



ASSESSMENT OF NOISE EFFECTS

SOUTHERN LINKS 1 – INDUSTRIAL NORTH
DEVELOPMENT

DATE

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Assessment of noise effects prepared by Styles Group.

REVISION HISTORY

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Statement of experience

I am and have been the Director and Principal of Styles Group Acoustics and Vibration Consultants for over 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 24 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 I have read Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and referred to in the *Fast-track Approvals Act 2024: Panel Convenors' Practice and Procedure Guidance*. This assessment has been prepared in compliance with that Code.

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Executive summary

Styles Group has assessed the operational and construction noise and vibration effects from the Southern Links 1 (SL1) Industrial North development.

This assessment has been prepared to accompany the substantive application for SL1 (the Project) under the Fast-track Approvals Act 2024 (FTAA). The Project is a combined 106ha development, including residential and industrial activities. This assessment relates to the industrial portion of SL1, referred to as the Industrial Area and Industrial Development in this report.

The Industrial Development is proposed on a site of approximately 60Ha located between Higgins Road and the North Island Main Trunk Railway line. The Industrial Development provides for the establishment of 60ha gross developable industrial land, together with associated infrastructure and services, including roading and associated stormwater ponds.

The Industrial Development is in the Rural Zone of the Waipa District. The adjacent land to the west and south of the site is also in the Rural Zone of the Waipa District. The northern and eastern boundaries of the site interface with the Industrial Zone across the territorial boundary with Hamilton City.

We have assessed the noise effects from the Project in accordance with the permitted operational noise standards prescribed by the Waipa District Plan. We have also assessed the potential noise effects received in the jurisdiction of the Hamilton District in accordance with the permitted standards prescribed by the Hamilton City District Plan.

Our assessment confirms that industrial activities can be located, designed and operated to achieve compliance with the permitted noise standards applying in the adjacent zones. We have recommended conditions of consent that will achieve ongoing land use compatibility with activities within and beyond the Site. These conditions control the operational noise levels received within and beyond the Site and manage compatibility with industrial land uses by precluding the establishment of noise sensitive activities.

The potential construction noise effects will be very typical for a development of this scale and nature. This assessment finds that noise from construction work can be managed to comply with the recommended numerical limits and assessment procedures set out in NZS 6803:1999 '*Acoustics – Construction Noise*' at all neighbouring residential dwellings.

The majority of the construction phase is expected to comply with the permitted construction noise limits at all other neighbouring buildings that are occupied by industrial activities. The recommended conditions seek to authorise intermittent and temporary exceedances of the permitted construction noise limits when works are undertaken near to neighbouring buildings that are not occupied by noise sensitive activities. Given the industrial nature of these receivers and the temporary and intermittent nature of potential exceedances, we expect that the construction noise levels will be reasonable with minimal disruption.

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.

Overall, this assessment finds that the proposal can achieve noise-related compatibility with adjacent land use activities. This assessment includes recommendations for the conditions of consent to deliver. These conditions are designed to ensure the appropriate management of operational and construction noise and vibration effects and to ensure that the Project does 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

Styles Group has been engaged to assess the operational and construction noise and vibration effects from the Industrial Development (the **Project**). This advice has been prepared accompany a substantive application under the Fast-track Approvals Act 2024.

This report includes an assessment of compliance with the permitted noise standards of the Waipā District Plan (**WDP**) along with recommended conditions of consent to ensure noise levels received at adjacent sites comply with the permitted noise levels for the adjacent zones, including sites and zones that are within the jurisdiction of the Hamilton City Operative District Plan (**HCDP**). This report should be read in conjunction with the documentation submitted with the Substantive application and plans.

2.0 The Project

The Project is to enable an Industrial Development on a Site¹ of approximately 60 hectares located between Higgins Road and the North Island Main Trunk (**NIMT**) railway line. The development comprises industrial lots, supporting roading and infrastructure and stormwater management areas. Figure 1 displays the proposed Masterplan.

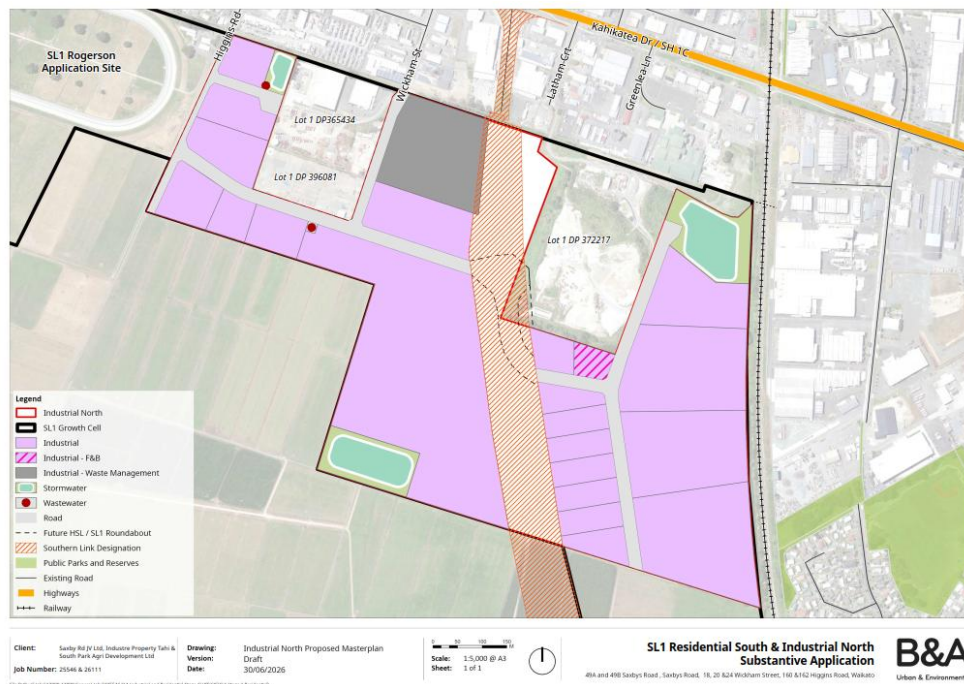


Figure 1 Industrial North Masterplan

¹ The landholding includes four parcels Lot 2 Deposited Plan 603134, Lot 1 Deposited Plan 603134 both within Southpark Agri Development Limited landholdings (circa 50ha), and Lot 1 Deposited Plan 584573 Industre Property Tahi Limited and S&S Property Investments Limited (7.8ha) and Lot 1 Deposited Plan 396081 and Lot 1 Deposited Plan 486522 within Industre Property Tahi Limited landholding (2.1ha).

The 22 serviced industrial lots vary in size and attributes to support a range of industrial uses. A truck and logistics activity is proposed on lot 7. All other industrial lots are sized to support a range of industrial activities that are anticipated and provided for in the Industrial Zone of the HCDP.

Access to the Site will be provided from the extension of Higgins Road, Wickham Street and the future Southern Links corridor. The Project includes substantial enabling works to establish developable land, including bulk earthworks across the Site.

3.0 The Site and surrounding environment

Figure 2 The Site in the Rural Zone of the Waipa District and adjacent zoning arrangements displays the Site and surrounding zoning arrangements. The Site is in the Rural Zone of the Waipa District. The adjacent sites to the west and south are also within the jurisdiction of the Waipā District and are zoned Rural. The Site is bisected by the designated road corridor for Southern Links. The eastern Site boundary borders the NIMT rail corridor and the Hamilton City district.

