DRAFT CNVMP

Draft Construction Noise and Vibration Management Plan (CNVMP) Arataki Road Project

Arataki Road Havelock North

dB0119058-FMR0422_V8-FT-CNVMP

Prepared for

CDL Land NZ Limited

CDL LAND
NEW ZEALAND LIMITED

DCIBEL LIMITED
Acoustic Consultants

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Document History

Version	Effective Date	Description of Revision	Prepared by	Comment
1-3	26 March 25	Working Draft	Internal Review	Drafts (V1-3.0)
3.1	28 March 25	Working Draft	Draft for Review	Draft 3.1
4.0	30 March 25	Draft review	Draft for FFT	Draft 4.0
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7.0	27 June 2025	Final Draft	Updated Draft (client rvw No 3)	Draft 7.0
8.0	16 July 2025	Final for FT	Final (draft) CNVMP for FT	Draft 8.0

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This CNVMP is a draft document. At the time of writing, the specific locations and scope of potential noise and vibration activities have not been fully determined. The CNVMP will be updated accordingly once final methodologies and plans are confirmed.

This CNVMP is based on information made available by the client to dB Limited. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this CNVMP, it is assumed that the information provided to Dcibel Limited from our client is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this CNVMP is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework.

This CNVMP should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Glossary of Acoustic Terms

Operational Sound Level	Sound associated with the activity being a composite of sounds from all sources.
Background Sound Level	The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted external ambient noise sources.
Decibel, dB	Unit of acoustic measurement. Measurements of power, pressure and intensity may be expressed in dB relative to standard reference levels.
$L_{Abg, T}$	The A-weighted background sound level measured over a time interval T.
$L_{Aeq, T}$	$L_{Aeq(t)}$ Time Average A-weighted Sound Level: Equivalent continuous A-weighted sound pressure level. This is the value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.
L_{AFmax}	L_{Amax} is the maximum A-weighted Sound Level: The A-weighted sound pressure level in decibels being 10 times the logarithm, to the base 10, of the ratio of the square of the maximum sound pressure, obtained with a standardised A-frequency weighting and a standardised exponential time weighting during a stated time period, to the square of the reference value. Unless otherwise stated the time weighting shall be F response.
NZS6801	NZS 6801: NZ Standard 'Measurement of Environmental Noise'
NZS6802	NZS 6802: NZ Standard 'Assessment of Environmental Noise'
Sound **Pressure** Level, L_p, dB, of a sound	A measurement directly obtained using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 microPascals.
Sound **Power** Level, Lw, dB of a source	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power level is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt.
Vibration	Vibration occurs when an object moves rapidly up and down or side to side.
PPV Peak Particle Velocity	Peak Particle Velocity is a measure of the vibration aptitude, zero to maximum. It is applied to assess building structural damage. Ground vibration can be measured in terms of Peak Particle Velocity (PPV) with units in mm/s or mm/s-1. The PPV refers to the movement within the ground of molecular particles and not surface movement. The displacement value in mm refers to the movement of particles at the surface (surface movement). PPV Measurements are made in 3-axis then the resultant PPV (peak particle velocity) is the vector sum (or worse case highest resultant or component PPV) i.e. the square root of the summed squares of the maximum velocities, regardless of when in the time history those occur. The axis measured for ppv are up-down (vertical), back-forth (longitudinal), side-side (horizontal). PPV is a standard metric for assessing construction vibration levels across many construction projects in NZ.
NZS6803	New Zealand Standard **NZS 6803:1999 Acoustics – Construction Noise**
DIN 4150	German Standard **DIN 4150-3:2016 Vibration in buildings – Part 3: Effects on structures**

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1 Application

By its very nature construction noise and related construction activities can be expected to be detectable in adjacent sites and some activities in the wider area, this does not necessarily mean the noise is unreasonable when all the relevant factors are taken into consideration including the physical and managerial controls set out in this Construction Noise and Vibration Management Plan (CNVMP).

Construction noise is an inevitable aspect of progress in any modern society. When temporary and of limited duration, communities are generally more tolerant of higher noise levels, provided it is well-managed, communicated clearly, kept to the necessary minimums, and restricted to appropriate controls.

This draft Construction Noise and Vibration Management Plan (CNVMP) has been prepared to provide an effective approach to managing potential noise and vibration effects. The primary objective of the CNVMP is to establish a framework for adopting best practise options (BPO) to avoid, remedy, or mitigate adverse effects on noise and vibration-sensitive receivers, as required under Section 16 BPO of the Resource Management Act 1991. The management of noise and vibration is required in accordance with this plan regardless of compliance with any recommended noise or vibration limits.

2 Introduction

This Construction Noise and Vibration Management Plan (CNVMP) forms part of the management (both managerial and physical) to ensure temporary construction noise and any vibration remains reasonable at all times for the project known as Arataki Road, a new residential lot development at the subject sites situated at No 86, 108 and 122 Arataki Road, Havelock North, Hastings District (**the construction site**). For this project it is recommended that:

- The guideline noise limits are the **long-term duration** noise limits set out in New Zealand Standard ***NZS 6803:1999 Acoustics – Construction Noise*** are adopted for construction noise (as referenced in the District Plan); and
- The guideline vibration limits for cosmetic building damage are the **long-term (continuous)** vibration limits set out in German Standard ***DIN 4150-3:2016 Vibration in buildings – Part 3: Effects on structures*** are adopted; and
- Standard construction hours between **7.30am to 6.00pm Monday to Saturday** with no construction work on Sundays or Public Holidays are adopted, unless otherwise agreed with any adjacent noise sensitive receiver.

This draft Plan must be updated once the final construction methodology is determined.

3 Contact Details

Role	Name	Organisation	Contact Number and Email
Project Manager			
Site Manager			
Noise Liaison Manager Teritary (1)			
Noise Liaison Manager Secondary (2)			
Acoustic Consultant			
Other:			

4 Objectives of Plan

4.1 Objective 1: Management of Noise and Vibration

The primary goal: to establish a clear and practical plan outlining methods for controlling and managing noise and vibration, ensuring compliance with the stated limits as far as practicable at all times at all locations on the construction site and at all times.

4.2 Objective 2: Consultation

To establish and adopt a formal community consultation procedure and protocols.

4.3 Objective 3: Adopt the Best Practical Option

To ensure that all individuals involved in construction activities, including contractors and subcontractors, consistently implement the best practicable option (BPO) to prevent noise and vibration emissions from exceeding a reasonable level, in accordance with Section 16 of the Resource Management Act (RMA). The RMA defines the best practicable option as:

"The best method for preventing or minimizing adverse environmental effects, considering, among other factors:
a. *The nature of the discharge or emission and the sensitivity of the receiving environment;*
b. *The financial implications and environmental effects of the option compared to alternatives; and*
c. *The current state of technical knowledge and the feasibility of successful implementation."*

Section 16 of the RMA imposes a general duty on land occupiers and all individuals conducting activities on-site to adopt the best practicable option to ensure that noise emissions remain at a reasonable level, regardless of compliance with any rule or recommended limit

4.4 Objective 4: Noise Monitoring and Complaints Procedures

Describe the noise monitoring measures and establish procedures and protocols for addressing complaints, ensuring all concerns are recorded, promptly addressed, and responded to efficiently to maintain compliance with the stated limits as far as practicable at all times.

