

BEFORE THE HEARINGS PANEL

IN THE MATTER

of the Resource Management Act 1991
("RMA")

AND

IN THE MATTER

of submissions by New Zealand
Transport Agency Waka Kotahi
("NZTA") (submitter and further
submitter 152) and KiwiRail Holdings
Limited ("KiwiRail") (submitter and
further submitter 233) on Hearing
Stream 3 of the Proposed Waitaki
District Plan ("**Proposed Plan**")

STATEMENT OF EVIDENCE OF DR STEPHEN CHILES ON BEHALF OF NZ TRANSPORT AGENCY WAKA KOTAHI AND KIWIRAIL HOLDINGS LIMITED

NOISE AND VIBRATION

1. INTRODUCTION

- 1.1 My name is Dr Stephen Gordon Chiles. I have the qualifications of Doctor of Philosophy in Acoustics from the University of Bath and Bachelor of Engineering in Electroacoustics from the University of Salford, UK. I am a Chartered Professional Engineer and Fellow of the UK Institute of Acoustics.
- 1.2 I am self-employed as an acoustician through my company Chiles Limited. I have been employed in acoustics since 1996, as a research officer at the University of Bath, a principal environmental specialist for NZTA and a consultant for Arup, WSP, and URS, Marshall Day Acoustics and Fleming & Barron. I am contracted as the principal advisor to provide the Environmental Noise Analysis and Advice Service to Te Whatu Ora - Health New Zealand.
- 1.3 I have been involved in many situations relating to noise effects on new or altered sensitive activities around existing infrastructure. I was an Independent Commissioner for plan changes for Queenstown and Wanaka Airports and a

plan variation for Port Nelson, which dealt particularly with noise effects. I have previously been engaged to advise NZTA and Auckland Transport (roads), KiwiRail (railways), Christchurch City Council (airport) and Environment Canterbury (port) on reverse sensitivity noise issues. I have presented acoustics evidence for NZTA and KiwiRail on numerous plan changes and plan reviews. I previously drafted potential environmental noise provisions for Clause G6 of the New Zealand Building Code for the Ministry of Business, Innovation and Employment.

- 1.4 I am convenor of the New Zealand reference group for 'ISO' acoustics standards and a member of the joint Australian and New Zealand committee responsible for acoustics standards. I was Chair of the 2012 New Zealand acoustics standards review, Chair for the current road-traffic noise standard revision, Chair for the 2010 wind farm noise standard, and a member for the 2008 general environmental noise standards.

2. CODE OF CONDUCT

- 2.1 I confirm that I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and will continue to comply with it while giving oral evidence at the hearing. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

3. SCOPE OF EVIDENCE

- 3.1 My statement relates to the potential effects of road and rail sound and vibration on new and altered sensitive activities and the need to manage those effects and activities through provisions in the Proposed Plan. I have prepared this statement for NZTA and KiwiRail as operators of the state highway and rail corridors within the Waitaki District. I was previously engaged by NZTA and KiwiRail to advise on their submissions, and I helped to prepare the noise overlay for state highways proposed by NZTA.
- 3.2 I have been separately engaged by, and prepared evidence for, the National Public Health Service with respect to its submissions on the Proposed Plan.
- 3.3 I have prepared general advice on land use controls for railway sound and vibration nationally. That advice is contained in Appendix 2 of the Section 32

report ("**KiwiRail Section 32 Report**") that was included as Attachment A to KiwiRail's submission on the Proposed Plan. To avoid repetition, I make reference to the KiwiRail Section 32 Report with respect to various matters I discuss in my evidence.

3.4 NZTA and KiwiRail made submissions on the Proposed Plan seeking the following amendments, relevant to my evidence:

- (a) inclusion of overlays for highway and rail noise, based on noise contours for highways (up to 100m from highways) and based on a fixed distance of 100m from the rail corridor designation boundary (NZTA and KiwiRail);
- (b) retention of noise standards requiring acoustic insulation and ventilation (KiwiRail);
- (c) replacement of noise standards requiring acoustic insulation and ventilation (NZTA); and
- (d) inclusion of a Rail Vibration Alert Area overlay for areas within 60m of the rail corridor boundary (KiwiRail).

