Powell Fenwick

241518

Pound Rd Industrial Fast Track Development

Noise Report

Acoustic

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Issue Authorisation

Issue	Description	Date
A	Acoustic Assessment - DRAFT	14 May 2025
B	Acoustic Assessment – Final	17 Jun 2025

Written By:

Sam Jackson
Senior Acoustic Engineer
PhD, B.E. (Hons), MASNZ, CPEng

Reviewed By:

Mark Lewthwaite
Senior Acoustic Engineer | Technical Director | Associate
B.E. (Hons), CPEng, CMEngNZ

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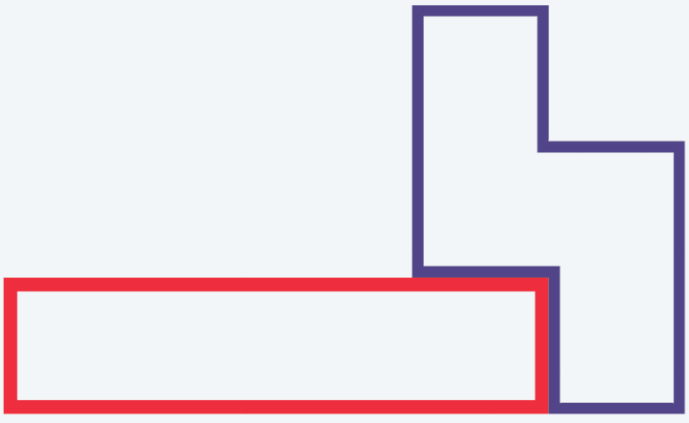


1. Introduction

1.1 Background

Powell Fenwick has been engaged by NTP Development Holdings Limited (NTP) to provide a noise assessment related to rural land on Pound Rd in Christchurch, proposed by NTP to be subdivided and used for industrial purposes.

NTP applied under the Fast Track Approvals Bill 2024 for the proposed development to be listed for referral to an expert consenting panel as per Schedule 2 Part A of the (now) Act, and were successful. This noise report is expected to accompany the application to the Environmental Protection Authority under that Act.

1.2 The Proposal

The proposed development is located north of Templeton and is bordered by Pound Rd to the east, Barters Rd to the south, Hasketts Rd to the west and the Templeton Golf Club to the north. The site relates to approximately 60 hectares of land. The development land is currently zoned Rural Urban Fringe as per the Christchurch District Plan ('CDP'). Land to the south and west of the proposed development is also zoned Rural Urban Fringe. To the north is land zoned Open Space Community Parks or Rural Quarry (Templeton) and to the east is land zoned Industrial General. Further to the northwest is the Specific Purpose (Ruapuna Motorsport) zone. The development is directly to the south of the Christchurch International Airport runway, and is under the landing/departure flight path. The development and surrounding area is depicted in Figure 1.1, Zoning as per the CDP is depicted in Figure 1.2 and the air noise contours related to Christchurch Airport re depicted in Figure 1.3.

14 Hasketts Rd is excluded from the development. We understand that this property is owned by Pillaiyar Kovil Trust and is earmarked for development as a Hindu temple, per approved resource consent RMA/2024/1718.

The purpose of this project is to deliver an industrial development generally consistent with Industrial General Zone activities that meets the specific demands for industrial land. The development would be an extension of the larger Hornby Industrial area, which extends to the southeast of the proposed development. The site will be for use by any permitted General Industrial activity as per the CDP.

The project activities primarily involve subdivision and land development to create the specified industrial sites and associated infrastructure development, including roads, utilities, and other necessary facilities.

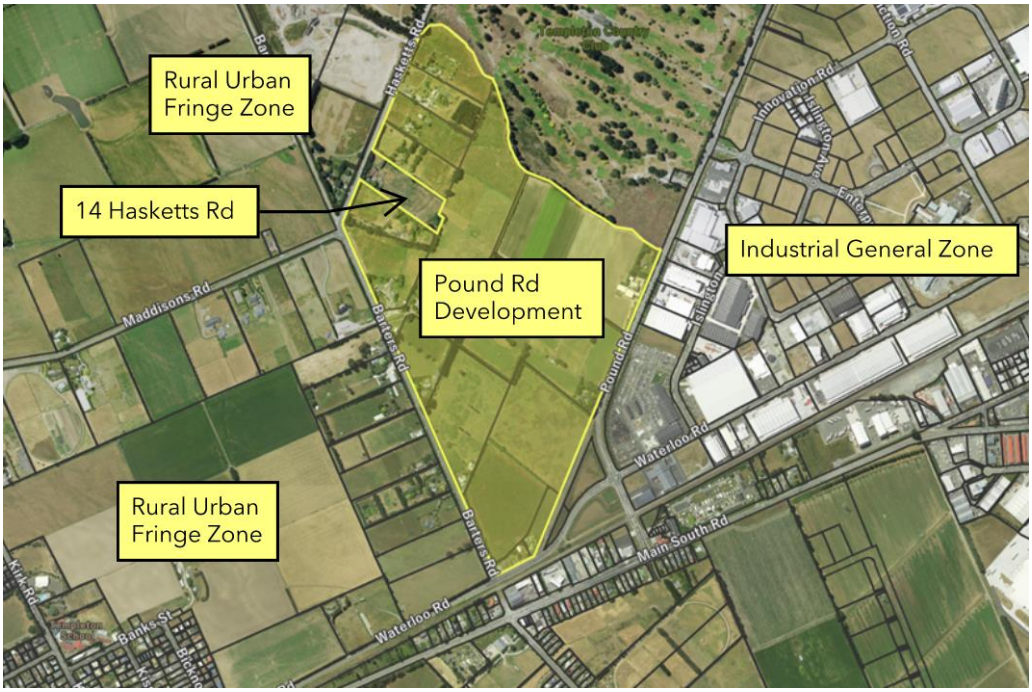


Figure 1.1: Location of the Pound Rd industrial development.

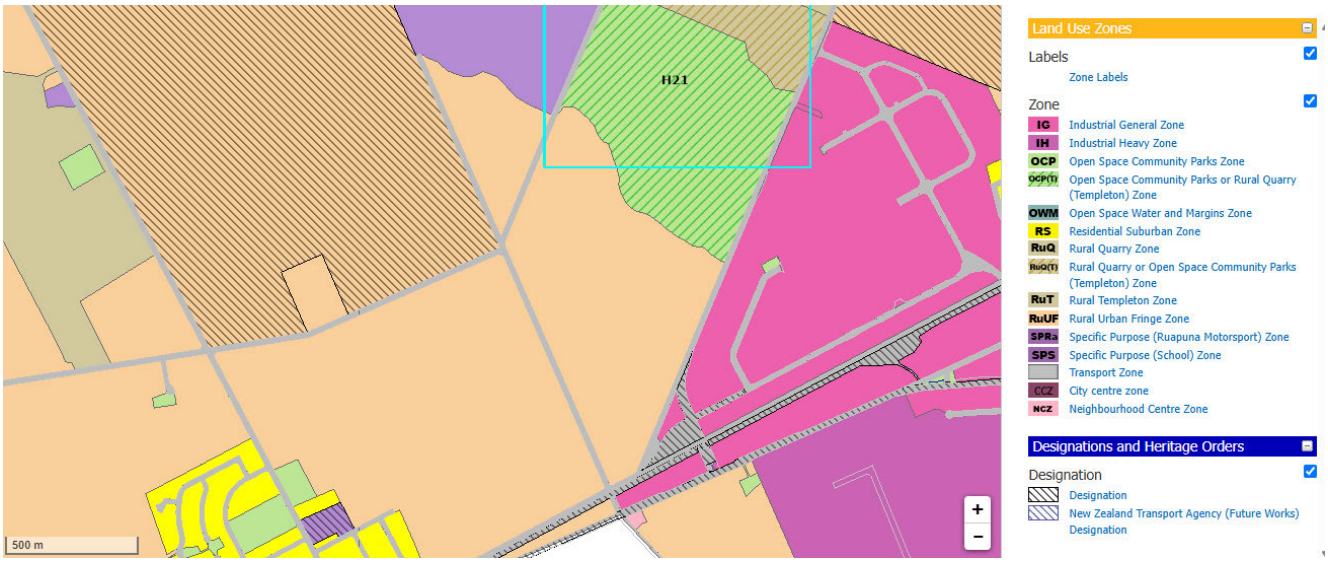


Figure 1.2: Christchurch District Plan zoning of the development and surrounding area.

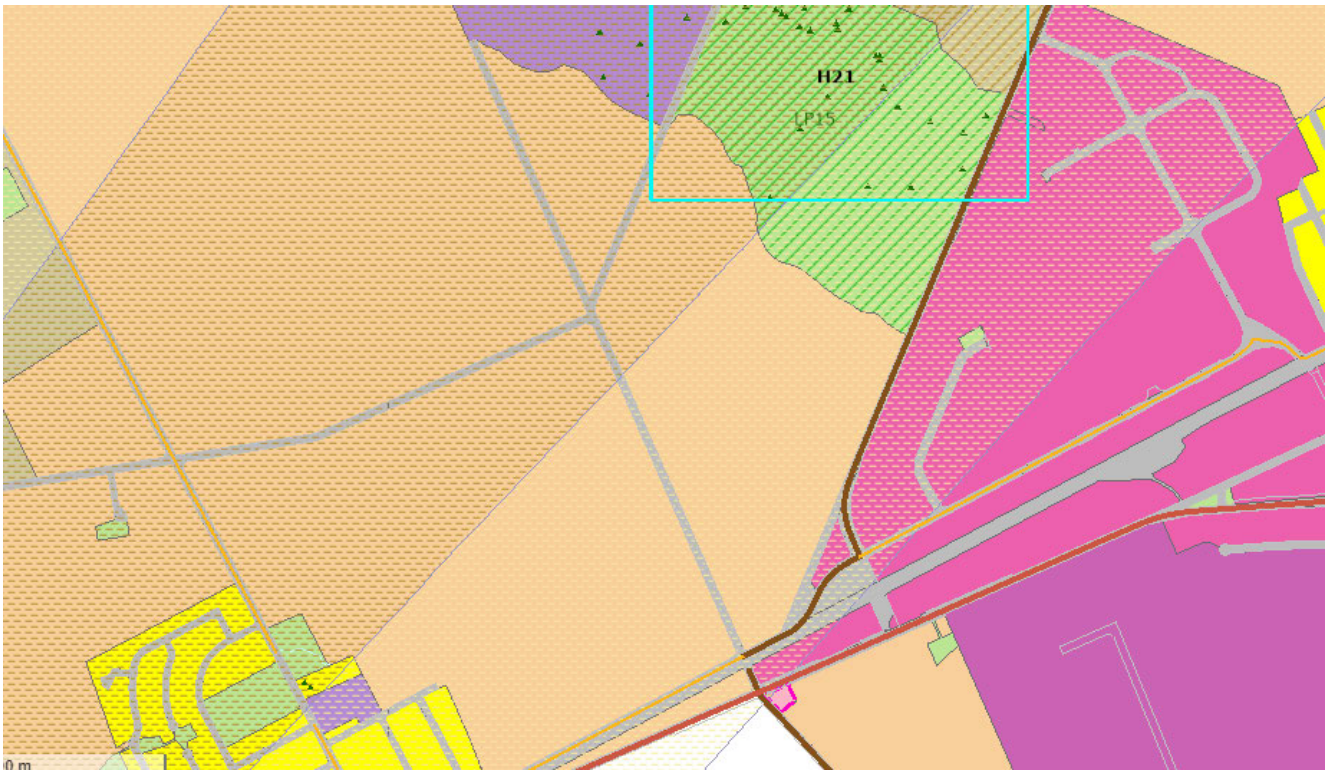


Figure 1.3: Christchurch District Plan 50 and 55 dB L_{dn} air noise contours.

1.3 Noise Considerations

Considerations related to noise that are investigated in this report are:

1. Noise generation from future operational activities within the industrial development and any effects on the amenity of nearby existing noise sensitive activities i.e. people living in rural dwellings within the rural urban fringe zone.
2. Noise from traffic generation on nearby public roads due the development as this may affect people living in rural dwellings within the rural urban fringe zone.
3. Reverse sensitivity effects related to establishing industrial activities within the vicinity of Christchurch Airport.
4. Construction noise effects on rural dwellings.

This report first looks into relevant CDP planning direction and rules, then describes the surrounding existing noise environment including as relates to noise surveys undertaken. Each acoustic consideration above is then addressed, and a summary is provided. Appendices are included at the rear of the report.

