Styles Group
Acoustics & Vibration Consultants

ASSESSMENT OF CONSTRUCTION AND OPERATIONAL NOISE EFFECTS

URBAN DEVELOPMENT
169-171 PEKA PEKA ROAD

PREPARED FOR

Waikanae North Developments Limited

DATE

13 March 2026

Acoustic assessment prepared by Styles Group for Waikanae North Developments Limited.

REVISION HISTORY

Rev:	Date:	Comment:	Version:	Prepared by:	Reviewed by:
1	24/07/25		Draft	Jon Styles, MASNZ Director and Principal Styles Group	Gemma Styles Consultant Styles Group
2	27/08/25		Final draft		
3	13/03/26	Updates addressing revised masterplan and consultation feedback from NZTA and Kapiti Coast District Council	Final		

Statement of experience

I am and have been the Director and Principal of Styles Group Acoustics and Vibration Consultants for 21 years. 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.

I have over 25 years' experience advising on the management of construction and operational noise and vibration effects. I have worked on a significant number of plan changes and resource consent applications for large-scale residential and mixed use developments across New Zealand. I have extensive experience advising on the management of noise effects between land use activities and the development of controls to achieve ongoing land use compatibility. I am a regular and experienced expert witness for Council, Environment Court, District Court, High Court and Board of Inquiry hearings. I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

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Executive summary

Styles Group has assessed the construction and operational noise effects from the Waikanae North Developments Project at 169-171 Peka Peka Road (the **Site**).

The proposal is to enable a master-planned urban development to accommodate residential dwellings, a local commercial centre, amenities including open space and recreation opportunities and significant ecological restoration of wetlands and dunes.

The Site is in the General Rural Zone of the Kāpiti District and is adjacent to the Kapiti Expressway. The receivers adjacent to the site are in the General Rural Zone and Rural Lifestyle Zone.

We have assessed the noise effects from the proposal in accordance with the permitted noise standards prescribed by the Kāpiti District Plan. Our assessment confirms that:

- Noise levels generated from the Site can comply with the permitted noise standards prescribed by NOISE-R2 and Table 2 when measured and assessed at the notional boundaries of adjacent sites in the General Rural Zone and Rural Lifestyle Zone.
- Noise from construction work will be managed to comply with NOISE-R10 when measured and assessed in accordance with NZS 6803:1999 *Acoustics – Construction Noise* at any occupied dwelling on an adjacent site.
- Road-traffic noise effects from the Kāpiti Expressway will be managed through the permitted activity standards in NOISE-R14. This will require future dwellings established within 80m from the closest edge of the Expressway to be designed and constructed in accordance with the specified noise performance standards in NOISE-R14.

We have provided recommended conditions for the appropriate management of noise effects between noise generating and noise sensitive land use activities in the Local Centre and Community Hub. These conditions are recommended as the underlying noise limits for the Rural Zone are not designed to manage noise levels between commercial and residential activity. We have recommended conditions that set the same noise standards that would apply if the Local Centre and Community Hub was zoned “Local Centre”. These include acoustic treatment controls for noise sensitive activities that may locate in this area. The Local Centre and Community Hub will be surrounded by residential lots. We have recommended that noise generated from the Local Centre and Community Hub comply with the relevant District Plan noise limits that would apply if the nearby residential lots (outside the Local Centre) are zoned “Residential”.

The potential construction noise effects will be typical for a development of this scale and nature. Our assessment finds that noise levels from construction work can be managed to comply with the recommended noise limits for long-term projects prescribed by NZS 6803:1999 *Acoustics – Construction* Noise at all adjacent receivers.

Overall, our assessment finds that the construction and operation of the master-planned community will comply with the permitted noise standards applying at all adjacent receivers.

Potential reverse sensitivity effects on the operation of the Kāpiti Expressway will be managed through the requirement to design and construct future dwellings in accordance with the specified noise performance standards in NOISE-R14. We consider that the underlying consent notice applying to the parent title (relating to road-traffic noise and operational vibration from the Kapiti Expressway) does not need to flow down to new residential lots. We do not consider that any controls are required to manage vibration from the Kapiti Expressway.

1.0 Introduction

Waikanae North Developments Limited has engaged Styles Group to assess the construction and operational noise effects from the proposed urban development at 169-171 Peka Peka Road (the **Site**).

This report includes an assessment of compliance with the permitted noise standards of the Kāpiti Coast District Plan (**District Plan)**, along with recommended conditions of consent.

This report should be read in conjunction with the application site plans and the Assessment of Environmental Effects. A glossary of acoustical terms used within this document is attached as Appendix A and the relevant District Plan noise standards are reproduced in Appendix B.

2.0 The proposal

WNDL propose to develop the Site for a master-planned urban development that will include approximately residential development, a local commercial centre and open spaces areas for amenity, recreation and ecological restoration.

Figure 1 displays the proposed Masterplan and the activity layout is shown in Figure 2.