3.5 The purpose of these provisions is to protect the health and amenity of occupants of those buildings, and to avoid or mitigate potential reverse sensitivity effects on the operations of NZTA and KiwiRail.

3.6 My evidence will address:

- (a) noise and vibration effects arising from road and rail infrastructure;
- (b) methods to manage adverse effects on new and altered buildings containing sensitive activities near existing infrastructure;
- (c) the appropriateness of the relief sought by NZTA and KiwiRail from an acoustics and public health perspective; and
- (d) the Section 42A report prepared by Ms Belgrave dated 21 September 2026 ("**Section 42A Report**"), including Appendix 4, which sets out comments by Marshall Day Acoustics ("**MDA**") dated 18 September 2026, in relation to recommendations on the relief sought by NZTA and KiwiRail.

4. NOISE AND VIBRATION EFFECTS FROM ROADS AND RAILWAYS

- 4.1 Sound and vibration from road and rail networks have the potential to cause adverse health effects on people living nearby. These adverse effects include ischaemic heart disease, annoyance and sleep disturbance for building occupants, as well as damage to buildings at greater railway vibration magnitudes than those which can cause annoyance.
- 4.2 I address these effects for railway sound and vibration in sections 2 and 3 of Appendix 2 to the KiwiRail Section 32 Report. The fundamental issues and key aspects of the evidence base are common for road and rail.
- 4.3 In summary, the evidence of adverse health effects from road and rail sound is documented by the World Health Organisation ("WHO").^{1,2} Local research has addressed the applicability of this international data to New Zealand.^{3,4,5} The relief sought by NZTA and KiwiRail on the Proposed Plan is consistent with WHO guidelines to reduce external sound, as an integral part of broader noise management activities. I describe below some of the actions that NZTA and KiwiRail seek to implement as part of this management approach.

5. METHODS TO MANAGE ADVERSE EFFECTS

- 5.1 In sections 7 and 8 of Appendix 2 to the KiwiRail Section 32 Report, I set out approaches to manage effects of railway sound and vibration. For both roads and railways, I have been involved in numerous different activities undertaken by NZTA and KiwiRail to manage and reduce sound and vibration where practicable. For railways, these activities include installation of ballast mat, rail grinding and tamping, ballast cleaning and replacement, and automated monitoring of rolling stock wheel condition. For roads, activities include development of quieter road surfaces, investigation into engine braking noise and installation of noise barriers. For new or altered roads, NZTA applies NZS 6806,^{6,7} which provides guidance on evaluating mitigation measures.

1 World Health Organisation, Guidelines for community noise, 1999; World Health Organisation, Burden of disease from environmental noise, 2011.

2 World Health Organisation, Environmental noise guidelines for the European region, 2018.

3 Humpheson D. and Magill K., 2024. Community response to transport noise exposure in New Zealand, NZTA Research Report 727. <https://nzta.govt.nz/resources/research/reports/727/>.

4 Humpheson D. and Wareing R., 2019. Evidential basis for community response to land transport noise, NZTA Research Report 656. <https://nzta.govt.nz/resources/research/reports/656/>.

5 Evans L. et al, 2024. Health cost of land transport noise exposure in New Zealand, NZTA Research Report 715. <https://nzta.govt.nz/resources/research/reports/715/>.

6 New Zealand Standard, NZS 6806:2010 Acoustics – Road-traffic noise – new and altered roads.

7 NZ Transport Agency, Guide to assessing road-traffic noise, 2024.

- 5.2 However, even with practicable improvements implemented, the operation of the state highway and rail networks can result in adverse effects such as noise and vibration, which cannot be completely internalised within typical designation boundaries. These effects commonly result from the road and rail networks maintained in normal condition, and cannot be solely attributed to defects in road surface, track or rolling stock.
- 5.3 As these effects cannot be completely internalised within the road and rail corridors, in my opinion, land use controls on new and altered buildings for sensitive activities are critical to protect those activities from adverse noise and vibration effects. Such controls, in turn, are fundamental to managing the potential for reverse sensitivity effects on the road and rail networks. The location of incompatible sensitive activities in proximity to road and rail infrastructure can lead to noise and vibration effects on, and complaints from, sensitive users.
- 5.4 If it is not practicable to avoid sensitive activities near road and rail corridors, for new buildings being constructed (or existing buildings being altered), it is relatively straight-forward to control internal sound and vibration through the building location, design and systems (like acoustic insulation and mechanical ventilation). In most cases, it is practical to achieve acceptable internal sound and vibration levels using such measures. Thus, with careful design of building location, orientation and materials, future occupants of that building can be protected from the most significant adverse effects associated with road and railway sound and vibration.
- 5.5 Rules in district plans commonly control the location and design of sensitive activities, where such activities seek to locate near existing sound sources such as roads, railways, airports, ports, quarries, industrial sites, industrial and business zones, gun clubs and motorsport facilities. In the Operative Waitaki District Plan there are acoustic insulation requirements for noise sensitive activities near Omarama Airfield.⁸ In the Proposed Plan there are general acoustic insulation requirements in relation to some urban zones, highways and railways, and a specific rule in relation to sensitive activities near Omarama Airfield.⁹

