

BEFORE THE HUTT CITY COUNCIL

Proposed District Plan Hearings Panel – Stream 7 – Other Topics

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the Proposed Lower Hutt District Plan

STATEMENT OF EVIDENCE OF MALCOLM J. HUNT

Noise and acoustics

6 October 2026

1.0 Introduction

- 1.1 My name is Malcolm Hunt. I am a self-employed noise and acoustic consultant based in Wellington. I have prepared this statement of evidence on behalf of the Hutt City Council (the Council) in respect of technical noise and vibration matters arising from exchange of evidence for the hearings on the Proposed Lower Hutt District Plan (PDP).

2.0 Qualifications, experience, and Code of Conduct

- 2.1 My qualifications and experience are set out in section B of my evidence of 10 September 2026, attached as Appendix 3 to the Section 42A Report. I repeat the confirmation given in that report that I have read and agree to comply with the Code of Conduct for Expert Witnesses.

3.0 Responses to submitter evidence and statements

- 3.1 In addition to my evidence of 10 September, this statement responds to materials submitted by:
- 3.1.1 Catherine Hepplethwaite for KiwiRail Holdings (442) and NZTA (385) – planning evidence, 29 September 2026
 - 3.1.2 Michelle Grinlinton-Hancock for KiwiRail Holdings (442) – submitter evidence, 29 September 2026
 - 3.1.3 Dr Stephen Chiles for KiwiRail Holdings (442) and NZTA (385) – acoustic evidence, 29 September 2026
 - 3.1.4 David Gibson for Te Kārearea & Rosco Ice Cream (447) – planning evidence, 29 September 2026
 - 3.1.5 Angela Goodwin for Waste Management NZ (461) – planning evidence, 29 September 2026

3.1.6 Micky Yang for Waste Management NZ (461) – acoustic evidence, 29 September 2026

3.1.7 Philip Heffernan for Winstone Aggregates (444) – planning evidence, 30 September 2026

3.1.8 Jamie Exeter for Winstone Aggregates (444) – acoustic evidence, 30 September 2026

4.0 Acoustic insulation standards within Highway and Railway Noise Overlays

4.1 The submission by KiwiRail Holdings (442) and NZ Transport Agency Waka Kotahi (385) seek to replace proposed acoustic insulation rules and standards NOISE-R6, NOISE-R7, NOISE-S5 and NOISE-S6 with new noise rules and standards that provide for new or altered buildings within a Highway and Railway Noise Overlay to be permitted activities provided a required “internal noise standard”¹ is achieved, measured indoors using A-weighted decibels.

4.2 As notified, the proposed plan adopts the ‘standardised level difference’ method ($D_{tr,2m, nTw}$)² for specifying acoustic insulation for new or altered buildings within a Highway and Railway Noise Overlay. The results are in decibels, dB, not A-weighted. The issue of differences in approach to specifying acoustic insulation are discussed at paragraphs 44 to 46 of my evidence in chief which sets out, in summary, that for the reasons given, I support the adopting only the $D_{tr,2m, nTw}$ method for specifying building insulation (hereafter referred to as the ‘ISO method’) due to the advantages in ease of design, verifying and checking compliance.

4.3 The evidence of KiwiRail and NZTA’s noise and vibration expert, Dr Stephen Chiles, states he considers the internal noise standard criteria as proposed by NZTA and KiwiRail is more efficient and

¹ KiwiRail Submission point 73 and NZTA submission point 76.

² Based on ISO 717-1:2020 *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation*.

effective at addressing potential indoor noise effects than the proposed acoustic installation standards of NOISE-S5 and NOISE-S6. At paragraphs 6.7 and 6.8 he gives his view that this is because road and rail noise exposure of buildings and parts of buildings varies substantially, and hence varying acoustic treatment is appropriate for different buildings and parts of building. He considers this would be a least cost' approach "always resulting in an appropriate indoor noise environment"³.

- 4.4 I believe cost savings due to treating parts of the building envelope differently to 'just comply' with an indoor dBA limit would not be very likely in practice. In my experience, most buildings are built and renovated whole rooms at a time with little or no cost efficiency to reduce panel thickness where this faces away from the highway (for example) or possibly reduced glazing thickness on one side of the building facing away from the railway.
- 4.5 Even if these variations in building claddings or glazing were implemented, for typical buildings housing activities sensitive to noise, I do not consider cost savings would be significant within overall construction costs. This is because costs associated with adding required levels of acoustic insulation (and provision for ventilation) represents a minor addition to overall building construction costs (e.g. 5% to 10% of the build cost, in my experience).
- 4.6 A further factor I consider relevant is my understanding that a typical room built to conform with current building standards will likely result in the room, if tested, achieving an insulation standard (windows closed) approaching compliance with $D_{tr,2m}, n_{Tw} > 30$ dB without any special treatment or design precaution. Such results indicate the costs of acoustic treatment to the required PDP standards for many new builds would be more related to the provision of supplementary ventilation rather than cost of acoustic insulation.