4.5 Objective 5

Describe and list key personnel relating to the measurement and management of construction noise or vibration.

5 Project Description and Methodology

At the time of preparing this plan, no final methodology had been appointed, and therefore, detailed construction methodologies are not yet available. However, based on the nature of this project and the information currently available, the construction is expected to follow defined stages as summarised below.

Duration: The project is expected to **start** construction on October 2025 and **end** construction in April 2027.
This is an expected construction period of 1 year and 6 months (long duration according to NZS6803:1999 – greater than 20 weeks).

Scale: Temporary construction noise from the site will be typical of residential developments across New Zealand. However, depending on the final staging and timing of the project, could be on a larger scale. It is understood that works will be taken across the site simulations. Temporary Construction Vibration is a subset of construction works. The proposed development will involve temporary construction-related vibration—including (but not limited to) site preparation, roading and earthworks.

Method: We have carried out our assessment methodology of the typical noise and vibration emissions by:

1. Adopting methodologies that have been used on similar projects; and
2. Assuming works will be carried out up to the site boundary (unless otherwise stated); and
3. Noise and vibration levels with mitigation in place as per this CNVMP (unless otherwise stated) with focus on adjacent sites noted below resolution for expected noise received at adjacent sites.

Expected Staging: The proposed development will involve temporary construction-related noise—including (but not limited to)

- Site enabling, preparation, roading, earthworks and construction of each dwelling and adjacent area.

The following is stages and related work is expected:

1. **Site Enabling and preparation works**

Initial preparatory activities must be carried out before the main construction begins. These works ensure the site is safe, accessible, and ready for construction. They typically may include site clearance, temporary access roads, fencing, temporary services, erosion and sediment controls, flood prevention, temporary structures and health & safety measures.

2. **Earthworks**

Construction earthworks may involve the excavation, movement, retaining and compaction of soil, rock, and other materials to create a stable foundation for a structure or infrastructure project. The key activities involved in earthworks include where needed excavation, cutting and fill, grade and levelling, soil compaction and structures.

3. **Roading and civil works**

Construction for residential subdivisions of this nature and scale will require with roading and civil works involves transforming raw land into a fully serviced residential area with roads, utilities, and infrastructure to support housing development itself. There is also civil works required for community or civic areas.

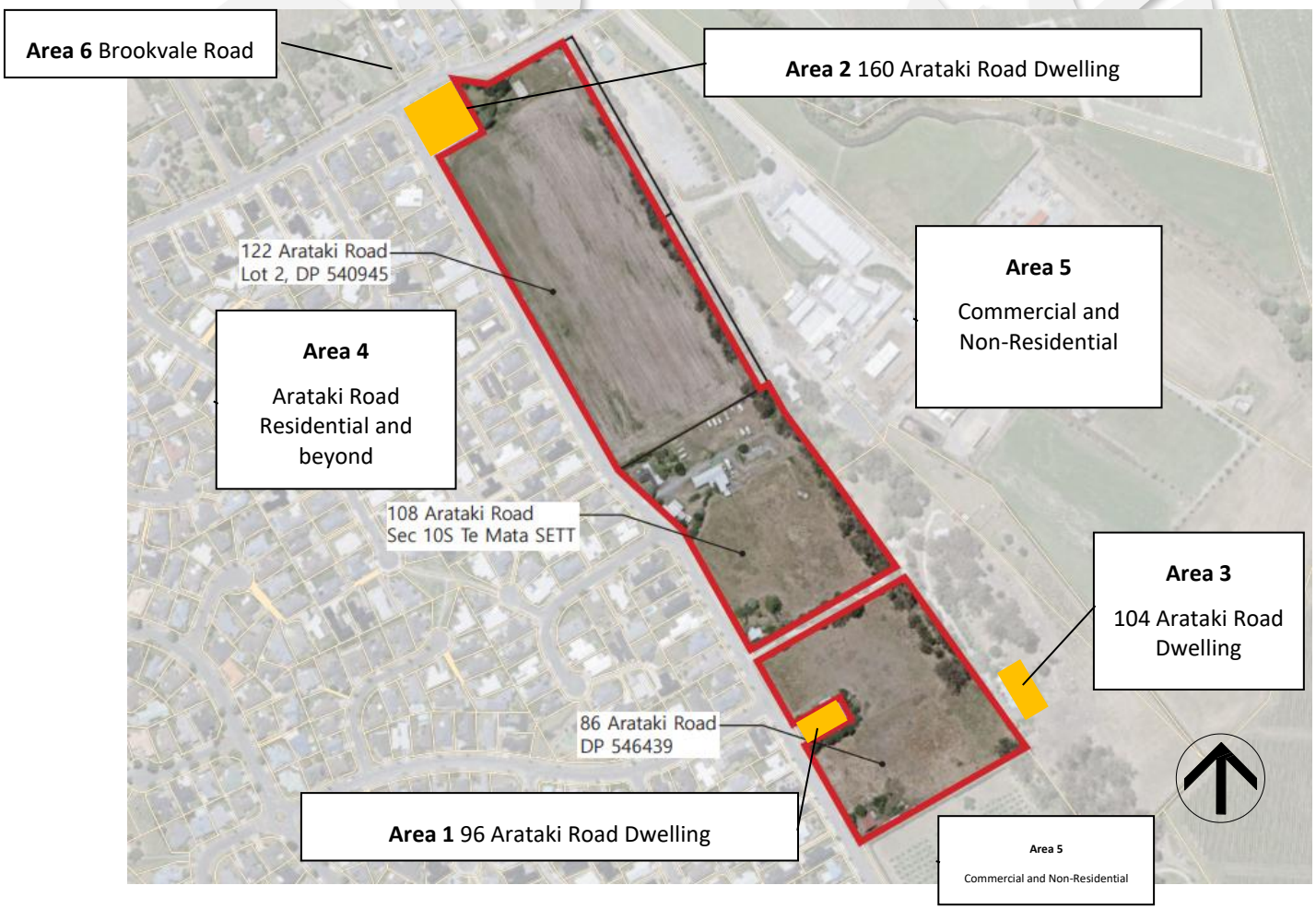
4. **Construction of dwellings**

Construction of the actual dwellings will involve localised site works, slab works, structural framing and roof installation, building water proofing and exterior cladding and windows generally followed by fit out of wall linings, bathrooms, kitchen, landscape etc

6 Subject Site and Surrounds

The project has been divided into six key receiver areas, there are a mix of residential receivers in relatively close proximity to the project site, as well as non residential sites such as adjacent commercial receivers. The following aerial indicates Area 1 to Area 6.

