



NOISE EFFECTS

BRYMER FARMS
127 BRYMER ROAD

PREPARED FOR
Brymer Farms Limited

DATE
11 August 2026



Noise and vibration assessment prepared by Styles Group for Brymer Farms Limited.

REVISION HISTORY

Rev:	Date:	Comment:	Version:	Prepared by:	Reviewed by:
1	10/08/26		Final Draft	Jon Styles, MASNZ Principal Styles Group	Gemma Styles Consultant Styles Group
2	11/08/26		Final		

Statement of experience

I am Jon Styles, the Director and Principal of Styles Group Acoustics and Vibration Consultants. I have over 24 years' experience advising on the management of construction and operational noise and vibration effects. I am a Council Member of the Acoustical Society of New Zealand, and I am on the Board of Directors of the Australasian Association of Acoustical Consultants. My qualifications and relevant experience are set out in further detail in my curriculum vitae provided in Appendix C to this report.

I confirm that I have read and understood the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023, and I agree to comply with it.

I acknowledge that, as an expert, I have an overriding duty to assist the decision maker impartially on matters within my area of expertise. In preparing this report, I have exercised my independent professional judgement, and the opinions I express are my own. I understand that my duty as an expert is not to advocate for the interests of the applicant or any other party.

I confirm that the matters addressed in this report are within my area of expertise, except where I expressly state that I am relying on information or opinions provided by another person. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed in this report.

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Executive summary

Styles Group has assessed the noise effects from the proposed Brymer Farms development (the **Project**) at 127 Brymer Road (the **Site**). This assessment has been prepared to accompany a substantive application under the Fast-track Approvals Act 2024 (**FTAA**).

The Project will provide approximately 1,043 residential units, including approximately 248 apartment units, across a range of housing typologies and densities. The Project also includes two mixed-use commercial centres that will provide 2,184 m² of commercial GFA and 40 upper floor apartments. The Project also includes transport and three-waters infrastructure and an integrated network of public and recreational open spaces.

We have assessed the operational noise and construction noise and vibration effects from the Project in accordance with the permitted noise standards prescribed by the Waikato District Plan – Operative in Part (**WDPOP**). We have also assessed the potential noise effects from the Project and received in the jurisdiction of the Hamilton District in accordance with the permitted standards prescribed by the Hamilton City District Plan (**HCDP**).

Our assessment confirms that:

- Operational noise generated from the Site will be compatible with the level of noise amenity that is anticipated and provided for in the Rural Zone of the Waikato District and Residential Zone of Hamilton City. We have recommended conditions of consent to deliver this outcome.
- The two proposed mixed-use areas will provide for commercial activities to service the needs of residents (e.g. a local superette, café etc) and upper floor apartments. We have recommended conditions of consent to control operational noise from commercial activity and to manage noise related compatibility in a mixed use environment. We have recommended the noise limits for the commercial areas are based on the permitted noise standards that apply in the WDPOP Local Centre Zone, including acoustic treatment requirements for noise sensitive activities that co-locate with commercial activities.
- A small area of the Site is inside the State Highway Corridor Noise Control Boundary (**NCB**). All future dwellings inside the NCB will be designed constructed to mitigate road-traffic noise, in accordance with the compliance pathway in NOISE-R44 and Section 8.1(4) of APP1 of the WDPOP. We have recommended a condition is attached to lots inside the NCB so future owners are aware of this requirement.

The potential construction noise and vibration effects will be typical for a development of this scale and nature. We have prepared a draft Construction Noise and Vibration Management Plan (**CNVMP**) that sets out the mitigation measures that must be implemented by the contractor to ensure that construction noise levels are managed to comply with the recommended noise limits for long-term projects prescribed by NZS 6803:1999 *Acoustics – Construction Noise*. The draft CNVMP also addresses vibration from construction work, including measures required to comply with DIN 4150-3:1999 *Structural vibration – Effects of*

vibration on structures. The draft CNVMP will be updated when the contractor has been appointed and the construction methodology has been confirmed. The CNVMP will be submitted to Waikato District Council for certification, prior to commencement of construction work.

Overall, taking into account the implementation of the conditions recommended in this assessment, we consider that the Project will not give rise to any unreasonable emission of noise in accordance with clause 7(f) of Schedule 5 to the Fast-track Approvals Act 2024

1.0 Introduction

Brymer Farms Limited has engaged Styles Group to assess the construction and operational noise effects from the proposal to enable the subdivision and development of approximately 80.99ha of land at 127 Brymer Road (the **Site**) for the Brymer Farms development (the **Project**).

This assessment has been prepared accompany a substantive application under the Fast-track Approvals Act 2024, following the Ministers' Notice of Decision to refer the Project on 4 September 2025. The substantive application seeks the land use, environmental, subdivision and associated infrastructure consents required to enable the development to be delivered progressively and in a coordinated manner.

This report provides an assessment of the Project in terms of the permitted noise standards prescribed by the Waikato District Plan Operative in Part (**WDPOP**). This assessment also assesses the potential noise effects that may be received in the jurisdiction of the Hamilton District in accordance with the permitted standards prescribed by the Hamilton City District Plan (**HCDP**). This assessment includes a framework of recommended conditions to ensure the appropriate management of construction and operational noise effects.

This report should be read in conjunction with the documentation submitted with the substantive application and site plans. A glossary of acoustical terms used within this document is attached as Appendix A.

2.0 The Project

The Project is a comprehensively planned, multi-stage residential development providing for the urbanisation and subdivision of the project site. The Project will provide approximately 1,043 residential units, including approximately 248 apartment units, across a range of housing typologies and densities. Housing will comprise a mix of terraced, duplex and detached dwellings, conventional and compact residential lots, irregular lots, and eight larger rural-residential lots.

The masterplan (Figure 1) provides for two mixed-use commercial sites, identified as C1 and C2, which will form a neighbourhood scale commercial component within the development. C1 will provide approximately 910 m² of ground-floor commercial gross floor area (**GFA**), with 24 two-bedroom apartments above. C2 will provide approximately 1,274 m² of ground-floor commercial GFA, with 16 two-bedroom apartments above. Both sites will incorporate basement car parking, dedicated vehicle access, servicing areas and landscaping. Collectively, C1 and C2 will provide approximately 2,184 m² of commercial GFA and 40 apartments, supporting the day-to-day needs of residents and contributing to a mixed-use neighbourhood environment.

The development will be supported by the necessary transport and three-waters infrastructure. Water supply and wastewater servicing will connect to the IAWAI reticulated networks, with

internal reticulation and associated infrastructure established progressively as development is staged. This may include pump stations, storage, reservoirs and mains, where required.

Implementation of the Project will require staged development related earthworks to establish suitable building platforms, a well-connected road network, infrastructure corridors, reserves and other components of the master plan. These works will include site formation, cut and fill, retaining, erosion and sediment control, and other enabling works required to facilitate the staged subdivision and development of the site. The Project will also require the undergrounding of existing power lines within the Site.

The development will provide an integrated network of public and recreational open spaces, pedestrian connections, wetlands, watercourses, stormwater reserves, landscaped areas and retained vegetation.

The overall open-space and movement network will connect with the surrounding urban environment and existing reserves, including Rakautahi Park, Brymer Glen Reserve, Brymer Park and Te Kootii Park. These connections will provide links between residential neighbourhoods, commercial and community areas, recreational spaces and the wider transport network.

The Project will be implemented through a multi-staged consenting and development framework, enabling subdivision, land use and infrastructure works to proceed progressively while ensuring that each stage is appropriately serviced and integrated with the wider development and surrounding environment.

The development will be subject to a comprehensive suite of proposed conditions of consent that provide the framework for managing the construction, staging, servicing and operation of the development.