³ Evidence of S. Chiles at paragraph 6.8

- 4.7 Also, I do not believe cost efficiency associated with the type of acoustic insulation standard to be a very significant factor given the issues and deficiencies I have identified associated with the indoor sound level standard based on dBA, as per the type of acoustic insulation rule proposed by NZTA and KiwiRail. Two leading examples of problems with the indoor dBA type limit are (1) inaccuracy in determining outdoor highway or rail noise against which the acoustic design must act; and (2) uncertainty on how low frequency noise will be quantified and addressed within the compliance reports Council may expect to receive.
- 4.8 At paragraph 45 of my evidence in chief, I set out my concerns regarding use of A-frequency weighting indoor sound levels which, in summary means certain building elements maybe lightweight in design and yet achieve the required dBA reduction in outdoor sound. Compared to the ISO standardised level difference approach, I consider the ‘internal noise standard’ approach involves uncertain and/or inconsistent outcomes, including for indoor low frequency sound. That is not to say low frequency sound is a specific problem to be guarded against in this district, it is about adequate acoustic design to avoid excessive low frequency noise indoors due to typical outdoor transportation noise and certainty of outcome.
- 4.9 Dr Chiles implies at paragraph 12 that these concerns can be disregarded as the “compliance report” will adequately cover this issue without any further refinement of the standard. Dr Chiles states at paragraph 7.12 that “*use of appropriate frequency spectra is a fundamental aspect of basic professional practice that should be addressed through this process*”. Whilst I acknowledge the vast knowledge and experience of fellow New Zealand acousticians, I do not share Dr Chiles confidence that issues such as accurate determination of outdoor sound levels and sufficient low frequency noise insulation would be outcomes assuredly resolved when dealing with an acoustic insulation standard based on the use of indoor dBA as a compliance limit.

- 4.10 KiwiRail and NZTA's planning expert, Ms Catherine Heppelthwaite, considers the approval of acoustic design reports is not required as Council building control officers only need to process the building consent application by checking the building design precautions (as provided by the acoustician) have been incorporated into the building consent plans. However, to me this appears too simplistic.
- 4.11 I consider it important for Council to receive a signed report by an acoustic expert acceptable to Council that sets out calculations indicating that, by constructing the building according to the plans now including certain specific materials, areas, glass thicknesses, etc., a certified sound insulation level is achieved across all relevant frequency bands (rather than ignoring sound energy below 100 Hz which is essentially how the A-weighting functions).
- 4.12 I am also concerned about uncertainty in how the calculated indoor dBA sound level accounts for sound absorption within the receiving room. Acoustic calculations based on ISO-717 adopt a standardised indoor reverberation time constant (0.5 secs) whereas the dBA method assumes no specific value and may not have been included (or even over-stated) within the acoustic report. The effect can be significant. In my experience, sound level measurements within an empty room with say hardwood floors may measure 38 dBA, however, once curtains and furniture are installed, indoor sound level due to the same level of outdoor sound may measure more like 34 dBA.
- 4.13 At paragraph 44(b) of my evidence in chief, I discuss potential difficulties monitoring and enforcement of acoustic insulation standards by Council. I consider it usual and in accordance with accepted practice to ensure district plan acoustic standards to be able to be tested using a verifiable method, preferably a NZ Standard or recognised international standard.
- 4.14 Ms Heppelthwaite (at paragraph 6.15) considers field testing would not be required - "*Once in place, further checks will not generally be required*" however I recommend a more cautious approach. In my view, the need for verifiable field testing is a real possibility. I

consider when stipulating compliance using a measurable quantity within a district plan performance standard, this should ideally be based on a recognised measurement standard, such as an international acoustic standard linked to the ISO-717 family.

- 4.15 I therefore consider the proposed ISO approach represents regulatory best practice. By calculating the acoustic performance of the roof and facade across the relevant frequency bands in a uniform manner, based on their size and acoustic attributes, and by standardising internal room acoustics, the ISO approach establishes a mathematically rigorous, legally enforceable standard.
- 4.16 I note at paragraph 7.14 Dr Chiles considers it is “inefficient” to address varying outdoor noise exposure with a fixed sound insulation standard. However, the standard is in fact two-level, being based on separate insulation standards for ‘high’ and ‘moderate’ noise areas. This ensures the insulation standard is appropriate for the outdoor noise environment.
- 4.17 Also, I consider Dr Chiles may have underestimated the utility of a unified, standardised ISO-type acoustic insulation standard that applies uniformly across a range a range of noise-affected zones and areas. I note in some circumstances development requiring buildings to be acoustically insulated may be located within a commercial zone and be located within the Highway and Railway Noise Overlay. In this situation both the indoor dBA acoustic insulation standard advocated by KiwiRail and NZTA and the standardised ISO standardised level difference would apply which I consider would be inefficient in achieving the aims of the PDP.
- 4.18 As a matter of record, I have recommended to Council the ISO-based acoustic insulation rules apply within all relevant ‘high’ and ‘moderate’ commercial and business zones, including within areas to which NOISE-S5 and NOISE-S6 apply, because this standardised approach will result in a more consistent outcome with benefit also accruing to designers, builders and developers in the district. I therefore do not support the view of Dr Chiles that the

standardised ISO approach to specifying acoustic insulation standards in PDP is 'inefficient'.

