



NATIONAL NOISE & VIBRATION

38 STOCKTON STREET & 8A TOMAREE STREET NELSON BAY NSW 2315

NOISE IMPACT ASSESSMENT

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Project Information

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1 INTRODUCTION

Engineering Sciences has been engaged by Coho Property to conduct a noise emission assessment for the proposed 10-storey mixed-use building to be located at 38 STOCKTON STREET & 8A TOMAREE STREET NELSON BAY NSW 2315.

The nearest noise sensitive receivers that may be impacted by noise emissions from the operation of the mixed-use building have been identified. This report also sets out recommendations (where deemed feasible and reasonable) to reduce any impact on the amenity of the adjacent noise sensitive receivers.

The potential noise emissions from the reception centre have been assessed against the requirements of:

- **Port Stephens Council** – Port Stephens Development Control Plan 2024.
- **NSW Environment Protection Authority (EPA)** - Noise Policy for Industry (NPfI) 2017

This report has been prepared with reference to the architectural drawings provided by Holdsworth Design, outlined in Table 1.

Table 1 - Architectural Drawings

Drawing. No	Drawing Title	Revision	Date
A-A001	Coversheet & Drawing Index	L	18.10.2024
A-A002	Site Context		
A-A003	Site & Site Analysis Plan		
A-A004	Gross Floor Area Diagrams		
A-A005	Landscape, Deep Soil Zone & Communal Space Diagrams		
A-A006	Street Sections		
A-A007	Building Height Analysis		

2 SITE DESCRIPTION

2.1 Project Description

The proposed project includes a 10-storey mixed-use building with 50 residential units, communal amenities such as a courtyard and swimming pool, and a basement and lower ground car park. This development also features two commercial spaces, suitable for office use or similar functions. Mechanical services for the building are planned to be housed within a plant room located in the basement car park. It is anticipated that the commercial tenancies will adhere to the operating hours specified in Table 2. Additionally, the mechanical plant is expected to operate continuously, 24 hours a day, 7 days a week.

Table 2 - Operating Hours

Activity	Day of Week	Operating Hours
Office Spaces	Monday to Sunday	7:00am – 5:30pm
Mechanical Plant	Monday to Sunday	24 Hours

