



DRAFT CNVMP

RESIDENTIAL DEVELOPMENT MIDDLE ROAD PROJECT

PREPARED FOR
CDL Land New Zealand Limited

DATE
20 August 2026

Construction noise and vibration management plan prepared by Styles Group for CDL Land New Zealand Limited.

REVISION HISTORY

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1.0 Introduction

CDL Land New Zealand Limited has engaged Styles Group to prepare a draft Construction Noise and Vibration Management Plan (**CNVMP**) for the construction of the Middle Road residential Development at 92, 108, and 148 Middle Road and 139 Te Aute Road in Havelock North (the **Site**).

The objectives of this CNVMP are to:

1. Set out the procedures to identify and adopt the best practicable options for minimising adverse construction noise and vibration effects on neighbours.
2. Define the procedures to be followed to ensure that the project construction noise and vibration limits are complied with.

This CNVMP has been prepared in accordance with the project conditions, Appendix E of NZS 6803:1999 *Acoustics – Construction noise* and the Association of Australasian Acoustical Consultants *Guideline for interpreting and applying NZS 6803:1999*.

This CNVMP must be certified by Hastings District Council (**HDC**) before any construction works begin on the Site.

A glossary of the acoustical terms used in this document is provided as Appendix A.

2.0 Contacts

The contact for queries or complaints regarding the project, and the Site Manager responsible for implementing this CNVMP is:

To be completed

The consultant engaged to provide construction noise and vibration monitoring and advice is:

Styles Group Acoustics & Vibration Consultants ph: 09 308 9015

3.0 Project conditions

The project conditions relevant to construction noise and vibration emissions are reproduced in full in Appendix B.

A summary of the applicable limits is provided in Sections 6.0 and 7.0 of this CNVMP.

4.0 Best practicable options

The best practicable options (**BPO**) as referred to in this CNVMP are the mitigation and management interventions that the contractor must put in place to reduce noise and vibration levels and manage the effects on neighbours to ensure they are 'reasonable'.

For the purpose of this CNVMP, construction noise and vibration emissions can be deemed to be reasonable where they comply with the project conditions (see Sections 0, 6.0 and 7.0).

The BPO for construction activities during this project may include one or more of the following mitigation measures. These measures are detailed further in this CNVMP.

- Physical noise mitigation – provided it makes a noticeable difference e.g. noise barriers or shrouds, location/orientation of plant, using alternative machinery or methods.
- Applying minimum setback distances for high noise and vibration generating activities.
- Communication with neighbours to advise them of the peak times for noise and vibration and to understand their concerns and any sensitivities.
- A clear and effective procedure for receiving and responding to any noise and vibration complaints.
- A procedure for training site personnel to ensure they understand the effects noise and vibration can have on the neighbours.

Where a mitigation measure required by this CNVMP includes 'where practicable', the Site Manager identified in Section 2.0 will evaluate the following before determining practicability:

- a) Whether the mitigation will result in a noticeable reduction in construction noise or vibration for the affected Receivers.
- b) The availability of alternative machinery.
- c) Whether specifications can still be achieved using alternative plant or methodologies.
- d) Whether adopting the mitigation or alternative methodologies would result in delays to the works programme.
- e) Whether adopting the mitigation or alternative methodologies would result in significant cost.

5.0 Construction work hours and scheduling

Construction works involving machinery and truck movements must only be undertaken on Monday to Saturday, between 7:30 am and 6:00 pm.

No noisy activity is permitted on the Site at night or on Sundays.

Activities such as site inspections, meetings, and administration can be undertaken on site at any time.

Quiet internal works such as internal plastering and painting can be undertaken at any time if they do not generate any audible noise at the neighbouring sites.

The programme of construction works is set out in Table 1.

Table 1: Programme of works

Activity	Time frame
Total duration from start to completion	Approximately four years
Duration of site clearance and earthworks	Approximately 19 months
Remainder of works including concrete pours, building construction, internal fit out and landscaping.	Approximately 29 months

6.0 Project construction noise limits

This section summarises the project construction noise limits. The construction noise limit conditions are reproduced in full in Appendix B.

All construction noise must be measured and assessed in accordance with the New Zealand Standard NZS 6803:1999 *Acoustics – Construction noise*. This means the noise limits apply at 1 m from the façade, and 1.2 to 1.5 m above the relevant floor level, of any building that is occupied during the works. The noise limits do not apply at unoccupied buildings.

