

## **Wharewaka Point Subdivision, Taupo Guidelines for Noise Control Treatment to Bedrooms, Lots 59-78 and Lot 125**

### **1.0 Introduction**

The following guidelines are provided to assist owners, designers, developers, builders etc to help comply with Condition 3 of the Consent Notice for the Wharewaka development.

In general, the condition requires that the noise level inside bedrooms due to traffic on the State Highway should not exceed 30 dBA Leq and 45 dBA Lmax.

### **2.0 Assessment**

The noise level inside bedrooms will depend on many factors. These include the external noise level and spectral/frequency content (varies throughout the day and night), the effect of any fence/barrier on the boundary, the types of building materials, the room layout, areas of walls, windows and doors, volume of rooms and the amount/type of sound absorbing materials inside the room (furnishings, drapes etc).

Design Acoustics Ltd has carried out representative noise measurements along the eastern boundary of the Wharewaka development, and carried out an assessment of the likely noise control treatment required to achieve the internal noise criteria. Our assessment of the noise control treatment has included our best engineering estimates of the many variables associated with calculation of noise inside buildings. We have assumed that building materials and construction types typically available and used in NZ will be used.

### **3.0 Guideline Recommendations**

The following should be read with the attached Figure and Tables 1 or 2 (depending on the Lot). It is assumed that "north" is parallel to the highway, heading towards Taupo City.

In general, noise control treatment is required to bedrooms which have external facades which face north (towards Taupo), east (towards the Highway) and south (to Wellington). The western facades of bedrooms (facing towards the lake) should not require any specific noise control treatment as long as these facades are generally parallel with the highway opposite the Lot (plus/minus 10 degrees). For these facades, typical timber framed construction should be sufficient with 6mm thick standard glass to windows/doors.

Note that the condition applies to **bedrooms only**, and not to any other room. Constructions (a) (b) (c) etc are cross-referenced to the attached Figure.

The consent condition requires that an application for building consent is to contain an acoustic design certificate for the particular dwelling - this should be carried out during final design stage by the applicant's consultant.

**Table 1: Guideline Noise Control Treatment to Bedrooms of Lots 59-75 (inclusive)**

**External Envelope of Bedrooms with facades facing East, North or South, and with no acoustic fencing to site boundaries**

Table 1 below applies to the following situations, where there is no "solid and airtight" fencing (eg. fencing with no significant acoustic properties such as trellis, or timber palings with gaps between boards etc.) on the boundaries of Lots 59-75 (inclusive):

- ◆ Bedrooms on lower and upper floors of two storey dwellings, with facades facing east, north or south.
- ◆ Bedrooms of single storey dwellings, with facades facing east, north or south.

**Table 1**

<b>Roof/ceiling Assemblies</b>	<b>External construction/cladding</b>	<b>Internal construction/lining</b>	<b>Notes</b>
Bedroom with pitched/trussed roof	Roof: (a) Concrete, clay or metal tiles or 0.55 mm corrugated steel over timber battens. OR Sheet membrane or bituminous tiles on 12.5mm plywood sarking	Ceiling: (c) 2 layers 13mm Gib Noiseline fixed to underside of trusses with timber battens.  (e) Minimum R2.4 Batts to ceiling cavity	See Figure 1.  No recessed light fittings in ceiling, use surface mounted fittings only.
Bedroom with skillion roof	Roof: (b) Concrete, clay or metal tiles or 0.55 mm corrugated steel, or sheet membrane on 12.5mm plywood sarking. OR Bituminous tiles on 17.5mm plywood sarking	Ceiling: (d) 2 layers 13mm Gib Noiseline fixed to underside of rafters, fixed with Rondo or USG clip/batten system.  (e) Minimum R2.4 Batts to ceiling cavity	See Figure 1.  No recessed light fittings in ceiling, use surface mounted fittings only.

**Table 1 continued**

<b>External Walls</b>	<b>External construction/ cladding</b>	<b>Internal construction/ lining</b>	<b>Notes</b>
Timber (or steel) framed construction of Bedroom Walls facing east, north and south	External cladding: (f) Sheet cladding system with minimum surface weight of 17 kg/m <sup>2</sup> eg. Hardies Exotech or CSR Expresswall	Internal lining: (i) 2 layers 13mm Gib Noiseline fixed to inside of wall with resilient channels (eg. Gibrails)  (m) Minimum R1.8 Batts to cavity	See Figure 1.  Fix resilient channels in strict accordance with Gib instructions.
	(g) Brick veneer cladding, minimum 175 kg/m <sup>2</sup>	(j) 1 layer 13mm Gib Noiseline  (m) Minimum R1.8 Batts to cavity	See Figure 1
Masonry Construction of Bedroom Walls facing east, north and south	(h) 150 or 200 series concrete block, cavities filled 100% with grout	(k) Minimum 20mm thick strapping with 1 layer 13mm standard Gib lining.  (n) 20mm thick insulation to cavity (eg. Pink Batts Masonry Batts).	See Figure 1
<b>Windows / Doors</b>			
To eastern wall of bedrooms (facing Highway)	(o) Minimum 10mm thick laminated glass, maximum area of windows 0.5 m <sup>2</sup>	(p) Secondary glazing, maximum area of windows 0.5 m <sup>2</sup> (separate window on inside of reveal). Minimum 6mm thick standard glass. Cavity between inner and outer pane not less than 75mm	Preferably no windows to eastern façade of bedrooms. No doors to bedrooms on eastern façade. No vents in joinery system. All glazing with good gaskets to seal "airtight". See Figure 1
Northern or Southern (external) Walls of bedrooms	(o) Minimum 10mm thick laminated glass, maximum area of window or door 2.4 m <sup>2</sup> or 25% of wall area (whichever is smaller)	N/a	No vents in joinery system. All glazing with good gaskets to seal "airtight". No sliding doors permitted – use hinged doors with good seals around perimeter. See Figure 1