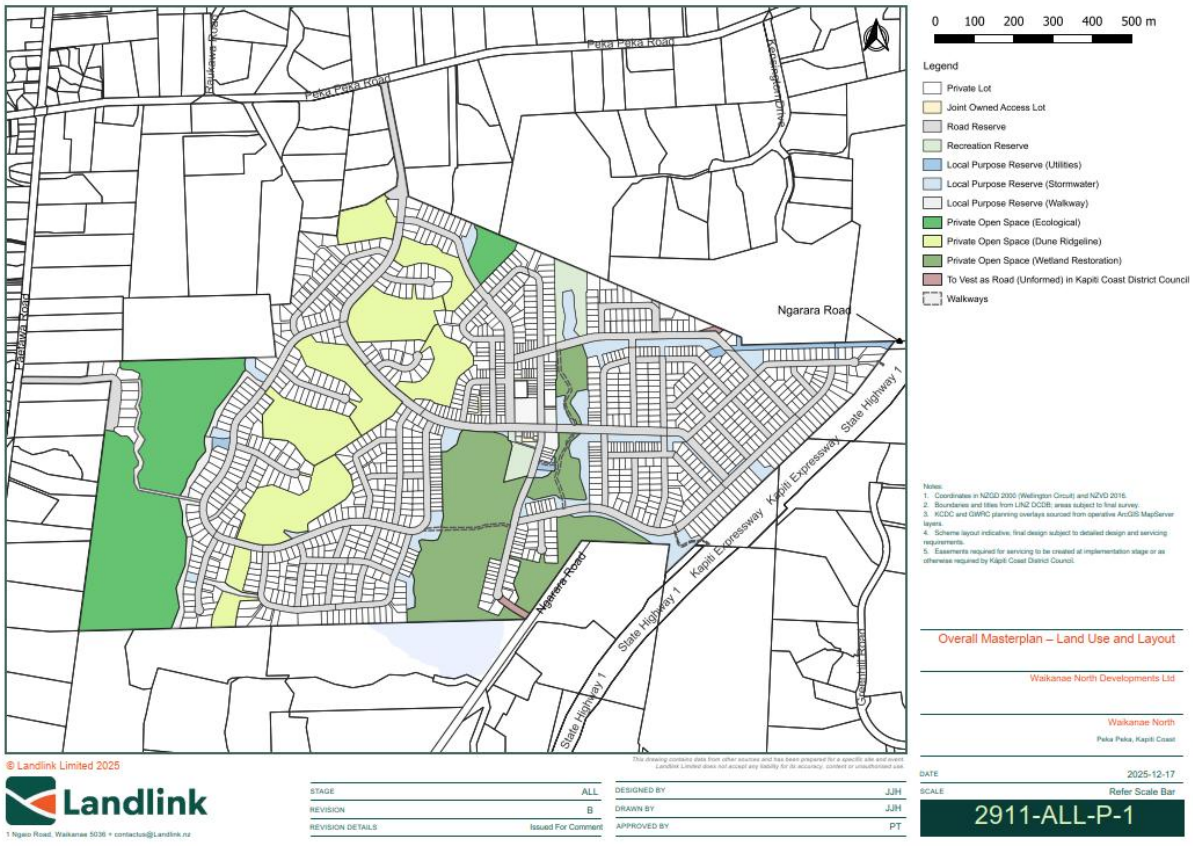

Figure 1 Masterplan

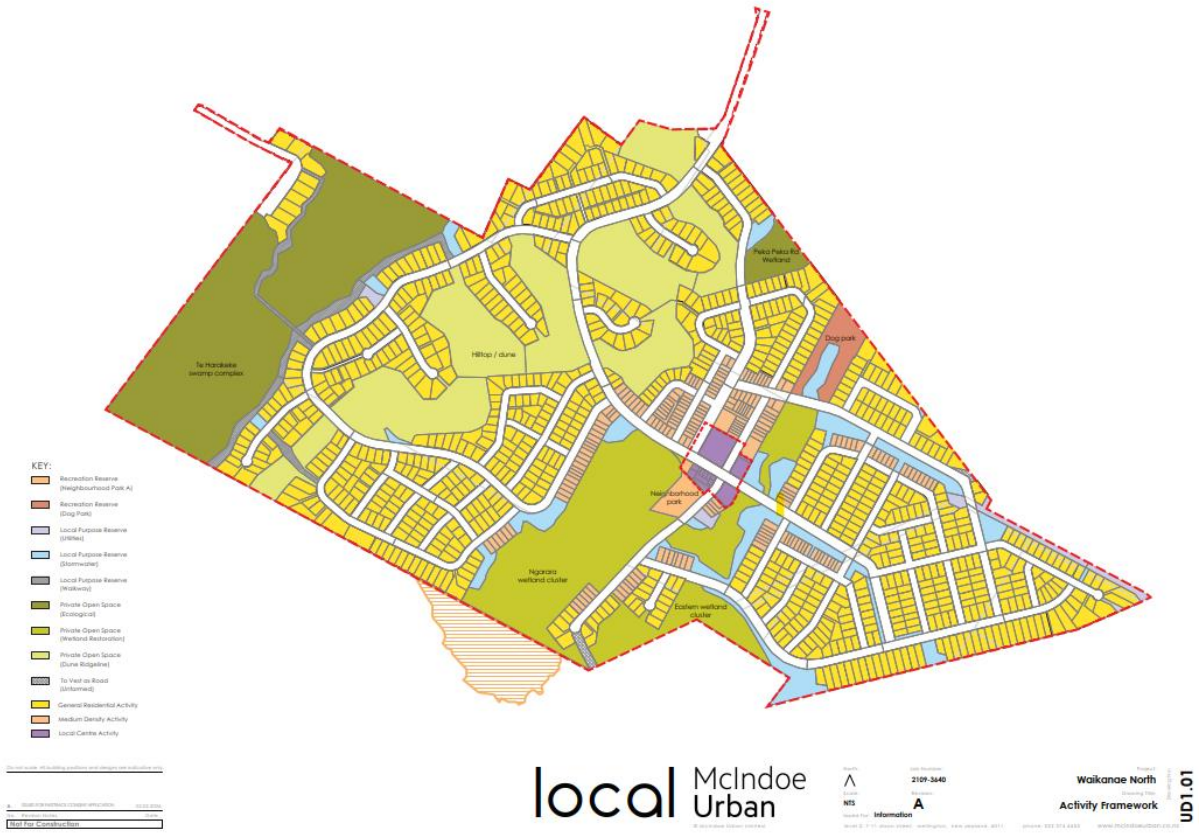

Figure 2 Activity layout

2.1 Receivers of noise

This assessment is focussed on the potential construction and operational noise effects that will be experienced by noise sensitive receivers (dwellings) adjacent to the Site. We also provide recommended conditions to control noise levels generated and received between land use activities within the Site:

The receivers adjacent to the Site include:

- The Peka Peka Road dwellings to the north-west, north and north-east of the Site. These dwellings are in in the Rural Lifestyle Zone (**RLZ**).
- The RLZ dwellings to the west of the Site along Paetawa Road.
- The dwellings to the south and north-east of the Site in the General Rural Zone (**GRZ**).

2.2 The key considerations for the appropriate management of noise effects

The key considerations for the management of noise effects generated from the Site and received beyond the Site are:

- To ensure the construction noise effects can comply with the permitted construction noise standards or otherwise be managed to achieve a reasonable level of noise at all assessment locations beyond the Site.
- To ensure that the operational noise levels generated from the Site comply with the maximum permitted noise levels prescribed by the District Plan at all assessment locations beyond the Site.

The key considerations for the management of noise effects received within the Site include:

- To ensure that future dwellings exposed to noise from the Kapiti Expressway will be designed and constructed to mitigate road-traffic noise levels to reasonable levels.
- To ensure that the proposal incorporates suitable controls to manage noise effects between commercial and noise-sensitive activities.

3.0 Assessment of operational noise effects

The Site is in the General Rural Zone (**GRZ**). The land adjacent to the Site is in the GRZ, except for the adjacent sites that to the north (along Peka Peka Road) and west of the Site (along Paetawa Road) that are in the Rural Lifestyle Zone (**RLZ**).

NOISE-R2 and Table 2 control the maximum permitted noise levels received at the notional boundary of any site in the Rural Zones[1].

NOISE-Table 2 prescribes the following noise limits when measured and assessed[2] at the notional boundary[3] of any dwelling in the GRZ or RLZ.

***Noise* – Table 2**

Noise when measured at or within the boundary of a subject site within	Daytime (7am to 7pm) $L_{Aeq(15min)}$	Evening (7pm to 10pm) $L_{Aeq(15min)}$	Night Time (10pm to 7am)	
			$L_{Aeq(15min)}$	L_{AFMax}
Rural Zones	55dB	50 dB	40 dB	75 dB

[1] The Rural Zones include the GRZ and RLZ.

[2] NOISE-R2(3) requires that *noise* measurements must be undertaken in accordance with the procedures set out in NZS6801:2008 Acoustics - Measurement of *Environmental* Sound and must be assessed in accordance with NZS6802:2008 Acoustics – *Environmental Noise*.

[3] Notional boundary means a line 20 metres from any side of a residential unit or other building used for a noise sensitive activity, or the legal boundary where this is closer to such a building.

NOISE-R2(4)(a) and (d) exempt the following activitiies from compliance with the noise limits in NOISE-Table 2:

> (a) any residential activity (excluding visitor accommodation which is not temporary residential rental accommodation) including non-commercial private gatherings, spontaneous social activities and non-commercial children's play;
>
> (d) vehicles on public roads or trains on rail lines, including at railway yards, railway sidings or stations and level crossing warning devices.