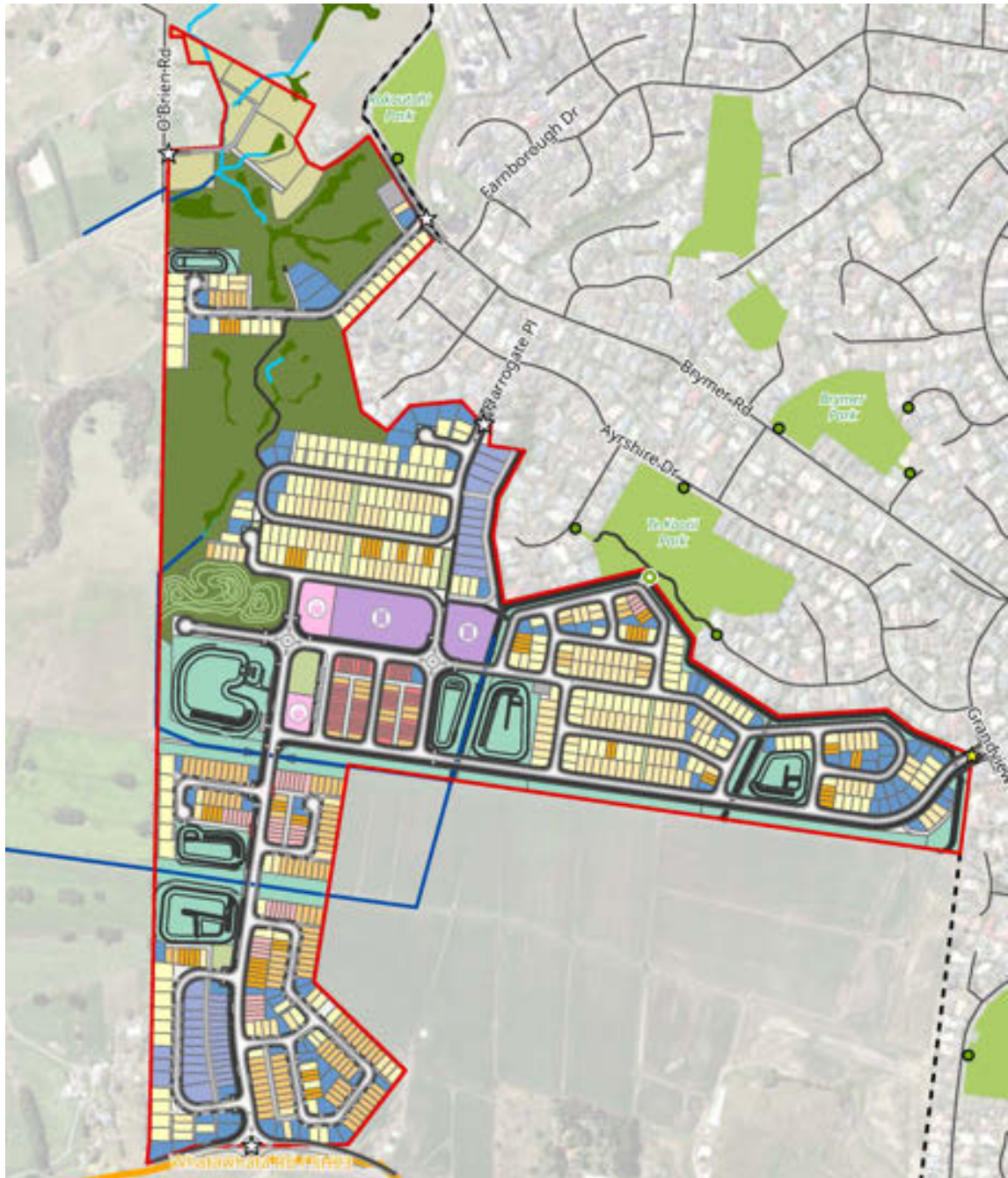


Figure 1 Brymer Farms Masterplan

3.0 The Site and receivers of noise

The Site is in the General Rural Zone (**GRUZ**) of the Waikato District. The adjacent land to the north, west and south of the Site is also in the GRUZ.

State Highway 23 (**SH23**) runs along the southern boundary of the Site. Figure 2 displays the spatial extent of the State Highway Corridor Noise Control Boundary (**NCB**) that affects an area of the Site near to the southern boundary. The north-eastern and eastern boundaries of the Site interface with the territorial boundary of Hamilton City. The adjacent land in Hamilton City is occupied by established residential development in the General Residential Zone (**Residential Zone**) of the HCDP.

Figure 2 displays the Site in relation to the closest GRUZ dwellings adjacent to the northern, western and southern boundaries of the Site and the established dwellings in the Residential Zone of Hamilton City to the east.

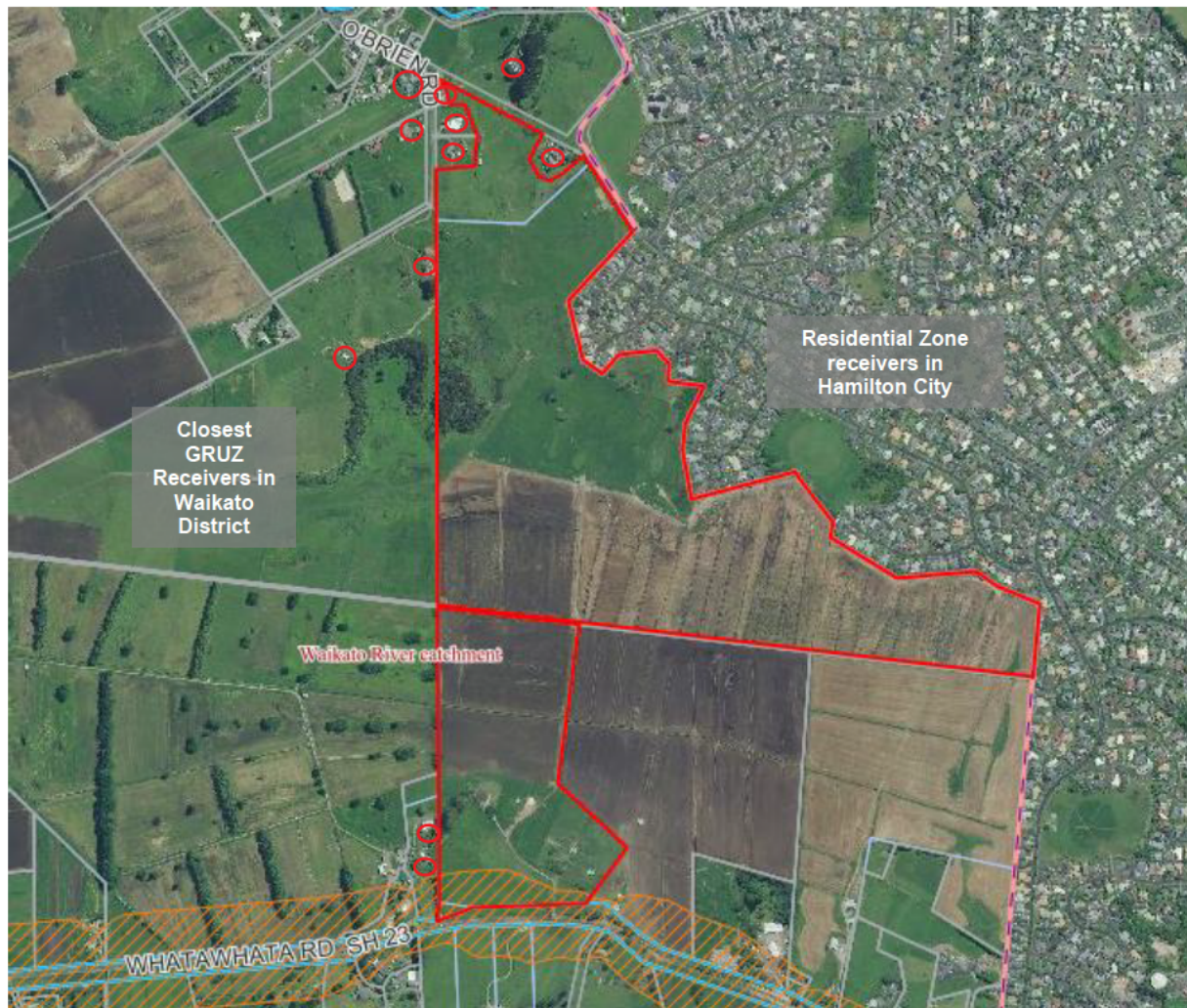


Figure 2 The Site (outlined red) and closest existing receivers in the GRUZ of the WDPop (identified with a red circle) and Residential Zone of Hamilton City

5.0 Operational noise assessment

The proposal is to enable a comprehensive residential development that will interface with the adjacent Residential Zone in Hamilton City.

The underlying noise limits for the GRUZ (and requirement for noise levels to be assessed at the notional boundary position) are generally designed to manage noise levels between large sites containing rural activities. This assessment therefore considers:

- Whether appropriate conditions should be attached to the consent to manage operational noise levels between sites **inside the Site** in what will be a predominantly residential development, with two areas of mixed use, commercial activity in areas C1 and C2.
- Whether bespoke noise limits are required to achieve a high level of compatibility with adjacent noise sensitive land use **outside the Site** in the Residential Zone of Hamilton City and in the GRUZ.

5.1 Noise levels between residential sites

The character, timing and level of noise from residential activity within the Site is expected to be consistent with a typical residential area, where the noise environment is primarily controlled by vehicle movements on public roads and intermittent noise from typical household activities (such as household maintenance and children's play). These activities and noise levels are expected to be consistent with the noise environment in the adjacent Residential Zone of Hamilton City.

The Site is in the GRUZ. The numerical noise limits applying in the GRUZ via NOISE-R8 are reproduced in Table 1. The GRUZ noise limits are presented for comparison alongside the permitted noise levels that apply in the adjacent Residential Zone of Hamilton City.

Table 1 Permitted noise standards that apply in the GRUZ of the Waikato District and Residential Zone of Hamilton City

NOISE R8 of the WDPOP	Rule 25.8.3.7 of the HCDP
<i>This rule controls noise generated in the GRUZ and received at the notional boundary of any dwelling in the GRUZ of the Waikato District</i>	<i>This rule controls the level of noise received in the Residential Zones of Hamilton City (measured at or within the site boundary).</i>
50 dB L_{Aeq} between 7am and 7pm	45 dB L_{Aeq} and 75 dB L_{Amax} between 6am and 7am
45 dB L_{Aeq} between 7pm and 10pm	50 dB L_{Aeq} between 7am and 8pm
40 dB L_{Aeq} and 65 dB L_{Amax} between 10pm and 7am.	45 dB L_{Aeq} between 8pm and 11pm
	40 dB L_{Aeq} and 75 dB L_{Amax} between 11pm and 6am

Table 1 shows that the WDPOP and HCDP both prescribe the same numerical noise limits during the daytime and nighttime periods with minor variations between the prescribed timeframes for daytime, evening, early morning and night-time. Compliance with the GRUZ noise limits must be assessed at the notional boundary, while the HCDP Residential Zone noise limits apply at or within the site boundary. Adopting the same numerical noise limits prescribed by NOISE-R8 will therefore deliver a similar level of acoustic amenity to what could reasonably be expected by a nearby resident in the Hamilton district.

We note that the permitted noise standards applying in the Residential Zone of Hamilton City do not apply to road traffic noise or noise ancillary to residential activities¹ in Residential Zones, including the use of garden equipment (such as lawnmowers, chainsaws or wood chippers). These noise sources are therefore anticipated and provided for in the Residential Zone of the Hamilton District. Our experience is that such 'exemptions' are a common and important part of residential noise limits in many district plans, however the WDPOP noise standards do not contain any similar exemptions for residential activity in either the residential or rural zone noise standards.

We consider that the most appropriate way to control noise between residential lots within the Site will be to draft a condition of consent that contains the same numerical noise limits in NOISE-R8, to require compliance at the site boundary (rather than the notional boundary) and to include exemptions to provide for normal household activities (such as lawn mowing or children playing) provided it is intermittent and undertaken at reasonable times of the day. A recommended condition is provided in Section 8.