- 4.19 For the reasons set out above and at paragraphs 44 and 45 of my evidence in Chief, I recommend retaining the ISO717-based units of $D_{tr,2m, nTw}$ for specifying minimum acoustic insulation standards within NOISE-S5 and NOISE-S6 and do not support adopting the 'internal noise standard' approach to setting minimum acoustic standards, as requested by submitters 385 (NZ Transport Agency) and 442 (KiwiRail Holdings Ltd).

5.0 Separation of high and moderate noise overlays

- 5.1 NZTA (385.76b; supported by Wellington Regional Council F38.20) and KiwiRail (442.73cm 442.73d) seek that the high and moderate noise overlay standards be deleted and replaced with a single standard based on an "indoor noise limit". This is taken as meaning the *Highway and Railway Noise Overlay – Moderate* and the *Highway and Railway Noise Overlay – High* would be replaced with a single *Highway and Railway Noise Overlay*.
- 5.2 This issue is directly related to the type of acoustic insulation standard adopted within NOISE-S5 and NOISE-S6 that I discuss above in Section 4. Where an ISO-based standard is adopted (as described above) then the two-level 'high' noise and 'moderate' insulation standard is considered essential to its proper functioning. If the alternative 'indoor noise level' approach is adopted, only a mapped area is needed, and the two-level approach is unnecessary and would not function in any meaningful way.
- 5.3 Page 1 of the Noise Chapter explains, in general terms, the range of outdoor noise levels used as an approximate basis for identifying high noise areas and separately, moderate noise areas. In my opinion, insulation standards for 'high' and 'moderate' noise reasonably align current and expected ambient noise levels I have measured and assessed within the Hutt district (although I would point out, I have not visited all parts of the district). I consider the generic, zone-based classification into 'high' and 'moderate' noise

environments, including alongside state highways and the Wellington –Wairarapa Railway Line reasonably aligns with ambient sound levels that are (or maybe) experienced in the area.

- 5.4 I am therefore of the opinion the mapped Highway *and Railway Noise Overlay – Moderate* and the *Highway and Railway Noise Overlay – High* have been appropriately located, with appropriate insulation (and ventilation) standards applying, where stipulated, within the affected ‘high’ and ‘moderate’ noise-affected areas of the district.
- 5.5 I recommend the two-level ‘high’ and ‘moderate’ insulation acoustic (and ventilation) standards (and mapped areas) be retained as the two-level acoustic standard is necessary for the proper functioning of the insulation standard based on ISO-717 adopted within NOISE-S5. I therefore do not support the submitter’s request to use only single noise overlays for highway and railway noise.

6.0 Extent of rail noise overlay

- 6.1 KiwiRail’s submission sought that the extent of the Noise Overlay applying to the rail corridor designation boundary be extended from 40m to 100m. Dr Chiles considers the notified 40m to be inadequate to protect new and altered noise sensitive activities from adverse health effects, and 100m is the more appropriate distance⁴. However, I do not accept the rationale for extending the overlay to 100m because rail noise effects are over-stated when rail noise levels are expressed using an assumed artificial 1 hour measure.
- 6.2 The 1 hour LAeq rail noise assessment method was originally developed by Marshall Day Acoustics with Dr Chiles explaining⁵ the 1 hour averaging method appropriately captures the noise “maximums” likely from the rail network. According to the available background information, the one hour LAeq level is based on the

⁴ Evidence of Dr Chiles, paragraph 6.6

⁵ At paragraph 5.5 of Chiles Ltd report “Land use controls for railway sound and vibration report” Reference: 130418h Date: 19 July 2023 included at Appendix 2 of the s32 report attached to the evidence of Ms Heppelthwaite).

assumption of two freight train movements in a one-hour period. For the reasons set out below, I consider the 1 hour ‘maximum’ rail noise inappropriate for developing outdoor rail noise standards for land use planning purposes given that established practice in New Zealand and elsewhere has been to examine the reaction to rail noise across all (or most) hours of day.

- 6.3 Paragraph 5.5 of the Chiles Ltd report discusses the basis for the LAeq(1 hr) metric and states *“the intention of the [1 hour] average is to provide an approximation of both the effects of a single event, and a generalised average of noise from the corridor”* however I consider such an approach to assessing rail noise impact steps away from established practice and over-estimates rail noise levels at any given distance.
- 6.4 It is noteworthy that KiwiRail seek (442.81) the extent of the rail overlay to be specified using the LAeq(24 hour) noise metric. Based on my experience and research, the assessment of rail noise effects on people and communities is usually based on noise experienced over 24 hours. In my view, this is best practice that has developed over the last 30 to 40 years. Most, if not all, rail noise annoyance studies use noise metrics which assess whole day exposure to rail noise, not rail noise assessed only over short periods of time, such as 1 hour.
- 6.5 I provide the following references to two examples of well-regarded published studies into rail noise annoyance that establish rail noise effects on people and communities in New Zealand and internationally is assessed on a whole day basis (or significant part thereof).
- 1) A New Zealand, a major study⁶ on transport noise annoyance (possibly NZ’s largest noise annoyance study of this kind) adopts the LAeq(24 hr) noise metric for quantifying transport noise

⁶ *Evidential basis for community response to land transport noise*. D Humpheson and R Wareing 2019.NZ Transport Agency research report 656

(including rail noise) for comparison with surveyed results of people's noise annoyance.