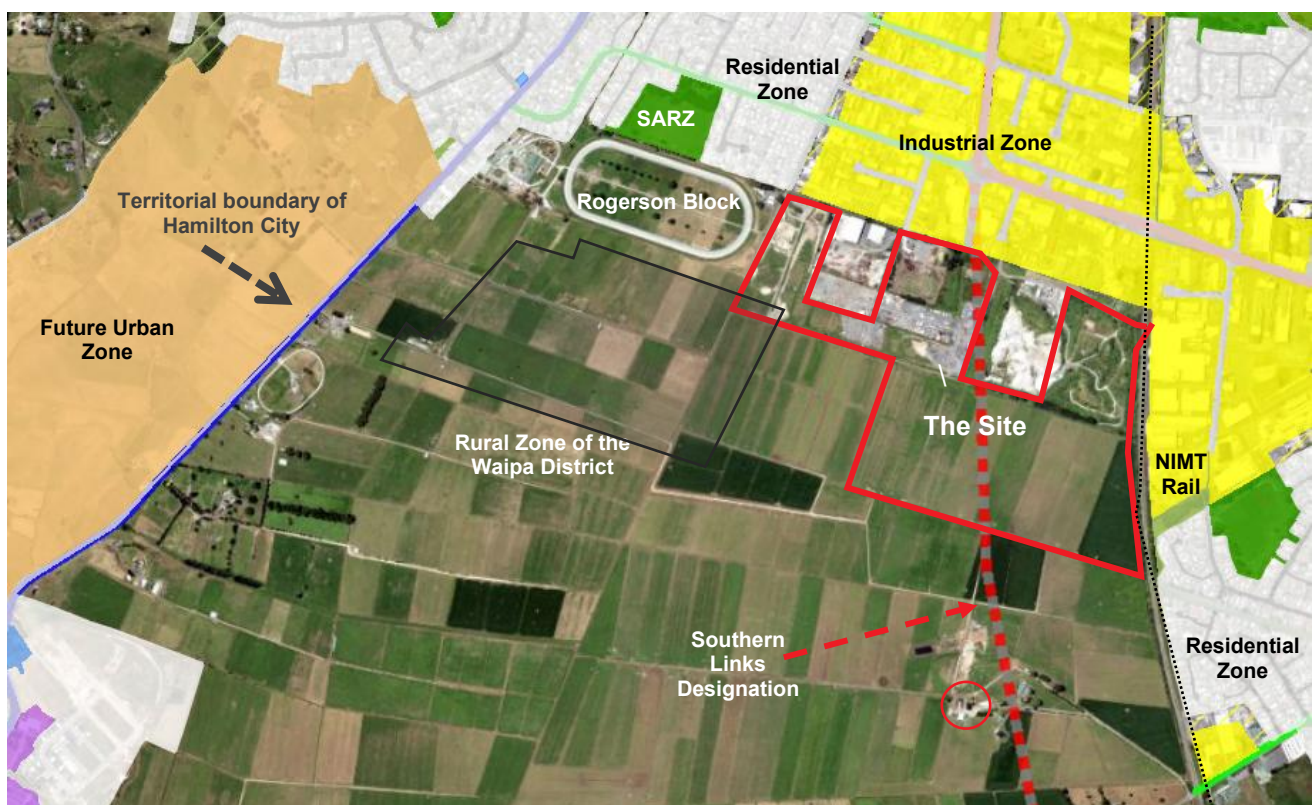


Figure 2 The Site in the Rural Zone of the Waipa District and adjacent zoning arrangements

Figure 2 displays the territorial boundary of Hamilton City which runs along the northern and eastern boundaries of the Site. The adjacent land to the north and east is in the Industrial Zone of the HCDP. The land to the north-west and the southeast of the Site is in the Residential Zone of the HCDP.

3.1 Receivers

The proposed Industrial Development has been designed to achieve a high level of compatibility with established and proposed industrial areas and high noise generating land transport corridors within and adjacent to the Site.

The land use activities and receivers surrounding the Site include:

- The Hamilton Transfer Station (Lot 1 DP 396081), logistics activities on Lot 1 DP 396081 and landscape and garden supplies (Lot 1 DP 397717) in the Rural Zone of the WDP.
- The Rogerson Block adjoining the western boundary of the Site. The Rogerson Block is zoned Rural and does not contain any dwellings. A referral application has been accepted under the under the Fast-track Approvals Act 2024 to develop the Rogerson Block for a comprehensive residential and industrial development. This Project has been designed to integrate with proposed industrial land use on the adjacent areas of the Rogerson Block.
- The northern and eastern site boundaries adjoin the established Industrial Zone (in Hamilton City). This area is occupied by a range of established industrial activities. The closest land uses adjacent to the northern boundary include a meat processing plant, compressed air service and repair activities and a car wrecking yard

The noise sensitive receivers adjacent to the Site include:

- The dwellings in the Residential Zone on the western side of Higgins Road, to the north-west of the Site in the jurisdiction of Hamilton City. These residential receivers are located at the well-established zoning interface between the Residential Zone and the Industrial Zone on the eastern side of Higgins Road.
- The dwellings in the Residential Zone in Purcell Place, Coventry Road and Corsair Place, to the south-east of the Site (in the jurisdiction of Hamilton City). These residential receivers are located on the eastern side of the NIMT, near to the well-established zoning interface between the Residential Zone and the Industrial Zone.
- There are no proximate Rural Zone dwellings adjacent to the Site. The closest Rural Zone dwelling (circled in Figure 2) is over 800m from the southern boundary of the Site.

4.0 Operational noise

The proposal seeks to enable a comprehensive industrial development that will integrate with the established industrial Zone to the north of the Site, and a future industrial development on the Rogerson Block to the west of the Site.

The proposed industrial lots are expected to provide for a range of general industrial uses that are anticipated and provided for by the HCDP Industrial Zone provisions, including manufacturing, workshops, truck yards and warehouses. Proposed Lot 7 will accommodate a truck and logistics activity.

4.1 Noise received beyond the Site

Noise generated from within the Site will be received in the jurisdiction of both the Waipa and Hamilton districts. The WDP does not prescribe any rules or standards to control cross-territorial noise received in the Hamilton District and vice versa.

The proposal is to ensure the industrial activities are managed to achieve compatibility with all established and future receivers adjacent to the Site, including the receivers in the Hamilton District.

Table 1 sets out the noise levels permitted to be generated in the zones that are adjacent to the Site according to the permitted noise standards of the WDP and HCDP. These help to understand the expectations that existing and future receivers would have in relation to noise effects.

Table 1 Maximum permitted noise levels in receiving zones

Receiving zone	Applicable rule/ standard	Maximum permitted noise levels	Comment
Noise generated and received in the Waipa District			
Noise received in the Rural Zone of the Waipa District	Rule 4.4.2.15 of the WDP	i. 50 dB L_{Aeq} between 7am and 10pm.	These permitted noise levels control the level of noise generated from the Waipa Rural Zone and received at the notional boundary of any dwelling in a Rural Zone
	<i>These noise limits apply when measured and assessed within the notional boundary of a dwelling in the Rural Zone of Waipa District</i>	ii. 40 dB L_{Aeq} at all other times	There are no existing proximate notional boundaries in the Rural Zone. All existing notional boundaries and potential notional boundaries enabled by the Rogerson Development are well separated from the Site.
		iii. Any single noise event between 10pm and 7am - 70 dB L_{Amax}	
Permitted noise levels prescribed by the Hamilton City District Plan			
Noise received in the Residential Zone of Hamilton City	Rule 25.8.3.7 of the HCDP	i. 45 dB L_{Aeq} and 75 dB L_{Amax} between 6am and 7am	These permitted noise levels control the level of noise received in the Residential Zones of Hamilton City
	<i>These noise limits apply when measured and assessed within the boundary of a Residential Zone (in Hamilton City).</i>	ii. 50 dB L_{Aeq} between 7am and 8pm	The closest receivers in the Residential Zone are located to the north-west of the Site, on the western side of Higgins Road.
		iii. 45 dB L_{Aeq} between 8pm and 11pm	

Receiving zone	Applicable rule/ standard	Maximum permitted noise levels	Comment
		iv. 40 dB L _{Aeq} and 75 dB L _{Amax} between 11pm and 6am	
Noise received in the Industrial Zone of Hamilton City	Rule 25.8.3.7(c) of the HCDP <i>This rule controls the level of noise permitted to be generated and received within the HCDP Industrial Zone</i>	65dB L _{Aeq} (15 min) at any point within the boundary of any other site within the HCDP Industrial Zone.	These permitted noise levels control the level of noise received in the Industrial Zone of Hamilton City The closest Industrial Zone receivers adjoin the northern boundary of the Site.

4.1.1 Noise levels received in the WDP Rural Zone or HCDP Residential Zone

Table 1 shows that the permitted noise levels prescribed by the WDP for the Rural Zone are similar to the permitted noise standards that apply in the Residential Zone of the HCDP. The only difference is that the HCDP standards allow a slightly higher noise level (+ 5dB) in the mornings between 6am and 7am.

The closest noise sensitive receivers are in the Residential Zone of Hamilton City. There are no proximate Rural Zone dwellings adjacent to the Site. The closest Rural Zone dwelling is over 800m from the southern boundary of the Site; however, we understand that there is some potential for future notional boundaries to be introduced on the adjacent land to the south.