The operational noise generated from residential activity and the internal road network that will be vested as public road is therefore exempt from compliance with the limits in NOISE-Table 2.

3.1 Noise levels from the Local Centre and Community Hub

3.1.1 Noise from commercial activity received beyond the Site

The proposal is to develop the Site for approximately 1190 residential allotments, as well as a Local Centre and Community Hub.

We have reviewed the separation distances between the Local Centre and Community Hub to determine whether the noise levels generated from commercial activity will comply the maximum permitted noise levels prescribed by NOISE-R2 and Table 2 when measured and assessed at all notional boundaries beyond the Site.

The Local Centre and Community Hub is centrally located within the Site with large separation distances between notional boundaries (dwellings) on adjacent sites in the Rural Zone and Rural Lifestyle Zone.

Our assessment finds that noise levels from the Local Centre and Community Hub will readily comply with the Rural Zone noise limits prescribed by NOISE-R2 and Table 2 when measured and assessed at all assessment locations beyond the Site due to the ample separation distances involved.

3.1.2 Recommended noise limits to control noise levels from the Local Centre and Community Hub within the Site

We understand that the Local Centre and Community Hub may provide for a mixed use environment including commercial activity to provide for the needs of local residents, as well as potential noise sensitive activities (i.e. apartments).

The underlying noise limits for the Rural Zone are not designed to manage the noise from the types of activities that are proposed. We have therefore recommended conditions of consent that are designed to be sufficiently enabling for commercial activity (i.e. retail and hospitality) that may establish within the Local Centre whilst managing the effects on noise sensitive receivers outside the Local Centre or Community Hub. The recommended noise limits are

based on the District Plan noise limits that would apply if the Local Centre and Community Hub is in a "Centres Zone" and the adjacent residential lots are zoned "Residential".

The proposed noise limits we have recommended for the Local Centre and Community Hub will not provide an adequate level of amenity for noise sensitive activities that may co-locate in those areas with commercial activity (e.g. such as an apartment above or adjacent to hospitality). We have therefore recommended that any noise sensitive activities within the Local Centre and Community Hub must be acoustically treated. This approach is consistent with the relevant District Plan acoustic treatment requirements for noise sensitive activities that would apply if the Local Centre and Community Hub was zoned "Local Centre".

We recommend conditions of consent that will deliver the following outcomes:

i. Require noise sensitive activities in the Local Centre and Community Hub to be designed and constructed to achieve an internal noise environment that is reasonable for living and sleeping. The proposed acoustic treatment controls are consistent with the requirements of NOISE-R14 for any noise sensitive activity in a Centres Zone.

ii. Enable activities in the Local Centre and Community Hub to generate maximum permitted noise levels that are consistent with the limits prescribed by NOISE-Table 3 and NOISE-Table 4 (fixed plant) for noise generated and received in a Centres Zones. The noise limits will apply within the boundary of any other site in the Local Centre and Community Hub, including noise sensitive activities that will be required to be acoustically treated as per (i).

iii. Require any commercial activity in the Local Centre and Community Hub to comply with the noise limits in NOISE-Table 3 that control noise generated from a Centres Zone and received in a "Residential Zone" (i.e. at any residential lot outside the Local Centre). The recommended noise limits are consistent with the limits that would apply if the proposed residential development outside the Local Centre is zoned "Residential".

3.1.3 Recommended conditions for the Local Centre and Community Hub

The recommended noise limits to manage land use compatibility between activities in the Local Centre and Community Hub are set out in the table below.

Table 1 Recommended noise limits applying to all lots within the Local Centre and Community Hub

All sites in the Local Centre and Community Hub		Daytime (7am to 7pm)	Evening (7pm to 10pm)	Night-time (10pm to 7am)	
		$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	L_{AFMax}
1	Noise when measured at or within the boundary of a site within the Local Centre and Community Hub	60 dB	55 dB	50 dB	85 dB

2	Noise from fixed plant measured at or within the boundary of a site within the Local Centre and Community Hub	55 dB	55 dB	50 dB	85 dB
3	Noise generated from any site in the Local Centre and Community Hub measured at or within the boundary of any residential lot (i.e. that is outside the Local Centre and Community Hub).	50 dB	45 dB	40 dB	70 dB
Noise levels shall be measured in accordance with the procedures set out in NZS6801:2008 Acoustics - Measurement of Environmental Sound and assessed in accordance with NZS6802:2008 Acoustics – Environmental Noise.					
4	Acoustic treatment requirements for any Noise Sensitive Activity within the Local Centre and Community Hub	Any new or altered Habitable Room within a building that house any Noise Sensitive Activity (including rooms used for hospital recovery; but excluding rooms used for Visitor Accommodation which is not Temporary Residential Rental Accommodation, outside of Residential Zones) on a Subject Site within the Local Centre and Community Hub must be protected from noise arising from outside the building by ensuring the external sound insulation level of the room achieves a performance standard of not less than D2m,nT,w + Ctr > 30 dB. Compliance shall be achieved by either: i. A statement by Licensed Building Practitioner that the construction of the external building elements of the new or altered habitable room conform with NOISE-Table 8 of the Operative Kapiti Coast District Plan 2021, and that ventilation of these rooms conforms with the mechanical ventilation requirements in (iii) below. ii. Constructing the habitable room in accordance with an acoustic design certificate prepared by an acoustic engineer acceptable to Council that describes the proposed design of the building that will achieve compliance with the specified performance standard for sound insulation with a ventilation system installed as required in (iii) below. iii. Where habitable rooms contain operable windows, a ventilation system must also be installed. This ventilation system must: a) achieve the requirements of Section G4 – Ventilation of the New Zealand Building Code 2011, and, while meeting this minimum requirement, the sound of the system must not exceed 30 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser; and b) provide ventilation at incremental rates controlled by the occupant up to a high air flow setting that provides at least 6 air			

		changes per hour, and, while meeting this requirement, the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser; and c) provide cooling that is controlled by the occupant and can maintain the temperature at no greater than 25°C; and d) result in air pressure inside the habitable room that is no more than 10Pa above ambient external air pressure. Note: for the purposes of this condition, the term altered habitable room' means any habitable room that is (or is proposed to be) expanded in floor area by 10% or more, or involves the fitting of new or replacement windows in external walls with an area more than 5% of the floor area of the room.

4.0 Road-traffic noise effects from the Kapiti Expressway

The eastern boundary of the Site is adjacent to the Kapiti Expressway.

District Plan rule NOISE-R14 and the consent notice[4] applying to the Site both prescribe acoustic treatment requirements for dwellings adjacent to the Expressway.

The noise performance standards in the consent notice and District Plan generally deliver the same outcomes but contain several differences. Importantly, these differences mean that it will be difficult for future lot owners to demonstrate compliance with NOISE-R14 in addition to the requirements of the consent notice (or vice versa). We therefore recommend that only one set of controls apply.

We have prepared the table below to summarise the key differences between the noise performance standards of the consent notice and NOISE-R14 so that the appropriate mitigation response can be confirmed.