6.1 Surrounding Site and Area



6.2 Noise Sensitive Receiver Sites and Adjacent Areas

Area 1 to Area 6 are described as follows:

- **Area 1**
  96 Arataki Road (single level dwelling). Site and dwelling are at same general ground level as the construction site.
  - The closest point from the façade of the dwelling to the construction site boundary is approximately **3m**

- **Area 2**
  160 Arataki Road (single level dwelling). Site and dwelling are at same general ground level as the construction site
  - The closest point from the façade of the dwelling to the construction site boundary is approximately **12m**

- **Area 3**
  104 Arataki Road (single level dwelling). Site and dwelling are at similar ground level as the construction site
  - The closest point from the façade of the dwelling to the construction site boundary is approximately **8m**

- **Area 4**
  Residential sites located along Arataki Road interface across from the construction site
  - The distance between the construction site boundary and façades in Arataki Street is approximately **20 to 25m**

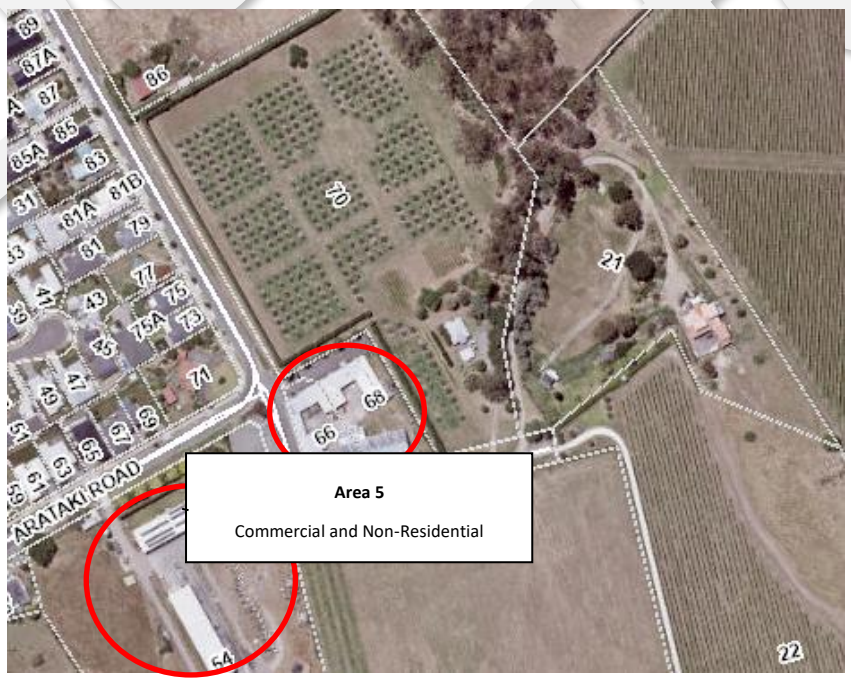
- **Area 5 – Commerical and Non Residentail**

  All sites including commerial sites and non residential sites (rural areas)

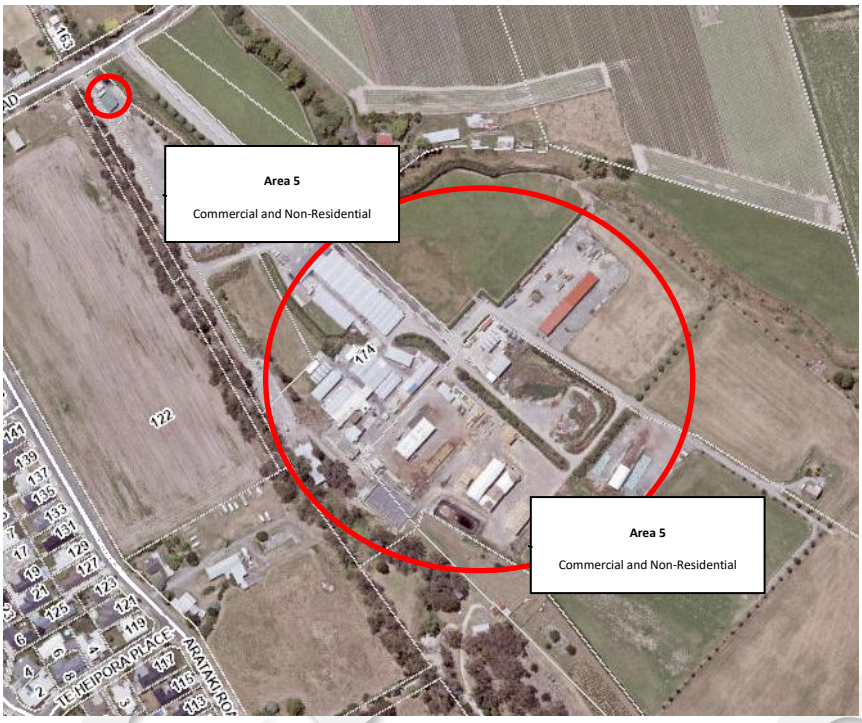
  - *The Grove:* The distance between the construction site boundary and Grove building site buildings is over **150m**

    N.B No 21 Arataki Road (residential site) is at sufficient distance from the site for anticipated compliance with the recommended noise and vibration limits when the methods in the CNVMP are adhered to

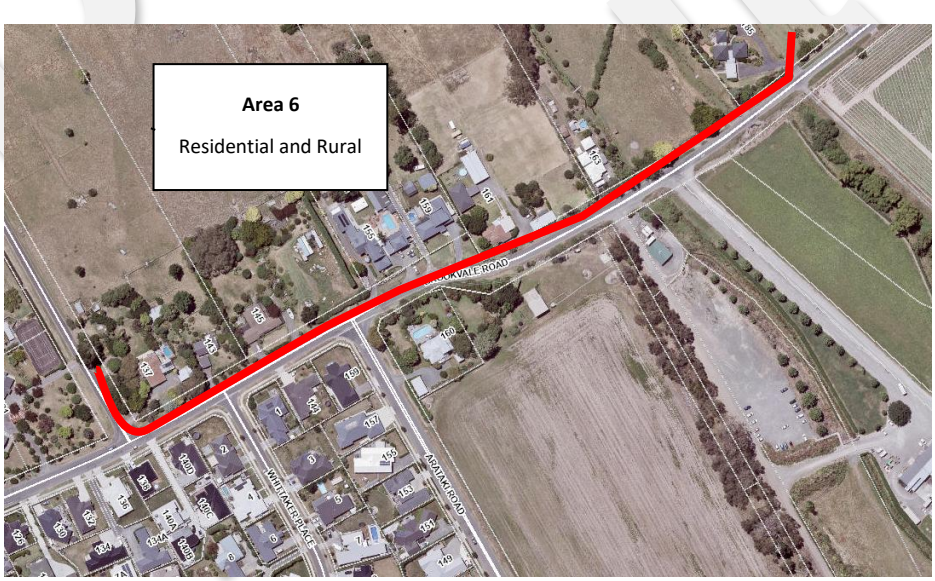
  - *Arataki Honey:* The distance between the construction site boundary and Arataki Honey site buildings is over **150m**



- *Business Park:* The distance between the construction site boundary and business park site buildings is between approximately **10m and 40m**



- **Area 6 – Residentail and Rural**
  All residential and rural sites located adjacent located along Brookvale Road
  - The distance between the construction site boundary and dwelling façades in Brookvale Street is approximately **25 to 30m**



7 Construction Noise Rules and Associated Standards

7.1 Hastings District Plan Construction Noise Rule 25.1.6L

25.1.6I CONSTRUCTION NOISE

(a) Any noise arising from construction, maintenance and demolition work in any Zone shall comply with NZS6803:1999 Acoustics - Construction Noise.

