Acoustic Report Arataki Road Project Fast Track Application

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Prepared for

CDL Land NZ Limited

CDL LAND
NEW ZEALAND LIMITED

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Document History

	Effective Date	Description of Revision	Prepared by	Comment
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5-6	30 June 2025	Final Draft	Legal Review	Final Draft
7	16 July 2025	Final	Submission FT App	Final

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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 (ambient)	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_n - L_{90}, L_{10} etc.	A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, i.e. L_{90} is the level which is exceeded for 90 percent of an observation period. L_{90} is commonly referred to as a basis for measuring the background sound level.
$L_{Abg, T}$	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 and NZS6802	NZS 6801: NZ Standard 'Measurement of Environmental Noise' 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.
Sound Insulation	Sound insulation is the prevention of the transmission of sound through a barrier such as a wall or window. There is no direct and inherent relationship between the sound insulation value of a barrier and the sound absorption performance of its surface.
C_{tr}	C_{tr} is the Spectrum Adaptation Term ISO 717-1:1996 Table A.1 Spectrum NUMBER TWO [2]. The ISO standard ISO717-1: 1996 gives C and C_{tr} indices which can be added to the R_w rating to give a rating for noises with either equal energy at all frequencies [C] or road traffic like spectra [C_{tr}].
R_w	R_w is the Weighted Sound Reduction Index where **Rw is the ISO equivalent of STC**
Notional Boundary (NB)	NB means a line 20 metres from and parallel to any wall of a building or any wall of a building used by a noise sensitive activity or the legal boundary whichever is closer.

Executive Summary

An application under the 'Fast-track Approvals Act 2024' has been submitted by the Applicant to the Environmental Protection Agency (EPA) to enable a new residential development on the Plains Production (rural) zoned site at Arataki Road, Havelock North. The proposal involves subdividing the site, with associated infrastructure, services, and earthworks, and developing the individual lots for housing under a planning and design framework.

Dcibel Limited has conducted an assessment of the noise effects associated with the proposed development. This assessment considers the potential environmental noise impacts of the new residential dwellings and surrounding living environments. The evaluation included a site visit, acoustic survey, and observations of neighbouring residential, commercial, and rural sites during both day and night.

The direct noise effects, such as the introduction of new residential sites in a currently vacant rural zoned area, have been examined. The assessment concludes that the noise emission standards of the Hastings District Plan can be fully met, considering the proposed site layout and the fact that residential uses are generally not noisy when managed appropriately by occupants.

The assessment also considers noise immission, which refers to noise produced by adjacent existing sites, including residential and commercial properties, as well as potential reverse sensitivity effects. It concludes that the noise levels received at the proposed site from neighbouring sites are expected to be reasonable, provided they

comply with the boundary noise limits set out in the Hastings District Plan or any applicable resource consent conditions for adjacent commercial sites.

Apart from the neighbouring residential, rural, or commercial properties identified in the assessment, no significant additional sources of sound, such as road or rail corridors, were observed to impact the new residential lots. While the development of dwellings on the land will move the notional boundary closer to neighbouring sites, for reasons set out below I do not expect the proposal to have significantly affect noise levels that will in practice be generated on the neighbouring sites.

Overall, the assessment concludes that the noise levels that will be generated by non-residential or commercial sites in the area are reasonable for the proposed residential site, both day and night.

As a result, the assessment finds that no special acoustic mitigation measures, such as bunding or acoustic fencing[1], are required for day-to-day operational noise to ensure that the noise levels at the site remain reasonable at all times.

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[1] Although the application proposes acoustic fencing along the boundary with the Olive Grove.

1 Introduction

Dcibel Limited have been commissioned by the Applicant, to provide an opinion on the proposed new residential lot development at the subject sites situated at No 86, 108 and 122 Arataki Road, Havelock North, Hastings District (**the CDL 'subject site'**). The project and sites are all encompassed within an identified urban growth area known as the '*Arataki Extension'*. **Dcibel Limited** have conducted a site visit, travelled to the site and surrounds and are aware of the area, adjacent noise sources and receiving environs, including adjacent commercial and rural operators.

This *acoustic report* has been prepared based on the reporting guidance of the Resource Management Act 1991 (the Act). The Act requires that such reports include details as corresponds with the scale and significance of the effects that the activity may have on the environment (Section 88 (2) of the Act). The objective is to describe potential nature and scale of noise effects arising from the proposed development as may affect existing surrounding land uses and to assess these in the context of the relevant standards and guidelines. This acoustic report sets out:

- *Information on noise-related aspects of the nature and scale of the activity and **site***
- *Information on noise-related aspects of the nature and scale of the **adjacent** activities and **sites***
- *An assessment of noise **emitted** from the site, and related **noise emission** levels as adjacent receiver sites*
- *An assessment of noise **received** from adjacent sites, and related **noise immision** levels from adjacent sites*
- *An assessment of temporary construction noise for the development of the site in terms of the District Plan construction noise rules*
- *An assessment of construction vibration for the development of the site in terms of the District Plan construction noise rules (with attached draft CNVMP)*
- *Commentary on reverse sensitivity effects.*

2 Document and Information Review

We have reviewed background project information relating to the application prepared by the Applicant's Agent (Woods) as well as information provided to us from the Applicant (Site Concept Plan). We have relied on all the supplied information when preparing this assessment to be true and accurate. We have also relied on the Applicant and their Agent to ensure the nature and scale of the proposed activity, as described, as being a true and accurate representation. A site visit was conducted by the author on Friday 4th and Saturday 5th October 2024 to the site and surrounding areas. We understand there is no substantial change to the area or surrounds since this site visit that would alter the conclusions. Further review of background documents has also been conducted including the Te Mata Mushrooms Limited resource consent for reuse to the site and Shaggy Range resource consent documents.

3 Subject Site and Surrounds

The underlying parcels referred to as 'the subject site' are detailed in the Application and supporting documents. The site is in the Arataki Extension Area. As a summary, Arataki Extension Area is immediately east of the existing urban area of Havelock North. An application is made to enable a new residential development to allow for associated infrastructure, servicing, and earthworks, and the individual lots to be developed for housing. It is anticipated that the site will enable around 180 dwellings to establish. The site is currently zoned Plains Production *Rural* under the Hastings District Plan (operative in part). No change to the underlying zoning is to occur.

The area of Arataki has been developed progressively over the years, with a traditional low-rise suburban density of ~ 12 dwellings per hectare, noting a host of residential dwellings already exist along Arataki Road. This progressive development is clearly shown when visiting the area and subject site, as well as viewing aerial photos of the area, which shows that Arataki Road now represents the current 'edge' of the residential zone boundary between Rural and Residentially zoned sites, a key observation was dwellings are already located directly adjacent to the existing rural zone inter-face. The proposal would be an extension of this interface. Immediately adjoining the eastern boundary of the development site is non-residential activities, namely commercial sites, including Brookvale Land Limited Business Hub (ex Te Mata Mushrooms facility) which has revised operations to reuse the site, with a temporary resource consent for 4 years. This includes a business park operation with auxiliary activities as noted in the consent decision (Te Mata Mushroom Site Business Use Decision RMA20230222).

The site (and Arataki Road and urban area) sits on a plateau approximately 6 metres above the adjacent commercial sites to the east, which act to a degree as a natural acoustic earth barrier. At the southern end of the development site is a dog boarding kennel known as 'Shaggy Range' and near this southern-most boundary is Arataki Honey and Olive Grove site. There is also farming and horticultural activity in the surrounding area which forms part of the rural area. The author of this report assisted 'Shaggy Range' with their consent and has knowledge of this site and activity. **Figure 3-1** indicates the existing site and surrounding areas, noting key adjacent sites. **Figure 3-2** indicates a photo of the existing site looking south-east down the Arataki Road interface with the site to the left and Arataki Road and dwellings to the right.

3.1 Site Location Map

Figure 3-1 Area map with subject site.
Reference: GIS District Planning Map

Figure 3-2 Subject site photo (existing site).
Reference: © dcibel Limited. October 2024

Appendix A contains further site photos taken during the October 2024 site visit.

4 Subject Site and Surrounding Areas

Figure 4-1 indicates a site map of the current subject site and adjacent areas.

Figure 4-1 Subject Site and adjacent areas. Not to Scale.
Reference: © Woods

Figure 4-2 indicates the proposed concept plan.

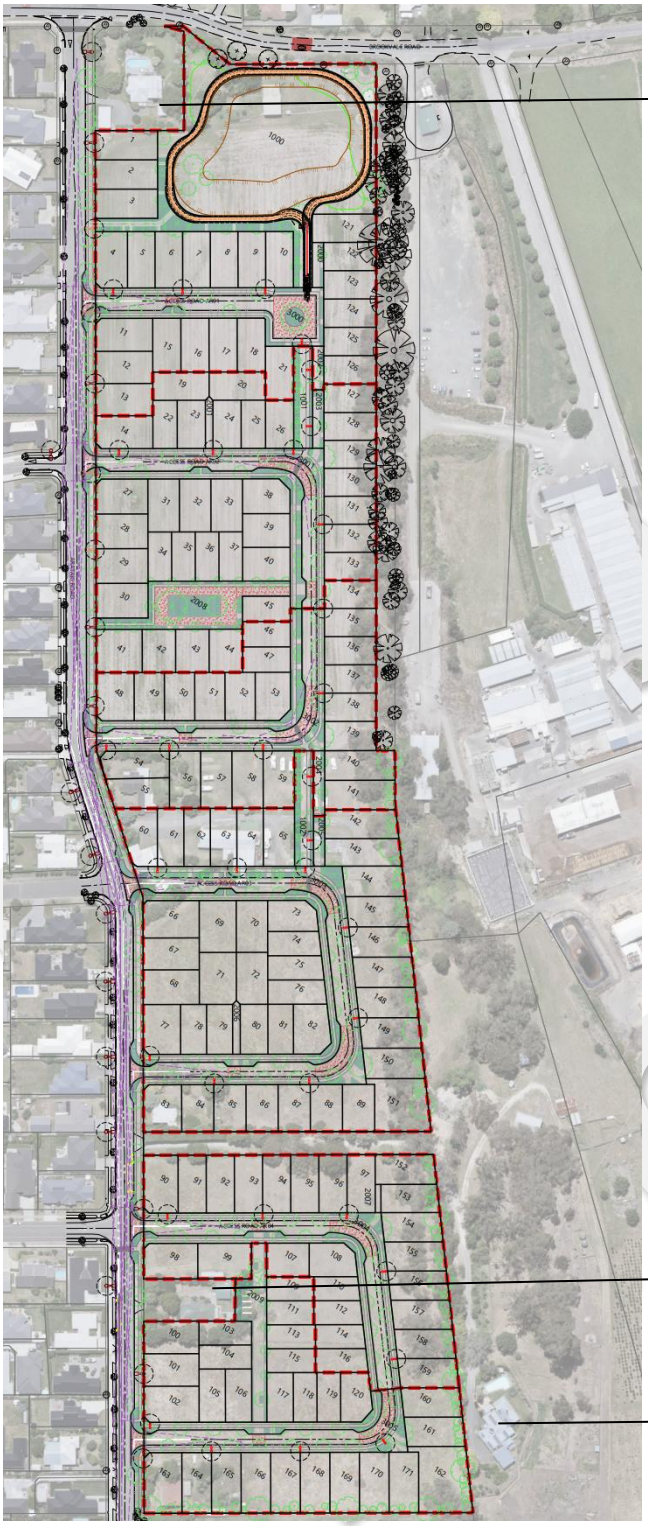


Figure 4-2 Concept Plan. Not to Scale.
Reference: © Woods

5 Existing Activity and Noise Sources – Subject Site

The existing subject site is currently unoccupied. The site is generally flat in contour and is rectangular in shape. The eastern edge of the site has a Council reserve strip containing a row of large gum trees. There are currently no noise sources of note on the site other than natural sounds such as bird call.

6 Existing Activity and Noise Sources –Adjacent Sites

The existing area hosts a number of noise sources which can be generally characterised as either rural (production or farming), residential or non-residential such as commercial (business) sites.