Table 2 Key differences between the consent notice and NOISE-R14

Performance standard	Consent Notice	NOISE-R14	Difference
Road traffic noise effects area	100m from the sealed edge of the Expressway carriageway	80m from the sealed edge of the Expressway carriageway	We consider that an effects area of 80m or 100m could be adopted. We note there is negligible difference (≈1 dB) between the road-traffic noise levels received at 80m when compared to 100m.

[4] We understand that the consent notice was issued in relation to RM220226 on 9 December 2022.

Performance standard	Consent Notice	NOISE-R14	Difference
Acoustic treatment requirements	Noise sensitive activites within 100m of the Expressway must be designed, constructed and maintained to achieve an indoor design noise level of 40 dB $L_{Aeq\ (24hr)}$ inside all habitable spaces	Any building containing a noise sensitive activity constructed between 40m-80m[5] of the Expressway must achieve a performance standard of not less than D2m,nT,w + Ctr > 30 dB.	The consent notice adopts a maximum indoor design noise level of 40 dB $L_{Aeq(24h)}$, whereas NOISE-R14 required the building to achieve a standardised level of noise reduction from outside to inside, where external road-traffic noise must be reduced by ≈30dB inside the dwelling. We consider that designing the dwellings inside the 80m setback to comply with NOISE-R14 will deliver a higher level of protection from road-traffic noise than the consent notice.
Mechanical ventilation requirements	The consent notice and NOISE-R14 both adopt the same performance standards for a mechanical ventilation system that must be implemented when external windows must be closed to achieve the internal noise environment.		No difference.
Compliance pathway at the time of building consent	Compliance must be demonstrated through a design report prepared by an acoustics specialist that takes into account future traffic noise levels.	NOISE-R14 provides three compliance pathways, two of which are practicable for this development (as discussed in the following section). Compliance can be demonstrated by: a) Constructing the dwelling in accordance with the construction schedule in NOISE-Table 8; or b) Submitting an acoustic design certificate prepared by an acoustic engineer that confirms the building that will	NOISE-R14 enables compliance to be demonstrated by adhering to the construction schedule in NOISE-Table 8, or through an acoustic design report that confirms the building will be designed to achieve a performance standard of not less than D2m,nT,w + Ctr > 30 dB. The acoustic report required by the consent notice requires a road-traffic noise modelling exercise to predict the future traffic noise levels at the building façade. The design report required by NOISE-R14 does not require traffic noise modelling as the outside to inside noise reduction is designed to reduce traffic noise levels to acceptable levels indoors.

[5] We understand that there are no proposed building platforms within 40m of the Expressway. Any noise sensitive activities within 40m of the Expressway would need to be designed, constructed and maintained to achieve D2m,nT,w + Ctr > 35 dB.

Performance standard	Consent Notice	NOISE-R14	Difference
		achieve compliance with the specified performance standards in NOISE-R14.	Overall, we consider that NOISE-R14 provides compliance pathways that are likely to be more straightforward and efficient for future residential lot owners.

Overall, we consider that the noise performance standards in NOISE-R14 provide a more robust and workable set of controls for future lot owners that are consistent with the controls that apply across the rest of the District. We have therefore based our assessment on compliance with the permitted activity standards in NOISE-R14.

As set out above, we note that it will be challenging and potentially costly for lot owners to discharge the requirements of both the consent notice and NOISE-R14. For this reason, we recommend that the historical consent notice does not "flow down" to new lots if the proposal is to comply with NOISE-R14.

NOISE-R14 is reproduced in Appendix B and is summarised below.

4.1 NOISE-R14

NOISE-R14 includes two sets of acoustic treatment controls that are based on distance from the carriageway:

1. The controls in NOISER14(1)(f) apply to any noise sensitive activity constructed more than 40m and up to 80m of the edge of the closest carriageway. Any building containing a noise sensitive activity within this area must achieve a performance standard of not less than D2m,nT,w + Ctr > 30 dB.
2. The controls in NOISER14(2) apply to any noise sensitive activity constructed within 40m of the edge of the closest carriageway. Any building containing a noise sensitive activity within this area must achieve a performance standard of not less than D2m,nT,w + Ctr > 35 dB.

We understand that there are no lots with a potential building platform within 40m of the Expressway. Figure 3 shows that all building platforms subject to NOISE-R14 will be located between 40m and 80m from the edge of the closest carriageway. This means that future buildings containing a noise sensitive activity must achieve a performance standard of not less than D2m,nT,w + Ctr > 30 dB.

Figure 3 The closest building platforms are separated from the Expressway by distances >40m

4.2 Proposed compliance pathway

NOISE-R14 provides the following compliance pathways:

i. Where the building containing a noise sensitive activity is constructed more than 40m and up to 80m from the edge of the closest carriageway, the construction schedule in NOISE-Table 8 can be used to determine the minimum construction requirements to achieve an outside to inside reduction of 30dB for road traffic noise. The rule enables compliance to be confirmed via a statement from a Licensed Building Practitioner that confirms the construction conforms with Table 8, and that ventilation of these rooms conforms with the mechanical ventilation requirements of Standard 4 of NOISE-R14 (set out below); or

ii. For any noise sensitive activity constructed up to 80m from the edge of the closest carriageway, compliance can be demonstrated through an acoustic design certificate prepared by an acoustic engineer that confirms the building that will achieve compliance with the specified performance standard, with a ventilation system installed as required under Standard 4 of NOISE-R14; or

iii. Providing an acoustic design report that confirms the outdoor free-field noise level at the most affected exterior wall of the building containing the habitable room will be unlikely to exceed 57 dB $L_{Aeq(24hr)}$ for road traffic noise.

We have undertaken road-traffic noise modelling to determine whether the compliance pathway in (iii) is a practicable compliance pathway for future development. The noise modelling we have undertaken confirms that road-traffic noise levels will exceed 57 dB $L_{Aeq(24hr)}$ at the most exposed façade of a dwelling within 80m of the Expressway. We

therefore recommend that compliance with NOISE-R14 is addressed through the compliance pathways described in (i) or (ii) above.

This will require the proposed construction of each dwelling to be assessed prior to building consent to confirm that the building façade achieves the prescribed level of outside to inside noise reduction. This work can only be done when the future building location, layout and heights are known.

4.2.1 Mechanical ventilation requirements in Standard 4 of NOISE-R14

Standard 4 of NOISE-R14 prescribes the following mechanical ventilation requirements for buildings that are subject to Standards 1 or 2 of NOISE-R14:

> 4. Where habitable rooms required to be insulated under standards 1 or 2 contain operable windows, a ventilation system must also be installed. This ventilation system must:
>
> a. achieve the requirements of Section G4 – Ventilation of the New Zealand Building Code 2011, and, while meeting this minimum requirement, the sound of the system must not exceed 30 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser; and
>
> b. provide ventilation at incremental rates controlled by the occupant up to a high air flow setting that provides at least 6 air changes per hour, and, while meeting this requirement, the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser; and
>
> c. provide cooling that is controlled by the occupant and can maintain the temperature at no greater than 25°C; and
>
> d. result in air pressure inside the habitable room that is no more than 10Pa above ambient external air pressure.

Compliance with Standard 4 of NOISE-R14 will need to be addressed as part of any future building consent.

