

Appendix M: Acoustic Insulation

M1 Application

This appendix is referred to in the rules related to subdivision and building in the noise control boundaries for Hamilton International Airport, for building in the noise control boundaries for Te Kowhai Airfield and the Waikato Gun Club, and in the Rural Zone rule allowing reduced building setbacks in certain circumstances.

M2 Buildings for which Acoustic Insulation is Required

- Papakainga housing
- Homestay
- Comprehensive residential development
- Buildings used for residential activity
- Travellers' accommodation
- Hospital
- Educational facility

M3 Conditions for Permitted Activities

Prior to the issue of a building consent for any building to which this rule applies, compliance with the requirements of this rule shall be demonstrated by one of the following:

- (a) by production of a design certificate from an appropriately qualified and experienced acoustic engineer, certifying that an internal noise level not exceeding Ldn 40dBA will be achieved by construction in accordance with the proposed design. Inside the Hamilton Airport Noise Outer Control Boundary the internal noise level shall be calculated in accordance with the predicted external level at the subject site shown on Appendix Ma 'Hamilton International Airport, Ldn Contours for Sound Insulation Design' and in accordance with the following adjustments to the dBA level to establish an unweighted external source spectrum for aircraft noise. (This paragraph does not apply to the Waikato Gun Club area).

External Aircraft Noise Octave Band Adjustments for Sound Insulation Design

<u>63 Hz</u>	<u>125 Hz</u>	<u>250 Hz</u>	<u>500 Hz</u>	<u>1 kHz</u>	<u>2 kHz</u>	<u>4 kHz</u>
<u>6</u>	<u>5</u>	<u>0</u>	<u>-3</u>	<u>-6</u>	<u>-8</u>	<u>-11</u>

Adjustments derived from ASTM E 1332-90 (2003) Tables

OR;

- (b) for dwellings incorporation of the following accepted acoustic design solutions in the building:
- (i) standard external cladding with minimum surface density of 8 kilograms per square metre such as brick, concrete, plaster, timber or plastic weatherboard and fibre cement, and
 - (ii) internal wall linings of gypsum plasterboard of at least 12 millimetres thickness or similar density material, and
 - (iii) continuous ceiling linings without cut-outs and of gypsum plasterboard of at least 10 millimetres thickness or similar density material, and
 - (iv) fibrous thermal insulation batts (not polystyrene) in wall and ceiling cavities, and
 - (v) standard roof cladding of steel, tiles, metal tiles or butynol on 17mm plywood, and

- (vi) standard external window and door glazing of minimum 6 millimetres thickness, or equivalent double glazing and
- (vii) aluminium external joinery fitted with airtight seals throughout, and
- (viii) room glazing with a total area of no more than 50 percent of the room's total floor area.

Inside the Hamilton Airport Noise Outer Control Boundary where under (a) or (b) above the required internal noise level for any building or part thereof can only be met with doors and windows closed, then an alternative means of ventilation must be provided as follows:

Ventilation Standards

<u>Room Type</u>	<u>Outdoor Air Ventilation Rate (Air Changes per Hour)</u>	
	<u>Low Setting*</u>	<u>High Setting*</u>
<u>Principal living rooms</u>	<u>1 – 2 ac / hr</u>	<u>Min. 15 ac / hr</u>
<u>Other habitable rooms</u>	<u>1 – 2 ac / hr</u>	<u>Min. 5 ac / hr</u>
<p><u>* Each system must be able to be individually switched on and off and when on, be controlled across the range of ventilation rates by the occupant with a minimum of 3 stages.</u></p> <p><u>Each system providing the low setting flow rates is to be provided with a heating system which is able to provide the incoming air with a 12 degC heat rise when the airflow is set to the low setting. Each heating system is to have a minimum of 2 equal heating stages.</u></p> <p><u>If air conditioning is provided to any space then the high setting ventilation requirement for that space is not required.</u></p>		

For non-habitable areas the ventilation requirements of the NZ Building Code shall apply.