- 2) A study by the World Health Organisation⁷ specifically examined the annoyance effect against transport noise assessed over a whole day. The study's noise metrics for transport noise (including rail noise) were LAeq,24h, Ldn, Lden or its components (Lday, Levening, Lnight).

6.6 I note at paragraph 5.5 of the 2023 Chiles report attached to the evidence of Ms Heppelthwaite states, in relation to the 1 hour LAeq values adopted within the KiwiRail submission, that "a one-hour average was considered inadequate to address the likely effects where more than rail 20 movements per day. My underlining.

6.7 I hold concerns regarding the applicability of the 1 hour LAeq noise unit in the Hutt district as rail traffic exceeds 20 rail movements per day on a regular basis (daily) in terms of rail traffic on the Wellington – Wairarapa Railway Line. By my estimation, based on noise peaks registered within the readings I have taken at rail-side noise measurement locations in the Hutt district, the Wellington – Wairarapa Railway line experienced more like 100 rail movements per day during the monitoring periods.

6.8 I note in evidence presented by Dr Chiles to a 2024 Hamilton City district plan hearing⁸, he stated "*the assumption of 2 freight train movements in a one-hour period was originally proposed as being approximately equivalent to the sound level from lines with regular passenger trains*". Based on measurements of freight trains on the Wellington – Wairarapa Railway Line, in my estimation 2 freight train movements would equate with passenger trains of 20 movements per hour. This violates the above '20 trains per day'

⁷ WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Annoyance by Guski, Schreckenberg & Schuemer. *Int J Environ Res Public Health*. 2017 Dec 8;14

⁸ Paragraph 5.5 of Statement Of Evidence Of Stephen Chiles On Behalf Of Kiwirail Holdings Limited, dated 24 July 2024 presented at hearings into Proposed Plan Change 12 to the Hamilton City District Plan.

threshold within which the KiwiRail LAeq(1 hr) rail noise guidance is said to be appropriate.

- 6.9 I am aware guidance on rail noise levels and buffer areas supported by Dr Chiles' (based on a stipulated LAeq(1 hr) level of rail noise at given distances) is promoted by KiwiRail as a standard metric for setting rail noise buffers within other district plans around New Zealand. To use the same reference rail noise source levels across different networks is surprising given I understand rail traffic (and hence noise) varies markedly across the rail network. I do not agree it is reasonable for the same level of rail noise emission to apply across all parts of the rail network which is inherent in accepting the KiwiRail submission.
- 6.10 KiwiRail seek (442.81) seeks the single Highway and Railway Noise Overlay extended out to a level of 57 dB LAeq(24h) "as modelled from the Railway corridor". No rail noise modelling results were provided to Council to determine where the LAeq(24 hr) 57 dB contour may be located alongside the Melling and Wellington – Wairarapa Rail Lines. Under these circumstances, the KiwiRail submission seeks the outer edge of the overlay be located 100m from the rail corridor.
- 6.11 Based on 24 hour rail noise levels measured adjacent to the rail corridor within the Hutt District (which I summarise below) I consider the outer extent of the overlay placed at 40m from the rail corridor is actually quite close to the requested level of rail noise of 57 dB.
- 6.12 Based on the information below, I consider the existing 40m overlay appropriate, in rail noise effects terms, as it encompasses locations most affected by rail noise while avoiding encompassing sensitive sites that receive outdoor rail noise at acceptable levels that do not require the acoustic protection of indoor habitable spaces.
- 6.13 At paragraphs 7.3 to 7.7 Dr Chiles discusses the results of my 24 hour rail noise readings referred to within my evidence in chief which he contrasts with KiwiRail's LAeq(1 hr) rail noise levels at

various distances to the corridor, to support extending the overlay to 100m from the rail corridor.

6.14 I now provide further data and details in support of the 40m extent of the rail noise overlay. However, firstly I would like to introduce results from rail monitoring I undertook in 2023 which occurred after completion of the ‘district-wide’ study⁹. **Appendix 1** (attached) describes further noise readings I took during March 2023 at Manor Park near the Wellington – Wairarapa Railway Line as part of a peer review of a noise assessment report prepared in relation to a resource consent application for a nearby proposed development in Benmore Crescent¹⁰.

	Distance (m) from rail	LAeq(24 hr) dB
A. 86 Cambridge Terrace, Waterloo	50	60.2
B. Ava Park, Adj. Water Treatment Plant	20	62.3
C. 3/86 North Street, Ava, Petone	48	54.0
D. 27A Mary Huse Grove, Manor Park	18	63.7

Table 1 Measured LAeq(24 hr) rail noise levels and distance to the rail track I have undertaken in the Hutt District.

6.15 I set out in Table 1 above, results of the original three rail readings at sites A, B and C undertaken as part of the district-wide survey referred to in my evidence in chief and forming, in part, the basis for a 40m overlay distance. Table also includes an additional rail noise reading (measured at site D) discussed above.

6.16 A graph of the Table 1 noise levels / distance results is presented in Figure 1 below, together the a the best-fit, log-based regression line based on these data points. I have extended this trend line to

⁹ Section D of my evidence in chief

¹⁰ While readings at site D were taken for this purpose, the location of the site adjacent to the Wellington – Wairarapa Railway Line and the relative absence of extraneous sounds (including the Hutt River) supports my view that, in the context of these hearings, site D readings are suitable to add to existing knowledge on rail noise in the district.

distances less than 20metres and greater than 50 metres to depict rail noise expected at closer and more distant locations.