4.3 Recommended consent notice condition for all lots with the Kapiti Expressway

We understand the proposal is to apply a new consent notice to all lots with a potential building platform within 80m from the edge of the Expressway carriageway.

The purpose of the consent notice is to ensure that all future buildings containing a noise sensitive activity within 80m of the Expressway carriageway are designed and constructed to achieve compliance with permitted activity standards in NOISE-R14. We recommend that the new consent notice supersedes the historical consent notice relating to road-traffic noise.

We recommend that the consent notice delivers the following outcomes (we leave exact drafting to others):

> [insert all lots affected by NOISE-R14]

Any new or altered habitable room* within a building used for a noise sensitive activity* within 80m of the edge of the closest carriageway of the Kapiti Expressway must be designed and constructed to comply with the acoustic treatment and mechanical ventilation requirements of NOISE-R14 of the Operative Kapiti Coast District Plan.

Compliance with Standard 1 of NOISE-R14 of the Operative Kapiti Coast District Plan must be achieved through:

i. A statement by Licensed Building Practitioner that the construction of the external building elements of the new or altered habitable room conform with NOISE-Table 8 of the Operative Kapiti Coast District Plan and that ventilation of these rooms conforms with the requirements of Standard 4 of NOISE-R14 of the Operative Kapiti Coast District Plan; or

ii. Constructing the habitable room in accordance with an acoustic design certificate prepared by an acoustic engineer acceptable to Council that describes the proposed design of the building will achieve compliance with the specified performance standard for sound insulation, with a ventilation system installed as required under Standard 4 of NOISE-R14 of the Operative Kapiti Coast District Plan.

**'Altered habitable room' means any habitable room that is (or is proposed to be) expanded in floor area by 10% or more, or involves the fitting of new or replacement windows in external walls with an area more than 5% of the floor area of the room.*

***Noise sensitive activity is defined in the Operative Kapiti Coast District Plan and NOISE-R14(1).*

Note: Road-traffic noise modelling undertaken as part of the subdivision application confirms that the outdoor free-field road traffic noise level at the most affected exterior wall of future buildings within 80m of the nearest edge of the Kapiti Expressway will exceed 57 dB $L_{Aeq(24hr)}$, The compliance pathway in Standard 1(iii) of NOISE-R14 of the Operative Kapiti Coast District Plan is therefore not available.

5.0 Vibration generated by road-traffic

The consent notice[6] applying to the underlying Certificate of Title requires that any new noise sensitive activities on the site that are located in or partly within 100m of the sealed edge of the Kapiti Expressway must be designed, constructed and maintained to achieve road-traffic vibration levels complying with class C of NS 8176E: 2005. The consent notice does not provide a pathway to demonstrate compliance with this requirement.

If the consent notice flows down to new lots within 100m of the Expressway, it is likely that many or all lot owners will need to engage a consultant to measure and predict vibration levels on each lot, to determine whether any treatment is required, and if so, what that treatment might be.

[6] We understand that the consent notice was issued in relation to RM220226 on 9 December 2022.

These investigations will add an additional compliance cost, and in our opinion, are not required given the separation distance between the Expressway and the closest potential building platforms. In our experience, a well-maintained road network should not give rise to a level of vibration likely to cause annoyance or complaints at distances where built development within the Site could reasonably be anticipated.

Land use controls managing vibration effects from operational road networks are very rare throughout New Zealand. It is generally accepted that significant levels of vibration extending beyond the state highway network are unusual; and in the unusual circumstances where effects do arise, the vibration can and should be remedied at source (i.e., by the roading authority).

Waka Kothi's own technical guidance on the cause and remedy of significant vibration levels from road corridors states that:

> *"Generally, when significant vibration can be felt inside a house this is a result of a nearby road-surface defect such as a pothole, rutting, or a manhole with an abrupt transition to the surrounding road surface.*
>
> *If such a defect is confirmed, the Transport Agency will review the significance of the vibration concern, the condition of the road, and any programmed road maintenance/re-surfacing work in the area and develop a plan to repair/correct the defect, if required*
>
> *In some cases, there may be issues with the road pavement (the engineered 'soil' layer that provides a strong and stable base for a smooth road surface) which can cause vibration to travel farther from the road and/or be more noticeable. In such cases Waka Kotahi will review the requirement to re-construct the road pavement. This is a major undertaking and, if required, would likely be programmed in at the time of the next major road rehabilitation/resurfacing work in the area.*[7]

We have reviewed the vibration evidence[8] that accompanied the Notice of Requirement for the designation and resource consent applications for the Mackays to Peka Peka Expressway proposal. This information confirms that there is no evidence of operational vibration effects extending onto adjacent land where built development would be likely to occur. The evidence of Mr Whitlock (for NZTA) states:

> *"The only vibration effects I consider could result from the operation of the completed Expressway is from heavy traffic (i.e. trucks) passing over imperfections in the road surface.*
>
> *Whilst the type of road surface may have a slight effect on vibration levels (both OGPA36 and chip seal are planned for the Project), the primary risk comes from bumps*

[7] https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-sustainability-in-our-operations/environmental-technical-areas/noise-and-vibration/frequently-asked-questions

[8] https://www.epa.govt.nz/assets/FileAPI/proposal/NSP000005/Evidence/f669b59338/James-Whitlock-Vibration-Evidence.pdf

and dips in the road, in particular poorly back-filled trenches. In my experience, those are the cause of practically all traffic vibration complaints.

I have measured vibration from heavy vehicles travelling along a 10 month old OGPA road surface, and the measured levels were insignificant (i.e. below the ambient vibration level). This demonstrates that operation effects can be fully mitigated by the provision of a smooth road surface.

To quantify vibration levels from degraded road surfaces, I measured heavy truck passes at two of the ambient survey locations along State Highway 1, Raumati South, and adjacent to a very dilapidated road surface outside a quarry in Auckland. All measurements were done in accordance with the NS 8176.E:2005 Standard contained in the Project criteria.

Translating these measurements to the Project (by correcting for distance and ground type) indicates that traffic vibration will comply with the Project criteria at 2 metres from a new OGPA road surface, and 15 metres from a very dilapidated road surface. There are no residences or other habitable buildings located this close to the proposed Expressway.

The NZTA has a system for monitoring and maintaining the condition of State Highway pavements and road surfaces which, when applied to the Project, would avoid any operation vibration effects. As discussed earlier in my evidence, particular attention should be given to ensuring backfilled trenches do not result in bumps or dips in the road surface. This is addressed in proposed designation condition DC.49."

Based on the above, we have not identified any requirement for any building vibration controls to apply to the Site. We recommend that the consent notice is amended or cancelled so that it does not "flow down" to new lots adjacent to the Expressway.

6.0 Construction noise effects

NOISE-R10 permits noise from activities associated with construction or demolition where construction noise is measured and assessed in accordance with NZS6803:1999 *Acoustics – Construction Noise* (**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. We understand that the construction timeframe will be greater than 20 weeks in duration. We have therefore assessed the potential construction noise levels in accordance with the NZS6803's recommended noise limits for long term projects[9].

