



ON NOISE AND AGEMENT PLAN

SOUTHERN LINKS 1
L SOUTH DEVELOPMENT

DATE

31 August 2026

Draft construction noise and vibration management plan prepared by Styles Group for SL1 Consortium.

REVISION HISTORY

The CNVMP is a living document. It will be updated throughout the works if necessary to adapt to changing work methodologies or a changing receiving environment.

CERTIFICATION

The final version of this CNVMP must be certified by Waipa District Council prior to commencement of construction.

AMENDMENTS TO THIS CNVMP

Any material updates to the certified CNVMP will be clearly marked using underlining for additional text and strikethrough for any deletions. Any amendments to a certified CNVMP will be provided to Waipa District Council for re-certification before being implemented.

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

Rev:	Date:	Comment:	Version:	Prepared by:	Reviewed by:
1	24/08/26	Draft for review.	Draft	Martyn Chambers, MASNZ Senior Consultant Styles Group	Jon Styles, MASNZ Director and Principal Styles Group
2	31/08/26	Draft for lodgement	Final draft	Jon Styles, MASNZ Director and Principal Styles Group	

This document is a draft CNVMP. It will be updated to reflect the conditions of consent and the results of further engagement with contractor, prior to construction commencing. The final version will be submitted for certification by Waipa District Council prior to commencement of construction.

Sections that must be updated are highlighted in grey.

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1.0 Introduction

Styles Group has prepared a draft Construction Noise and Vibration Management Plan (**CNVMP**) to ensure the appropriate management of the construction noise and vibration effects associated with the Southern Links 1 (SL1) Residential Development (the **Project**).

This CNVMP sets out the measures to be implemented to ensure appropriate management of noise and vibration effects during the construction period of the Project and to ensure noise and vibration generated from construction work complies with the resource consent conditions for the Project.

This CNVMP has been prepared in accordance with the *recommended* conditions that are contained in Appendix C of the *Assessment of Noise Effects* prepared by Styles Group for SL1 Residential South and Appendix E of NZS 6803:1999 *Acoustics – Construction noise*.

Appendix B of this CNVMP must be updated to include the final conditions of consent.

This CNVMP is a 'living document' that will be updated as the works progress and if changes become necessary. It must be certified by Waipa District Council before construction work commences.

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

2.0 Objectives of this CNVMP

The objectives of this CNVMP are:

1. To identify and require the adoption of the best practicable option to minimise construction noise and vibration effects at all receivers.
2. Ensure compliance with the Project Noise and Vibration Conditions.
3. Set out the specific requirements for all construction work within 40m of any occupied building on another site.
4. Set out the requirements for construction activities that are subject to activity-specific noise and vibration limits.
5. Set out the specific requirements for all construction work undertaken outside the hours of 7:30am- 6:00pm, Monday to Saturday.

3.0 Contacts

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

Dillon Kelliher

ph: [REDACTED]

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

Styles Group Acoustics & Vibration Consultants

ph: [REDACTED]

4.0 Updates to this CNVMP

The CNVMP is a living document, and it will 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 must be clearly marked using underlining for additional text and strikethrough for any deletions. Any amendments to a certified CNVMP must be provided to Waipa District Council for re-certification before being implemented.

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

This is a draft CNVMP and not the version to be certified by the Waipa District Council.

5.0 General requirements

A copy of this CNVMP must 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 Project Manager and in consultation with Waipa District Council.

All personnel must be informed about the need to reduce noise and vibration to a minimum and about the effects of excessive noise on the neighbouring sites. As part of their training, special attention will be given to:

- i. Proper selection, use and maintenance of tools and plant.
- ii. Positioning of machinery on site.
- iii. Avoidance of unnecessary noise.
- iv. Procedures for receiving, reporting and investigation of noise and vibration complaints.

6.0 Project conditions

This draft CNVMP is based on the recommended conditions to control construction noise and vibration that are contained in Appendix C of the *Assessment of Noise Effects* prepared by Styles Group for SL1 Residential South. Appendix B of this CNVMP must be updated to include the conditions of consent.