1.4 Author

The principal author of this report, Sam Jackson, is a Senior Acoustic Engineer within the Acoustic Team at Powell Fenwick. Sam completed a Bachelor of Engineering with Honours and a PhD from the University of Canterbury in 2013 and 2017, respectively.

Sam has eight years experience in acoustics, including four years in product design at Dyson Technology in the UK and four years in consulting for Powell Fenwick. Relevant areas of experience include:

+ Measurement and assessment of environmental noise
+ Prediction of noise from proposed activities, including industrial equipment and processes
+ Prediction of noise from road and air traffic sources
+ Interpretation of District Plan and other planning rules, and New Zealand Standards
+ Peer review of noise reports accompanying applications, on behalf of Councils

Sam is a Member of the Acoustical Society of New Zealand and a Chartered Professional Engineer with Engineering New Zealand in the field of acoustics.

All measurements, data processing and writing of this report has been undertaken by Sam. The report including all findings and conclusions have been reviewed by Mark Lewthwaite, Head of Department of the Powell Fenwick acoustic team.

2. Christchurch District Plan

2.1 Introduction

The following objectives, policy and rules relate to operational noise from Christchurch International Airport (CIA) and generation of noise from industrial activities.

2.2 Objectives

The Objectives are reproduced from CDP Chapter 3 – Strategic Directions, Chapter 6 – Noise and Chapter 13 – Specific Purpose Zones.

3.3.12 Objective - Infrastructure

Proposed new 3.3.13

a. *The social, economic, environmental and cultural benefits of infrastructure, including strategic infrastructure , are recognised and provided for, and its safe, efficient and effective development, upgrade, maintenance and operation is enabled; and*

b. *Strategic infrastructure , including its role and function, is protected from incompatible development and activities by avoiding adverse effects from them, including reverse sensitivity effects. This includes:*

    …

    iii. avoiding new noise sensitive activities within the 50dB L_{dn} Air Noise Contour and the 50dB L_{dn} Engine Testing Contour for Christchurch International Airport, …

The day-night average level (dB Ldn) penalises noise by 10 dB during a defined night-time period due to increased noise sensitivity during night-time. It is therefore a weighted average rather than a true average over a 24 hour period.

The development site falls within the operative 50dB L_{dn} Air Noise Contour, and the northwest portion of the site is within the 55dB L_{dn} contour (an is therefore also within the 50 dB L_{dn} Air Noise Contour). The airport noise contours have recently been subject to an independent review process and updated contours have been agreed between CIAL and Environment Canterbury. However, based on comments in the Christchurch Airport Remodelled Contour Independent Expert Panel Report dated June 2023, this will not significantly change quantitative assessment or conclusions. Therefore, the site is within an area where sensitive activities are to be avoided.

The District Plan definition for sensitive activities means:

a. *residential activities, unless specified below;*

b. *care facilities;*

c. *education activities and preschools, unless specified below;*

d. *visitor accommodation, unless specified below;*

e. *health care facilities which include accommodation for overnight care;*

f. *hospitals; and*

g. *custodial and/or supervised living accommodation where the residents are detained on the site;*

but excludes in relation to airport noise:

h. *any residential activities, in conjunction with rural activities that comply with the rules in the relevant district plans as at 23 August 2008;*

i. *flight training or other trade and industry training activities located on land zoned or legally used for commercial activities or industrial activities, including the Specific Purpose (Airport) Zone; and*

j. *commercial film or video production activities; and*

k. *visitor accommodation which is designed, constructed and operated to a standard to mitigate the effects of aircraft noise on occupants.*

As above, sensitive activities are those broadly residential or educational in nature. Industrial activities are therefore not noise sensitive for the purposes of the District Plan and may be provided for in this location within the context of Objective 3.3.12/3.3.13.

3.3.14 *Objective - Incompatible activities*

Proposed new 3.3.15

a. *The location of activities is controlled, primarily by zoning, to minimise conflicts between incompatible activities; and*

b. *Conflicts between incompatible activities are avoided where there may be significant adverse effects on the health, safety and amenity of people and communities.*

6.1.2.1 Objective - Adverse noise effects

a. *Adverse noise effects on the amenity values and health of people and communities are managed to levels consistent with the anticipated outcomes for the receiving environment.*

13.10.2.1 Objective - Motorsport

a. *Ruapuna Motorsport Park continues to operate as a facility of regional importance servicing motorsport, as well as training and recreational activities, whilst ensuring the adverse noise effects of activities at the Park on the surrounding community and environment are effectively managed to not increase and, if practicable, are reduced.*

The effects of noise from the proposed development will be considered in later sections of this report.

2.3 Policies

The policy below is reproduced from CDP Chapter 6 – Noise, Chapter 13 – Specific Purpose Zones and Chapter 17 - Rural.

6.1.2.1.5 Policy - Airport noise

a. *Require the management of aircraft operations and engine testing at Christchurch International Airport, so that:*

   i. *noise generated is limited to levels that minimise sleep disturbance and adverse effects on the amenity values of residential and other sensitive environments so far as is practicable;*

   ii. *where practicable, adverse noise effects are reduced over time.*

b. *Mitigate adverse noise effects from the operations of the Christchurch International Airport on sensitive activities, by:*

   iii. *prohibiting new sensitive activities within the Air Noise Boundary and within the 65 dB L_{dn} engine testing contour; and*

   iv. *requiring noise mitigation for new sensitive activities within the 55 dB L_{dn} air noise contour and within the 55 dB L_{dn} engine testing contour; and*

   v. *requiring Christchurch International Airport Limited (CIAL) to offer appropriate acoustic treatment in respect of residential units existing as at 6 March 2017 within the 65 dB L_{dn} Annual Airport Noise Contour, and within the 60 dB L_{dn} engine testing contour.*

As per the previous page under Objectives, industrial activities are not noise sensitive for the purposes of the District Plan and may be provided for in this location within the context of Policy 6.1.2.1.5.

From the rural chapter:

17.2.2.5 Policy - Establishment of industrial and commercial activities

a. Avoid the establishment of industrial and commercial activities that are not dependent on or directly related to the rural resource unless they:

   …

   v. *will not have significant adverse effects on rural character and amenity values of the local environment or will not cause adverse effects that cannot be avoided, remedied or mitigated.*

13.10.2.1.1 Policy - Motorsport

a. To ensure that motorsport activities operate in a manner which do not result in an unreasonable level of noise being received by activities which are noise sensitive; and

b. To manage noise sensitive activities where they would be affected by noise from motorsport activities.

The effects of noise from the proposed development will be considered in later sections of this report.

2.4 Rules and Standards

The Rules and Standards are reproduced from Chapter 6 – Noise and Chapter 8 - Subdivision, Development and Earthworks and Chapter 13 – Specific Purpose Zones.

6.1.7 Rules - Activities near infrastructure

6.1.7.1 Activity status tables

6.1.7.1.1 Permitted activities

a. The activities listed below are permitted activities, if they meet the activity specific standards set out in the following table.

Activity		***Activity specific standards***
…	…	…
P2	*In any rural zone other than the Rural Quarry Zone, any addition of a whole room to an existing building or any part of a new building where these are intended for a sensitive activity proposed between the Ruapuna Inner and Outer Noise Boundary relating to Ruapuna Motorsport Park as shown on the relevant planning maps*	*a. The activities shall be designed and constructed to ensure compliance with the indoor design sound levels in Rule 6.1.7.2.1.*

6.1.7.2.2 Activities near Christchurch Airport

a. The following activity standards apply to new buildings and additions to existing buildings located within the 55 dB L_{dn} air noise contour or the 55 dB L_{dn} engine testing contour shown on the planning maps:

i. Any new buildings and/or additions to existing buildings shall be insulated from aircraft noise and designed to comply with the following indoor design sound levels:

A. Residential units, hosted visitor accommodation and unhosted visitor accommodation:

I. Sleeping areas – 65 dB L_{AE}/40 dB L_{dn}

II. Other habitable areas – 75 dB L_{AE} /50 dB L_{dn}

B. Visitor accommodation (other than hosted visitor accommodation and unhosted visitor accommodation), resort hotels, hospitals and health care facilities:

III. Relaxing or sleeping - 65 dB L_{AE} /40 dB L_{dn}

IV. Conference meeting rooms - 65 dB L_{AE} / 40 dB L_{dn}

V. Service activities – 75 dB L_{AE} /60 dB L_{dn}

C. Education activities:

VI. Libraries, study areas – 65 dB L_{AE} /40 dB L_{dn}

VII. Teaching areas, assembly areas – 65 dB L_{AE} /40 dB L_{dn}

VIII. Workshops, gymnasiums – 85 dB L_{AE} /60 dB L_{dn}

D. Retail activities, commercial services and offices:

IX. *Conference rooms – 65 dB L_{AE} /40 dB L_{dn}*

X. *Private offices – 70 dB L_{AE} /45 dB L_{dn}*

XI. *Drafting, open offices, exhibition spaces - 75 dB L_{AE} /50 dB L_{dn}*

XII. *Typing, data processing – 80 dB L_{AE} /55 dB L_{dn}*

XIII. *Shops, supermarkets, showrooms - 85 dB L_{AE} /60 dB L_{dn}*

E. *Sound stages, studios for filming and/or sound production for Commercial film or video production activities - 47 dB L_{AE}*

ii. *Noise insulation calculations and verification shall be as follows:*

A. *Building consent applications shall be accompanied with a report detailing the calculations showing how the required sound insulation and construction methods have been determined.*

B. *For the purpose of sound insulation calculations, the external noise levels for a site shall be determined by application of the air noise contours L_{dn} and L_{AE}. Where a site falls within the contours the calculations shall be determined by linear interpolation between the contours.*

C. *If required by the Council, in conjunction with the final building inspection the sound transmission of the façade shall be tested in accordance with ISO 16283-3:2016 to demonstrate that the required façade sound insulation performance has been achieved, and a test report is to be submitted to the Council's Head of Building Consenting (or any subsequent equivalent position). Should the façade fail to achieve the required standard then it shall be improved to the required standard and re-tested prior to occupation.*

Activity categories A-C are unlikely to occur within an industrial area, however category D – defined retail activities and offices ancillary to industrial uses would be expected to occur on all or parts of some lots. Assessment of the acoustic insulation properties of the exterior envelope of the listed spaces would be required in order to ensure the required internal design sound levels are achieved where the space is within the 55 dB L_{dn} air noise contour i.e. the northwest side of the site.

6.1.5.2.1 Zone noise limits outside the Central City

a. *Outside the Central City , any activity that generates noise shall meet the Zone noise limits in Table 1 below at any site receiving noise from that activity, as relevant to the zone of the site receiving the noise.*

Table 2.1 (CDP Table 1): Zone noise limits outside the Central City

Zone of site receiving noise from the activity	***Time (hrs)***	***Noise Limit (dB)***	
		L_{Aeq}	L_{Amax}
…	*07:00-22:00*	*50*	*n/a*
b. *All rural zones, except Rural Quarry Zone, assessed at any point within a notional boundary*			
…	*22:00-07:00*	*40*	*65*
…	*07:00-22:00*	*55*	*n/a*
f. *All open space zones*			
g. *All rural zones, except Rural Quarry Zone, assessed at the site boundary*	*22:00-07:00*	*45*	*70*
…			

l. Industrial General Zone *…*	*07:00-22:00*	*70*	*n/a*
	22:00-07:00	*70*	*n/a*
…			

The above receiving rural and open space zone limits would apply to noise generation from activities on sites within the proposed development. If these limits cannot be complied with, resource consent will be required as either a restricted discretionary activity (where noise limits exceeded by 10 dB or less) or a non-complying activity (where noise limits exceeded by more than 10 dB) as set out in Chapter 6.1.5 CDP.

In CDP Section 6.1.4.1.a: *'…noise shall be measured in accordance with NZS 6801:2008 "Acoustics – Measurement of environmental sound", and assessed in accordance with NZS 6802:2008 "Acoustics-Environmental noise", except that provisions in NZS 6802 referring to Special Audible Characteristics shall not be applied'.* The time average noise level (dB L_{Aeq}) is therefore an average assessed over a 15 min period in accordance with NZS 6801 – though may be subject to corrections as per NZS 6802. The maximum noise level (dB L_{Amax}) best reflects the loudest noise event during a period, which if short, may not contribute significantly to the time-average level. The maximum noise night-time limit protects against events that may cause awakenings.