⁸ Operative Waitaki District Plan, rules 3.4.9, 4.4.10, 7.4.12 and 9.4.8.

⁹ Proposed Waitaki District Plan, rules NOISE-R2 and NOISE-R9.

6. RELIEF SOUGHT

Highway and railway noise overlays/areas

- 6.1 The NZTA and KiwiRail submissions seek for the Proposed Plan to include highway and railway noise overlays, defining the extent in which controls on new and altered sensitive activities apply. In the notified version of the Proposed Plan, controls are defined by distances specified in NOISE-R2, NOISE-S3 and the definition of a "Transport Corridor".
- 6.2 The NZTA and KiwiRail submissions seek changes to both the mechanics of how distances are specified (ie by mapped overlay rather than an area defined by words in plan provisions), and the specific values of those distances whether mapped or written. In my experience, mapped overlays generally provide the clearest approach, also allowing for more nuanced variable distances from highways as I will discuss below. However, regardless of whether mapped overlays are used, I consider it fundamental for controls to apply over an adequate distance from highways and railways to encompass noise exposures that could require mitigation.
- 6.3 For highways, NZTA submitted that an overlay should be a variable extent from highways based on noise modelling. NZTA provided geospatial data for a proposed overlay, which I helped to prepare. The variable distance shown in this proposed overlay is capped at a maximum of 100m from highways for policy reasons, and subject to a 25m minimum distance. The proposed overlay extends along the entire length of highways, including all speed limits. The proposed overlay often extends up to the 100m cap on higher speed sections of SH1, but reduces where there is terrain screening or lower speeds. For SH83, SH85, and to some extent SH8, lower traffic volumes typically result in a narrower overlay. In general, for highways I consider an overlay based on modelled contours can have a benefit in targeting controls on the most affected areas.
- 6.4 For railways, KiwiRail requested an overlay apply over land that is 100m from the rail corridor boundary. I discuss rail sound levels in section 5 of Appendix 2 to the KiwiRail Section 32 Report, including a table of typical levels at varying distances from railways. I understand from KiwiRail that the Main South Line through the Waitaki District has scheduled freight movements, including at night.¹⁰ I consider that the typical sound levels in the KiwiRail Section 32 Report

¹⁰ Statement of Evidence of Michelle Grinlinton-Hancock, dated 8 October 2026, section 3.

provide a reasonable basis to determine where land use controls should apply in this instance, corresponding with the proposed 100m distance.

Noise controls

- 6.5 Proposed NOISE-R2, NOISE-S2, NOISE-S3 relate to new and altered buildings for use by a sensitive activity near to road and rail.
- 6.6 KiwiRail submitted in general support of the acoustic insulation and ventilation controls (NOISE-R2, NOISE-S2, NOISE-S3) in the notified version of the Proposed Plan. NZTA sought an alternative set of controls be used in relation to highway noise, by replacing the notified provisions with a set of provisions that NZTA had developed through mediation in another district. There is a high degree of overlap between the notified provisions and the provisions sought by NZTA, with the same matters generally being addressed in both sets.
- 6.7 Having considered the notified noise provisions further, I consider there are a number of technical issues with the notified provisions (NOISE-R2, NOISE-S2, NOISE-S3) which need to be fixed. These issues could be addressed by either:
- (a) replacing the notified provisions with the NZTA requested provisions (I understand this is NZTA's preferred position); or
 - (b) alternatively, amending parts of the notified provisions rather than replacing them entirely.
- 6.8 Key issues with the notified provisions that the NZTA provisions highlight are:
- (a) In the NZTA provisions, compliance with acoustic treatment requirements is determined based on internal noise levels, always resulting in healthy indoor environments. By comparison, under the notified provisions there is an alternative criterion of fixed sound insulation that could be inadequate in some situations with houses close to highways. I consider criteria based solely on internal noise levels are appropriate for road and rail noise.
 - (b) Indoor noise criteria for different types of noise sensitive activities are specified in the NZTA provisions rather than by reference to an external standard as in the notified provisions. I consider explicit reference to the different types of noise sensitive activities in the noise provisions is appropriate because it is more efficient for plan users and avoids potential ambiguity in categorising activities under the external standard.