7.0 Permitted hours of construction work

Noisy construction works may only be undertaken from Monday to Saturday between 7:30 am and 6:00 pm. There can be no works in the evening or on Sundays that generate audible construction noise at any receiver.

Quieter activities and works inside buildings may occur outside these hours if they do not generate any audible noise at the neighbouring sites. Examples include light vehicle movements, planting, electrical work, works set well back from receivers, site meetings, surveying or monitoring activities.

If a contractor is unsure whether an activity qualifies as a quieter activity, they must carry it out during normal construction hours or seek advice before doing it outside those hours.

8.0 Management of construction noise

This CNVMP identifies the areas where contractors must carefully consider noise and vibration when selecting plant, equipment and construction methods.

The Project Construction Noise and Vibration Limits set specific noise limits for certain activities in defined areas of the site. This approach sets specific controls on activities that may exceed the permitted standards.

8.1 Construction noise limits

The construction noise limits for the Project are set out in

[Table of consented noise limited to be inserted]

Table 1. 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 not on the Site that is occupied during the works (the **Receivers**).

The noise limits **do not apply** at buildings on the Site itself or at buildings on neighbouring sites that are unoccupied.

[Table of consented noise limited to be inserted]

Table 1: Noise limits for construction work

8.2 Plant noise levels and minimum separation distances

Table 2 lists the plant and minimum separation distances required for the plant to comply with the daytime noise limits of 70 dB L_{Aeq} and 85 dB L_{AFmax} .

Table 2: Noise sources levels and minimum separation distances where a noise limit of 70 dB L_{Aeq} applies

Construction activity	Unmitigated L_{Aeq} noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (based on 2m noise barrier) ¹	
			One story dwelling	Two story dwelling
Sheet piling for stormwater ponds	86 dB	85 m	n/a	n/a
Bored piling with a 20-t excavator	79 dB	38 m	12 m	21 m
Chainsaw works to remove trees (33% on-time)	77 dB	30 m	10 m	18 m
D6, D7, or D8 bulldozer working in small area	76 dB*	27 m	9 m	16 m
Vibratory compaction roller 15t – 20-t	76 dB*	27 m	9 m	16 m
Cut and fill, clearing, and loading trucks with a 40-t – 50-t excavator	75 dB	24 m	8 m	14 m
Wetland works using 40-t – 50-t excavator	75 dB	24 m	8 m	14 m
Retaining wall construction using a 14 - 20-t excavator and auger	74 dB	22 m	7 m	12 m
Cat 825 static compactor 30-t	72 dB*	17 m	6 m	10 m
Cut and fill, clearing, and loading trucks with a 20-t excavator	69 dB	12 m	4 m	7 m
Cat 815 static compactor 18-t	69 dB*	12 m	4 m	7 m
Concrete pump and truck discharging	69 dB	12 m	4 m	7 m

¹ In accordance with the specifications set out in Section 8.5.

Construction activity	Unmitigated L_{Aeq} noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (based on 2m noise barrier) ¹	
			One story dwelling	Two story dwelling
Cut and fill, clearing, and loading trucks with a 12-t excavator	67 dB	10 m	3 m	6 m
Large generator	66 dB	9 m	3 m	5 m
Terrex TS14 30-t motor scraper	65 dB*	8 m	3 m	4 m
7,000 L watercart	65 dB	8 m	3 m	4 m
Grader	62 dB*	6 m	2 m	3 m
Idling delivery truck, dump truck, moxy, tractor	62 dB	6 m	2 m	3 m
Paving works (with all ancillary equipment operating)	75 dB	25 m	8 m	14 m

*Reference noise level is for a moving noise source that moves past a receiver repeatedly.

The reference noise levels in Table 2 should be updated based on the results of noise measurements undertaken during the project.

8.3 Noise Control Zone within 40m of any occupied dwelling on an adjacent Site

This CNVMP establishes a “Noise Control Zone” for all parts of the Site that are within 40 m of an occupied dwelling on an adjacent site. The Noise Control Zone represents the area in which high noise generating construction work will require specific mitigation or management to comply with the noise limits.