5.2 Operational noise from activities in the mixed-use commercial areas

The areas shown as C1 and C2 on the masterplan will include a mix of small-scale commercial activities (i.e. café, local superette) with upper-floor apartment living.

The character of noise from commercial activities will be different in character to the residential area. However, all commercial noise sources will be located a significant distance from receivers in the Residential Zone of Hamilton City and will not be audible from this area.

The underlying GRUZ noise limits in NOISE-R8 are not designed to control noise levels in a mixed use environment. The establishment of an apartment above or immediately adjacent to a commercial activity would introduce a noise compliant point that would require a commercial activity to comply with the noise limits in NOISE-R8. The requirement to meet the GRUZ noise limits at very close compliance locations would present a significant constraint to the operation of commercial activities (such as the delivery of goods to a superette using refrigerated heavy goods vehicles).

¹ Defined by the HCDP to mean the use of land and buildings by people for living accommodation (whether or not any person is subject to care or supervision).

We therefore recommend that the substantive application includes conditions that will deliver the following outcomes:

Lots inside areas C1 and C2

- i. We recommend that the noise limits controlling noise generated and received between sites in areas C1 and C2 are based on the WDPOP permitted noise levels for the Local Centre Zone (**LCZ**). The LCZ noise limits enable noise levels of up to 65dB $L_{Aeq} (15min)$ during the day (7am to 11pm) and 55dB $L_{Aeq} (15min)$ and 85dB L_{Amax} during the night (11pm to 7am). We recommend the noise limits apply at or within the boundary of any other site in areas C1 and C2. These noise limits will provide sufficient operational flexibility for small-scale commercial activities.

Acoustic treatment of noise sensitive activities inside areas C1 and C2

- ii. Require any building containing a Noise Sensitive Activity² in areas C1 and C2 to be designed and constructed to comply with the same acoustic insulation requirements that apply in the LCZ, as set out in Standard LCZ-S9(1)(ii) of the WDPOP. LCZ-S9(1)(ii) requires a building containing a Noise Sensitive Activity to be designed and constructed to achieve the internal design sound levels specified in APP1 - Acoustic insulation, *Table 25 - Internal sound levels*. The condition will assist to manage land use compatibility by ensuring that apartments (or other Noise Sensitive Activities) are provided with an adequate level of indoor amenity, taking into account the elevated noise levels from commercial activities.

Noise levels generated from areas C1 and C2 and received at any residential lot

- iii. We recommend a consent condition that requires activities in areas C1 and C2 to comply with the same noise levels set out in NOISE-R14(ii) when assessed at or within the boundary of any adjacent residential lot. The recommended noise limits are 5dB higher than the noise limits that otherwise apply in areas of the Site that are well separated from areas C1 and C2. The recommended noise limits ensure a reasonable level of noise for residential activity in the areas immediately surrounding areas C1 and C2, while recognising that noise emissions near to commercial activities might be slightly elevated when compared to other areas of the site.

² Defined by the WDPOP to mean any or all of the following:

- (a) buildings used for residential activities, including boarding establishments, retirement villages, papakainga housing development, visitor accommodation, and other buildings used for residential accommodation but excluding camping grounds;
- (b) marae and marae complex;
- (c) hospitals;
- (d) teaching areas and sleeping rooms in an education facility;
- (e) places of assembly

Section 8 includes recommended conditions to manage noise levels associated with areas C1 and C2.

5.3 Operational road traffic noise

The masterplan shows that the proposed spine road to access the northern area of the Site will extend from the current termination of Harrogate Place (currently a cul-de sac). An additional access point will be formed from Brymer Road and the southern access will extend from SH23.

The HCDP does not control road traffic noise levels generated from the alteration of transport corridors that are identified as a local road³ and The WDPOP zone noise limits do not apply⁴ to road traffic noise generated from roads that are vested or dedicated as road.

We do not consider that any control is required for road noise.

5.4 Noise from wastewater pumpstations

Wastewater pump stations will be required to service the development. The proposal is to construct three new wastewater pumpstations (identified as Pumpstations A, B and D) within the Site and to upgrade an existing pumpstation (Pumpstation C) located on Grandview Road. The proposed upgrades to Pumpstation C include the installation of a 15m³ buffer storage tank.

We recommend that a condition is attached to the consent that will ensure all new pumpstations within the Site are designed and constructed to achieve a high level of compatibility with adjacent residential activity. The recommended condition in Section 8 requires mechanical plant associated with pumpstations A, B and D to be designed, constructed and maintained to comply with noise levels that are 5dB lower than the noise limits prescribed by NOISE-R8. The recommended noise limits will ensure operational plant noise (i.e. pumps) is not dominant or intrusive when observed from adjacent dwellings and will provide receivers with a good level of protection from sleep disturbance effects.

The wastewater pumpstations will be underground. Based on our experience with similar pumpstations we expect the recommended noise limit can be easily complied with.

5.5 Noise effects on existing receivers outside the Site

Overall, we consider that the proposed framework of noise limits will ensure the character, timing and level of noise from the Site will be consistent with the noise environment in the

³ Standard 25.8.3.4(b)iii) *Design and Construction of New and Altered Roads* states that the standard does not apply to local transport corridors identified within Volume 2, Appendix 15-4, Figures 15-4b to 15-4f of the HCDP. The transport hierarchy plan in Figure 15-4e of the HCDP identifies that Harrogate Place is a local road and therefore Standard 25.8.3.4 does not apply.

⁴ AINF Rule 10 of the WDPOP states that any zoning rules cease to have effect from the time land is vested or dedicated as road.

established Residential Zone directly adjacent to the Site, and consistent with the level of amenity that is anticipated and provided in the GRUZ of the WDPOP.

5.5.1 Adjacent receivers in the GRUZ of the WDPOP

The operational noise effects on GRUZ receivers adjacent to the Site are expected to be reasonable on the adjacent GRUZ receivers for the following reasons:

- i. The recommended noise limits will ensure noise levels from residential lots comply with numerical noise levels that are the same as the permitted noise levels that apply in the GRUZ.
- ii. The Masterplan shows that significant areas in the northern part of the Site that are close to some existing receivers will be set aside for public recreational reserve.
- iii. There are some GRUZ receivers that will be exposed to intermittent noise from typical residential activity from nearby proposed residential lots. The character, timing and level of noise from residential activity is expected to be reasonable.
- iv. Noise levels from the mixed-use commercial areas are well separated from GRUZ receivers. Noise from commercial activities is not expected to be audible beyond the Site boundaries.

5.5.2 Receivers in the Residential Zone of Hamilton City

The operational noise effects on Residential Zone receivers adjacent to the Site are expected to be reasonable for the following reasons:

- i. Section 8 of this report includes recommended noise limits that will ensure noise levels from residential lots comply with noise levels that are similar to the permitted noise levels that apply in the Residential Zone of the HCDP.
- ii. Noise levels from the mixed-use commercial areas are well separated from receivers in the Residential Zone. Noise from commercial activities will not be audible from the Residential Zone.

Overall, we consider that the framework of noise limits in Section 8 will deliver a level of acoustic amenity that is consistent (or slightly better than) the permitted noise levels in the Residential Zone of the HCDP.

6.0 Road-traffic noise effects from SH23

Figure 3 displays the extent of the Site that is within the State Highway Corridor Noise Control Boundary (**NCB**). The overlay affects all parts of the Site within approximately 25m from the eastern frontage with SH23, increasing to approximately 95m at the western end of the Site frontage.

NOISE-R44 of the WDPOP requires that new dwellings constructed inside the NCB are designed and constructed to mitigate road-traffic noise. NOISE-R44 and Section 8.1(4) of

APP1 require bedrooms and habitable rooms to be designed and constructed so that road traffic noise does not exceed 40 dB $L_{Aeq}(24\text{hours})$ indoors.

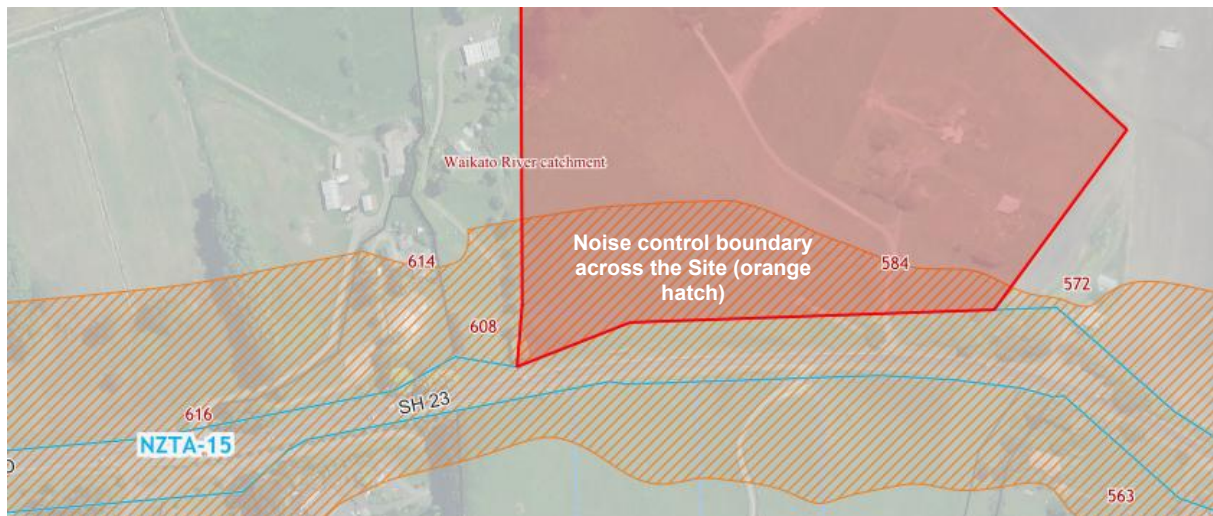


Figure 3 Area of the Site within the State Highway Corridor Noise Control Boundary

6.1.1 Compliance with NOISE-R44

Compliance with NOISE-R44 will be straightforward to achieve through the compliance pathway specified in the rule and permitted activity standard in Section 8.1(4) of APP1. The rule and permitted activity standard enables compliance with the internal noise levels to be demonstrated through the following compliance pathways prior to construction of any building:

- i. Through the submission of an acoustic design report that uses prediction or measurements to demonstrate that the noise levels at all external building facades will be no more than 15dB higher than the maximum indoor design noise levels; or
- ii. Through the submission of an acoustic design report that demonstrates that the proposed construction will meet (or exceed) the acoustic performance of the construction schedule in Table 29 of APP1.