- (c) The NZTA provisions require a 3dB allowance to be added to measured or predicted road-traffic noise, compared to 2dB in the notified provisions. I consider the notified 2dB does not adequately allow for uncertainty and typical variations in roads and traffic, and 3dB is more appropriate.
- (d) Indoor noise criteria for different types of noise sensitive activities are specified in the NZTA provisions rather than by reference to an external standard as in the notified provisions. I consider explicit reference to the different types of noise sensitive activities in the noise provisions is appropriate because it is more efficient for plan users and avoids potential ambiguity in categorising activities under the external standard.
- (e) In the NZTA provisions, mechanical ventilation is always required when windows need to be closed, whereas the notified provisions are ambiguous or omit mechanical ventilation if fixed sound insulation or the construction schedule options are adopted. Mechanical ventilation should always be required under those alternative options because otherwise the intended sound insulation performance would not be achieved when windows need to be opened.
- (f) Mechanical ventilation specifications include airflow and temperature requirements in the NZTA provisions, to reduce the need for building occupants to open windows that need to be kept closed for sound insulation. I consider this is appropriate.
- (g) Alternative compliance pathways are included in the NZTA provisions for scenarios that do not require technical assessment.

6.9 In my opinion, the notified provisions in the Proposed Plan should be replaced or amended to address the above issues. These changes will ensure the provisions are technically effective, clear and enforceable, and appropriately manage effects on sensitive activities. This will also provide greater certainty for NZTA and KiwiRail as operators of the state highway and rail networks.

Rail vibration

6.10 KiwiRail's submission seeks a Rail Vibration Alert Area Overlay be included in the Proposed Plan. As set out in sections 3 and 6 of Appendix 2 to the

KiwiRail section 32 report, vibration can routinely exceed relevant criteria over 100m from the railway tracks in New Zealand.

- 6.11 From a technical perspective, it would be preferable to assess all sites within at least 100m of rail corridors and to apply land use controls to manage the vibration effects. However, despite my technical opinion, KiwiRail's submission does not seek land use controls, only an alert layer extending 60m from the rail corridor designation boundary.

7. RESPONSE TO NOISE SECTION 42A REPORT

Extent of overlay / area

- 7.1 Ms Belgrave recommends that controls on sensitive activities near both highways and railways should apply within a "*Transport Corridor Noise Control Area*".¹¹
- 7.2 Ms Belgrave recommends that the Transport Corridor Noise Control Area should extend 100m from railway corridors.¹² Based on rail noise levels I have discussed above, I consider this an appropriate distance.
- 7.3 For highways, Ms Belgrave recommends that the Transport Corridor Noise Control Area should extend 100m from the highway if the speed limit is 70km/h or above, and 35m if the speed limit is less than 70km/h. I have compared these fixed distances to the varying distances in the mapped overlay proposed by NZTA and found:
- (a) a 100m fixed distance is the same as the overlay cap applied by NZTA, so the fixed distance covers all parts of the overlay proposed by NZTA for highways with a speed limit of 70km/h or above;
 - (b) a 35m fixed distance appears to encompass most or all of the overlay proposed by NZTA for parts of SH8, SH83 and SH85 with a speed limit below 70km/h; and
 - (c) a 35m fixed distance does not cover significant portions of the overlay proposed by NZTA for parts of SH1 with a speed limit below 70km/h in Oamaru, Hampden and Palmerston. The extent of the NZTA overlay varies significantly in these areas but as a compromise

¹¹ Section 42A Report, paragraph 64.

¹² Section 42A Report, paragraph 69.

value, I consider a fixed distance of 50m could cover the majority of the overlay.