Section 4.5 includes recommended conditions of consent that will require the noise levels from any industrial lot to be managed to comply with the noise limits that apply at the receiving zone. In practice, these conditions will require compliance with:

- The same numerical noise limits prescribed for the WDP Rural Zone when measured and assessed at any notional boundary in the WDP Rural Zone.
- The same numerical noise limits prescribed for the HCDP Residential Zone when measured and assessed at the boundary of any site occupied by a dwelling in the HCDP Residential Zone.

The conditions of consent will deliver essentially the same noise limits as the relevant District Plans. This will ensure that the noise levels from the Site are controlled to be consistent with the level of noise that could be generated by an activity that is permitted or anticipated in the receiving zone.

4.1.2 Noise levels generated from the Site and received in the HCDP Industrial Zone

The WDP does not regulate the cross-territorial noise levels generated from activities on the Site and received in the Industrial Zone of the HCDP.

We recommend all industrial lots are subject to a noise limit of 65 dB L_{Aeq} (at any time) when the noise is measured at any other site in the HCDP Industrial Zone.

This noise limit is consistent with the permitted noise environment in the HCDP Industrial Zone and is consistent with the noise levels we have recommended for the Rogerson Block industrial area. These noise limits will apply in tandem with the requirement to meet the lower noise limits that apply at any notional boundary in a Rural Zone or dwelling in a Residential Zone.

4.1.3 Noise generated from established industries on adjacent Rural Zone sites

The Masterplan identifies three sites that are outside the application Site but share common boundaries with the application site. These include the Hamilton Transfer Station on Lot 1 DP 396081, logistics activities on Lot 1 DP 396081 and landscape and garden supplies on Lot 1 DP 397717. These sites are in the Rural Zone of the WDP. This proposal cannot impose noise limits on land outside the Site and the noise limits for the underlying Rural Zone will not control the noise levels generated from these activities and received within the Site. However, as these activities are established and operational, any future prospective industrial operator on the Site will have a clear understanding of the noise generating characteristics of the adjacent activities before they elect to establish on the Site.

4.2 Recommendations to manage noise levels within the Site

The underlying noise standards for the Rural Zone are not designed to manage noise generated and received between industrial lots. The Rural Zone noise limits only control noise levels where the receiver is occupied by a “notional boundary”. An industrial activity will not create a notional boundary which means that the Rural Zone noise limits will not set any noise limits between the industrial lots. The lack of any noise limits between sites may give rise to incompatibility and potential conflict.

We therefore recommend that the substantive application includes conditions that will set a noise limit of 65 dB L_{Aeq} ² (at all times) when measured and assessed at the boundary of any other industrial lot **within** the Site. This is consistent with the noise limits that applies between sites in the adjacent Industrial Zone of the HCDP to the north and east of the Site. This noise limit is also consistent with the recommended noise limits for the Rogerson Block industrial area.

4.2.1 Restriction on any noise sensitive activities

We understand that the permitted activity standards for the underlying Rural Zone could potentially enable the establishment of noise sensitive activities within the Site. Noise sensitive activities are defined by the Waipa District Plan as:

“BUILDINGS used for RESIDENTIAL ACTIVITIES, including boarding establishments, homes for elderly persons, RETIREMENT VILLAGE

² This noise limit is recommended provided the establishment of any noise sensitive land use on the industrial lots is precluded.

*ACCOMMODATION AND ASSOCIATED CARE FACILITIES, in-house aged care facilities, hotels and motels, and other BUILDINGS used for residential accommodation but excluding camping grounds; and
MARAE ;and
HOSPITALS; and
Teaching areas and sleeping rooms in an EDUCATION FACILITY.”*

The potential introduction of a noise sensitive activity on any of the industrial lots would introduce a notional boundary, in turn requiring the industrial activities to meet the Rural Zone noise limits. These noise limits would introduce a significant constraint on the efficient operation of the industrial lots within the Site and would also introduce a reverse sensitivity effect on established industrial activities within the adjacent Industrial Zone of Hamilton City.

We therefore recommend that substantive application incorporates a mechanism that will preclude the establishment of noise sensitive activities on the Site, subject to the exemption in Section 4.2.2. This measure will assist to achieve appropriate separation between industrial and noise sensitive activities and will manage the potential for incompatibility and conflict.

4.2.2 Providing for trade and industrial training activities

The WDP definition of *Noise Sensitive Activities* includes educational facilities. We consider that educational facilities are sensitive to noise and should be precluded in industrial areas, with one exception. Trade and industrial training activities are a common feature of industrial zones and are anticipated and provided for under the HCDP Industrial Zone provisions.

We recommend that the mechanism used to preclude the establishment of noise sensitive activities on the Site amends or qualifies the definition of noise sensitive activities to specifically exclude trade and industry training facilities. This definition would need to make it clear that the establishment of a trade and industry training facilities does not introduce a notional boundary for the assessment of noise.

4.3 Overall assessment of operational noise effects

The proposal has been designed to integrate with the established Industrial Zone to the north of the Site and future industrial activity within the Rogerson Block to the west of the Site. We have recommended conditions to ensure the noise limits for noise generated and received between the industrial lots are consistent with the same permitted noise levels that apply in the HCDP Industrial Zone. Our advice for the Rogerson referral application also recommends the same noise levels are used to control noise levels from the Rogerson industrial development.

We have recommended conditions of consent that will require operational noise levels generated from the industrial lots to meet the relevant noise limits that apply when measured and assessed at the notional boundary of any noise sensitive activity adjacent to the Site (including dwellings in the Residential Zone of Hamilton City). The WDP Zone Rural noise limits and HCDP Residential Zone noise limits are designed to deliver a good level of acoustic amenity to non-acoustically treated dwellings.

4.3.1 Effects on nearby dwellings in the Residential Zone

The closest noise sensitive receivers are located in the established Residential Zone on the western side of Higgins Road. This Residential Zone is located at the well-established zoning interface with the Industrial Zone on the eastern side of Higgins Road.

We understand Higgins Road and Wickham Street are defined as local transport corridors³. The HCDP does not control road traffic noise levels generated from the alteration of transport corridors that are identified as local transport corridors.

The Southern Links designation bisects the Site. Southern Links is a joint project between the New Zealand Transport Agency and Hamilton City Council and we understand that it will be constructed by others. The proposed industrial land uses will not be sensitive to the noise from road traffic in the Southern Links designation.

The proposal is not expected to appreciably change the permitted noise environment for the Higgins Road Residential Zone receivers to the north-west of the Site. This is due to the established industrial zoning arrangements and recommended conditions that will ensure operational noise levels from the industrial lots are managed to comply with the noise levels that apply in the Residential Zone.

The Project will bring industrial land uses closer to the Residential Zone receivers to the southeast of the Site (Purcell and Corsair Place). The receivers closest to the Site will experience a small change in their existing noise environment as the proposal will introduce industrial activities onto land that is currently used for grazing. The change in noise environment is expected to be modest given that these receivers are located near to the established interface with the existing HCDP Industrial Zone to the north. This change is unlikely to be noticeable to the Residential Receivers in the northern parts of Purcell Place and Coventry Road, given their proximity to the established Industrial Zone.

Overall, we expect that the Project will have the potential to increase the total noise level across the areas that are shaded orange in Figure 3 by approximately 5- 10dB during the day and night and to levels that would be consistent with the noise environment for other residential receivers at or near to an interface with industrial activities (including the northern parts of Purcell Place and Coventry Road). The noise levels from the industrial lots will not exceed the noise limits set out in Section 4.1.1 which will protect receivers from sleep disturbance at night and maintain a reasonable level of amenity during the day.

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. These plans identify that Higgins Road and Wickham Street are local transport corridors.