To the north is Brookvale Road, across this road are residential dwellings and rural paddocks. To the east is Brookvale Land Limited Business Hub (ex Te Mata Mushrooms facility). Also to the east is Shaggy Range. Located adjacent the site to the south is Arataki Honey and Olive Grove. To the west across Arataki Road are residential dwellings. To the north-east corner adjacent the site, is the Brookvale water pump station (producing a low-level constant noise). This noise is only audible when close, not at the adjacent site.

All the above sites have both external and internally based noise sources, with the external sources being mainly mobile plant or people from the commercial sites. A summary of noise sources associated with all **commercial** sites noted above include the following:

- **People sound**: People and visitors on site entering and leaving the sites. Administration work indoors. In all cases people sounds while outside the buildings would be assumed to be normal speaking.
- **Light vehicle:** vehicle noise associated with vehicles from staff or visitor vehicles (cars, vans, light trucks) and visitor vehicles such as delivery trucks or cars etc including engine exhaust; engine noise; door opening/closing and gear noise. Goods or material handling. Vehicle movements on site would be assumed to be slow moving.
- **Heavy and specialist vehicle:** Heavy vehicle noise associated with delivery or taking of product off site including engine exhaust; engine noise; door opening/closing and gear noise and material handling. There are also specialist vehicles such as forklifts, front end loaders etc. Truck or vehicle washes. Occasional agriculture activity.
- **Plant:** Plant noise associated with each specific site and activity which is generally internalised and located indoors. Based on our research, generally most external plant items outdoors appear to be mobile plant such as trucks, loaders or forklifts with some people noise or processes associated with goods or material handling.

The sites in the wider rural area also include rural residential and non-residential commercial or rural sites, many of which are agricultural, farming based or commercial sites. The wider area is a mix of both residential and rurally based sites.

The following provides further details on the adjacent existing sites and related operations.

6.1 Brookvale Business Hub Site

Te Mata Mushrooms Limited applied for resource consent RMA20230222 to establish a temporary business park within the existing facilities. As part of the Application an AEE was prepared by Mitchell Daysh Limited acting on behalf of the Applicant. Subsequently Te Mata Mushrooms Limited was granted Resource Consent to Reuse existing buildings for various activities at 174 and 176 Brookvale Road.

The consent permits commercial activities for a maximum period of 4 years from 23 February 2024 to be undertaken by the listed tenants within existing buildings and outdoor yard areas, as identified in the Approved Plan (HDC Ref: RMA20230222).

Figure 6-1 sets out a map of the approx. boundaries showing the Te Mata Mushrooms Limited Resource Consent to Reuse at 174 and 176 Brookvale Road. The site is now formally known as the Brookvale Land Limited Business Hub (aka Brookvale Business Hub).

Figure 6-1 Approx site boundary of adjacent Brookvale Business Park Hub.
Reference: Te Mata Mushrooms Limited Resource Consent existing buildings AEE prepared by Mitchell Daysh, dated 18 October 2023.

Consent for Reuse of the site included the following listed tenants:

- Storage of information technology hardware for business and hobby tractor (Agri Automation)
- Electronic Door storage (Technaserve)
- Industrial electrical storage (Grace Investments Ltd)
- Office space only (Arxada NZ Ltd)
- Mechanical storage & workshop (Schmidt Automative)
- Storage of steel barrels & art workshop (Metal Metcalfe Ltd)
- Auction company (Trade Co Ltd)
- Transportation Contractor (bulk carrier)
- Kleer Contractors HB Ltd yard space, plus and truck washing and refuelling area
- Civil Works Storage (Wilson Fergusson)
- Joinery Workshop (Hopkins Joinery)
- Wine Bottling, labelling, store and retailing (Radburnd Cellars)
- Wine Bottling, labelling and storage (Methode Services Ltd)
- Directional drilling & hydro excavation specialist depot (Xtreme Contracting Ltd)
- Temperature controlled wine storage (Personal Cellar Ltd)
- Joinery workshop (Natural Edge Joinery)
- Furniture storage for use in open home displays (Insideout Design)
- Pool storage (Brad Justham)
- Exotic mushroom growing in sawdust medium (Exotix Ltd)
- Personal storage (Gavin Linsey)
- Personal storage (Quintin De Groote)
- Personal storage (Shamus, 57m^2)
- Storage of Walk of Wonders props (Vesica Ao Tearoa)

The balance of land at the site continues to be used for agricultural production being permitted under the Hastings District Plan. The approved layout plan from RMA20230222 is set out below in **Figure 6-2** illustrating the layout of the Brookvale business hub site and related businesses.

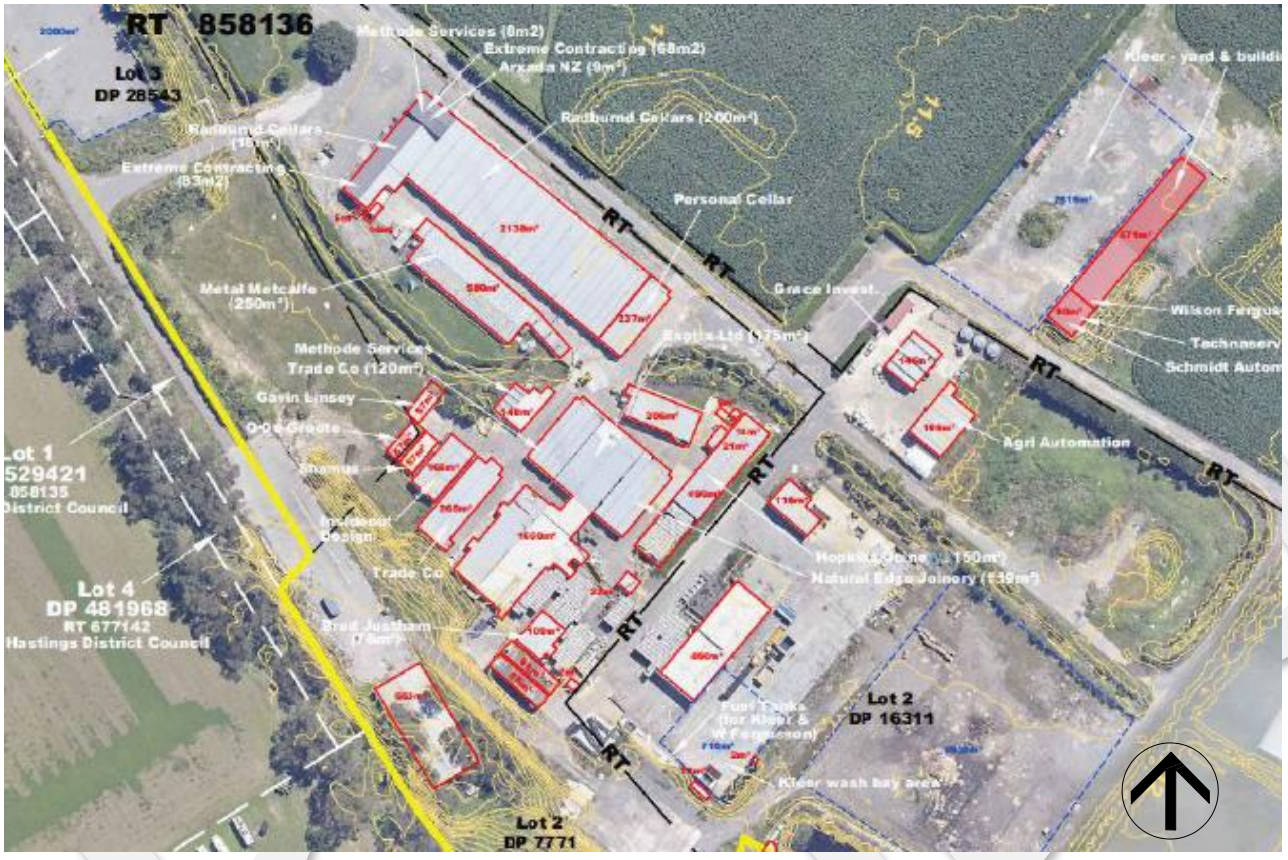


Figure 6-2 Brookvale Business Park Hub site layout map

Reference: Te Mata Mushrooms Limited Resource Consent to Reuse existing buildings AEE prepared by Mitchell Daysh, dated 18 October 2023.

In addition to the listed businesses, a new indoor mushroom operator has established on site. This involves a new method of growing and no longer involves composting, which historically involved the use of external noise sources.

With respect to the existing consent ***Condition 6*** of the decision specifically sets noise limits at the site boundary of the Brookvale business hub site, summarised as follows:

Condition 6.

That the following noise limits shall not be exceeded at any point beyond the site boundary:

Control Hours	Noise Level
0700 to 1900 hours	55 dB $L_{Aeq\ (15\ min)}$
1900 to 2200 hours	50 dB $L_{Aeq\ (15\ min)}$
2200 to 0700 hours the following day	45 dB $L_{Aeq\ (15\ min)}$
2200 to 0700 hours the following day	75 dB L_{AFmax}

Condition 7 also sets hours of operation for the Brookvale business hub site, summarised as follows:

Hours of Operation

7. That activities authorised by this consent shall only operate within the following hours

Radburnd Cellars (sale of wine only)	0800 to 2200 any day of the week
Kleer Contractors HB Ltd	0700 to 1800 Monday to Saturday, and
	0700 to 1800 on Sunday (during the harvesting season only)

All other consented activities 0700 to 1800 Monday to Saturday.

Other controls are implemented which include for example Condition 8 requiring ***"all vehicles associated with the activities authorised by this consent shall only use the main vehicle entrance on Brookvale Road to enter and exit the site".***

These conditions are key mitigation measures in order to ensure noise emitted cross boundary on the site are suitably managed and controlled by the operators.

With respect to **noise emitted from** the Brookvale business hub site (and received on adjacent sites, including the subject site) ***Section 5.4*** of the Mitchell Daysh AEE, was submitted in support of the Application for the temporary use of the site as a business park, a site-specific noise report was also prepared in support. ***Section 5.4*** of the AEE specifically notes that an acoustic report, prepared by Earcon Acoustics Limited, dated November 2017 entitled '*Te Mata Mushroom Bunker Extension – 174 & 176 Brookvale Road, Lot 2 DP 7771, Havelock North, Hastings – Acoustic Report*' was prepared in support of the previous consent application for mushroom farming.

That acoustic report noted 'conservative' modelling was undertaken with respect to noise emitted from the site. This modelling included mobile plant as well as fixed plant. The conclusion of the acoustic assessment was "***In accordance with the requirements of the Hastings District Plan, and based on conservatively modelled scenarios pertaining to the operation of the proposed facility, it is predicted that the noise levels from the operation of the proposed facility would comply with the relevant noise criteria at all assessed receivers at all times"[2].***

The above finding was accepted in the resource consent decision of the independent commissioners, who made the following conclusion regarding potential noise effects of the proposed expanded mushroom production and composting operation stating "***It is considered that any adverse noise effects will be no more than minor. An acoustic report had been provided with the application and it predicted that any noise levels would comply with the relevant DP noise provisions at all times[3]***

In regard to the various tenants comprising the building reuse proposal, the Mitchell Daysh AEE notes both Kleer and Xtreme would produce noise associated with heavy vehicles moving from their storage yards to the road and vice versa, however such noise would be periodic and not continuous. We agree as this was our observation when we conducted our site visit and observed the Xtreme business operating the truck wash and limited vehicle movements.

The Mitchell Daysh AEE also notes that various workshop activities, including Hopkins Joinery, Natural Edge Joinery, and Metal Metcalfe, are all located indoors and screened by other buildings to the northeast and to Brookvale Road to the northwest. There is no line of sight to neighbours to the southwest due to the terrace landform.

We agree with this statement and also draw attention to the comment with respect to the 'terraced landform' which in lay terms is an approx. 6m height difference between the Brookvale business hub site and site.

