been included within the table below:

Table 16: Noise Level Spectrum

	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	dB(A)
Communal Open Space	55	63	60	59	58	55	50	46	62 @ 3M

9.4.2. Communal Open Space Noise On Closest Sensitive Receivers

Based on the above acoustic model and parameters given, we have calculated the resulting sound pressure levels at each of these closest affected residences & have listed the relevant criteria as shown in the table below:

Table 17: Summary of Outside Noise Intrusion for surrounding properties

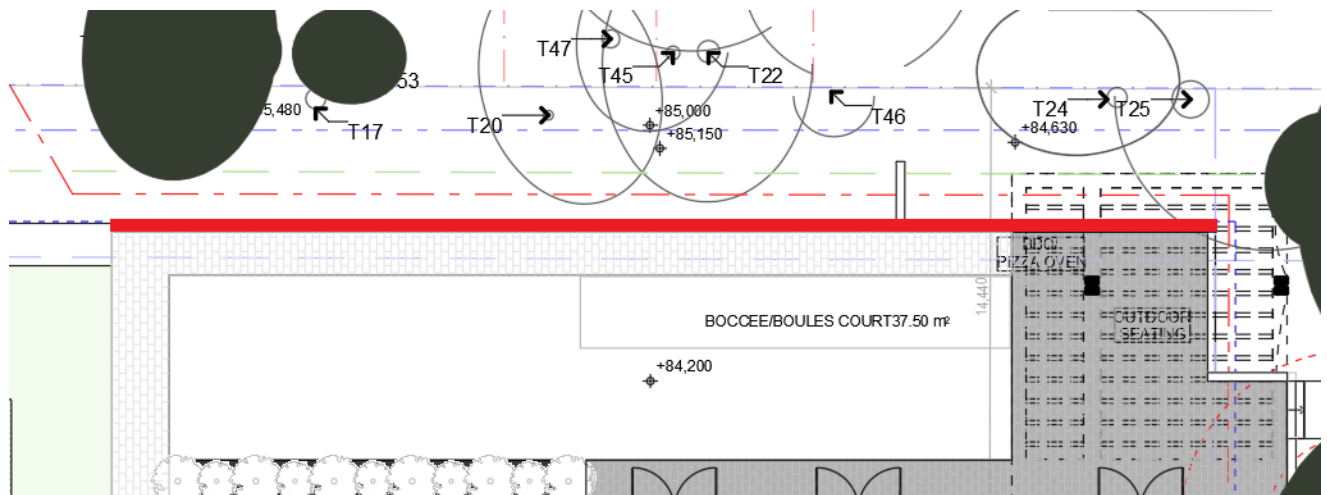
Source Location	Closest Sensitive Receiver	Noise Level	PSNL	Calculated Noise Level	Compliance with Criteria
Lower ground Ground COS	Closest Sensitive Receiver 8	62dB(A) @3m	46 / 43 / 38 dB(A)	38dB(A)	Yes / Yes / Yes
Ground COS	Closest Sensitive Receiver 1	62dB(A) @3m	50 / 43 / 38 dB(A)	52dB(A)	No / No / No
Ground COS with Fence	Closest Sensitive Receiver 1	62dB(A) @3m	50 / 43 / 38 dB(A)	43dB(A)	Yes / Yes / No

Per the above we have calculated the attenuation with a 1800mm high fence along the Eastern Boundary of the communal open space. The fence is to be of solid construction with no gaps. We believe the attenuation provided by the barrier effect of a fence alone would be sufficient for site, due to this we have no recommendations regarding specific materials. Potential complying combinations could be;

- Any fence air tight
- Lap and cap fence
- Colorbond fence
- Glass fence

Final decisions on fence materials to be confirmed by the architect.

The extent of the fence has been shown below in red.



9.5.COMMERCIAL LOT

This proposed commercial lot consists of a small retail shop. This shop is expected to be a general merchandise shop.

The acoustic nature of this lot would likely consist of people entering and exiting without major congregating or gathering of people.