(b) Construction noise shall be measured and assessed in accordance with NZS6803:1999 Acoustics - Construction Noise.

(c) To avoid doubt, Standards 25.1.6C to 25.1.6H above shall not apply to construction noise.

7.2 New Zealand Standard NZS6803:1999 Acoustics Construction Noise

NZS 6803:1999 Acoustics – Construction Noise outlines procedures for measuring and assessing noise from construction activities. NZS 6803 includes guideline noise limits for short, typical and long-term duration construction works. The long-term duration limits are shown in below for residential and commercial receivers.

These noise limits provide for the reasonable protection of health and amenity inside a building. Based on construction works occurring during typical hours for long term project the following recommended upper levels are set by the standard (assessed at 1m from any occupied dwelling or commercial building):

- **70 dB L_{Aeq}** between 7:30am to 6:00pm Monday to Saturday for noise sensitive receivers, e.g. **occupied dwellings** (refer Table 1 of NZS6803)
- **85 dB L_{AFmax}** between 7:30am to 6:00pm Monday to Saturday for noise sensitive receivers, e.g. **occupied dwellings** (refer Table 1 of NZS6803)
- **70 dB L_{Aeq}** between 7:30am to 6:00pm all days of the week for noise sensitive receivers, e.g. **occupied commercial** or industrial site building (refer Table 2 of NZS6803). There is no Lmax limits set for commerical or industrial under 6803.

These recommended noise limits provide for Table 2 (residential) and table 3 (commercial and industrial) of NZS 6803:1999 *Acoustics – Construction Noise*, summarised as follows:

Long-Term duration Table 2 NZS6803: 1999

Recommended Residential Noise Limits

Time of Week	Time Period	L_{eq}	L_{max}
Weekdays	0630-0730	55	75
	0730-1800	**70**	**85**
	1800-2000	65	80
	0630-0730	45	75
		L_{eq}	L_{max}
Saturdays	0630-0730	45	75
	0730-1800	**70**	**85**
	1800-2000	45	75
	0630-0730	45	75

		L_{eq}	L_{max}
Sundays and Public Holidays	0630-0730	45	75
	0730-1800	55	85
	1800-2000	45	75
	0630-0730	45	75

Long-Term duration Table 3 NZS6803

Recommended Commercial and Industrial Noise Limits

	Time Period	L_{eq}
All Days of the Year	0730-1800	**70**
	1800-0730	75

8 Vibration

There are two main types of vibration "effects" that relates to **Damage of Structure (Building Structures) -**We recommend the adoption of ***DIN 4150-3:2016 "Structural vibration – Part 3: Effects of vibration on structures. AND*** **Human Amenity and Perception**

We can adopt standards such as ***BS 5228-2:2009 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (BS 5228-2)*** to assess effects from perception.

A primary goal of controlling any construction vibration is to prevent damage to nearby buildings, structures, and services. For most construction activities, any adverse effects on human comfort are typically short-lived. It is important to note that the vibration levels perceived by humans—and those that may cause annoyance—are significantly lower than the levels required to cause structural damage. As a result, even when vibration levels comply with building damage criteria, this may still lead to concern or discomfort among occupants who could mistakenly believe their building is being harmed. This is why education and communication with stakeholders prior to any works that may generate cross boundary vibration is critical.

Hastings District Plan Construction Noise Rule 25.1.6B

Ther District Pla under Rule 25.1.6B 'Exemptions for Maximum Noise Limits' states **"***The **Act defines 'noise' as including vibration**. Section 16 of the Resource Management Act 1991 refers to the adoption of best practicable option to ensure that the emission of noise from land or water does not exceed a reasonable level, while Part XII relates to excessive noise"*.

8.1 German Standard DIN 4150-3:2016 Vibration in buildings – Part 3: Effects on Structures

The District Plan sets no vibration standards, but as noted above requires adoption of the BPO. Importantly the RMA defines noise and including vibration. A main vibration concern of building owners and occupants is usually building damage, but they may feel vibration at levels much lower than those that would cause damage. The German Standard ***DIN 4150-3:2016 "Vibration in buildings – Part 3: Effects on structures"*** is used widely throughout New Zealand to assess cosmetic damage resulting from vibration and the vibration standard recommended for this project. DIN4150 is adopted across various plans.

DIN 4150-3 limits are set for avoiding cosmetic and structural building damage, such as cracking in paint or plasterwork. Cosmetic building damage effects are deemed 'minor damage' in the Standard and can generally be easily repaired. The Standard states: "*Experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur*." Much higher vibration levels (i.e. an order of magnitude higher) would be needed for potential structural damage.

The Standard defines recommended vibration limits as short or long term. Short-term (transient) vibration is "***vibration which does not occur often enough to cause structural fatigue and which does not produce resonance in the structure being evaluated***". Long-term (continuous) vibration includes types not covered by the short-term vibration definition.

The guideline vibration limits for avoiding cosmetic building damage, such as cracking in paint or plasterwork for both the long-term (continuous) and short term (transient) vibration limits set out in German Standard ***DIN 4150-3:2016 Vibration in buildings – Part 3: Effects on structures*** (assessed at the horizontal plane for the highest floor) as summarised as follows:

Structure type	Peak particle velocity vibration level (mm/s) ppv	
	Short term (transient)	Long-term (continuous)
Line 1. Commercial or industrial buildings	40	**10**
Line 2. Residential buildings	15	**5**
Line 3. Historic or sensitive structures	8*	2.5*

* DIN 4150 states that sensitive or heritage structure limits should be used for buildings ***"that, because of their particular sensitivity to vibration, cannot be classified under Lines 1 and 2 and are of great intrinsic value (e.g. listed building)". Decibel Limited*** are not aware of any sensitive or heritage listed buildings within the vicinity of the Project location.

Based on the information supplied at the time of preparing this draft CNVMP and expected nature and scale of works described the **long term (continuous) limits** from ***DIN 4150-3:2016 Vibration in buildings – Part 3: Effects on structures*** are recommended for adoption by this Plan. The recommended noise limits provide from ***DIN 4150-3:2016 Vibration in buildings – Part 3: Effects on structures*** (assessed at the horizontal plane for the highest floor, summarised as follows:

Long Term (continous)

- **5 mms ppv** for residential receivers
- **10 mms ppv** for commerical or industrial receivers

Where any predicted vibration levels are above the DIN values, management of vibration activities will be required and mitigation implemented to reduce the impacts. In addition to the avoidance of building damage, construction vibration can be perceived at a much lower level.

