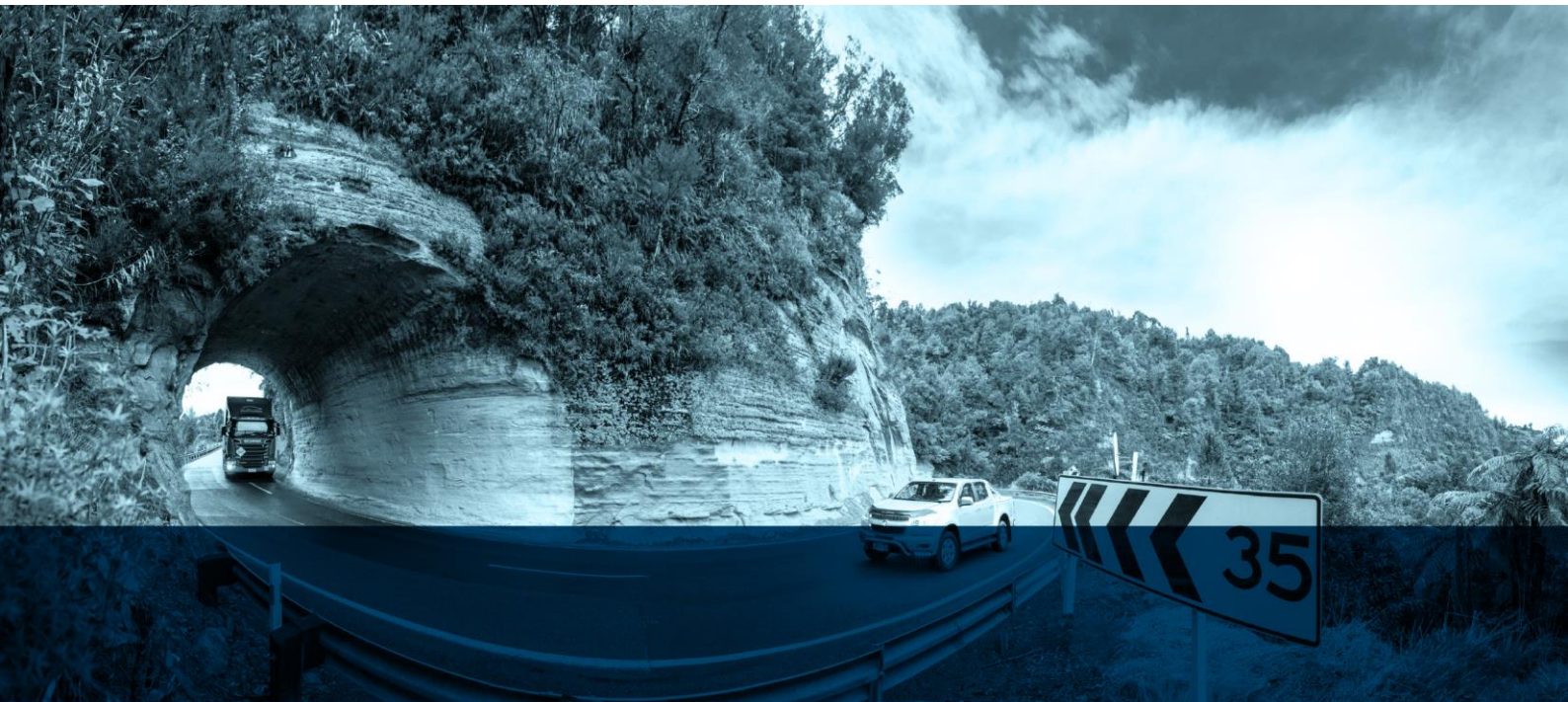








Construction Noise Management Plan

September 2023

Mt Messenger Alliance

MMA-ENV-PLN-PW-GE-GE018



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0.	December 2017	Draft for consent lodgement
1.	May 2018	Updated for Council
2.	July 2018	Updated for Council Hearing
3.	August 2018	Final following Council comments
4.	September 2018	Updated for Council Hearing
5.	February 2021	Updated for Certification
6.	May 2022	Updated to include site-specific advice
7.	Sept 2022	Revised for 2022/23 construction season. Inclusion of Fill Disposal site #4 (2397 Mokau Road).
8.	September 2023	Updated for annual review and re-certification.

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Glossary

Abbreviation	Term
Noise	A sound that is unwanted by, or distracting to, the receiver.
dB	Decibel (dB) is the unit of sound level. Expressed as a logarithmic ratio of sound pressure (P) relative to a reference pressure (Pr), where $dB = 20 \times \log(P/Pr)$.
dB(A)	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) to more closely approximate to the frequency bias of the human ear. A-weighting is used in airborne acoustics.
L_{Aeq}(t)	The equivalent continuous (time-averaged) A-weighted sound level commonly referred to as the average level. The suffix (t) represents the period, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10pm and 7am.
L_AF_{max}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise"

1 Introduction

This Construction Noise Management Plan (CNMP) has been prepared for Waka Kotahi’s Mt Messenger Bypass project (the Project). This plan has been updated for activities occurring on the project during the construction period 1st October 2023 to 30th September 2024, after which the plan will be reviewed. The CNMP for activities outside of this period will be covered in subsequent versions of the CNMP, undertaken as part of an annual review and recertification.