The relevant project construction noise limits between 7:30 am and 6:00 pm on Monday to Saturday are 70 dB L_{Aeq} and 85 dB L_{Amax} .

Construction noise must not be generated outside the hours of 7:30 am to 6:00 pm on Monday to Saturday.

The L_{Aeq} is the average noise level over time (usually 15 minutes).

The L_{Amax} is the loudest sound during the same time period.

See Appendix A for further information.

7.0 Project construction vibration limits

This section summarises the project construction vibration limits. The construction vibration limit conditions are reproduced in full in Appendix B.

All construction vibration must be measured and assessed in accordance with DIN 4150-3:2016 *Vibrations in buildings – Part 3: Effects on structures* (**DIN 4150-3:2016**).

The project vibration limits are set out in Table 2.

Table 2: Project construction vibration limits

Receiving building	Vibration limit
Occupied buildings	2 mm/s PPV within any occupied building where this limit can be complied with by adopting the vibration mitigation measures outlined in Section a). <u>otherwise</u>
	5 mm/s PPV within any occupied building subject to the following criteria being satisfied: 1. The following information must be provided in writing to the building occupants no less than three days before the works that will exceed 2 mm/s PPV begin: a) The dates and approximate times for the highest levels of vibration. b) A phone number and contact person for any questions or to advise of any sensitive times for construction vibration during the day. 2. A record of any consultation with the building occupants must be maintained and provided to Hastings District Council if requested within six months of earthworks being completed.
All buildings	The guideline vibration values provided by DIN 4150-3:2016 (outlined below).

The guideline values of DIN 4150-3:2016 referenced in Table 2 are designed to avoid minor building damage, such as cracks forming or expanding in plaster.

The Standard uses a three-tiered classification system for buildings according to their susceptibility to vibration damage, as follows:

Line 1: Buildings used for commercial purposes, industrial buildings and buildings of similar design (Line 1);

Line 2: Dwellings and buildings of similar design and/or occupancy (Line 2);

Line 3: Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value e.g. buildings listed buildings under preservation order (Line 3).

The guideline values are also determined by the frequency and the nature of the vibration (short-term or long-term). The short-term vibration limits of the Standard should be applied unless measurements demonstrate that the vibration is producing resonance in the structure, or it is occurring often enough to cause structural fatigue.

The applicable limits also depend on whether the vibration is measured and assessed at the foundations of the building or at the upper level. The Standard should therefore be referred to in full when being applied. A suitably qualified structural expert should be consulted if there are concerns about a building being particularly sensitive to vibration, or where the DIN 4150–3:2016 classification of the building requires confirmation.

The DIN 4150–3:2016 frequency-dependant guideline values for short-term vibration measured at the foundations of the building are illustrated in Figure 1.

Construction vibration measured in residential, commercial, and industrial buildings is typically less than 50 Hz. It occurs for a limited duration, and it does not often produce resonance in low rise structures. The Line 2 criteria typically apply at residential dwellings.