[2] Te Mata Mushroom Bunker Extension – 174 & 176 Brookvale Road, Lot 2 DP 7771, Havelock North, Hastings – Acoustic Report, Earcon Acoustics Limited, November 2017 (section 10).
[3] In the matter of an application by Te Mata Mushrooms Company Limited to expand an existing intensive rural production activity …Decision of Hearings Commissioners, 19 December 2019 (page 12) (see HDC File: 58916#0357)

Our direct observations from our site visit, showed most activities were internally conducted inside buildings. Further to this, as noted in the AEE, the workshops are all relatively low in scale and intensity, with limited staff. The various storage activities are likely to only produce low levels of noise in association with traffic movements and the loading and unloading of vehicles.

The Mitchell Daysh AEE further notes that given the above findings on the 2017 proposal to expand mushroom production from 25 tonnes per week to 100 tonnes per week, with continually operating loaders in addition to the traffic movement and other activities within the site, it is fair to conclude that the business hub proposal, which generates significantly less general traffic and activity, and with no associated loader or continuous heavy machinery operation, will be able to comply with the relevant District Plan noise limits when suitably managed. We agree, and note that condition 6 of the business hub consent requires the current District Plan noise limits to be complied with at the site boundary.

We consider that compliance with condition 6 of the business hub consent will result in a reasonable noise environment for the subject site and so any noise effects on residents from the business hub will be anticipated to be reasonable.

Based on our own site visit and direct observations, including the review of noise related plant from the Brookvale business hub site, although audible at times the noise appears to be unremarkable for a commercial site of this nature and scale and was internalised with limited activity outdoors and traffic movements on or off site.

Based on our direct site visit observations the business park was well managed and noise only audible during certain limited periods, for example low level voices were noted at one point, vehicle movements as well as Xtreme Contracting cleaning vehicles. Impact sounds (likely from joinery) and metal sounds (likely from the metal working or metal barrels being moved) were noted on site sporadically and were noted only during limited periods at the subject site zone interface. The distance from the subject site's eastern boundary to closest buildings on the business park site is around 40-50m.

The sampled levels complied at all times with the permitted District Plan limits. For clarity no site visit to the business park itself was made, the park was viewed directly from the subject site, this was due to being no trespass signs at the Brookvale business hub site entryway.

Overall, the Brookvale business hub site has large sheds for storage, production and packing as well as internally based operations and activity with a high majority of plant being located indoors. Vehicle movements on site were noted. The noted noise sources relate mostly to vehicles or low-level production (metal impact). The main buildings are well set back from the common site boundary inter-face. The majority of the site is northward of the proposed inter-face.

Noise from the adjacent business and commercial sites was noted at being well managed and low level with all sampled results indicating full compliance with the District Plan and condition 6 at the subject site boundary.

6.2 Shaggy Range Doggy Day Care

Shaggy Range Day Care for Dogs is a doggy day care that has an existing resource consent (refer to 104 Arataki Road RMA-20170139). As part of the resource consent the site has a detailed Noise Management Plan prepared as a condition of consent. Importantly, the centre is subject to consent conditions and management practices that will in my opinion assist its compatibility with residential development on the site:

1. Condition 1(a) of the consent requires the operating hours of facility to be daytime, between 7:00am and 6:00pm Monday to Friday.
2. Condition 1(b) provides that, "no overnight boarding shall be provided for". In conjunction with condition 1(a), this limits potential noise effects from the activity to daytime hours on weekdays.
3. Condition 1(c) provides that the facility will be closed for drop-offs and pick-ups through the middle part of the day between 9:30am and 3:15pm.
4. Condition 2 requires submission of a Noise Management Plan for approval by Council. The NMP is required to address a number of matters including noise control methods (managerial and physical), the location of outdoor activities, and minimum animal training requirements for staff.

5. As noted in the reasons for the Council decision, "*an existing building is proposed to be used to house the dogs, which does not have any openings on the side closest to the south west boundary, reducing visibility of the facility and potential noise*." This will have positive benefits for the incoming residents on the site.
6. The reasons for the decision also note that, "*the location of the proposed buildings and dog exercise area means that they will not be readily viewed from any public area or private residence given the existing screening on the subject site and topography of the site*." The outside run areas are specially designed areas being set back 15m from the proposed new residential zone boundary. Again, these positive factors will minimise noise effects on the incoming residents.
7. The operator's website notes that dogs *are fully supervised* meaning all dogs to be suitably managed at all times not to produce any unreasonable noise.

I consider that, collectively, those existing managerial and physical characteristics of the doggy daycare centre will ensure an acceptable and reasonable noise level in the residential development on the site and that the facility's operations will not need to change in response to the development on the site. No noise from the Shaggy Range site was noted i.e. was audible at all during our site visit.

6.3 Arataki Honey

Arataki Honey buildings are located at a significant buffer distance (> 150m) from the proposed development; however, it is noted that the site currently lays directly adjacent to the existing rural / residential interface and across from residential sites. With respect to noise sources, based on our research the high-level process of honey making involves the honey being collected from the hives and brought to site for processing.

The frames are taken from the hives and placed on a conveyor or similar process, after this the frames are placed in an extractor which rotates and removes the honey from the frames it is then placed into a separator. The extracted honey is then stored in tanks ready for processing, packaging and sale. Based on research, and site visit, the noise and related plant from the site appears to be unremarkable for a commercial site of this nature and scale. The site has large sheds for processing, storage and packing which are internal and have the plant mostly located indoors. The observed outside noise sources relate mostly to vehicles and people.

The main buildings are also well set back from the common site boundary inter-face. A host of activities occurred during our site visit including customers and traffic movements in the main car park. A delivery truck with forklift was noted but in Albany Lane, this was not audible once off site on Aratki Road. There was a hive of activity with vehicles and people on the Aratki Honey processing building outside their plant with hives and vehicles. Again, this was only noted visually and no noise could be noted on Arataki Road adjacent. Noise from this commercial site was noted at being well managed and low level with all sampled results indicating full compliance with the District Plan at the subject site boundary.

6.4 Olive Grove

The southern end of the subject site lies adjacent to the Olive Grove, which is an olive tree plantation site. The site is located in the *Te Mata Special Character Zone* which enables rural and horticulture activities. With respect to noise the chapter recognises that activities in the area can potentially generate significant amounts of noise, which however is not expected for the Olive Grove site or related activities. Regardless noise may be generated at limited times from the operation of machinery at the site.

We understand the Olive Grove olives are used by the operator to produce Arataki Road Olive Oil (also known as ARO). The closest existing olive trees are approx. 30m from the edge of the common boundary between the Olive Grove site and subject site with aerial photography indicating there appears to be around 500 olive trees on site. However, we acknowledge that operational practices may change over time, for example, additional trees may be planted, and future planting could occur closer to the boundary. I understand the primary noise producing activities related to the Olive Grove are maintenance, harvest and bird management. These are discussed as follows.

Maintenance and Harvest: There are two ways to harvest olives, that is manually by hand or mechanically. Traditionally, when picking olives by hand, this involves people and ladders. Growers may also use modern hand-held machinery to help them harvest; this would traditionally be the use of a long handled, vibrating tong or similar machinery used to shake the olives from the branches onto nets spread out under the tree. Harvesting may also involve low level noise from auxiliary plant such as vehicles (utes, tractors, trunk shaker). There would also be times throughout the year that the growers are on site such as pruning or maintenance. Harvesting depends upon climate but is limited in duration and length.

To assist in the management of olive maintenance and harvest and potential reverse sensitivity effects, a 2.0m high acoustic grade fence is proposed along the shared boundary of the subject site and Olive Grove. A 10m wide rural / urban transition buffer will also be in place along the shared boundary of the subject site and Olive Grove. Based on the subject site layout, buffers, acoustic fencing and knowledge of olive harvesting as well as expected noise emitted[4] from any use of mechanical plant, our assessment is olive harvesting activities or maintenance would be expected to fully comply with the District Plan noise limits when assessed at the subject site boundary. Any noise emitted from the above activities would be anticipated to be intermittent and reasonable at the adjacent subject sites when suitably managed by the operator.

Bird Management: In addition to routine operational and harvesting activities, it is understood that the Olive Grove employs an audible bird scaring device specifically the Vinetech Bird Scarer (a gas gun device), as part of its bird management strategy to mitigate potential crop damage. We understand the device is used during limited seasonal periods when the olive crop is particularly vulnerable to bird activity, typically during the ripening and pre-harvest phases. Based on available research, these periods generally occur between February and April, although timing may vary depending on regional and local environmental conditions.

Bird management practices commonly involve a combination of deterrents, ranging from *passive* visual devices and netting to *active* mechanical solutions such as the Vinetech Bird Scarer which is the specific device used by the Olive Grove. The use of such devices is typically both seasonally restricted and operated with variable discharge timing. This variability is essential, as birds may become habituated to consistent or predictable noise patterns. To address this, discharges may often be randomised or triggered by motion sensors.

The Vinetech Bird Scarer[5] is equipped with programmable settings, including light sensors, timers, and adjustable discharge frequency, allowing for tailored control of discharge intervals and groupings. Furthermore, the device is designed to rotate with each discharge, enabling coverage over a 360-degree arc.

This rotational firing pattern distributes noise emissions across a broader area, assisting in the reduction of any cross-boundary noise at one location or site. The Vinetech website[6] states that the device's discharge settings can be adjusted to align with most Council regulatory requirements, allowing users to tailor the discharge frequency and timing to ensure compliance with local noise control rules.

The Hastings District Plan Rule 25.1.7A regulates the use of audible bird scaring devices, including gas guns, to manage noise impacts on nearby residents, including existing and the proposed dwellings that would be built on the new subject site. The overall purpose of Rule 25.1.7A is set out in the 'outcome' of the rule which is that "***Bird scaring devices will be controlled to avoid excessive intrusion on adjoining residents".***

[4] '2022NoiseExposureinOliveHarvestMechanization.pdf' ÖZKUL, Seçil & Sümer, Sarp. (2021). Noise Exposure in Olive Harvest Mechanization. Kahramanmaraş Sütçü İmam Üniversitesi Tarım ve Doğa Dergisi. 25. 10.18016/ksutarimdoga.vi.770711.

[5] See Vinetech web site and manuals: https://www.vinetechbirdscarers.com.

[6] '2022NoiseExposureinOliveHarvestMechanization.pdf' ÖZKUL, Seçil & Sümer, Sarp. (2021). Noise Exposure in Olive Harvest Mechanization. Kahramanmaraş Sütçü İmam Üniversitesi Tarım ve Doğa Dergisi. 25. 10.18016/ksutarimdoga.vi.770711.

The Hastings District Plan (Rule 25.1.7A) restricts the operation of bird scaring devices to 'between half an hour before sunrise and half an hour after sunset'. In practical terms for Hawke's Bay, this typically limits operations to daylight hours only.

With respect to the permitted activity rules and standards the Hastings District Plan Rule 25.1.7A regulates the use of audible bird scaring devices. The plan notes where sound emissions are below 85 dBC_{peak}, there are no restrictions on the number of shots or events. For emissions above 85 dBC_{peak}, Rule 25.1.7e states sound levels generated by an audible bird scaring device shall not exceed:

25.1.7e i) 100dBC_{peak} at any point within any boundary of a Residential Zone.
25.1.7e ii) 115dBC_{peak} at any point within the notional boundary of any noise sensitive activity in a Rural Zone.

The advice notes under Rule 25.1.7e states

*Note: As an indicative guide only, a setback distance of approximately **420 metres** is required to achieve the limit in Rule 25.1.7A.1I(i) and a setback distance of approximately **150 metres** is required to achieve the limit in Rule 25.1.7I(e)(ii) where a device is directed towards the respective boundary. A device directed away from the respective boundary is likely to comply with a lesser setback distance.*

The existing buffer distance from the closest edge of the Olive Groves to the Arataki Residential Zone Boundary or proposed new subject site boundary is less than 50m in both cases.

Importantly with regard to all noise sources on the Olive Grove, there are two existing dwellings in close proximity to the common boundary with the subject site, the house on the subject site at the southern point of the Arataki Road frontage and the dwelling connected to Shaggy Range.

