



NOISE EFFECTS AND GROVE DEVELOPMENT

PREPARED FOR

Gordon Litt Farms
155 Kay Road, Rototuna

DATE

11 November 2025

Acoustic assessment prepared by Styles Group for Gordon Litt Farms.

REVISION HISTORY

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1	20/08/25		Final Draft	Jon Styles, MASNZ Director and Principal Styles Group	Gemma Styles Consultant Styles Group
2	28/08/25		Final		
3	11/11/25	Updated masterplan	Final		

Statement of experience

I am and have been the Director and Principal of Styles Group Acoustics and Vibration Consultants for 20 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 from land transport infrastructure, and development of controls to improve the compatibility of residential development around such infrastructure.

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 noise and vibration and operational noise effects from the Orchard Grove development at 155 Kay Road, Rototuna (the **Site**).

The proposal is for a comprehensively designed residential development (including subdivision, earthworks and land use). The proposal includes subdivision to create residential lots, a small neighbourhood centre, open space and recreation areas, roading and walking and cycling facilities, three waters infrastructure, and all associated site and civil works.

The Site is in the General Rural Zone of the Waikato District. The receivers adjacent to the Site are in the General Rural Zone of the Waikato District and General Residential Zone of Hamilton City. This assessment identifies the key considerations for the management of noise effects from the proposal, including the appropriate management of cross- territorial noise effects received in the jurisdiction of Hamilton City.

The proposal will enable a comprehensive residential development at the interface of the General Rural Zone of the Waikato District and Residential Zone of Hamilton City. This assessment finds that the proposal can be designed and constructed to comply with the relevant permitted activity noise standards of the Waikato District Plan Operative in Part (**WDPOP**). Our assessment also finds that the proposal can achieve the level of acoustic amenity anticipated and provided for by the Hamilton City Operative District Plan (**HCDP**).

We have provided recommendations for the appropriate management of noise effects from the proposed neighbourhood centre and pumpstations proposed within the Site. These recommendations are straightforward and can be readily addressed within the substantive application.

Our preliminary assessment of construction noise effects finds that the majority of the construction phase can be managed to achieve compliance with the permitted construction noise standards in the WDPOP. Construction noise levels from high generating construction activities (vegetation removal and road construction) may generate short term exceedances of the permitted construction noise standards when works are undertaken close to occupied residential dwellings. The assessment provided for the substantive application will confirm whether it will be practicable to comply with the permitted standards, or if a restricted discretionary activity resource consent will be required under NOISE-R4 for temporary and intermittent exceedances of the permitted construction noise standards.

In the event that the substantive assessment identifies that some aspects of the construction phase will require resource consent for short-term exceedances of the permitted noise standards, the assessment will provide details of how a CNVMP will be used to ensure the best practicable option is adopted so that construction noise effects are minimised as far as practicable. We are confident that construction noise levels can be managed to be reasonable for all receivers.

1.0 Introduction

Gordon Litt Farms has engaged Styles Group to assess the construction and operational noise effects from the proposal to develop approximately 72 hectares of land at 155 Kay Road (the **Site**)

This advice has been prepared accompany a referral application under the Fast-track Approvals Act 2024.

This assessment sets out the key considerations for management of noise effects from the proposal and provides an assessment of the potential construction and operational noise effects in accordance with the relevant permitted noise standards prescribed by the Waikato District Plan Operative in Part **(WDPOP)**.

The rules and standards in the Hamilton City Operative District Plan **(HCDP)** do not apply to the proposal (as they are in a different jurisdiction). However, this assessment determines whether the potential construction and operational noise effects received in the jurisdiction of Hamilton City can achieve the level of acoustic amenity anticipated and provided for by the HCDP.

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

2.0 The proposal

The Orchard Grove development is a comprehensively designed residential development. The proposal includes subdivision to create residential lots, a small neighbourhood centre, open space and recreation areas, roading and walking and cycling facilities, three waters infrastructure, and all associated site and civil works. The Masterplan is shown in Figure 1 overleaf.

The proposal includes a mixed-use neighbourhood centre that will provide amenities and services to support the residential development.

