Part 6

NOISE – Noise

APP40 – Acoustic insulation requirements

1. Airport effects control overlay

The airport provisions will be published once Council has received confirmation of the Airport Company's future plans.

2. Port effects control overlay

a. Acoustic insulation requirements for the Port effects control overlay are included in NOISE – Noise. However, no minimum construction requirements for habitable spaces are specified for the Port effects control overlay. Instead, the rules require certification from an acoustic engineer that the building design will achieve the required design sound level for that zone and certification on completion of the works.

b. Ventilation options:

In addition, where the indoor design level cannot be achieved with ventilating windows open, the minimum ventilation requirements for habitable spaces require either:

i. a mechanical system or mechanical ventilation system capable of:

A. providing at least 15 air changes of outdoor air per hour in the principal living room of each building and give 5 air changes of outdoor air per hour in the other habitable spaces of each building, in each case with all external doors and windows of the building closed with the exception of such windows in non-habitable spaces that need to be ajar to provide air relief paths; and

B. enabling the rate of airflow to be controlled across the range, from the maximum airflow capacity down to 0.5 air changes (plus or minus 0.1) of outdoor air per hour in all habitable spaces; and

C. limiting internal air pressure to not more than 30 pascals above ambient air pressure; and

D. being individually switched on and off by the building occupants, in the case of each system; and

E. creating no more than 40 dB $L_{Aeq(15\ min)}$ in the principal living room, no more than 30 dB $L_{Aeq(15\ min)}$ in the other habitable spaces, and no more than 50 dB $L_{Aeq(15\ min)}$ any hallway, in each building. Sound levels from the mechanical system(s) shall be measured at least one meter away from any diffuser; and

F. this is the ventilation option provided for by the Port Noise Mitigation Plan. In the event that qualifying residents opt for the following (more expensive) air conditioning option APP40.2.b.ii.B.), those residents shall be required to pay the difference.

or

ii. air conditioning plus mechanical outdoor air ventilation capable of:

A. providing internal temperatures in habitable spaces not greater than 25 degrees Celsius at 5% ambient design conditions as published by the National Institute of Water & Atmosphere Research (NIWA) (NIWA, Design Temperatures for Air Conditioning (degrees Celsius), Data Period 1991-2000), with all external doors and windows of the habitable spaces closed; and

B. providing 0.5 air changes (plus or minus 0.1) of outdoor air per hour in all habitable spaces; and

C. each of the air conditioning and mechanical ventilation systems shall be capable of being individually switched on and off by the building occupants; and

D. creating no more than 40 dB $L_{Aeq(15\ min)}$ in the principal living room, no more than 30 dB $L_{Aeq(15\ min)}$ in the other habitable spaces, and no more than 40 dB $L_{Aeq(15\ min)}$ in any hallway, in each building. Sound levels from the mechanical sytems(s) shall be measured at least one metre away from any diffuser; and

E. a mechanical kitchen extractor fan ducted directly to the outside to serve any cooking hob, if such an extractor fan is not already installed and in sound working order; and

F. a single residential unit may contain a combination of the ventilation options in APP40.2.b.i.A. and APP40.2.b.i.B. to achieve the most practicable and cost effective approach. As an example it may be best for the principal living room to comply with option APP40.2.b.ii.B. whilst the other habitable spaces may comply with option APP40.2.b.ii.A.