Where assessment at a notional boundary is required (see b. above), the CDP definition of notional boundary *"… means a line 20 metres from any wall of a residential unit or a building occupied by a sensitive activity, or the site boundary where this is closer to the residential unit or sensitive activity."* Most typically this means that in the case of a rural dwelling more than 20 m from the site boundaries, a notional boundary assessment would consider noise levels 20 m from the dwelling (on the side exposed to noise) rather than at the legal boundaries. In this case, unusually, the CDP requires assessment in rural zones at the site boundary and the notional boundary, with slightly different noise levels.

6.1.7.1.1 Rules - Activities near infrastructure

a. The activities listed below are permitted activities, if they meet the activity specific standards set out in the following table.

Activity		***Activity specific standards***
…	*…*	*…*
P2	*In any rural zone other than the Rural Quarry Zone, any addition of a whole room to an existing building or any part of a new building where these are intended for a sensitive activity proposed between the Ruapuna Inner and Outer Noise Boundary relating to Ruapuna Motorsport Park as shown on the relevant planning maps*	*a. The activities shall be designed and constructed to ensure compliance with the indoor design sound levels in Rule 6.1.7.2.1.* *Advice note:* *1. These rules are intended to mitigate the effects of motorsport noise within internal building spaces only. Noise from motor sport activities will also be audible outside of buildings to a varying degree. When constructing new dwellings, residents are encouraged to consider orientating outdoor living spaces away from the Motorsport Park. Where this is not practical, the use of solid continuous walls or fencing encircling the outdoor space, can be used to help mitigate noise.*

Any new sensitive activity established within the Ruapuna noise boundaries must be designed to insulate against noise from Ruapuna Park.

8.9.2.1 Permitted activities - earthworks

a. *The activities listed below are permitted activities if they meet the activity standards set out in the following table.*

b. *Activities may also be controlled, restricted discretionary, discretionary, non-complying or prohibited as specified in Rules 8.9.2.2, 8.9.2.3, 8.9.2.4, 8.9.2.5 and 8.9.2.6.*

Activity		***Activity Standard***
P1	*Earthworks:* *a. not for the purpose of the repair of land used for residential purposes and damaged by earthquakes; and* *…* *…*	*(e) Earthworks involving soil compaction methods which create vibration shall comply with DIN 4150 1999-02 and compliance shall be certified through a statement of professional opinion provided to the Council from a suitably qualified and experienced chartered or registered engineer.* *…* *(f) Earthworks involving mechanical equipment, other than in residential zones, shall not occur outside the hours of 07:00 and 22:00 except where compliant with NZS 6803:1999.*

The District Plan does not have an overarching requirement for assessing vibration as related to construction activities, however the above standard is an example of assessment requirement for the specific case of vibration creating soil compaction methods. Reference is given to DIN 4150 1999-2 *Structural vibration – Human exposure to vibration in buildings* in this case.

Part (f) also specifies earthworks to be limited to day-time hours, consistent with those defined in CDP noise rule 6.1.5.2.1.

If the activity standards for P1 above for earthworks involving soil compaction methods are not met, then the earthworks will be an RD activity with discretion limited to considering the matters set out in 8.9.4.1.

8.9.4 Matters of discretion

8.9.4.1 Nuisance

…

f. The extent to which any adverse effects from noise and vibration associated with earthworks and land improvement can be avoided or mitigated, and the effectiveness of any methods to mitigate such effects.

…

13.10 Specific Purpose (Ruapuna Motorsport) Zone

13.10.4.2.7 Permitted activities noise standards

Table 2.2 (CDP Table 1): Raceway Noise Standards

Permitted Activity	***Days of the Week***	***Maximum Number of calendar days per year***	***Boundary Noise Logger Noise Limits***		***Hours of Operation***
			$L_{Aeq(15\ min)}$	L_{AFmax}	
Motor vehicles using the Racetrack except motor racing vehicles , and not operating above 100 km/h	*Mondays*	*50*	*65 dB*	*85 dB*	*09:00 - 18:00*
Motor racing vehicles using the Racetrack	*Any day except Mondays*	*90*	*65 dB*	*90 dB*	*09:00 - 18:00* *Except on 5 days Friday to Sunday 09:00 - 20:00 hours*
		75	*70 dB*	*90 dB*	
		120 of which no more than 50 days shall occur from Tuesday to Friday inclusive	*80 dB*	*95 dB*	
Drag racing vehicles using the Racetrack	*Any day except Mondays*	*5*	*80 dB*	*105 dB*	*09:00 - 18:00*
Special Interest Vehicles using the Racetrack	*Any day except Mondays*	*6 as part of any permitted activity listed in this table*	*90 dB*	*105 dB*	*Maximum of 90 minutes per day* *10:00 - 17:00*

Table 2.3 (CDP Table 2): Speedways Noise Standards

Permitted Activity	***Days of the Week***	***Maximum Number of calendar days per year***	***Boundary Noise Logger Noise Limits***		***Hours of Operation***
			$L_{Aeq(15\ min)}$	L_{AFmax}	
Speedway race meeting	Any day except Mondays	15	80 dB	95 dB	18:00 - 22:00
Speedway practices	Any day except Mondays	5	80 dB	95 dB	12:00 - 18:00

The above tables set out the noise levels and durations that are permitted to be made by the Ruapuna Park raceway and speedway. The levels are relevant to this assessment as they are used to calculate the permissible noise exposure to adjacent Rural Urban Fringe zones.

3. Site Layout and Sensitive Receivers

3.1 Site Layout

The subdivision of the development is shown in Figure 3.1 below. The site will be subdivided into 73 lots ranging in size from approximately 800 m^2 up to approximately 5 hectares. We note that Lot 73, currently shown with indicative roading, will have the potential to be further divided into approximately 9 lots, with areas expected to be up to approximately 1 hectare. The larger lots are typically located along Hasketts Rd, with the exception of Lot 72 which is adjacent to Pound Rd. All lots will have access internal to the development via newly constructed roads.

Three lots (200, 201 and 202) will be Local Purpose (Utility) Reserves vested in Christchurch City Council, covering a total of approximately 3.8 hectares of the site.

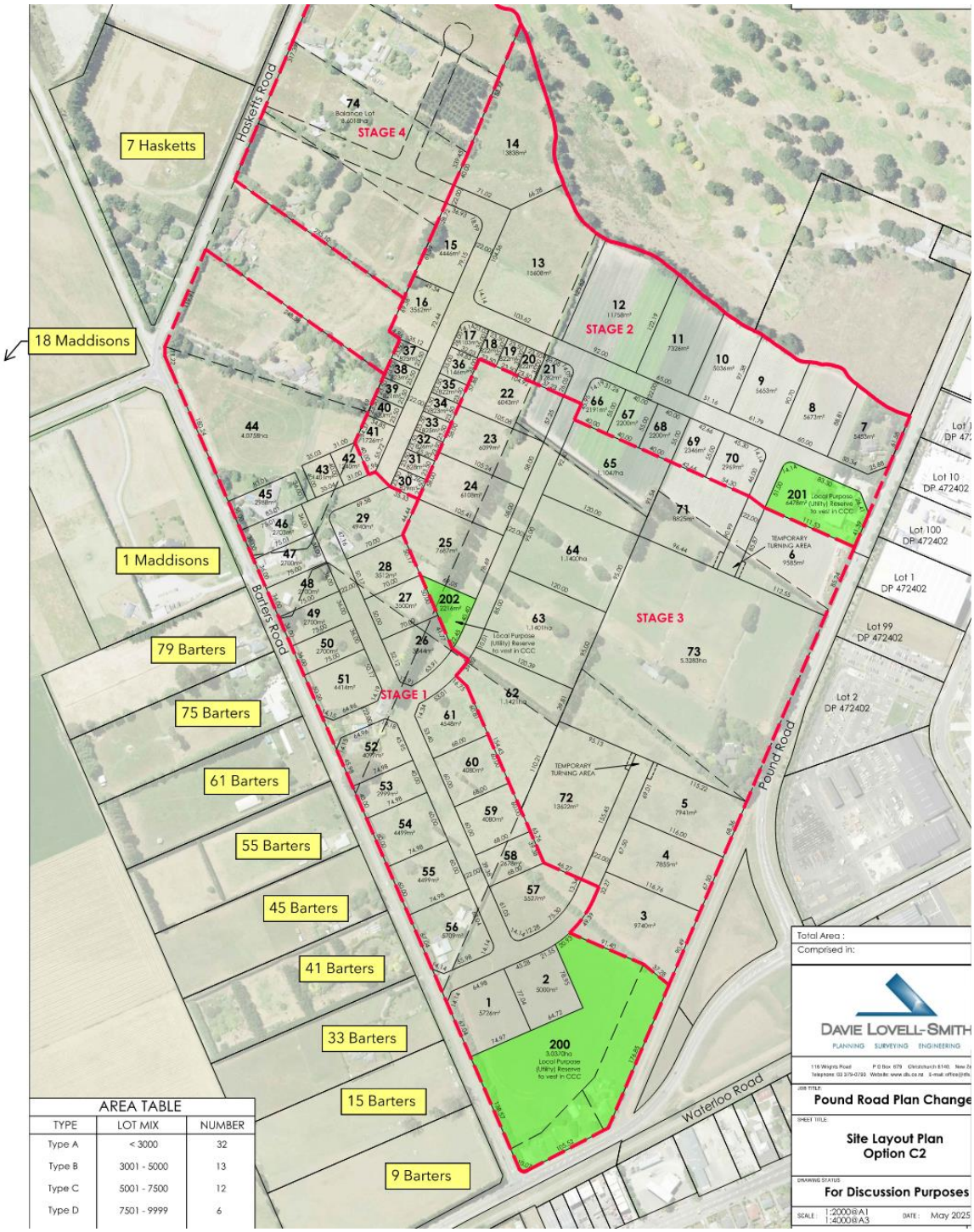


Figure 3.1: Site Layout plan

3.2 Sensitive Receivers

We have identified nearby sensitive receivers as properties that appear to have buildings that could be used for residential purposes. Identified properties are along Hasketts Rd, Barters Rd and Maddisons Rd.

Noise sensitive receivers are presented in Table 3.1.

Table 3.1: Identified sensitive receivers

Receiver	Nearest Lot	Distance from nearest lot to notional boundary (m)	Additional notes
7 Hasketts Rd	43	20	This property is owned by Christchurch City Council and the dwelling is derelict. We understand this property cannot be used for residential purposes following purchase by Council following noise issues from Ruapuna Park. [1]
1 Maddisons Rd	43	45	Site shared with Burnell & Son Transport Ltd. Site appears to be used for truck parking.
18 Maddisons Rd	45	180	Assumed to be rural residential use
33 Barters Rd	1	80	Assumed to be rural residential use
41 Barters Rd	55	35	Assumed to be rural residential use
45 Barters Rd	54	40	Assumed to be rural residential use
55 Barters Rd	53	20	Assumed to be rural residential use
61 Barters Rd	51	60	Assumed to be rural residential use
75 Barters Rd	49	20	Site appears to be used in part for truck parking.
79 Barters Rd	48	20	Assumed to be rural residential use

[1] The property is listed in a Council document titled Disposal of Council-owned Properties dated 2021 and is listed as derelict and leased for grazing only

The Templeton Golf Club (located to the immediate north of the site) is zoned Open Space and therefore subject to the same noise limits as Rural Urban Fringe zoned land as per the CDP. We do not consider the Golf Club to be a noise sensitive receiver as it is not used for a sensitive activity as per the CDP definition. We have assessed noise to the Golf Club in this context. At the closest location, fairways are within 25 m of the proposed development boundary.

4. Existing Noise Environment

4.1 Noise Sources

The existing noise environment is primarily relevant to the acceptability of new industrial noise in the environment. Reverse sensitivity effects of the environment on the proposed industrial activities (aircraft noise) is covered by Rule 6.1.7.2.3 of the CDP.

Generic rural environments are typically subject to noise such as nearby road traffic, occasional/seasonal farming activities including use of substantial equipment such as harvesters, light aircraft movements – sometimes related to farming or tourism, and noise from processing plant or other activities permitted within district plans or otherwise undertaken with resource consent, as well as ad-hoc or temporary activities.

Known significant noise sources specific to this area that make it different to the 'generic' rural environment above include the following:

+ Aircraft approaching and (to a lesser extent) departing Christchurch Airport.
+ Road traffic noise from Pound Rd, Hasketts Rd and Barters Rd.
+ Ruapuna Park (including raceway and speedway)

We have not considered noise from existing industrial sites further to the east of Pound Rd, or from quarry activities further to the north of the proposed development due to the distance of these noise sources from the development which have assessment locations for noise compliance much closer to those noise sources.