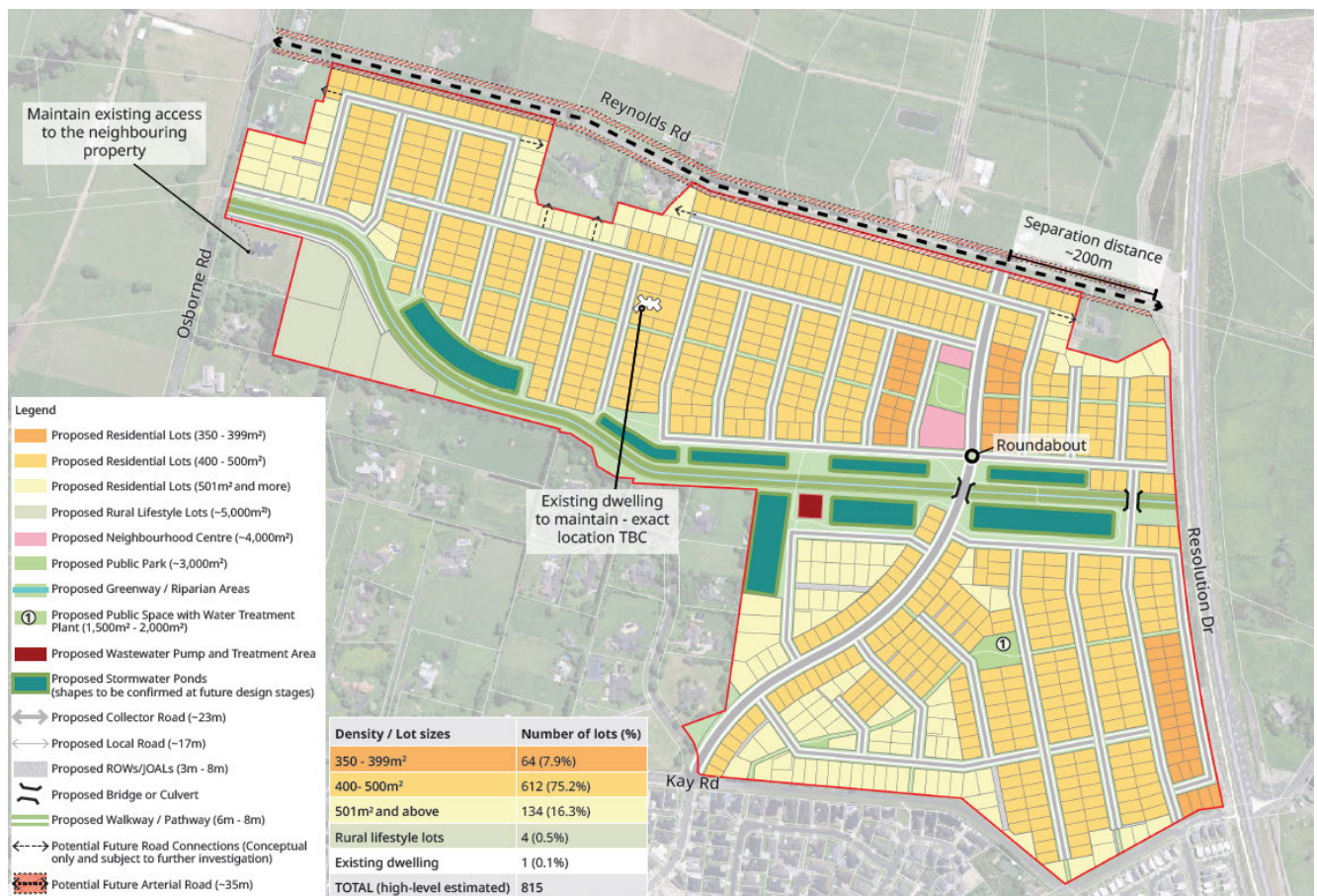


Figure 1 Orchard Grove Masterplan

3.0 The Site and closest receivers

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

The southern boundary of the Site that borders Kay Road is adjacent to the territorial boundary of Hamilton City. The adjacent land that is within the jurisdiction of Hamilton City is zoned General Residential Zone (**Residential Zone**).