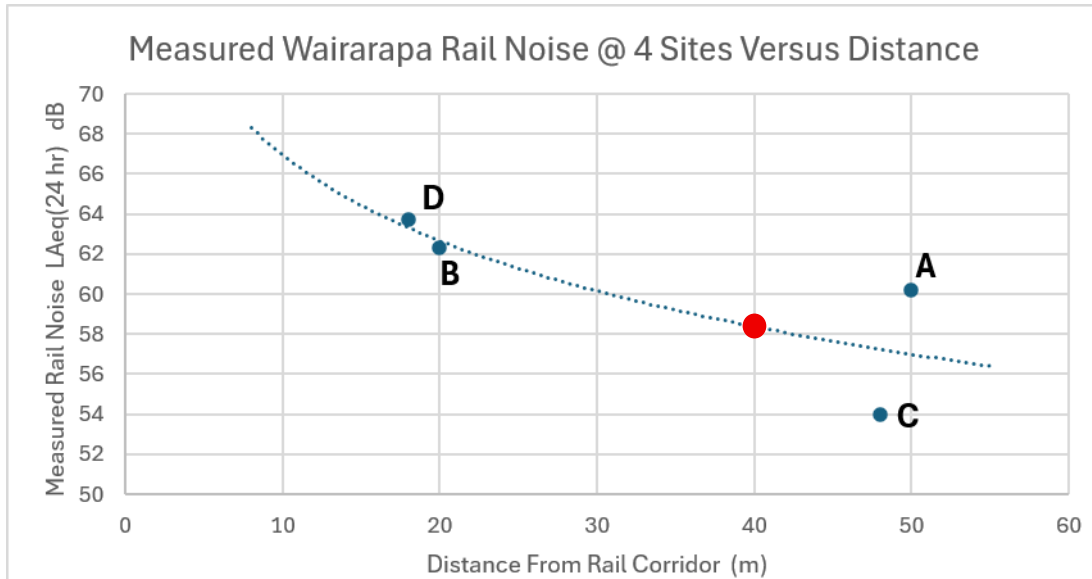


Figure 1 Graph of measured LAeq(24 hr) rail noise levels for four measurement sites A – D versus distance to the rail track. The red dot signals, on average, a rail noise level of 58 dB LAeq(24 hr) can be expected at 40m from the track.

6.17 As often occurs in practice, rail noise levels at the two more distant measurement sites (site A and site C) vary from the expected values. I note site C was partially screened from the rail corridor, as mentioned at paragraph 7.5 of Dr Chiles's evidence. Site A is located near Ava railway station (also mentioned by Dr Chiles) which I consider has led to measured noise levels at this location likely including extra noise (above the expected rail noise value) due to a contribution from activity within the nearby car park and traffic-related noise in the street associated with Ava Station.

6.18 Based on the above, I consider the 'best fit' curve of figure 1 reasonably represents the typical noise/distance relationship typically found adjacent to the rail network in the Hutt district.

6.19 The red dot in Figure 1 has been placed on the curved regression line where, on average, a rail noise level of 58 dB LAeq(24 hr) can be expected at 40m from the track. As this noise level at 40m is only 1 dB above the requested level of 57 dB LAeq(24 hr), I

consider the result at 40m reasonably aligns with the KiwiRail request to set the outer extent of the rail noise. More importantly, rail noise levels measured at the various distances confirm the current outer extent of the rail overlay suitably encompasses higher levels of rail noise which are able to be fully addressed by NOISE-S5 and NOISE-S6.

- 6.20 My assessment of the adequacy of the notified highway noise rail noise overlays and associated acoustic standards includes having regard to future noise from the Wellington – Wairarapa Railway Line, including increases in rail movements in the future. In September 2026 I note national media reported that new electric ‘Tūhono’ trains were arriving in 2030 and these are to travel between Wellington, Wellington – Wairarapa and Palmerston North *“replacing 35-year-old diesel trains and carriages that currently run services to the capital”*¹¹. I consider in the future it is likely trains operating from overhead mains power, hybrid diesel power or fully battery powered options will be in more frequent use on the Hutt rail network resulting in reduced operational noise from the rail corridor.
- 6.21 I estimate the new electric ‘Tūhono’ trains will result in ‘pass-by’ noise levels at least 10 dB less below the pass-by level of the current trains they are replacing. On this basis, increasing rail services (such as a doubling or tripling of daily services) will be more than compensated for in daily noise terms by the reductions achieved by introducing quieter electric units and their carriages.
- 6.22 At paragraph 7.54 of Dr Chiles’ evidence, he does not agree with my assumption that, on average, night time rail noise levels are 10 dB lower than the whole-day average. Looking at the data again, I agree the data shows night time levels may, on average, be less than 10 dB below whole-day average noise levels (for example, as shown in Appendix 1 data for Manor Park shows differences between 5.1 and 6 dB). Even at these lower difference values, my assessment of the adequacy of the indoor night time rail noise

¹¹ <https://www.stuff.co.nz/politics/360816651/lower-north-island-get-brand-new-fleet-electric-trains>

levels at my paragraph 41 remains. That is, that acoustic insulation standards proposed for the 'high' and 'moderate' noise overlays will result in acceptable night time indoor rail noise levels of not more than 30 dB LAeq(24 hr) indoors, within insulated (and ventilated) rooms complying with NOISE-S5 and NOISE-S6.