As part of the District Plan rules, Ruapuna Park has a permanent noise logger set up at the northwest boundary, the data for which is available at www.noiseandweather.co.nz. Noise emissions from the park are governed by the limits set out in the CDP (Rule 13.10.4.2.7, refer to Section 2.4). The venue is allowed to generate elevated noise above District Plan zone noise limits (up to 90 dB $L_{Aeq(15\ min)}$ at the Ruapuna Park site boundary), however this is only for a set number of days per year and only during daytime hours.

The area to the east and south of the proposed development therefore includes a number of notable noise sources, in particular the significant roads and Christchurch Airport flight path, which would be expected to result in higher noise levels than most rural environments that are more remote from significant infrastructure.

4.2 Noise Survey

4.2.1 General

Environmental noise measurements were undertaken from 16 to 28 January 2025. Measurements were taken at two locations to capture noise from Pound Rd and Barters/Hasketts Rd, as well as noise from aircraft movements. Measurements were taken using Convergence Instruments NRST_mk4 noise loggers, which were set to log continuously and record L_{Aeq} and L_{AFmax} levels at 1 minute intervals.

The loggers were set up at 173 Pound Rd and 94 Barters Rd. The locations of the loggers are shown in Figure 4.1. Logger 1 was located approximately 45 m from the nearest marked traffic lane of Pound Rd. Due to the constraints of the site, it was not possible to locate the logger away from vegetation. Logger 2 was located approximately 10 m from the nearest marked traffic lane of Barters Rd and approximately 60 m from the intersection of Barters Rd, Hasketts Rd and Maddisons Rd.

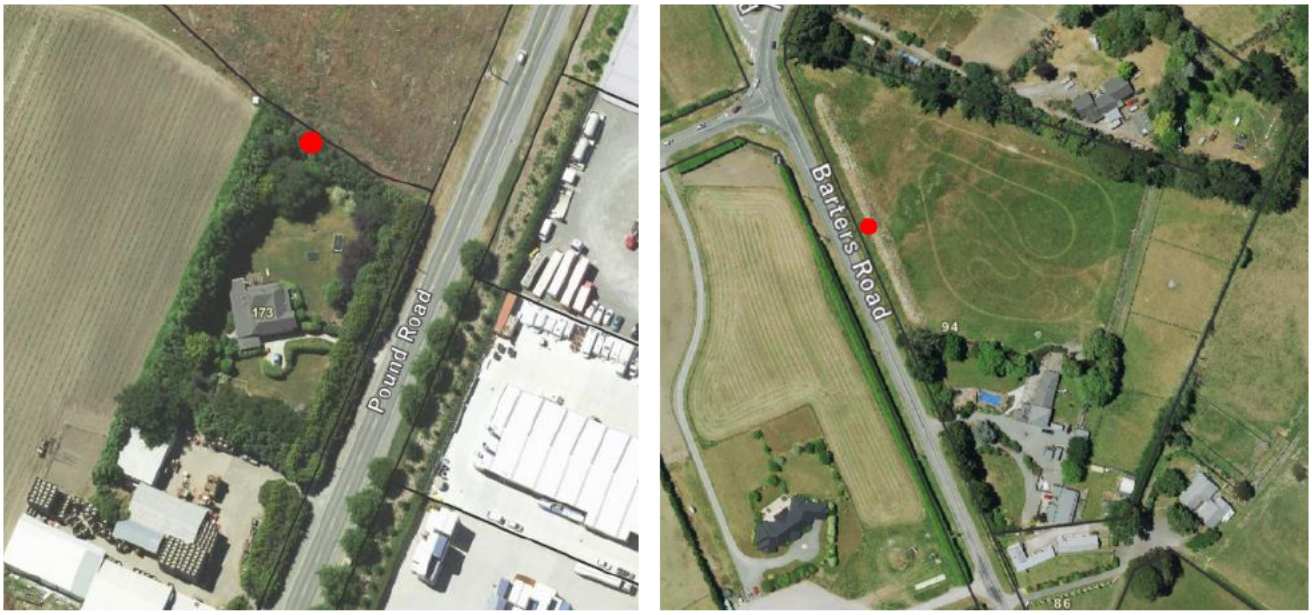


Figure 4.1: Noise logger locations shown in red.

Throughout the survey period the weather was typically clear/overcast with varying light to moderate winds, with the exception of 26 and 27 January which saw light rain. See Appendix A for wind speed and precipitation obtained from Wunderground. General measurement practice was in accordance with NZS 6801:2008.

Conditions were not always within NZS 6801:2008 guidelines due to wind speed being higher than the recommended 20 km/h at times. Noise at 173 Pound Rd was found to be fairly consistent over the measurement period, suggesting road traffic noise, which was a constant and elevated noise source, was dominant over wind noise. Notwithstanding this analysis, the measurements represent the overall noise environment from all noise sources, which could include wind induced noise as well as road traffic noise. The highest daily average wind speed was 27 km/h, and maximum wind speeds were 45 km/h at the Christchurch weather station. The meter and windscreen used have induced noise at these wind speeds of 45 dBA and 58 dBA, respectively.

The sound level meters and data loggers were calibrated before and after each survey period. No significant calibration drift was observed. The equipment used for the survey is presented in Table 4.1 below. Full calibration records can be provided upon request.

Table 4.1: Measurement Equipment

Item	Manufacturer	Model	Serial No.	Calibration Date.
Data logger	Convergence Instruments	NRST_MK4	AnF0DnUY0109ojvg60rRlD	11 Nov 2023
Data logger	Convergence Instruments	NRST_MK4	CnLWDlW48d03ILHAS2rxvD	11 Nov 2023
Calibrator	Castle Group	dB Cal	075733	11 Jul 2024

4.2.2 Measurement Outcomes

A summary of the logger measurements are presented below in Table 4.2. The period of the day is noted i.e. either within the District Plan daytime period (0700 – 2200 h) or night-time period (2200 – 0700 h). The ranges represent the highest and lowest 15 minute average and maximum values recorded over the entire 12 day period.

Table 4.2: Summary of Datalogger Measurements

Activity Period	Datalogger Location	Time period	Time Average Noise Level, dB $L_{Aeq(t)}$	Maximum Noise Level, dB L_{AFmax}
Day	173 Pound Rd	16 Jan 2025 – 28 Jan 2025	57 - 65	N/A
Night		16 Jan 2025 – 28 Jan 2025	52 - 59	57 - 65
Day	94 Barters Rd	16 Jan 2025 – 28 Jan 2025	56 – 62	N/A
Night		16 Jan 2025 – 28 Jan 2025	47 - 54	71 - 94

The full noise logs for each location at 15 minute intervals is provided in Appendix B Figures B3 and B4 ($L_{Aeq(15\ min)}$ and $L_{AFmax(15\ min)}$).

Noise at 173 Pound Rd was observed to be largely from road traffic on Pound Rd, which has high percentage of heavy vehicles (11%) and a high speed limit (80 km/h). There was minimal difference between daytime and night time levels (approximately 5 dB) suggesting that there is still significant noise from road traffic, and in particular heavy vehicles, during night time hours. Noise levels during night time hours were only below 50 dB $L_{Aeq(15\ mins)}$ for approximately 5 hours each night, usually from 0100 h to 0600 h.

Noise at 94 Barters Rd was also observed to be largely from road traffic but with significant additional noise from air traffic, which was observed to pass nearly directly overhead when aircraft were landing from the south. The road has a speed limit of 80 km/h and 10-11% heavy vehicles.

The measured noise at 94 Barters Rd was consistently 5-10 dB above District Plan noise limits in Rural zones at site boundaries (40 dB L_{Aeq} night time and 50 dB L_{Aeq} day time). Noise during night time hours was only below 50 dB $L_{Aeq(15\ mins)}$ for approximately 6 hours each night, usually from 0000 h to 0600. Maximum noise levels during night time hours were substantially higher than at 173 Pound Rd, which we attribute to aircraft noise, with the noise logger position being almost directly under the flight path to Christchurch Airport. Noise from trucks accelerating/decelerating at the intersection was likely a secondary source of maximum noise events. Maximum noise levels during night time hours were typically at or above the District Plan limit of 70 dB L_{Amax}, and were observed to reach or exceed 70 dB L_{Amax} at any point during night time hours, although less regularly between 0200 h and 0600 h, which approximately aligns with the typical operating hours of Christchurch Airport, with the last scheduled arrival of the day typically scheduled for 0045 h and the first departures typically scheduled for 0545 h.

A secondary source at 94 Barters Rd would have been from Ruapuna Park. From the Park's website, several racing events took place during the measurement period. There are no clear changes in the day-night noise patten as presented in Figure B1, suggesting that noise from Ruapuna Park was not a significant contributor to overall noise levels.

5. Noise Generated by Industrial Activities

5.1 General

Limits for noise generated by activities in Industrial General zone, which would be proposed to apply within the development site, are a time-average level of 70 dB L_{Aeq} any time of the day, with no maximum noise limit, as per District Plan rule 6.1.5.2.1. Noise generated by industrial activities will also be required to meet District Plan Rural Zone noise limits, which are 55 dB L_{Aeq} daytime and 45 dB L_{Aeq}/70 dB L_{Amax} night time at rural site boundaries, and 50 dB L_{Aeq} daytime and 40 dB L_{Aeq}/65 dB L_{Amax} night time at the notional boundary where there are rural dwellings.

7 Hasketts Rd is the most exposed property to future industrial noise that has a residential dwelling, as the dwelling on the property is both close the development boundary (less than 30 m) and directly adjacent to the second largest lot in the proposed development (Lot 43). As noted in Section 3.2, this dwelling is derelict and is not for used residential purposes. The property is listed in a Council document titled Disposal of Council-owned Properties dated 2021 and is listed as derelict and leased for grazing only. We therefore have not considered noise exposure to 7 Hasketts Rd further.

1 Maddisons Rd is the next most exposed property with a residential dwelling, also due to its proximity to Lot 43.

All other identified sensitive receivers are located adjacent to smaller lots varying in size from 2700 m^2 to 5700 m^2. These sites are likely too small to contain regular activities involving larger vehicles that would be expected to make greater noise. Noise from these sites is more likely to be dominated by smaller handling vehicles such as forklifts.

As summarised in Section 4.2.2, noise exposure from road traffic and aircraft movements at the corner of Hasketts Rd, Barters Rd and Maddisons Rd was noticeably above permitted rural zone noise limits. Due to the proximity of 1 Maddisons Rd to this location, we would expect similar noise exposure at their respective site boundaries. It is therefore reasonable that industrial activities could generate noise levels 5-10 dB above District Plan averaged noise limits and 0-5 dB above maximum noise limits at night time while having minimal or negligible impact on these dwellings relative to the existing noise environment.

Road traffic and aircraft noise exposure to Barters Rd properties is expected to diminish heading southeast from the measurement location at a rate such that noise exposure to the boundary of 33 Barters Rd would be 3-4 dB lower than at the measurement location. This is due to the increased distance from the intersection and the increased distance from the Christchurch Airport flight path. We expect noise levels from the existing environment to be elevated above District Plan Urban Fringe limits, but only marginally so.

5.2 Cumulative Noise

The potential for cumulative noise levels substantially higher than noise limits i.e. multiple industrial sites producing noise near the noise limit but together being well over the noise limits at a specific rural assessment location, is low, for a number of reasons including:

+ The most directly adjacent industrial site to a particular rural dwelling may generate noise some margin below the limits.
+ Other industrial sites *not* directly adjacent to the particular rural dwelling, will have to be compliant at a different rural dwelling, and screening and distance between that other industrial site and the particular rural dwelling will tend to reduce the noise levels.
+ Each site may generate noise intermittently or periodically and therefore noise generation may not coincide.
+ Sites may not operate at night when the more restrictive limits apply.

5.3 Likelihood of Compliance

Imposing noise limits does not guarantee compliance. Certainly industrial activities can include mobile or fixed machinery that could exceed boundary noise limits and even noise from people or light vehicles can exceed limits when near to immediate boundaries when appropriate attention is not given to noise control. It is our experience that the majority of commercial and general industrial activities can be designed to comply

with residential/rural limits with appropriate acoustic input. Further, activities may comply without acoustic input through good luck based on site layout factors, default mass building construction and/or activities being modest in nature.

We have been asked to be involved in cases of noise complaints related to commercial or industrial activities. These complaints would typically be confirmed to have a non-compliance, but usually the issue(s) would have a reasonably practicable mitigation or management controls such as the addition of screening around a particular plant item, modifying an item of equipment or process, limiting truck deliveries to day-time hours or a particular more screened point of access, and closing exterior doors casually left open.