The State Highway Noise Control Boundary does not affect the Site and there are no other relevant noise control overlays.

3.1 Receivers

The appropriate management of noise effects generated from the Site (within the jurisdiction of the Waikato District) and receivers outside the Site in the Hamilton City and Waikato District is a key focus of this assessment.

The receivers surrounding the Site include:

- The dwellings in the GRUZ adjacent to the northern, western, and south-western boundaries of the Site. These receivers are in the Waikato District. The closest GRUZ dwellings are identified with a red circle in Figure 2.
- The dwellings in the Residential Zone of Hamilton City to the south of the Site. These receivers are in the jurisdiction of Hamilton City.

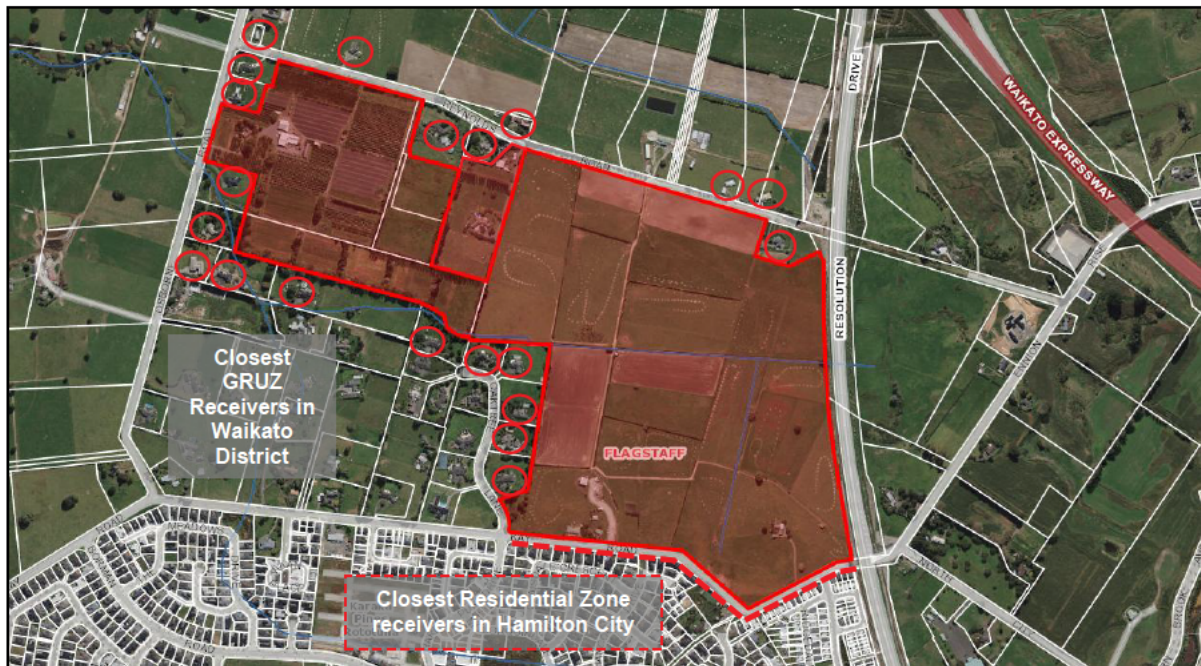


Figure 2 The Site (outlined red) and closest receivers in the GRUZ and Residential Zone. The closest adjacent GRUZ dwellings are identified with a red circle.

4.0 The key noise 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 boundaries of the Site are:

- To ensure that construction noise 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 permitted noise levels prescribed by the District Plan at all assessment locations beyond the Site.

The key consideration for the management of noise effects received within the Site is to ensure that the proposal incorporates suitable controls to manage noise effects between commercial activities in the proposed neighbourhood centre, the proposed water and waste-water pumpstation, and proximate noise-sensitive activities.

We have prepared a high-level assessment of compliance in accordance with the relevant permitted activity noise standards prescribed by the WDPOP and HCDP given that noise generated from the Site has the potential to be received by receivers in the GRUZ of the Waikato District and Residential Zone of Hamilton City.