1.1 Purpose and Objectives of the CNMP

This CNMP has been prepared to manage and mitigate the adverse effects relating to construction noise during construction of the Project. It identifies the performance standards for the Project and sets out best practicable options (BPO) for construction noise management.

Specifically, the CNMP identifies:

- The general hours of work for the Project;
- The details of any activities that may be undertaken outside of the general hours of work for the Project;
- The necessary setbacks for specific construction plant and equipment in relation to residential dwellings;
- Procedures to comply with the New Zealand Standard NZS 6803:1999 “Acoustics - Construction Noise” (NZS 6803:1999); and
- The management and communication procedures for works that cannot comply with NZS 6803:1999.

This CNMP is an Appendix to the Construction Environmental Management Plan (CEMP) for the Project. The construction methodology for the Project is set out in the CEMP; as well as in the Assessment of Environmental Effects for the Project.

1.2 Review and updates to the CNMP

This CNMP will be the primary tool to inform the Project’s management of construction noise effects. It is a live document that will be reviewed and updated during the course of the Project to reflect significant changes associated with construction techniques, mitigation, monitoring results or the natural and physical environment.

The review and amendment process is described in Section 8 of the CEMP and shall include reviewing any comments or recommendations from New Plymouth District Council (NPDC). The outcomes of any such review shall be provided to NPDC.

The CNMP shall remain in place until the completion of construction.

1.3 Relevant Conditions

Table 1-1 identifies the designation conditions relevant to this CNMP and where they are addressed in this CNMP.

Table 1-1 -Designation Conditions relevant to this CNMP

Condition No.	Condition	Relevant CNMP section
19	Construction noise shall, subject to the exceptions provided for in the Construction Noise Management Plan (CNMP) set out in conditions 20 and 21, comply with the following criteria in accordance with NZS6803:1999 [refer to table in Condition 19]	This plan, including Section 3

Condition No.	Condition	Relevant CNMP section
19a	<p>Should the Requiring Authority not rent or otherwise occupy the dwelling at 2397 Mokau Road during construction:</p> <p>(a) operation of the spoil disposal site at 2397 Mokau Road shall be limited to Monday to Saturday 0730 to 1800 (no works are permitted on Sundays, public holidays or between 1800 and 0730 Monday to Saturday)</p>	Section 5.6
19b	<p>(b) Noise mitigation at this site shall be implemented in accordance with the CNMP: The Requiring Authority shall prior to the commencement of Works, write to the occupiers of the dwelling at 3072 Mokau Road to offer to provide alternative housing from the commencement of Works until the Completion of Construction Works. If that offer is accepted, the Requiring Authority will provide that alternative housing in a form that is as similar as is reasonably practicable to the dwelling at 3072 Mokau Road. The obligation to provide alternative housing under this condition will not apply (or will cease to apply) if condition 5A(e)(iv) applies or if the Requiring Authority acquires rights over the dwelling at 3072 Mokau Road.</p>	This plan
20	<p>The Requiring Authority shall implement the CNMP, which identifies how the Requiring Authority will manage effects from construction noise that will exceed the criteria in condition 19. The CNMP shall remain in place until the Completion of Construction Works.</p> <p>The CNMP shall be in accordance with:</p> <p>(a) the requirements of Annex E to NZS 6803:1999; and (b) the NZ Transport Agency State highway construction and maintenance noise and vibration guide (2013).</p>	This plan
21	<p>The CNMP shall include:</p> <p>(a) the general hours of work for the Project; (b) the details of any activities that may be undertaken outside of the general hours of work for the Project; (c) procedures to comply with NZS6803:1999; (d) the details of any activities that may not comply with NZS6803:1999 and measures to mitigate construction noise from those activities as far as practicable to ensure the effects are appropriate; (e) the necessary setbacks for specific construction plant and equipment in relation to residential dwellings; and (f) the management and communication procedures for Works that may not comply with NZS6803:1999.</p>	<p>Section 2.1 Section 2.1 Section 5 Sections 4 - 7 Section 4 Sections 5 and 6</p>

2 Construction Methodology

A detailed description of the construction works is provided in the CEMP. Key aspects relating to noise and vibration are outlined below.

2.1 Construction duration and working hours

The construction phase of the Project is anticipated to take approximately four years. Construction works are commenced in May 2022 and are scheduled to be complete around the end of 2026. An indicative programme is set out in the CEMP (however this programme is subject to change due to a number of factors).

