

■ **Annexure 7**

Acoustic Report

Earcon Acoustics Ltd,
December 2020



PROPOSED APARTMENTS 31 DAY STREET AUCKLAND CENTRAL

for
The Avoka Apartments – Body Corporate 183777

ACOUSTIC REPORT

Prepared by
Earcon Acoustics Limited

For Resource Consent

Dec 2020
Ref J004344

QUALITY ASSURANCE

**Document: 31 Day St
Proposed Apartments
Acoustic Report – For Resource Consent**

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1. INTRODUCTION

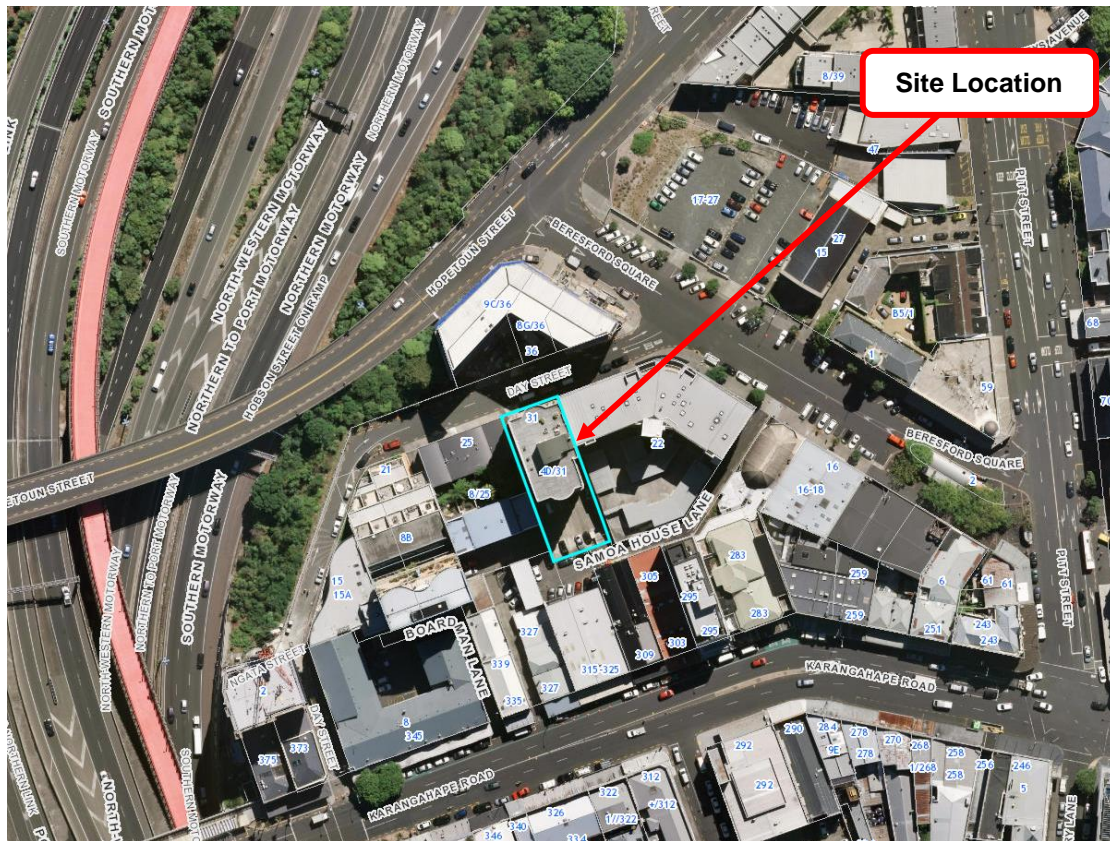
This report has been prepared for Resource Consent for the proposed changes to apartments of the existing building at 31 Day St in Central Auckland. This report addresses the following:

- Auckland Unitary Plan and internal noise limits.
- Building envelope acoustic performance.
- Additionally, recommendations are made for the internal noise levels from traffic noise based on the recommendations of AS/NZS 2107:2016.