The Christchurch City Council Plan Change 14 ('PC14') considered potential effects of intensification of similarly sensitive residential activities next to industrial zones, and as part of that Acoustic Engineering Services were commissioned to observe the interfaces between industrial and residential activities, with outcomes as contained within noise report Industrial-Residential Interface – Review of Potential Noise Issues dated 20 January 2023. Relevant specific comments from the report included:

+ *Higher risks appeared to be involved with dwellings located across a road from an Industrial zone – as they were more likely to be exposed to the active / outdoor aspects of the Industrial activities and/or the heavy traffic which they attract, with no prospect of meaningful screening from interviewing structures. In some cases, if the road is wide and carries a high volume of traffic (for example, Shands or Maces Road) this arrangement did not appear to be particularly problematic.* (Section 4.1.)

+ *There were a moderate number of instances where Industrial site accessways run along the length of a Residential boundary. In addition, as above, on narrow low volume roads on- and off-site heavy vehicle noise can also be a distinct source at Residential receiver locations.* (Section 4.2.)

+ *… mechanical plant is typically a very easily quantified source during the design stage of a project, which should be always able to be designed to comply with the CDP limits. We did not observe anything during our site visits which suggested a different approach was needed – despite numerous examples being observed where mechanical plant did not comply with the CDP limits (sometimes by more than 20 dBA). This always appeared to be due to absence of any effort to implement any of the various mitigation which is routinely implemented by good operators… It is interesting to note that despite numerous on-going non-compliances, this type of mechanical plant noise does not feature highly in the complaints records discussed in the following section – suggesting neighbours are actually quite tolerant of that type of noise, even at levels above the CDP limits.* (Section 4.2.)

The noise report in Section 6.0 then included the following "general" comments on their review and analysis:

+ *The CDP noise limits which control the Industrial-Residential interface are in line with best practice (including the directives of the National Planning Standards) and put the onus on Industrial operators to comply with 'residential level' limits by the time their noise reaches residential areas. This in effect creates a 'buffer area' around the perimeter of, but within, each area of Industrial zoning. Within this buffer area, only low to moderate noise generating Industrial activities can locate and realistically expect to operate in compliance with the CDP, irrespective of the range of industrial activities permitted in the zone generally.*

+ *Many of the activities currently occurring in Industrial zones close to the Industrial-Residential interface are not high noise generating (potentially self-selected due to the close proximity of a boundary at which stringent noise limits apply), or have arranged their sites such that compliance with the CDP noise limits is readily achieved, and it is likely that residential neighbours in these areas rarely experience any noise adverse effects.*

+ *Some of the historic complaints involved situations where Industrial operators were not complying with the CDP noise limits. The fact that residential neighbours complained is not a failure of the noise limits in those situations…*

In summary as is most pertinent to this assessment, the noise report did not identify significant issues with current noise rules or outcomes related to industrial activities (see Section 6 and 7 of that report), often because active areas of industrial sites faced away from residential, in part because access was from the opposing side to direct residential interfaces. There were increased issues or risk of issues where active industrial areas faced residential areas such as across narrow or lower traffic volume roads from which access was gained.

Comparing risk factors for this rural to industrial interface to the residential to industrial interfaces in the study, rural dwellings and habitable outside areas should be further from the industrial activity than dwellings and outdoor areas on residential sites, meaning noise levels from equivalent industrial noise sources will

generally be lower near rural dwellings in this rural receiving environment. Specifically, Hasketts Rd and Barters Rd ensure setbacks to existing rural dwellings. Furthermore no site has access via these roads, with all site access being via roads internal to the development.

5.4 Compatibility of Industrial Activities in Environment

It is therefore our conclusion that there is no fundamental incompatibility establishing general industrial zone activities (as defined in the application) within this rural environment. This section explicitly excludes consideration of 14 Hasketts Rd, which is addressed separately in Section 5.5.

Despite adjacencies to rural residential dwellings, we consider it unlikely that industrial general activities directly adjacent to Barters Rd (Lots 44 to 55 and Lot 1) will exceed District Plan Rural noise limits. The lots are arranged such that access is from within the development. We therefore consider it likely that buildings on these sites will be on the southern end of the site with outdoor yards on the northern side. It is also unlikely there would be opening windows and doors on the southern façade. Should yards be located on the southern side of these lots, we expect only small vehicles to be used such as forklifts. In the event that noise exceedances do occur and cause nuisance at residential dwellings on Barters Rd we consider practicable mitigation and management measures can be implemented to reduce noise, for example using lower noise equipment, adding screening, and closing windows and doors that may otherwise be left open without consideration of noise effects on neighbours.

Lot 43 is a large lot, and may be considered for activities with yards operating larger machinery, large truck manoeuvring on site and/or container handling. It is likely possible for such activities to operate on the site while generating noise that is no higher than that of the existing environment during daytime hours as discussed in Section 4.2.2, although physical and managerial measures will almost certainly be required to mitigate noise effects. Noise emissions from night time operation of such activities would likely be incompatible with the Rural Urban Fringe zone and noise exceeding that of the existing environment would likely be generated. We therefore consider it appropriate to impose a condition of consent on Lot 43 requiring a noise report be completed by an appropriately qualified and experienced acoustic engineer should the lot be used for container handling or other similar scale activities involving use of heavy machinery outdoors.

Other lots adjacent to Hasketts Rd (currently Lot 73 on the site plan) are smaller and less likely to contain activities involving larger machinery and container handling. Furthermore these lots will have a greater separation to existing residential dwellings (400+ m). For this reason we consider that site operators can be reasonably expected to operate in a manner that does generate noise above that of the existing daytime noise environment.

Given the more stringent District Plan noise limits and lower environmental noise during night time hours, there is a greater risk that activities on lots adjacent to Barters Rd exceed acceptable noise levels if operating during night time hours. Operators on these sites should consider the noise effects of their activities as part of their due diligence prior to starting operations, and can be expected to put in place reasonable managerial measures if operating at night. Should exceedances occur at or within properties on Barters Rd resulting in nuisance and complaint, operators should be able to retrospectively apply physical and managerial mitigations to reduce noise. We therefore do not consider a condition requiring a noise assessment to be necessary for these lots.

Lots on the northern edge of the development are directly adjacent to the Templeton Golf Club, which is zoned Open Space and subject to the same noise limits as the Rural Urban Fringe zone. As the Golf Club would not be occupied during night time hours, we consider it reasonable that noise from industrial lots be subject to the Open Space daytime limit during night time hours at the Golf Club. Furthermore, the areas of the Golf Club directly adjacent to the development would only be occupied for short periods of time by any individual, and is therefore less sensitive to noise. While the risk of industrial general activities on these sites exceeding District Plan daytime limits is low, marginal exceedances are unlikely to result in adverse effect. We therefore do not consider these lots require a noise report prior to establishing industrial activities.

Lastly, we note that the Rural Urban Fringe Zone and Industrial General Zone do directly adjoin, or indirectly adjoin across roads in other locations, and the CDP therefore anticipates and accepts such activities can locate in close proximity.

5.5 Noise Effects to 14 Hasketts Rd

14 Hasketts Rd is currently not part of the industrial development and is proposed to remain zoned Rural Urban Fridge. We have singled out this site for assessment over other sites in the Rural Urban Fringe zone because it will be directly adjacent to proposed industrial lots (not separated by a road and berm), adjacent to larger industrial lots and will be surrounded by industrial activities on three sides.

The site is owned by Pillaiyar Kovil Trust and is to be developed as a Hindu temple. This will place a sensitive activity (as per the Christchurch City Council definition) within an area used for industrial activities. Based on images of the proposed development on the Christchurch Hindu Temple & Hindu Culture Centre website, we expect there will be two buildings on the site, a temple and a culture centre (orientation unknown) plus car parking, outdoor gardens and a playground for children. We assume that the temple may be occupied during night time hours, but is not expected to be used for sleeping. We therefore consider the night time noise limits of 45 dB L_{Aeq} and 70 L_{Amax} of the Rural Urban Fringe zone to be less relevant to the proposed temple, which are predominantly to protect against sleep disturbance.

A reasonable and practicable mitigation to reduce noise from the industrial site to the temple is to construct an acoustic boundary fence around the entire boundary of 14 Hasketts Rd. We recommend that this be included as a condition of the development. We would expect such a fence to reduce noise transmission to 14 Hasketts Rd by up to 10 dB from smaller industrial activities (small vehicle movements, most mechanical plant/machinery and typical yard activities) and by up to 5 dB from larger industrial activities (for example large truck movements or container handling). With the boundary fence, permitted industrial activities could generate noise of 60-65 dB $L_{Aeq(15\ min)}$ at the boundary of their own sites while remaining at or below the daytime limit of 55 dB $L_{Aeq(15\ min)}$ within 14 Hasketts Rd. This is likely to be achieved with most smaller industrial activities without further physical or managerial mitigation.

14 Hasketts Rd is within the 55 dB L_{dn} air noise contour (exposure approximately 56 dB L_{dn}) and within the Ruapuna Inner Noise Boundary Overlay. Hasketts Rd, while an unclassified Rd, is expected to generate noise above the Rural Urban Fringe limit of 55 dB L_{Aeq} at the northwest boundary of the site (see Section 4.2). The site is therefore subject to an elevated noise environment. Based on the permitted activity levels of Ruapuna Park (see Section 4.2) and the setback from the Speedway (approximately 700-800 m) noise from permitted racing activities could be up to 65 dB $L_{Aeq(15\ min)}$ although this would only occur on 20 occasions per year. Based on the setback from the raceway (800-1200 m) noise from permitted racing activities could be up to 65 dB $L_{Aeq(15\ min)}$ on 120 occasions per year, up to 60 dB $L_{Aeq(15\ min)}$ on another 75 occasions per year and up to 55 dB $L_{Aeq(15\ min)}$ on another 140 occasions per year. In Section 4.1 we stated that we did not consider Ruapuna Park a significant noise source to residential dwellings with regards to assessing the effects of noise from future industrial activities. Noise from Ruapuna Park to be relevant to the noise effects at 14 Hasketts Rd as the proposed Hindu temple will be occupied by any individual for relatively short periods of time and not every day. Furthermore there is a reasonable likelihood that events will be held at the temple at times that coincide with events at Ruapuna Park generating elevated noise, for example on Friday and Saturday afternoons and evenings.

Extrapolating from measured data at 94 Barters Rd (see Section 4.2) and the air noise contours, we expect noise exposure during daytime hours at 14 Hasketts Rd could be 55-60 dB L_{Aeq} near the road boundary and 50-55 dB L_{Aeq} further into the site. (For aircraft noise, the day-night measure is not a true time-average (L_{Aeq}) as night-time noise generation is penalised by 10 dB, therefore resulting in day-night levels being numerically higher than 24 hour time-average levels for the same measurement.) Maximum noise events (primarily due to aircraft) is expected to be 70-75 dB L_{Amax} during night time hours and 75-80 dB L_{Amax} during daytime hours.

Finally, we understand based on feedback from NTP and the planner, that the Pillaiyar Kovil Trust are generally in favour of the industrial development proceeding, noting that it will provide inherent security from development of the surrounding area. For this reason, plus the reasons given above,it is likely that the temple would be tolerant to noise from industrial activities that meet the District Plan daytime limit of 55 dB L_{Aeq} during daytime and into night time hours, compared to the permitted limits of 55 dB L_{Aeq} during daytime hours and 45 dB L_{Aeq} during night time hours. Furthermore some exceedance of these levels (up to 60 dB $L_{Aeq(15\ mins)}$) may be less likely to cause compliant for the same reasons and because of the existing elevated noise environment. Maximum noise limits could reasonably be set at 75 dB L_{Amax} during daytime and night time hours due to the existing noise environment. We recommend a daytime and night time limit of 55 dB L_{Aeq} and 75 dB L_{Amax} be sought for noise from industrial sites to 14 Hasketts Rd, noting that comment from the Trust will be sought during the process of the application. We consider it likely that most general industrial activities will meet these noise levels with no or minimal mitigation, and that a condition requiring a noise assessment for lots adjacent to 14 Hasketts Rd is not required.