Those houses act as controls on noise generated on the olive grove by virtue of the extent of their notional boundaries. While a portion of the land between the two houses currently falls outside the notional boundaries for each house, the extent to which elevated noise levels can lawfully be experienced there, is in practice, limited. That is because there are only small parts of the Olive Grove site where higher noise levels could be generated that would adversely affect the land between the two adjacent houses without likely exceeding the relevant noise standards at the notional boundary of either house. Accordingly, I consider that the proposal will not make any substantive difference to the levels of noise than can be generated on the Olive Grove.

6.5 Residential Homes (Adjacent Residential Zone)

The existing residential sites and related residential activities, include people on surroundings streets, people on adjacent sites and other 'typical' residential based activities such as people cutting their grass, washing cars or gardening for example. In my view these are all genuine low-level noise activities.

Other activities are related to residential sites such as use of domestic fixed plant i.e. heat pumps for example. It is noted that the most 'dominant' noise source noted for the residential sites included traffic movements of residents driving to or from their homes on the surrounding roading network.

In summary the site is surrounded by residential sites to the north and west, these produce genuine low-level noise as received on the proposed site.

7 Hastings District Plan Noise Criteria

Figure 7-1 illustrates a zone map from the Hastings District Plan e-maps.

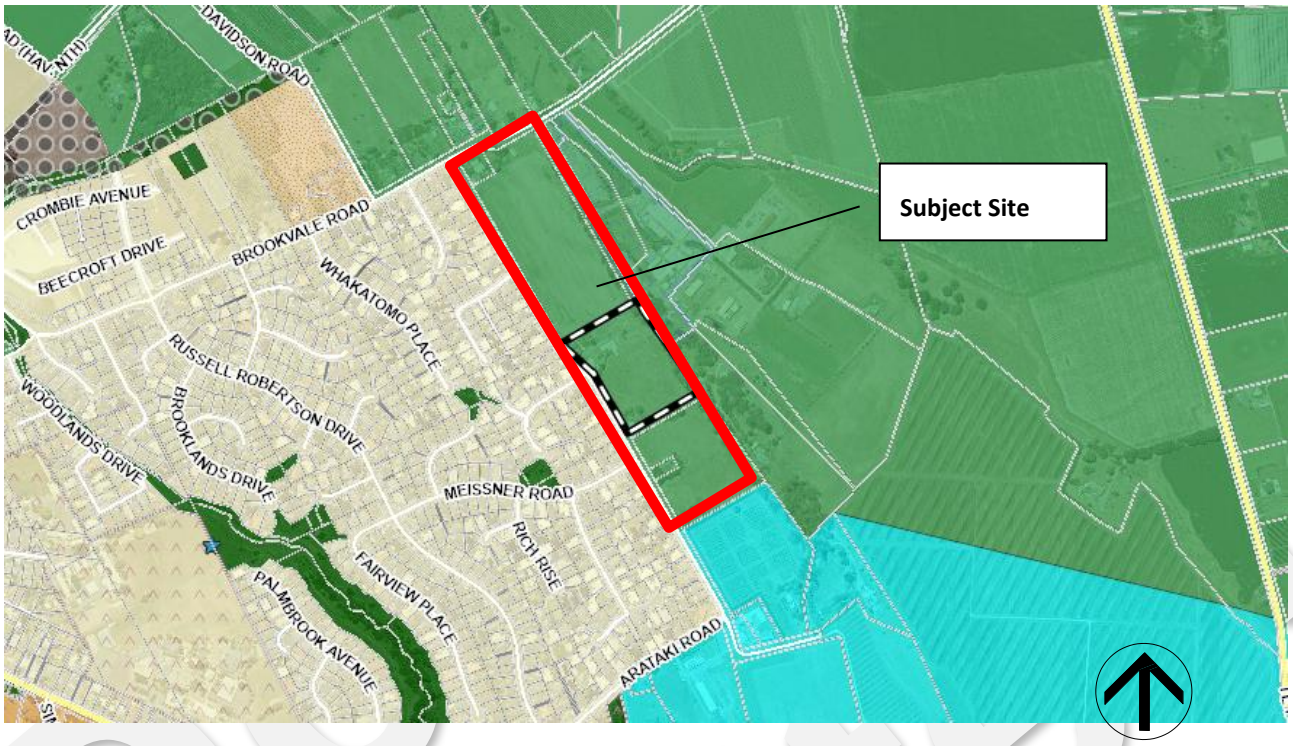


Figure 7-1 Hastings District Plan Zone map of application site and surrounding environs with approx. overlay of subject site. Not to Scale.
Reference: Hastings District Plan GIS Planning Maps

Rural Zones in the Hastings District Plan include Rural, Plain Production, Rural Residential and Te Mata Special Character. Adjacent sites to the north of the proposed subject site are zoned Plain Production while the sites to the south east are zoned Te Mata Special Character. The adjacent sites which house the non-residential activity such as Brookvale business hub site, Shaggy Range, Arataki Honey, Olive Grove etc are therefore all zoned Rural under the Hastings District Plan.

Rule 6.2.5G Noise states that the noise limits set out in ***Section 25.1*** of the Hastings District Plan for noise shall be achieved. Specifically, activities shall comply with the provisions of ***Section 25.1*** of the District Plan on Noise. ***Rule 25.1.5*** requires any activity that meets the Noise Performance Standards for the relevant Zone and the General and/or Specific Performance Standards and Terms in ***Sections 25.1.6*** and ***25.1.7***.

For the purposes of the noise section of the Plan it is noted at Rule ***25.1.6K Residential Zones*** include all zones within the **Havelock North Residential Environment** (which lies adjacent the site to the west). ***Rural Zones*** include **Plain Production** (which are sites located to the northeast) and **Te Mata Special Character** which includes the sites to the south).

7.2 Noise Rule 6.2.5G

Parking will be achieved.

6.2.5G NOISE

Activities shall comply with the provisions of Section 25.1 of the District Plan on Noise.

Note: There are exemptions and/or specific Standards provided under Section 25.1 for the use of agricultural machinery, audible bird scaring devices, hail cannons and frost protection fans.

Outcome
The outcomes of Section 25.1 of the DISTRICT PLAN on Noise will be achieved.

7.3 Rural Zone Rule 25.1.6D

25.1.6D RURAL ZONES

The following noise conditions shall apply to all land uses within all Rural Zones, other than those exempted in Rule 25.1.6B and 25.1.7E (Wind Farm Noise):

(a) The following noise limits shall not be exceeded at any point within the notional boundary of any noise sensitive activity on any other site within a Rural Zone, or at any point within the boundary of any site, in any Zone other than an Industrial Zone:

Control Hours	Noise Level
0700 to 1900 hours	55 dB $L_{Aeq\ (15\ min)}$
1900 to 2200 hours	50 dB $L_{Aeq\ (15\ min)}$
2200 to 0700 hours the following day	45 dB $L_{Aeq\ (15\ min)}$
2200 to 0700 hours the following day	75 dB L_{AFmax}

Outcome
Noise emissions will not intrude to an unreasonable degree on the Existing noise ENVIRONMENT in Rural Zones.

The Plan sets 55 dB L_{Aeq} (day time), 50 dB L_{Aeq} (evening) and 45 dB L_{Aeq} (night time) noise limits for this zone.
A maximum level of 75 dB L_{AFmax} (night time).

It is noted that the permitted noise rules require assessment at the 'Notional Boundary' which is defined in the District Plan *as a line 20 metres from and parallel to any wall of a building or any wall of a building used by a noise sensitive activity or the legal boundary whichever is closer to the building.*

7.4 Residential Zone Rule 25.1.6C

25.1.6C RESIDENTIAL ZONES

The following noise conditions shall apply to all land uses within all Residential Zones (including noise from fixed plants such as air conditioning units and other similar devices but excluding noise from emergency service facilities), other than those exempted in Rule 25.1.6B:

(a) The following noise limits shall not be exceeded at any point beyond the site boundary:

Control Hours	Noise Level
0700 to 1900 hours	50 dB $L_{Aeq\ (15\ min)}$
1900 to 2200 hours	45 dB $L_{Aeq\ (15\ min)}$
2200 to 0700 hours the following day	40 dB $L_{Aeq\ (15\ min)}$
2200 to 0700 hours the following day	70 dB L_{AFmax}

The Plan sets 50 dB L_{Aeq} (day time), 45 dB L_{Aeq} (evening) and 40 dB L_{Aeq} (night time) noise limits for this zone.
A maximum level of 70 dB L_{AFmax} (night time).

7.5 Summary of Applicable Noise Limits under District Plan

The subject site is zoned **Rural**. The *Rural* Zone noise rules permit the following noise limits at or within any other site:

- 55 dB L_{Aeq} (day time)
- 50 dB L_{Aeq} (evening)
- 45 dB L_{Aeq} (night time) and 75 dB L_{AFmax}

Adjacent sites are zoned *Residential* Zone. The *Rural* Zone noise rules permit the following noise limits at or within any other site:

- 50 dB L_{Aeq} (day time)
- 45 dB L_{Aeq} (evening)
- 40 dB L_{Aeq} (night time) and 70 dB L_{AFmax}
-

7.6 Reverse Sensitivity Rule 25.1.8.B

Rule 25.1.8B 'REVERSE SENSITIVITY EFFECTS' of the Plan specifically notes:

25.1.8B REVERSE SENSITIVITY EFFECTS

(a) Whether the design, including location, and methods and construction techniques proposed are likely to avoid or mitigate reverse sensitivity effects on the national, arterial and primary collector road network Bridge Pa Aerodrome or legitimately established commercial and industrial activities;

(b) Whether any proposed ventilation system will provide for a comfortable living environment;

(c) Whether adequate sound insulation is achieved by constructing the building to achieve the Minimum External Sound Insulation Level in all habitable spaces;

(d) Whether an Acoustic Design Report has been provided to the Council demonstrating the Minimum External Sound Insulation Level has been achieved in all habitable spaces.

(e) Whether any site screening exists such as acoustic fences or noise barriers.

As noted further below, based on the permitted noise emission levels set out in the plan at the site boundary of adjacent sites, the report indicates that typical modern construction can provided adequate sound insulation thus achieving a required Minimum External Sound Insulation Level in all habitable spaces. I do not consider that the existing activities around the site would need to amend their operations to ensure a reasonable and appropriate noise environment on the site once the residential development has been undertaken. In that context I do not anticipate any reverse sensitivity effects arising.

7.7 General Rule 25.1.8A

25.1.8A GENERAL

(a) The sensitivity of the receiving environment to the effects of the noise and the effects that noise will have on potential receivers, especially where the affected activity has a component where people need to sleep or concentrate;

(b) The likely mitigation measures to reduce noise generation;

(c) The character of the locality or activities within the Zone (including traffic and pedestrian activity) and level of background noise;

(d) The location of the activity in relation to any nearby noise sensitive activities and the extent to which the noise generated will affect the amenity values of those surrounding noise sensitive activities;

(e) The extent to which the design and location of the activity and any ancillary activities incorporate noise mitigation and management techniques to reduce noise levels;

(f) The length of time for which specified noise levels are exceeded, especially at night;

(g) Whether the activity will contribute to the cumulative effects of noise.

7.8 Hawkes Bay Regional Policy Statement

Chapter 3.0 of the Hawkes Bay Regional Policy Statement sets out the regionally significant issues, objectives and policies of the Plan which apply across the Hawkes Bay region. Section 3.5 of the Regional Policy Statement is relevant to "*effects of conflicting land use activities*".