Therefore, we believe the operation of this commercial lot would have little to no acoustic impact on closest sensitive receivers.

10.CONSTRUCTION NOISE AND VIBRATION MITIGATION

10.1.RESOLVING NOISE & VIBRATION COMPLAINT ISSUES

The issue of the Construction Time table should be sufficient to provide the closest adjacent neighbours with an overall feeling and time frame of the project.

The Site recommended to display the following

1. Display a notice at the front of the property details of the following:
 - Builders name, principal address, fixed and mobile phone numbers, hours contactable,
 - Site Supervisor's fixed and mobile phone numbers
2. Instruct the Builder to keep a diary of any contact with neighbours that have raised a noise or vibration complaint
3. The Builder immediately advise the Nominated Council Officer and discuss the issue to attempt to modify onsite construction practices to alleviate the problem.

10.2.UNRESOLVED NOISE AND VIBRATION COMPLAINT ISSUES

During the demolition and excavation stage, the resulting noise may exceed the noise criteria for periods. We propose the following strategies and additional respite periods to be applied:

- Change excavation location ie carry out works at front of site then relocate to the rear of site
- Intermittent breaks of high noise producing equipment

In the event that noise complaints continue in addition to strategies and further acoustic assessments are carried out by an acoustic engineer of actual construction noise then cut-off point may occur in either of the following two situations:

- When complaints have been received at site, unsuccessful attempts have been made by the Builder to diffuse the complaint, the Builder immediately advise the Nominated Council Officer for direction
- When nominated in writing as a unresolved noise complaints by the Nominated Council Officer for the site, the Nominated Council Officer to request the Acoustic Engineer to prepare a reply along with any recommendations to mitigate the cause of the complaint raised and the Owner and/or the Builder implement the changes to attempt to resolve the objections being raised.

10.3.EXCAVATION AND CONSTRUCTION NOISE MONITORING

Although we do not expect it should a noise complaint be received, we recommend that when the nominated works proceeds, a hand held sound level metre be used to monitor the $L_{Aeq\ t=15\ min}$ descriptor of the source of noise that was described in the complaint outside the residence who made the complaint, typically that would be at the closest sensitive receivers #1, the level measured adjusted by -10 dB(A) to account for attenuation through an open window and this level be compared with the criteria.

If the noise level determined is above the criteria, discuss and come to an agreement with the person making the complaint, suitable mitigation methods that can be employed including changes to work times, the duration that item of work is continuously carried out, the use of respite periods or alternatives that can be employed to attenuate the noise level to comply with the criteria or satisfy their sense of offense to the excavation or construction noise.

10.3.1.Excavation And Construction Vibration Monitoring

Although we do not expect it should a vibration complaint be received, we recommend that when the nominated works proceed, a vibration sensor be used to monitor that source of the induced velocity of the vibration on the outer wall of the adjoining closest sensitive receivers #1.

If the level of vibration being created is above the criteria, (though highly doubtful), discuss and come to an agreement with the person making the complaint mitigation measures that can be employed including changes to work times, apply respite periods or alternatives that can be employed to either reduce or attenuate the vibration level to comply with the criteria or satisfy their sense of offense to the excavation or construction vibration being created.

11.OPERATIONAL NOISE EMISSION STATEMENT

Due to the nature of the development the expected operational noise would be the mechanical exhaust system, communal open space noise and minimal commercial noise.

During this stage of the development mechanical services designs have not been completed and therefore we cannot comment on compliance however based on the architectural drawings showing the plant locations we likely expect compliance can be easily achieved.

We do note that due to the low nature of background noise within the area specific acoustic attention must be paid to the final designed mechanical exhaust system. Based on our experience this would consist of the following;

- Acoustic silencing on the car park ventilation system
- Potential acoustic treatment of Air Cooled Condensers serving the air conditioning systems within the plant area on the roof, this may or may not require simple screening around the plant, subject to further investigation during the CC stage.

Mechanical ventilation systems such as toilet exhaust typically contain a small internally mounted fans that do not affect background noise or neighbours.