As 14 Hasketts Road sits entirely within the Ruapuna Inner Noise Boundary Overlay, it is subject to Rule 6.1.7.1.1 P2 to be a permitted activity, which requires that any buildings on the site shall be constructed to meet the indoor design sound levels of Rule 6.1.7.2.1, which is 40 dB $L_{Aeq(24\ hr)}$ to habitable spaces (we have not reproduced the full wording of the rule in this report). The rule is unclear exactly how this would be applied, however the worst case 24 hour noise exposure from Ruapuna Park is 65 dBA generated from 0900 h to 2000 h based on Rule 13.10.4.2.7, which would equate over a 24 hour period to 62 dB $L_{Aeq(24\ hr)}$. The level of acoustic insulation required to meet the District Plan rule should also provide sufficient protection against noise from industrial activities even with the proposed limits of 60 dB L_{Aeq} and 75 dB L_{Amax}.

6. Noise from Traffic Generation on Public Roads

6.1 Traffic Data and Predictions

To assess the effects of noise generation on public roads from traffic generation related to the proposed development, we consulted project traffic engineer Nick Fuller from Novo Group. He provided the following modelled traffic data courtesy of the QTP Traffic Modelling Report "Pound Road Rezoning Traffic Volumes for Noise Assessment – May 2025" (assessed using the CAST model as commonly acceptable to Council), supplemented by his own calculations of heavy vehicle percentage.

Notably, the model identifies points of traffic congestion and delay, with drivers being predicted to re-route to avoid congestion to generally optimise their travel times. As such, traffic volumes are not necessarily predicted to increase at all locations with the development traffic added to the network.

6.1.1 Current Road Traffic Volumes

Figure 6.1. Current average two-way weekday traffic volume estimates

For the data contained in the above figure the proportion of heavy vehicles are:

+ Pound Road: 11% (from a Council count in 2019)
+ Barters Road: 13% (from a Council count in 2018)
+ Hasketts Road: 10% (from a Council count in 2018)

6.1.2 Future 2038 Road Traffic Volumes, Without Development

Figure 6.2. Predicted 2038 average two-way weekday traffic volume estimates without development.

For the data contained in the above figure the proportion of heavy vehicles are (as per the base model):

+ Pound Road: 11% (from a Council count in 2019)
+ Barters Road: 13% (from a Council count in 2018)
+ Hasketts Road: 10% (from a Council count in 2018)

The above data forms the baseline for future road traffic noise commentary below.

6.1.3 Future 2038 Road Traffic Volumes, With Development

Figure 6.3 illustrates the predicted 2038 average daily traffic volumes with the proposed development traffic added to the road network.

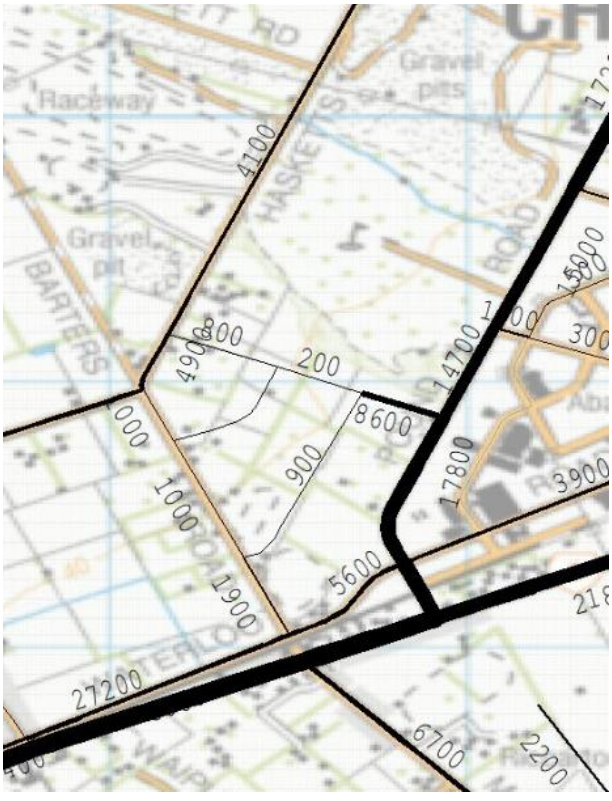


Figure 6.3. 2038 average two-way weekday traffic volume estimates with development.

For the data contained in the above figure (2038 with development) the proportion of heavy vehicles are as follows:

+ Pound Road (north of access): 11%
+ Pound Road (south of access): 10%
+ Barters Road: 11%
+ Hasketts Road: 10% (from a Council count in 2018 as no change with development)

6.2 Assessment

6.2.1 Current Road Traffic Noise Levels at Rural Dwellings

The expected daily average road traffic noise levels at rural dwellings along Barters Rd and Maddisons Rd, which are situated approximately 15-90 meters from the road edge and not located near any intersection, would likely range between 42 - 58 dB $L_{Aeq(24hr)}$ based on the calculated 24-hour time average noise levels in Table 4.2.

6.2.2 Predicted Future Road Traffic Noise Changes at Rural Dwellings on Pound Rd

If the proposed development goes ahead, there will be no residential dwellings on Pound Rd in the vicinity of the development, however there are dwellings further north on Pound Rd towards the intersection with Buchanans Rd.

With the development, traffic on Pound Rd north of the development is predicted to increase by 15%, with no change in the percentage of heavy vehicles, including during night time hours. Road traffic noise exposure to residential dwellings north of the development along Pound Rd due the development proceeding is calculated to increase by ~1dB, which will have a negligible effect.

6.2.3 Predicted Future Road Traffic Noise Changes at Rural Dwellings on Barters Rd

An access road to the industrial development is proposed to Barters Rd approximately adjacent to 41 Barters Rd. North of this intersection traffic volumes are predicted to decrease relative to current traffic levels and future traffic levels without development.

South of this intersection traffic is predicted to increase by 35% but with a decrease in percentage heavy vehicles. An additional three heavy vehicle movements can be expected during the peak night time traffic hour. Noise to 9, 15, 33 and 41 Barters Rd is calculated to increase by ~1-2 dB, which will have a negligible effect. We note that 9 and 15 Barters Rd do not currently have rural dwellings.

6.2.4 Predicted Future Road Traffic Noise Changes at Rural Dwellings on Hasketts Rd

Hasketts Rd north of the development is expected to see no change in traffic compared to future road traffic without the development, and no change in heavy vehicles. There are therefore no noise effects on properties further north on Hasketts Rd towards the intersection with Buchanans Rd resulting from the development.

6.2.5 Predicted Future Road Traffic Noise Changes at Rural Dwellings on Maddisons Rd

Maddisons Rd is expected to see traffic increase by 10% compared to future road traffic without the development. During the same time period, road traffic on Maddisons Rd is predicted to increase by 50% by 2038 regardless of whether the development proceeds, which will result in a 1-2 dB increase in noise exposure. Noise levels at residential properties is expected to increase by ~1 dB on top of this 1-2 dB increase due to the development, which will have a negligible effect.

6.2.6 Road Noise Mitigation

Increased maximum noise levels from accelerating/decelerating at the new intersections on Barters Rd *might* be reduced by constructing an intersection with a large radius, allowing heavy vehicles to take a swept path and accelerate/decelerate more gradually. We do not consider this mitigation a necessity with regards to noise effects being reasonable, and raise it for consideration only.

7. Airport Noise Effects on Industrial Activities

While industrial activities are not particularly noise sensitive, and are not noise sensitive based on the District Plan definition, consideration should be given to noise levels from a health and safety perspective, and establishing good indoor conditions for workers including undertaking office type work at the proposed development site.

The northwest portion of the site is within the 55 dB L_{dn} air noise contour as per the Christchurch District plan. As per rule 6.1.7.2.2 (refer to Section 2.4), spaces such as offices and conference rooms on lots within this contour will require an acoustic assessment to demonstrate that internal noise levels do not exceed the levels stipulated in the rule (40 – 50 dB L_{dn}). This will require façade elements to achieve an external to internal reduction of 5 – 15 dB $D_{ntw} + C_{tr}$, which is readily achievable with standard light weight constructions.

The establishment of industrial activities within the 55 dB L_{dn} air noise contour is appropriate and readily controlled with appropriate building constructions.

8. Construction Noise and Vibration

Construction, particularly at scale, requires the use of heavy equipment. Such equipment produces noise and vibration effects levels exceeding those typically experienced in established environments. Although this may mean the noise is undesirable, it is not necessarily unreasonable with all factors considered, and in the context of construction being temporary and a necessary contributor to societal progress.

NZS 6803:1999 *Acoustics - Construction Noise* is commonly referenced in District Plans and by consultants as a governing document for managing noise effects from construction activities. The standard recommends noise limits and provides guidance concerning methods for predicting and managing construction noise.

In Table 2 of the standard (Table 8.1 below), recommended limits are provided for noise received at dwellings in rural areas.

Table 8.1 (Table 2 NZS 6803). Recommended upper limits for construction noise received in residential zones and dwellings in rural areas.

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

As can be seen in Table 8.1, more lenient noise levels are recommended during core daytime periods (varying slightly from the day-time period in the District Plan or NZS 6802:2008 Acoustics – Environmental Noise). Evenings, night-times and Sundays – in grey – are given more protection with limits similar to those in District Plans and NZS 6802 for normal activities. It is worth noting that the above noise limits are at assessed at 1 m from a dwelling façade, not at the notional or legal boundary.

A similar table with less restrictive limits is included in NZS 6803 for noise at industrial or commercial activity locations.

Certainly the horizontal construction and likely the vertical construction will exceed six months and therefore need to meet the long-term duration limits in the table.

Construction tasks vary in equipment and are not always continuous resulting in stages where noise levels are close to limits for parts of the defined periods, and stages where noise levels are well below the limits. In this case with noise separation across Hasketts Rd and Barters Rd to the closest rural dwellings, and other dwellings being more remote, the majority of works can be expected to comply with the noise limits from NZS 6803.

In Section 16 of the Resource Management Act 1991, "*Every occupier of land … shall adopt the best practicable option to ensure that the emission of noise from that land … does not exceed a reasonable*

level." Under section 16, a national environmental standard, plan, or resource consent made may prescribe noise emission standards.

NZS 6803 anticipates that in some instances recommended limits cannot be met even where best practicable options for noise avoidance or mitigation have been investigated, and advises that these stages of works are identified to the relevant authority, in this case Christchurch City Council. This is so that scrutiny can be given and so that adequate notification can be given to the affected community.

Assessment of vibration is not required in the District Plan for general construction activities. At this stage, we would expect assessed vibration levels would not exceed cosmetic damage guidance limits with reference to DIN standards.

9. Summary and Proposed Conditions

Powell Fenwick has been engaged by Ngai Tahu Property Development Holdings Limited (NTP) to provide a noise assessment related to rural land on Pound Rd in Christchurch, proposed by NTP to be subdivided and used for industrial purposes. This noise report is expected to accompany the application to the Environmental Protection Agency under the Fast-track Approvals Act 2024..

The proposed development is located north of Templeton and is bordered by Pound Rd to the east, Barters Rd to the south, Hasketts Rd to the west and the Templeton Golf Club to the north. The site relates to approximately 60 hectares of land. 14 Hasketts Rd is excluded from the development. We understand that this property is owned by Pillaiyar Kovil Trust and has resource consent approval to construct a Hindu temple.

The purpose of this project is to deliver an industrial development which meets the specific demands for industrial growth in south-west Christchuch, providing for significant regional benefits. The development would be an extension of the larger Hornby Industrial area, which extends to the southeast of the proposed development. The site will be for use by any permitted activity per the Industrial General Zone of the Christchurch District Plan.

The most critical existing noise generating features within the surrounding area include road traffic noise from Pound Rd, Hasketts Rd, Barters Rd and Maddisons Rd, noise from aircraft approaching and departing Christchurch Airport, and occasional elevated noise from Ruapuna Park.

Rural dwellings on Barters Rd south of the development and on Maddisons Rd in the vicinity of the Maddisons Rd/Hasketts Rd/Barters Rd intersection are the existing noise sensitive activities most relevant to the assessment. For the reasons set out within our assessment, we do not consider any significant adverse effects to arise on these activities. We do not consider the Templeton Golf Club to be a noise sensitive receiver as it is not used for a sensitive activity as per the Christchurch District Plan definition. We have assessed noise to the Golf Club in this context. In conclusion, there are no adverse impacts that reach the threshold of a "sufficiently significant adverse impact" such that they need to be taken into account in terms of an assessment under s 85 of the Fast-track Approvals Act 2024.

