

ACOUSTIC

Memo No **A01 Issue B**
Job Name **John Paterson Dr Private Plan Change**
Job No **251613**
Date **15 April 2026**
To **Urban Estates**
Address **s 9(2)(a)**
Issued By **Sam Jackson**

Initial Acoustic Assessment - Fast Track Referral Stage

1. Introduction

Powell Fenwick has been engaged by Urban Estates to assess road traffic noise exposure for the proposed Private Plan Change to re-zone and subdivide land around John Patterson Dr in Christchurch for residential use.

This memorandum is prepared to accompany an application for Fast Track referral.

The site is adjacent to the Christchurch Southern Motorway (State Highway 76) as well as Halswell Junction Rd and Springs Rd (major and minor arterial roads, respectively) and is subject to elevated road traffic noise. A site plan of the proposed area to be re-zoned is shown in Figure 1.1 below. The site is generally flat. There is an existing bund approximately 2.5 m high which extends along the northern portion of the site adjacent to the motorway. The bund stops short at the cycle path that runs adjacent to Springs Rd. We have accounted for this existing bund in our assessment.

In this memo, we provide a high level summary of our measurement and modelling outcomes and provide comment on the suitability of the current noise environment for residential activities and any potential mitigation measures required to reduce road traffic noise exposure. This assessment is provisional only, for the purpose of concluding where noise outcomes are expected to be compared to appropriate noise criteria, and also the nature of the development compared to other developments that have been approved.



Figure 1.1: Area of land covered by the proposed plan change.

2. Criteria

Christchurch District Plan

Rule 6.1.7.2.1 of the Christchurch District Plan requires residential buildings constructed near major roads or railways to be designed and constructed to protect residents from undue noise effects. For road traffic noise exposure, the prescribed internal design sound level in bedrooms and other habitable spaces is 40 dB $L_{Aeq(24h)}$.

The Christchurch District Plan does not have rules or guidance on outdoor amenity.

World Health Organization

The World Health Organisation (WHO) publishes noise level guidance, including for residential properties to protect against annoyance and sleep disturbance. Table 4.1 from *Guidelines for Community Noise* published in 1999 is reproduced in Table 2.1 below.

In the absence of outdoor amenity guidance from the Christchurch District Plan, Guidelines for Community Noise is a common point of reference for annoyance onset levels in outdoor areas associated with residential living.

Table 2.1: WHO guideline noise levels for residential activities

Specific Environment	Critical health effect(s)	L_{Aeq} [dB]	Time base [hours]	$L_{Amax, fast}$ [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-

To achieve quality outcomes in line with WHO guidelines, it is desirable to have an outdoor living space that is subject to noise levels no higher than 55 dB L_{Aeq} averaged across the daytime and evening period (16 hours from 0700 h to 2200 h).

3. Measurement

Measurements of road traffic noise across the site were taken over a period of ten days from 26 Nov 2025 to 05 Dec 2025 at four locations across the site. A map showing the location of the sound level meters is shown in Figure 3.1. The sound level meters used were Class 1 NSRT meters by Convergence Instruments, refer to Table 3.1.

Table 3.1: Schedule of Equipment

Item	Manufacturer	Model	Serial No.	Calibration Date
Sound Level Meter	Convergence Instruments	NSRTw_mk4	CnLWDIW48d03ILHAS2rxvD	26 Mar 2024
Sound Level Meter	Convergence Instruments	NSRTw_mk4	CtjWDvUSed83iDnQZ6h5tD	18 Nov 2023
Sound Level Meter	Convergence Instruments	NSRT_mk4	CHp2h1Wye98dAJISz6hxnD	06 Dec 2023
Sound Level Meter	Convergence Instruments	NSRT_mk4	AnF0DnUY0109ojvg60rRID	06 Dec 2023



Figure 3.1: Location of sound level meters

Measurement results were used to calibrate the road traffic noise model described in Section 4 below. Measured noise levels across the 10 days of measurements were as follows.