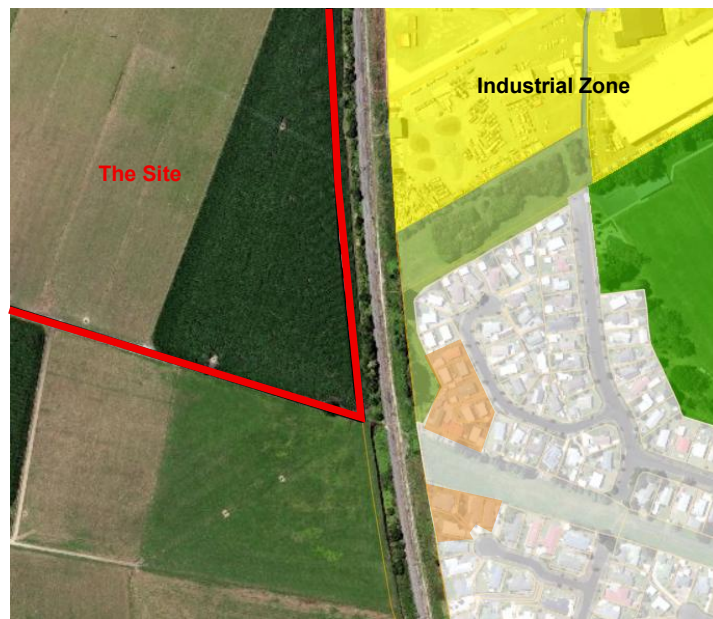


Figure 3 Purcell and Corsair Place receivers (shaded orange) expected to experience a change in noise environment

4.4 Recommended operational noise limits

We recommend conditions that will require the industrial activities to be located, designed and operated to achieve compliance with the following noise limits:

Lot generating the noise	Recommended maximum permitted noise levels and assessment location
Noise generated from any industrial lot	65 dB L_{Aeq} at all times when measured and assessed at or within the boundary of any other industrial lot, including: - Any other industrial lots within the Site - Any industrial lot in the Rogerson Block - Any site in the Industrial Zone of Hamilton City Noise levels shall be measured in accordance with NZS 6801:2008 <i>Acoustics – Measurement of Environmental Sound</i> and assessed in accordance with NZS 6802:2008 <i>Acoustics – Environmental Noise</i>.
Noise generated from any industrial lot within the Site and received at the notional boundary of any noise sensitive activity in the Rural Zone of the Waipa District.	i. 50 dB L_{Aeq} between 7am and 10pm ii. 40 dB L_{Aeq} at all other times iii. Any single noise event between 10pm and 7am - 70 dB L_{Amax} When measured and assessed at the notional boundary of any noise sensitive activity in the Rural Zone of the Waipa District. Noise levels shall be measured in accordance with NZS 6801:2008 <i>Acoustics – Measurement of Environmental Sound</i> and

Lot generating the noise	Recommended maximum permitted noise levels and assessment location
Noise generated from any industrial lot within the Site and received at the site boundary of any dwelling in the Residential Zone of Hamilton City.	assessed in accordance with NZS 6802:2008 <i>Acoustics – Environmental Noise</i> .
	i. 45 dB L_{Aeq} and 75 dB L_{Amax} between 6am and 7am ii. 50 dB L_{Aeq} between 7am and 8pm iii. 45 dB L_{Aeq} between 8pm and 11pm iv. 40 dB L_{Aeq} and 75 dB L_{Amax} between 11pm and 6am. When measured and assessed at the site boundary of any dwelling in the Residential Zone of Hamilton City. Noise levels shall be measured in accordance with NZS 6801:2008 <i>Acoustics – Measurement of Environmental Sound</i> and assessed in accordance with NZS 6802:2008 <i>Acoustics – Environmental Noise</i>.

Noise sensitive activities (except trade and industry training facilities) are prohibited within the Site.

Noise sensitive activities includes:

BUILDINGS used for RESIDENTIAL ACTIVITIES, including boarding establishments, homes for elderly person, RETIREMENT VILLAGE ACCOMMODATION AND ASSOCIATED CARE FACILITIES, in-house aged care facilities, hotels and motels, and other BUILDINGS used for residential accommodation but excluding camping grounds; and MARAE ;and HOSPITALS; and Teaching areas and sleeping rooms in an EDUCATION FACILITY (except a trade and industry training facility.

Trade and industry training facilities means “premises accommodating specialised education and training facilities where groups of people are given trade or industry tuition and training on a formal basis. For the avoidance of doubt, the establishment of a trade and industry training facility does not introduce a notional boundary for noise.

5.0 Construction noise and vibration effects

Construction works for earthworks and civil works will include cut and fill works to re-contour the Site, construction of three stormwater wetlands, swales and drains and the installation of waste water pump stations. This work will be followed by compaction and paving of access roads,

Earthworks will be divided into three distinct phases and completed over ten earthworks seasons. Construction vehicles will access the Site via Higgins Road and Wickham Road.

We understand 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 no blasting or rock breaking will be required due to the nature of the ground conditions.

Sheet piles are proposed for the installation of the waste water pumpstations. These works are well separated from receivers and will be very short-term (1-2 days). Sheet piling works are expected to comply with the permitted construction noise standards based on separation distance to neighbouring buildings.

5.1 Permitted construction noise standards

Rule 4.4.2.19 of the WDP and Rule 25.8.3.2 of the HCDP require that construction noise levels are managed in accordance with the recommended numerical limits and assessment procedures set out in NZS 6803:1999 '*Acoustics – Construction Noise*' (**NZS6803:1999**).

NZS6803:1999 provides guideline noise limits that are based on the duration of construction works at any one location, and the occupation of the receiving site. Construction activity will place between 7:30am and 6:00pm, Monday to Saturday, when NZS6803:1999 recommends the following guideline noise limits for long term⁴ construction work:

- i. 70 dB L_{Aeq} and 85 dB L_{AFmax} when measured and assessed 1m from the façade of any occupied dwelling in a rural or residential zone.
- ii. A noise limit of 70 dB L_{Aeq} when measured and assessed 1m from the façade of any occupied building in an industrial or commercial zone.

5.2 Proposed construction noise standards

We understand that Rule 4.4.2.19 of the WDP does not control construction noise levels received in the jurisdiction of Hamilton City. We have therefore proposed project construction noise standards that will control construction noise levels that will be received at the closest receivers (occupied dwellings) in the Residential Zone of Hamilton City, as well as receivers in the WDP Rural Zone.

The proposed project construction noise standards have been developed by reviewing the potential⁵ construction noise levels from proposed civil and general construction works that will be undertaken on the Site⁶.

Our review finds that the vast majority of the construction phase is expected to readily comply with the permitted construction noise limits. Construction work that is well separated from the boundaries with adjacent buildings (by distances greater than 40-50m) will readily comply with the permitted noise limits by a comfortable margin.

The closest Residential Zone receivers (158 and 156B Higgins Road) are expected to experience the highest construction noise levels during civil works to form the construction entrance from Higgins Road, and later for works to connect Higgins Road (currently a cul-de-sac). Construction noise generated from within the Site is predicted to comply with a noise limit of 70 dB L_{Aeq} and 85 dB L_{AFmax} when measured and assessed 1m from the façade of residential dwellings, without the need for mitigation. The proposed conditions of consent require

⁴ The construction noise limit applying to construction projects greater than 20 weeks in duration.

⁵ At the time of preparing this report, a contractor has not yet been appointed. As the exact construction methodology has not yet been confirmed, it is not practicable to specify the exact mitigation measures that will need to be implemented during the construction phase. The draft CNVMP will be updated when the construction methodology and equipment has been confirmed.

⁶ The permitted construction noise limits only apply to construction vehicles when they are within the Site. There is no noise limit applying to trucks operating on public roads.

compliance with the permitted (District Plan) construction noise limits when measured and assessed at any residential building.

All other receivers adjacent to the Site are industrial in nature, including a car wrecker, waste transfer station, compressed air service and repair and a large meat processing plant. The proposed construction works will comply with the permitted construction noise limits at these receivers for the vast majority of the construction phase. However, there may be some intermittent and short-term infringements of the permitted limit when works are very close (within 30m) of occupied industrial buildings. Example situations might include several hours over a day or a few days when a bulldozer and/or large compactor might be required for earthworks near to the boundary, boring pile holes within 30-40m of a receiver or concrete pours required near to the boundary.

The proposed conditions of consent authorise temporary and intermittent exceedances (up to 10dB) of the permitted construction noise limits at any non-residential occupied building. We have prepared a draft Construction Noise and Vibration Management Plan (**CNVMP**) to ensure that any exceedances will not exceed 80dB L_{Aeq} during normal working hours.

5.3 Assessment of construction noise effects

The proposal is to implement a CNVMP to ensure construction noise and vibration effects will be reasonable for the receivers. 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 or at locations that are screened from the works. For receivers indoors, the highest noise levels 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 when construction works are undertaken within 150m of any occupied buildings are summarised in Table 2 below.