The relevant permitted activity noise standards of the WDPOP and HCDP are reproduced in full in Appendices B and C.

5.0 Assessment of construction noise and vibration effects

5.1 Construction noise

Construction noise will be generated from the civil works to prepare the Site for future development, including the civil works to clear and prepare the Site for infrastructure, building platforms and road construction, followed by construction of buildings.

We expect that the construction works will require very typical plant and machinery such as bulldozers, compactors, chainsaws, excavators, paving machines, concrete pours and trucks. We understand that the proposed construction works will not include any rock breaking or blasting.

The highest construction noise levels likely to be experienced by receivers will be generated by activities near to the perimeter of the Site, such as preliminary earthworks involving heavy plant, vegetation removal, and compaction, grading and paving works associated with the construction of the internal road network.

The construction noise levels from vertical construction (buildings) will generally be quieter than the noise from civil works.

5.1.1 Permitted construction noise standards

NOISE-R4 of the WDPOP require that construction noise levels are managed in accordance with the recommended numerical limits set out in NZS 6803:1999 '*Acoustics – Construction Noise*' (**NZS6803**). Rule AINF-R2¹ of the WDPOP controls noise associated with the construction of infrastructure² and also requires compliance with the noise limits in NZS6803:1999.

Construction noise generated from the Site will be received in the Residential Zone of Hamilton City. Rule 25.8.3.2 of the HCDP also manages construction noise in accordance with the noise limits set out in NZS6803:1999.

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.

¹ We understand this rule is subject to currently subject to an appeal [000086].

² Including structures for transport on, under or over land by cycle ways, rail, roads, walkways, or any other means.

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 projects³.

We understand that 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 measured and assessed 1m from the façade of any occupied dwelling in a rural or residential zone.

5.1.2 Construction noise and vibration assessment to be provided as part of the substantive application

The highest construction noise levels are likely to be experienced where high noise generating works (such as road construction and vegetation removal) are undertaken within 50m of occupied dwellings on adjacent sites. At this point in time, the masterplan that will determine the internal road network and connection points is conceptual only. In addition, the proposed construction methodology detailing the construction equipment and durations of construction work in various parts of the Site is not yet available. For these reasons, we have not been able to predict the construction noise levels with a high degree of certainty.

Our very preliminary assessment finds that construction noise levels from high noise generating activities (namely vegetation removal and road construction) may temporarily exceed or require the implementation of mitigation to ensure compliance with the permitted construction noise limits for occupied dwellings within 50m of the works.

A detailed construction noise and vibration assessment will be provided as part of the substantive application that will include a detailed assessment of the proposed construction works in accordance with the recommended numerical limits and assessment procedures set out in NZS 6803:1999. The assessment will confirm whether or not a restricted discretionary activity resource consent will be required under NOISE-R4 to authorise temporary and intermittent exceedances of the permitted construction noise standards. The assessment will address the relevant assessment criteria in NOISE-R4, including:

- a) Effects on amenity values
- b) Hours and days of construction
- c) Noise levels
- d) Timing and duration; and
- e) Methods of construction.

The construction noise assessment will also provide details of how a CNVMP will be used to ensure the best practicable option is adopted so that construction noise effects on receivers are minimised

³ The construction noise limit applying to construction projects greater than 20 weeks in duration.

as far as practicable, and to ensure compliance with the permitted standards for as much of the project as is practicable.

Based on our experience with similar projects, we expect that construction noise levels can be managed to be reasonable for all receivers through a Construction Noise and Vibration Management Plan (**CNVMP**) that is designed to mitigate the effects of any minor exceedances of the construction noise limits.

5.2 Construction vibration

The WDPOP does not include any rules or standards to control vibration generated from construction work.

Notwithstanding, we have reviewed the likely separation distances between the Site boundaries and adjacent dwellings to determine whether vibration from construction work would be likely to approach or exceed the vibration limits set out in 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 DIN limits are adopted in Rule 25.8.3 of the HCDP to manage vibration generated by construction activities and are commonly adopted in District Plans and resource consents throughout New Zealand.