3. City Centre zone

Acoustic insulation requirements for the CCZ – City centre zone are included in NOISE-R7. Under this rule a choice can be made between minimum construction requirements or having the acoustic insulation specifically designed for the proposed development. When designing acoustic insulation the rule requires certification from an acoustic engineer that the building design will achieve the required design sound level.

a. Ventilation options:

This appendix sets out the minimum ventilation requirements for a new bedroom in the CCZ – City centre zone where the indoor design level cannot be achieved with ventilating windows open. These require either:

i. a mechanical system or mechanical ventilation system capable of:

A. 5 air changes of outdoor air per hour in new bedrooms. In each case with all external doors and windows of the building closed with the exception of such windows in non-habitable spaces that need to be ajar to provide air relief paths; and

B. enabling the rate of airflow to be controlled across the range, from the maximum airflow capacity down to 0.5 air changes (plus or minus 0.1) of outdoor air per hour in all new bedrooms; and

C. limiting internal air pressure to not more than 30 pascals above ambient air pressure; and

D. being individually switched on and off by the building occupants, in the case of each system; and

E. creating no more than 30 dB $L_{Aeq(15\ min)}$ in new bedrooms. Sound levels from the mechanical system(s) shall be measured at least one metre away from any diffuser.

or

ii. air conditioning plus mechanical outdoor air ventilation capable of:

A. providing internal temperatures in new bedrooms not greater than 25 degrees Celsius at 5% ambient design conditions as published by the National Institute of Water & Atmosphere Research (NIWA) (NIWA, Design Temperatures for Air Conditioning (degrees Celsius), Data Period 1991-2000), with all external doors and windows of the new bedrooms closed; and

B. providing 0.5 air changes (plus or minus 0.1) of outdoor air per hour in all new bedrooms; and

C. each of the air conditioning and mechanical ventilation systems shall be capable of being individually switched on and off by the building occupants; and

D. creating no more than 30 dB LAeq(15 min) in new bedrooms. Sound levels from the mechanical system(s) shall be measured at least one metre away from any diffuser.

b. Individual rooms in a single residential unit may contain a combination of the ventilation options 3.1.i. and 3.a.ii. set out above to achieve the most practicable and cost effective approach.

c. Acoustic insulation of new bedrooms in the CCZ – City centre zone:

The minimum measurements identified in APP40 – Table 1: Acoustic insulation of new bedrooms in the CCZ – City centre zone below are one of two ways of demonstrating permitted activity status for acoustic insulation of a new bedroom in the CCZ – City centre zone. See NOISE-R7.

APP40 – Table 1: Acoustic insulation of new bedrooms in the CCZ – City centre zone

Building element	Required construction	
Walls	Exterior:	20mm timber weatherboards
		or 2 x 6mm fibre cement
		or 1 x 9mm compressed fibre cement
	Frame:	nominal 100mm with acoustic blanket
	Interior:	3 x 13mm high density gypsum plasterboard for top floor bedrooms
		2 x 13mm high density gypsum plasterboard for mid-level bedrooms
	Or:	190 series concrete blocks (minimum every 4th core filled)
	Or:	100mm thick pre cast concrete slabs
	Or:	Solid clay brick veneer (minimum 70mm thick) with standard internal framing and plasterboard lining.

Windows	Minimum 17mm thick laminated glass for top floor bedrooms Minimum 13mm thick laminated glass for mid-level bedrooms Or: Double glazed unit with 10mm and 6mm panes, separated by a minimum 50mm air gap.
Roof	Top floor only, not needed for mid-level bedrooms Cladding: 0.5mm profiled steel or tiles or 6mm corrugated fibre cement Frame: Timber truss with acoustic blanket Ceiling: 3 x 13mm high density gypsum plasterboard
External door	Hinged solid core door of at least 40kg/m^2 with airtight seals (or if glazed, as per window requirements). Sliding doors are not suitable.
Internal door	Internal doors to new bedrooms shall be hinged solid core of at least 16kg/m^2.
Ventilation	The indoor design sound level shall be achieved with windows and doors shut. This requires the use of minimum ventilation requirements as set out in APP40 – Acoustic insulation requirements.

d. Acoustic blanket: 75mm of acoustically absorbent material with minimum area density of 580g/m^2, such as fibreglass, rockwool, polyester or wool. Thermal insulation such as R1.8 is also suitable.

e. High density plasterboard: Gypsum plasterboard of minimum density of 960kg/m^3.