Compliance with the internal noise levels in NOISE-R44 will be straightforward to achieve through standard construction upgrades (such as those specified in the WDPOP construction schedule). Our assessment finds that compliance with the rule and permitted activity standard can be demonstrated as part of any future building consent application when the appropriate level of construction detail is available.

If required, a condition could be attached to all lots inside the State Highway Corridor Noise Control Boundary to ensure future owners are aware of the requirement to demonstrate compliance with NOISE-R44 as part of any future building consent application. A recommended condition is provided in Section 8.

7.0 Assessment of construction noise and vibration effects

We understand that civil works to prepare the site for development will be undertaken in four stages over 8 construction seasons.

Construction will occur in stages over a 12-year programme. The enabling works will include bulk earthworks, recontouring, compaction, construction and paving of access roads, and installation of services. Built development will follow the completion of each stage.

We understand the preliminary bulk earthworks and civil works will be carried out using standard civil construction plant and equipment, such as hydraulic excavators for bulk excavation and trimming, bulldozers for stripping and spreading, articulated dump trucks for haulage of materials, and graders for final contouring. Compaction will be undertaken using rollers suitable for the material type, while water carts will be used for dust suppression and moisture conditioning. Additional equipment such as loaders, trenchers, and small plant may be used as required for specific tasks. We understand that the ground conditions mean that no blasting or rock breaking will be required.

7.1 Permitted construction noise and vibration standards

7.1.1 Construction noise

NOISE-R4 of the WDPOP and Rule 25.8.3.2 of the HCDP both require that construction noise levels are managed in accordance with the recommended numerical limits set out in NZS 6803:1999 '*Acoustics – Construction Noise*' (**NZS6803**). Rule AINF-R2⁵ of the WDPOP controls noise associated with the construction of infrastructure⁶ and also requires compliance with NZS6803.

NZS6803 provides guideline noise limits that are based on the duration of construction works at any one location, and the occupation of the receiving site.

NZS6803's construction noise limits for long term projects are reproduced in Table 1 below.

Table 2 - NZS6803 recommended upper limits for construction noise received in residential zones and dwellings in rural areas

Time of Week	Time Period	Long-term duration (dBA)	
		L _{eq}	L _{max}
Weekdays	0630-0730	55	75
	0730-1800	70	85

⁵ We understand this rule is subject to currently subject to an appeal [000086].

⁶ Including structures for transport on, under or over land by cycle ways, rail, roads, walkways, or any other means;

Time of Week	Time Period	Long-term duration (dBA)	
		L _{eq}	L _{max}
Saturdays	1800-2000	65	80
	2000-0630	45	75
	0630-0730	45	75
	0730-1800	70	85
	1800-2000	45	75
	2000-0630	45	75
Sundays and public holidays	0630-0730	45	75
	0730-1800	55	85
	1800-2000	45	75
	2000-0630	45	75

The noise levels from construction work are required to be assessed 1m from the façade of any occupied building⁷. There is no averaging or other adjustment over the day, night or any other period. The noise limits set out in NZS6803 must be complied with for every 15-to-60 minute period during the works.

7.1.2 Construction vibration

The WDPOP does not include any rules or standards to control vibration generated from construction work. Rule 25.8.3 of the HCDP requires that construction vibration received by any building on any other site shall comply with the provisions of and be measured and assessed in accordance with German Standard DIN 4150-3:1999 *Structural vibration – Effects of vibration on structures* (the **DIN limits**).

The DIN Standard limits are designed to ensure that construction vibration avoids damage to buildings and are commonly adopted in District Plans and resource consents throughout New Zealand.

We have recommended a condition that will require construction vibration levels to be managed to comply with the DIN limits at any building on an adjacent site.

⁷ The 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. They do not apply at unoccupied buildings.

7.2 Assessment of compliance with permitted construction noise and vibration limits

The proposal is to manage construction noise and vibration effects to comply with the permitted standards through a Construction Noise and Vibration Management Plan (**CNVMP**), prepared in accordance with the information requirements set out in Annex E of NZS 6803.

A draft CNVMP is provided in Appendix C. The draft CNVMP confirms that noise and vibration mitigation measures will be required to ensure compliance with the construction noise and vibration limits at the closest receivers.

The draft CNVMP is a 'living document' that will be updated when the construction methodology for the development has been confirmed. The recommended condition in Section 8 requires the final CNVMP is certified by Waikato District Council before construction commences.

The draft CNVMP confirms that compliance with the permitted construction noise and vibration standards can be achieved, subject to the implementation of the mitigation measures outlined in the document. We consider that the mitigation methods set out in the CNVMP are typical and practicable for a project of this nature.

7.2.1 Assessment of construction noise effects

The proposal is to implement a CNVMP to ensure construction noise and vibration effects are managed to comply with the permitted limits at all times. In our experience, a CNVMP is an important tool for the successful management of noise and vibration effects on receivers in proximity to large scale construction works.

The engagement required by the CNVMP will ensure that the receivers are provided with advanced notice of the timing and duration of construction works, enabling them to plan around any potential disruption. Higher noise levels from temporary construction activities are generally tolerated if there is consultation with the neighbours, the works are no louder than necessary, and the noise only occurs during daytime hours. In most cases, where people are exposed to construction noise outside, they will be able to find respite indoors (including in rooms in rooms that are shielded from construction noise) or at locations that are further screened from the works.

The potential construction noise effects when construction works are undertaken within 150m of any occupied dwellings are summarised in Table 3 below.

Table 3: Temporary construction noise effects at the nearest sites

Construction works	Noise level at 1 m from the façade L_{Aeq} (15 min)	Potential effects outside the buildings	Potential effects inside the nearest rooms of the buildings
Earthworks, civil works (road construction and vertical construction work within 50m-150m of occupied dwellings)	55 - 65 dB	Conversation may require raised voices over long distances	Noise levels will be noticeable, but they are unlikely to interfere with daily residential activities
Earthworks and civil works (road construction) within 60m	65 - 70 dB	Conversation will require raised voices. People are unlikely to spend time outside	Slightly raised sound levels may be necessary for television, radio, and phone conversations

The construction noise levels generated from works that are more than 150m from occupied dwellings will be lower than 55dB L_{Aeq} . These noise levels are unlikely to be dominant or intrusive in the context of background traffic noise from nearby urban areas.

We consider that the construction noise and vibration levels will be typical for a project of this scale and nature. The CNVMP will be used to manage compliance with the permitted standards in the WDPOP and ensure the noise levels will be reasonable.

7.2.2 Assessment of construction vibration effects

The proposal is to implement a CNVMP that will ensure any high vibration generating activities near to occupied buildings complies with the DIN limits.

The DIN limits are designed to ensure that construction vibration avoids damage to buildings. Assessment under the DIN standard is in terms of a reduction in “serviceability”, which includes minor cosmetic damage such as cracked plaster. We consider it will be practicable for all construction work to comply with the DIN limits.

We expect the highest construction vibration levels that will be experienced by occupants (but will not exceed the DIN limits) will be generated during excavation, compaction, and heavy vehicle movements when they are operating close to the boundaries of the Site. The vibration from works further within the Site (>30-50m) will generally go unnoticed at neighbouring sites.

Construction vibration levels are largely dependent on the equipment used, the skill of the operator, the subsoil conditions and the response of the receiving structure. Accurate predictions are not always possible without site, receiver and plant specific data.

Table 4 presents typical vibration levels for the relevant construction activities. These are derived from previous measurements using a geophone buried in the ground. Measuring these activities from a building will likely provide lower results due to the loss of energy when the vibration transfers from the ground into the foundations and structure.

Table 4 Typical construction vibration levels

Construction activity	Distance	Typical vibration level (PPV)
Vibratory compaction with a 15-t – 20-t roller	10 m	3-4 mm/s
Vibratory compaction with a 5-t – 7-t roller	10 m	2-3 mm/s
Compaction with a large static roller	10 m	1 mm/s
Cut and fill works, loading trucks, and tracking slowly with a 20-t excavator	10 m	1-2 mm/s
Heavy vehicle or tractor pass-by on even ground	10 m	<1 mm/s

Construction vibration between 2 mm/s and 5 mm/s will be clearly felt within buildings and may be experienced as small jolts or short periods of steady vibration that are just perceptible. Depending on the separation distances, the vibration may at times reach levels that are clearly felt and high enough to rattle crockery and glassware (levels between 2 mm/s and 5 mm/s PPV). The vibration levels will range from not noticeable to noticeable but are unlikely to unreasonably disrupt residential activities and will not be high enough to cause building damage.

The effects of the vibration are expected to be tolerated because the receivers will receive advance notice of the timing and duration of the proposed construction works through the CNVMP, the vibration will only occur during the day, the effects will be intermittent and will be of short duration when works are near to the site boundary.

8.0 Recommended conditions

We recommend the following conditions are attached to the consent.