Table 2: Temporary construction noise effects outdoors

Construction works	Noise level at 1 m from the façade L_{Aeq} (15 min)	Potential effects outdoors
Earthworks, civil works (road construction and vertical construction work within 50m-150m of occupied buildings	55 - 65 dB	Conversation may require raised voices over long distances

Construction works	Noise level at 1 m from the façade L_{Aeq} (15 min)	Potential effects outdoors
Earthworks and civil works (road construction) within 60m	65 - 70 dB	Conversation will require raised voices. People are unlikely to spend time outside
Paving and compaction works near to the boundary (within 30m of a building)	70dB- 80 dB	Conversation will be difficult, even with raised voices

5.3.1 Construction noise effects on residential receivers

Construction noise generated from the Site and received at any residential building is expected to comply with the permitted construction noise limits without the need for mitigation. The construction noise levels generated from the Site are unlikely to be dominant or intrusive in the context of background traffic noise and adjacent industrial land uses. We expect there may be short periods (when works are within 50m of dwellings) when construction noise levels may be dominant in the residential environment. These noise levels will not exceed the permitted construction noise standards prescribed by the WDP or HCDP.

5.3.2 Construction noise effects on other receivers

All other receivers are occupied by noise generating activities that are not sensitive to noise, including a meat processing factory, air compression service and repair, car wreckers, a waste transfer station and a landscape and garden supplies. These activities are not sensitive to noise, and rely on the operation of noise generating plant and equipment.

The majority of the construction phase is expected to readily comply with the permitted construction noise limits at these receivers without the need for mitigation. However, noise levels from civil works could intermittently reach levels as high as 80dB L_{Aeq} at the closest industrial receivers when construction works are undertaken within approximately 10-20m of the receiving building. Example situations might include several hours over a day or a few days when a bulldozer and/or large compactor might be required for earthworks and compaction works very near to the boundary or concrete pours required near to the boundary.

We expect that any infringements will be intermittent and generally short term (even over a day) as works progress across the Site and the different phases of work near to the receivers occurs. Given the nature of the adjacent land uses, we expect that intermittent and temporary exceedances of the construction noise limits will be tolerated and unlikely to disrupt the business activities.

We consider that the construction noise and vibration levels will be typical for a project of this scale and nature. The implementation of the CNVMP will ensure the timing and level of noise will be reasonable for the receivers adjacent to the Site.

5.4 Construction vibration

The WDP does not include any rules or standards to control vibration generated from construction work. However, there are no proximate buildings in the WDP that are likely to be affected by vibration from construction work on the Site.

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 limits are designed to ensure that construction vibration avoids damage to buildings.

The proposal is to ensure vibration generated from construction work complies with the limits in German Standard DIN 4150-3:1999 *Structural vibration – Part 3 Effects of vibration on structures* at all adjacent sites. These 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.

The CNVMP prescribes the measures that must be implemented to ensure that any high vibration generating activities near to the closest occupied buildings complies with the DIN limits. We consider that the types of construction activities required for the construction phase will be able to comply with the relevant limits without any issue.

5.4.1 Assessment of potential construction vibration effects

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.

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.

The vibration levels in nearby buildings will depend on the separation distance, the size of the plant and how it is used, the ground conditions, and the response of the building itself.

Table 3 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 3 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

Construction activity	Distance	Typical vibration level (PPV)
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. The vibration levels will range from not noticeable to noticeable but 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.

5.5 Recommended construction noise and vibration conditions

We recommend the following conditions are attached to the consent to manage construction noise and vibration effects:

1. Construction work hours

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 (for example, site meetings, electrical fitout, painting etc).

2. Construction noise limits

- Construction noise levels generated from the Site shall comply with the following limits, when measured and assessed at the façade of any occupied dwelling on any other site in accordance with NZS 6803:1999: *Acoustics – Construction Noise*:

Time period	Maximum noise levels	
	L _{Aeq} (30min)	L _{AFMax}
7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB

All other times and on Public Holidays	45 dB	70 dB
--	-------	-------

- ii. Construction noise levels generated from the Site shall comply with the following limits, when measured and assessed at the façade of any other occupied building on any other site in accordance with NZS 6803:1999: *Acoustics – Construction Noise*:

Time period	Maximum noise levels
	L _{Aeq} (30min)
7:30am- 6:00pm, Monday to Saturday	80 dB
All other times and on Public Holidays	75 dB

3. Construction vibration limits

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 *Structural vibration – Effects of vibration on structures* when measured from any building not on the construction site in accordance with the Standard.

4. Construction noise and vibration management plan (CNVMP)

The consent holder must submit a Construction Noise and Vibration Management Plan (CNVMP) to [insert Waipa District Council delegation] for certification. The CNVMP must be submitted a minimum of ten working days before starting any construction works authorised by this approval.

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) To ensure compliance with the project noise and vibration conditions.
- 3) To 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 *Acoustics – Construction Noise* and the AAAC *Guideline for interpreting and applying NZS 6803 1999* as a minimum. Construction works must not begin until certification has been received in writing from Waipa 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 Waipa District Council for certification.

5. Notice of construction work

The consent holder must advise the occupants of all dwellings within 50m of the site boundary about the construction works that will be undertaken at least five days before

works 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. 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.
- iii. The approximate dates and duration of the noisiest activities on site.

6.0 Summary

Styles Group has assessed the potential operational and construction noise and vibration effects from the Southern Links 1 Industrial North development.

This assessment finds that the proposal can achieve noise-related compatibility with adjacent land use activities.

We have recommended conditions that will ensure the appropriate management of operational and construction noise and vibration effects. These conditions will ensure that the Project does 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.

Appendix A WDP Noise standards

These provisions apply to noise generated from the Site and received between sites in the Waipa District

Definition of Noise Sensitive Activities

“BUILDINGS used for RESIDENTIAL ACTIVITIES, including boarding establishments, homes for elderly persons, RETIREMENT VILLAGE ACCOMMODATION AND ASSOCIATED CARE FACILITIES, in-house aged care facilities, hotels and motels, and other BUILDINGS used for residential accommodation but excluding camping grounds; and MARAE ;and HOSPITALS; and Teaching areas and sleeping rooms in an EDUCATION FACILITY.”

Rule 4.4.2.15 Noise (Rural Zone)

Noise generating activity other than that from farm animals including farm dogs, agricultural vehicles (when not being used for recreational purposes), agricultural machinery or equipment (including produce packing facilities where the only produce packed is grown on-site) operated and maintained in accordance with the manufacturer's specifications and in accordance with accepted management practices (e.g. for milking, spraying, harvesting, packing and the like, but not including frost fans) and provided that the best practicable option (including the option for the activity to take place at another time of the day), is adopted to ensure that the emission of noise does not exceed a reasonable level; shall be conducted and buildings located, designed and used to ensure that they do not exceed the following limits within the notional boundary of and dwelling excluding dwellings within mineral extraction sites):

- | | | |
|----|-------------------------------|--------------|
| a. | Day time - 7.00am to 10.00pm | 50dBA (Leq) |
| b. | Nighttime- 10.00pm to 7.00am | 40dBA (Leq) |
| c. | Night time single noise event | 70dBA (Lmax) |

The 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 assessed in accordance with New Zealand Standard NZS 6802:2008 Acoustics – Environmental noise. Provided that this rule shall not apply to the use or testing of station and vehicle sirens or alarms used by emergency services.

Activities that fail to comply with this rule will require a resource consent for a discretionary activity.

Rule 4.4.2.19 Construction noise

Construction noise emanating from a site shall meet the limits recommended in and be measured and assessed in accordance with New Zealand Standard NZS 6803:1999 Acoustics – Construction noise.

Appendix B HCDP Noise standards

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

Definition of Noise-Sensitive Activities

Noise-sensitive activities:

Means residential activities (including residential accommodation in buildings which predominantly have other uses such as commercial or industrial premises), marae, spaces within buildings used for overnight patient medical care, and teaching areas and sleeping rooms in buildings used as educational facilities. For the purpose of this definition educational facilities includes tertiary institutions and schools, and premises licensed under the Education (Early Childhood Services) Regulations, and playgrounds which are part of such facilities and located within 20m of buildings used for teaching purposes.