7.4 Based on the above, I consider that the state highway fixed distances proposed by Ms Belgrave could largely provide an adequate alternative to the mapped overlay proposed and preferred by NZTA, if amended to account for lower speed parts of SH1. If these fixed distances are adopted, I recommend that (if retained) the definition for the "Transport Corridor Noise Control Area" proposed by Ms Belgrave¹³ be further amended to either:

- (a) increase the 35m distance to 50m from all highways where the permanent speed limit is less than 70km/h; or
- (b) qualify the 35m distance so that it only applies to SH8, SH83 and SH85, and add a new 50m distance to apply to parts of SH1 with a permanent speed limit less than 70km/h.

7.5 I note a minor potential matter relating to variable speed limits. For example, at Duntroon School the speed limit on SH83 varies from 70km/h to 30km/h, straddling the threshold for the two distances. In my opinion, the definition should explicitly relate to the higher "permanent speed limit".

NOISE – R2

7.6 Ms Belgrave discusses NZTA's requested amendment of NOISE-R2 at section 7.17.2 of the Section 42A Report. In summary, she recommends an amendment of NOISE-R2 to reference the Transport Corridor Noise Control Area (as defined).¹⁴ This amendment is not reflected in the drafting of the rule at paragraph 217, which only shows changes to PER-2, whereas Appendix 1 also shows changes to PER-1 to exclude highways. I assume this is an oversight, and support the recommended amendments to PER-1 and PER-2 of NOISE-R2 marked up in Appendix 1 to the Section 42A report. These amendments will correctly apply NOISE-S2 and NOISE-S3 for sensitive activities in the Transport Corridor Noise Control Area. I also note a minor error that "a" should be deleted from the area description.

7.7 In paragraph 215 of the Section 42A Report, Ms Belgrave discusses potential difficulties in applying NOISE-R2 to internal alterations to buildings with reference to the advice from MDA. There appears to be a discrepancy

¹³ Section 42A Report, paragraph 69.

¹⁴ Section 42A Report, paragraph 212.

between the MDA advice and Ms Belgrave's recommendation on this matter. MDA supports maintaining the notified NOISE-R2 to address both new buildings as well as additions and alterations, rather than splitting new buildings and alterations/additions into separate rules as in the NZTA proposed provisions. However, Appendix 1 to the Section 42A Report shows NOISE-R2 not applying to any alterations including additions. In my opinion, to manage potential noise effects, NOISE-R2 should apply to all new buildings containing a noise sensitive activity and additions or alterations to buildings that result in a new space for a sensitive activity. I note that the change Ms Belgrave has proposed to NOISE-R2 is not consistent with NOISE-S3 which still applies to alterations and additions.

NOISE-S2

- 7.8 In paragraphs 302 and 303 of the Section 42A Report, Ms Belgrave discusses mechanical ventilation provisions in NOISE-S2. She highlights that evidence has not been provided for alternate requirements sought by NZTA and considers heating and cooling requirements are managed by the Building Code and not related to noise.
- 7.9 Firstly, I disagree that mechanical ventilation provisions, including temperature control, are not related to noise. The absence of adequate mechanical ventilation and temperature control in a home results in occupants opening doors and windows for airflow. This results in greater noise exposure for those occupants. Secondly, relying on advice I have previously commissioned for the NZTA,^{15,16} I understand that Building Code requirements are inadequate for the purpose of allowing residents unfettered choice to keep windows closed. I understand there is a need for greater air flows, heating and cooling from a mechanical ventilation system so that residents have a viable choice to keep windows closed, such that the building then provides adequate sound insulation to reduce external road and rail noise to healthy levels inside.
- 7.10 The alternative acoustic treatment and ventilation provisions sought by NZTA require mechanical ventilation in all instances where windows must be closed to achieve specified internal criteria, and if applying a construction schedule. I consider this is essential from a noise management perspective.