Noise from ventilation systems shall not exceed the following noise limits:

<u>Room Type</u>	<u>Noise Level Measured at Least 1m from the Diffuser (Leq dBA)</u>	
	<u>Low Setting</u>	<u>High Setting</u>
<u>Habitable rooms (excluding sleeping areas)</u>	<u>35</u>	<u>40</u>
<u>Sleeping areas</u>	<u>30</u>	<u>35</u>

(c) Where any building to which this rule applies (except Educational Facilities) is proposed to be located within the SEL 95 Boundary shown on the planning maps then the following shall also be complied with:

(i) prior to the issue of a building consent a design certificate shall be produced from an appropriately qualified and experienced acoustic engineer, certifying that an internal noise level not exceeding Sound Exposure Level (SEL) 65dBA will be achieved in sleeping areas by construction in accordance with the proposed design. The internal noise level shall be calculated in accordance with the predicted external level at the subject site shown on the planning maps and in accordance with the following adjustments to the dBA level to establish an unweighted external source spectrum for aircraft noise.

External Aircraft Noise Octave Band Adjustments for Sound Insulation Design

<u>63 Hz</u>	<u>125 Hz</u>	<u>250 Hz</u>	<u>500 Hz</u>	<u>1 kHz</u>	<u>2 kHz</u>	<u>4 kHz</u>
<u>6</u>	<u>5</u>	<u>0</u>	<u>-3</u>	<u>-6</u>	<u>-8</u>	<u>-11</u>

Adjustments derived from ASTM E 1332-90 (2003) Table 1

Where the required internal noise level for any building or part thereof can only be met with doors and windows closed, then an alternative means of ventilation must be provided as follows:

Ventilation Standards

<u>Room Type</u>	<u>Outdoor Air Ventilation Rate (Air Changes per Hour)</u>	
	<u>Low Setting*</u>	<u>High Setting*</u>
<u>Sleeping areas</u>	<u>1 – 2 ac / hr</u>	<u>Min. 5 ac / hr</u>
<p><u>* Each system must be able to be individually switched on and off and when on, be controlled across the range of ventilation rates by the occupant with a minimum of 3 stages.</u></p> <p><u>Each system providing the low setting flow rates is to be provided with a heating system which is able to provide the incoming air with a 12 degC heat rise when the airflow is set to the low setting. Each heating system is to have a minimum of 2 equal heating stages.</u></p> <p><u>If air conditioning is provided to any space then the high setting ventilation requirement for that space is not required.</u></p>		

Noise from ventilation systems shall not exceed the following noise limits:

<u>Room Type</u>	<u>Noise Level Measured at Least 1m from the Diffuser (Leq dBA)</u>	
	<u>Low Setting</u>	<u>High Setting</u>
<u>Sleeping areas</u>	<u>30</u>	<u>35</u>

M4 Airport Noise Outer Control Boundary and SEL 95 Boundary Consent Notice

“**THE** Owner (as defined in the Resource Management Act 1991) of the land shall, on a continuing basis, ensure that:

- I. Written notice of the following matters shall be given on the title:
 - (a) The land is located within either;
 - The Airport Noise Outer Control Boundary, or;
 - The Airport Noise Outer Control Boundary and the SEL 95 Boundary.
 (as shown on the Waikato District Plan Maps) associated with Hamilton International Airport and that activities on the land will be affected by the noise of aircraft.
 - (b) The noise generated by aircraft movements associated with the airport is predicted to reach levels between 55dBA Ldn and 65dBA Ldn within the Airport Noise Outer Control Boundary and up to Sound Exposure Level (SEL) 95dBA within the SEL 95 Boundary. Those noise levels, which are identified in the Waikato District Plan, may be higher than the present levels of aircraft noise affecting the land, as allowance has been made for predicted expansion of airport facilities and activities.
 - (c) The requirements for acoustic insulation of dwellings set out in the Waikato District Plan and in this Consent Notice are intended to manage the effects that airport noise may have on residential activity and reduce the potential for constraints on airport development and activities.