9 Construction Noise Levels and Sample Setbacks

The table below presents indicative sound pressure levels received at the building façade based on setback distance, aiming to meet the recommended upper limit of 70 dB L_{Aeq} as specified in *NZS 6803:1999 Acoustics – Construction Noise*. The results in the table assume **no mitigation measures or screening** from buildings or barriers (worse case) and are calculated in accordance with Section 3.0 of *NZS 6803:1999*, including allowance for a +3 dB façade reflection (as per the standards recommendation).

The source sound power levels are sourced from the ***British Standard BS 5228-1:2009 "Code of practice for noise and vibration control on construction and open sites, Part 1: Noise***, and from measurements of similar equipment, carried out by **Dcibel Limited**, the higher level of the two has been adopted to provide a conservative approach.

Plant	Sound Power (at *source*)	10m	20m	30m	40m	50m
Excavator (20t)	104 dB	79 dB	73 dB	69 dB	67 dB	65 dB
Excavator (12t)	101 dB	76 dB	70 dB	66 dB	64 dB	62 dB
Dozer	114 dB	89 dB	83 dB	79 dB	77 dB	75 dB
Scraper	110 dB	85 dB	79 dB	75 dB	73 dB	71 dB
Compactor	110 dB	85 dB	79 dB	75 dB	73 dB	71 dB
Articulated Dump Truck	108 dB	83 dB	77 dB	73 dB	71 dB	69 dB
Road Truck	97 dB	72 dB	66 dB	62 dB	60 dB	58 dB
Water Cart	102 dB	77 dB	71 dB	67 dB	65 dB	63 dB
Loader	103 dB	78 dB	72 dB	68 dB	66 dB	64 dB

Roller	110 dB	85 dB	79 dB	75 dB	73 dB	71 dB
Grader	109 dB	84 dB	78 dB	74 dB	72 dB	70 dB
Concrete Truck with pump	108 dB	83 dB	77 dB	73 dB	71 dB	69 dB
Hand tools	101 dB	76 dB	70 dB	66 dB	64 dB	62 dB
Hand tool grinder	108 dB	83 dB	77 dB	73 dB	71 dB	69 dB
Compressor	93 dB	68 dB	62 dB	58 dB	56 dB	54 dB

Note that predicted noise levels could, at times, be higher than the noise limits of NZS 6803:1999. This is not unusual for these types of construction works and levels may not be deemed unreasonable when this CNVMP management methods are adopted. Construction noise is generally measured over 15 minutes and up to 60 minutes under the Standard.

9.1 Internal Sound Pressure Levels

The sound level received inside any adjacent sites such as residential dwellings will depend on the a host of factors including buffer distances and external noise level, the building's façade (particularly the glazing and if there are openable windows) and the acoustics of the space itself. Based on our knowledge of the adjacent residential receivers being modern light weight buildings a outside-to-inside façade reductions of 30 dB could be expected. If the windows were open an outside-to-inside façade reductions of 15 dB could be expected.

10 Vibration Levels vs Sample Setbacks

The table below presents predicted vibration levels (as ppv mms/) at building foundations within close proximity to activities for expected equipment to be used on site.

Plant	Set back Distance to achieve 5mm/s ppv (Residential)	Set back Distance to achieve 10mm/s ppv (Commercial)
Roller (5t vibro functions)	6m	3m
Plate Compactors (500kg)	6m	3m

10.1 Human Perception and Amenity

The District Plan has no vibration standards for the **effects** on human exposure within buildings, however, it is accepted practice to apply the guidance from ***BS 5228-2:2009 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (BS 5228-2). BS 5228-2:2009*** addresses the "*disturbing effect of vibration*" from construction vibration and acknowledges that even very low levels can be perceptible by people and can cause anxiety, annoyance, and disturbance of sleep, work, and leisure activities.

The following table provides guideance of Vibration Effects ***BS 5228-2:2009*** **vibration level and degree of human perception for continuous vibration**

Vibration Level (PPV mm/s)	Degree of Human Perception (8 Hz to 80 Hz range)
0.14 mm/s	Vibration might be perception in the most sensitive situations for most vibration frequencies associated with construction, at lower frequencies people are less sensitive to vibration
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration at this level in a residential environment will cause complaints but can be tolerated if prior warning and explanation have been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a brief exposure to this level in most building environment

11 Site Wide Noise Control Methods (Noise Management)

The following noise control measures are recommended to be adopted as far as practical at all times across the site in order to manage and mitigate noise or vibration effects off site:

11.1 Noise Liaison Person and Responsibility

The Consent Holder is ultimately responsible for all nosie management at the site, at all times, this includes noise and vibration. The consent holder must elect a Noise Liaison Manager (NLM). The Noise Liaison Manager position is a key role, and its purpose is to oversee all noise emissions and any vibration, at all times, as well as deal with any complaints for noise from the public or communications with Council or other stakeholders. If the NLP is not on site, then a 'duty' NLP shall be elected for the time the Noise Liaison Manager is off site. Accordingly, it is recommended:

- The Consent Holder must ensure there is an elected Noise Liaison Manager or duty Noise Liaison Person for the site at all times; and the Noise Liaison Manager or elected Noise Liaison Person must ensure all stake holders (contractors, subcontractors etc) follow all noise and vibration control measures set out in this CNVMP, as far as practical, for the perpetuity of the construction works and at all times.

11.2 General Operations and Inductions

- The Consent Holder and Noise Liaison Manager must ensure that all staff comply with this CNVMP as well as ensure they adopt the best practical option approach to manage noise from their activity in accordance with section 16 of the Resource Management Act.
- The Consent Holder and Noise Liaison Manager must ensure all staff must participate in an induction training session before starting work on the construction, with attention given to the following matters:
  - Activities with the potential to generate high levels noise and/or vibration; and
  - Required mitigation and management measures required under this plan; and
  - Identification and location of noise sensitive receivers (Areas 1 to 5) and any agreements made through engagement.

For clarity where this CNVMP refers to '**all staff'** this applies to and includes any contractors, sub-contractors, visitors and any related third-party. Where required any contacts and agreements should make requirements under the CNVMP clear.

11.3 Operational Noise Management Plan/Policy

- The Consent Holder and Noise Liaison Manager must ensure as a key tool for day-to-day training and on boarding to the new all staff and any stakeholders review this plan. Where any changes are made to the plan the required stakeholders must be advised and review any plan updates.

11.4 Operating Hours and Operating Days

- The Consent Holder and Noise Liaison Manager must ensure the hours of operation for construction activity will be between **7.30am to 6.00pm Monday to Saturday only.**
  - For clarity arrival to site for example may occur before 7.30am. Any 7.30am works mut be limited activity prior such as quiet arrival, and related quiet activity only. All staff should be extra vigilant during this early morning.