Construction hours will generally be Monday to Sunday between 0630 – 2100 hours. These general hours extend into the night-time and take into account the remote Project location and small number of surrounding dwellings (refer to Section 3.2). There will however be some construction activities undertaken outside the general working hours. These activities may include:

- Works on the existing State Highway 3 (SH3) corridor, including construction of site access points at the start of the Project, and tie-ins of the new alignment to the existing State highway at the end of the Project;
- After-hours material and plant delivery, including bridge and tunnelling equipment and materials where the transport of oversize loads outside working hours will be less disruptive;
- Tunnelling works, which will be undertaken 24 hours a day; seven days a week during the relevant phase of the Project;
- Early morning concrete batching and pours; and
- On-site servicing of plant and equipment to minimise impacts on construction programme.

There is the potential that construction works outside Monday to Saturday 0730—1800 hrs will exceed the relevant construction noise limits when undertaken in proximity to occupied dwellings (refer to Section 3) and will need to be managed in accordance with Sections 5 and 6 of this Plan. However, much of the alignment has large setbacks to the nearest receivers and natural shielding by the local topography, which may enable compliance with the night-time noise limits.

In accordance with designation condition 19(b) works on the southern spoil disposal site (Fill site #4 – 2937 Mokau Road, Gordon property) shall occur Monday to Saturday 0730 - 1800 hrs only, to align with the NZS 6803:1999 daytime period.

2.2 Construction Sequencing

Due to the nature and scale of the Project, construction will be undertaken at multiple worksites at the same time. Figure 2-2 shows the indicative construction programme and sequencing for the Project.

Figure 2-2 - Indicative construction programme and sequencing for the Project.

Mobilisation and Site Establishment	Area /Activity	YR: 2022 (Q1,2,3 & 4)	2023	2024	2025	2026
	Northern Region					
Southern Region						
Northern Region	Cableway Install					
	Cuts and Fills					
	Road Finishing					

3 Performance Standards

3.1 Noise

Construction noise must be measured and assessed in accordance New Zealand Standard NZS 6803:1999. The noise limits apply at 1m from external façades of occupied buildings.

The long-duration construction noise limits in NZS 6803:1999 apply to the Project as the construction duration will exceed 20 weeks duration (refer Section 2.2).

The relevant construction noise limits in proposed designation condition 15 are summarised in Table 3-1 and Table 3-2.

Table 3-1 - Long duration construction noise criteria for residential buildings¹

Time of week	Time period	Noise Criteria	
		dB L _{Aeq}	L _{AFmax}
Weekdays	0630 – 0730	55	75
	0730 - 1800	70	85
	1800 - 2000	65	80
	2000 - 0630	45	75
Saturdays	0730 - 1800	70	85
	1800 - 0630	45	75
Sundays and public holidays	0730 – 1800	55	85
	1800 - 0630	45	75

Table 3-2 - Long duration construction noise criteria for commercial buildings²

Time of week	Time period	Noise Criteria
		dB L _{Aeq}
All days	0730 – 1800	70
	1800 – 0730	75

3.2 Sensitive Receivers

There are 4 dwellings located within 1km of the Project:

¹ The noise criteria for two time periods recorded separately in NZS 6803:1999, under Saturdays and Sundays and public holidays, have been collated to record the same noise criteria for one time period 1800 – 0630

² Commercial buildings include occupied farm sheds.

- 2397 Mokau Road (Gordon) at the southern end of the alignment, approximately 45m from the southern fill area (Fill #4), and approximately 30m from the designation boundary for the area.
- 2528 Mokau Road (Thomson) at the southern end of the alignment, approximately 120m from the nearest point of earthworks; and
- 2750 Mokau Road (Beard) at the middle of the alignment, approximately 400m from the tunnel construction site.

It is understood that the dwelling at 3072 Mokau Road (Pascoe) will be purchased and will be vacant during construction. Therefore, this dwelling is not considered to be a sensitive receptor for the purposes of this Plan.

4 Predicted Noise Levels

Table 4-1 provides indicative construction noise levels for proposed construction machinery, and setback distances without mitigation or terrain shielding to comply with the Project noise limits.

It should be used by the Environmental Manager (or nominated person) prior to construction to inform what equipment will require mitigation and/or management, and when. The table should be kept up to date by the Acoustic Specialist when new information is available through noise monitoring (refer to Section 7) or other means.

Table 4-1 - Equipment Noise Levels (without mitigation or topographical shielding)

Equipment	Sound Power (dB L _{WA})	Façade Noise Level (dB LAeq) at a distance (m)				Limit Compliance Setback (m)	
		10	20	50	100	70dB LAeq	45dB LAeq
Concrete/rock breaker (large)	121	93	87	78	71	132	1318
Concrete cutting	115	87	81	72	65	76	759
Impact piling (no mitigation)	123	95	89	80	73	158	1585
Impact piling (casing & dolly)	114	86	80	71	64	69	692
Vibratory sheet piling	116	88	82	73	66	83	832
Bored or screw piling	111	83	77	68	61	52	525
Hydrovac excavation	107	79	73	64	57	36	363
Excavator (20T)	103	75	69	60	53	25	251
Concrete truck and pump	103	75	69	60	53	25	251
Mobile Crane (35T) operating	98	70	64	55	48	14	158
Crawler Crane (600T) operating	99	71	65	55	49	14	158
Hydraulic power pack	97	69	63	54	47	13	145
Generator (150kVA)	93	65	59	50	43	8	100
Generator (1000 kVA)	108	80	74	65	58	40	398
Pump (150mm dia)	93	65	59	50	43	8	100