Except for sheet piling, construction works *outside* the Noise Control Zone are expected to comply with the noise limits without specific mitigation.

Mitigation requirements for sheet piling and required separation distances are addressed separately in Section 8.4.1.

Figure 1 shows the extent of the Noise Control Zone.



Figure 1 Noise Control Zone – all construction work within this area must be managed to comply with the noise limits.

Note: Specific requirements apply to sheet piling inside and outside the Noise Control Zone

Before starting construction work (except sheet piling²) within areas of the site that are subject to a Noise Control Zone, the contractor must follow these steps:

1. Identify the proposed construction activity and the equipment required.
2. Determine the shortest distance between the proposed work area and the nearest occupied dwelling.
3. Find the applicable compliance distance for the activity and equipment in Table 2.
4. Compare the actual distance with the compliance distance:

² All mitigation requirements and separation distances for works involving sheet piling are set out in Section 8.4.1.

- If the dwelling is outside the compliance distance, the activity may proceed without further noise mitigation.
- If the dwelling is within the compliance distance, noise mitigation must be implemented before the activity begins.

5. Select one or more of the following mitigation measures:

- Use smaller or quieter equipment. Check Table 2 to confirm that the revised equipment will comply.
- Install a noise barrier in accordance with the guidance set out in Section 8.5 and use the mitigated compliance distance in Table 2 to confirm compliance. Position the barrier as close to the activity as practicable and ensure it blocks the line of sight between the equipment and the dwelling. Section 8.5 sets out the barrier requirements.
- Use a combination of quieter equipment and a noise barrier to achieve the applicable compliance distance in Table 2.
- Carry out the work while the dwelling is unoccupied. The construction noise limits do not apply when the dwelling is unoccupied.

6. Seek advice from Styles Group. Further assessment may include on-site noise measurements to determine whether an exceedance is likely.

7. Confirm that the selected mitigation measures are in place and that compliance has been demonstrated before commencing the activity.

8.4 Specific mitigation requirements

This section sets out specific mitigation measures that must be followed for specific construction works

8.4.1 Specific mitigation requirements for sheet piling works

The following mitigation measures are expected to be required as part of perimeter reinforcement works for Wetlands A and B. These measures will be confirmed when a contractor has been appointed and the final construction methodology has been confirmed.

This section of the CNVMP will be updated to include the areas of the Site where sheet piling may be used, and the specific methods, mitigation requirements and procedures that must be implemented to ensure compliance.

This section of the CNVMP will also identify the specific areas of the Site where alternative methods to sheet piling must be used, and will identify the specific methods, mitigation requirements and procedures that must be implemented to ensure those methods also achieve compliance.

Section 10 of this CNVMP will be updated to include the specific engagement procedures for receivers that may be exposed to noise levels above 70 dB L_{Aeq} .

An activity-specific Project Noise Limit of 75 dB L_{Aeq} has been set for works associated with the perimeter reinforcement of Wetlands A and B.

This noise limit allows sheet piling to be used in areas of the Site where sheet piling can comply with the Project Noise Limit. This noise limit will require the use of alternative methods (such as bored piling) in areas of the Site where sheet piling cannot comply with the noise limits due to the proximity of occupied buildings on adjacent sites.

8.4.1.1 Specific procedure for sheet piling

The following process must be undertaken at the commencement of sheet piling works:

- 1) Sheet piling works must commence in areas of the Site that are well separated (by distances exceeding 100m) from any potentially occupied building;
- 2) Noise measurements of the initial sheet piling work shall be undertaken;
- 3) The noise measurements shall be used to determine:
 - a. How close sheet piling can be undertaken in proximity to receivers whilst remaining compliant with the noise limits;
 - b. What noise mitigation measures are available to reduce the noise levels of piling and therefore decrease the distance in (a). Any reduction in noise level and therefore decrease in distance must be supported by noise measurements.
 - c. The specifications of any noise mitigation measures or requirements for the use of alternative perimeter reinforcement methods that will consistently comply with a noise limit of 75dB L_{Aeq} , where sheet piling cannot comply.