¹⁵ <https://nzta.govt.nz/assets/Highways-Information-Portal/Technical-disciplines/Noise-and-vibration/Research-and-information/Other-research/Ventilation-systems-installed-for-road-traffic-noise-mitigation.pdf>

¹⁶ <https://nzta.govt.nz/assets/Highways-Information-Portal/Technical-disciplines/Noise-and-vibration/Research-and-information/Other-research/ventilation-specifications-for-acoustic-treatment-june-2020.pdf>

- 7.11 The notified version of NOISE-S2 has significant gaps where it might not require mechanical ventilation because when NOISE-S3.1.a or NOISE-S3.2.b are applied, there are no indoor design sound levels, so the preconditions in NOISE-S2.1 are not met. I also note a discrepancy in use of sound levels and noise levels between NOISE-S2 and NOISE-S3. Ms Belgrave does not address these issues.
- 7.12 In my opinion, the notified NOISE-S2 needs to either be amended or replaced with the NZTA requested provisions. If the notified version is to be amended, I consider NOISE-S2 should be amended to apply in all instances, including where NOISE-S3.1.a, NOISE-S3.1.b or NOISE-S3.2.b are applied.

NOISE-S3

- 7.13 Ms Belgrave recommends an amendment of NOISE-S3 to remove the notified limitation of application so that it then would apply to all of the Transport Corridor Noise Control Area.¹⁷ I agree this amendment is essential for NOISE-S3 to apply to all of this area.
- 7.14 If the notified NOISE-S3 is to be amended rather than using the alternative provisions proposed by NZTA, I recommend the following additional amendments:
- (a) There should be an exclusion added to NOISE-S3.1.a so that it cannot be applied in relation to road and rail noise, such that NOISE-S3.1.b must always be applied. This is because NOISE-S3.1.a will not provide adequate sound insulation close to highways and railways. Conversely, for buildings slightly further away within the Transport Corridor Noise Control Area, or with sensitive spaces facing away from the highway or railway it would result in excessive sound insulation.
 - (b) NOISE-S3.1.b.ii and iii should use the defined term "habitable room" rather than "habitable space".
 - (c) NOISE-S3.1.b.iv should expressly refer to internal sound level criteria (rather than an external standard).
 - (d) NOISE-S3.Note should be amended to require a 3dB allowance for uncertainty and future traffic growth (rather than 2dB). This is

¹⁷ Section 42A Report, paragraph 312.

because while 2dB might be appropriate to allow for typical traffic growth, it is inadequate to allow for measurement or prediction uncertainty, and typical changes such as road surfaces, lane positioning, traffic composition and speed.

NOISE-APP1

- 7.15 Ms Belgrave recommends a minor amendment to NOISE-APP1,¹⁸ but otherwise, recommends retaining the notified construction schedule.
- 7.16 The notified NOISE-APP1 only applies to lower speed highways and certain building locations/designs. In other situations a design report from a specialist is required. I recommend this sentence should be deleted as in any other situations NOISE-S3.2.a should apply. Otherwise the notified NOISE-APP1 effectively provides a loophole to bypass the criteria in NOISE-S3.1. I therefore recommend deletion of the following words from NOISE-APP1: "~~In all other situations, a design report from a suitably qualified acoustics specialist is required.~~"
- 7.17 In my opinion, the limitations in NOISE-APP1 are appropriate for road noise but are ambiguous with respect to rail noise, for which the construction schedule would often be inadequate. I recommend that either NOISE-S2.2.b or NOISE-APP1 should explicitly prevent application of the construction schedule for rail noise.
- 7.18 Given the applicability limitations in NOISE-APP1, with the above deletion and an explicit requirement added to NOISE-S2 for mechanical ventilation, I consider the notified NOISE-APP1 could be adequate for highway noise in lieu of the NZTA alternative provisions.
- 7.19 The amendments I have recommended to the notified provisions do not address the NZTA alternative provisions in relation to alternative compliance pathways or commissioning for mechanical ventilation. While the alternative compliance pathways are not necessary to achieve the core internal acoustic outcomes, they remain beneficial in providing efficient compliance options in some circumstances. I do not have expertise to comment on the necessity of commissioning mechanical ventilation.

¹⁸ Section 42A Report, paragraph 102.

Rail vibration

- 7.20 MDA comments that rail vibration is an issue that warrants an alert mechanism. However, in paragraph 92 of the Section 42A Report, Ms Belgrave recommends rejecting a rail vibration alert overlay, as it may cause confusion. I confirm my opinion that controls for rail vibration are warranted for new and altered buildings to manage potential effects on occupants.

Dr Stephen Chiles

8 October 2026