Meter Location 1:

- + 24 hour average: 53 dB $L_{Aeq}(24hr)$
- + 16 hour daytime average: 54 dB $L_{Aeq}(16hr)$

Meter Location 2:

- + 24 hour average: 55 dB $L_{Aeq}(24hr)$
- + 16 hour daytime average: 56 dB $L_{Aeq}(16hr)$

Meter Location 3:

- + Measurements were found to be contaminated by wind generated noise from nearby trees. Data from this measurement location was not used.

Meter Location 4:

- + 24 hour average: 53 dB $L_{Aeq}(24hr)$
- + 16 hour daytime average: 54 dB $L_{Aeq}(16hr)$

4. Assessment

A proprietary software package (SoundPLAN) has been used to model the variation in road traffic noise levels across the site. SoundPLAN implements the principles of ISO 9613-2:1996 Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation. The topography and local site features including the existing bund along the southern edge of the motorway have been included in the model together with a correction for the surfaces surrounding the site.

In addition to the existing bund, we have included additional screening extending from the end of the existing bund to the edge of John Patterson Dr. This screen should extend to the same height above ground as the existing bund and should either be a solid timber paling fence, an earthen bund or a combination. This additional screening is required to block line of sight between the motorway and the northern portion of the site to reduce road traffic noise exposure. The proposed screen relative to the existing bund is depicted in Figure 4.1.



Figure 4.1: Proposed additional screening.

A noise contour plot of the calibrated 24 hour time averaged noise exposure is shown in Figure A1 in Appendix A, while the 16 hour time averaged noise exposure is shown in Figure A2 in Appendix A. The proposed subdivision plan has been included in the contour plots.

Calculated 24 hour time averaged noise levels with the existing bund and proposed additional screening are 55 dB $L_{Aeq(24h)}$ or below. Suitable internal noise levels to habitable spaces of future residential dwellings as per Rule 6.1.7.2.1 can be readily achieved with typical residential constructions without enhancements. Properties directly adjacent to the SH76 and Springs Rd (Lots 261 to 277) may require mechanical ventilation to some habitable spaces to mitigate future road traffic noise which requires an additional + 3 dB factor to be included as per Rule 6.1.7.2.1. This would be determined for individual dwellings at the time of Building Consent submission.

The majority of sites are subject to daytime noise levels (16 hour time averaged) of less than 55 dB $L_{Aeq(16h)}$, which is a suitable level for maintaining amenity in outdoor living areas. The lots most exposed to road traffic, namely Lots 269 to 277 have noise exposure in the northern portion of the sites marginally above 55 dB $L_{Aeq(16h)}$, which is where the primary outdoor living area would be located. We note that other developments along the southern side of SH76, specifically on Sholto Duncan Cres and Bronco Dr, are of a similar setback from the motorway with similar height screening to the proposed Lots 269 to 277. Given the equivalent orientation of these dwellings, we expect noise exposure to primary outdoor living areas in those developments to also be marginally above 55 dB $L_{Aeq(16h)}$. We therefore consider there to be precedence that the marginal exceedance of the 55 dB $L_{Aeq(16h)}$ guidance for outdoor living spaces is acceptable provided a reasonable level of screening has been provided, which is the case with the existing bund and proposed additional screening. Notwithstanding this conclusion, it is feasible to further reduce noise exposure from road traffic to the proposed subdivision by increasing the height of the existing bund or constructing a fence on top of the existing bund.

5. Summary

Based on the assessment of road traffic noise exposure presented in Section 4, we consider the reverse sensitivity effects on the proposed subdivision can adequately controlled. We therefore consider the proposed re-zoning and subdivision of the land for residential use to be appropriate with regards to reverse sensitivity noise effects from existing road traffic.

Notwithstanding our findings, all new dwellings established within the subdivision that are within 100 m of SH76, or within 40 m of an arterial road (Springs Rd) will need to be individually assessed for internal noise exposure to habitable spaces in accordance with Rule 6.1.7.2.1 of the District Plan. Based on the assessed noise exposure, it will be feasible to achieve the internal design sound levels of the rule with typical residential constructions without enhancements. Mechanical ventilation may be required to some habitable spaces most exposed to road traffic noise due to the requirement to include a +3 dB factor to address future noise as per Rule 6.1.7.2.1.