Our preliminary assessment of the works likely to be required finds that vibration generated by construction work on the Site is likely to readily comply with the limits for avoiding building damage without requiring any specific mitigation. This is due to the separation distances between potential vibration-generating construction activities on Site and the nearest physically existing and potential future buildings.

5.2.1 Construction vibration assessment to be provided as part of substantive application

Our preliminary assessment finds that vibration levels from construction work activity is likely to readily comply with the DIN limits at all nearby receivers. However, we have not undertaken a detailed assessment as the proposed construction methodology has not yet been confirmed.

We recommend that the substantive application includes an assessment that confirms that construction vibration levels can be managed to comply with the DIN limits, and how a CNVMP will be used to ensure the best practicable option is adopted so that construction vibration effects are minimised as far as practicable and to be reasonable.

6.0 Operational noise effects

Rule NOISE-R8 of the WDPOP controls the noise levels generated and received between sites in the GRUZ. The rule requires that noise levels received at the notional boundary of any site in the GRUZ must not exceed:

- 50 dB L_{Aeq} between 7am and 7pm
- 45 dB L_{Aeq} between 7am and 10pm

- 40 dB L_{Aeq} and 65 dB L_{Amax} between 10pm and 7am

The permitted noise levels in the GRUZ of the WDPOP are relatively consistent⁴ with the permitted noise levels in the adjacent Residential Zone of the HCDP. Rule 25.8.3.7 of the HCDP requires that noise levels received at the boundary of any site in a Residential Zone must not exceed:

- 45 dB L_{Aeq} and 75 dB L_{Amax} between 6am and 7am
- 50 dB L_{Aeq} between 7am and 8pm
- 45 dB L_{Aeq} between 8pm and 11pm
- 40 dB L_{Aeq} and 75 dB L_{Amax} between 11pm and 6am

The permitted noise standards for the GRUZ of the WDPOP and Residential Zone of the HCDP are very similar. The only difference is that the HCDP standards allow a slightly higher (5dB) noise level in the mornings between 6am and 7am. This means that compliance with Rule NOISE-R8 of the WDPOP at all GRUZ receivers will deliver a level of acoustic amenity that is consistent with (or slightly better than) the permitted noise environment in the Residential Zone of the HCDP.

6.1 Assessment of operational noise sources

We have reviewed the masterplan to identify the location of all noise generating activities and to determine compliance with the maximum permitted noise levels prescribed by NOISE-R8 of the WDPOP. Achieving compliance with Rule NOISE-R8 of the WDPOP at all proximate receivers will ensure that noise effects are reasonable for the Residential Zone receivers in Hamilton City.

The operational noise sources associated with the proposal include:

- Noise levels from residential activity across the development
- Noise levels from vehicles on the proposed internal road network
- Noise levels from commercial activity in the proposed neighbourhood centre.

These sources are discussed below.

6.1.1 Residential activity

The masterplan shows that the majority of the Site, including the areas near to the perimeter of the Site, will be developed for residential activity.

The noise from residential activity is expected to be consistent with a residential area where the noise environment is primarily controlled by vehicle movements and intermittent noise from typical household activities. The noise levels experienced by receivers beyond the Site will be consistent with the overall character, timing and duration of noise generated by residential activity in the lifestyle lots that surround the site, as well as the adjacent Residential Zone.

⁴ The WDPOP and HCDP both prescribe the same numerical noise limits during the daytime and nighttime periods, however the prescribed timeframes for daytime, evening, morning and night-time vary slightly between the plans.

Our review of the masterplan has not identified any noise issues for the proposed residential activities within the Site and compliance with the permitted noise standards prescribed by the WDPOP (for noise received at any notional boundary in the GRUZ) and the HCDP (for noise received at the boundary of any site in a Residential Zone).

6.1.2 Road traffic noise

We understand that the internal road network will be vested as public road. The WDPOP zone noise limits do not apply⁵ to road traffic noise generated from roads that are vested or dedicated as road.

6.1.3 Activities in the neighbourhood centre

We understand that a small-scale mixed use neighbourhood centre (5,500m²) will be provided for the needs of residents. We have not identified any concerns in terms of noise from proposed commercial activities affecting receivers beyond the perimeters of the Site due to the large separation distances involved.