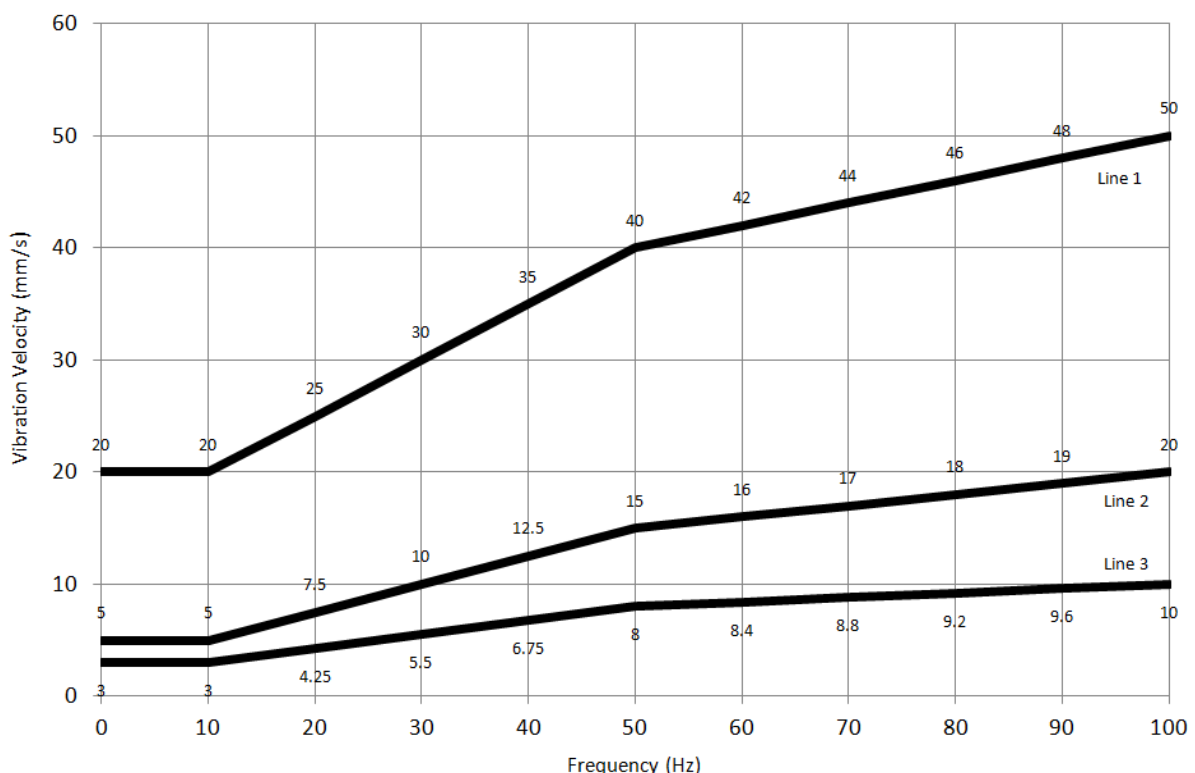


Figure 1: DIN 4150–3:2016 guideline values for short-term vibration

8.0 The neighbouring sites

Figure 2 identifies groups of dwellings within approximately 50 m of the Site. Table 3 displays the individual properties within each group.

The properties identified in Table 3 require notification of the project before construction works begin – in accordance with Section 9.0.



Figure 2: Groups of dwellings within 50 m of the Site

Table 3: Dwellings within approximately 50 m of the Site

Receiver group (Figure 3)	Addresses	Description
A	4-32 Upham St (even numbers) 63, 67, 69, and 92 Te Aute Rd	Dwellings. North and northeast of the Site.
B	80, 84 Middle Rd	Dwellings. Northeast of the Site.
C	99-109, 115-127, 121B, and 147-151 Middle Rd (odd numbers) 1A Breadalbane Rd	Dwellings or sites under development. East of the Site.
D	129-143 (odd numbers), 157, and 159 Middle Rd	Dwellings or sites under development. Southeast of the Site.
E	150 Middle Rd 147, 167, and 169 Te Aute Rd	Dwellings to the south and west. 147 Te Aute Rd contains the Village Baptist Church.
F	122 and 150 Te Aute Rd	Dwellings to the north, northwest, and west of the Site. 122 Te Aute Rd contains a retirement village.

9.0 Community liaison

The occupants of all buildings within 50 m of the works (identified in Table 3) will be provided the following information by letter drop at least 10 working days before any construction works begin on site.

- A brief overview of the works
- The expected start date, working hours, and approximate duration.
- The approximate timing and duration of the highest noise and vibration generating activities.
- The noise and vibration mitigation that will be in place.
- Contact details for the receipt of any noise or vibration complaints or concerns.

10.0 Complaints about noise and vibration

Any complaints received by site personnel from the public will be directed to the Site Manager identified in Section 2.0.

A register will be kept and maintained on the Site to record the details of any complaints, including:

- a) The time and date of the noise and/or vibration giving rise to the complaint.
- b) The nature of the noise and/or vibration and what it was caused by (if known).
- c) The name and contact number of the complainant (if given).
- d) The investigation and action taken in response to the complaint.
- e) Any corrective action measures implemented in accordance with Section 15.0.
- f) The register will be made available to HDC on request.

11.0 Reference noise levels and setback distances

Table 4 shows the construction activities during the project, together with reference sound levels, and minimum separation distances for compliance with the project noise limits. The calculated separation distances are based on the following assumptions:

- The minimum distance stated is from the noise generating plant to the assessment position at 1 m from the most exposed façade of the building.
- The plant is being used continuously at the reference distance over a 15-minute sample period (i.e. 100% on-time) unless otherwise stated.
- The distances include a +3 dB adjustment to the noise levels for reflections from the façade of the receiving building (as required by NZS 6803:1999).
- Acoustically reflective ground is assumed between the noise source and the Receiver for distances up to 30 m, as recommended by NZS 6803:1999. Ground absorption has otherwise been considered in the calculations.
- The mitigated compliance distances are based on barriers effectively screening the assessment point from the noise generating activity and reducing the L_{Aeq} noise level by 10 dB (see Section 12.2).