11.5 Scheduling

- The Consent Holder and Noise Liaison Manager must ensure, as far as practical, high-noise and vibration-intensive works will be planned to minimize disruption (scheduling is a crucial management tool, especially when a receiver raises concerns about construction activities at specific times of the day).
- The Consent Holder and Noise Liaison Manager must ensure, as far as practical, that activities are scheduled during periods when nearby sensitive receiver buildings are unoccupied, as this is the most effective way to avoid impacts, if high impact activities are undertaken during periods of occupation notification should be provided prior notifications.

11.6 Plant and Equipment Selection

- The Consent Holder and Noise Liaison Manager must ensure, all staff, as far as practical, when selecting equipment that:
  - Quieter construction methodologies and methods are adopted where practicable; and
  - Adopt the use of electric motors as opposed to combustion or diesel engines where practicable; and
  - Adopt the use of equipment that is suitably sized and specified for the task; and
  - Avoid tonal reversing or warning alarms (beepers). Alternatives include broadband alarms (squawkers/quackers), flashing lights, proximity sensors, reversing cameras and spotters; and
  - Take all reasonable steps to managed noise such as adopt the use of rubber tracked equipment rather than steel tracked equipment or fit plant with exhaust silencers and engine covers where practicable.

11.7 Construction Vehicles on Public Roads

- The Consent Holder and Noise Liaison Manager must ensure any vehicles waiting to enter site prior to 7.30am do not produce any unreasonable noise on neighbouring sites and that all operators follow best practise such as turning engines off and not slamming doors or talking loudly. Noise produced by vehicles on a public road is subject by control over vehicle operating rules administered by the NZTA. No noise limits are specified. However, noise effects are expected to be reasonable when drivers follow the road rules and the roads are kept in a suitable condition by the roading operators (NZTA and Council) i.e., free from pothole, ruts or undulations.

11.8 Traffic Speed on Site

- The Consent Holder and Noise Liaison Manager must ensure, as far as practical, all traffic operations move at a very slow speed while on site i.e. where possible no more than 30 km/hr for light vehicles and as slow as practical for heavy vehicles.
- The Consent Holder and Noise Liaison Manager must ensure all staff are verbally advised of required speed limits and if required install suitable signage at the entry to the site to remind staff of requirements to drive at safe slow speeds.

11.9 Site Surfaces and Internal Roads

- The Consent Holder and Noise Liaison Manager must ensure, as far as practical, the yard, set down, internal roadways are all kept in good order and as such this means the ground surface is flat and graded, as far as practical so that the site surface where any vehicle or plant may drive is free from any large undulations or holes i.e., potholes, ruts or undulations.

It is critical to ensure trucks and loads or any trailers avoid unreasonable impact sounds such as metal on metal for example and impact sounds of trailers or loads banging. The Consent Holder and Noise Liaison Manager must ensure:

- Any vehicles driving on or off site do so in a manner that ensures that loads or trailers do not impact and make unreasonable sounds from impacts or 'metal of metal' such as unsecured tail gates; and
- All loads should be secured to avoid impact sounds; and
- All vehicles must drive at slow speeds as this too will help reduce any impact sounds.

11.10 Loading and Unloading of Vehicles and Trailers (Mobile Plant, Excavators etc)

- The Consent Holder and Noise Liaison Manager must ensure any loading or unloading of large plant or vehicles, onto off of trailers for example take place after 8.00am only.
- The Consent Holder and Noise Liaison Manager must ensure staff avoid, as far as practical dropping, tools or materials; avoiding dropping of tailgates or trailers and the like and avoid dropping or any impact sounds (especially during the night time period) such as from metal on metal or loads on hard surfaces for example.
- The Consent Holder and Noise Liaison Manager must ensure, as far as practical, all loads, chains etc are secured and all truck beds are secured so as to not produce impact sounds off site.
- The Consent Holder and Noise Liaison Manager must ensure, as far as practical, trucks and loads or any trailers avoid impact sounds such as metal on metal for example and impact sounds of trailers or loads banging. It is critical that any vehicles driving on or off site do so in a manner that ensures that loads or trailers do not impact and make unreasonable sounds from impacts or 'metal of metal' such as unsecured tail gates.

11.11 Delivery

- The Consent Holder and Noise Liaison Manager must ensure any delivery of loads onto site take place after 8.00am only.

11.12 Entry/Exit Point to Site and Row/Driveway

- The Consent Holder and Noise Liaison Manager must ensure entry and exit to the site are via the designated entry and exit points only.

11.13 Driver and Plant Operating Rules

The Consent Holder and Noise Liaison Manager must ensure, as far as practical, the following operator requirements will be incorporated into standard operating procedures to be used when operating a vehicle or plant on site:

- Do not accelerate vehicles unnecessarily; and
- Avoid high engine revs by selecting appropriately sized equipment and turning off engines when idle; and
- Drive at safe slow speeds while on site or driving around site; and
- All loads, tailgates must be secured at all times to avoid impact sounds; and
- Avoid unnecessary use of horns (unless expressly required for Health and Safety); and
- Adhere to internal road speed limits at all times; and
- Drive all vehicles and mobile plant on site at slow speeds and sensibly to avoid unreasonable noise; and
- Avoid where able tonal reversing or warning alarms (suitable alternatives may include flashing lights, broadband audible alarms or reversing cameras inside vehicles); and
- Ensure trucks and all equipment used on site are maintained in good order; and
- Minimize steel-on-steel contact, such as when loading scaffolding onto trucks; and
- Prevent banging or shaking of excavator buckets.

The Consent Holder and Noise Liaison Manager must ensure, as far as practical, the following noise mitigation are implemented:

- Ensure that equipment is properly maintained, in good working order and defects such fixed when found; and
- Mitigate track squeal from tracked equipment (this includes ensuring the tracked plant for example has the correct tensioning and watering or lubricating the tracks regularly); and
- The access route (any internal roads or tracks) and any other vehicle paths that are developed on the site should be maintained and kept free of potholes, undulations etc to minimise truck noise and impact sounds; and
- Loading/unloading techniques to minimise the banging of tailgates (make sure loads are secure and tailgates etc securely closed, ensure impact sounds 'metal on metal' or truck loads/trailers are managed to reduce impact sounds; and
- Any loads (particularly the first loads into the trucks bed) should be carefully placed into the truck & trailer trays or screens, rather than "dumped" from a height above the tray; and
- Avoid where able tonal reversing or warning alarms (suitable alternatives may include flashing lights, broadband audible alarms or reversing cameras inside vehicles); and
- Handle materials and equipment with care; avoid rough handling; and
- Locate plant and equipment away from noise sensitive receivers and/or screen them behind site buildings, plant and material stores; and
- Orient mobile machinery to maximise the distance between the engine exhaust and the nearest sensitive building façade (e.g. excavators).

11.14 Radio (Music) Noise

The Consent Holder and Noise Liaison Manager must ensure all staff are reminded to ensure any radio noise or amplified sound may be used during the building process but are kept to a low reasonable level so as to not be deemed unreasonable off site or any receiver location. The definition of what is unreasonable for this clause is any radio or amplified sound that 'uunreasonably interferes with the peace, comfort, and convenience of any person off site'.