2. SITE & ENVIRONS

The subject site is located 31 Day St in Central Auckland. The site and surrounding area are zoned Business – City Centre Zone.

Figure 1: Site location

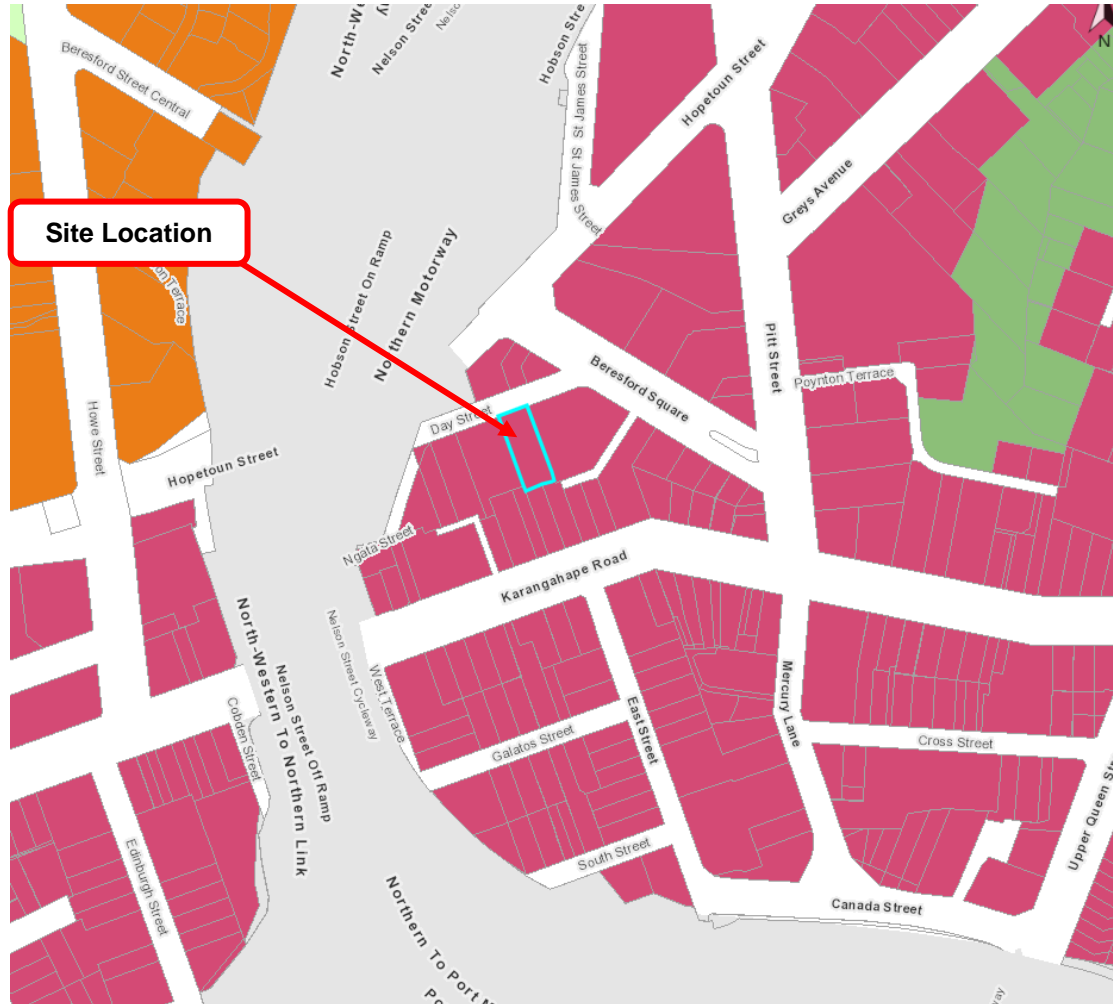


3. AUCKLAND UNITARY PLAN REQUIREMENTS

3.1 Auckland Unitary Plan Noise Rules

The site is zoned *Business – City Centre Zone*, the following rules apply:

Figure 2: Zoning



E25.6.8 Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone

(1) The noise (rating) level and maximum noise level arising from any activity in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone measured or assessed as the incident level on the façade of any building on any other site in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone must not exceed the limits in Table E25.6.8.1 Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone below:

Table 1: Referencing table E25.6.8.1 of the Auckland Unitary Plan

Time	Business – City Centre Zone
7am – 11pm	65dB LAeq
11pm – 7am	60dB LAeq
	65dB at 63 Hz Leq
	60dB at 125 Hz Leq
	75dB LAFmax

(2) The 63Hz and 125Hz octave band limits do not apply to fixed mechanical plant.