Table 4: Reference noise levels and minimum compliance distances

Construction activity	Unmitigated reference noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (with noise barrier)
Sheet piling for temporary coffer dam during wastewater pump station installation	88 dB L _{Aeq}	73 m	n/a
Mulcher / chipper	83 dB L _{Aeq}	43 m	19 m
Bored piling with a 20-t excavator	79 dB L _{Aeq}	30 m	12 m
Demolition of existing structures in the Project Area using a 20-t excavator	79 dB L _{Aeq}	30 m	12 m
Petrol chainsaw felling trees (based on 33% on-time)	78 dB L _{Aeq}	30 m	11 m
D6, D7, or D8 bulldozer working in small area	76 dB L _{Aeq} *	27 m	9 m
Padfoot vibratory compaction roller 15-t – 20-t	76 dB L _{Aeq} *	27 m	9 m
Drilling with a 12-t excavator for retaining walls and construction of pedestrian footbridge	75 dB L _{Aeq}	24 m	8 m
Plate compactor	74 dB L _{Aeq}	22 m	7 m
Cut and fill, clearing, and loading trucks with a 40-t – 50-t excavator	72 dB L _{Aeq}	17 m	6 m
Cat 825 static compactor 30-t	72 dB L _{Aeq} *	17 m	6 m
55-t mobile crane	70 dB L _{Aeq}	14 m	5 m
Cut and fill, clearing, and loading trucks with a 20-t excavator	69 dB L _{Aeq}	12 m	4 m
Cat 815 static compactor 18-t	69 dB L _{Aeq} *	12 m	4 m
Vibratory compaction roller 5-t – 7-t	69 dB L _{Aeq} *	12 m	4 m
Concrete pump and truck discharging	69 dB L _{Aeq}	12 m	4 m

Construction activity	Unmitigated reference noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (with noise barrier)
Cut and fill, clearing, and loading trucks with a 12-t excavator	67 dB L _{Aeq}	10 m	3 m
Single drum static compaction roller 5-t	67 dB L _{Aeq} *	10 m	3 m
Vibratory compaction roller 3-t	67 dB L _{Aeq} *	10 m	3 m
Large generator	66 dB L _{Aeq}	9 m	3 m
Single drum static compaction roller 3-t	65 dB L _{Aeq} *	8 m	3 m
Terrex TS14 30-t motor scraper	65 dB L _{Aeq} *	8 m	3 m
Use of handheld power tools	65 dB L _{Aeq}	8 m	3 m
Grader	62 dB L _{Aeq} *	6 m	2 m
Idling delivery truck, dump truck, moxy, tractor	62 dB L _{Aeq}	6 m	2 m

* Reference noise level is for a moving noise source.

All construction activities must be undertaken outside of the mitigated compliance distances displayed in Table 4.

A summary of the barriers required for compliance is displayed in Table 5. The barriers are only required where the neighbouring building is occupied during the works. This information may be updated based on the results of noise measurements undertaken during the project.

Table 5: Construction noise barrier requirements for compliance

Construction activity	Unmitigated compliance distance	Dwellings that require screening when working within the unmitigated compliance distance
Demolition of existing dwellings with a 20-t excavator	30 m	• 84 Middle Rd
Bulldozer works	27 m	• Receiver Group A. • 147 Te Aute Rd (Church). • 150 Middle Rd. • 84 Middle Rd.
Vibratory compaction 15-t – 20-t roller	27 m	• Receiver Group A. • 147 Te Aute Rd (Church). • 150 Middle Rd. • 84 Middle Rd.
Drilling with a 12-t excavator	24 m	• 76 Middle Rd.
Static compaction 30-t	17 m	• 84 Middle Rd.
Plate compaction	22 m	• 147 Te Aute Rd (Church). • 84 Middle Rd.
Cut and fill, clearing, and loading trucks with a 20-t excavator	12 m	• 84 Middle Rd.
Compaction with an 18-t static roller or 5-t – 7-t vibratory roller	12 m	• 84 Middle Rd.
Compaction with a 5-t static roller or a 3-t vibratory roller	10 m	• 84 Middle Rd.