2. Any dwellinghouse, or building listed below, which is hereafter erected on land within the Airport Noise Outer Control Boundary shown on the Waikato District Plan Maps, shall be designed and constructed to incorporate appropriate acoustic insulation measures to ensure an internal Ldn not exceeding 40dBA.
3. Any alteration or addition to any existing dwelling house, or building listed below, which is on land within the Airport Noise Outer Control Boundary shown on the Waikato District Plan Maps, shall be designed and constructed to incorporate appropriate acoustic insulation measures to ensure an internal Ldn not exceeding 40dBA.
4. Any dwellinghouse, or building listed below, which is hereafter erected on land within the SEL 95 Boundary shown on the Waikato District Plan Maps, shall be designed and constructed to incorporate appropriate acoustic insulation measures to ensure an internal SEL not exceeding 65dBA in sleeping areas.
5. Any alteration or addition to any existing dwellinghouse, or building listed below, which is on land within the SEL 95 Boundary shown on the Waikato District Plan Maps, shall be designed and constructed to incorporate appropriate acoustic insulation measures to ensure an internal SEL not exceeding 65dBA in sleeping areas.
6. Where the required internal noise level for any building or part thereof can only be met with doors and windows closed, then an alternative means of ventilation shall be provided as follows:

Ventilation Standards

<u>Room Type</u>	<u>Outdoor Air Ventilation Rate (Air Changes per Hour)</u>	
	<u>Low Setting*</u>	<u>High Setting*</u>
<u>Principal living rooms</u>	<u>1 – 2 ac / hr</u>	<u>Min. 15 ac / hr</u>
<u>Other habitable rooms</u>	<u>1 – 2 ac / hr</u>	<u>Min. 5 ac / hr</u>
<p><u>* Each system must be able to be individually switched on and off and when on, be controlled across the range of ventilation rates by the occupant with a minimum of 3 stages.</u></p> <p><u>Each system providing the low setting flow rates is to be provided with a heating system which is able to provide the incoming air with a 12 degC heat rise when the airflow is set to the low setting. Each heating system is to have a minimum of 2 equal heating stages.</u></p> <p><u>If air conditioning is provided to any space then the high setting ventilation requirement for that space is not required.</u></p>		

For non-habitable areas the ventilation requirements of the NZ Building Code shall apply.

Noise from ventilation systems shall not exceed the following noise limits:

<u>Room Type</u>	<u>Noise Level Measured at Least 1m from the Diffuser (Leq dBA)</u>	
	<u>Low Setting</u>	<u>High Setting</u>
<u>Habitable rooms (excluding sleeping areas)</u>	<u>35</u>	<u>40</u>
<u>Sleeping areas</u>	<u>30</u>	<u>35</u>

7. Prior to the issue of a building consent for any dwellinghouse or building listed below, compliance shall be demonstrated with the Plan requirements for acoustic design, construction and performance of such buildings located within the Airport Noise Outer Control Boundary and the SEL 95 Boundary.
8. List of Buildings:
 - Papakainga housing
 - Homestays
 - Travellers accommodation
 - Residential activity
 - Educational facilities

M5

1. In accordance with Rule 27.61A.1 the Operator of Hamilton International Airport shall make an offer to the owners to install (“the Offer”), and if the Offer is accepted shall install, acoustic treatment and related ventilation measures (“the Treatment Measures”) to achieve an internal acoustic environment in the existing or consented sleeping areas of the buildings (with all external doors of the building and all windows of the habitable rooms closed) of SEL 65dBA provided that no such Offer shall be required in respect of any site owned by the Operator of Hamilton International Airport. The offer shall include all building consent and certification fees payable to the Council. The Offer shall be made within two months of the commencement of scheduled wide body jet operations between 10pm and 7am on more than three occasions per week.
2. The Treatment Measures shall achieve the standards of acoustical treatment and ventilation set out in section M3(c)(i) of Appendix M.
3. The Offer shall be made on the following basis:
 - (a) any structural or other changes required under the Building Act or otherwise, to enable the installation of the Treatment Measures shall be at the expense of the Operator of Hamilton International Airport, except that nothing in this clause shall require the Airport Operator to fund any measures required to bring a building up to the standard required in any building bylaws or any provisions of any statute that applied when the building or relevant part was constructed or to improve the standard of finishes in the building;
 - (b) it will remain open for acceptance on a willing participant basis for three years from the date on which it was made after which time the Operator of Hamilton International Airport obligations under this rule will be deemed to be fulfilled; and

~~(c) where the Operator of Hamilton International Airport installs any Treatment Measures the Airport Operator shall provide the Council with a certificate from a suitably qualified person nominated by the Airport Operator and approved by the Council, that the installation of those Measures has been properly undertaken in accordance with sound practice.~~