8.1 Operational noise

Any residential lot inside the State Highway Noise Control Boundary (NOISE-R44)	All habitable rooms in any residential building within the State Highway Noise Control Boundary shall be designed, constructed and maintained to comply with NOISE-RR, including the maximum future indoor design noise levels in Table 28 in APP1 and ventilation requirements in Section 8.1(4) of APP1 of the Waikato District Plan.
Noise limits for noise generated and received between any residential lot (except a lot inside Area C1 or C2)	The noise (rating) level and maximum noise level from any residential lot must not exceed the following limits when measured and assessed at or within the boundary of any other lot containing a Noise Sensitive Activity: i. 50 dB $L_{Aeq}(15min)$, between the hours of 7am to 10pm;

	ii. 45 dB L_{Aeq} (15min) between the hours of 7pm to 10pm; iii. 40 dB L_{Aeq} (15min) and 65 dB L_{Amax}, between the hours of 10pm to 7am The noise limits applying between 7am and 10pm do not apply to normal residential activities (including children's play and the use of garden equipment). Noise levels shall be measured and assessed in accordance with the requirements of New Zealand Standard NZS 6801:2008 Acoustics – Measurement of environmental sound and New Zealand Standard NZS 6802:2008 Acoustics – Environmental noise.
Noise limits for noise generated and received between sites in areas C1 and C2	The noise (rating) level and maximum noise level from any site in Area C1 or C2 must not exceed the following limits when measured and assessed at the boundary of any other site in Area C1 or C2: i. 65 dB L_{Aeq} (15min), 7am to 11pm every day; and ii. 55 dB L_{Aeq} (15min) and 85 dB L_{Amax}, 11pm to 7am the following day. The noise (rating) level and maximum noise level from any site in a C1 or C2 must not exceed the following limits when measured and assessed at or within the boundary of any lot containing a Noise Sensitive Activity (that is outside area C1 or C2) i. 55 dB L_{Aeq} (15min) between the hours of 7am to 7pm; and ii. 50 dB L_{Aeq} (15min) between the hours of 7pm to 10pm; and iii. 40 dB L_{Aeq} (15min) and 65 dB L_{Amax} between the hours of 10pm and 7am. Noise levels shall be measured and assessed in accordance with the requirements of New Zealand Standard NZS 6801:2008 Acoustics – Measurement of environmental sound and New Zealand Standard NZS 6802:2008 Acoustics – Environmental noise.
Acoustic treatment requirements for any Noise Sensitive Activity inside areas C1 and C2.	Any Noise Sensitive Activity inside Area C1 or C2 shall be designed, constructed and maintained to ensure that external noise does not exceed an internal design sound level of 40 dB L_{Aeq}. Compliance with the internal design sound level of 40 dB L_{Aeq} shall be demonstrated prior to occupation of the building through: i. Providing an acoustic design certificate from an appropriately qualified and experienced acoustic specialist certifying that the internal sound level of 40 dB L_{Aeq} will be achieved, based on the permitted external noise levels inside areas C1 and C2. ii. Providing a commissioning report to the Council prior to occupation of the building demonstrating compliance with all of the mechanical ventilation system performance requirements specified in Section 6.1 (2) of APP1.

	Noise sensitive activity is defined by the WDPOP to mean any or all of the following: (a) buildings used for residential activities, including boarding establishments, retirement villages, papakaainga housing development, visitor accommodation, and other buildings used for residential accommodation but excluding camping grounds; (b) marae and marae complex; (c) hospitals; (d) teaching areas and sleeping rooms in an education facility; (e) places of assembly.		
Noise limits for pump stations A, B and D.	The noise (rating) level and maximum noise level from Pumpstation A, B or D must not exceed the levels in the table below, when measured and assessed at or within the notional boundary of any Noise Sensitive Activity (except in Area C1 or C2).		
	Noise source	Timeframe	Noise rating level
	Fixed mechanical plant and processes or noise sources that operate continuously or on an automated basis	7am – 10pm	45 dB LAeq
		10pm – 7am	35 dB LAeq 60 dB LAFmax
	All other activities, including but not limited to vehicle movements, deliveries and inspections.	7am – 10pm	50 dB LAeq
10pm – 7am		40 dB LAeq 65 dB LAFmax	
Noise levels shall be measured and assessed in accordance with the requirements of New Zealand Standard NZS 6801:2008 Acoustics – Measurement of environmental sound and New Zealand Standard NZS 6802:2008 Acoustics – Environmental noise.			

8.2 Construction noise and vibration

Timing of construction work	Construction work and heavy vehicle movements on the site may only take place between the hours of 7:30 am. and 6:00 pm, Monday to Saturday. No noisy works shall be undertaken on Sundays or public holidays. This condition does not preclude quiet works from taking place outside of standard construction hours, providing they comply with the permitted construction noise limits at these times (e.g., site meetings, interior fitouts,
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	planting or other works that are well-separated from neighbouring receivers) where they are authorised by the CNVMP.											
Construction noise limits	Construction noise levels generated from the Site shall comply with the following limits, when measured and assessed 1m from the façade of any occupied dwelling or building on any other site in accordance with NZS 6803:1999: <i>Acoustics – Construction Noise</i>: <table><tr><th rowspan="2">Time period</th><th colspan="2">Maximum noise levels</th></tr><tr><th>L_{Aeq}</th><th>L_{AFMax}</th></tr><tr><td>7:30am- 6:00pm, Monday to Saturday</td><td>70 dB</td><td>85 dB</td></tr><tr><td>All other times and on Public Holidays</td><td>45 dB</td><td>70 dB</td></tr></table>	Time period	Maximum noise levels		L _{Aeq}	L _{AFMax}	7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB	All other times and on Public Holidays	45 dB	70 dB
Time period	Maximum noise levels											
	L _{Aeq}	L _{AFMax}										
7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB										
All other times and on Public Holidays	45 dB	70 dB										
CNVMP	The consent holder must submit a Construction Noise and Vibration Management Plan (CNVMP) to Waikato District Council for certification. The CNVMP must be submitted a minimum of ten working days before starting any construction works authorised by this consent. The objectives of the 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 specific requirements for all construction work undertaken outside the hours of 7:30am- 6:00pm, Monday to Saturday. The CNVMP must address the requirements of Annex E of NZS 6803:1999 <i>Acoustics – Construction Noise</i> and the AAAC <i>Guideline for interpreting and applying NZS 6803 1999</i> as a minimum. Construction works must not begin until certification has been received in writing from Waikato District Council. The CNVMP and any amendments must be prepared by a suitably qualified acoustics consultant (e.g. MASNZ). Amendments to a certified CNVMP that include changes to the construction methodology must be tracked and the revised CNVMP submitted to Waikato District Council for certification. All construction works on the site must be carried out in accordance with the certified CNVMP. A copy of the CNVMP must be kept on site during construction hours.											
Notice of construction work	The consent holder must advise the occupants of all buildings within 50 m of the site boundary about the construction works at least five days before demolition or earthworks begin on site. The advice must be provided in writing and include the following information: i. An overview of the construction works including the duration of the project and the working hours on site											

	ii. The approximate dates and duration of the noisiest activities on site iii. A contact name and phone number to advise of any sensitive times for high noise levels and for any questions or complaints regarding noise and vibration throughout the project.
Vibration	All construction works on the site must be designed and conducted to ensure that the construction vibration does not exceed the guideline vibration values set out in the German Standard DIN 4150-3:1999 <i>Structural vibration – Effects of vibration on structures</i> when measured from any building not on the construction site in accordance with the Standard.

9.0 Summary

Styles Group has assessed the potential operational and construction noise and vibration effects from the Brymer Farms project.

This assessment confirms that the Project can achieve a good level of compatibility with the level of acoustic amenity anticipated and provided for in the GRUZ of the Waikato District as well as the adjacent Residential Zone of Hamilton City.

We have recommended conditions of consent and have prepared a draft CNVMP to ensure the appropriate management of operational and construction noise and vibration effects.

Appendix A WDPOP Noise standards

These provisions apply to noise generated from the Site and received in the Waikato District.

Definition of Noise Sensitive Activities

Means buildings or parts of buildings used for, or intended to be used for the following purposes:

1. Residential activity;
2. Visitor accommodation;
3. Schools and tertiary education premises;
4. Health centre

Definition of Noise Sensitive Activity

Means any or all of the following:

- (a) buildings used for residential activities, including boarding establishments, retirement villages, papakainga housing development, visitor accommodation, and other buildings used for residential accommodation but excluding camping grounds;
- (b) marae and marae complex;
- (c) hospitals;
- (d) teaching areas and sleeping rooms in an education facility;
- (e) places of assembly

Construction Noise

NOISE- R4	Noise- Construction	
All zones	(1) Activity status: PER Where: (a) Noise from any construction, maintenance, or demolition activity that is measured, assessed and managed in accordance with the requirements of NZS6803:1999 'Acoustics - Construction Noise'	(2) Activity status where compliance not achieved: RDIS (a) Effects on amenity values; (b) Hours and days of construction; (c) Noise levels; (d) Timing and duration; and (e) Methods of construction.

Construction Noise – All Infrastructure (Appeal 000086)

AINF-R2	Construction noise	
All zones	(1) Activity status: PER Where: (a) Construction, maintenance, repair, replacement, upgrading or removal of infrastructure or the installation of new infrastructure must comply with NZS 6803:1999 Acoustics - Construction noise.	(2) Activity status where compliance not achieved: RDIS Council's discretion is restricted to the following matters: (a) Effects on amenity values; (b) Hours of construction;

		(c) Noise levels; (d) Timing and duration; and (e) Methods of construction
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Noise generated and received in the General Rural Zone

NOISE- R8	Noise- general	
GRUZ- General Rural Zone	(1) Activity status: PER Where: (a) Noise measured at the notional boundary on any other site in the GRUZ - General Rural Zone must not exceed: (i) 50dB L_{Aeq}, 7am to 7pm every day; (ii) 45dB L_{Aeq}, 7pm to 10pm every day; (iii) 40dB L_{Aeq} and 65dB L_{Amax}, 10pm to 7am the following day. (b) Noise measured within any site in any zone, other than the GRUZ - General rural zone, must meet the permitted noise levels for that zone. (c) Noise levels must be measured in accordance with the requirements of New Zealand Standard NZS 6801:2008 "Acoustics - Measurement of Environmental Sound". (d) Noise levels must be assessed in accordance with the requirements of New Zealand Standard NZS 6802:2008 "Acoustic - Environmental noise".	(2) Activity status where compliance not achieved: DIS