If measurements show that any activity is exceeding the project noise limits, Sections 12.0, a), and 15.0 of this CNVMP will be referred to. Mitigation will be implemented and follow up measurements undertaken to ensure compliance

11.1 Cumulative noise levels

It is unlikely that multiple noisy activities will be undertaken in the same area at once due to the staging of works. However, if this becomes necessary, the project acoustics consultant will calculate the required setback distance based on site measurements or the reference levels displayed in Table 4. The calculated distance for the multiple activities to comply cumulatively will be added to Table 5.

11.2 Multiple level dwellings

The process outlined in Section 0 will also be used to calculate setback distances or the requirement for higher noise barriers where an activity must be undertaken within the unmitigated distances displayed in Table 4 from a multiple level dwelling.

One, or both, of the following measures will be adopted where necessary to ensure compliance at the upper level of an occupied dwelling:

- a) Barriers will be positioned close to the equipment and made high enough to block the line of sight between the noisy activity and the upper level of the dwelling
- b) Smaller, quieter equipment will be used.

12.0 Noise mitigation measures

The contractor will reduce noise emissions from the Site by implementing the mitigation measures outlined in this section.

12.1 General noise mitigation measures

- a) The minimum mitigated separation distances set out in Section 11.0 will be observed at all times.
- b) The quietest machinery and methods available will be used where practicable. This includes using plant that is no larger than necessary to complete the works.
- c) All machinery will be maintained throughout the project to ensure it is not generating unnecessary noise e.g. plant will be lubricated to reduce squeaking.
- d) When machinery or plant is not required to be running, it will be switched off and not left idling.
- e) Stationary machinery will be set back from the boundaries to minimise noise levels for neighbours.
- f) Plant on site will use broadband reverse alarms in place of traditional pure tone 'beepers' where practicable.
- g) The tail gates of trucks will not be slammed or allowed to fall closed.
- h) Material will not be dropped from height into empty trucks.
- i) Tools, equipment, and materials will not be dropped on hard ground or dragged across the Site.
- j) Vehicle horns will only be used for emergencies.
- k) Any radios or music played on the Site must be inaudible at the nearest dwellings.
- l) Communication over distance will be by radio or phone.

- m) Equipment generating excess or unnecessary noise will be stopped (when safe) and reported to the Site Manager.
- n) Daily pre-start meetings held by the Site Supervisor will include discussions about any noise and vibration issues, and any complaints received.
- o) All personnel on site will be made aware of the potential impacts of noise on neighbours.

12.2 Acoustic barriers

- a) All acoustic barriers will be at least 2.4 m high and have a surface mass of no less than 7 kg/m² e.g. 12 mm plywood. They will be solid with no gaps between panels or between the barriers and the ground.

Proprietary construction noise barriers with a lower surface mass may be used if they equal or exceed the overall noise reduction properties of a solid barrier. Examples of proprietary construction noise barriers are below. Please note that the reductions stated for these products by the manufacturers are at isolated frequency bands and they do not reflect the overall L_{Aeq} reductions. The overall reduction will be approximately 8-10 dBA.

- SFI Echo Barrier
<https://supplyforce.co.nz/construction-noise-barrier/>
- Ultimate Solutions Acoustic Curtain
<https://www.ultimatesolutions.co.nz/product/soundbuffer-curtain/>
- Hushtec construction noise barriers
<https://www.hushtecsolutions.com/nz/industries-we-serve/construction-noise-control/>

- b) Acoustic barriers will block the line of sight between the noise source and the receiver.
- c) Acoustic barriers will be positioned on the boundary or close to an activity (localised) where construction plant must be operated within the unmitigated compliance distances (Table 4).
- d) Localised acoustic barriers will be positioned as close as practicable to the noise source to maximise noise reduction.
- e) Localised acoustic barriers should extend past the noise source by a distance of 1.5 times the height of the plant/machinery. If possible, the screening should partially surround the noise source.

12.3 Mulching, wood chipping, and chainsaws

- a) A mulcher or woodchipper will not be used within 50 m of any occupied building.
- b) Petrol chainsaws will not be used with 30 m of any occupied building.

13.0 Vibration mitigation measures

The following measures will be observed when working within 50 m of any occupied dwelling to minimise vibration for the neighbours:

- a) Excavators and heavy vehicles will be driven slowly (fast movement across an uneven site generates higher vibration levels).
- b) The lightest plant available will be used for works near to the site boundary where practicable.
- c) Excavator operators will avoid banging buckets on the ground.
- d) Static compactors or plate compactors will be used instead of vibratory rollers where practicable.
- e) Vibratory compaction works will be undertaken making passes parallel to the site boundary. The operator will not change direction or stop in the nearest part of the site to an occupied building where possible.
- f) Equipment generating excessive or unnecessary vibration will be stopped (when safe) and reported to the Site Manager.