8.4.2 Specific mitigation requirements for retaining wall construction along Saxbys Road

The following mitigation measures are expected to be required as part of retaining wall construction works adjacent to dwellings on Saxbys Road. These measures will be confirmed when a contractor has been appointed and the final construction methodology has been confirmed.

An activity-specific Project Noise Limit has been set for retaining wall construction works in the northern part of the Site, adjacent to dwellings on Saxbys Road.

Due to the short distance between the retaining wall works and receivers on Saxbys Road, an activity-specific Project Noise Limit of 75 dB L_{Aeq} applies at the closest dwellings, with the exception of 71B Saxbys Road (the closest dwelling) where a Project Noise Limit of 80 dB L_{Aeq} applies. Figure 2 shows the retaining wall locations and the receivers within 22 m of the works.



- iii. Offer the occupants of 71B Saxbys Road an in-person meeting before the works begin. A noise barrier is unlikely to be practicable due to the short distance between the property and the works. The contractor must therefore consult the occupants about the timing and duration of the section of retaining wall that runs parallel to their property.

8.4.3 Saxbys Road access road construction

The following mitigation measures are expected to be required as part of the construction of the haul road. These measures will be confirmed when a contractor has been appointed and the final construction methodology has been confirmed.

During the construction of the cut through road from Saxbys Road into the Site, the use of earthmoving and compaction equipment, particularly vibratory compaction rollers, may exceed the Project Noise Limits that apply at 55 Saxbys Road. Mitigation is likely to be required to achieve compliance.

Before construction begins, the contractor must install a noise barrier along the Site boundary adjoining this property, as shown in Figure 3. The barrier must be at least 2 m high to provide suitable screening. The barrier must meet the specifications in Section 8.5.

Static compaction equipment should be used for works close to 55 Saxbys Road.

If **vibratory compaction** or other noisy equipment is required, the contractor must follow the process in Section 8.3 before starting the activity. This may require smaller or quieter equipment, localised barriers, an increased separation distance, real-time noise and vibration monitoring and/ or advice from Styles Group.

If a fixed boundary barrier is impracticable, the contractor must use localised barriers in accordance with Section 8.5.1.



Figure 3 Noise barrier requirements for Saxby Road site access road construction works

8.4.4 Heavy vehicles accessing the site via Saxbys Road

Stages 2, 3 and 4 construction works will access the site via Saxbys Road. Construction traffic movements using this site access must comply with the construction noise limits in Section 8.1.

During normal construction hours, up to 40 heavy vehicle movements distributed over a day will comply³ with the construction noise limits, provided that no other construction works occur on the access road at the same time.

Heavy construction vehicles must not use the Saxbys Road access outside the normal construction hours of 7:30 am to 6:00 pm, Monday to Saturday.

Drivers must schedule their arrival to the Site so that they arrive at or after 7:30 am. Trucks must not queue, park or idle on Saxbys Road or nearby local roads while waiting to enter the Site.

Any truck that arrives early must wait at a suitable location away from residential properties.

8.5 Acoustic barriers

Acoustic barriers must be used where compliance with the construction noise limits in Table 2 cannot be achieved without other forms of mitigation.

The barriers must comprise of either fixed barriers located on the site boundary, or localised acoustic barriers around the specific noise-generating activity.

The barriers will need to be a minimum of 2m high and positioned to block line of sight between the receiving property, and the noise-generating aspects of the construction works.

The barriers must be constructed from solid timber with a surface mass of at least 7 kg/m², such as 12 mm plywood or proprietary construction noise barriers (scaffolding and acoustic blankets such as Echo Barrier⁴, Soundbuffer⁵ or Hushtec⁶).

8.5.1 Localised / portable acoustic barrier specifications

- Localised acoustic barriers can be U-shaped and wrap around the noise source or in a straight line.

³ This is based on a maximum of 20 truck visits (where each visit includes one arrival and one departure) per day during the earthworks stage.