State Highway Noise Control Boundary

NOISE- R44	Construction of a new building containing a sensitive land use within a State Highway or Rail Corridor Noise Control Boundary	
1. Activity status: PER Activity-specific standards: (a) New buildings are designed, constructed and maintained to ensure that any part of the building located within the State Highway or Rail Corridor Noise Control Boundary and containing an activity listed in Table 28 APP1: i. complies with the maximum future indoor design noise levels in Table 28 in APP1 and meets the ventilation requirements in Section 8.1(4) of APP1; or ii. is located so the nearest exterior façade of that part of the building is at least 50m	Activity status where compliance not achieved: RDIS Council's discretion is restricted to the following matters: 1. Adverse effects on health and amenity of people indoors within the Noise Control Boundary overlays 2. Alternative options for building design or location that would achieve compliance with the standards in APP1 3. Adverse effects on the continuing operation of the state highway network, or railway corridor as a result of non-compliance with the standards in APP1	

from the formed carriageway of the state highway and 50m from the formed railway track and there is a solid building, fence, wall or landform that blocks the line of sight from all parts of all windows and doors to that activity to: 1) All parts of the formed carriageway of the state highway. 2) All points 3.8m directly above the formed railway track; or iii. is located so it can be demonstrated by way of prediction or measurement by a suitably qualified and experienced acoustic consultant that noise at all exterior facades of that part of the building will be no more than 15 dB above the relevant maximum indoor design noise levels in Table 28 in APP1: or iv. accords with the construction schedule in Table 29 of APP1 and meets the ventilation requirements in Section 8.1 (4) of APP1.	4. Any natural or built features of the site or surrounding area that will mitigate noise effects 5. The outcome of any consultation undertaken with NZTA or KiwiRail
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Appendix B HCDP Noise standards

These provisions apply to cross territorial noise effects generated from the Site and received in Hamilton City.

Construction noise and vibration

25.8.3.2

Construction Noise

All construction noise shall comply with the relevant noise levels stated in NZS6803: 1999, section 7.2 'Recommended numerical limits for construction noise' and shall be measured and assessed in accordance with NZS 6803:1999 'Acoustics – Construction Noise'.

25.8.3.3

Construction Vibration

Construction vibration received by any building on any other site shall comply with the provisions of and be measured and assessed in accordance with German Standard DIN 4150-3:1999 Structural vibration – Effects of vibration on structures.

Noise performance standards for noise received in Residential Zones

25.8.3.7

Noise Performance Standards for Activities in all Zones Except Major Facilities, Knowledge, Open Space, Ruakura Logistics and Ruakura Industrial Park Zones

Activities in all Zones except Major Facilities, Knowledge, Open Space, Ruakura Logistics and Ruakura Industrial Park Zones, shall not exceed the following noise levels at any point within the boundary of any other site in the:

i. Residential Zones.

Time of day	Noise level measured in L _{Aeq} (15min)	Noise level measured in L _{AFmax}
0600- 0700 hours	45 dB	75 dB
0700- 2000 hours	50 dB	-
2000- 2300 hours	45 dB	-
2300- 0600 hours	40 dB	75 dB

Rules – Specific Standards

25.8.3.1

Measurement and Assessment of Noise

Noise levels shall be measured in accordance with NZS 6801:2008 "Acoustics – Measurement of Environmental Sound" and assessed in accordance with NZS 6802:2008 'Acoustics – Environmental Noise'. These apply unless otherwise stated.

Design and Construction of New and Altered Roads

25.8.3.4

Design and Construction of New and Altered Roads

- a. Application of this standard.
 - i. This standard shall apply only to new and altered roads predicted to carry at least 2000 annual average daily traffic (AADT) at the design year.
- b. **This standard shall not apply:**
 - i. In circumstances where NZS 6806: 2010 does not apply, as listed in paragraph 1.3.1 of NZS 6806: 2010.
 - ii. **To local transport corridors identified within Volume 2, Appendix 15-4, Figures 15-4b to 15-4f.**
 - iii. To altered roads where the vertical or horizontal alignment changes relate solely to providing pedestrian footpaths, cycleways, dedicated passenger transport or high-occupancy vehicle lanes, vehicle stopping or parking whereby that part of the carriageway dedicated to usual vehicle movement does not move closer to any protected premises and facilities.
- c. Road-traffic noise shall be measured and assessed in accordance with NZS 6806:2010 'Acoustics – Road traffic noise – New and altered roads'.
- d. Subject to 25.8.3.4.a and b. above, new or altered roads are designed and constructed to mitigate road-traffic noise in compliance with NZS 6806: 2010 'Acoustics – Road traffic noise – New and altered roads'.

Note

- 1. This rule mainly affects road controlling authorities such as Council and the New Zealand Transport Authority, but sometimes may affect a private developer building or altering a road in a subdivision designed to carry the requisite traffic volumes. The practical effect of the standard is that traffic noise received at 'protected premises and facilities' will be reduced by design features such as quieter road surfaces.

Appendix C Draft CNVMP



ON NOISE AND AGEMENT PLAN

BRYMER FARMS
127 BRYMER ROAD

PREPARED FOR
Brymer Farms Limited

DATE
10 August 2026

Draft construction noise and vibration management plan prepared by Styles Group for Brymer Farms Limited.

REVISION HISTORY

Rev:	Date:	Comment:	Version:	Prepared by:	Reviewed by:
1	10/08/26	Draft for lodgement. <i>This draft CNVMP is to be updated following further engagement with contractor prior to construction work and submitted for certification by Waikato District Council prior to commencement of construction.</i>	Draft	Martyn Chambers, MASNZ Senior Consultant Styles Group	Jon Styles, MASNZ Director and Principal Styles Group

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Appendices

Appendix A	Glossary of terms
Appendix B	Consent conditions
Appendix C	Noise monitoring form

1.0 Introduction

Brymer Farms Limited has engaged Styles Group to prepare a draft Construction Noise and Vibration Management Plan (**CNVMP**) to enable the appropriate management of the construction noise and vibration effects associated with the Brymer Farms development at 127 Brymer Road (the **Site**).

This CNVMP sets out the measures that must be implemented to ensure appropriate management of noise and vibration effects during the construction period and to ensure noise and vibration generated from construction work complies with the Project Conditions.

This CNVMP has been prepared in accordance with the recommended project conditions and Appendix E of NZS 6803:1999 *Acoustics – Construction noise*.

This CNVMP is a 'living document' that will be updated as the works progress and if changes become necessary. It must be certified by Waikato 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 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:

TBA

ph:

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

Styles Group Acoustics & Vibration Consultants

ph: 09 308 9015

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

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

5.0 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 Project Manager and in consultation with Waikato District Council.

All personnel will 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

The *recommended* conditions of consent controlling construction noise and vibration are reproduced in Appendix B.

Note: *Appendix B must be updated to reflect the conditions of consent in the decision.*

Sections 9.1 and 9.1 of this CNVMP provide guidance for interpretation of the construction noise and vibration limits, in accordance with the permitted working hours and receiving sites.

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 only. There can be no works in the evening or on Sundays that are noisy at any receiver.

Quieter activities and internal works may occur outside these hours. Examples include light vehicle movements, works set well back from receivers, site meetings or necessary monitoring activities, such as for stormwater management.

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

8.1 Construction noise limits

The construction noise limits for the project are set out in 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 or at any other unoccupied buildings.

Table 1: Noise limits for construction work

Receiver	Time period	Noise limit L_{Aeq}	Noise limit L_{AFmax}
All receivers	7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB
	At all other times	45 dB	75 dB

8.2 Management of construction noise levels

Table 2 lists the equipment that is proposed and typical for this type of project. Table 2 sets out minimum separation distances required for the equipment 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 2 m noise barrier)	
			One story dwelling	Two story dwelling
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

Construction activity	Unmitigated L_{Aeq} noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (based on 2 m noise barrier)	
			One story dwelling	Two story dwelling
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	72 dB	17 m	6 m	10 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
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

8.3 Specific mitigation requirements

This section sets out specific noise mitigation measures that must be followed for construction works that are within 40 m of an occupied dwelling on an adjacent site. Figure 1 identifies the parts of the site within the “Noise Control Zone”.