Considerations related to noise that were investigated in this report are listed below, with summaries of the assessments bulleted underneath:

1. Noise generation from future operational activities within the industrial development to residential dwellings on rural sites excluding 14 Hasketts Rd.
    - Due to the orientation and size of Lots 44 to 55 and Lot 1, we consider it unlikely that industrial general activities on these lots would exceed District Plan rural noise limits at residential dwellings across Barters Rd.
    - Lot 43 is a larger lot that could potentially be used for noisier activities involving heavy machinery such as container handling. District Plan rural noise limits at residential dwellings may be exceeded without suitable physical and managerial mitigation.
    - Lots adjacent to the Templeton Golf club should be able to comply with daytime noise limits, with marginal exceedances unlikely to cause nuisance. As the Golf course is not expected to be occupied during night time hours, we do not consider the site sensitive to night time noise, which is the stricter 45 dB $L_{Aeq(15\ min)}$ limit.
    - It is our conclusion that there is no fundamental incompatibility establishing Industrial General zone activities (as defined in the application) within this rural environment.
2. Noise generation from future operational activities within the industrial development to 14 Hasketts Rd.
    - 14 Hasketts Rd is currently not part of the industrial development and is proposed to remain zoned Rural Urban Fringe. This site will be directly adjacent to proposed industrial lots (not separated by a road and berm), adjacent to larger industrial lots and will be surrounded by industrial activities on three sides.
    - The site is owned by Pillaiyar Kovil Trust and is proposed to be developed as a Hindu temple.
    - We assume that the temple may be occupied during night time hours, but is not expected to be used for sleeping. We therefore consider the night time noise limits of 45 dB L_{Aeq} and 70 L_{Amax} of the Rural Urban Fringe zone to be less relevant to the proposed temple, which are predominantly to protect against sleep disturbance.

- Noise from permitted industrial activities on adjacent lots that meet the District Plan daytime limit of 55 dB L_{Aeq} during daytime and into night time hours at 14 Hasketts Rd should be acceptable.
- 14 Hasketts Rd is exposed to noise from aircraft approaching and departing Christchurch airport, road traffic noise from Hasketts Rd, and frequent elevated noise from events at Ruapuna Park.
- A reasonable and practicable mitigation to reduce noise from the industrial site to the temple is to construct an acoustic boundary fence around the entire boundary of 14 Hasketts Rd.

3. Noise from traffic generation on nearby public roads associated with the development affecting people living in rural dwellings.
   - The expected daily average road traffic noise levels at rural dwellings on Barters Rd and Maddisons Rd would likely range between 42 - 58 dB $L_{Aeq(24hr)}$ at the rural dwellings.
   - Increases in traffic due to the development proceeding on Pound Rd, Hasketts Rd, Maddisons Rd and Barters Rd will result in an increase in road traffic noise exposure of less than 1 dB to up to 2 dB at rural dwellings.
   - Night time traffic volumes and the percentage of heavy vehicles is expected to be largely unchanged as a result of the development proceeding.
   - The noise effects on rural dwellings of marginal increases in future traffic on public roads should be negligible.
4. Reverse sensitivity effects related to establishing industrial activities within the aircraft noise contours.
   - As per rule 6.1.7.2.2 of the Christchurch District Plan, spaces such as offices and conference rooms on lots within the 55 dB L_{dn} contour will require an acoustic assessment to demonstrate that internal noise levels do not exceed the levels stipulated in the rule (40 – 50 dB L_{dn}), which is readily achievable with standard light weight constructions.
   - The establishment of industrial activities within the 55 dB L_{dn} air noise contour is appropriate and readily controlled with appropriate building constructions.
5. Construction noise effects on rural dwellings.
   - Construction, particularly at scale, requires the use of heavy equipment. Such equipment produces noise and vibration effects exceeding those typically experienced in established environments.
   - Construction management plans should include management of noise effects.

Based on the above assessments, the operation of industrial activities at the project site will result in minimal adverse noise effects on rural dwellings, which will not be significant nor out of proportion with the project's regional benefits as laid out by the planner. The potential outstanding risk sare controllable through appropriate conditions of consent.

Recommended conditions:

+ A 2.2 m high acoustic fence shall be erected along the boundaries of the development with 14 Hasketts Rd. The fence shall be constructed of with minimum surface mass of 10 kg/m^2 (20 mm timber palings or equivalent) and shall be constructed such that there are no gaps. Examples of a suitable construction area over lapping timber palings, timber board and batten or concrete block. The fence shall have no gaps to the ground.
+ Considering noise from industrial sites to 14 Hasketts Rd, the daytime limit of 55 dB $L_{Aeq(15\ min)}$ and a maximum noise limit of 75 dB L_{Amax} shall be adopted as the daytime and night time noise limit within 14 Hasketts Rd.
+ Considering noise from industrial sites to the Templeton Golf Club, the daytime limit of 55 dB $L_{Aeq(15\ min)}$ and no maximum noise limit shall be adopted as the daytime and night time noise limit within the Golf Club.
+ Should Lot 43 be used for container handling or other similar scale activities involving heavy machinery, a noise report be completed by an appropriately qualified and experienced acoustic engineer prior to activities commencing on the lot.

Appendix A.
Meteorological Data

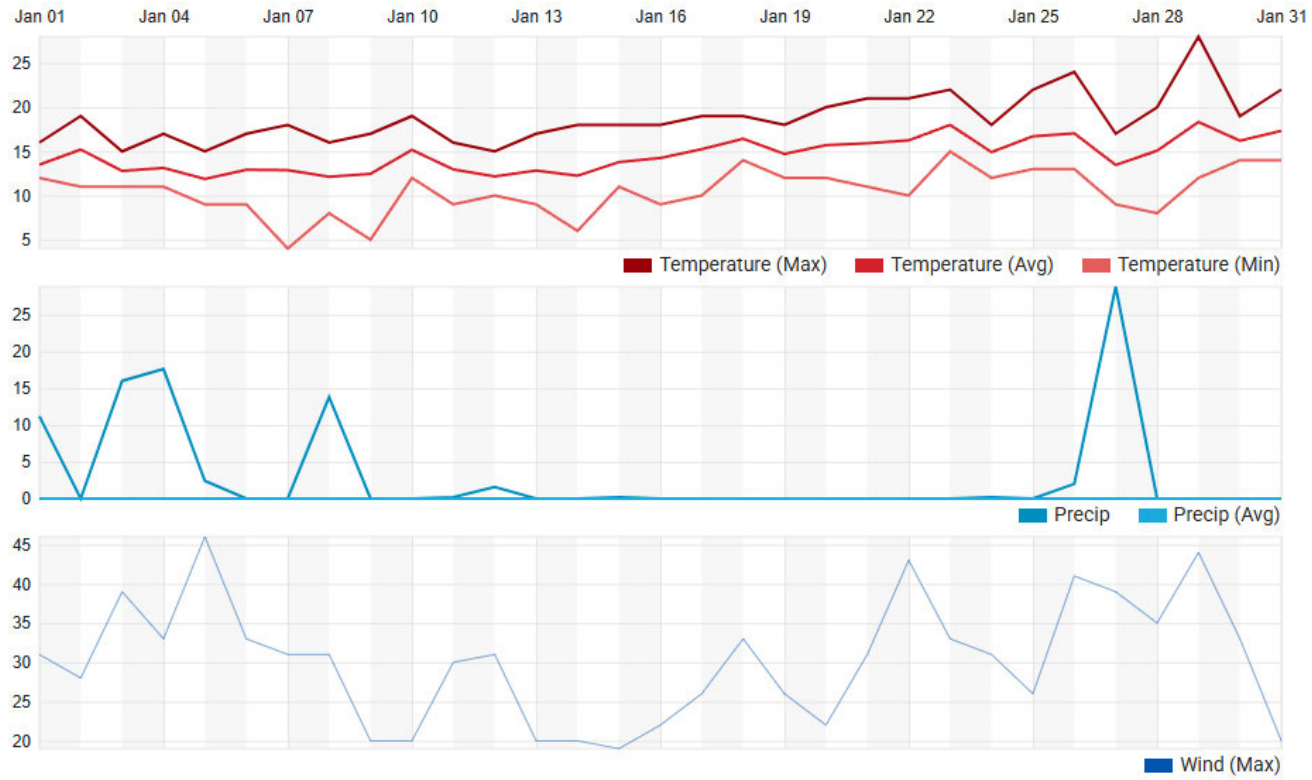
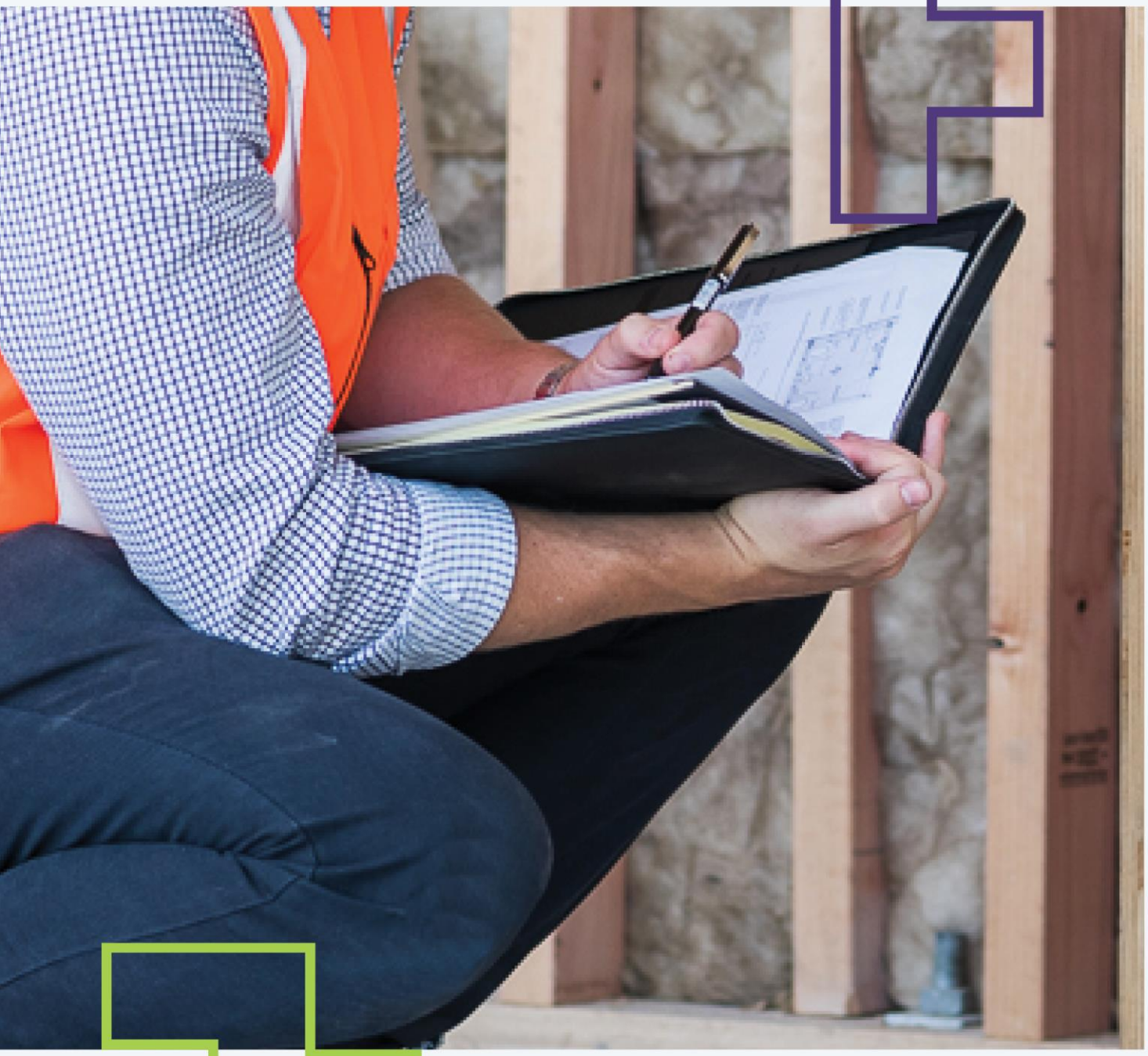


Figure A1: Meteorological data for January 2025 from the Christchurch weather station.