This memorandum is suitable for submission to Ministry as part of a fast track referral application.

Appendix A. Noise Contour Plots



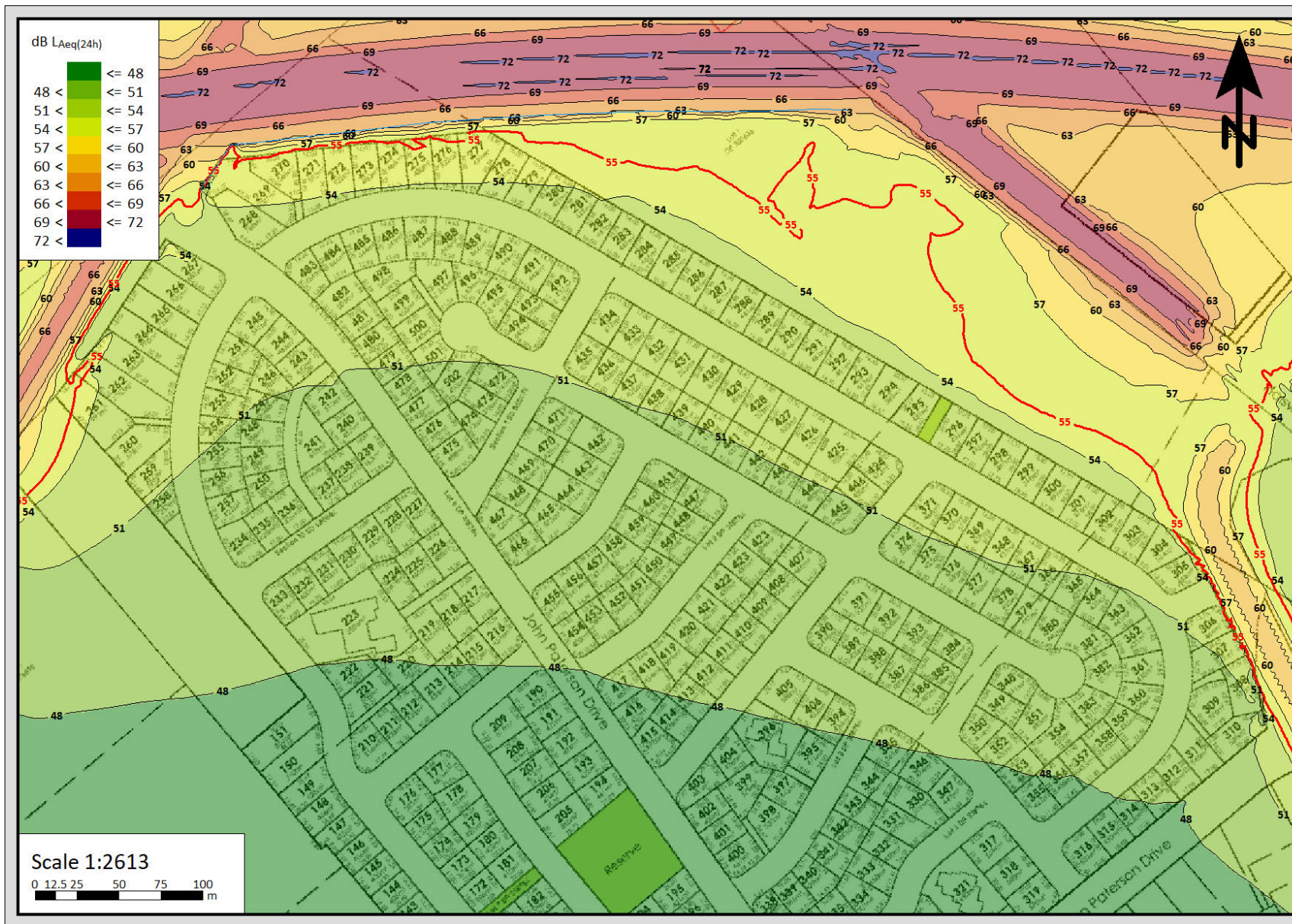


Figure A1: Noise contour plot of 24 hour time averaged noise levels from road traffic overlaid on the proposed subdivision.