The mechanical services equipment must comply with the relevant criteria being RBL+5dB(A) during the day and evening and inaudible inside adjacent receivers.

12. TRANSPORT NOISE IMPACT STATEMENT

As addressed within section 6.3 we believe the acoustic impact of cars on the area would be negligible due to the requirement of the cars to drive slower. The site also contains approximately 74 car spots being significantly higher occupant to car spot ratio than existing and therefore would reduce the load on local street parking.

13. CONCLUSION

This acoustic report has been prepared by West & Associates Pty Ltd on behalf of Perifa Rosalind Development Pty Ltd (Perifa) to assess the potential environmental impacts that could arise from the construction of a seniors housing development (the development) at 19-23 Rosalind Street, Cammeray (the site). This report supports the assessment of the proposed development under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Based on the above calculations carried out within the report we believe that the demolition, excavation and construction will meet requirements within the EPA Construction Noise Guideline.

Typically, the biggest impact of noise and vibration is rock breaking and drilling during the excavation stage which would be carried out at ground level.

The proposed development involves the demolition of the existing buildings located on site, bulk earthworks of the site & major excavation for multiple basement levels to the maximum depth of approximately 10m below ground level. As stated within the Geotech report the majority of this fill would be Sandstone.

We note that during the use of ground level excavation and the use of the rock saw we recommend that part of the Demolition & Construction Noise Management Plan is to include respite periods restricting overall hours, this may include periods in which the equipment is not to be used in between periods of use. In addition to this the equipment could also be used during late morning through to early afternoon periods.

We believe the site can easily achieve acoustic compliance with all relative standards and regulations. Due to the overall quiet nature of the area there are no acoustic requirements or recommendations for the architectural structure.

From our review we can confirm that no mechanical supply of outside air is required and glazing requirements can be met with standard 6.38Lam glass.

We do note that during the CC stage specific attention must be paid to the mechanical ventilation system to ensure compliance with RBL+5dB(A).