Construction activity will take place between 7:30am and 6:00pm, Monday to Saturday, when NZS6803:1999 recommends that a noise limit of 70 dB L_{Aeq} and 85 dB L_{AFmax} applies when

[9] The construction noise limit applying to construction projects greater than 20 weeks in duration.

measured and assessed 1m from the façade of any occupied dwelling in a rural or residential zone. The construction noise limits do not apply at vacant sites or buildings that are not occupied at the time of construction work.

6.1 Proposed construction work

The earthworks plan indicates that the majority of enabling earthworks that are likely to be undertaken near to the Site boundaries will comprise bulk earthworks to excavate and remove peat and soft organic soils and replace with compacted dune sand (from the site) and/ or imported clean fill; followed by regrading and installation of subsoil drainage contouring, compaction and paving of access roads and installation of services. We expect that the works will require very typical plant and machinery such as bulldozers, compactors, excavators, paving machines, concrete pours and trucks. We understand that the proposed construction works will not include any rock breaking or blasting.

The construction noise generated by the enabling earthworks and civil works will be the noisiest aspect of the construction phase. The noise levels from subsequent construction of buildings will generally be quieter than the noise from civil works, especially where buildings are well-separated from boundaries.

6.2 Receivers of construction noise

This assessment is focussed on construction work in areas of the Site that are near (i.e within 100m) of occupied dwellings on adjacent sites. The closest receivers (dwellings) within 100m of proposed construction work are displayed in Table 3.

The proposed earthworks plan and masterplan shows that there will be many areas of the Site where there will be no or minimal construction work. These areas include Te Harakeke Wetland in the western part of the Site and the Wetland Sanctuary in the central part of the Site. Te Harakeke Wetland will also provide a large separation buffer between the main area of construction work and receivers on Paetawa Road.

Figure 4 Closest receivers of construction noise

Table 3 Closest receivers of construction noise

Address	Building type	Separation distance from closest potential construction activity and building façade
Paetawa Road Receivers		
101 Paetawa Rad	Single level dwelling	≈83m from access road construction
107 Paetawa Rad	Single level dwelling	≈7m from access road construction
109 Paetawa Rad	Single level dwelling	≈15m from access road construction
121 Paetawa Road	Single level dwelling	≈70m from access road construction
Peka Peka Road Receivers		
153 Peka Peka Road	Single level dwelling	≈100m from construction access road and areas of road construction 100m from boundary of the Site
155 Peka Peka Road	Single level dwelling	≈70m from construction access road and areas of road construction 35m from closest building platform

Address	Building type	Separation distance from closest potential construction activity and building façade
162 Peka Peka Road	Single level dwelling	≈100m from construction access road
163 Peka Peka Road	Single level dwelling	≈110m from construction access road
172 Peka Peka Road	Single level dwelling	≈55m from construction access road
173 Peka Peka Road	Single level dwelling	≈90m from construction access road ≈65m from closest future building platform
175 Peka Peka Road	Single level dwelling	≈55m from construction access road ≈120m from closest future building platform
177 Peka Peka Road	Single level dwelling	≈60m from construction access road
193 Peka Peka Road	Single level dwelling	≈50m from closest areas of road construction ≈20m from closest future building platform
203 Peka Peka Road	Single level dwelling	≈65m from closest areas of road construction ≈40m from closest future building platform

6.3 Assessment of compliance with permitted construction noise limits

Table 4 includes reference noise levels for the noisiest potential construction activities likely to be undertaken near to occupied buildings on adjacent sites.

The reference noise levels are based on our database of construction noise measurements undertaken by Styles Group on numerous projects nationwide. They are generally consistent with guideline noise data provided in NZS 6803:1999 Appendix C *Guide to Sound Level Data on Site Equipment and Site Activities* and best practice.

Our reference levels are based on worst-case assumptions for noise emissions. Good plant selection, regular maintenance, and experienced operators will generally result in lower noise emissions during the works.

Table 4 displays the minimum separation distance for each activity to comply with the permitted construction noise limit for the proposed hours of work (i.e. times when a noise limit of 70 dB L_{Aeq} applies) under the following assumptions:

- The distances include an adjustment of +3 dB to the noise levels for reflections from the façade of the receiving building (in accordance with NZS 6803:1999).
- The compliance distance stated is from the noise generating plant (or the noisiest part of the plant e.g., an excavator engine) to the most exposed façade of the building.
- The plant is being used continuously at the reference distance over a 15-minute sample period (i.e., 100% on-time) unless otherwise stated.
- Hard, acoustically reflective ground is assumed between the noise source and the building.
- The mitigated noise levels include a reduction of 10 dB from an effective acoustic barrier such as topography or fencing that blocks line of sight between the noise generating part of the plant and the assessment point.

Table 4 Reference noise levels and compliance distances

Construction activity	Unmitigated $L_{Aeq(15\ min)}$ noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (with noise barrier)
D6, D7, or D8 bulldozer working in small area	76 dB*	27 m	9 m
Padfoot vibratory compaction roller 15t – 20-t	76 dB*	27 m	9 m
Cut and fill, clearing, and loading trucks with a 40-t – 50-t excavator	72 dB	17 m	6 m
Cut and fill, clearing, and loading trucks with a 20-t excavator	69 dB	12 m	4 m
Cat 815 static compactor 18-t	69 dB*	12 m	4 m
Concrete pump and truck discharging	69 dB	12 m	4 m
Cut and fill, clearing, and loading trucks with a 12-t excavator	67 dB	10 m	3 m
Large generator	66 dB	9 m	3 m
Terex TS14 30-t motor scraper	65 dB*	8 m	3 m
7,000 L watercart	65 dB	8 m	3 m
Grader	62 dB*	6 m	2 m
Idling delivery truck, dump truck, moxy, tractor	62 dB	6 m	2 m
Paving works (with all ancillary equipment operating)	75 dB	25 m	8 m

** Reference noise level is for a moving noise*

6.3.1 Assessment of compliance with permitted construction noise limits

6.3.1.1 Peka Peka Road receivers

The highest noise generating construction work near to the Peka Peka Road receivers is expected to arise from works associated with road construction from Peka Peka Road access

The closest Peka Peka Road receiver is approximately 50m from the proposed access road that will be subject to earthworks, compaction, grading and paving works. The construction noise levels from these activities will comply with the permitted construction noise limit of 70 dB L_{Aeq} without any specific noise mitigation or management.

The construction noise effects are summarised in Table 5 below.

6.3.1.2 Paetawa Road receivers

The highest noise generating construction work near to the dwellings on 107 and 109 Paetawa Road is expected to be the construction of the driveway from Paetawa Road.

The proposal is to ensure that the construction noise levels from all works associated with the construction of the driveway are managed to comply with the permitted noise limits in NZS6803, unless a written approval is provided to authorise non-compliance with the limits.

Our assessment finds that construction work can be managed to comply with the permitted noise limits through a combination of the following measures.

- Managing the type of machinery that will operate near to the dwellings when they are occupied
- Using smaller machinery to complete high noise generating work such as compaction work (e.g. using a static roller instead of a vibratory compactor)
- Completing high noise generating works when the buildings are unoccupied (when the construction noise limits do not apply).
- Using temporary acoustic screening to screen line of sight between the dwelling and construction work. Barriers up to 2m high could reduce construction noise levels at the dwellings by up to 5-8dB depending on the nature and proximity of the works being undertaken. Higher barriers may be required depending on the nature and proximity of machinery that will be used.
- Ensuring works are only undertaken between the hours of 7:30 am. and 6:00 pm, Monday to Saturday.