6.23 I note Dr Chiles considers¹² that, in the vicinity of the Melling Line, state highway noise overlay(s) should be shown separately from the rail noise overlay. I note the 'joint overlay' occurs to a much greater extent where State Highway 2 and the Wellington – Wairarapa Railway align are in close proximity for several kilometres.

6.24 Taking cumulative noise effects into account, I consider implementing the PDP provisions via the current 'unified' highway and rail noise overlays to be an effective and efficient approach, including in the vicinity of the Melling Rail Line. Using the road and rail noise overlay shown in the planning maps, to me it is quite clear on which sites new or altered buildings require acoustic treatment with provision for additional ventilation. For the purposes of implementing the PDP, I do not consider it necessary to modify the maps to show two noise overlays which would overlap in wide areas due State Highway 2 and the Wellington – Wairarapa Railway Line occur in proximity to each other along a significant portion of the Hutt Valley.

7.0 Quarry Zone noise limits

7.1 I have considered matters relating to the Quarry Zone daytime noise limit set out in "Comments in response from Jamie Exeter, acoustic & vibration expert on behalf of Winstone Aggregates" dated 30 September 2026.

7.2 At his paragraph 3, Mr Exeter identifies an error of mine at paragraph 14 of my evidence in chief which prefaced my discussion

¹² Paragraph 7.8 of Dr Chiles evidence.

on the submitter request to adjust the quarry zone daytime permitted noise limit.

- 7.3 I agree I should have stated the correct notified daytime noise limit in the Quarry Zone in NOISE-APP1 is 67 dB LAeq(15 min), not as I indicated 65 dB which was helpfully picked up by Mr Exeter which he considers a typographical error.
- 7.4 However, I do not accept the argument that the technical difference between LA10 noise limits and LAeq noise limits justifies the 1 dB increase to 68 dB which Mr Exeter supports.
- 7.5 In part, the problem is that we experts often resort to small decibel numbers between such as 1 and 3 dB when describing the difference between LA10 and LAeq measured levels for the same sound. The common vernacular is that a difference of between 1 to 3 dB is often quoted as representing the difference between these two types of noise units (when measuring the same sound). However, these are simplistic attempts to put into numbers what actually occurs and this does not tell the full story in my view.
- 7.6 When adopted as a compliance limit, a 'numbers' comparison (as above) may lead one to believe the LAeq will allow more noise than an LA10 noise limit. However, this could be considered false thinking when it is considered the sound energy of each short duration, high level sound over the 15 minute period is fully captured by the LAeq type noise limit. Such maximum excursions during the 15 minutes would not be captured by the LA10 metric as, statistically, 10% of the highest sound levels are not controlled to the LA10 limit. To this extent, noise limits using LAeq units and noise limits based on LA10 have a very similar control effect in my view.
- 7.7 Thus, I remain of the view there is no clear technical reason to apply any adjustment as sought when changing from LA10 to LAeq noise limits. On this basis, the requested of submission point 444.18 to increase the Quarry Zone APP 2 daytime noise limit to 68 dB is not recommended to be adopted.

8.0 Construction noise

- 8.1 I have considered matters relating to the assessment of construction noise set out in “Comments in response from Jamie Exeter, acoustic & vibration expert on behalf of Winstone Aggregates” dated 30 September 2026.
- 8.2 I acknowledge points (a) to (f) set out in Mr Exeter’s paragraph 13, however I do not consider the situations he describes fully focus on how Council assesses and enforces construction noise limits in practice, should they be required to do so.
- 8.3 While I agree it should not be necessary to comply with construction noise limits outside an unoccupied building, I do not support the wording Mr Exeter proposes, or similar, being adopted into NOISE-APP2 (Noise limits for construction activities). I consider the enforcement of construction noise limits in any Council undertaking would include consideration of compliance with other parts of the noise chapter, specifically NOISE-P2 (Short-term noise generating activities) which is a policy clearly focused on people's health, and to the need to avoid adverse effects on people that are unreasonable.
- 8.4 Following any complaints, or when generally assessing construction noise, I consider a prudent Council officer would focus on construction noise received at buildings housing activities sensitive noise. It would be normal for the Council officer to satisfy themselves that a receiver location is occupied by people who regularly inhabit the building (at least for part of the day). I therefore do not agree that words such as the requested “Occupied buildings with activities sensitive to noise” be included in NOISE-APP2.
- 8.5 If construction noise compliance at an unoccupied building ever become an issue beyond these precautions taken at the officer level, I consider the issue to be adequately dealt with by the recommendation to improve the compliance pathway within NOISE-R2.2 for situations where construction noise may exceed the

relevant noise limit at buildings known to be unoccupied during the construction work period.