⁴ <https://supplyforce.co.nz/echo-barrier>

⁵ <http://soundbuffer.co.nz>

⁶ <https://duraflex.co.nz/hushtec>

- If a U-shaped barrier is used it will need to be 3 m high, and at least 2 m x 3 m x 2 m wide. If proprietary flexible screens are used to line scaffolding, the barriers must have a mass of at least 6 kg/m² and there should be no gaps between the sheets.
- If a straight barrier is used it needs to be solid with no gaps and should block line-of-sight from the noisiest part of the plant/machinery to the receiver by as much as possible (including windows at upper-level facades).
- The acoustic barrier 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.

8.6 General noise mitigation measures

The contractor must take all practicable steps to reduce noise from works within the 40m noise control zone by implementing the mitigation measures listed below:

- The minimum separation distances identified in this CNVMP must be complied with at all times unless the noise levels can be made to comply with the relevant noise limits using other methods (e.g. screening).
- The quietest plant, machinery, and methods available will be used wherever practicable. This includes using plant that is no larger than necessary to complete the works.
- All construction equipment will be maintained to ensure it is not generating unnecessary noise.
- When machinery or plant is not required to be running, it should be switched off and not left idling for extended periods.
- Noisy plant and machinery should be strategically positioned on the site to reduce the effects on neighbours where practicable.
- All plant on site will utilise broadband reverse alarms in place of traditional pure tone 'beepers' where practicable.
- The tail gates of trucks will be closed with care and not slammed or allowed to fall closed.
- Material will not be dropped from height into empty trucks if it creates high noise levels. Softer materials will be loaded into trucks first, where possible.
- Tools and equipment will not be dropped on hard ground. Materials will not be dragged along the ground.
- Vehicle horns will not be used unless in the case of an emergency.
- Any radios or music played on site will be used quietly so they are inaudible at the nearest dwellings.
- Stationary equipment such as pumps and generators will be located as far from occupied dwellings as practicable.

- There will be no shouting or swearing on site. Communication over distance will be by radio or phone.
- Equipment generating excess or unnecessary noise will be stopped (where safe) and reported to the Site Manager.
- Any regular meetings held by the Site Supervisor will include discussions about any noise and vibration issues, and any complaints received.
- All workers on site shall be familiar with the provisions of this CNVMP and made aware of the potential impacts of noise on neighbours.

9.0 Management of vibration effects

Sheet piling, tracked excavators, vibratory rollers and other heavy plant and vehicles operating close to houses may generate vibration that can be felt within nearby dwellings.

The specific vibration management and monitoring requirements for sheet piling are set out separately in Section 9.3.

The following measures apply when undertaking any works within 20 m of an occupied dwelling. These measures should ensure that vibration complies with the Project Conditions and does not cause unreasonable disturbance.

9.1 Project construction vibration limits

The applicable vibration limits for the Project are set out in Table 3.

Table 3: Applicable vibration limits

Location	Limit
All buildings, at all times	DIN 4150 guideline values

All construction vibration will be measured and assessed in accordance with DIN 4150-3:1999

The DIN 4150-3:1999 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 DIN Standard is specifically concerned with the structure of the building, not the effect of the vibration on the people within the building. Assessment is in terms of a reduction in

‘serviceability’ as defined in the DIN standard, which includes minor cosmetic damage such as cracked plaster.

The DIN standard frequency-dependant vibration limits for short-term vibration are reproduced in graphical form as Figure 3. Line 2 of the DIN criteria is very typically applied to residential dwellings unless the receiving structure is particularly sensitive to vibration. A suitably qualified structural expert should be consulted: where there are concerns about a building’s susceptibility to vibration; or where the appropriate assessment classification under DIN 4150–3:1999 requires confirmation.

The DIN standard includes many other recommendations and prescribes more stringent limits for long-term vibration (which may induce fatigue or resonant movement). The DIN standard should therefore be referred to in full when being applied.