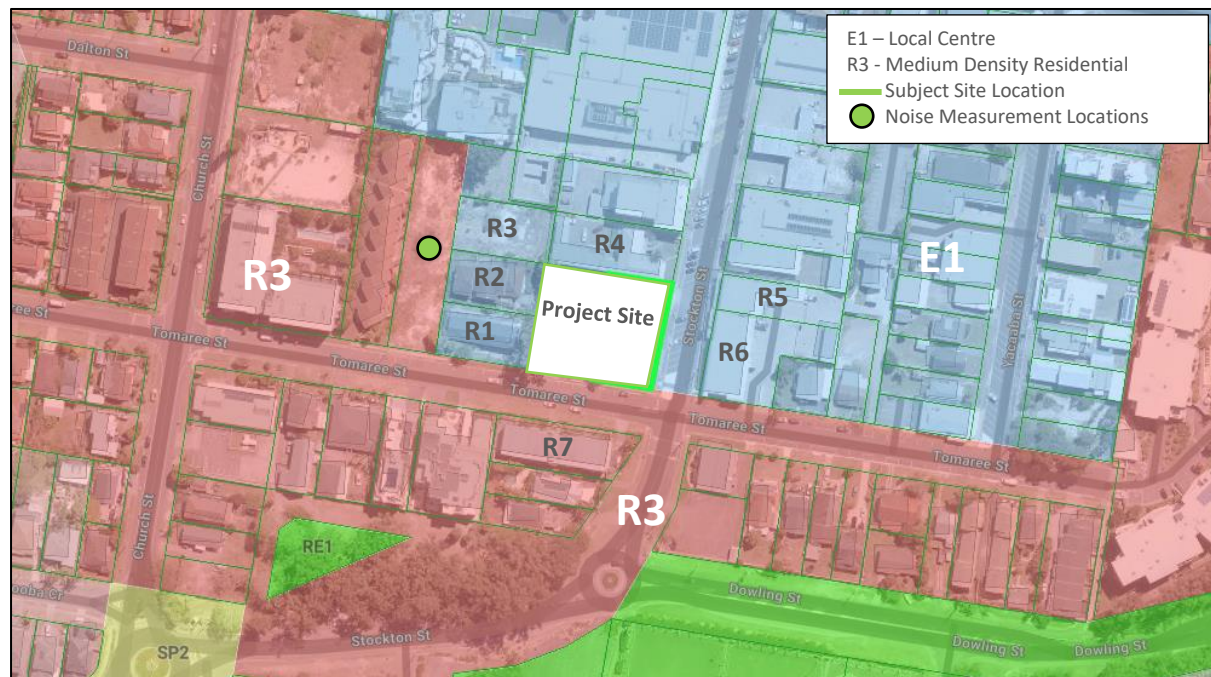
Figure 1 – Proposed Site Image



2.2 Project Locality

Land use zones for the project site area and surroundings have been presented within the table below. The project site is surrounded by residential and commercial premises with the nearest and most potentially impacted noise receivers identified.

Figure 2 - Zoning of Surrounding Areas (Mecone Mosaic)



2.3 Nearest Noise Sensitive Receivers

The nearest noise sensitive receivers are detailed below in Table 3 and shown in Figure 3.

Table 3 - Nearest Noise Sensitive Receivers

Type	ID	Description
Residential	R1	8 TOMAREE STREET NELSON BAY NSW 2315
	R2	10 TOMAREE STREET NELSON BAY NSW 2315
	R3	12 TOMAREE STREET NELSON BAY NSW 2315
	R4	36 STOCKTON STREET NELSON BAY NSW 2315
Commercial	R5	33 STOCKTON STREET NELSON BAY NSW 2315
	R6	35 STOCKTON STREET NELSON BAY NSW 2315
Residential	R7	42 STOCKTON STREET NELSON BAY NSW 2315

3 EXISTING AMBIENT NOISE LEVELS

3.1 Sound level Descriptors

Noise level descriptors used in the assessment are explained below. For analysing noise, the following descriptors are used:

- L_{90} is known as background noise. L_{90} is a statistical sound level which describes the percentage of times a sound level is exceeded. This parameter is used to set up the allowable noise levels for intrusive noise sources since the level of disturbance of the intrusive noise source will be dependent on how audible it is above the existing noise environment.
- L_{eq} is the equivalent sound level which represents the average noise level during a measurement period. L_{eq} describes a receiver's cumulative noise exposure from all events over a specified period for compliance assessment purposes.
- L_{01} is the noise level exceeded for 1% of the measurement period. During the measurement period, the noise level is below the L_{01} level for 99% of the time

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- L_{10} is the noise level exceeded for 10% of the measurement period. During the measurement period, the noise level is below the L_{10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise
- L_{Amax} is the maximum instantaneous noise level during a measurement period
- A-weighted Sound Level (instantaneous) is the most common weighting used in noise measurements, and it represents the frequency range detectable by the human ear. A-weighted is used for noise measurements and prediction purposes.

3.2 Unattended Background Noise Measurements

Long-term environmental noise monitoring was conducted to quantify the existing ambient background levels of the area. The noise logger was placed in an area shielded by local noise in order to capture background data with a conservative approach. the location shown in Figure 2.

Unattended background noise monitoring was conducted using a Ngara ARL Environmental Noise Logger set on A-weighted fast response mode and recording in 15-minute intervals. Unattended noise measurements were undertaken with the microphone located 1.5m above the natural surface level and at least 3m from buildings, fences, and other reflective surfaces.

Instrument calibration was checked before and after measurements, with variation in calibrated levels not exceeding ± 0.5 dB. The acoustic instrumentation employed was designed to comply with the requirements of AS IEC 61672.1—2004 – Electroacoustics—Sound level meters, Part 1: Specifications and carries current manufacturer calibration certificates.

Unattended Noise Monitoring Results are shown below in Table 4. Full unattended noise monitoring data is included in Appendix B – Background Noise Monitoring Data.