It identifies as an issue *the occurrence of offsite impacts or nuisance effects, especially odour, smoke, dust,* ***noise****, vibrations, agrichemical spray drift and increased traffic, caused by the location of conflicting land use activities.* There are a host of accompanying explanations and reasons for this objective are –

POLICY POL 6 - ***Problem-Solving Approach– Future Land Use Conflicts: To recognise that the future establishment of potentially conflicting land use activities adjacent to, or within the vicinity of each other is appropriate provided no existing land use activity (which adopts the best practicable option or is otherwise environmentally sound) is restricted or compromised. This will be primarily achieved through liaison with territorial authorities and the use of mechanisms available to territorial authorities, which recognise and protect the ongoing functioning and operation of those existing activities.***

The accompanying explanation and reasons for this policy are (bold emphasis added): ***3.5.12- Policy 6 sets out an approach to avoid the existing level of problems arising from incompatible land uses becoming worse as a result of future decisions. In particular, this policy seeks to encompass the notion of "reverse sensitivity", recognising the rights of existing lawfully established activities.***

7.9 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.

Construction Standard ***NZS6803:1999 Acoustics Construction Noise*** applies. ***Appendix D*** contains a draft construction noise and vibration management plan (CNVMP).

7.10 Vibration

Rule 25.1.6B 'EXEMPTIONS FROM 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".***

7.11 Havelock North Residential Environmental

The Havelock North Residential Environment Chapter at ***'8.2.5N Noise'*** makes reference to Section 25.1 of the District Plan for Noise. ***Rule 25.1.5*** requires any activity meet the Noise Performance Standards for the relevant Zone in ***Sections 25.*** The overall purpose for noise management with respect to the Havelock North Residential Environment Chapter is to ensure development compatible in amenity, scale, intensity and character with residential activity and which do not undermine the integrity of adjacent sites or have adverse impacts. This will be the case for the proposed development.

8 Ambient Sound Level Sample and Existing Sound Environs

Existing ambient sound levels experienced in the local area have been taken into account as it is our observation that ambient sound levels can affect the perception of noise. Many factors affect sensitivity to noise including time of day, state of mind, and the activity being carried out when noise is experienced. Of importance is the "intrusiveness" of nuisance noise, often defined as the degree by which the normally occurring ambient sound levels are exceeded. Existing ambient sound levels experienced in the local area have been considered. ***Appendix B*** contains full details relating to background (ambient) sound level sampling.

The purpose of the noise survey was to sample typical noise emitted from adjacent sites as received on the proposed subject site i.e. assess the existing environment to quantify the existing noise effects. Three sample periods were elected, mid to late morning, later afternoon / evening and night (after 10.00pm). The summary of results is shown in **Figure 8-1** below as follows:

Period	IP1 $L_{Aeq\ (5\ min)}$	IP2 $L_{Aeq\ (5\ min)}$	IP3 $L_{Aeq\ (5\ min)}$	IP4 $L_{Aeq\ (5\ min)}$	IP5 $L_{Aeq\ (5\ min)}$	IP6 $L_{Aeq\ (5\ min)}$	IP7 $L_{Aeq\ (5\ min)}$	IP8 $L_{Aeq\ (5\ min)}$	IP9 $L_{Aeq\ (5\ min)}$
Morning 11.30am to 12.30pm	47 dB	41 dB	52 dB	49 dB	57 dB	42 dB	48 dB	43 dB	-
Afternoon 3.15pm to 4.30pm	64 dB	62 dB	53 dB	60 dB	52 dB	63 dB	56 dB	63 dB	49 dB
Night 10.30pm to 11.30pm	36 dB	35 dB	33 dB	34 dB	33 dB	34 dB	33 dB	37 dB	34 dB

Figure 8-1 Background immission point sample results (ambient background levels) October 2024.

8.2 Discussion of Measurement Results

A list of background (ambient) sound levels in the area included (but not limited to):

- Traffic on local roads, including mostly light traffic or vehicle drive by on Arataki Road (utes, cars, vans), with occasion heavy vehicles noted
- Sound associated with commercial based activities, namely sporadic noise from the Brookvale business park site– noting no noise from Arataki Honey production, Olive Grove or Shaggy Range was noted at any time of sampling
- Sounds from residential sites in the wider area i.e., sounds associated with adjacent sites and activities such as car movements, people, vehicles and residual noise; people walking dogs in the evening and kids playing on the street and
- Sounds from natural environs i.e., bird song and recreational activities, namely bird song and bird call including what appeared to be Pūkeko birds in the eastern boundary gum tree reserve strip of the subject site adjacent the commercial Brookvale business hub site interface.

- The morning sample levels taken between ~ 11.30am and 12.30pm range between **41 dB $L_{Aeq\ (5\ mins)}$ and 57 dB $L_{Aeq\ (5\ mins)}$**
    - The noise source during this period ranged from vehicle by-pass on Arataki Road, through to birdsong on the subject site. Some impact metal on metal and hitting sounds were also noted during this site visit from the Brookvale business hub site. At one point some faint ground-based aircraft noise was just audible. Some residential activity was noted in dwellings along Arataki Street for example a person in their garden. Overall levels were fairly steady when traffic movements were not involved from surrounding area.
- The afternoon sample levels taken between ~ 3.15pm and 4.30pm range between **49 dB $L_{Aeq\ (5\ mins)}$ and 64 dB $L_{Aeq\ (5\ mins)}$**
    - The noise source during this period ranged from vehicle by-pass on Arataki Road, through to birdsong on the subject site. Some impact metal on metal and hitting sounds were also noted again, as was some pressure washer noise from the Brookvale business hub site. Vehicle movements were also noted from the business park. Some residential activity was noted in dwellings along Arataki Street for people on site for example in their open garage and people walking down Arataki Street (walking dogs)
    - Overall, the afternoon levels were steady and the most noted activity was light traffic by-pass with the occasion heavy vehicle or truck. Overall levels were fairly steady when traffic movements were not involved from surrounding area.
- The night sample levels taken between ~ 10.30pm and 11.30pm range between **34 dB $L_{Aeq\ (5\ mins)}$ and 37 dB $L_{Aeq\ (5\ mins)}$**
    - The noise sources during this period were very low. No commercial activity or noise noted.
    - Overall, the nighttime levels were steady and low level.

Our assessment is that existing noise sources identified in **Figure 8-1** give rise to very intermittent noise effects from the adjacent commercial Brookvale business hub site, and only during the daytime. From direct observation any noted noise from the Brookvale business hub site was generally sporadic and limited in both level and duration, noting most activity appeared to be indoors.

There is vehicle by-pass from traffic in the surrounding area which also increase sample levels, however overall, the scale and nature of the existing background sound levels would not preclude the use of the area for residential use. Where sampled levels were noted as being above 50 dB $L_{Aeq\ (5\ min)}$ this was due to vehicle movements on public roads (not adjacent commercial site activity).

Overall background sound level samples were deemed typical for this area being a residential interface with rural and commercial in the wider area.

9 Assessment

The assessment below has considered both direct noise effects on people in their setting adequate to protect human health and amenity, whilst also dealing with the potential for reverse sensitivity effects for established land uses in the area including adjacent commercial businesses.

9.1 Noise Emission Assessment: Noise Emitted from Subject Site (Direct Noise)

The subject site currently contains limited noise sources and has a modest to low ambient sound climate eminently suited to sensitive land uses such as residential activities.

The main noise sources associated with the site, proposed activities and new dwellings are:

1. **Vehicle movements** new internal roads built within the subject site and onto the wider existing roading network. The expected vehicle movements[7] once the development is operational will contribute to change (a small increase – albeit minor) in noise level.
2. **Fixed Plant** from heating, ventilation or air conditioning. When dwellings are established on site, they will likely have residential size fixed plant. This can be suitably designed, specified, placed and operated to comply with the permitted boundary noise limits. In cases where mitigation could be required this can be introduced via various mitigation measures (if required).
3. **Typical residential sound** from day-to-day activity such as lawn mowing, gardening, people, house maintenance etc. The day-to-day activity from each dwelling would be expected to be reasonable and compliant when suitably managed by the home owner. The closest residential sites are those on the opposite side of Arataki Road being dwellings adjacent to the western interface of the site. These sites would not be likely to experience any noticeable noise effects due to the residential activities being proposed.
4. **Temporary construction noise** from the construction of site would be typical of residential developments across New Zealand. However. The proposed development will involve temporary construction-related noise—including site enabling, preparation, roading, and earthworks which I recommend be measured, assessed, and managed in accordance with *NZS 6803:1999 Acoustics – Construction Noise.* Most nearby dwellings, except for three, are separated from the site by Arataki Road, which acts as a natural noise buffer. The three adjacent properties are *96 Arataki Road, 160 Arataki Road; and 104 Arataki Road (Shaggy Range occupants).* To minimise noise impacts, so as to ensure noise effects are reasonable at all sites, best-practice mitigation measures should be implemented. These include adhering to standard construction hours (7:30am– 6:00pm Monday to Saturday) and developing a site-specific *Construction Noise and Vibration Management Plan (CNVMP).* **Appendix D** contains a draft construction noise and vibration management plan (CNVMP).
5. **Temporary Construction Vibration** is a subset of construction works. The goal of controlling construction vibration is to prevent damage to nearby buildings, structures, and services. Vibration generation and propagation are highly site-specific, influenced by factors such as local geology, the type of equipment used, the nature of the work, and even the operator. Given the nature and scale of the proposed works, the expected construction equipment and methods as well as the available offset distances, compliance with the recommended vibration criteria outlined in *DIN 4150-3:2016 Vibration in Buildings – Part 3: Effects on Structures* is anticipated.

The proposal is to establish residential dwellings with associated services. It is our assessment that the noise emission standards of the Hastings District Plan can be fully complied with, taking into account the proposed structure plan layout and the fact that residential uses in themselves are not inherently noisy. "Direct" noise effects emitted from the subject site relates to noise arising from residentially based activities. This would be as a result of noise associated with people, vehicles, fixed plant (HVAC) home equipment (lawn mowers etc), pets, etc. and may include noise created by vehicle movements.

Overall noise effects arising from the proposed residential activities are considered able to be adequately controlled and managed so to comply with the operative noise limits set out in Hastings District Plan. The subject site is not likely to be a source of significant noise emission. Thus, overall, our assessment is that the direct noise effects arising from the proposed residential use of the land will be acceptable for residential development.

9.2 Noise Immission Assessment: Noise Received from Adjacent Sites on the Subject Site

Actual or potential adverse noise effects due to noise from adjacent activities, received within the proposed subject site could occur, where the received levels are sufficiently high enough to trigger concerns at the subject site.

[7] NZTA Report 'Trips and parking related to land use' dated November 2011

It is generally accepted that reverse sensitivity guidelines are commonly applied in what the author refers to as 'high noise areas' or 'high noise environs'—such as established or new residential or other noise-sensitive sites located near major noise sources like airports, state highways, railways, roads, quarries, or other high-impact noise-generating activities. However, such assessments are typically made on a case-by-case basis, depending on the specific relationship between the adjacent activities. In the author's view, the subject site or particular area does not qualify as a high noise impact or high noise environment.

As discussed above, I have considered the interface between existing activities in the vicinity of the site and the proposed residential development. For the reasons outlined, I am of the view that the existing activities and the incoming residential use will be compatible and able to coexist without generating adverse effects for future residents or reverse sensitivity effects on neighbouring activities.

Based on my review of the key adjacent sites, including the Brookvale Business Hub, Arataki Honey, Olive Grove, and Shaggy Range, the noise levels and associated plant at these locations appear typical for operations of this nature and scale. The Brookvale Business Hub and Arataki Honey sites feature large sheds used for storage, production, and packing, with the majority of plant located indoors. Shaggy Range is well designed and operates under a Noise Management Plan and other controls to manage potential noise effects.

9.3 NZS 6802:2008 Guideline Health and Amenity Value

New Zealand Standard NZS 6802:2008 *"Acoustics - Environmental Noise"* recommends for its upper limits for the protection of health and amenity value 55 dB L_{Aeq} day and 45 dB L_{Aeq} night. These are exterior levels at the site boundary. The limits are set to protect the majority of people from being annoyed. Clearly any limit cannot protect the entire population from noise effects or annoyance however the level of 55 dB L_{Aeq} during the day and 45 dB L_{Aeq} night are commonly adopted thresholds.