Appendix B.
Noise Measurements



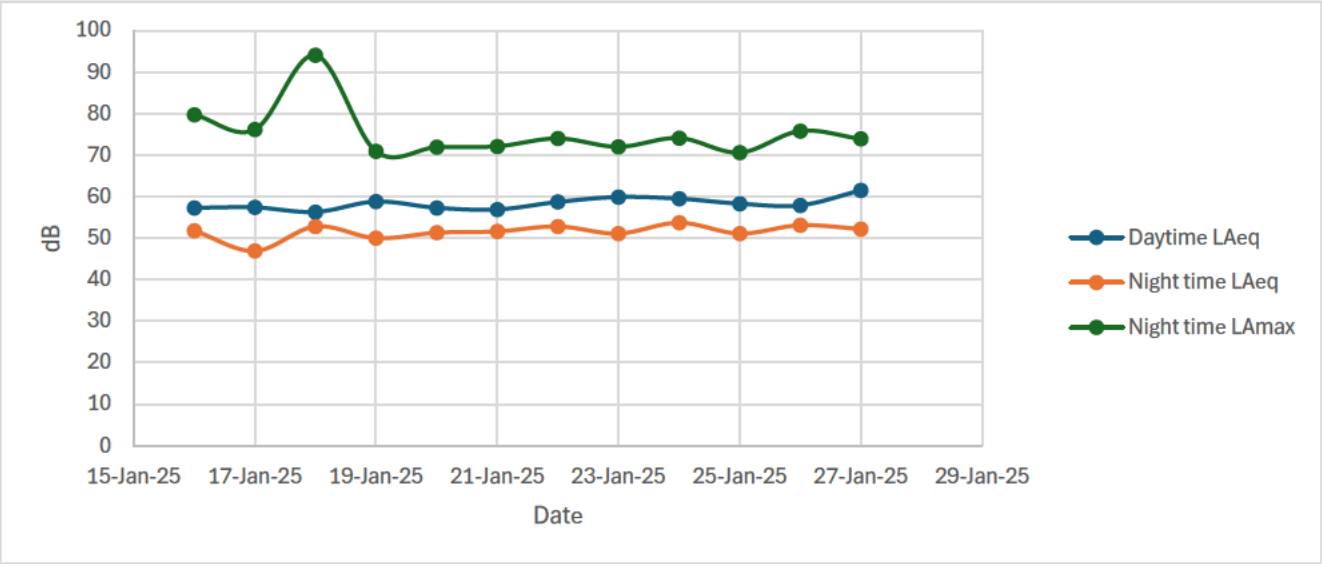


Figure B1: Daily time average and maximal noise levels at 94 Barters Rd

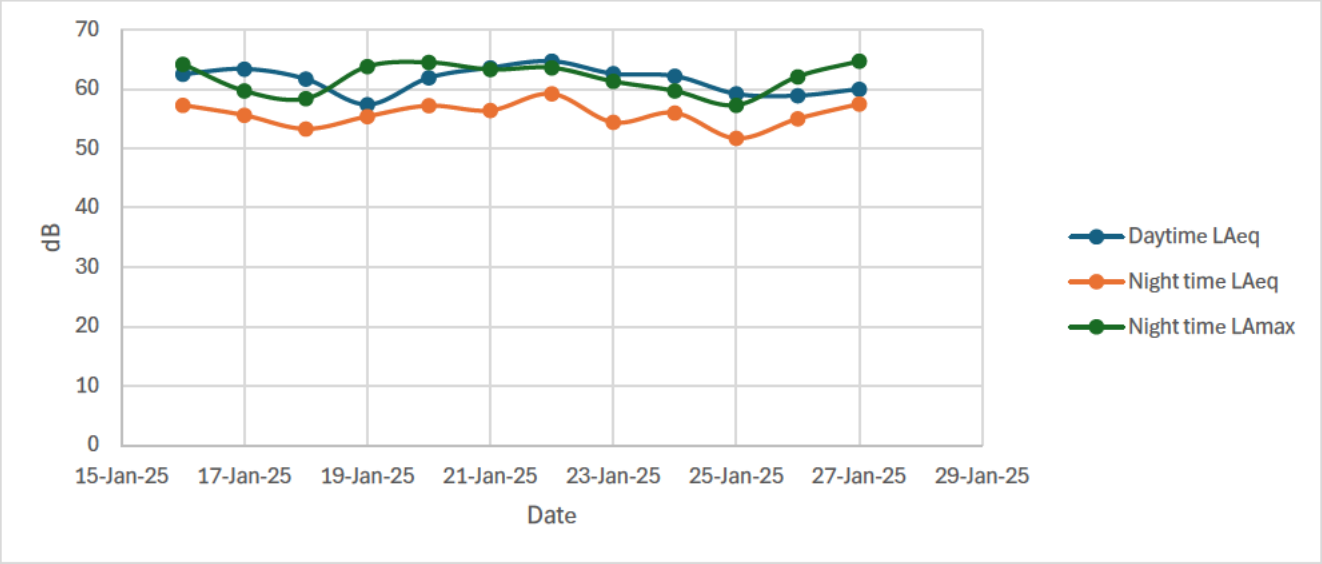


Figure B2: Daily time average and maximal noise levels at 173 Pound Rd

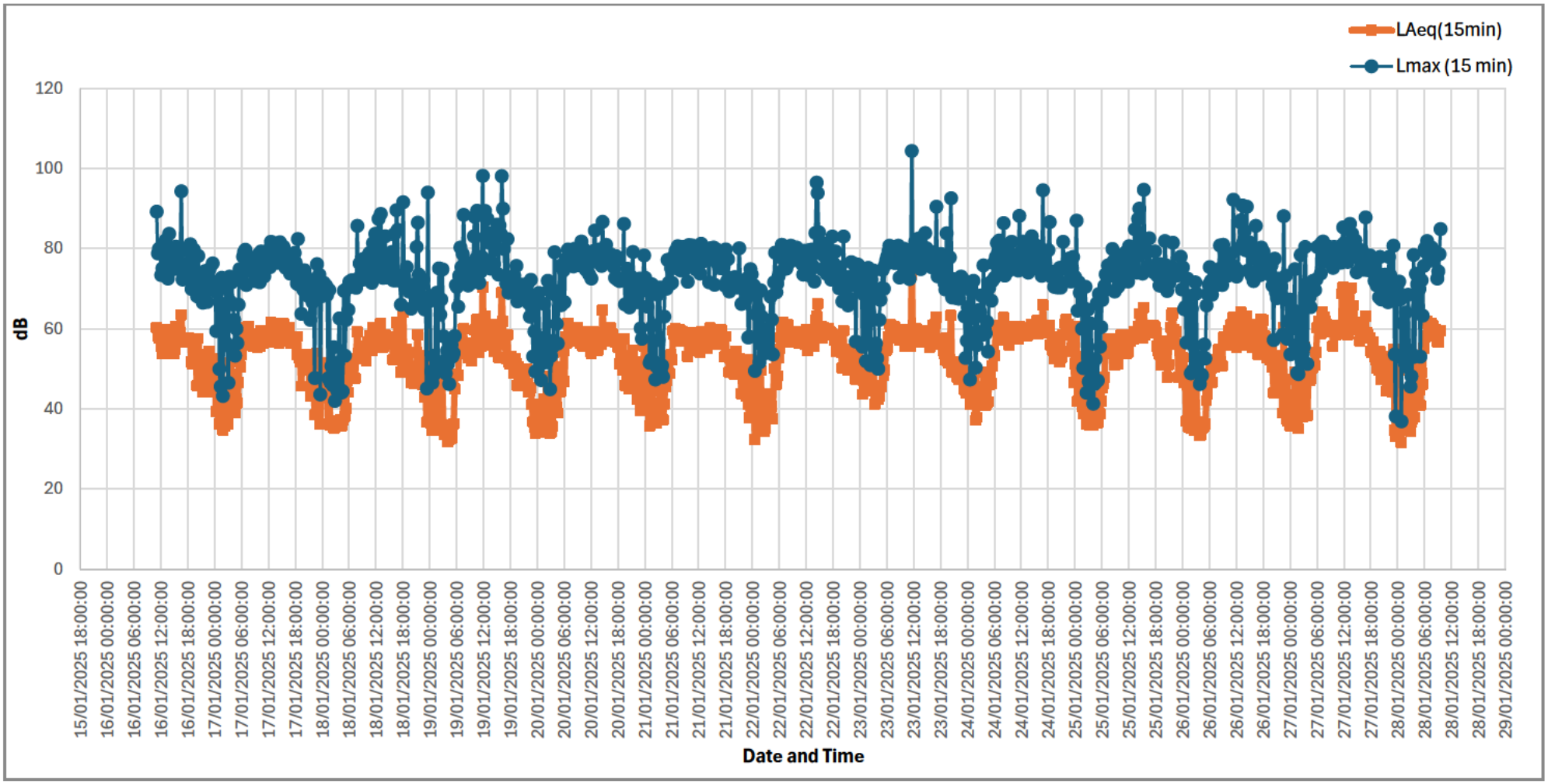


Figure B3: 15 minute time average noise levels over the entire measurement period at 94 Barters Rd

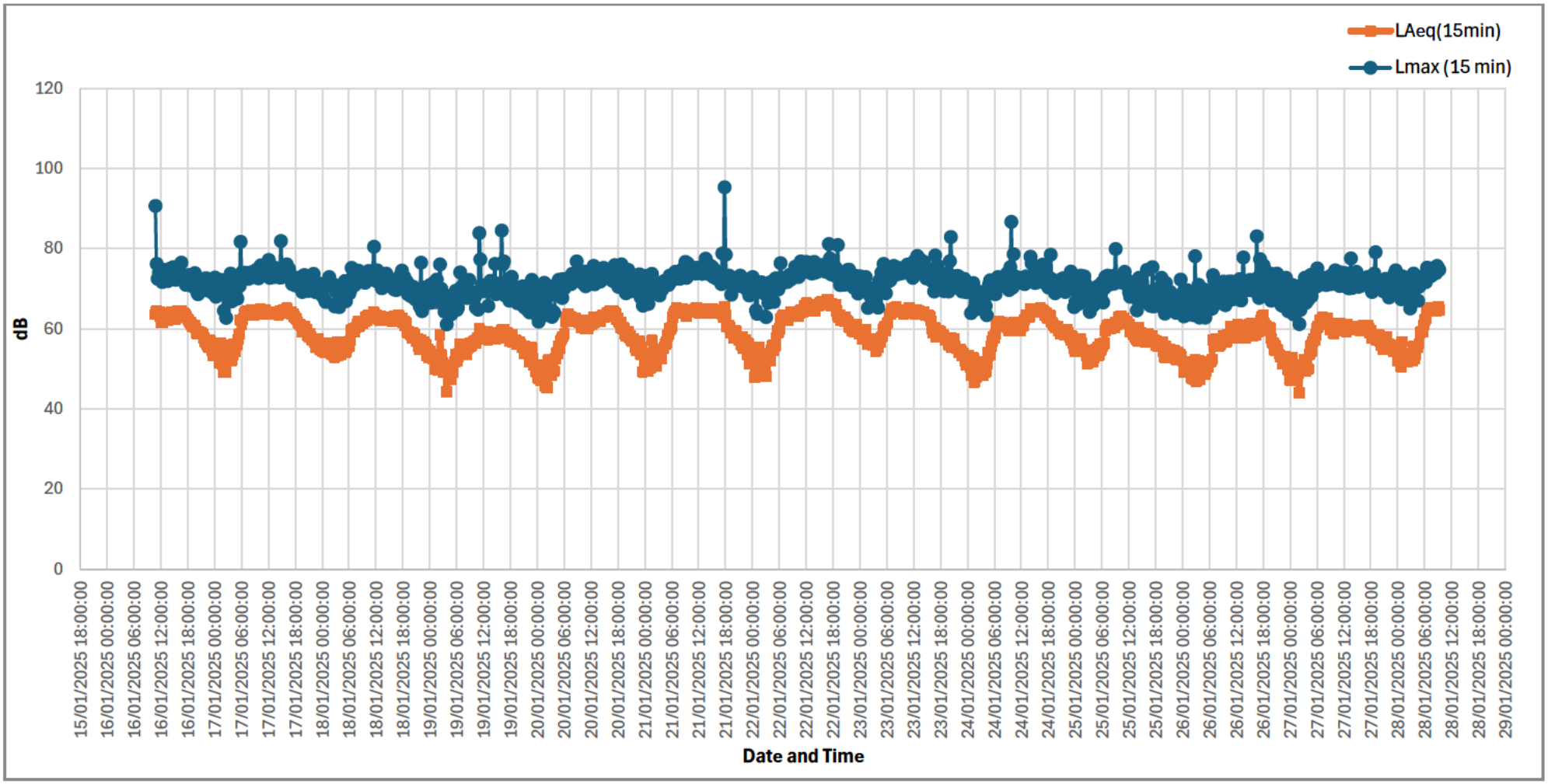


Figure B4: 15 minute time average noise levels over the entire measurement period at 173 Pound Rd

Powell Fenwick