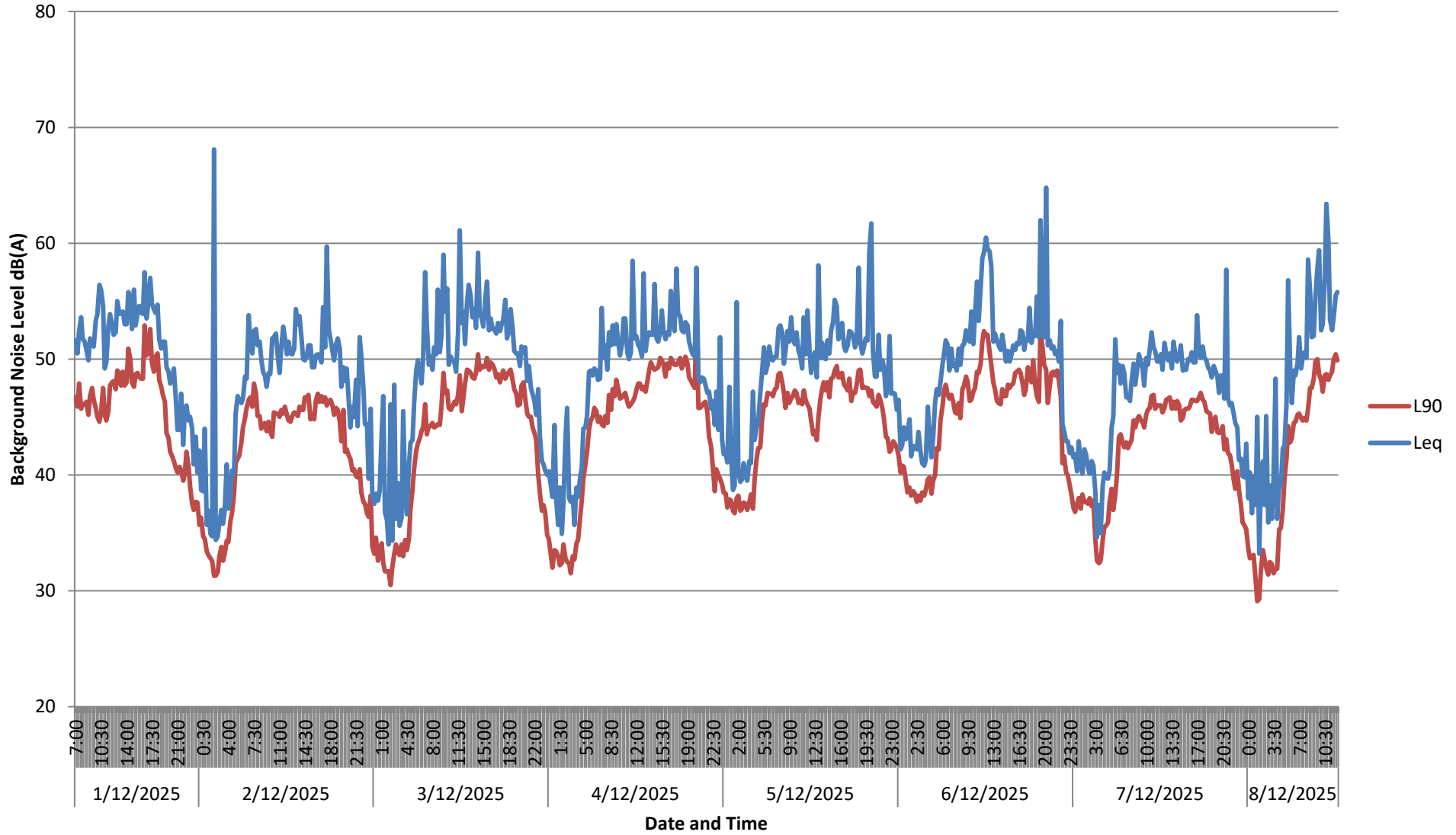
Based on our assessments carried out within this acoustic report we expect the development of this project to be able to be suitably built in a method that is in full compliance with the criteria set out by the following codes and regulations;

- AS 2436; 2010- 'Guide to noise and vibration control on construction, demolition and maintenance sites'
- Environmental Protection Agency (EPA) Interim Construction Noise Guideline 2009
- Noise Guide to Local Government
- Noise Policy for Industry 2017
- North Sydney Council DCP
- SEARS guideline