Equipment	Sound Power (dB L _{WA})	Façade Noise Level (dB LAeq) at a distance (m)				Limit Compliance Setback (m)	
		10	20	50	100	70dB LAeq	45dB LAeq
Compressor	93	65	59	50	43	8	100
Truck idling	91	63	57	48	41	6	83
Articulated dump truck (30T)	109	81	75	66	59	40	398
Milling machine	110	82	76	67	60	48	479
Plate compactor	108	80	74	65	58	40	398
Paving machine	103	75	69	60	53	25	251
Static or vibratory roller	103	75	69	60	53	25	251
Grader	111	83	77	68	61	52	525
Bulldozer	114	86	80	71	64	69	692
Soil nail drilling rig	107	79	73	64	57	36	363

The noise level received inside a noise sensitive space (e.g. bedroom or living room) will depend on the external noise level, sound insulation performance of the façade (particularly the glazing) and room constants (such as the room dimensions and surface finishes). These factors can vary widely.

The NZS 6803:1999 says that construction noise can be assessed inside a building, assuming a façade sound level difference of 20 decibels. However, 20 decibels may not be appropriate for houses with windows open for ventilation. With knowledge of the façade glazing type, the sound insulation performance can generally be estimated as follows:

- Openable windows (closed) 20 – 25 decibels façade sound level difference
- Open windows 15 decibels façade sound level difference

Table 4-2 and Table 4-3 provide guidance on the effects in noise sensitive spaces during the day and night respectively, depending on the external noise level and façade glazing type. The potential effects are colour coded as follows:

- Typically acceptable
- Annoyance and reduction in work efficiency for some occupants (day)
Sleep disturbance for some occupants (night)
- Annoyance and degradation of communication quality for most occupants (day)
Sleep disturbance for most occupants (night)

Table 4-2 - Daytime noise levels habitable rooms in dwellings

External Noise Level (dB L _{Aeq})	Estimated Internal Noise Level (dB L _{Aeq})	
	Closed Windows	Open Windows
90 – 95	65 – 70	75 – 80
85 – 90	60 – 65	70 – 75
80 – 85	55 – 60	65 – 70
75 – 80	50 – 55	60 – 65
70 – 75	45 – 50	55 – 60

Table 4-3 – Night-time noise levels in bedrooms of dwellings

External Noise Level (dB L _{Aeq})	Estimated Internal Noise Level (dB L _{Aeq})	
	Closed Windows	Open Windows
70 – 75	45 – 50	55 – 60
65 – 70	40 – 45	50 – 55
60 – 65	35 – 40	45 – 50
55 – 60	30 – 35	40 – 45
50 – 55	25 – 30	35 – 40
45 – 50	20 – 25	30 – 35

5 Mitigation and Management

5.1 Training

All staff will participate in a Project induction training session prior to the start of construction, with attention given to the following matters:

- Construction noise limits (refer to Section 3.1);
- Activities with the potential to generate high levels of noise and/or vibration (refer to Section 4);
- Noise mitigation and management procedures (refer to Section 5); and
- The sensitivity of receivers and any operational requirements and constraints identified through communication and consultation (refer to Section 6)

Awareness of current noise matters on, or near, active worksites, will be addressed during regular site meetings and/or 'toolbox' training sessions.

Refer to the CEMP for further detail on staff training.

5.2 Equipment Selection

When selecting construction equipment to be used in proximity to sensitive receivers, where practicable:

- Use quieter construction methodologies (e.g. bored piling instead of drop hammer piling);
- Use electric motors over diesel engines;
- Use rubber tracked equipment over steel tracked equipment;
- Equipment shall be suitably sized for the proposed task;
- Equipment shall be maintained and fitted with exhaust silencers and engine covers; and
- Avoid using tonal reversing alarms. Use alternative alarms including flashing lights, broadband audible alarms or reversing cameras inside vehicles.

The above points are particularly important in the event of night-time works in proximity to dwellings.

5.3 Scheduling of works

Works near sensitive receivers (determine setback using Table 4-1) shall be scheduled to, where practicable, avoid night works. Where night works are necessary, noisy works shall be programmed early in the evening or night-time period to avoid sleep disturbance. Note that people tend to be less disturbed by low frequency, continuous engine noise, than intermittent noise or activities with special audible character (e.g. reversing beepers, whistling, banging tailgates or shouting).

Night works which exceed the relevant limits should be no longer than 5 consecutive nights at any one receiver, depending on overall level and duration. The Acoustic Specialist (refer to Table 2-1) shall be involved in scheduling of night works and monitoring to ensure BPO is adopted

Stakeholder engagement will be critical and shall be undertaken with occupiers of buildings located within 400m of the night works (refer to Section 6).