At the time of preparing this report, a contractor has not yet been appointed which means that there is little or no detail on the specific types of equipment and durations of work phases for the Project. This means that it is not practicable to specify the exact mitigation measures that will need to be implemented during the construction phase.

The proposal is to require a Construction Noise Management Plan (CNMP) to be submitted prior to commencement of the construction of the access road from Paetawa Road. The CNMP

will prescribe the specific measures that will be implemented to ensure compliance throughout the construction work, including:

- Limitations on working hours for specific activities and work areas
- Specifications and requirements for acoustically effective barriers that must be installed prior to commencement of specific activities
- Minimum separation distances for compliance with the noise limits in the consent conditions
- Details for advising the occupiers of the neighbouring buildings of the works, including when the highest noise levels can be expected
- Details for ensuring that contractors and operators on site are aware of the requirement to minimise noise effects on the neighbouring sites.
- Procedures for response to neighbour's concerns and dealing with any complaints

It is our experience that a CNMP is an important tool for the successful management of noise effects on receivers in proximity to construction works of this nature.

The engagement required by the CNMP 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 or at locations that are further screened from the works. The highest noise levels indoors will be experienced within the rooms nearest to the construction works. Construction noise levels will be lower in rooms on the other side of the building.

The potential construction noise effects are summarised in Table 5 below.

Table 5: 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

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 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

6.3.1.3 All other receivers

All other receivers are well separated from areas of the site that will be subject to construction work. The construction noise levels generated from construction work in other areas of the Site will be much lower and will readily comply with the noise limits in NZS6803 due to the large separation distances.

6.4 Recommended conditions to manage construction noise

We recommend the following conditions of consent are imposed to control noise levels from construction work:

Maintenance of accessway	The consent holder must ensure that the access way between Peka Peka Road and the main site is maintained to be smooth and free from potholes or defects that give rise to unnecessary noise when used by trucks during the construction phase.
Timing of construction work	Construction work and heavy vehicle movements on the site must 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).
Construction Noise Management Plan to manage noise effects on 107 and 109 Paetawa Road **Not required if a written approval for construction noise is provided from 107 and 109 Paetawa Road.*	The CNMP must be submitted a minimum of ten working days before starting any construction works authorised by this consent. The objective of the CNMP must be to identify and require the adoption of the best practicable option to minimise construction noise effects and ensure compliance with the project noise conditions. The CNMP must address the requirements of Annex E of NZS 6803:1999 *Acoustics – Construction Noise*. All construction works on the site must be carried out in accordance with the certified CNMP. A copy of the CNMP must be kept on site during construction hours.
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: *Acoustics – Construction Noise*:

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

7.0 Response to consultation feedback

A draft copy of this assessment was provided to Kapiti Coast District Council (KCDC) and the New Zealand Transport Agency (NZTA) for comment. This feedback is summarised below.

7.1 Feedback from KCDC

We understand that KCDC are satisfied that noise has been adequately addressed in our assessment.

7.2 Feedback from NZTA

NZTA have requested the following matters are addressed:

> *"What increase in the background noise environment is expected from 1200 households and the associated infrastructure e.g local roads*
>
> *The reverse sensitivity mitigation you are proposing needs to be considered against the noise levels that will become part of the existing environment if your development is approved".*

We do not expect that the development will be likely to contribute to any noticeable increase in the background noise environment, beyond what would typically be expected from a residential area. In this case, the background noise levels across the Site and in the vicinity of the Site are dominated by road-traffic noise from the Kapiti Expressway. Vehicle noise from the local road network within the Site will generate a very low level of noise in this context.

We have not identified the potential for any reverse sensitivity issues to arise for noise reasons. The proposal is to ensure that dwellings adjacent to the Kapiti Expressway are designed and constructed to adequately protect occupants from road-traffic noise when they are indoors, in accordance with the permitted activity standards prescribed by the District Plan.

We are satisfied that the proposal will manage ongoing land use compatibility between activities within the Site and all adjacent sites through the following measures:

- The masterplan layout which achieves ample separation between commercial activities within the proposed local centre and all adjacent sites in the GRZ
- The adoption of noise limits (that are consistent with the District Plan noise limits) to deliver noise sensitive activities with a good level of amenity.

We consider that the noise environment enabled by the proposal will be consistent with a residential area, characterised by intermittent noise from typical household activities and vehicle movements. These noise levels will not be dominant or intrusive in the context of the existing noise environment from the Kapiti Expressway.

8.0 Conclusion

Styles Group has assessed the construction and operational noise effects from the Waikanae North Developments Project at 169-171 Peka Peka Road.

Our assessment finds that the operational noise levels from the proposal will be compatible with the level of acoustic amenity anticipated and provided for in the Rural and Rural Lifestyle Zone of the District Plan.

The potential construction noise effects will be typical for a development of this scale and nature. Our assessment finds that noise levels from construction work can be managed to comply with the recommended noise limits for long-term projects prescribed by NZS 6803:1999 *Acoustics – Construction* Noise at all adjacent receivers.

Road-traffic noise effects from the Kapiti Expressway will be managed in accordance with the permitted activity standards in NOISE-R14. The acoustic treatment requirements will ensure that future occupants of dwellings within 80m of the Expressway are adequately protected from road-traffic noise while indoors. The acoustic treatment requirements are designed to adequately manage the potential for reverse sensitivity effects on the operator of the transport corridor. No assessment of or treatment to mitigate vibration effects from the Kapiti Expressway is necessary.

We have provided recommended conditions for the appropriate management of noise effects between noise generating and noise sensitive land use activities in the Local Centre and Community Hub.

Overall, our assessment finds that the construction and operation of the master-planned community will comply with the permitted noise standards prescribed by the District Plan at all adjacent receivers.

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 definition of noise includes vibration under the Resource Management Act.
Best practicable option	Defined in section 2 of the Resource Management Act as: in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to— a. the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and b. the financial implications, and the effects on the environment, of that option when compared with other options; and c. the current state of technical knowledge and the likelihood that the option can be successfully applied.
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.
Noise rating level	A derived noise level used for comparison with a noise limit.
Notional boundary	A line 20 metres from any side of a residential unit or other building used for a noise sensitive activity, or the legal boundary where this is closer to such a building.
NZS 6801:2008	N.Z. Standard NZS 6801:2008 Acoustics – Measurement of environmental sound.
NZS 6802:2008	N.Z. Standard NZS 6802:2008 Acoustics – Environmental noise.
NZS 6803:1999	N.Z. Standard NZS 6803:1999 Acoustics – Construction noise.
The Act	The Resource Management Act 1991.

s16	Section 16 of the Act states that “every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level”.
ISO 9613-1/2	International Standard ISO9613-1/2 Attenuation of sound during propagation outdoors
NS 8176.E:2005	Norwegian Standard NS 8176.E:2005 – Vibration and shock. Measurement of vibration in buildings from land based transport and guidance to the evaluation of its effects on human beings.
DIN 4150–3:1999	German Standard DIN 4150-3:1999 Structural Vibration – Part 3: Effects of vibration on structures. 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 District Plan noise rules and standards