14.0 Noise and vibration monitoring

This section sets out the requirements for construction noise and vibration monitoring during the project.

The results of any site and plant specific noise and vibration monitoring will be used to update this CNVMP to ensure that minimum compliance distances and mitigation measures are specifically tailored to the project.

Any non-compliance identified through monitoring will be addressed by following the corrective action measures in Section 15.0 of this CNVMP.

The results of all noise and vibration monitoring will be retained for the duration of the project and made available to HDC on request.

14.1 Noise monitoring

Noise measurements will be performed:

- a) At the beginning of any activity within the mitigated (with barrier) setback distances specified in Table 4 to monitor compliance.
- b) If the noise from any activity on the site appears excessive in the opinion of the Site Manager or HDC.
- c) Following the receipt of any reasonable noise or complaint.

All noise monitoring will be completed by a suitably qualified and experienced person (e.g. MASNZ) or a person trained by the project acoustics consultant.

All noise measurements will be undertaken using a sound level meter conforming to at least IEC651 Type 2 criteria, and in accordance with NZS 6803:1999 *Acoustics – Construction Noise*.

A noise monitoring form is attached to this CNVMNP as Appendix C.

14.2 Vibration monitoring

Vibration measurements will be performed following the receipt of any reasonable construction vibration complaint.

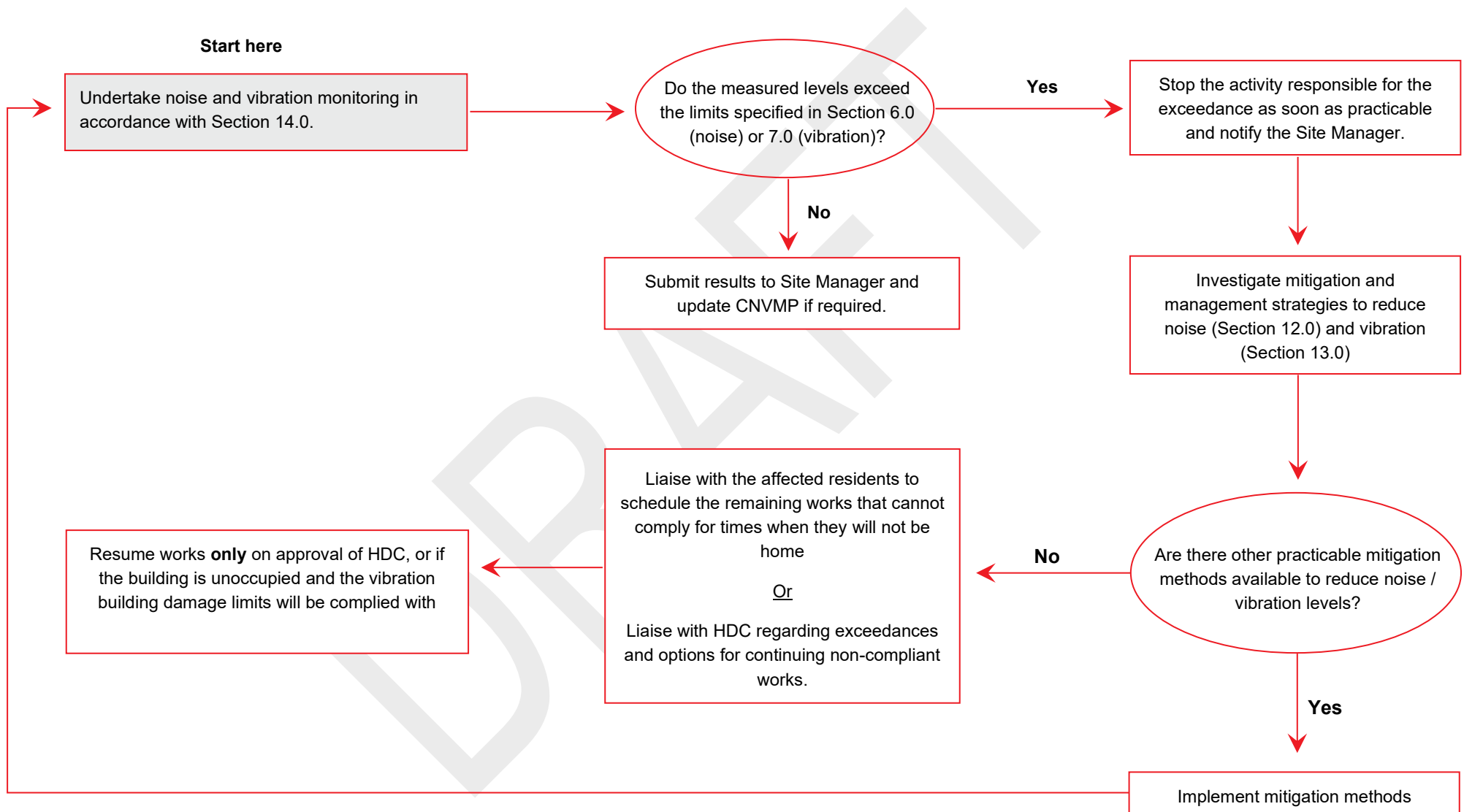
All vibration monitoring will be completed by a suitably qualified and experienced person (e.g. MASNZ) or a person trained by the project acoustics consultant.