5.4 General Measures

Complaints can arise whether or not noise levels comply with the Project limits. To avoid complaints, general mitigation and management measures will include, but not be limited to, the following:

- Avoid unnecessary noise, such as shouting, the use of horns, loud site radios, rough handling of material and equipment, and banging or shaking excavator buckets.
- Avoid steel on steel contact such as during the loading of scaffolding on trucks.
- Avoid high engine revs through appropriate equipment selection and turn engines off when idle.
- Maintain site access ways to avoid pot holes and corrugations.

- Mitigate track squeal from tracked equipment, such as excavators (may include tensioning and watering or lubricating the tracks regularly).
- Minimise construction duration near sensitive receivers.
- Stationary equipment (e.g. generators) shall be located away from noise sensitive receivers and site buildings and material stores used to screen them.
- Orient mobile machinery to maximise the distance between the engine exhaust and the nearest sensitive building façade (e.g. excavators).
- Utilise noise barriers where appropriate (refer to Section 0).
- Ensure advanced communication is complete (refer to Section 6) prior to commencing activities that are predicted to exceed the noise performance standards (refer to Section 4).
- Where nearby sensitive receivers are identified with particularly noise sensitive equipment and/or activities, a suitably qualified and experienced specialist (e.g. Member of the Acoustical Society of New Zealand) will review the performance standards (Section 4) to ensure they are appropriate and participate in consultation (refer to Section 6.2).
- Undertake monitoring as appropriate (refer to Section 7).

5.5 Noise Barriers

Temporary noise barriers will be used where a construction noise limit is predicted to be exceeded (refer to Section 4) and the barriers would noticeably reduce the construction noise level. They shall be installed prior to works commencing and maintained throughout the works. Effective noise barriers typically reduce the received noise level by 10 decibels.

The following guidelines shall be incorporated in the design and utilisation of temporary noise barriers:

- The panels shall be constructed from materials with a minimum surface mass of 6.5kg/m². Suitable panels include 12mm plywood or the following proprietary 'noise curtains':
 - Duraflex 'Noise Control Barrier - Performance Series' (www.duraflex.co.nz)
 - Soundex 'Acoustic Curtain - Performance Series' (www.ultimate-solutions.co.nz)
 - Flexshield 'Sonic Curtain with 4kg/m² mass loaded vinyl backing' (www.flexshield.co.nz)
 - Alternatives should be approved by a suitably qualified acoustic specialist because some proprietary noise curtains have insufficient surface mass for general use.
- The panels shall be a minimum height of 2m, and higher if practicable to block line-of-sight.
- The panels shall be abutted or overlapped to provide a continuous screen without gaps at the bottom or sides of the panels.
- The panels shall be positioned as close as practicable to the noisy construction activity to block line-of-sight between the activity and noise sensitive receivers.

5.6 Site-specific management

Some worksites require particular attention because of their potential to generate non-compliance or effects.

- Appendix A contains advice relating to each of these sites, and additional sites shall be added to this CNMP if required. If selection of quiet equipment cannot enable compliance, investigate the effectiveness of bunds and/or temporary noise barriers to reduce noise levels.

6 Stakeholder Engagement

6.1 Communication

Communication with key stakeholders in relation to construction works is described in Section 6 of the CEMP. A Project hotline will be operational 24/7 during construction and clearly included on any written Project notifications and Project signage.

6.1.1 Daytime works

Communication (meeting or written communications) should be undertaken with occupiers of dwellings located within 200m of where noise due to construction works are predicted to exceed the relevant limits.

Some construction activities are predicted to generate high noise levels that may exceed the Project noise criteria or result in disturbance to sensitive receivers. Communication will be undertaken with these receivers prior to the commencement of the relevant construction activities and will provide receivers with details of the construction works, timing and duration of high noise generating works, anticipated noise effects and Project contact details.

6.1.2 Night-time works

Occupants of dwellings located within 400m of construction activities that are to be undertaken at night shall be advised of the works at least 5 days prior to the works commencing. Occupants shall be advised as to the work details, duration, timing, anticipated noise effects and Project contact details.

An acoustic engineer should be involved in scheduling and monitoring of potentially noisy night-time works to ensure the BPO is adopted.

6.2 Consultation

Consultation shall be undertaken to address any/all construction noise concerns on a case-by-case basis. The Stakeholder Engagement and Communications Manager shall address any concerns and complaints in accordance with Section 6.3. A copy of all correspondence will be made available to Council upon request.

The following process will be implemented by the Environmental Manager (or nominated person) should the measured noise levels from any construction activity exceed the Project noise limits:

- Review the construction methodology, mitigation and management strategies to ensure they represent the BPO.
- Undertake consultation with affected parties to understand their sensitivities, including times, activities and locations. Consultation should focus on a collaborative approach to managing the adverse effects from construction noise. A record of consultation should be kept at the site office and be available to the affected parties and Council if requested.
- Implement measures as practicable to avoid significant adverse effects as agreed with the affected party and monitor the activity to verify the extent of any adverse effects.
- Temporary relocation should be considered for sensitive receivers where all practicable noise management and mitigation measures have been implemented and significant adverse noise effects are predicted. This will be in exceptional cases only, and advice from the Acoustic Specialist will be sought prior.