9.4 Reverse Sensitivity

It is understood existing case law establishes reverse sensitivity as an "effect" under the Resource Management Act. Council has a duty to manage noise effects in the district. This involves reverse sensitivity noise and vibration effects to be assessed. Reverse sensitivity may potentially arise where newly proposed sensitive activities are introduced to an environment. Under the proposal here noise sensitive residential activities will be established on sites within proximity to established commercial or non-residential activities. Accordingly, as part of the subject site fast track application, assessment of reverse sensitivity effects on adjacent sites (commercial and agriculture) has been undertaken.

It is widely acknowledged reverse sensitivity may potentially arise where noise from existing activities adversely affects newly established noise-sensitive activities. Case law such as *Affco New Zealand v Napier City Council* (Environment Court Wellington, W082/2004) found that reverse sensitivity effects may arise where an ***"established use may be required to restrict its operations or mitigate its effects so as to not adversely affect the new activity".***

In terms of land use compatibility, the adverse effects of primary concern are the noise effects directly on the health and amenity of people, including in their places of sleep, rest relaxation or enjoyment of outdoor areas.

No adjacent commercial sites operate at night, hence the low sampled levels of between **34 dB $L_{Aeq\ (5\ mins)}$ and 37 dB $L_{Aeq\ (5\ mins)}$** which are typical for a residential area or zone throughout New Zealand which sits on the edge of a rural area. We are also not aware of any noise issues or complaints with the existing interface dwellings in Arataki Road based on noise emitted from adjacent sites, for example Arataki Honey which is located directly across the road from existing dwellings in Arataki Road.

For the reasons set out above with respect to the business park, doggy daycare and Olive Grove, I consider the incoming residential development will not give rise to any reverse sensitivity effects.

10 Mitigation

Our assessment is no special mitigation measures[8], other than modern building specifications for sound insulation ratings and techniques are deemed necessarily for noise purposes. Further comment is provided as follows.

10.1 Set Backs, Bunds and Acoustic Fencing

Additional mitigation measures along the boundary interface such as setbacks (to achieve buffer distances), acoustic fencing or bunding are not deemed necessary for this site to ensure the subject site receives a reasonable level of noise. Nevertheless, as part of the wider project development a 2.0m high acoustic grade fence and 10m wide rural / urban transition buffer will also be in place along the shared boundary of the subject site and Olive Grove.

10.2 Sound Insulation of Typical Modern Dwelling

In addition to the District Plan noise limits, which sets levels at the boundary outdoors, the World Health Organization (WHO) Guidelines for Community Noise and other acoustic standards recommends 30 dB L_{Aeq} **inside** bedrooms to minimise the onset of sleep disturbance. This limit is in line with New Zealand Standard NZS 6802:2008 "Acoustics - Environmental Noise" and Australian/New Zealand Standard AS/NZS 2107:2010 "Acoustics - Recommended design sound levels and reverberation times for building interiors.

When suitable typical modern residential dwelling specifications and techniques are adopted (and permitted noise levels are achieved at the zone interface) internal levels of 30 dB L_{Aeq} can be anticipated to be achieved for the new proposed dwellings on the development. Accordingly, there is no reason why the proposed dwellings located on the new residential lots adopting typical modern construction methods and materials cannot be designed and specified to ensure suitable sound insulation values that result in suitable internal levels of sound with typical modern building specifications and techniques.

WHO recommends 45 dB L_{AFmax} inside bedrooms to minimise the onset of sleep disturbance. The *Guidelines for Community Noise* notes that to avoid sleep disturbance, guidelines for community noise should be expressed in terms of equivalent sound pressure levels (L_{Aeq}) as well as $L_{AFmax.}$ This is because it is not enough to characterize the noise environment in terms of noise measures or indices based on energy average summation (L_{Aeq}) alone, because different critical health effects require different descriptions.

It is noted that noise limits of up to 55 dB L_{Aeq} (day time) and 45 dB L_{Aeq} (night time) are commonly adopted across New Zealand in District Plans for residential zones (providing for traditional single-house residential activity such as that being proposed) at the interface with business or industrial zones, and rural zones. As noted in New Zealand Acoustic Standards such noise levels represent the upper noise limits for traditional residential development requiring an adequate level of outdoor amenity. There are various examples in the district that have residentially zoned sites (and zone interfaces) which lie adjacent to Rural sites or commercial areas and co-exist.

The development is only at high level and as such no details on specific construction or specifications relating to the use of the lots are known. We can however provide *generic* observations with respect to sound insulation of 'typical modern' construction dwellings and what expected internal levels may result from their construction based on the external noise limit set in the Plan. All building and homes including the elements that make up the façade such as walls, windows and roof, reduce noise to some degree. Certain elements, dwelling designs and specifications are more effective at reducing external airborne noise, this will depend on various factors such as its mass for example.

The performance requirements of New Zealand Building Code (G6) do not set standards for the facade of the building from outside noise. The Building Code currently only sets standards and performance requirements for inter-tenancy walls and floors. However, the Building Code does set performance standards for thermal performance of the building envelope.

[8] Although the application proposes acoustic fencing along the boundary with the Olive Grove.

Based on the author's experience and research, modern constructed dwellings that achieve the minimum thermal performance requirements of the New Zealand Building Code would be expected to achieve a sound reduction from outside to inside of approximately 25 to 30 dB with all windows and doors closed. This is a conservative value. This means for 'typical standard modern dwellings' of this nature it is not unreasonable to adopt a total predicted sound insulation rating of 30 dB[9] for the façade[10]. Applying a conservative reduction of 30 dB by the building façade and assuming 55 dB L_{Aeq} during the day, 50 dB L_{Aeq} evening and 45 dB L_{Aeq} night the following external to internal level difference results:

55 dB $L_{Aeq\ permitted\ outdoors}$ – 30 dB $_{(building\ facade\ sound\ reduction)}$ = 25 dB $L_{Aeq\ (indoors)}$. **(Eq 1)**

50 dB $L_{Aeq\ permitted\ outdoors}$ – 30 dB $_{(building\ facade\ sound\ reduction)}$ = 30 dB $L_{Aeq\ (indoors)}$. **(Eq 2)**

45 dB $L_{Aeq\ permitted\ outdoors}$ – 30 dB $_{(building\ facade\ sound\ reduction)}$ = 15 dB $L_{Aeq\ (indoors)}$. **(Eq 3)**

At night, the sound pressure levels at the outside façades of the living spaces should not ideally exceed 45 dB L_{Aeq} so that people may sleep with bedroom windows open. The Plan currently sets a limit of 45 dB L_{Aeq} at night. These values can be obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB i.e.

45 dB $_{Exterior\ Incident\ Sound\ Level}$ – 15 dB[11] $_{Façade\ reduction\ (windows\ open\ for\ ventilation)}$ = 30 indoors (**Eq 4)**.

As noted above the actual sampled background levels were 10 dB lower at night than the permitted 45 dB at around 35 dB which indicates suitable internal sound levels for health, amenity and sleep protection at night can be achieved with a large safety margin. The results from the survey show background levels for the area are not high, including at night.

10.3 Temporary Construction Noise and Vibration Mitigation (CNVMP)

A draft Construction Noise and Vibration Management Plan (CNVMP) has been prepared and is attached to ***Appendix D***. I recommend updating this plan once the final construction methodology is determined and as needed throughout the various construction stages. In my view, the CNVMP and its implementation 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. In my view it has been deemed necessary to produce a section of the CNVMP that is specific to the adjacent dwellings located at 96 Arataki Road, 160 Arataki Road; and 104 Arataki Road (Shaggy Range occupants). Annex E2 of NZS 6803:1999 Acoustics – Construction Noise outlines the minimum information requirements for a CNVMP which the draft plan is based on.

11 Qualifications of Technical Review

This acoustic report is produced by Dcibel Limited solely for the benefit and use by the client in accordance with the terms of the engagement relating to the nature and scale of the specific site and activity. This report and any conclusions drawn or recommendations should not be used or applied at any other site, or activity (even if similar). The conclusions and results are specific to this site and location / design / orientation /listed noise sources and a host of other variables such as distances, construction, site and geometry relative to the receiver sites.

Lindsay Hannah.

Lindsay Hannah

Dcibel Limited

16 July 2025

[9] $D_{2m,nT,w} + C_{tr} > 30$ dB (with all doors and windows closed)
[10] The façade is any part of the building that is an incident sound path of external element to incident sound such as (but not limited to) floor, wall, roof, ceiling, windows.
[11] The 15 dB reduction is indicative only. Depending upon the final dwellings specifications, location and design to enable the windows to be needed to closed to achieve the required internal levels thus a mechanical fresh air ventilation system (as a minimum) and air conditioning (for thermal comfort) may be required.

APPENDIX

A

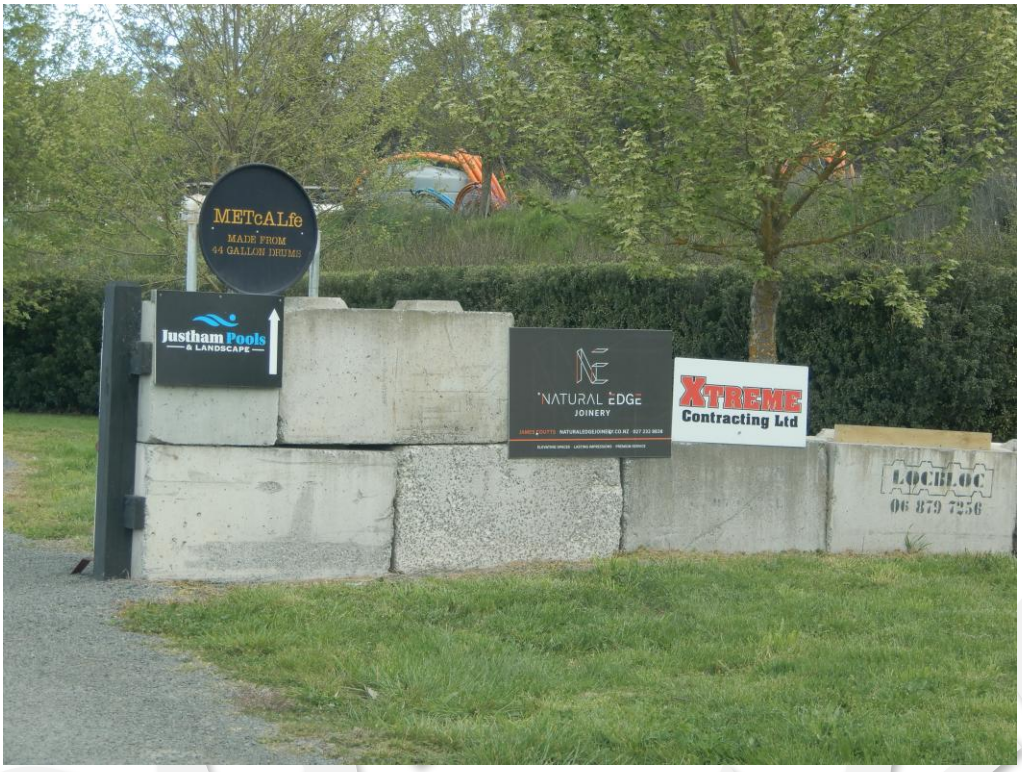
PHOTO SET

DCIBEL LIMITED
Acoustic Consultants

Photos taken 5th October 2024


NOTICE
CAUTION
BEE FLIGHT AREA


20
SPEED LIMIT
TRESPASSERS WILL BE PROSECUTED
onside
BROOKVALE ROAD NURSERY
Have you checked in?
WARNING
THIS WORKPLACE IS A HAZARDOUS AREA
DO NOT ENTER
WITHOUT PERMISSION AND NOTIFICATION OF THE HAZARDS