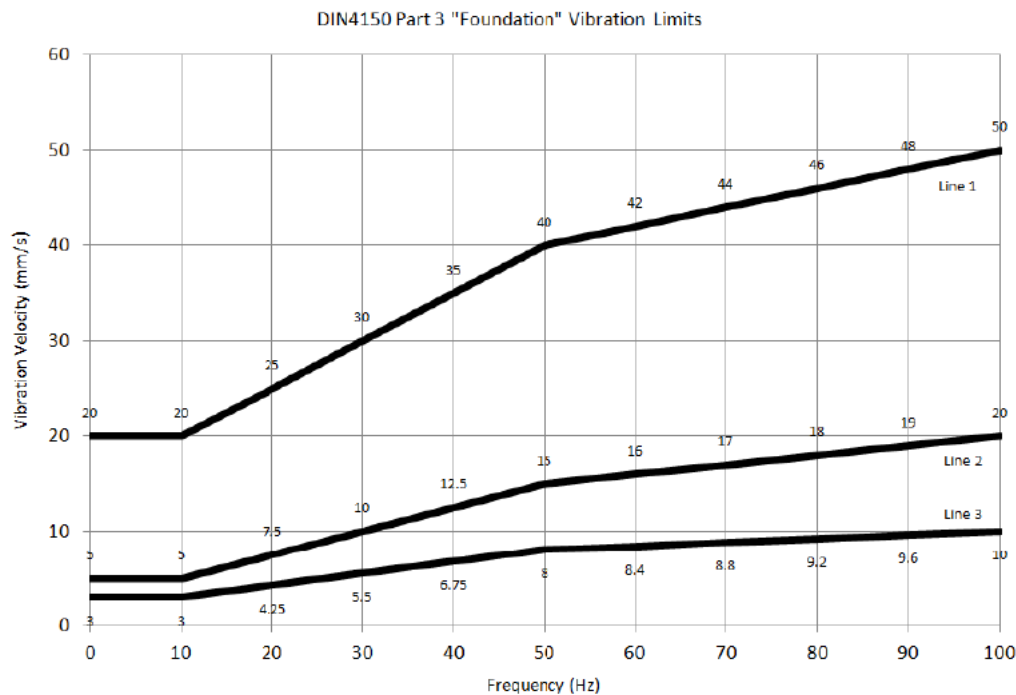


Figure 4: Curves for guideline values (short-term vibration) specified in DIN 4150-3:1999

9.2 Vibration mitigation measures within 20m of any occupied dwelling

The operation of tracked excavators, vibratory compaction rollers, and other heavy plant and vehicles on site have the potential to generate vibration that may be felt within the nearest dwellings.

The vibration received within the nearest dwellings will depend largely on the equipment used, the separation distance, the ground conditions, how the plant is operated, and the response of the receiving structure.

The following measures will be observed when working within 20 m of any occupied dwelling, to ensure that vibration complies with the Project Conditions and does not cause unreasonable disturbance:

- Workers will be informed of the need to reduce vibration effects at the nearest dwellings, and the mitigation measures available to achieve this.
- Excavators and heavy vehicles will be driven slowly (fast movement across an uneven site can generate high vibration levels).
- The lightest plant practicable and available will be used for the works.
- Wheeled plant will be selected over tracked plant where practicable.
- Excavator operators will avoid banging buckets on the ground.
- Any vibratory compaction works necessary 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 dwelling.

Equipment generating excessive or unnecessary vibration will be stopped (where safe) and reported to the Site Manager.

9.3 Sheet piling vibration

These measures will be confirmed when a contractor has been appointed and the final construction methodology has been confirmed.

Following the measures set out to ensure compliance with the Project Noise Limits should also result in sheet piling complying with the Project Vibration Limits.

Sheet piling must not occur within 20m of a dwelling (even when it is unoccupied), unless vibration monitoring is in place to confirm compliance with the Project Vibration Limits.

Vibration from works within 50m of a building may still be perceptible within nearby dwellings and may cause some disturbance. However, the vibration is expected to remain tolerable if residents receive advance notice of the works and clear information about the expected timing and duration.