6.3 Complaints Response

All construction noise complaints should be recorded in accordance with the Project complaints response process outlined in Section 6 of the CEMP. For complaints related to construction noise, an investigation should be undertaken involving the following steps as soon as practicable following receiving the complaint:

- Acknowledge receipt of the concern or complaint within 24 hours and record:
 - Time and date the complaint was received and who received it.
 - Time and date of the activity subject to the complaint (estimated where not known).
 - The name, address and contact details of the complainant (unless they elect not to provide).
 - The complainant's description of the activity and its resulting effects.
 - Any relief sought by the complainant (e.g. scheduling of the activity).
- Identify the relevant activity and the nature of the works at the time of the complaint.
- Review the activity noise levels (refer to Section 4) to determine if the activity is predicted to comply with the relevant performance standards (refer to Section 3.1) at the complainants building. Consider attended monitoring (refer to Section 7) to verify the underlying reference level assumptions.
- Review the mitigation and management measures in to ensure the activity represents the BPO. Review the relief sought by the complainant. Adopt further mitigation and management measures as appropriate.
- Review the potential residual effects (refer to Section 4) of activities that are predicted to exceed the relevant performance standards (refer to Section 3.1).
- Report the findings and recommendations to the Environmental Manager, implement changes and update this CNMP as appropriate.
- Report the outcomes of the investigation to the complainant, identifying where the relief sought by the complainant has been adopted or the reason(s) otherwise.

In most cases, ceasing the activity would provide immediate relief. In some cases, this may not be practicable for safety or other reasons. The complainant shall be kept updated regularly during the time it takes to resolve the matter.

7 Monitoring

Construction noise levels will be monitored:

- By a suitably qualified and experienced specialist (e.g. Member of the Acoustical Society of New Zealand) in accordance with the requirements of New Zealand Standard NZS 6803: 1999 “Acoustics - Construction Noise”.
- During the first occurrence of activities that are predicted to exceed the noise limits (refer to Section 3.1).
- In response to a reasonable noise complaint (refer to Section 6.3).
- At 1m from the most affected building façade, or proxy position and adjusted for distance and façade reflections where appropriate.
- For a representative duration, reported with the measured level (e.g. 65 dB $L_{Aeq}(30min)$).
- The results should be used to update Section 4 if appropriate.

A noise monitoring flowchart is presented in Figure 7.1.

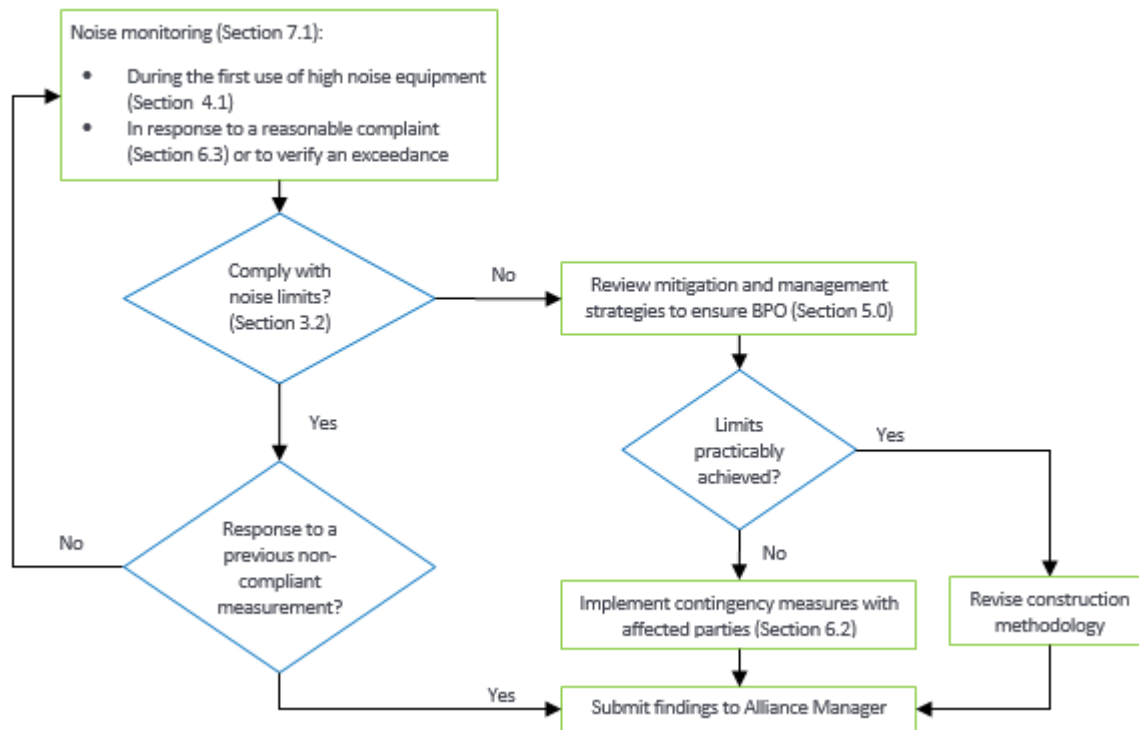


Figure 7.1 - Noise Monitoring Flow Chart

Appendix A – Site-specific management

This appendix contains management and communication requirements for specific sites along the Project alignment.