METcALfe
MADE FROM
44 GALLON DRUMS
Justham Pools
& LANDSCAPE
NATURAL EDGE
JOINERY
XTREME
Contracting Ltd
LOCBLOC
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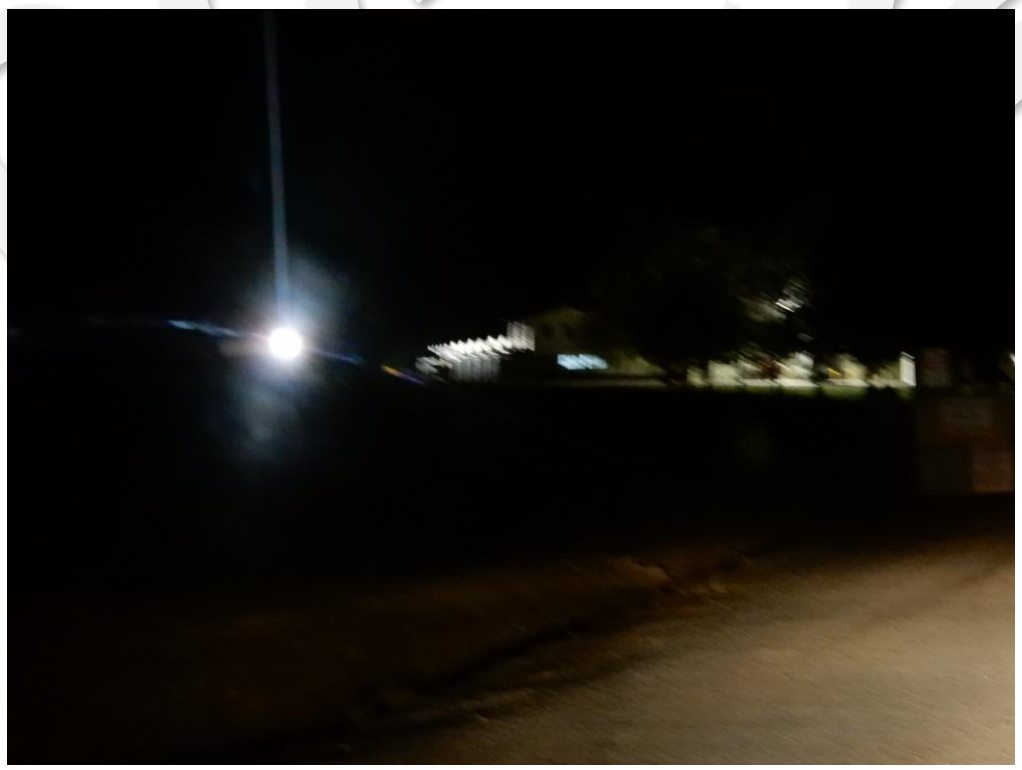


APPENDIX

B

ACOUSTIC SURVEY DETAILS

DCIBEL LIMITED
Acoustic Consultants

The following sets out the information relating to the site visit and acoustic measurements:

11.1 Data and Time

Specially commissioned acoustic measurements were carried out on the Friday 4th October 2024 between 11.00am and 11.30pm.

11.2 Measurement Locations

Measurements were under taken at the several locations within the immediate surrounding the proposed subject site including on site and at key interfaces.

11.3 Monitoring Personnel

All acoustic monitoring was conducted by Lindsay Hannah, Principal acoustic engineer of Dcibel Limited.

11.4 Acoustic Standards

All sound levels were measured and assessed in accordance in general accordance with the technical guidance set down in ***NZS6801: 2008 Acoustics – Measurement of Environmental Sound*** and ***NZS6802:2008 Acoustics - Acoustics Environmental Sound*.**

11.5 Calibration Certification

The NTI measurement system platforms hold current calibration certification.

11.6 Weather and Environmental Conditions

The weather during the event was within the require met window of ***NZS6801: 2008 Acoustics – Measurement of Environmental Sound*** with nil winds or precipitation and still warm, humid temperature.

11.7 Field Monitoring Equipment

All sound level background sound levels measurement were undertaken using NTI measurement system platforms. An NTI XL-2 Type Approved Sound Level Meter analyser with 1/1 and 1/3 third octave analysis was adopted. The sound level meters are both Type/Class 1 specifications for precision grade sound level meters. Field calibration was checked before and after the measurement sets.

The following settings were employed;

- A weighting (dBA), Fast response;
- Time varying and Z- weighting (un-weighted (dBZ)) employed for 3rd octave band analysis;
- Measurement Metrics: L_{Aeq} (with octave analysis);
- Octave Filters (1/1 and 1/3 octave analysis);
- Measurement Period: 5 minutes

The following sets out the sound level measuring equipment used for the compliance measurements and related data.

11.8 Measurement Equipment (Bruel and Kjaer Measurement Platform)

NTI XL-2 Type Approve Sound Level Meter	NTI XL-2 Type Approved Sound Level Meter Sound Level Meter complying with IEC 61672-1 Class 1, and IEC60651 Type 1 and IEC60804 Type 1 and IEC61260 Class 1 specifications for Sound Level Meters. Type approved microphone. **IANZ Lab Calibration Due 08-03. 2025**	
Norsonic Calibrator Type 1256	Norsonic Calibrator Nor1256 Calibrator Type 1256 94 dB @1000Hz 114dB @1000Hz	
Bruel and Kjaer Calibrator Type 4230	Bruel and Kjaer Calibrator Bruel and Kjaer Calibrator Type 4231 94 dB @1000Hz.	
Wind Screen	90 mm Foam Wind Screen type UA237	

Table 11-1 Summary table of measurement equipment: NTI Measurement Platform.

11.9 Auxiliary Equipment Platform (Navigation, Weather and Environment)

Hand Held Digital Anemometer	Skywatch Xplorer 2 JD Instrument	
Garmin GPS Unit	Garmin GPS 60 Navigator	
Hand Held Stablia Laser Distance Measure	LD420 100m range	

Table 11-2 Summary table of auxiliary measurement equipment – navigation, weather and location

11.10 Noise Assessment Locations for Subject Site – Acoustic Survey

Figure 11-1 Background immission point sample locations for ambient background levels.
Reference: Base map Hastings Council District Council GIS Planning Maps.

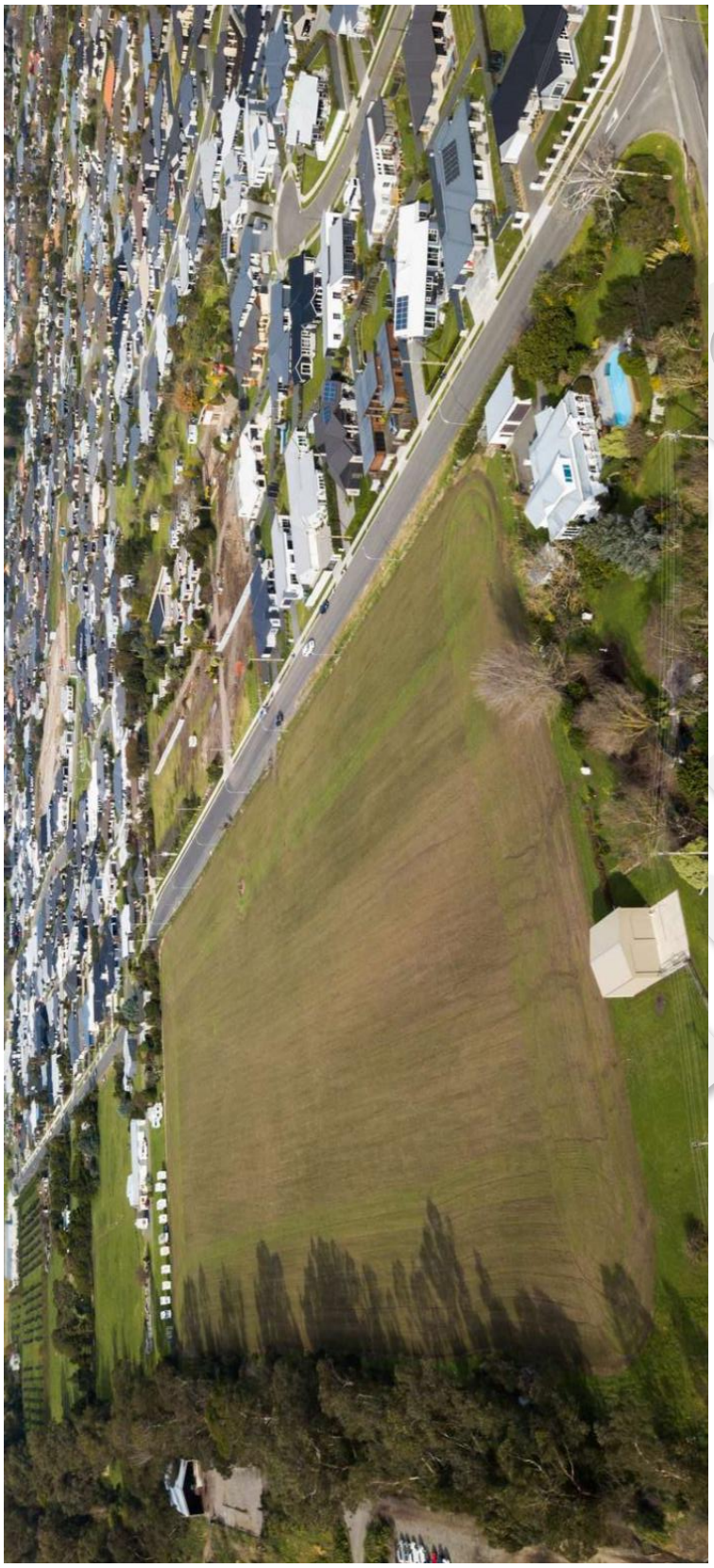
APPENDIX

C

AERIAL PHOTO

DCIBEL LIMITED
Acoustic Consultants

Aerial: Source: https://www.raywhite.co.nz/hawkes-bay/hastings/havelock-north/HVN20592/



APPENDIX

D

CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN (DRAFT)

DCIBEL LIMITED
Acoustic Consultants

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

DRAFT CNVMP

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Document Information

Prepared for	CDL Land NZ Limited
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File Reference	dB0119058_CNVMP_Arataki Road__Draft_16 July 2025
Job Reference	dB0119058-FMR0422_V8-FT-CNVMP
Date	16 July 2025
Version Number	8.0

Author:

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Principal Acoustic Engineer

M.A.S.N.Z (M1202HL). M.I.E.H.

MPhil (Sc) (Dist). Acoustics

Post Graduate Diploma Science (Dist)

Bachelor Building Science (BBSc)

Effective Date 16/07/2025

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
5.0	28 April 25	Draft review	Updated Draft (client rvw No 1)	Draft 5.0
6.0	9 May 2025	Draft review	Updated Draft (client rvw No2)	Draft 6.0
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

DRAFT CNVMP

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.

DRAFT CNVMP

Table of Contents

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**

DRAFT CNVMP

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.