E25.6.9 Noise levels between units in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone, Business – Local Centre Zone, Business – Neighbourhood Centre Zone or the Business – Mixed Use Zone

(1) In situations where common building elements such as floors and walls connect two units in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone, Business – Local Centre Zone, Business – Neighbourhood Centre Zone or the Business – Mixed Use Zone the noise (rating) level arising from any activity measured in any unit must not exceed the levels in Table E25.6.9.1 Noise levels between units in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone, Business – Local Centre Zone, Business – Neighbourhood Centre Zone or the Business – Mixed Use Zone. below:

Table 2: Reference Table E25.6.9.1 under AUP

Unit affected	Time	Noise Level
In all units except those containing activities sensitive to noise	At all times	50dB LAeq
In Bedrooms and sleeping areas within units containing activities sensitive to noise	Between 11pm and 7am	35dB LAeq 45dB at 63 Hz Leq; and 40dB at 125Hz Leq
	Between 7am and 11pm	40dB LAeq
Other noise sensitive spaces	At all other times	

(2) The 63Hz and 125Hz octave band limits no not apply to fixed mechanical plant.

E25.6.10 Noise Levels for noise sensitive spaces in the Business – City Centre Zone

(1) Noise sensitive spaces must be designed and/or insulated so that the internal noise levels do not exceed the levels in Table E25.6.10.1 Noise levels for noise sensitive spaces in the Business – City Centre Zone below:

Table 3: Reference Table E25.6.10.1 under AUP

Unit affected	Time	Noise Level
Bedrooms and sleeping areas Business – City Centre Zone	Between 11pm and 7am	35dB LAeq 45dB at 63 Hz Leq; and 40dB at 125Hz Leq
Other noise sensitive spaces	At all other times	40dB LAeq

(2) The levels in Table E25.6.10.1 Noise levels for noise sensitive spaces in the Business – City Centre Zone above must be met based on the maximum level of noise permitted by the zone or precinct standards or any adjacent zone or precinct standards.

(3) (f) have a mechanical ventilation and/or a cooling system that generates a noise level no greater than L_{Aeq} 35 dB when measured 1m from the diffuser at the minimum air flows required to achieve the design temperatures and air flows in Standard E25.6.10(3)(b)(i) and (ii) above.

Under the Auckland Unitary Plan no internal noise rules apply to noise sensitive spaces from existing ambient noise generated by road traffic. The following recommendations for internal noise levels are based on the AS/NZS 2107:2016 standard.

3.2 AS / NZS 2107:2016 – Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors.

The following internal noise levels are recommended for bedrooms and other habitable spaces in residential buildings near major roads:

Table 4: Recommended Internal Noise Levels

Space	Design Sound Level ($L_{Aeq,t}$) Range	Recommended Level L_{Aeq} dB
Living Areas	35 – 45	40
Sleeping Areas (Night-Time)	35 – 40	35
Work Areas	35 – 45	40

4. EXTERNAL BUILDING ENVELOPE

4.1 Design Criteria

- Control the internal noise levels from external sources in all bedrooms and sleeping areas between 11pm and 7am to L_{Aeq} 35dB, 45dB at 63 Hz L_{eq} ; and 40dB at 125Hz L_{eq} and L_{Aeq} 40BA, at all other times in other habitable spaces.
- Additionally, it is recommended that bedrooms meet 35dB L_{Aeq} between 11pm and 7am from traffic noise in all habitable spaces.
- The following assessment is based on the maximum level of noise permitted by the AUP standards within the surrounding Business zones and existing ambient traffic noise levels.

