

BEFORE THE INDEPENDENT COMMISSIONERS

IN THE MATTER of the Resource Management Act 1991 ("**RMA**")

AND

IN THE MATTER on the Plan Change 14 ("**PC14**") to the Christchurch District Plan ("**District Plan**")

**REBUTTAL STATEMENT OF EVIDENCE ON BEHALF OF
KIWIRAIL HOLDINGS LIMITED**

VENTILATION

9 OCTOBER 2023

**Russell
McAugh**

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1. SUMMARY

1.1 My full name is Angus Charles Macdonald. I have the qualifications of Bachelor of Engineering (Honours) in Mechanical Engineering from the University of Canterbury. I am a Principal Mechanical Engineer at Cosgroves Ltd.

1.2 I am a Chartered Professional Engineer with Engineering New Zealand with 19 years practise in the field of Building Services, specialising in heating, cooling and ventilation services design and analysis.

Code of Conduct

1.3 I have read the Environment Court's Code of Conduct for Expert Witnesses 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.

Scope of rebuttal evidence

1.4 This rebuttal statement of evidence has been prepared on behalf of KiwiRail and relates to the statements of evidence of Jonathon Selkirk and Matthew Lindenberg on behalf of Kāinga Ora – Homes and Communities dated 12 September 2023.

2. VENTILATION

2.1 Kāinga Ora is proposing amendments to the ventilation provisions in Rule 6.1.7.2.1 of the District Plan (as set out in Mr Lindenberg's evidence) on the basis of the evidence of Mr Selkirk. I understand that Rule 6.1.7.2.1 has recently been amended through Plan Change 5E to the District Plan.

2.2 It is standard practice for acoustic controls to include ventilation, heating and cooling provisions to ensure that the acoustic insulation is not undermined by insufficient ventilation. This is because for acoustic insulation to work, windows need to be kept shut. If there is insufficient ventilation, people are forced to open their windows and are then exposed to the noise from the noise generating activity.

2.3 I agree with the heating and cooling requirements set out in the evidence of Mr Selkirk¹ and included in the amendments to the plan provisions proposed in Mr Lindenberg's evidence.

2.4 However, I disagree with the proposed amendments to the ventilation requirements in Rule 6.1.7.2.1(d)(i) and (ii). The proposed wording states (amendments proposed by Kāinga Ora are shown in underline and strikethrough):

d. Heating, Cooling and ~~V~~ventilation systems shall meet the following specifications:

i. The room is provided with ~~M~~mechanical ventilation which must satisfy clause G4 of the New Zealand Building Code; and

ii. Where noise sensitive internal spaces are not provided opening window area to comply with natural ventilation requirements of clause G4 of the New Zealand Building Code; mechanical ventilation shall be adjustable between the minimum ventilation rate specified in i above, and up to 1 air change per hour; and

iii. The room is provided with heating and cooling that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C when assessed using a 2.5% design weather condition for the applicable location. An acceptable design weather set is 24 hour NIWA 2.5% published weather data for the applicable region; and

~~ii. Achieve a minimum of 7.5 litres of air per second per person; and~~

...

2.5 The rule proposed by Kāinga Ora only requires compliance with the New Zealand Building Code ventilation rate for any noise affected habitable space which contains a compliant opening window. For spaces lacking an "opening window area" the provisions proposed by Kāinga Ora still include the New Zealand Building Code as the minimum ventilation rate but include a maximum of up to 1 air change per hour of mechanical outdoor air ventilation.

2.6 The decisions version of Plan Change 5E also only includes a requirement for mechanical ventilation systems to satisfy clause G4 of the New Zealand Building Code.

2.7 The New Zealand Building Code air change provisions are at such a low threshold that in my view they do not provide adequate ventilation with windows closed. I consider that any habitable space should be provided with mechanical ventilation of up to 1 air change per hour, irrespective of whether

¹ Evidence of Mr Selkirk dated 18 September 2023, at [1.6].

the space has a compliant natural ventilation device or not. A compliant natural ventilation device that is not opened due to ambient noise, is no different to a room with non-complaint or fixed windows. Both scenarios should have the same ventilation requirements.

- 2.8 I recommend that all noise affected habitable spaces should be provided with mechanical ventilation to 1 air change per hour. This ventilation rate should be fixed and not variable as has been included in the draft provisions proposed by Kāinga Ora.
- 2.9 I also recommend that reference to 7.5L/s of air per occupant be reinstated in 6.1.7.2.1 (d)(i). Although this reflects what is required under the New Zealand Building Code, it is an important component of the mechanical ventilation requirements and I consider it is helpful to readers of the plan for it to be included.
- 2.10 I attach as **Appendix A** my recommended amendments to the provisions proposed by Kāinga Ora that I consider are a minimum requirement to ensure that acoustic installation installed under Rule 6.1.7.2.1 is not undermined by insufficient ventilation.

Angus Macdonald

9 October 2023

**Appendix A – Proposed amendments to the ventilation provisions suggested by
Kāinga Ora**

(Suggested amendments shown in blue underline and strikethrough)

d. Heating, Cooling and ~~V~~ventilation systems shall meet the following specifications:

i. The room is provided with ~~M~~mechanical ventilation which can operate continuously to ~~must~~ satisfy clause G4 of the New Zealand Building Code and that provides at least 1 air change per hour, but no less than 7.5L/s per occupant;

~~ii. Where noise sensitive internal spaces are not provided opening window area to comply with natural ventilation requirements of clause G4 of the New Zealand Building Code; mechanical ventilation shall be adjustable between the minimum ventilation rate specified in i above, and up to 1 air change per hour; and~~

~~iii. The room is provided with heating and cooling that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C when assessed using a 2.5% design weather condition for the applicable location. An acceptable design weather set is 24 hour NIWA 2.5% published weather data for the applicable region; and~~

~~ii. Achieve a minimum of 7.5 litres of air per second per person; and~~