Table 4 – Unattended Background Noise Monitoring Results

Unattended Measurement Location	Date	Measured Background Noise Level, L_{90} dB(A)		
		Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)
16 TOMAREE STREET NELSON BAY NSW 2315	Wednesday, 22 January 2025	46	41	46
	Thursday, 23 January 2025	49	50	41
	Friday, 24 January 2025	47	46	40
	Saturday, 25 January 2025	47	47	38
	Sunday, 26 January 2025	44	44	41
	Monday, 27 January 2025	-	46	41
	Tuesday, 28 January 2025	48	-	41
	Overall Background Noise Level	47	45	41
Note:	- Long-term background measurements were taken as unaffected by adverse meteorological conditions including abnormal wind conditions above 5ms^{-1} or any precipitation.			

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4 NOISE EMISSION CRITERIA

4.1 Port Stephens Council Development Control Plan 2024

Development controls

B3.2 An acoustic report is required for development that has the potential to produce offensive noise, meaning:

- that, by reason of its level, nature, character or quality or the time at which it is made, or any other circumstances:
 - is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
 - interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted
- that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations, such as the Environmental Protection Authority. 2000, 'NSW Industrial Noise Policy'14

Note: Development that is likely to require compliance with this requirements includes:

- clubs, hotels and pubs with outdoor smoking, dining and gaming areas, mechanical plant, carparks;
- **function centres** that host outdoor weddings;
- childcare centres with outdoor and indoor play areas, air-conditioning plant, carparks;
- residential developments with ventilation and air-conditioning plant, carparks;
- and
- commercial developments with workshops, mechanical and ventilation plant such as air exhaust and supply fans, chillers, cooling towers, truck and freight train movements, loading docks etc.

NSW EPA Noise Policy for Industry 2017

Noise sources covered by this code will be operational noise, including noise from mechanical plant and equipment. The *EPA Noise Policy for Industry (NPfI) 2017* has developed a method for determination of a Project Noise Trigger Level, such that exceedances of the trigger level require a management response. The Project Noise Trigger Level is determined by the most stringent of the Intrusiveness and Amenity Criteria.

4.1.1 Project Intrusiveness Criteria

The intrusiveness guideline is intended to limit the degree of change that a new noise source introduces to an existing environment for residential receivers only. It requires to measure the noise emissions from a source (using the L_{Aeq} descriptor), measured over a 15-minute period, and ensure it does not exceed the Rating Background Level (RBL) by more than 5dB. The resultant Project Intrusiveness Criterion is stated in Table 5.

Table 5 – Project Intrusiveness Criterion (NPfI)

Location	Period	Measured RBL, $L_{90,period}$ dB(A)	Project Intrusiveness Criterion (RBL +5dB), $L_{eq,15min}$ dB(A)
Residential	Day	47	52
	Evening	45	50
	Night	41	46

4.1.2 Project Amenity Criteria

A project amenity criterion is determined based on the land use in the area to limit the ambient noise level within an area to a level that is consistent with the general environment, categorised as rural, urban or suburban. The subject site is classified as urban in accordance with the criteria established in Table 2.3 of the NPfI 2017 policy documentation.

4.1.3 Project Amenity Time Correction

Under the NPfI, the assessable L_{Aeq} is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. Under section 2.2 of the NPfI, the assessable L_{Aeq} is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same amount of noise heard by a person for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, the following correction applicable under the NPfI has been adopted:

- **ANL $L_{Aeq,15min}$ will be taken to be equal to RANL $L_{Aeq, period} + 3$ decibels (dB).**

The established amenity criteria for the project has been established based on the EPA's NPfI Section 2.2 and 2.4 project corrections made to the Recommended Amenity Noise Levels (RANL), as shown in Table 6 below.

Table 6 – Amenity Noise Criterion (NPfI)

Receiver	Period	Recommended Amenity Noise Level (ANL), $L_{eq,period}$ dB(A)	Project Amenity Criterion (ANL-5dB + 3dB), $L_{eq,period}$ dB(A)
Residential - Urban	Day	60	58
	Evening	50	48
	Night	45	43
Commercial	When in Use	65	63
Note:	Assessment Period is defined in accordance with the NPfI as: Day: - 7 am to 6 pm Monday to Saturday or - 8 am to 6 pm on Sundays and public holidays Evening: - 6 pm to 10 pm Night: - All other times		

4.2 Resultant Criteria

Following a review of the relevant noise regulations and standards in this Section, the resultant criteria applicable to this project have been established and presented in the Table below. These criteria are tailored to ensure that all operational noise levels meet the stipulated guidelines for environmental noise control.