**Table 1 continued**

<b>Ventilation System</b>	<b>Requirement</b>	<b>Notes</b>
All bedrooms	<p>Mechanical ventilation system to comply with NZ Building Code Clause G4. The noise from the fan should not exceed 25 dBA Leq in the bedroom.</p> <p>Split system air conditioners may be required or desirable for thermal control.</p>	<p>See Figure 1. Likely to be achieved by a small supply fan in ceiling cavity, with 1.5 metres of acoustic flexible duct on each side of the fan.</p>

**Table 2: Guideline Noise Control Treatment to Bedrooms of Lots 59-75 (inclusive): External Envelope of Bedrooms with facades facing East, North or South (with acoustic fencing to site boundaries).**

**OR**

**Guideline Noise Control Treatment to Bedrooms of Lots 76,77,78 and 125: External Envelope of Bedrooms with facades facing East, North or South (with or without acoustic fencing to site boundaries).**

Table 2 below applies in the following situations and where a solid fence, at least 1.8 metres high and with some acoustic properties (eg. concrete block, a close-boarded timber fence with batten over gaps, or other approved "acoustic" fence with a minimum surface weight of 10kg/m<sup>2</sup>) is located on the eastern, northern and southern boundaries of each of the Lots 59-75 (inclusive).

- ◆ Bedrooms on upper or lower floors of two storey dwellings, with facades facing east, north or south.
- ◆ Bedrooms of single storey dwellings, with facades facing east, north or south.

The following Table 2 also applies to bedrooms on upper and lower floors of Lots 76,77,78 and Lot 125, whether or not there is an acoustic fence to the Lot boundaries.

**Table 2**

<b>Roof/ceiling Assemblies</b>	<b>External construction/cladding</b>	<b>Internal construction/lining</b>	<b>Notes</b>
Bedroom with pitched/trussed roof	Roof: (a) Concrete, clay or metal tiles or 0.55 mm corrugated steel over timber battens. OR Sheet membrane or bituminous tiles on 12.5mm plywood sarking	Ceiling: (c) 2 layers 13mm Gib Noiseline fixed to underside of trusses with timber battens. (e) Minimum R2.4 Batts to ceiling cavity	See Figure 1. No recessed light fittings in ceiling, use surface mounted fittings only.
Bedroom with skillion roof	Roof: (b) Concrete, clay or metal tiles or 0.55 mm corrugated steel, or sheet membrane on 12.5mm plywood sarking. OR Bituminous tiles on 17.5mm plywood sarking	Ceiling: (d) 2 layers 13mm Gib Noiseline fixed to underside of rafters, fixed with Rondo or USG clip/batten system. (e) Minimum R2.4 Batts to ceiling cavity	See Figure 1. No recessed light fittings in ceiling, use surface mounted fittings only.

**Table 2 continued**

<b>External Walls</b>	<b>External construction/ cladding</b>	<b>Internal construction/ lining</b>	<b>Notes</b>
Timber (or steel) framed construction of Bedroom (external) Walls facing east, north and south	External cladding: (f) Sheet cladding system with minimum surface weight of 10 kg/m <sup>2</sup> eg. Hardies Monotech	Internal lining: (i) 2 layers 13mm Gib Noiseline fixed to inside of wall with resilient channels (eg. Gibrails) (m) Minimum R1.8 Batts to cavity	See Figure 1. Fix resilient channels in strict accordance with Gib instructions.
	(g) Brick veneer cladding, minimum 175 kg/m <sup>2</sup>	(j) 1 layer 13mm Standard Gib (m) Minimum R1.8 Batts to cavity	See Figure 1
Masonry Construction of Bedroom (external) Walls facing east, north and south	(h) 150 or 200 series concrete block, cavities filled 100% with grout	(k) Minimum 20mm thick strapping with 1 layer 10 or 13 mm standard Gib lining. (n) 20mm thick insulation to cavity (eg. Pink Batts Masonry Batts).	See Figure 1
<b>Windows /Doors</b>			
To eastern wall of bedrooms (facing Highway)	(o) Minimum 6mm thick laminated glass, maximum area of windows 0.5 m <sup>2</sup>	(p) Secondary glazing, maximum area of windows 0.5 m <sup>2</sup> (separate window on inside of reveal). Minimum 4mm thick standard glass. Cavity between inner and outer pane not less than 75mm	Preferably no windows to eastern façade of bedrooms. No doors to bedrooms on eastern façade. No vents in joinery system. All glazing with good gaskets to seal "airtight". See Figure 1
Northern or Southern (external) Walls of bedrooms	(o) Minimum 6mm thick laminated glass, maximum area of window or door 2.4 m <sup>2</sup> or 25% of wall area (whichever is smaller)	N/a	No vents in joinery system. All glazing with good gaskets to seal "airtight". No sliding doors permitted – use hinged doors with good seals around perimeter. See Figure 1

**Table 2 continued**

<b>Ventilation System</b>	<b>Requirement</b>	<b>Notes</b>
All bedrooms	Mechanical ventilation system to comply with NZ Building Code Clause G4. The noise from the fan should not exceed 25 dBA Leq in the bedroom.  Split system air conditioners may be required or desirable for thermal control.	See Figure 1.  Likely to be achieved by a small supply fan in ceiling cavity, with 1.5 metres of acoustic flexible duct on each side of the fan.