All vibration measurements will be undertaken in accordance with the Standard DIN 4150-3:2016.

15.0 Corrective action measures

The corrective action measures illustrated in Figure 3 will be followed if non-compliance with the project noise or vibration limits is identified through monitoring.

Figure 3: Process for corrective action measures



16.0 Amendments to CNVMP

The CNVMP may be updated throughout the works if necessary to adapt to changing work methodologies or a changing receiving environment.

Any material updates to the certified CNVMP will be clearly marked using underlining for additional text and strikethrough for any deletions. The amended CNVMP will be provided to HDC for verification before being actioned.

All activities will be undertaken in accordance with the latest version of the certified CNVMP.

17.0 General requirements

A copy of this CNVMP will be kept at the work site for the duration of the project.

This CNVMP may be updated throughout the works with the approval of the Site Manager and in consultation with HDC.

All personnel will be informed about the need to reduce noise and vibration to a minimum and about the effects of excessive noise and vibration on the neighbouring sites, including training on:

- a) The proper selection, use, and maintenance of tools and plant.
- b) Positioning of machinery on site.
- c) Avoidance of unnecessary noise.
- d) Procedures for receiving, reporting, and investigating noise and vibration complaints.

Appendix A Glossary of terms

A-weighting	A frequency filter applied to the full audio range (20 Hz to 20 kHz) to approximate the response of the human ear at lower sound pressure levels.
Best practicable option(s) (BPO)	For the purpose of this CNVMP, the BPO comprises the mitigation and management interventions that must put in place to reduce noise and vibration levels and manage the effects on neighbours to ensure they are 'reasonable'.
dB (decibel)	The basic measurement unit of sound. The logarithmic unit used to describe the ratio between the measured sound pressure level and a reference level of 20 micropascals (0 dB).
$L_{Aeq(t)}$ (dB)	The A-weighted equivalent sound pressure level with the same energy content as the measured varying acoustic signal over a sample period (t). The preferred metric for sound levels that vary over time because it considers the total sound energy over the period of interest.
L_{AFmax} (dB)	The maximum A-weighted sound pressure level recorded during the measurement period using a fast time-weighting response.
Noise	A sound which serves little or no purpose for the exposed persons and is commonly described as 'unwanted sound'. The Resource Management Act definition of noise is "includes vibration".
PPV	Peak particle velocity, measured in mm/s. The standard metric for the measurement of ground borne vibration in New Zealand. The instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
Reasonable	For the purpose of this CNVMP, construction noise and vibration emissions can be deemed to be 'reasonable' where they comply with the project limits set out in Sections 6.0 and 7.0.

Appendix B Resource consent conditions

This section of the draft CNVMP has been completed based on our recommended construction noise and vibration conditions and the relevant HDP standards. The final version will be updated with the consented conditions and limits.

1. A Construction Noise and Vibration Management Plan (**CNVMP**) must be prepared for the site clearance, earthworks, and civil works by a suitably qualified person and submitted to Hastings District Council for certification at least ten days before any construction works authorised by the approval begin.

The objectives of the CNVMP must be to:

- a. Set out the procedures to identify and adopt the best practicable options for minimising adverse construction noise and vibration effects on neighbours.
- b. Define the procedures to be followed to ensure that the project construction noise and vibration limits are complied with.