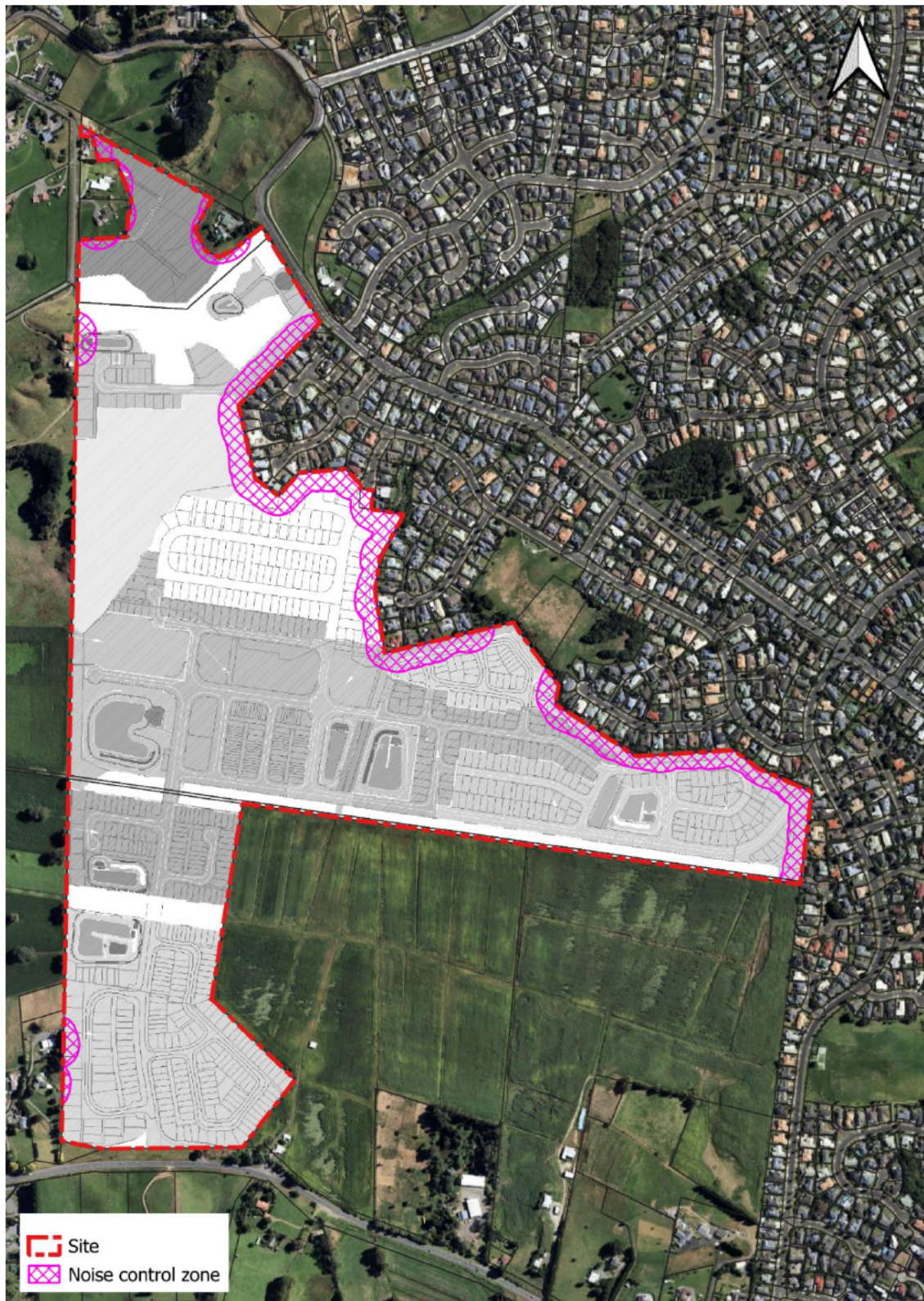


Figure 1 Construction works within the Noise Control Zone

8.4 Construction works within the Noise Control Zone

Before starting construction work 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:
 - a. If the dwelling is outside the compliance distance, the activity may proceed without further noise mitigation.
 - b. 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:
 - a. Use smaller or quieter equipment. Check Table 2 to confirm that the revised equipment will comply.
 - b. Install a noise barrier in accordance with the guidance set out in Section 8.6 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 8.6 sets out the barrier requirements.
 - c. Use a combination of quieter equipment and a noise barrier to achieve the applicable compliance distance in Table 2.
 - d. Carry out the work while the dwelling is unoccupied. The construction noise limits do not apply when the dwelling is unoccupied.
 - e. Seek advice from Styles Group. Further assessment may include on-site noise measurements to determine whether an exceedance is likely.
6. Confirm that the selected mitigation measures are in place and that compliance has been demonstrated before commencing the activity.

8.5 The construction and use of the Harrogate Place haul road

This section sets out the measures required to ensure that the construction and use of the temporary site access road created at the southern end of Harrogate Place complies with the construction noise levels.

8.5.1 Haul road construction

The use of earthmoving and compaction equipment, particularly vibratory compaction rollers, may exceed the Project noise limits that apply at 9 and 12 Harrogate Place. Mitigation is likely to be required to achieve compliance.

The following mitigation measures are expected to be required as part of the construction of the haul road. These measures will be confirmed based on the final construction methodology.

Before construction begins, the contractor must install a noise barrier along the Site boundary adjoining these properties, as shown in Figure 2. The barrier must be at least 2.5 m high to provide screening for the two-storey dwelling at 12 Harrogate Place. The barrier must meet the specifications in Section 8.6.

Static compaction equipment should be used for works close to 9 and 12 Harrogate Place. If vibratory compaction or other noisy equipment is required, the contractor must follow the process in Section 8.4 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 8.6.1.

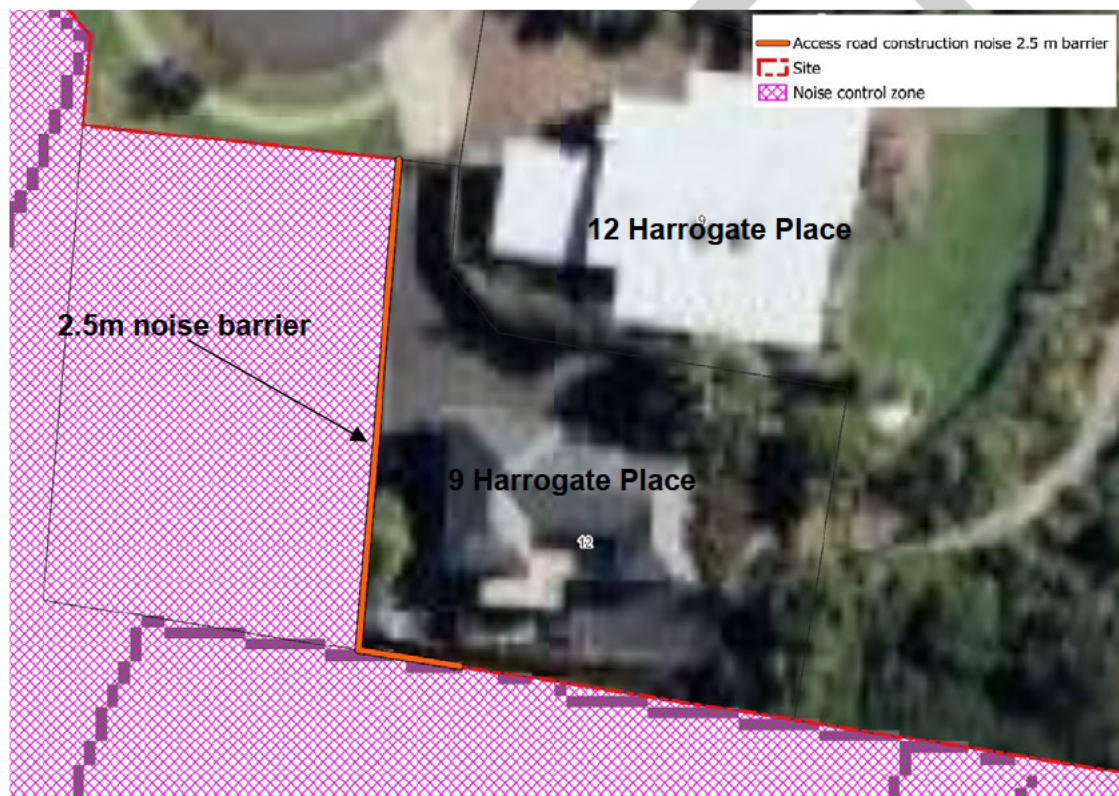


Figure 2 Noise barrier requirements for Harrogate Place haul road construction works

8.5.2 Heavy vehicles on Harrogate Place access road

Heavy vehicles using the temporary access route must comply with the construction noise limits in Section 8.0.

During normal construction hours, up to 40 heavy vehicle movements distributed over a day will comply¹ with the construction noise limits, provided that no other construction work occur on the access road at the same time.

¹ 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.

Heavy construction vehicles must not use the Harrogate Place 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 Harrogate Place 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.

8.6 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 Barrier², Soundbuffer³ or Hushtec⁴).

8.6.1 Localised / portable acoustic barrier specifications

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

² <https://supplyforce.co.nz/echo-barrier>

³ <http://soundbuffer.co.nz>

⁴ <https://duraflex.co.nz/hushtec>

8.7 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

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. This section sets out the following measures must 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:

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.

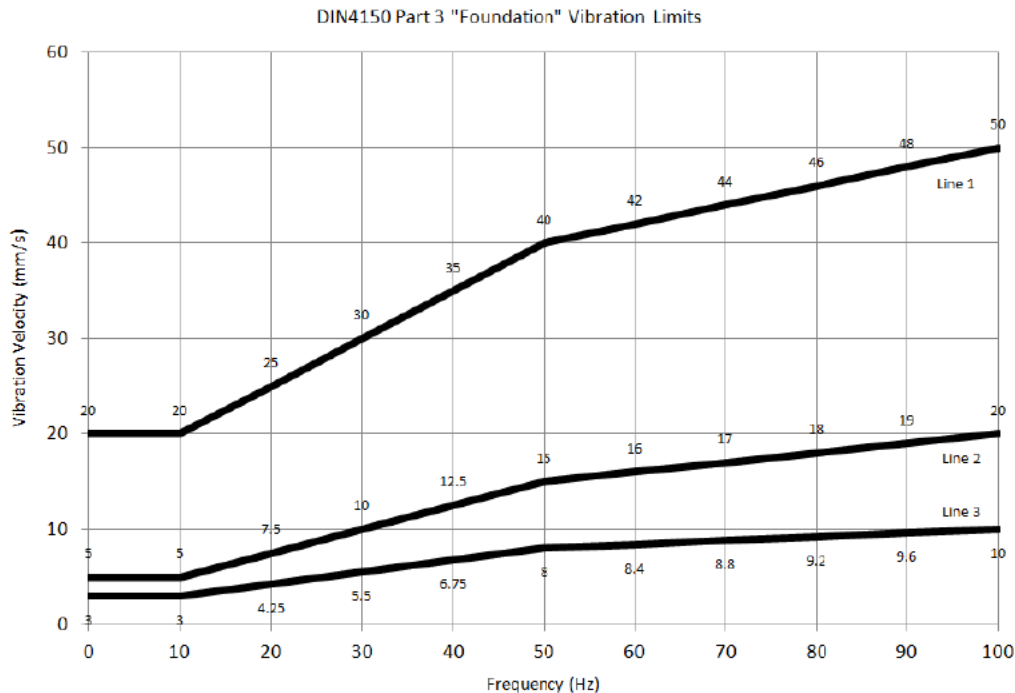


Figure 3: Curves for guideline values (short-term vibration) specified in DIN 4150-3:1999

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 has 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.