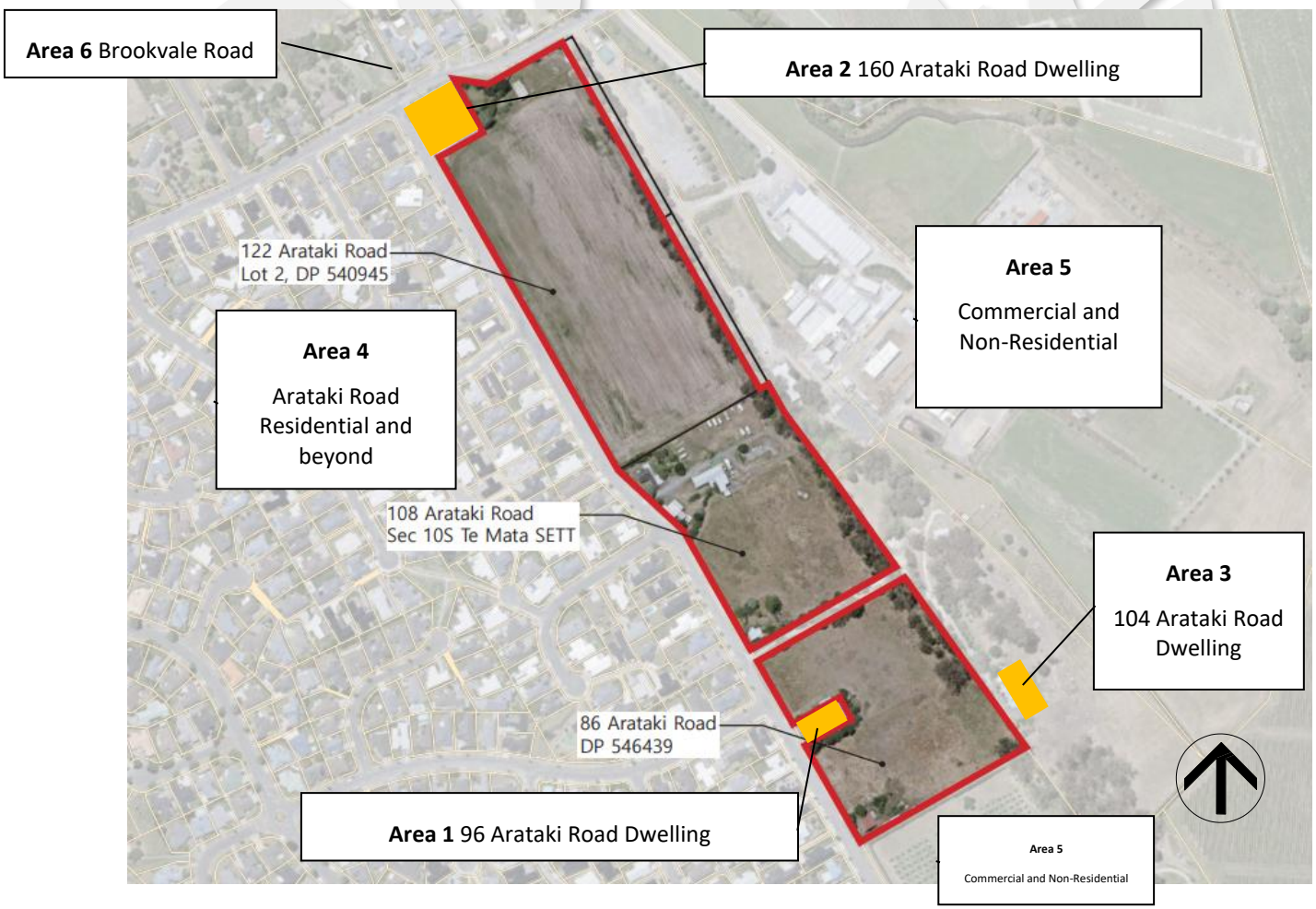
4. **Construction of dwellings**

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**

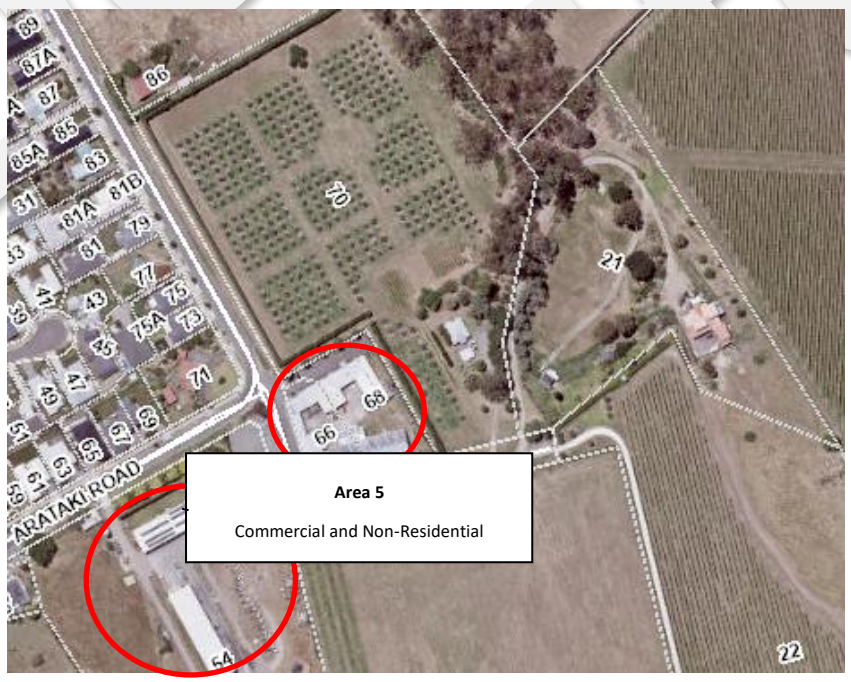
- **Area 5 – Commerical and Non Residentail**

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

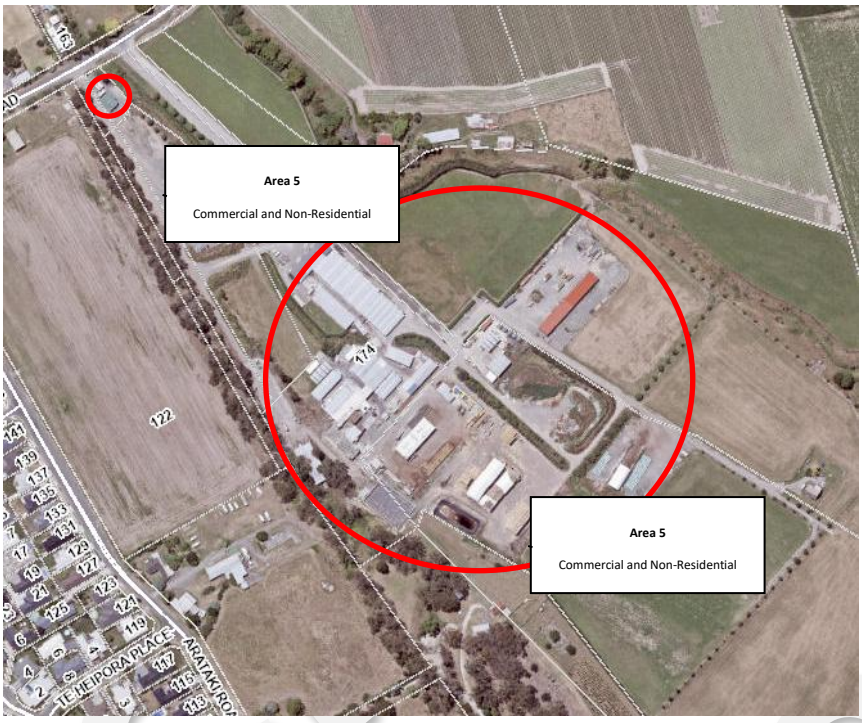
  - *The Grove:* The distance between the construction site boundary and Grove building site buildings is over **150m**

    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

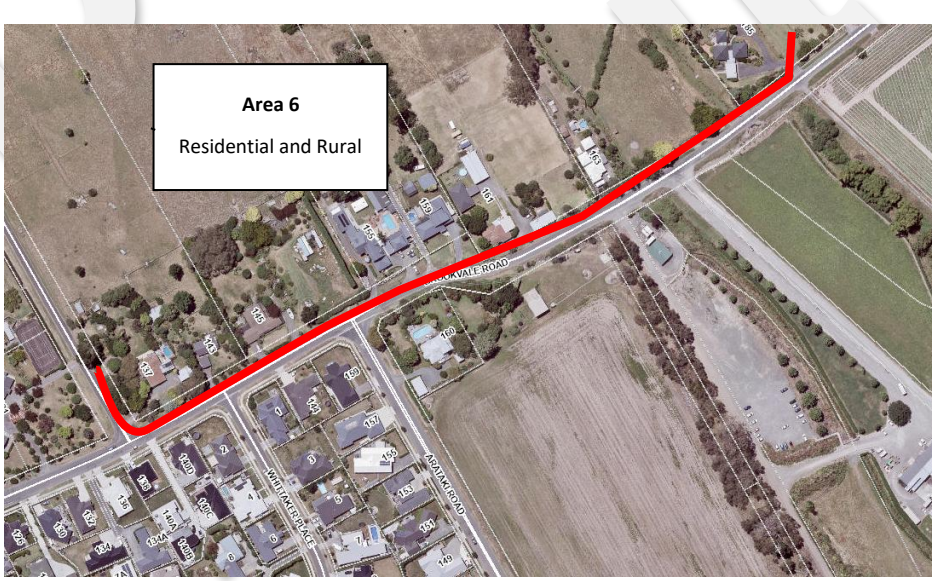
  - *Arataki Honey:* The distance between the construction site boundary and Arataki Honey site buildings is over **150m**



- *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

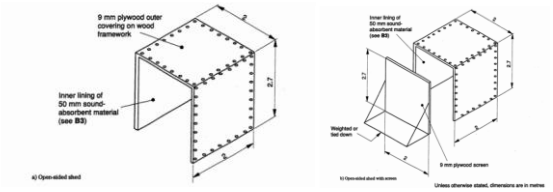
The Consent Holder and Noise Liaison Manager must ensure, if combustion engine chainsaws are used for vegetation removal, that this must only occur after 8:30a.m, Monday to Friday.

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


CDL LAND
NEW ZEALAND LIMITED
D
DCIBEL LIMITED
Acoustic Consultants

1. My full name is Lindsay John Hannah.

2. I am the Principal Acoustic Engineer of Dcibel Limited Acoustics.

3. I hold a Master's Degree specialising in Acoustics from Massey University.

4. I hold a Post Graduate Diploma in Science. Both by Masters and Post Graduate qualifications were awarded with distinction.

5. I hold a Bachelor of Building Science Degree from Victoria University School of Architecture and Design.

6. I also hold various other qualifications in acoustics including the '*Technical University of Denmark Specialist Sound Insulation Course*' and specialist full year acoustics course taught at Massey University '*Bio-physical effects of noise, vibration and electrometric radiation*'.

7. I have been involved with the prediction, measurement and assessment of building acoustics and environmental noise from a range of developments across New Zealand and overseas on a continuous basis for over 25 years.

8. I have been responsible for acoustics assessments and design for numerous different activity and project types nationwide and overseas including residential, industrial and commercial.

9. I also in experience in noise control engineering and design works, including building acoustics.

10. I was the Lead of Acoustics at a global infrastructure and environmental company called Cardno (now Stantec) operating in over 100 countries. I have worked at other specialist consultancies and roles that specialise only in acoustics, including the Specialist Acoustic Consulting Firm Malcolm Hunt Associates where I was a consultant for over 20 years.

11. I have been employed by Massey University where I held the position as Adjunct Lecturer for a period or around 5 years teaching a host of areas including acoustics, building, health and architecture.

12. I am the current Editor in Chief of 'New Zealand Acoustics' the only New Zealand acoustics Journal, a position I have held for over 10 years.

13. I was until I resigned in 2022 an elected board member of the New Zealand Acoustical Society a position I held since 2008, a total of over 10 years' service as a board member / officer of the society.

14. I have authored close to 30 specialist acoustic papers which have been published both in the New Zealand Acoustical Journal as well as published internationally, including in the International Acoustics Journal produced by the Institute of Acoustics (IOA), United Kingdom.

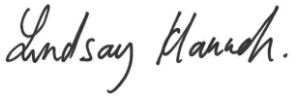
15. I am a full member of the New Zealand Acoustics Society[1], with a requirement of Full Membership being that I satisfy the Society's two-yearly requirements in regard to continuing professional development (CPD) for both on-going education and development in the field of acoustics. My membership is fully up to date.

16. I have been on various acoustic committees and boards for example the Waka Kotahi (NZTA) Steering Committee *'Community Response to Transport Noise Exposure in New Zealand (ART 19/27)'.* I was a founding Committee Member and Treasurer of the Wellington Audio Society, established in 2006. I have been a past member of the New Zealand Planning Institute.

17. I have been awarded the *I.H.R.A.C.E Prize* from the Council of the Institute of Heating, Refrigeration and Air Conditioning Engineers of New Zealand. I was also awarded the *New Zealand Institute of Architects Prize* by the Council of New Zealand Institute of Architects.

18. I confirm that other than when I state I am relying on the advice of another person, this reporting is within my area of expertise.

19. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.



16 July 2025

[1] NZAS Membership Number M1202HL