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 the Residential Zone

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 LAeq(15min)	Noise level measured in LAFmax
0600- 0700 hours	45 dB	75 dB
0700- 2000 hours	50 dB	-
2000- 2300 hours	45 dB	-
2300- 0600 hours	40 dB	75 dB

Noise performance standards for noise received in the Industrial Zone

25.8.3.7

- c. Any activity within the Industrial and Te Rapa North Industrial zones shall not exceed a noise level of 65dBA (LAeq [15 min]) at any point within the boundary of any other [site](#) within that zone. This standard does not apply to [sites](#) held in common ownership with the [site](#) containing the activity generating the noise. This standard applies to Stage 1A of the Te Rapa North Industrial Zone, but does not apply to the remainder of the Te Rapa North Industrial Zone until such time as the Deferred Industrial Zone overlay is removed.

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.

Appendix C Draft CNVMP



DRAFT CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

SOUTHERN LINKS 1
INDUSTRIAL NORTH DEVELOPMENT

DATE

31 August 2026



REVISION HISTORY

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

CERTIFICATION

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

AMENDMENTS TO THIS CNVMP

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

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

Rev:	Date:	Version:	Comment:	Prepared by:	Reviewed by:
1	21/08/26	Draft	Draft for review	Jon Styles, MASNZ Director and Principal	Gemma Styles Consultant
2	31/08/26	Final Draft	Final draft		

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

Sections that must be updated are highlighted in grey.

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Appendices

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

1.0 Introduction

Styles Group has prepared a draft¹ Construction Noise and Vibration Management Plan (**CNVMP**) to ensure the appropriate management of the construction noise and vibration effects associated with the Southern Links 1 (SL1) Industrial North Development (the **Project**).

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

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

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

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

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

2.0 Objectives of this CNVMP

The objectives of this CNVMP are:

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

¹ This version of the CNVMP is draft and will be updated to reflect the conditions of consent and the results of further engagement with contractor, prior to construction commencing. The final version will be submitted for certification by Waipa District Council prior to commencement of construction.

2.1 Focus of this CNVMP

This CNMVP is focussed on the management of construction noise and vibration levels from areas of the Industrial Area that are within 40m of a potentially occupied building on another site. These areas of the Site are shaded blue in Figure 1.

Contractors must carefully consider noise and vibration when selecting plant, equipment and construction methods when working within these areas.



Figure 1 Areas of construction work within the Site that are within 40m of a *potentially occupied building on another Site**

**The construction noise limits apply at any occupied building. This map should be updated to prior to construction to reflect the location of all potentially occupied buildings. Many of the structures/ buildings on adjacent sites are used for storage (and may not be occupied) or are prefabricated buildings that may be relocated.*

3.0 Contacts

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

Dillon Kelliher

ph: 022 033 7705

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

Styles Group Acoustics & Vibration Consultants

ph: 09 308 9015

4.0 Updates to this CNVMP

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

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

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

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

5.0 Project conditions

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

6.0 General requirements

A copy of this CNVMP must be kept at the work site for the duration of all earthworks and civil works.

This CNVMP may be updated throughout the works with the approval of the Project Manager and in consultation with Waipa District Council.

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

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

7.0 Permitted hours of construction work

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

Quieter activities and works inside buildings may occur outside these hours if they do not generate any audible noise at the neighbouring sites. Examples include light vehicle

movements, planting, electrical work, works set well back from receivers, site meetings, surveying or monitoring activities.

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

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

8.0 Management of construction noise

This section must be updated to ensure the limits are consistent with the conditions of consent.

The construction noise limits applying at any **occupied residential dwelling** are set out in Table 1.

The construction noise limits applying at any **other occupied building** are set out in Table 2.

The construction noise limits apply when measured 1 m from the façade, and 1.2 to 1.5 m above the relevant floor level, of any building **not on the Site**. The noise limits do not apply at buildings on the Site or at any other buildings that are **unoccupied** during works.

Table 1: Noise limits for construction work at any occupied residential dwelling

Receiver	Time period	Noise limit $L_{Aeq(30min)}$	Noise limit L_{AFmax}
Occupied dwellings	7:30am- 6:00pm, Monday to Saturday	70 dB	85 dB
	At all other times	45 dB	75 dB

Table 2: Noise limits for construction work at any other occupied building

Receiver	Time period	Noise limit $L_{Aeq(30min)}$
Any occupied building (except a dwelling)	7:30am- 6:00pm, Monday to Saturday	80 dB
	At all other times	75 dB

The L_{Aeq} is the average noise level over a 30min period. The L_{Amax} is the loudest sound during the same time period.

Construction noise must be measured and assessed in accordance with the New Zealand Standard NZS 6803:1999 *Acoustics – Construction noise*.

8.1 Closest receivers

The Project Conditions require compliance with the relevant limits that apply at the closest occupied buildings (**receivers**) adjacent to the Site. The closest receivers are shown in the map at Figure 2 below* and are identified in Table 3.

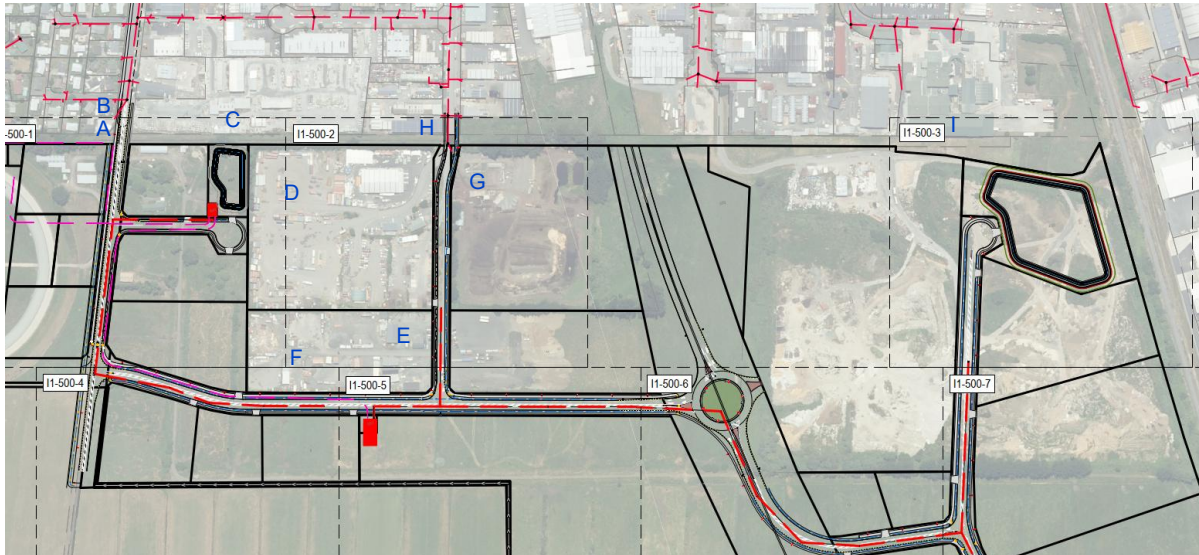


Figure 2 Closest receivers

**This map must be updated to reflect the potentially occupied buildings that exist prior to construction and their location. Many of the adjacent buildings/ structures are used for storage (and may not be occupied) or are prefabricated buildings that may be relocated.*

Table 3 Closest receivers

ID	Address	Building type	Approximate distance between closest potential construction activity within the Site and receiving building façade
A	Dwelling on 158 Higgins Road	Single level dwelling	≈35m from the closest Site boundary, where construction noise will be generated from: - Road construction, including earthworks and compaction works - Heavy construction vehicles accessing the Site from the termination of Higgins Road. <i>This receiver is over 100m from the closest area of the Site where sheet piling is proposed for the Waste Water Pumpstation (WWPS).</i>