4.2 External Walls

The external facades are concrete and will be upgraded to include metal panel cladding for visual aesthetics. These walls shall be complete with thermal insulation and 10mm standard plasterboard. This construction is rated above STC (Sound Transmission Class) 50 and is acoustically suitable. The construction is acoustically suitable in mitigating the potential permitted noise levels to meet compliance with the Auckland Unitary Plan standards and reduce the existing ambient traffic/train noise to a reasonable level.

4.3 Glazing

The window systems to the apartments are required to be rated at STC 38 minimum, e.g. MetroGlass Laminate IGU (6.38 mm / 12mm AS / 6mm). Where existing glazing is retained, an additionally layer of glazing is required to form a secondary sash. Assuming 4mm existing float glass an additional pane of 6.38mm laminate is recommended at no less than 50mm from the existing glazing.

The windows to all habitable rooms are required to be closed to meet the internal noise levels, therefore mechanically ventilation and/or air-conditioning is required as per the requirements of the Auckland Unitary Plan.

There is no minimum requirement for glazing in non-habitable spaces such as bathrooms.

The window suites / frames are required to match the STC ratings noted above, complete with compressible weather seals. We would like to clarify that the windows are operable, i.e. not fixed windows.

4.4 Roof

The proposed roofing is a communal outdoor area and assumed to consist of a concrete floor slab and will be complete with timber decking and landscaping/planting. The ceilings below will be complete with thermal insulation and a minimum of 13mm Gib noiseline or equivalent plasterboard. This construction is rated above STC 50 and is acoustically suitable.

4.5 Doors

Where external doors consist of or include glazing the requirements of section 5.3 apply.

5. BUILDING SERVICES

5.1 Noise to Boundary Design Criterion

The average maximum noise level L_{Aeq} as measured at the façade of any neighbouring building, located in the Business Zone, shall be restricted to an average maximum noise level as indicated in Table E25.6.8.1 of the Unitary Plan.

Table 5: Unitary Plan Noise Limits: Reference Table E25.6.8.1 under AUP

Time	Noise Level
7am – 11pm	65dB L_{Aeq}
11pm – 7am	60dB L_{Aeq} 65dB at 63 Hz L_{eq} 60dB at 125 Hz L_{eq} 75dB L_{AFmax}

5.2 Building Air conditioning and Ventilation

Based on the Auckland Unitary Plan rules all external doors and windows are required to be closed in order to meet the internal noise level requirements. Mechanical ventilation is therefore required and shall be selected to meet compliance with rules E25.6.8 (external noise limits) and E25.6.10 (internal noise limits).

We would like to clarify that the windows are operable, i.e. not fixed windows.

5.3 Mechanical Services acoustic treatment

The table below summarises the indicative acoustic treatment in place. The detailed acoustic treatment will be coordinated with the Mechanical Engineer and Contractor at the time of building consent documentation.

Table 6: Typical Mechanical Plant Acoustic Treatment

Noise source	Location	Acoustic treatment
Fresh air fans	One dedicated system for each unit	Attenuators on intake and discharge of the fan as required. Vibration isolation
Toilet exhaust fans	One dedicated system for each unit	Attenuators on intake and discharge of the fan as required. Vibration isolation
Kitchen extract fan	Kitchen Hood	Multi speed control for the fan Attenuators on intake and discharge of the fan.
Condensing units	At ground level	Multi speed control Vibration isolation

5.4 Background Noise Design Criteria

Mechanical services to be designed and acoustically treated to meet the following design criteria:

Table 7: Recommended Internal Noise Levels

Space	Noise Level L_{Aeq}
Bedrooms	30 dBA
Other habitable spaces	35 dBA
Toilets	45 dBA

6. CONCLUSION

The proposed apartment will comply in all habitable rooms with the Auckland Unitary Plan requirements with the existing concrete cladding and proposed treatment for the glazing.

All habitable spaces will be required to be mechanically ventilated to meet the internal noise level requirements of the Auckland Unitary Plan.