Table 7 – Project Noise Trigger Levels (PNTLs)

Receiver	Period	Project Noise Trigger Levels, $L_{eq,15min}$ dB(A)
Residential	Day	52
	Evening	48
	Night	43
Commercial	When in Use	63

5 NOISE EMISSION ASSESSMENT

5.1 Operational Scenario

In order to assess a worst-case operational scenario of the mixed-use building, the following assumptions have been considered in the noise emission assessment:

Night-time Operation

- Noise emissions will be assessed against the project noise trigger levels presented in Section 4.
- The night-time noise criteria will be assessed under the assumption that compliance during the day is achieved if it is met during the night.
- The office spaces are considered low impact and will not be assessed.
- The mechanical plant and carpark exhaust will operate continuously, 24 hours a day, 7 days a week, and will be equipped with roof extraction systems.
- The exhaust will be located nearest to Tomaree Street.
- The Exhaust will contain an acoustic attenuator reducing noise to 85dB and directed to the north.
- 15 cars enter and exit the carpark over a 15-minute assessment period.

5.2 Noise Sources

The sound power level of cars and mechanical extraction noise was taken from our technical database. Octave band sound power levels are reported in linear Z-weighting while overall sound power levels are expressed in A-weighting (Equivalent loudness perceived by human ear).

Table 8 – Sources Sound Power Levels

Noise Source	Overall Sound Power Level, dB(A)	Sound Power Level, L_w (dB(Z)), Octave Band Frequency, Hz								
		31.5	63	125	250	500	1k	2k	4k	8k
Rooftop Mechanical Exhaust	95	93	92	91	90	89	88	86	84	93
Car < 10km/h	81	45	61	65	66	70	76	74	74	69

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5.2.1 Noise Modelling

Noise emissions levels at the nearest noise sensitive receivers have been calculated using computer-based 3D acoustic noise modelling software iNoise version 2023.1.1. iNoise utilizes ISO 9613 calculation algorithms to determine noise emission levels at the nearest affected noise sensitive receivers. The following assumptions have been included within the noise model:

- Distance attenuation.
- Atmospheric attenuation.
- Directivity.
- Ground absorption ($G = 0.5$)
- Barrier effects/screening.
- Ground Elevation Contours.

Noise contours have been generated to clearly identify the resulting noise level impacts at adjacent noise sensitive receivers at a height where the receiver is most impacted. Noise contours generated with iNoise can be found in Appendix A – iNoise Noise Contours.

5.3 Predicted Noise Levels

Noise produced by the mixed-use building is assessed for compliance with the criteria presented in Section 4. External noise predictions at the facades of the nearest noise sensitive receivers are outlined in Table 9.

Table 9 - Predicted Noise Levels at the Nearest Receivers

Receiver	Period	Noise Criteria L_{Aeq} dB(A)	Predicted Noise Level L_{Aeq} dB(A)	Compliant?
R1	Night-time	43	38	✓
R2			35	✓
R3			32	✓
R4			31	✓
R5	When in-use	63	28	✓
R6			27	✓
R7	Night-time	43	42	✓

6 CONCLUSION

The noise impact assessment for the proposed 10-storey mixed-use building located at 38 Stockton Street & 8A Tomaree Street, Nelson Bay NSW 2315, conducted by Engineering Sciences, has thoroughly evaluated the potential noise emissions against the criteria set by both the Port Stephens Council and the NSW EPA Noise Policy for Industry 2017.

Our assessment has determined that with the incorporation of appropriate noise mitigation measures, such as the use of acoustic attenuators and roof extraction systems for the mechanical plant and carpark exhaust, the development is expected to comply with all relevant noise emission criteria. The predictive noise models indicate that even under worst-case operational scenarios, the noise levels at the nearest sensitive receivers will remain within acceptable limits.

For any further details or clarifications regarding this assessment, please do not hesitate to contact our office.

Sincerely,

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Appendix A – iNoise Noise Contours (Night-time)



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Appendix B – Background Noise Monitoring Data