Some of these requirements have been reported in separate documents, in which case they have been copied into this CNMP.

Site-specific management has been provided for the following sites:

- A1 – Southern spoil disposal site at 2397 Mokau Road
- A2 – Construction yard at 2528 Mokau Road
- A3 – Cableway tower at 2750 Mokau Road
- A4 – Zones 3 to 7 and 9
- A5 – Zone 8, Fill 6 at 2528 Mokau Road (Thomson Property)
- A6 – Zone 10, Fill 7 at 2289 Mokau Road (Anglesey property)

A1 - Southern spoil disposal site (Fill #4 – 2397 Mokau Road, Gordons property)

The southern spoil disposal site (Zone 10, Fill 4) is located adjacent to the Gordon dwelling at 2397 Mokau Road. The property will be used for 58,000m³ of fill for the construction season commencing October 2022.

The minimum setback required for operating a D6 Bulldozer is 33m from the nearest dwelling. However, due to the topography and the higher elevation of the dwelling compared to the fill site, there is no line of sight when dozers are operating closer than 33m, and it is expected that the ground will provide shielding of 5-10dB.

Given the proximity of the dwelling (approximately 45m) to the spoil disposal site, there is a potential for construction works to exceed the Project's Monday to Saturday daytime construction noise limits. The following management procedures shall be implemented to ensure activities at the southern spoil site comply with the relevant noise limits.

- In accordance with condition 19(a) the spoil disposal site shall only be used Monday to Saturday 0730 – 1800 hours.
The limitation on hours and days only applies if the house is not occupied by persons working on the project or written approval has not been secured.
- Select quiet equipment with the purpose of minimising setback distances (refer to Section 5.2).
- Staff shall be inducted and trained on minimising noise levels (refer to Section 5.1).
- Measure initial activities to determine appropriate setbacks (refer to Section 7 and Table 4.1).

A2 – Construction yard at 2528 Mokau Road

The proposed site is shown in Figure 1 below. There is one dwelling at the address which is approximately 60m south of the proposed construction yard. The Google Street View image of the dwelling is shown in Figure 2. The dwelling is slightly elevated above the site which will impact on the efficacy of acoustic screens. Mt Messenger Alliance proposes to construct a 1m high earth bund around the construction yard as shown in Figure 1.