The noise limits in NOISE-R8 will control the noise levels generated from a commercial activity and received at adjacent sites containing a dwelling or other noise sensitive activities. However, the GRUZ noise limits will not control noise between generated and received between commercial tenancies (i.e. in situations where a site does not contain a notional boundary).

The noise limits in NOISE-R8 may also present an unreasonable constraint in a mixed-use-type situation such as where commercial and residential activity propose to co-locate (i.e. in a scenario where a supermarket loading bay is directly adjacent to residential activity, or an apartment is located above hospitality).

We recommend that the substantive application includes appropriate mechanisms to manage land use compatibility between neighbourhood centre activities and noise sensitive activities, recognising that the underlying GRUZ noise limits in NOISE-R8 are not designed to manage commercial activity.

The proposed mechanisms to ensure ongoing land use compatibility can be confirmed within the substantive application when the lot layout is confirmed and when further detail on the proposed land use activities is available. The types of mechanisms to manage land use compatibility may include:

- i. Controls that would require any noise sensitive activity within or adjacent to the neighbourhood centre to be adequately separated/ precluded so that the proposed commercial activities can operate effectively and without the potential for incompatibility (i.e. in a scenario where noise generated by a supermarket loading bay cannot comply with the underlying GRUZ noise limits in NOISE-R8 unless there is an adequate buffer); or
- ii. Controls that would enable higher noise limits⁶ inside the neighbourhood centre that would enable commercial activities to operate, while requiring noise sensitive activities that may co-

⁵ AINF Rule 10 of the WDPOP states that any zoning rules cease to have effect from the time land is vested or dedicated as road.

⁶ Higher than the underlying GRUZ noise limits in NOISE-R8.

locate within the neighbourhood centre to be acoustically treated from the higher noise levels. This approach would still require commercial activities to operate in a way that achieves compliance with the noise limits in NOISE-R8 at non-acoustically treated dwellings that are outside the neighbourhood centre.

The proposed mechanisms that will ensure land use compatibility will be straightforward to achieve and will be confirmed within the substantive application.

6.1.4 Water Plant, Wastewater Pump and Treatment Area

The masterplan displays the proposed location of the water plant and wastewater pump and treatment area. This infrastructure is well separated from the perimeters of the Site. We have not identified any concerns in terms of pumpstation noise affecting receivers beyond the Site boundaries due to the large separation distances involved.

The detailed design of the water and wastewater plant is not available at this point in time and therefore we have not been able to predict the noise levels likely to be experienced at the residential lots proposed within the site. We therefore recommend that the pumpstations are designed, constructed and maintained to comply with noise levels that are 5dB lower than the underlying zone standards. Compliance with such standards is likely to be straightforward using common engineering methods and construction materials and will ensure that the potentially constant noise generated from mechanical plant within the pumpstation will not be dominant or intrusive when experienced at adjacent lots.

The proposed mechanisms to manage noise from pumpstation infrastructure are straightforward and will be confirmed within the substantive application.

7.0 Summary

Styles Group has assessed the potential noise and vibration effects from the Orchard Grove development.

Our analysis of the masterplan finds that the proposal is capable of achieving a high level of compatibility with the level of acoustic amenity anticipated and provided for in the GRUZ of the Waikato District and Residential Zone of Hamilton City.

We have identified four key recommendations for the appropriate management of construction and operational noise. These recommendations are straightforward and can be readily addressed within the substantive application.

The key recommendations are:

Recommendation 1: Construction Noise

We recommend that the substantive application includes an assessment of construction noise levels in accordance with the recommended numerical limits and assessment procedures set out in NZS 6803:1999 *Acoustics – Construction Noise*. The assessment will confirm whether a restricted

discretionary activity resource consent will be required under NOISE-R4 to authorise temporary and intermittent exceedances of the permitted construction noise standards.

The assessment will detail how a CNVMP will be used to ensure the best practicable option is adopted so that construction noise effects are minimised to ensure compliance with the permitted standards for as much of the project as is practicable. We are confident that the construction noise effects can be managed to be reasonable at all receivers.

Recommendation 2: Construction Vibration

The WDPOP does not include a rule or standards to control vibration generated from construction work.