NOISE-R2 and NOISE-Table 2

NOISE-R2	*Noise* from activities (excluding *plantation forestry* activities that are regulated under the *NESCF*) located within the Rural *Zones*, *River Corridor*, *Natural* *Open Space Zone* and *Open Space Zone*.
Permitted Activity	**Standards** 1. Excluding the activities provided for in Rules NOISE-R8 to NOISE-R15, *noise emission level*s must comply with the limits in NOISE-Table 2. 2. Compliance locations in Rural *Zones* shall be at the *notional boundary* of any *residential unit* (excluding *visitor accommodation* which is not *temporary residential rental accommodation*). 3. *Noise* measurements must be undertaken in accordance with the procedures set out in NZS6801:2008 Acoustics - Measurement of *Environmental* Sound and must be assessed in accordance with NZS6802:2008 Acoustics – *Environmental Noise*. 4. The following activities are exempt from standard 1 above: a. any *residential activity* (excluding *visitor accommodation* which is not *temporary residential rental accommodation*) including non-*commercial* private gatherings, spontaneous social activities and non-*commercial* children's play; b. any warning device used by emergency services for emergency purposes; c. *noise* from *fixed plant* that is used solely for emergency purposes. Examples of such equipment are alarms, standby generator sets that are used to supply electricity only at times of electrical supply failure, or for plant used only during life threatening situations such as smoke fans or sprinkler pumps and is not used to generate power for the *national grid*; d. vehicles on public *roads* or trains on rail lines, including at railway yards, railway sidings or stations and level crossing warning devices; e. in Rural *Zones*, livestock *noise*, mobile sources associated with *primary production* activities and temporary activities required by normal agricultural and horticultural practice, such as cropping and harvesting; and f. in Rural *Zones*, *noise* from helicopter landing areas and landing *strips* for fixed wing aircraft that are associated with *primary production* activities and where a maximum of 10 flight movements take place in any calendar month, or where maximum L_{AFmax} sound levels at any rural dwelling or *Residential Zone site boundary* does not exceed L_{AFmax} 90 dB for daytime L_{AFmax} 70 dB at night time.

NOISE-Table 2	*Noise* when measured at or within the *boundary* of a *subject site* within:	Daytime (7 am to 7 pm)	Evening (7pm to 10pm)	Night Time (10pm to 7 am)	
		$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	L_{AFmax}
	Residential Zones	50 dB	45 dB	40 dB	70 dB
	Centres or Hospital *Zones*	60 dB	55 dB	50 dB	85 dB
	General Industrial Zone	60 dB	55 dB	50 dB	85 dB
	Rural *Zones*	55 dB	50 dB	40 dB	75 dB

NOISE-R10 Noise from activities associated with construction or demolition

NOISE-R10	*Noise* from activities associated with construction or *demolition*.
Permitted Activity	**Standards** 1. Construction *noise* must be measured and assessed in accordance with, and must comply with, NZS 6803:1999 Acoustics – Construction *Noise*.

NOISE-R14 Noise sensitive activities

NOISE-R14	*Noise sensitive activities.*	**Amended** 01 Sep 23 PC2
Permitted Activity	**Standards** 1. Any new or altered *habitable room* within a *building* that houses any *noise sensitive activity* (including rooms used for hospital recovery; but excluding rooms used for *visitor accommodation*, which is not *temporary residential rental accommodation*, outside of *residential zones)* on a *subject site* within any of the following: a. the area between the *air noise boundary* and the *outer control boundary* of the Kāpiti Coast Airport; b. Hospital Zone; c. any Centres Zone; d. General Industrial Zone; e. within 100m of the boundary of a *designation* for rail corridor purposes; and f. greater than 40m, and not greater than 80m, from the nearest edge of the *carriageway* of *transportation noise effect route*; must be protected from *noise* arising from outside the *building* by ensuring the *external sound insulation level* of the room achieves a performance standard of not less than D2m,nT,w + Ctr > 30 dB. Compliance with standard 1 above shall be achieved by either: i. a statement by Licensed Building Practitioner that the construction of the external *building* elements of the new or altered *habitable room* conform with NOISE-Table 8 and that ventilation of these rooms conforms with the requirements of standard 4 below; or ii. constructing the *habitable room* in accordance with an acoustic design certificate prepared by an acoustic engineer acceptable to Council that describes the proposed design of the *building* that will achieve compliance with the specified performance standard for sound insulation with a ventilation system installed as required under standard 4 below; or iii. providing an acoustic design certificate prepared by an acoustic engineer acceptable to Council stating the outdoor free-field *noise* level at the most affected exterior wall of the *building* containing the *habitable room* will be unlikely to exceed; 55 dB $L_{Aeq(1hr)}$ for rail traffic noise 57 dB $L_{Aeq(24hr)}$ for *road* traffic noise. 2. Any new or altered *habitable room* within a *building* that houses any *noise sensitive activity* (including rooms used for hospital recovery; but excluding rooms used for *visitor accommodation*, which is not *temporary residential rental accommodation*, outside of *residential zones)* on a *subject site* within 40m of the nearest edge of the *carriageway* of any formed *State Highway*, or any transport corridor designated for *State Highway* purposes that has yet to be formed, must be protected from *noise* arising from outside the *building* by ensuring the *external sound insulation level* of the room achieves a performance standard of not less than D2m,nT,w + Ctr > 35 dB. Compliance with standard 2) above shall be achieved by either:	

	a. constructing the *habitable room* in accordance with an acoustic design certificate prepared by an acoustic engineer acceptable to Council that describes the proposed design of the *building* that will achieve compliance with the specified performance standards for sound insulation with a ventilation system installed as required under standard 4 below; or b. providing an acoustic design certificate prepared by an acoustic engineer acceptable to Council stating the outdoor *noise* level at the most affected exterior of the *building* containing the *habitable room* will be unlikely to exceed: 57 dB $L_{Aeq(24hr)}$ for *road* traffic noise. 3. For any designated corridor that has yet to be formed, the location of the nearest edge of the *carriageway* shall be deemed to be as indicated on the drawings referenced in the *designation* conditions or an approved Outline Plan, whichever is the latest, or 5m inside the *designation* boundary if there are no such drawings or approved Outline Plan. 4. Where *habitable rooms* required to be insulated under standards 1 or 2 contain operable windows, a ventilation system must also be installed. This ventilation system must: a. achieve the requirements of Section G4 — Ventilation of the New Zealand Building Code 2011, and, while meeting this minimum requirement, the sound of the system must not exceed 30 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser; and b. provide ventilation at incremental rates controlled by the occupant up to a high air flow setting that provides at least 6 air changes per hour, and, while meeting this requirement, the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser; and c. provide cooling that is controlled by the occupant and can maintain the temperature at no greater than 25°C; and d. result in air pressure inside the *habitable room* that is no more than 10Pa above ambient external air pressure. **Note:** for the purposes of this rule, the term 'altered habitable room' means any *habitable room* that is (or is proposed to be) expanded in floor area by 10% or more, or involves the fitting of new or replacement windows in external walls with an area more than 5% of the floor area of the room.