End of Report

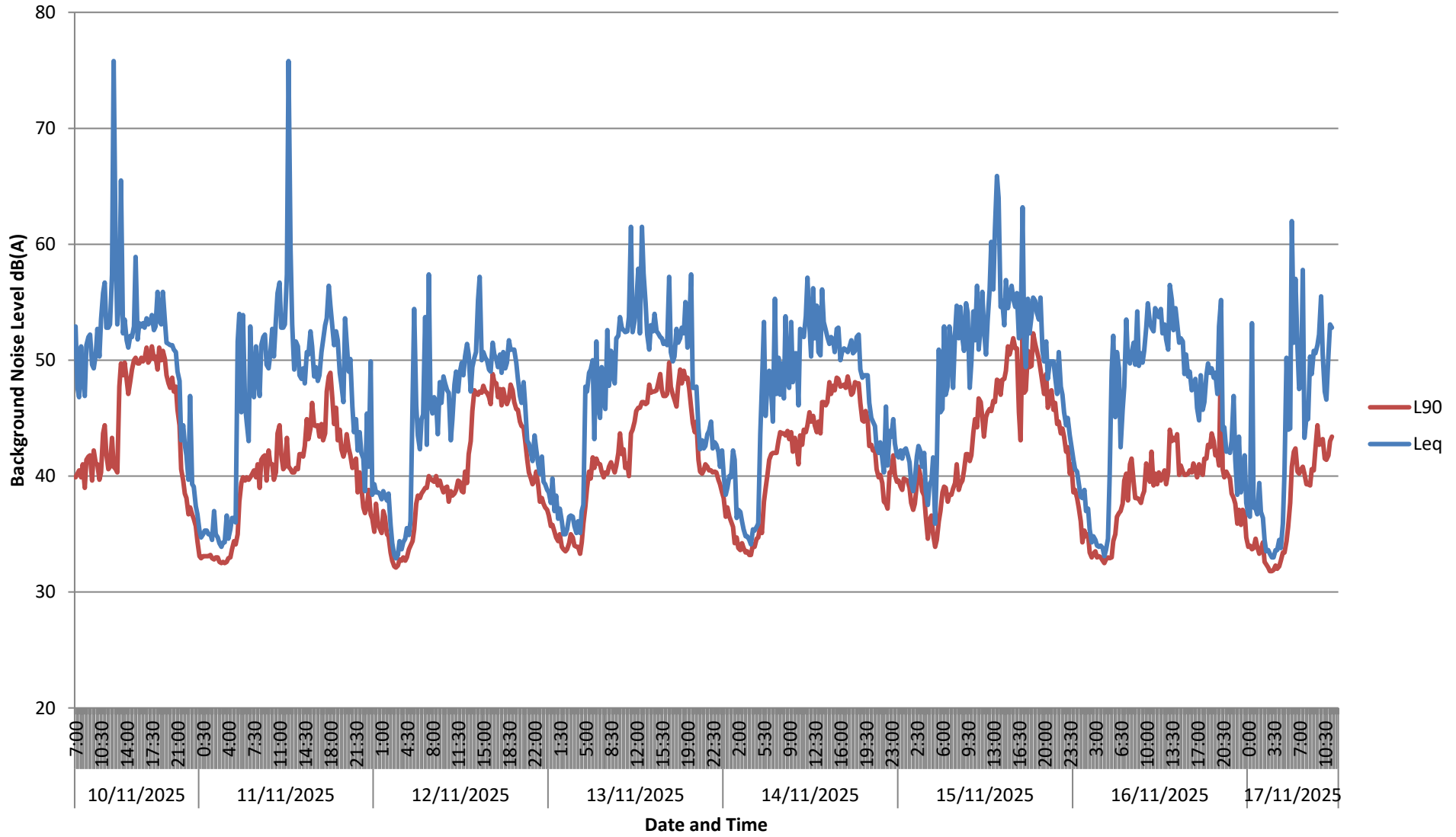
19-23 ROSALIND STREET, CAMMERAY

Background Noise Monitoring Location #1



19-23 ROSALIND STREET, CAMMERAY

Background Noise Monitoring Location #2



Class	Unconfined compressive strength q_u (MPa)	Defect spacing	Allowable seams
I	>24	>600mm	<1.5%
II	>12	>600mm	<3%
III	>7	>200mm	<5%
IV	>2	>60mm	<10%
V	>1	N.A.	N.A.

Table 1a Classification for sandstone

Table 2-1: Rock Classification

Geotechnical Unit	BH1	BH2	BH3	BH4	BH5	BH6
Surface RL (m)	84.34	85.34	86.67	84.45	85.42	86.76
Fill (Unit 1)	0.00 – 1.80m	0.10 – 1.20m	0.10 – 1.50m	0.10 – 1.80m	0.04 – 0.10m	0.00 – 0.50m
Residual Soils (Unit 2)	1.80 – 2.40m	1.20 – 1.50m	1.50 – 1.90m	1.80 – 3.30m	0.10 – 0.50m	0.50 – 1.20m
Class V/IV Sandstone (Unit 3a)	2.40 – 5.25m	1.50 – 3.39m	1.90 – 4.70m	3.30 – 3.78m	0.50 – 0.60m	1.20 – 1.30m
Class III Sandstone (Unit 3b)	5.25 – 14.74m Termination depth	3.39 – 10.23m Termination depth	4.70 – 10.00m Termination depth	3.78– 11.00m Termination depth	0.60-10.00m Termination depth	1.30-10.00m Termination depth