Our preliminary assessment of the masterplan and likely works finds that vibration generated by construction work on the Site is likely to readily comply with the limits in German Standard DIN 4150-3:1999 *Structural vibration – Effects of vibration on structures* for avoiding building damage without requiring any specific mitigation.

We recommend that substantive application includes an assessment of construction vibration levels to confirm compliance with the DIN limits at all receivers in the GRUZ of the Waikato District as well as Residential Zone receivers in Hamilton City. The application should also set out how a CNVMP will be used to ensure the best practicable option is adopted so that construction vibration effects are minimised as far as practicable and to be reasonable.

Recommendation 3: Operational noise

The wastewater and water pumpstation is well separated from the perimeters of the Site and will readily comply with the permitted noise standards at all receivers beyond the Site.

We have recommended that pumpstation infrastructure is designed, constructed and maintained to achieve compliance with noise levels that are 5 dB lower than the maximum permitted noise levels in NOISE-R8 at the nearest residential lots (within the site). This approach will ensure that noise levels from pump station infrastructure are not dominant or intrusive when observed from nearby residential lots.

The proposed mechanisms to manage noise from pumpstation infrastructure are straightforward and will be confirmed within the substantive application.

Recommendation 4: Noise levels in the neighbourhood centre

The underlying noise limits for the GRUZ in NOISE-R8 are not designed to manage noise generated and received between commercial activities, or to manage noise levels in buildings that contain a mix of noise generating and noise sensitive activities.

We therefore recommend that substantive application includes appropriate mechanisms that will successfully manage compatibility between commercial land use and noise sensitive activities within and adjacent to the neighbourhood centre. These measures are straightforward and will be confirmed within the substantive application.

Appendix A WDPOP Noise standards

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

Definition of Noise Sensitive Activities

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

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

Definition of Noise Sensitive Activity

Means any or all of the following:

(a) buildings used for residential activities, including boarding establishments, retirement villages, papakaaingā housing development, visitor accommodation, and other buildings used for residential accommodation but excluding camping grounds;

(b) marae and marae complex;

(c) hospitals;

(d) teaching areas and sleeping rooms in an education facility; (e) places of assembly.

(e) places of assembly

Construction Noise

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

Construction Noise – All Infrastructure (Appeal 000086)

AINF-R2	Construction noise	
All zones	(1) Activity status: PER Where: (a) Construction, maintenance, repair, replacement, upgrading or removal of infrastructure or the	(2) Activity status where compliance not achieved: RDIS Council's discretion is restricted to the following matters: (a) Effects on amenity values;

	installation of new infrastructure must comply with NZS 6803:1999 Acoustics - Construction noise.	(b) Hours of construction; (c) Noise levels; (d) Timing and duration; and (e) Methods of construction
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Noise generated and received in the General Rural Zone

NOISE- R8	Noise- general	
GRUZ- General Rural Zone	<p>(1) Activity status: PER</p> <p>Where:</p> <p>(a) Noise measured at the notional boundary on any other site in the GRUZ - General Rural Zone must not exceed:</p> <ul style="list-style-type: none"> (i) 50dB LAeq, 7am to 7pm every day; (ii) 45dB LAeq, 7pm to 10pm every day; (iii) 40dB LAeq and 65dB LAmax, 10pm to 7am the following day. <p>(b) Noise measured within any site in any zone, other than the GRUZ - General rural zone, must meet the permitted noise levels for that zone.</p> <p>(c) Noise levels must be measured in accordance with the requirements of New Zealand Standard NZS 6801:2008 "Acoustics - Measurement of Environmental Sound".</p> <p>(d) Noise levels must be assessed in accordance with the requirements of New Zealand Standard NZS 6802:2008 "Acoustic - Environmental noise".</p>	(2) Activity status where compliance not achieved: DIS

Appendix B HCDP Noise standards

These provisions do not apply across the territorial boundaries but are helpful for understanding the amenity expectations for residents in Hamilton City.

Definition of 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 Residential Zones

25.8.3.7

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

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

i. Residential Zones.

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

Rules – Specific Standards

25.8.3.1 Measurement and Assessment of Noise

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