ID	Address	Building type	Approximate distance between closest potential construction activity within the Site and receiving building façade
B	Dwelling on 156 Higgins Road	Single level dwelling	≈40m from the closest Site boundary, where construction noise will be generated from: • Road construction, including earthworks and compaction works. • Heavy construction vehicles accessing the Site from the termination of Higgins Road. <i>This receiver is over 100m from the closest area of the Site where sheet piling is proposed for the WWPS.</i>
C	Atlas Auto Limited (car wreckers) at 119 Higgins Road	Single level building	≈20m from the closest Site boundary, where construction noise will be generated from earthworks. <i>This receiver is over 80m from the closest area of the Site where sheet piling is proposed for the WWPS.</i>
D	Hamilton Transfer Station	Single level building	≈20m from the closest Site boundary, where construction noise will be generated from earthworks. <i>This receiver is over 160m from the closest area of the Site where sheet piling is proposed for the WWPS.</i>
E	TI Roadlink (logistics) at 16A Wickham Street	Single level building	≈20m from the closest Site boundary, where construction noise will be generated from earthworks. <i>This receiver is over 80m from the closest area of the Site where sheet piling is proposed for the WWPS.</i>
F	Hamilton Organic	Single level building	<i>Location of any occupied building to be verified prior to construction.</i>
G	Landscape Supplies	Single level building	≈20m from the closest Site boundary, where construction noise will be generated from: • Heavy construction vehicles accessing the Site from the termination of Wickham Road • Road construction, including earthworks and compaction works. <i>This receiver is over 80m from the closest area of the Site where sheet piling is proposed for the WWPS</i>

ID	Address	Building type	Approximate distance between closest potential construction activity within the Site and receiving building façade
H	Ash Air (service and repair) at 12 Wickham Street	Single level building	≈17m from the closest Site boundary, where construction noise will be generated from: - Heavy construction vehicles accessing the Site from the termination of Wickham Road - Road construction, including earthworks and compaction works. <i>This receiver is over 80m from the closest area of the Site where sheet piling is proposed for the WWPS</i>
I	Greenlea Premier Meats (meat processing plant) at Greenlea Lane	≈Four story building	≈35m from the closest Site boundary, where construction noise will be generated from earthworks. <i>This receiver is well separated from the closest area of the Site where sheet piling is proposed for the WWPS</i>

8.2 Reference noise levels and set back distances

Tables 4 and 5 list the equipment that is typical for this type of project.

Table 4 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} at any **occupied residential dwelling**.

Table 5 provides minimum separation distances required for the equipment to comply with the daytime noise limits of 80 dB L_{Aeq} and 85 dB L_{AFmax} at any **other occupied building (excluding a dwelling)**.

The calculated separation distances are based on the following assumptions:

- The minimum distance stated is from the noise generating plant to the assessment position at 1 m from the most exposed façade of the building.
- The plant is being used continuously at the reference distance over a 15-minute sample period (i.e. 100% on-time) unless otherwise stated.
- The distances include a +3 dB adjustment to the noise levels for reflections from the façade of the receiving building (as required by NZS 6803:1999).
- Acoustically reflective ground is assumed between the noise source and the Receiver for distances up to 30 m, as recommended by NZS 6803:1999. Ground absorption has otherwise been considered in the calculations.
- The mitigated compliance distances are based on barriers effectively screening the assessment point from the noise generating activity and reducing the L_{Aeq} noise level by 10 dB (see Section 10.1)

Table 4: Noise sources levels and minimum separation distances where a noise limit of 70 dB L_{Aeq} applies at any occupied residential dwelling

Construction activity	Unmitigated L_{Aeq} noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (based on 2m noise barrier) ²	
			One story dwelling	Two story dwelling
Sheet piling for stormwater ponds	86 dB	85 m	n/a	n/a
Bored piling with a 20-t excavator	79 dB	38 m	12 m	21 m
Chainsaw works to remove trees (33% on-time)	77 dB	30 m	10 m	18 m
D6, D7, or D8 bulldozer working in small area	76 dB*	27 m	9 m	16 m
Vibratory compaction roller 15t – 20-t	76 dB*	27 m	9 m	16 m
Cut and fill, clearing, and loading trucks with a 40-t – 50-t excavator	75 dB	24 m	8 m	14 m
Retaining wall construction using a 14 - 20-t excavator and auger	74 dB	22 m	7 m	12 m
Cat 825 static compactor 30-t	72 dB*	17 m	6 m	10 m
Cut and fill, clearing, and loading trucks with a 20-t excavator	69 dB	12 m	4 m	7 m
Cat 815 static compactor 18-t	69 dB*	12 m	4 m	7 m
Concrete pump and truck discharging	69 dB	12 m	4 m	7 m
Cut and fill, clearing, and loading trucks with a 12-t excavator	67 dB	10 m	3 m	6 m

² In accordance with the barrier specifications set out in Section 10.1.

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

*Reference noise level is for a moving noise source.

Table 5: Noise sources levels and minimum separation distances where a noise limit of 80 dB L_{Aeq} applies at any occupied building (excluding a dwelling)

Construction activity	Unmitigated $L_{Aeq}(15 \text{ min})$ noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (with noise barrier)
Sheet piling for WWPS	86 dB	27 m	n/a
Bored piling with a 20-t excavator	79 dB	12 m	4 m
Chainsaw works to remove trees (33% on-time)	77 dB	10 m	< 4 m
D6, D7, or D8 bulldozer working in small area	76 dB*	9 m	< 4 m
Padfoot vibratory compaction roller 15t – 20-t	76 dB*	9 m	< 4 m
Cut and fill, clearing, and loading trucks with a 40-t – 50-t excavator	72 dB	6 m	< 4 m
Cat 825 static compactor 30-t	72 dB*	6 m	< 4 m
Cut and fill, clearing, and loading trucks with a 20-t excavator	69 dB	4 m	< 4 m

Construction activity	Unmitigated $L_{Aeq(15\text{ min})}$ noise level at 10 m	Unmitigated compliance distance	Mitigated compliance distance (with noise barrier)
Cat 815 static compactor 18-t	69 dB*	4 m	< 4 m
Concrete pump and truck discharging	69 dB	4 m	< 4 m

* Reference noise level is for a moving noise source.

The reference noise levels in Table 4 and 5 may be updated based on the results of any noise measurements undertaken during the project.

Any of the activities in Tables 4 and 5 can occur without the need for mitigation, provided that they are undertaken at a distance that meets or exceeds the Unmitigated Compliance Distance when measured from the closest area of construction work and 1m from the façade of the closest occupied building.

9.0 Process for managing compliance near to neighbouring buildings

Before starting construction work **within 40m of any occupied building on another site**, 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 or occupied building.
3. Find the applicable compliance distance for the activity and equipment in Tables 4 and 5.
4. Compare the actual distance with the compliance distance:
 - If the dwelling or building is outside the compliance distance, the activity may proceed without further noise mitigation.
 - If the dwelling or building is within the compliance distance, noise mitigation must be implemented before the activity begins.
5. Where mitigation is required, select one or more of the following mitigation measures:
 - Use smaller or quieter equipment. Check Tables 4 and 5 to confirm that the revised equipment will comply or seek specific advice from Styles Group.
 - Install a noise barrier in accordance with the guidance set out in Section 10.1 and use the mitigated compliance distance in Tables 4 and 5 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 10.1 sets out the barrier requirements.
 - Use a combination of quieter equipment and a noise barrier to achieve the applicable compliance distance in Table 4 and Table 5.

- Carry out the work while the dwelling or building is unoccupied. The construction noise limits do not apply when the receiving building is unoccupied.
- 6. Seek advice from Styles Group. Further assessment may include on-site noise measurements to determine whether an exceedance is likely.
- 7. Confirm that the selected mitigation measures are in place and that compliance has been demonstrated before commencing the activity.

10.0 General noise mitigation measures

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

- a) The minimum separation distances set out in Section 8.2 must be complied with at all times unless the noise levels can be made to comply using other methods (e.g. screening).
- b) The quietest machinery and methods available will be used where practicable. This includes using plant that is no larger than necessary to complete the works.
- c) All machinery will be maintained throughout the project to ensure it is not generating unnecessary noise e.g. plant will be lubricated to reduce squeaking.
- d) When machinery or plant is not required to be running, it will be switched off and not left idling.
- e) Stationary machinery will be set back from the boundaries to minimise noise levels for neighbours.
- f) Plant on site will use broadband reverse alarms in place of traditional pure tone 'beepers' where practicable.
- g) The tail gates of trucks will not be slammed or allowed to fall closed.
- h) Material will not be dropped from height into empty trucks.
- i) Tools, equipment, and materials will not be dropped on hard ground or dragged across the Site.
- j) Vehicle horns will only be used for emergencies.
- k) Any radios or music played on the Site must be inaudible at the nearest dwellings.
- l) Communication over distance will be by radio or phone.
- m) Equipment generating excess or unnecessary noise will be stopped (when safe) and reported to the Site Manager.
- n) Daily pre-start meetings held by the Site Supervisor will include discussions about any noise and vibration issues, and any complaints received.
- o) All personnel on site will be made aware of the potential impacts of noise on neighbours.