10.0 Community liaison and complaints

10.1 Community liaison

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
- 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 Waikato District Council on request.

11.0 Noise and vibration monitoring and reporting

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

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 Waikato 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.

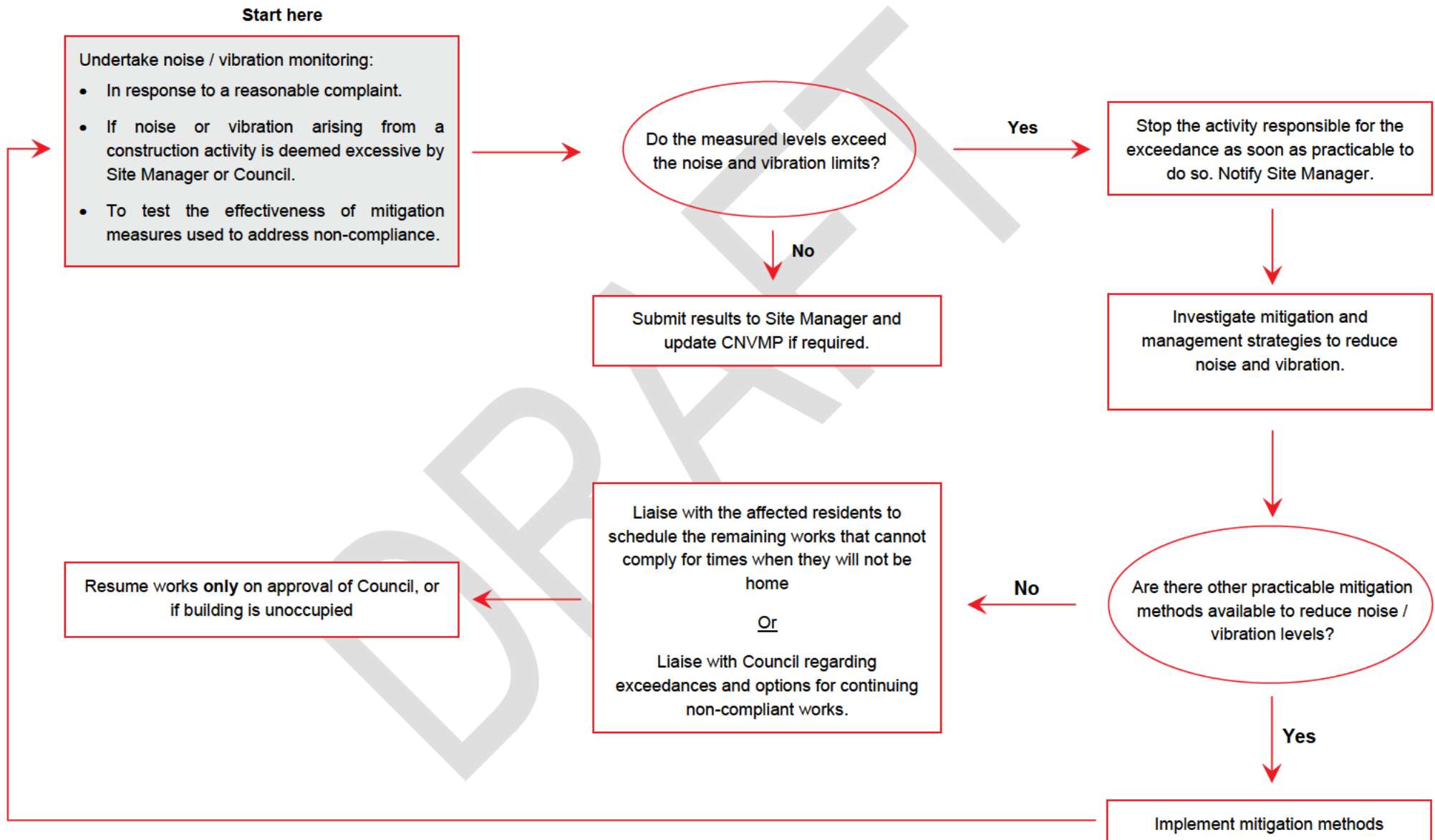
The results of all noise and vibration monitoring will be retained for the duration of the project and made available to Waikato District Council on request.

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 4 will be followed if non-compliance with the project noise or vibration limits is identified through monitoring.

Figure 4: 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

These conditions are draft and must be updated to include the final consent conditions.

Timing of construction work	Construction work and heavy vehicle movements on the site may only take place between the hours of 7:30 am. and 6:00 pm, Monday to Saturday. No noisy works shall be undertaken on Sundays or public holidays. This condition does not preclude quiet works from taking place outside of standard construction hours, providing they comply with the permitted construction noise limits at these times (e.g., site meetings, interior fitouts, planting or other works that are well-separated from neighbouring receivers) where they are authorised by the CNVMP.											
Construction noise limits	Construction noise levels generated from the Site shall comply with the following limits, when measured and assessed 1m from the façade of any occupied dwelling or building on any other site in accordance with NZS 6803:1999: <i>Acoustics – Construction Noise</i>: <table><tr><th rowspan="2">Time period</th><th colspan="2">Maximum noise levels</th></tr><tr><th>L_{Aeq}</th><th>L_{AFMax}</th></tr><tr><td>7:30am- 6:00pm, Monday to Saturday</td><td>70 dB</td><td>85 dB</td></tr><tr><td>All other times and on Public Holidays</td><td>45 dB</td><td>70 dB</td></tr></table>	Time period	Maximum noise levels		L _{Aeq}	L _{AFMax}	7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB	All other times and on Public Holidays	45 dB	70 dB
Time period	Maximum noise levels											
	L _{Aeq}	L _{AFMax}										
7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB										
All other times and on Public Holidays	45 dB	70 dB										
CNVMP	The consent holder must submit a Construction Noise and Vibration Management Plan (CNVMP) to Waikato District Council for certification. The CNVMP must be submitted a minimum of ten working days before starting any construction works authorised by this consent. The objectives of the 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 specific requirements for all construction work undertaken outside the hours of 7:30am- 6:00pm, Monday to Saturday. The CNVMP must address the requirements of Annex E of NZS 6803:1999 <i>Acoustics – Construction Noise</i> and the AAAC <i>Guideline for interpreting and applying NZS 6803 1999</i> as a minimum. Construction works must not begin until certification has been received in writing from Waikato District Council.											

	The CNVMP and any amendments must be prepared by a suitably qualified acoustics consultant (e.g. MASNZ). Amendments to a certified CNVMP that include changes to the construction methodology must be tracked and the revised CNVMP submitted to Waikato District Council for certification. All construction works on the site must be carried out in accordance with the certified CNVMP. A copy of the CNVMP must be kept on site during construction hours.
Notice of construction work	The consent holder must advise the occupants of all buildings within 50 m of the site boundary about the construction works at least five days before demolition or earthworks begin on site. The advice must be provided in writing and include the following information: i. An overview of the construction works including the duration of the project and the working hours on site ii. The approximate dates and duration of the noisiest activities on site iii. A contact name and phone number to advise of any sensitive times for high noise levels and for any questions or complaints regarding noise and vibration throughout the project.
Vibration	All construction works on the site must be designed and conducted to ensure that the construction vibration does not exceed the guideline vibration values set out in the German Standard DIN 4150-3:1999 <i>Structural vibration – Effects of vibration on structures</i> when measured from any building not on the construction site in accordance with the Standard.

Appendix C Noise monitoring form

DRAFT

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	

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 correction or barriers

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 options*

Appendix D Curriculum Vitae



Jon Styles

Director & Principal Consultant



Expertise

- Environmental Noise
- Policy and Review
- Underwater Noise

Qualifications & Professional Memberships

BAppSci (Environmental Health)

Council Member & Professional Member (MASNZ) of the Acoustical Society NZ (6 consecutive two-year terms) and past two-term President of ASNZ (2016-2021)

Executive Member and on the Board of Directors of the Association of Australasian Acoustic Consultants (AAAC)

Founder of Styles Group and the leader of the Styles Group team for 21 years, Jon is known for his thorough approach, ability to communicate concepts clearly and a fervent commitment to providing clients with the best advice and value for money. Jon has been practicing in the acoustics industry since 2001 and is particularly respected for his ability to integrate his advice into the resource management framework.

Jon is a Council Member and a Past President of the Acoustical Society of New Zealand (ASNZ). In 2022, Jon was appointed as an Executive Member of the Australasian Association of Acoustical Consultants (AAAC) and now serves on its Board of Directors.

Jon has significant experience in the development, assessment and review of noise and vibration provisions under the RMA, enabling his technical expertise to be directly adopted into the RMA decision making framework. Having completed the Ministry for the Environment's Making Good Decisions programme and being highly familiar with the requirements for the submission and presentation of expert evidence, his advice can be seamlessly integrated to all stages of the planning process.

Jon is committed to raising awareness and understanding of noise effects across the resource management professions and delivers a significant number of training courses each year to members of the New Zealand Planning Institute, the New Zealand Institute of Environmental Health and a number of local authorities across New Zealand. To date, over 1500 resource management professionals have attended Jon's training courses. His regular interaction and close relationship with the planning industry and the ability to converse directly with experts in the field has given him a very detailed insight into the way that technical advice on noise and vibration is applied in the resource management framework.

Jon is an active participant in resource management reform. In his capacity as President of the ASNZ, Jon convened a working group to assist the Ministry for the Environment's ongoing development of National Planning Standards for noise and vibration, bringing together the nation's top experts to determine best practice in a number of areas.

Jon has over 21 years' experience working across New Zealand for the EPA, local government and private clients on a variety of plans and projects, including District Plan changes and reviews and major infrastructure projects across New Zealand. Jon is a regular and experienced expert witness in the Environment Court and has appeared before six Board of Inquiry Hearings, including as the Boards' expert.

Jon was engaged by Auckland Council to provide expert noise and vibration advice and evidence to inform the development of noise and vibration objectives, policies and rules for the Auckland Unitary Plan and regularly participates in District Plan reviews and plan changes throughout New Zealand.