The CNVMP must address the requirements of Annex E of NZS 6803:1999 *Acoustics – Construction Noise* as a minimum and must be prepared in accordance with the Association of Australasian Acoustical Consultants Guideline for interpreting and applying NZS 6803:1999.

Construction works must not begin until certification has been received in writing from Hastings District Council. All construction works on the site must be carried out in accordance with the certified CNVMP.

2. The occupants of all dwellings within 50 m of the site boundary must be advised of the construction project at least ten days before earthworks begin. The advice must be provided in writing and must include the following information:
 - a. A general description of the construction works including the duration of the project and the working hours on site; and
 - b. A contact name and phone number for any questions or complaints during the project.
3. All construction works, as defined by NZS 6803:1999 *Acoustics – Construction noise*, must only take place between 7:30 am and 6:00 pm, Monday to Saturday. No works are permitted on Sundays or public holidays. The timing restrictions in this condition do not apply to quiet activities such as site meetings, site inspections, administration, and internal works (e.g. painting and plastering) providing that any noise generated complies with limits of 40 dB L_{Aeq} and 70 dB L_{Amax} when measured at the notional boundary of any dwelling.
4. Chipping and mulching must not take place within 50 m of any occupied building.
5. Petrol chainsaws must not be used within 30 m of any occupied building.

6. All vibration generated by construction activities must comply with:

- a. The guideline vibration limits in the German Standard DIN 4150-3:2016 when measured and assessed at any building in accordance with that Standard (for the purpose of avoiding building damage); and
- b. A vibration limit of 2 mm/s PPV at the foundations of all occupied dwellings (for the purpose of avoiding adverse effects on amenity).

Where predictions or monitoring indicate that 2 mm/s PPV may be exceeded, the Approval Holder must implement vibration mitigation measures in accordance with the CNVMP and review the construction methodology and plant to minimise vibration levels.

Where compliance with the 2 mm/s PPV vibration limit cannot be achieved following implementation of those measures, the Approval Holder must provide the following information to the occupants of the affected dwelling(s) at least three days before the vibration-generating works begin (or continue):

- i. The dates and approximate times during which vibration levels may exceed 2 mm/s PPV;
- ii. The name and telephone phone number of a contact person who can respond to enquiries and receive advice regarding any vibration-sensitive activities or times at the dwelling; and
- iii. Confirmation that construction vibration will be managed to comply with the cosmetic building damage limits in DIN 4150-3:2016 *Vibrations in buildings – Part 3: Effects on structures*.

Following completion of the above requirements, vibration at the foundations of the affected dwelling must not exceed 5 mm/s PPV.

7. Any noise arising from construction, maintenance and demolition work in any Zone shall comply with NZS 6803:1999 *Acoustics – Construction noise* (HDP)
8. Construction noise shall be measured and assessed in accordance with NZS 6803:1999 *Acoustics – Construction noise* (HDP)

Appendix C Noise monitoring form

DRAFT

Name:

Date:

Notes for noise monitoring

Complete all sections of this form when undertaking construction noise measurements for the project. Provide a sketch of the area, sound sources and measurement position on the rear of this form.

Measurements should be undertaken at 1 m from the façade of the receiving building most exposed to the sound under investigation, and 1.2 m to 1.5 m above the relevant floor level. No adjustment to the measured level is to be made for reflected sound from the façade. Valid measurements cannot be undertaken in persistent rain or in wind speeds greater than 5 m/s.

Adjustments to the measured level may be required to correct for distance and façade reflections if measurements must be undertaken at a proxy location.

Sound source and instrumentation

Location of works	
Description of construction activity being monitored	
Measurement instrumentation (type and serial number)	
Date of most recent laboratory calibration	
Field calibration check (time and adjustment)	

Meteorological conditions

Cloud cover (octas)	
Rain	
Wind speed and direction	

Methodology

Location/orientation of microphone	
Height of microphone above ground and distance to facade of receiving building	
Distance between microphone and sound source	
Ground conditions between sound source and microphone	
Any barriers or objects between sound source and microphone	
Distance to any reflective surfaces other than receiving facade	
Extraneous noise sources	

Measurement results

Sample start time	Duration of sample	L _{Aeq} (dB)	L _{AFmax} (dB)	Sound source controlling the measured levels	Adjustments required for distance, facade reflections, or barriers

Do the measurements show full compliance with the project noise limits?

Yes: Use the measurement results to update the site-specific noise levels and separation distances in the CNVMP if required.

No: Refer to the CNVMP for the appropriate corrective action measures and further noise mitigation options.