The specific community engagement procedures for sheet piling are set out in Section 10.1.

10.0 Community liaison and complaints

10.1 Community liaison

This section will be updated when the contractor has been appointed and the final construction methodology has been confirmed. This section will include any specific community engagement requirements for sheet piling works.

All receivers within 50 m of works must be informed of the following information by letter drop at least 10 working days before works commence on site:

- i. A brief overview of the works;
- ii. The expected start date of works;

- iii. The expected duration of the works;
- iv. The days and hours of the week when works may be undertaken;
- v. The approximate timing of the highest noise and vibration activities;
- vi. The noise and vibration mitigation to be implemented; and
- vii. Contact details for the receipt of any noise or vibration complaints or concerns.

10.2 Complaints about noise and vibration

Any complaints received will be directed to the manager identified in Section 3.0. A register will be kept and maintained on site to record the details of any complaints, including:

- i. The time and date of the noise and/or vibration causing the complaint.
- ii. The nature of the noise and/or vibration and what it was caused by (if known).
- iii. The name and contact number of the complainant (if given).
- iv. The action taken in response to the complaint.
- v. Any corrective action measures taken in accordance with Section 12.0.

The complaints register must be made available to Waipa District Council on request.

11.0 Noise and vibration monitoring and reporting

This section sets out requirements for construction noise and vibration monitoring during construction of the Project. This section will be updated when the contractor has been appointed and the final construction methodology has been confirmed.

Noise and vibration measurements will be performed:

- i. At the beginning of any activity within the mitigated (with barrier) setback distances specified in Table 2 to monitor compliance with the Project Noise Limits.
- ii. If the noise or vibration from any activity on the site appears excessive in the opinion of the Site Manager or Waipa District Council.
- iii. Following the receipt of any reasonable construction noise or vibration complaint.
- iv. By a suitably qualified and experienced person (e.g., MASNZ) or any person trained by the project construction noise and vibration consultant.
- v. Using a sound level meter conforming to at least IEC651 Type 2 criteria, and in accordance with NZS 6803:1999 Acoustics - Construction Noise (noise only).
- vi. In accordance with DIN 4150-3:1999 *Structural Vibration – Part 3 Effects of Vibration on Structures* (vibration only).

A noise monitoring form is attached as Appendix C

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.