11.15 Manufacturing

The Consent Holder and Noise Liaison Manager must ensure no manufacturing takes place on site; this includes concrete batching.

11.16 Blasting and Rock Breaking

The Consent Holder must ensure no blasting or rock breaking works take place on site.

11.17 Material Handling and Hand Tools

The Consent Holder and Noise Liaison Manager must ensure, as far as practical, all staff avoid dropping tools or materials and handle materials with due care to avoid unnecessary impact or drop sounds.

11.18 Concrete Cutting

- The Consent Holder and Noise Liaison Manager must ensure, as far as practical:
  - No concrete cutting takes place on site prior to 8.00am; and
  - Any cutting period, and, the number of cutting periods are complete all cutting in one extended period rather than two shorter periods with the same overall duration, as far as practical
  - The use of a tightly fitted blade shroud and/or a 'quiet' blade type (tooth design)

11.19 Removal of Vegetation and Use of Chainsaws

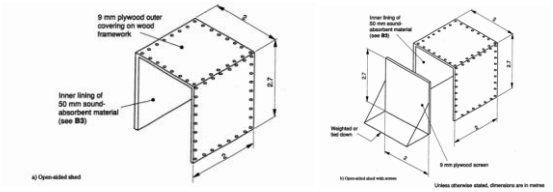
The Consent Holder and Noise Liaison Manager must ensure, if combustion engine chainsaws are used for vegetation removal, that this must only occur after 8:30a.m, Monday to Friday.

11.20 Vibration Specific Management

- **We recommended the Consent Holder and Noise Liaison Manager must ensure where vibration levels of 1 mm/s PPV or higher is predicted at any occupied residential or commercial receiver that the building occupiers are communicated with prior to the works occurring.**
- The Consent Holder and Noise Liaison Manager must ensure to operation of plant, especially large plant such as excavators must be operated by experienced operators and ensure these operators take care to operate equipment with smooth movements, avoid shaking of buckets and bucket impact on the ground as well as ensuring they control the weight shift of the plant to avoid track lift;
- The Consent Holder and Noise Liaison Manager must ensure that if a plate compactor vibration is used that where the vibration function is available, it is used to minimise amplitude and maximise the driving frequency to minimise vibration effects where practicable. Where practical also minimise the number of periods (e.g. complete all plate compaction in one extended period rather than two shorter periods with the same overall duration);
- The Consent Holder and Noise Liaison Manager must ensure the site access routes, road and ground conditions where plant may operate is maintained and kept free of potholes, undulations, as far as practical, to avoid vibration and impact sounds.

11.21 Acoustic Enclosures

Acoustic enclosures differ from acoustic barriers or terrain (such as earth bunds) in that they surround the sound source on multiple sides and typically may include a roof also. Their effectiveness depends on how well the noise source can be enclosed without restricting equipment operation or creating an unsafe work environment due to factors such as noise exposure, excess heat buildup, dust, or unsafe lighting or working conditions. Additionally, enclosures may pose challenges for on-site traffic management and extend construction timelines, particularly for short-term activities. In other cases, enclosures can cause challenges with wind loading also. Acoustic enclosures designed according to the principles in Figure B2 of NZS 6803:1999 can help mitigate noise from unavoidable loud activities such as sawing, hammering, and concrete cutting when these operations are not already shielded by a building facade. These enclosures must be solid and free of gaps. Suitable materials for temporary shielding include moveable plywood screens, mass-loaded sheet vinyl, or equivalent materials. To enhance noise reduction, the internal side of the screens can be lined with 50 mm of sound-absorbing material, such as Autex AAB 35-50 or a comparable alternative, as illustrated below:



Suitable solid barrier materials may include (but are not limited to) 12mm Plywood panels 12mm Saveboards (www.saveboard.nz), pvc panels on weighted footings or any mass panel with no holes in or under it.

12 Area Specific Noise Control Methods

In alignment with Objective 3, the best practicable option (BPO) should be implemented to prevent unreasonable noise emissions from exceeding acceptable levels (regardless of compliance with a rule or standard). We recommend the following area-specific mitigation measures. These areas and site boundaries have been selected due to the close proximity of dwellings to construction work zones (within 20m). We recommend that the final CNVMP specify the required location, height, type and specifications for the localized acoustic barriers. This should be determined in consultation with the landowner or neighbour, taking into account existing site fencing and terrain/topography and any other required factors.

12.1 Area 1: 96 Arataki Road

The closest point from the façade of the dwelling to the construction site boundary is approximately **3m.**

- We recommend the use of localised acoustic screening as either natural screening such as earth overburden, earth bunds, or built screening such as acoustic barriers, panels or curtains. A mix of bunding with screening on top could also be adopted.
- We recommend the acoustic screening is considered around the perimeter of this property as it will also assist with other non-mitigation measures

12.2 Area 2: 160 Arataki Road

The closest point from the façade of the dwelling to the construction site boundary is approximately **12m**

- We recommend the use of partial localised acoustic screening as either natural screening such as earth overburden, earth bunds, or built screening such as acoustic barriers, panels or curtains. A mix of bunding with screening on top could also be adopted.
- We recommend the acoustic screening is considered along the north-east and south-eastern perimeter of this property.

12.3 Area 3: 104 Arataki Road (Shaggy Range)

The closest point from the façade of the dwelling to the construction site boundary is approximately **12m.**
We understand that the construction yard and set down area may be located adjacent this property, however at the time of preparing the draft CNVMP was yet be finalised.

- We recommend the use of partial localised acoustic screening as either natural screening such as earth overburden, earth bunds, or built screening such as acoustic barriers, panels or curtains. A mix of bunding with screening on top could also be adopted.
- We recommend the acoustic screening is considered partially along the south-west perimeter of this property so as to provide suitable screening to the dwelling and outdoor areas.

Acoustic screening for all sites noted above could take the form as either natural screening such as earth overburden, earth bunds, or built screening such as acoustic barriers, panels or curtains. A mix of bunding with screening on top could also be adopted such as chain link fencing atop bunding. Fencing could be constructed using acoustic blankets affixed to chain-link fences or applying high mass panels such as plywood hoarding panels a minimum surface density of 8kg/m2 (e.g., 12mm plywood) or with PVC hoarding practicable. The barrier should be high enough, wide and long enough to block site. As a general guideline, if an acoustic barrier or topographic feature such as earth bund is present between the noise source and the receiver, an approximate attenuation of up to 5 dB can be assumed when the top of the equipment is just visible above the barrier. If the noise screen fully obscures the source from the receiver's view, the attenuation can be estimated to be up to 10 dB.

12.4 Area 6: Brookvale Road (Infrastructure and Stormwater Works)

Infrastructure pipework will be installed alongside some Brookvale Road properties, including the construction of a scruffy dome and associated stormwater infrastructure adjacent to the property at 163 Brookvale Road. The distance from the nearest façade of 163 Brookvale Road to the roadside stormwater pipe will be approximately **15m**, with the scruffy dome work area located slightly further to the northeast.