9.0 Vibration – qualitative or quantitative standard for amenity

- 9.1 Winstones submission point 444.12 seeks to introduce measurable peak particle velocity (PPV) limits for non-blasting vibration at occupied buildings in place of the qualitative wording in NOISE-R5.1(a). In response, my evidence recommends against a district-wide PPV standard. Mr Exeter's updated evidence at paragraphs 15 to 29 clarifies that his recommended numerical limits are directed to vibration generated by construction works, even though this was not mentioned within the submission.
- 9.2 While I acknowledge that Mr Exter raises some valid points at his at paragraphs 17 to 20 - that more complex vibration standards are difficult to use as permitted activity standards, while PPV can be predicted and monitored in practice, I am not persuaded such benefits outweigh the difficulties. At paragraphs 60 to 66 of my evidence in chief, I set out issues and problems which may arise when attempting to apply district-wide daytime and night time ground vibration limits, albeit confined to sources of construction vibration.
- 9.3 Given it is now clear the submission sought a vibration standard proposed for NOISE-R5.1(a) would only apply to construction vibration, I cannot agree evidence exists that the proposed tabulated PPV limits allow a suitable tolerance over vibration limits adopted elsewhere (in other relevant standards and guidelines) that apply to day-to-day activities that are not generated by temporary construction activities. It can be seen from a comparison of NOISE-R5 construction and non-construction generic noise limits than the PDP allows construction noise at limits that are significantly relaxed, compared to limits on non-construction activities to account for the limited duration of construction activities.
- 9.4 Overall, I remain supportive of the qualitative approach of NOISE-S5.1(a) for the above reasons and as set out in my evidence chief.

Council has many options to apply in any situation where the management of vibration from construction activities requires Council involvement. I firmly believe that, should vibration associated with a construction site require action, Council would adopt the multi-faceted FIDOL approach to assess whether the effect reaches an “objectionable” threshold which may indicate the point at which regulation is necessary.

9.5 I therefore remain of the view that I do not support amending NOISE-R5.1(a) to apply numerical PPV vibration limits to construction vibration district-wide as requested.

9.6 Mr Yang on behalf of Te Kārearea Limited ("TKL") and Rosco Ice Cream Ltd ("Rosco") Submitter #447 has reviewed proposed rule NOISE-R5. He recommends a separate vibration rule for construction activities using alternative wording to NOISE-R5.1(a) qualitative standard as shown below:¹³

The activity is managed in such a way that construction vibration effects do not unreasonably compromise amenity values within any other site.

9.7 As a consequential amendment, Mr Yang's sets out additional wording to add “except construction activities” to the title of NOISE-R5 which, I agree, would be necessary if the additional qualitative construction vibration recommended by Mr Yang were adopted.

9.8 However, I do not support adding a new rule which would separately apply to construction vibration. Although the added qualitative standard would target vibration from construction, I do not agree the attributes of construction and non-construction activities are sufficiently different to require separate consideration. This is particularly because of the qualitative approach of NOISE-R5.1(a) already enables sufficient flexibility to ensure vibration from construction and non-construction sources can be adequately

¹³ Paragraph 7.9 Statement of Evidence of Micky Yang (Noise and Vibration)

assessed, with Council able to require suitable mitigation measures be applied depending upon the circumstances.

- 9.9 At paragraph 4.3 Mr Yang's evidence he argues that separate qualitative vibration standards for construction and non-construction vibration sources mirrors the approach already adopted in the Proposed Plan for noise, where day-to-day operational noise is controlled via NOISE-R1 and temporary construction noise is controlled via NOISE-R2. While I agree the Proposed Plan recognises that construction noise warrants different treatment from operational noise owing to its temporary in nature. I see no similar demarcation between proposed qualitative standards NOISE-R5.1(a) and proposed NOISE-R5.1(b) as worded on page 6 of the evidence Mr Alexander Gibson, from Spencer Holmes Limited, the planner representing this submitter.
- 9.10 NOISE-R5.1(a) as currently worded bases vibration acceptability on a level of ground vibration which does not *".... compromise public health or safety, or wellbeing and amenity values within any other site"* whereas proposed construction vibration-specific standard would require this type of vibration to be controlled to a similar standard using the words *"...managed in such a way that construction vibration effects do not unreasonably compromise amenity values within occupied areas of any other site"*.
- 9.11 I therefore do not support the proposal for a separate qualitative standard for construction vibration. I consider construction vibration can be adequately managed using the wording of NOISE-R5.1(a), specifically based on whether construction vibration will *".... compromise public health or safety, or wellbeing and amenity values within any other site"*.
- 9.12 Overall, I cannot agree there is a clear need for a distinction within NOISE-R5.1 when setting qualitative standards for vibration from construction and for vibration arising from other sources. In essence, the requested separate of qualitative controls over ground vibration seems to be a solution to a problem that, in my view, does not exist.

- 9.13 Paragraph 4.14 of Mr Gibson’s evidence and Mr Yang’s paragraph 4.9 discuss the proposal to insert the word “unreasonable” within the notified wording of NOISE-R5.1(a) so that that it reads as follows;

“...do not unreasonably compromise public health or safety, or well-being and amenity values within any other site”.