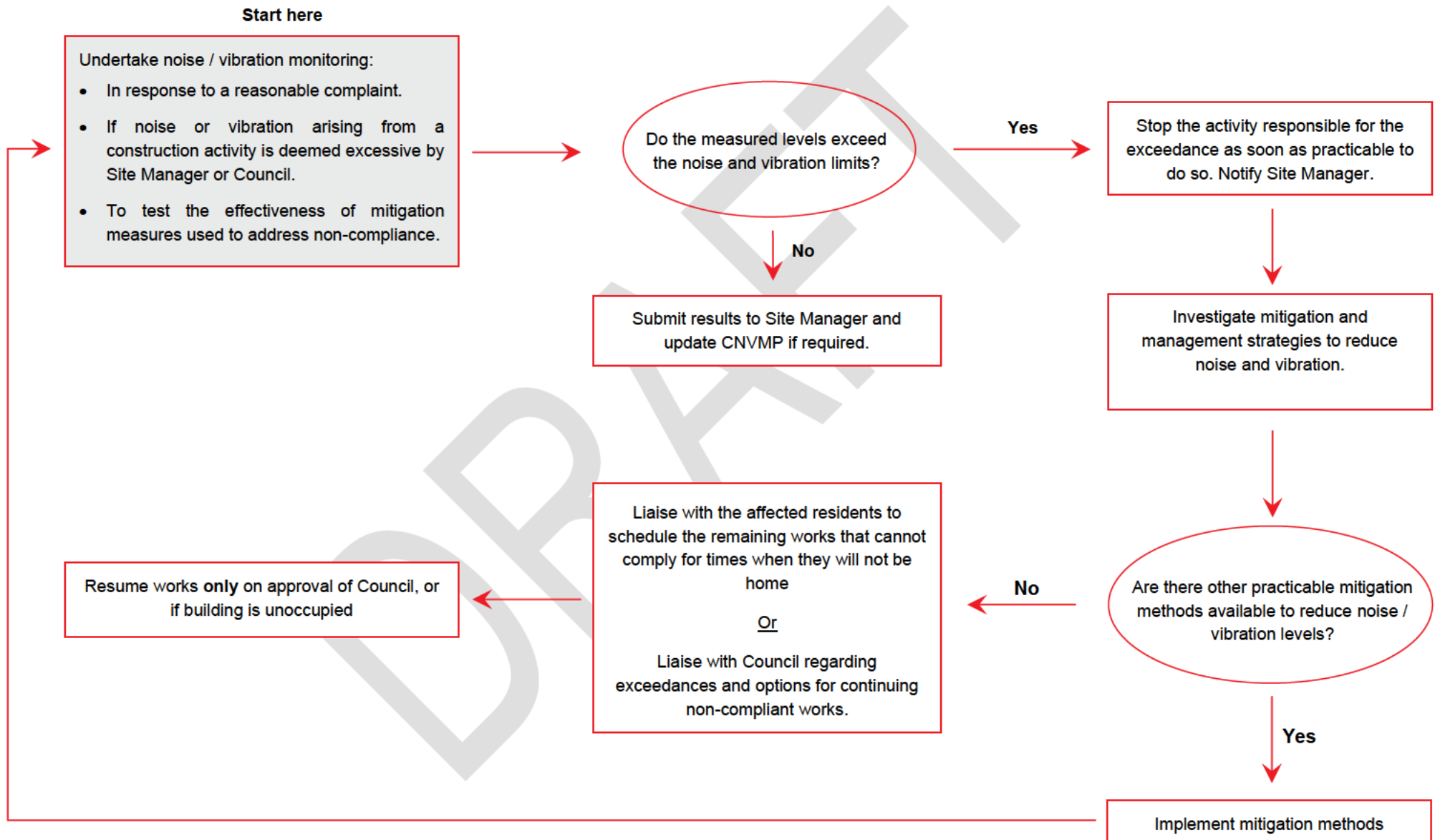
The results of all noise and vibration monitoring will be retained for the duration of the Project and made available to Waipa District Council on request.

Any non-compliance with the noise limits identified through monitoring will be addressed by following the corrective action measures in Section 12.0 of this CNVMP.

12.0 Corrective action measures

The corrective action measures illustrated in Figure 5 will be followed if non-compliance with the Project Noise or Vibration limits is identified through monitoring.

Figure 5: Process for corrective action measures



Appendix A Glossary of terms

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".
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).
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.
$L_{Aeq(t)}$ (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 takes into account the total sound energy over the time period of interest.
L_{AFmax} (dB)	The maximum A-weighted sound pressure level recorded during the measurement period using a fast time-weighting response.
NZS 6803:1999	N.Z. Standard NZS 6803:1999 <i>Acoustics – Construction noise</i>.
DIN 4150–3:1999	German Standard DIN 4150-3:1999 <i>Structural Vibration – Part 3: Effects of vibration on structures</i>. Typically adopted for the assessment of structure borne vibration in New Zealand.
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.
CNVMP	Construction noise and vibration management plan. A document to help the contractor manage noise and vibration emissions during construction works.

Appendix B Consent conditions

This section must be updated to include the conditions of consent.

DRAFT

Appendix C Noise monitoring form

Name:

Date:

Notes for noise monitoring

All sections of this form must be completed when undertaking construction noise measurements for the project. Please provide a sketch of the area, sound sources and measurement position on the rear of this form.

Measurements are to 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	

DRAFT

Measurement results

Sample start time	Duration of sample	L _{Aeq} (dB)	L _{AFmax} (dB)	Sound source controlling the measured levels

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

Yes: *The measurement results shall be used to update the site specific noise levels and construction separation distances within the CNVMP.*

No: *The CNVMP shall be referred to for the appropriate corrective action measures and further noise mitigation option*