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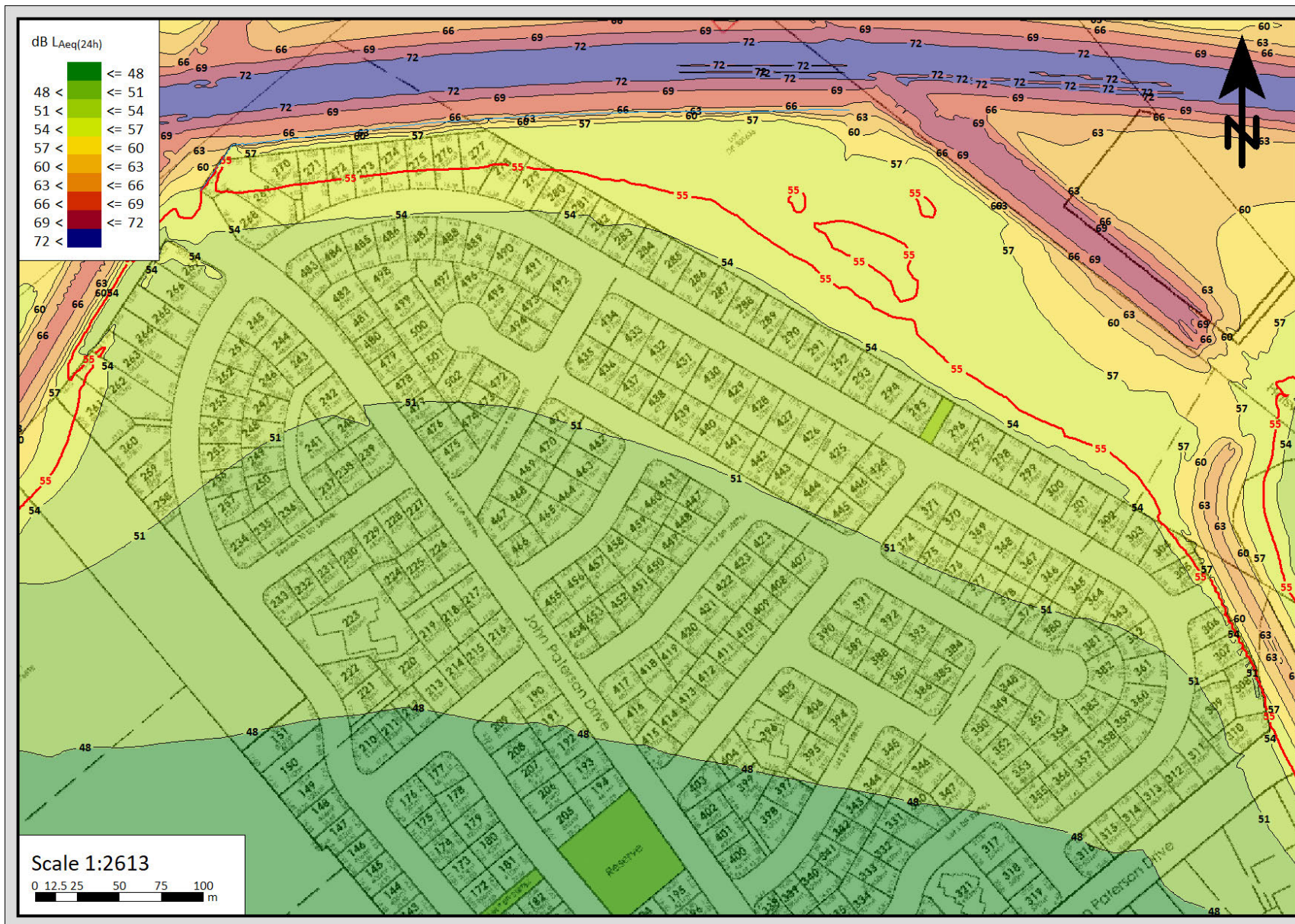


Figure A2: Noise contour plot of 16 hour time averaged noise levels from road traffic overlaid on the proposed subdivision.