10.1 Acoustic barriers

Acoustic barriers will be required when any construction plant is proposed to be operated within the unmitigated compliance distances specified in Tables 4 and 5. These barriers could either be fixed or localised barriers, dependant on the location of construction work.

Acoustic barriers shall meet the following specifications:

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

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

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

- b) Acoustic barriers will block the line of sight between the noise source and the receiver.
- c) Acoustic barriers will be positioned on the boundary or close to an activity (localised) where construction plant must be operated within the unmitigated compliance distances (Tables 4 and 5)
- d) Localised acoustic barriers should extend past the noise source by a distance of 1.5 times the height of the plant/machinery. If possible, the screening should partially surround the noise source.

11.0 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 buildings. This section sets out the following measures must be observed when working within 20 m of any occupied building, to ensure that vibration complies with the project conditions and does not cause unreasonable disturbance:

11.1 Project construction vibration limits

The applicable vibration limits for the project are set out in Table 6.

Table 6: Applicable vibration limits

Location	Limit
All neighbouring 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.

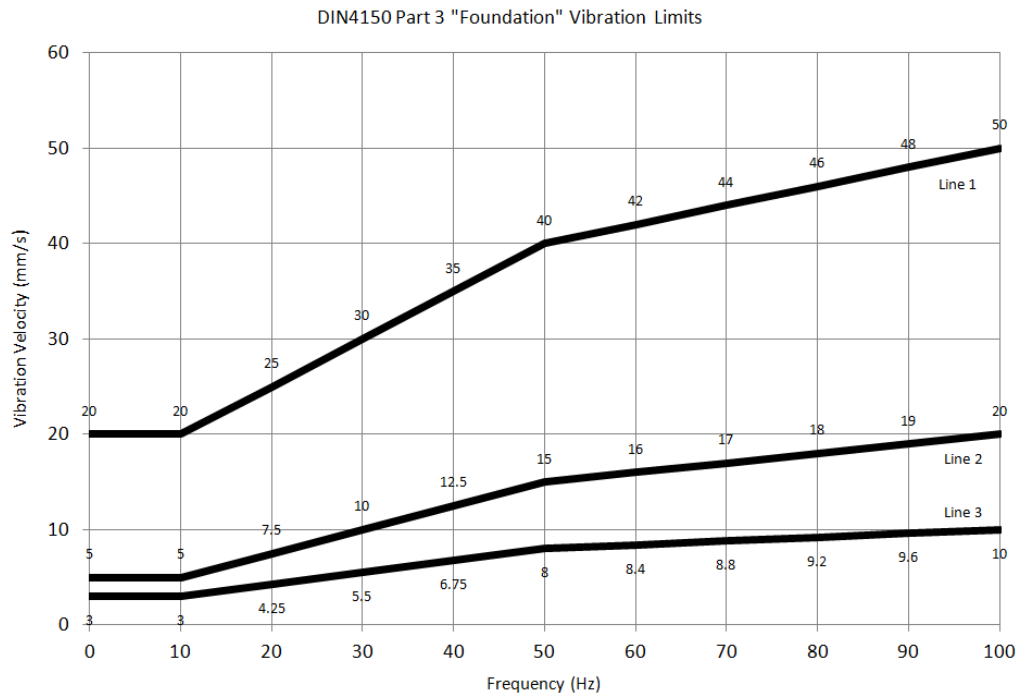


Figure 3: Curves for guideline values (short-term vibration) specified in DIN 4150-3:1999

11.2 Vibration mitigation measures within 20m of any occupied building

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

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

The following measures will be observed when working within 20m of any occupied building 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.

12.0 Community liaison and complaints

12.1 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; and
- vii. Contact details for the receipt of any noise or vibration complaints or concerns.

12.2 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 14.0.

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

13.0 Noise and vibration monitoring and reporting

This section sets out requirements for construction noise and vibration monitoring during the construction of 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 Tables 4 and 5 to monitor compliance with the Project noise limits.

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

A noise monitoring form is attached as Appendix C .

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

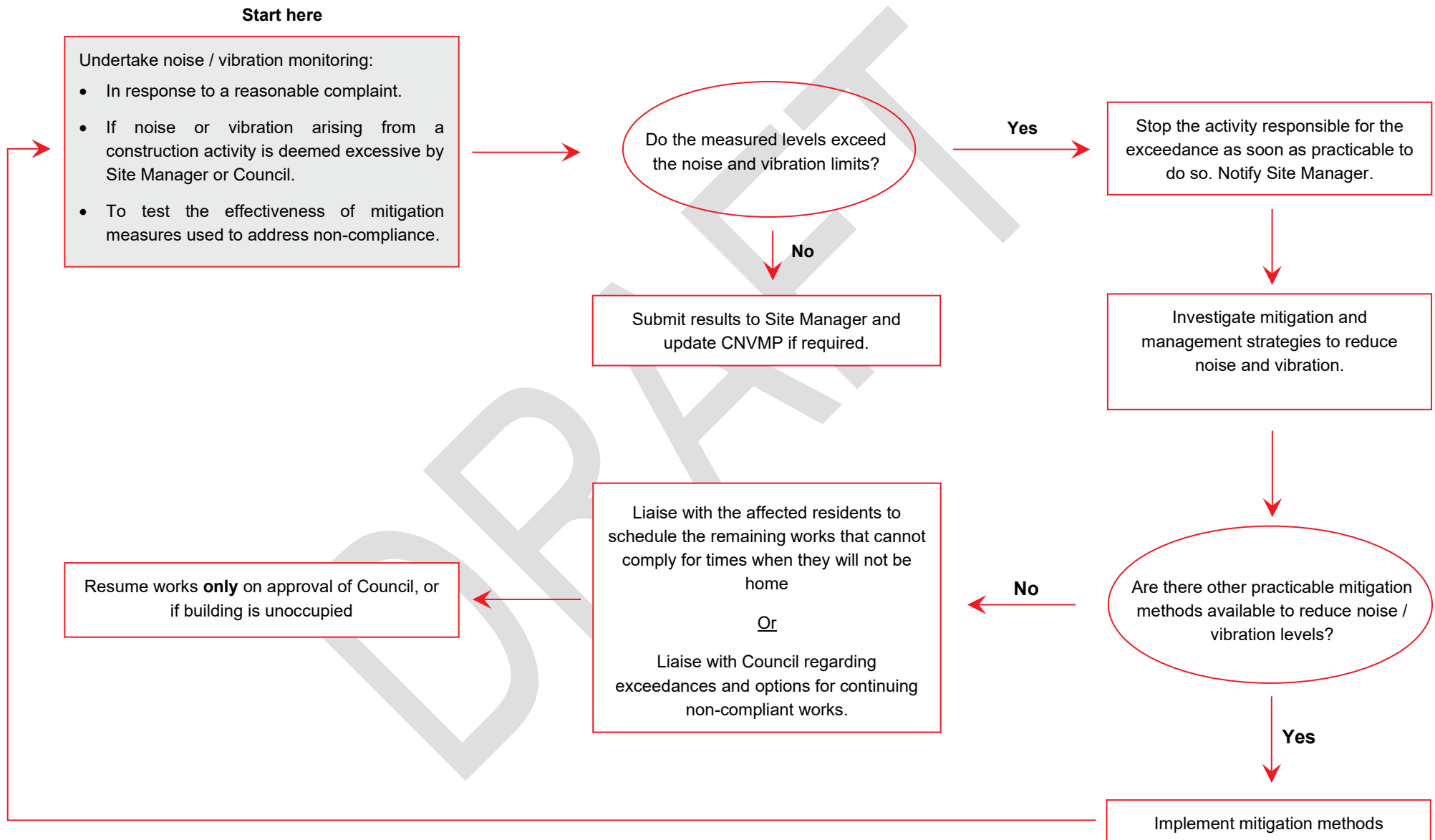
The results of all noise and vibration monitoring will be retained for the duration of the project and made available to Waipa District Council on request.

Any non-compliance with the noise limits identified through monitoring will be addressed by following the corrective action measures in Section 14 of this CNVMP.

14.0 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

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

DRAFT

Appendix C Noise monitoring form

Name:

Date:

Notes for noise monitoring

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

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

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

Sound source and instrumentation

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

Meteorological conditions

Cloud cover (octas)	
Rain	
Wind speed and direction	

Methodology

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

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*