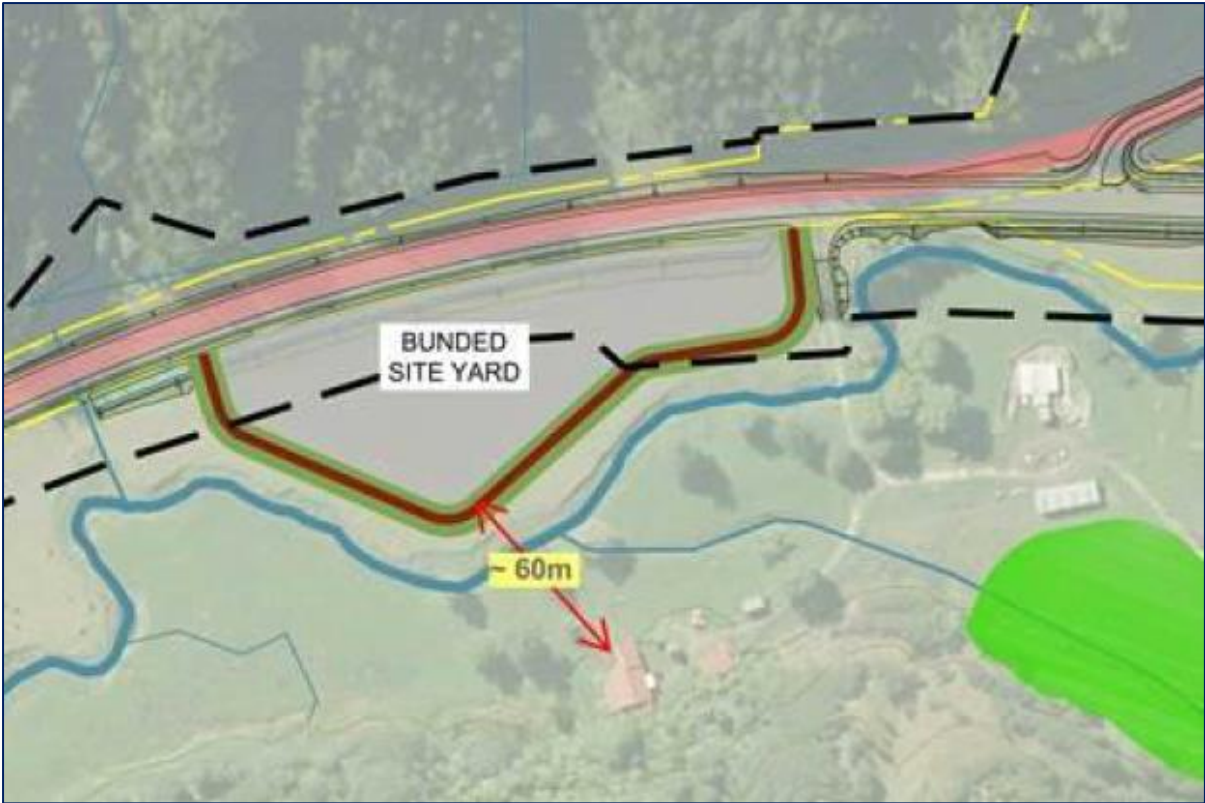


Figure 1: Proposed Construction Yard



Figure 2: Street View of Dwelling at 2528 Mokau Road

The construction yard will involve the following activities, occurring approx. 5am to 7pm during summer and 6am to 6pm during winter.

- Night-time parking for equipment operating at the northern end of the project
- Main supply yard access – stores and mechanics. All materials for north of the tunnel will come through this location
- Mechanics yard, grinding, welding, tyres etc
- Septic tank emptying, water supply tank filling
- Induction training and smoko areas
- The following vehicle numbers
 - 30-40 light vehicles 5am to 7pm every day
 - Heavies – road trucks/truck and trailers approximately 20 loads per day both full and then out empty
 - Circuit traffic (40t dumpers) morning start up and night for shut down
 - Diesel tanker at night to fuel up

A 2 metre high acoustic hoarding should be constructed on top of the bund. This barrier should comply with the requirements in Section 5.5 of the CNMP.

We have carried out a high-level assessment of the likely noise levels from the proposed activities. Compliance with the noise limits (see Section 3.1 of CNMP) can be achieved for most activities. A breakdown is provided below.

Between 0730 and 1800 Monday – Saturday

We predict that all of the proposed will comply with the daytime noise limits (70 dB L_{Aeq} and 85 dB L_{Amax}). This includes excavation to construct the earth bund and construction yard groundworks.

Between 0630 – 0730 and 1800 – 2000 Monday – Friday

All of the proposed activities can comply with these shoulder period noise limits (55 and 65 dB L_{Aeq} and 75 and 80 dB L_{Amax}).

At all other times when the 45 dB L_{Aeq} limit applies

We predict that low noise activities such as light vehicle movements, diesel tanker delivery and trucks idling (location dependent) will comply. Higher noise activities such as maintenance with grinders, loading aggregate onto trucks cannot comply and should only occur during daytime (0730 to 1800 Monday to Saturday).

A3 – Cableway tower at 2750 Mokau Road

The construction of the cableway tower involves minor earthworks using excavators, trucks and cranes. Predicted noise levels at 2750 Mokau Road are less than 45 dB L_{Aeq} , which complies with the noise limits at all times.

A4 – Zones 3 to 7 and 9

Construction activities proposed for the 2023-24 season in in Zones 3-7 and 9 involve the following equipment and require the following minimum setback distances for 70 dB L_{Aeq} noise limit compliance:

- 20t Excavator – 25m setback
- Soil nail rig – 36m setback (Zone 3 only)
- Dump truck – 40m setback
- Piling rig – 158m setback (Zone 6 only)
- Crane – 14m setback

We understand that construction hours are between 0730 - 1800 hours from Monday to Saturday. Restricting works to these hours will ensure that activities in Zone 6 and 7 can comply with the relevant noise limits.

Works in Zones 3, 4, 5 and 9 can occur 0600 – 2000 Monday to Friday while complying with the noise limits. Night-time works should not occur.

A5 – Zone 8, Fill 6 at 2528 Mokau Road (Thomson property)

Fill disposal site 6 on the Thomson property at 2528 Mokau Road will be used for 48,000m³ of fill for the construction season commencing in October 2023. The nearest point of the disposal site is approximately 60 metres from the dwelling.

The minimum setbacks required for operating a Moxy dump truck is 40m from the nearest dwelling. When the cumulative noise levels from a 20t excavator, crane and up to three Moxy dump trucks are considered, we predict that noise levels at this fill site can comply with the 0730-1800 hours Monday to Saturday daytime limits. We recommend that operation of the equipment described above is therefore restricted to these times only. We note that the topography between the dwelling and the fill site will provide some screening for the majority of the fill site.

A6 – Zone 10, Fill 7 at 2289 Mokau Road (Anglesey property)

The Anglesey property at 2289 Mokau Road will be used for 69,000m³ of fill for the construction season commencing in November 2023. The nearest point of this disposal site is greater than 150 metres from the nearest dwelling.

Similar equipment to that used for Fill 6 described above will be used. As this dwelling is much further away from the fill site, we anticipate that noise levels from the fill site will comply with the 0730-1800 hours Monday to Saturday daytime limits. Night-time works should not occur.