- 9.14 I support this amendment as I consider it adds strength of the basis of assessment required and, as Mr Yang points out at his paragraph 4.12, recognises that people can tolerate a higher level of vibration when it is temporary, and that such vibration is not necessarily unreasonable given its temporary nature. I believe this amendment would strengthen the ability of NOISE-S5.1(a) to assess whether the effects of received vibration are sufficient to require Council action.
- 9.15 I note TKL's submission point 447.12d opposed NOISE-R5 (Activities that result in vibration) and sought an amendment to clarify that temporary activities and construction activities are not subject to NOISE-R5.1(a). I do not support the submission point regarding exempting Temporary Activities from NOIOSER-R5.1(a). for the reason(s) outlined above, specifically that an over-arching qualitative vibration standard (amended as above) can adequately assess vibration from construction and non-construction activities.
- 9.16 I note Mr Yang (at his paragraph 5.2 to 5.4) discusses the submission by the Manor Park and Haywards Residents Community Incorporated Society ("the Association"). The Association’s submission requests wording of NOISE-R5 be amended to require ground vibration to “not be discernible” on any residential land outside the subject development. I agree with Mr Yang whether ground vibration is “discernible” would not represent an appropriate assessment threshold for NOISE-R5.1(a) in my view. Given humans can perceive ground vibration at very low vibration amplitudes, whether ground vibration is detectable is not in my view a reasonable basis to assess the significance of the ground vibration effect. I therefore support Mr Yang’s view that the

Association's submission recommending modification of NOISE-R5 to insert terms based on discernible levels of ground vibration be rejected.

MALCOLM HUNT

For Hutt City Council

6 October 2026

APPENDIX 1: 2023 Rail Noise Measurements

In Section 6 of this evidence I discuss rail noise measurements I have undertaken in the Hutt District. After carrying out the district-wide ambient noise survey during 2021, I carried out a further noise reading during March 2023 at Manor Park near the Wellington – Wairarapa Railway Line as part of a peer review of a noise assessment report prepared in relation to a consent application for a nearby proposed development in Benmore Crescent. The readings I obtained were presented in the following report I prepared for Council;

Peer Review of T&T Acoustic Report: Waste Management Facility, 30 Benmore Crescent, Manor Park. On behalf of Hutt City Council.
Malcolm Hunt Associates report dated March 2023.

During my 2023 site visit I set up and operated an automated sound level monitor at the location indicated In Figure 1 (below) 18 metres from the Wellington – Wairarapa Railway Line, adjacent to the rear boundary of 27A Mary Huse Grove, Manor Park. The unit was left in place for several days.



Figure 1 Aerial photograph showing the location of ambient sound level monitoring adjacent to the rear boundary of 23A Mary Huse Grove.

Rail noise levels reasonably unaffected by other sounds in the area were measured over relatively calm weather conditions between 25th and 28th March 2023. The microphone was located at 1.2m above ground. At this height the track itself is partially screened but trains travelling past the site on either set of tracks were not screened.

A graph of sound levels measured at this location are shown in Figure 2 below.

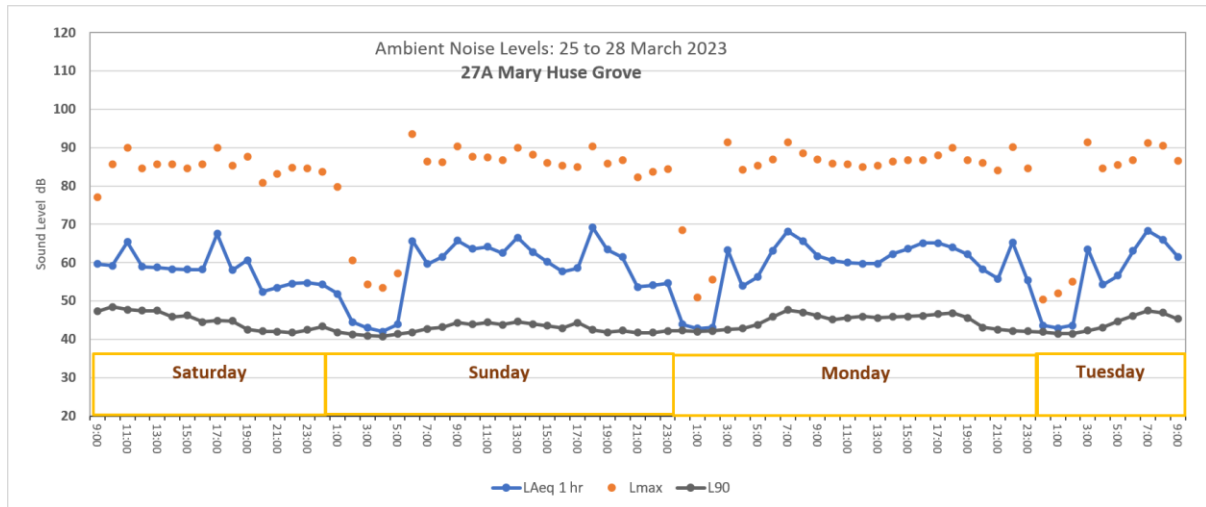


Figure 2 Ambient sound levels measured at 18m from the rail tracks adjacent to the rear boundary of 23A Mary Hulse Grove, Manor Park.

One-hour LAeq rail noise received at this location are summarised in the following table.

	LAeq24 hr	LAeq NIGHT	LAeq(24hr) minus NIGHT
25th March	62.7	57.5	5.1
26th March	64.9	57.8	6.5
27th March	63.3	59.9	5.1

[end]