For **163 Brookvale Road** and any other properties along Brookvale Road where construction activities occur within 20 metres of a dwelling, the following measures are recommended:

- **Work hours**: As far as practicable, works should commence no earlier than 8:00 a.m. and occur Monday to Friday only, excluding Saturday.
- **Resident communication**: One-on-one consultation should be undertaken with affected occupants to inform them of the schedule and timing of this specific component of the project. This communication should include contact details for personnel responsible for handling complaints and a summary of the activities expected to occur adjacent to their properties.

13 Community Engagement, Consultation and Notification

A key noise management method to reduce potential annoyance, complaints, and potential adverse effects of the Project is effective communication with sensitive receivers.

- We recommend that the Consent Holder and Noise Liaison Manager must ensure ensure before any construction begins:
  - Receivers in Areas 1, 2 and 3 (96, 160 and 104 Arataki Road) have been consulted with and received written communication outlining the project details, contact information for personnel handling complaints, and acknowledgment of activities expected to occur on site.
  - Receivers in Area 4 (Existing residences in Arataki Road) have been consulted with and received written communication outlining the project details, contact information for personnel handling complaints, and acknowledgment of activities expected to occur on site. For clarity we recommend the directly adjacent dwellings across from the site.
  - Area 5 (The Grove, Arataki Honey and the Business Park) have been consulted with and received written communication outlining the project details, contact information for personnel handling complaints, and acknowledgment of activities expected to occur on site. We also recommend similar consultation with 21 Arataki Road.
  - Area 6 (Brookvale Road) any construction works asspocaited with stormwater or infastructure within 20m of any dwelling along Brookvale Road have been consulted with and received written communication outlining the project details, contact information for personnel handling complaints, and acknowledgment of activities expected to occur. We also recommend one on one consultation including 163 Brookvale Road.
- Additionally, implementing a regular newsletter (weekly or monthly) is recommended to provide updates or changes to the project. It is common that emails are also sent regular from the project team and these can be sent out by those who 'opt in' to emails for neighbours; and;
- Erect public site signage (sign board) which must include contact details of Project Manager. Such signage would be erected where it is clearly noticeable and in a safe area for people to approach and read. The board should be updated as required.

14 Community Complaints

We recommend that the Consent Holder and Noise Liaison Manager must ensure that if any complaint is received, that

1. The complaint is taken seriously and addressed with genuine intent to resolve it;
2. The complaint is reviewed as soon as possible, preferable the same day, but no later than 24 hrs;
3. All noise complaints should are formally recorded in a complaints file;
4. The local District Council are also updated on any formal complaints and outcomes;
5. For each complaint, an investigation should be undertaken involving the following steps as soon as practicable:

A. The Consent Holder and Noise Liaison Manager must ensure that if any complaint is received, that on review of a complaint that if found the CNVMP is not being followed, or it is found measured levels exceed the relevant construction noise or vibration performance standards that the following actions are taken:

A1: Review the construction methodology, mitigation measures, and management strategies to ensure they align with the Best Practicable Option (BPO). This review should consider the interests of affected parties, the practicality and effectiveness of additional measures, and the impact on project timing, duration, and cost.

A2: Engage with affected parties to understand their sensitivities regarding specific times, activities, and locations. Consultation should take a collaborative approach to managing construction noise impacts. A project representative must be available during works, and records of consultations should be maintained at the site office, accessible to affected parties and the Council upon request.

A3: Implement agreed-upon measures to prevent significant adverse effects and continuously monitor activities to assess and verify the extent of any impacts.

When any complaint is received the formal complaints, file should note:

- Time and date the complaint was received;
- The contact details of the complainant (unless they elect not to provide);
- Nature and scale of compliant (including noise sources, location and related details such as resulting effects);
- Time and date of the activity subject to the complaint (estimated where not known);
- Review of investigation and outcomes (what was done to review and if required remedy situation);
- Update and implement required changes and if required update this CNVMP as appropriate;

The complainant shall be kept updated regularly during the time it takes to resolve the matter or what the outcome was.

15 Applicable Noise Monitoring (Noise Monitoring Planning)

The proposal here is to firstly manage noise emissions at all times so not to receive complaints, however in the instance where necessary that a noise complaint is received the following protocols below shall be enacted to ensure that the noise is reduced to a reasonable level that is complaint at all times. If any monitoring is required The Consent Holder and Noise Liaison Manager must ensure monitoring is to be undertaken in accordance with the scope, procedures and reporting requirements for noise monitoring set out below.

- ✓ All noise or vibration monitoring under this Plan will be carried out a suitably qualified and experienced person such as an acoustic engineer in accordance with required acoustic standards;
- ✓ All noise measurements are undertaken with suitable equipment such as using an integrating Sound Level Meters that comply with IEC651 Type 1/Class 1 specification for sound level meters and can measure time averaged (A-weighted) sound levels such as L_{Aeq} as well as L_{AFMax}.
- ✓ All vibration measurements are undertaken suitable equipment such as undertaken vibration monitoring with suitable geo-phone that measures ppv (mm/s).

The scope of all noise monitoring shall be to assess compliance with the relevant noise limits refer to *objectives* above which sets out applicable permitted nose limits and to identify any further noise mitigation measures that may be available and consistent with the RMA definition of "best practical option" s.16 RMA.

15.1 Scope of Monitoring

- ✓ To obtain reliable measurements of sound levels or vibration levels received in the area surrounding the site; and
- ✓ To undertake monitoring during representative on-site activities as appropriate; and
- ✓ To assess compliance with permitted limits and New Zealand Acoustic Standards or International Standards as relevant; and
- ✓ To identify any further noise mitigation measures that may be available and consistent with the RMA definition of "best practical option".

All monitoring procedures will be based on the technical guidance on noise measurement contained in NZS 6801:2008 Measurement of Environmental Noise and assessed in accordance with NZS 6802:2008 Assessment of Environmental Noise.

All vibration monitoring shall be in accordance with the German Standard *DIN 4150-3:2016 "Vibration in buildings – Part 3: Effects on structures"*.

Records shall be kept of all monitoring results and where required a written report produced consistent with the reporting requirements of the appropriate standard if required.

16 Health and Safety Hierarchy

This draft CNVMP outlines a range of recommended noise and vibration control measures. For example, the plan suggests avoiding tonal reversing or warning alarms (beepers) where practicable and using alternatives such as broadband alarms (squawkers/quackers), flashing lights, proximity sensors, reversing cameras, and spotters.

For clarity, health and safety must always take priority over noise and vibration management. While managing noise or vibration is very important, worker well-being and safety should always come first. Health and safety should never be compromised.

17 Qualifications of CNVMP

This CNVMP is draft and a supporting document for the Fast Track Consent.

Lindsay Hannah.

Lindsay Hannah for Dcibel Limited

16 July 2025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