

File Ref: AC15057 – 05 – D1

13 September 2017

Mr H. Wheelans
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Email: hamish@gwlimited.co.nz

Dear Hamish,

**Re: Preston Downs Subdivision, West Melton
Explanation of Resource Consent traffic noise requirements**

As requested, this letter contains an explanation of the traffic noise requirements which apply to some Lots within the Preston Downs subdivision, due to their proximity to State Highway 73.

1.0 Background

The New Zealand Transport Agency (NZTA) has an interest in any new houses which are constructed near a State Highway. They do not want houses to be constructed in locations where the people who eventually live in the dwellings will take issue with noise from the State Highway.

Therefore, in some locations the NZTA will try to prevent construction of any new dwellings. In other locations, they will seek to put in place a requirement that any new dwellings are upgraded to a higher level of sound insulation, to ensure traffic noise is at least controlled to reasonable levels within the dwelling.

These requirements may appear as a Condition on a Resource Consent which relates to a particular site or development, or on the Certificate of Title for particular Lots.

In the case of the Preston Downs Subdivision, the involvement of the NZTA has led to the following:

- A requirement for an acoustic fence between the certain Lots and the State Highway.
- A requirement that dwellings constructed within some areas of certain Lots be reviewed and acoustic insulation upgraded if necessary to provide a stated level of sound insulation.

Each of these requirements is discussed below.

2.0 Acoustic fence

Condition 3 of the approved Resource Consent requires the following:

3. *That prior to the habitation of any dwelling on each of Lot 4, 12 or 13, an acoustic fence shall be established on that Lot in accordance with the areas shown red on Figure 1 below. Each fence shall be a minimum height of 1.8m and a surface mass of not less than 8.0kg/m². The fences shall be continuous and shall be maintained with no gaps or cracks. The fences shall be constructed and maintained in accordance with the plans labelled "boundary treatment – option 2" dated July 2017 by Xteriorscapes. For the*

avoidance of doubt, an acoustic fence need only be established on Lot 4 prior to the habitation of a dwelling on Lot 4. The same principle shall apply to Lots 12 and 13.

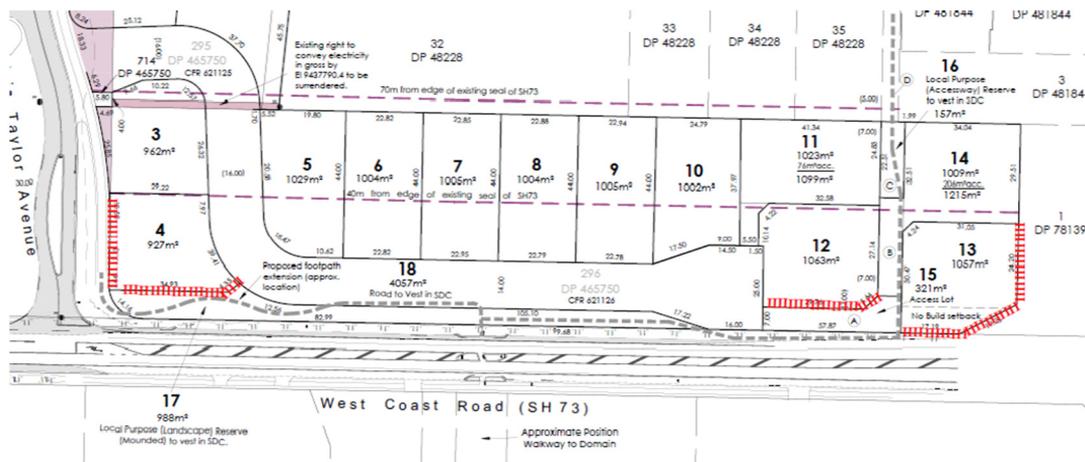


Figure 1 – Acoustic fencing requirements

The purpose of the acoustic fence is to reduce the traffic noise levels received at ground level on these sites. This means that the normal NZTA setback between the State Highway and any new dwellings has been able to be reduced, and the acoustic insulation upgrades required for dwellings on these sites are not as onerous as they would have been without the acoustic fence.

The developer will put in place the acoustic fence for these Lots. As this fence is there to satisfy this condition, eventual owners of these sites cannot remove or alter the fence.

3.0 Acoustic insulation of dwellings

In addition to the above, Condition 2 of the approved Resource Consent outlines the following sound insulation requirements for certain Lots:

2. *That any dwelling, family flat, and any rooms within accessory buildings used for sleeping or living purposes:*
 - i) *at ground floor level, within 35m from the edge of the sealed carriageway of State Highway 73 for Lots 4-10 and 12-14, as indicated on the approved subdivision plans (Davie, Lovell-Smith, Drawing C.16714/1 Revision R7.1 dated July 2017); and*
 - ii) *at first floor level or above, within 80m of the edge of the sealed carriageway of State Highway 73 for Lots 2-14*

shall have internal noise levels from road traffic noise that do not exceed the limits set out below with all windows and doors closed

 - a. *Within Bedrooms 35 dBA (Leq 24 hours)*
 - b. *Within Living Area Rooms 40 dBA (Leq 24 hours)*

Evidence to demonstrate compliance with this condition shall be provided with each building consent application that relies on this condition.

These requirements only apply to any bedroom or living areas constructed within the distances stated in the condition (35 metres for ground floor spaces, and 80 metres from upper levels spaces). Living areas include any room other than a room principally used as a bedroom, laundry, bathroom or toilet. In some cases, it may be possible to arrange the site plan so that these areas do not fall within the higher road noise area.

If bedrooms or living areas are to be located within these higher road noise areas, then some upgrades of the walls, windows and roof may be required, compared to a typical house. The exact upgrades will depend on a number of factors including the location of the dwelling, area of windows, walls and roof etc. Due to the number of variables involved, specific advice and

calculations will be required for any dwelling with bedrooms or living areas which fall within the higher road noise areas.

The property owner or their building company will therefore need to contact an acoustic engineer before the project is submitted for Building Consent, and provide them with the plans and specifications for the proposed dwelling. The acoustic engineer will then carry out calculations for the individual rooms which are located within the higher road noise area and determine the constructions needed to comply with the NZTA requirement. The cost of this analysis and report would typically be \$2,000 to \$4,000 + GST.

For reference, based on our experience with this type of assessment when initially designing the dwellings on these Lots the following should be considered:

- Windows are typically the weakest point in terms of sound transmission. In many cases the type of double glazing used in living and bedroom windows located in the higher road noise levels area will need to be upgraded. Standard double glazing consists of a 4 mm pane of glass, a 12 mm air gap and another 4 mm pane of glass. A common upgrade to double glazing due to traffic noise is to change one of the glazing layers to a 10 mm pane of glass. This means the whole double glazed unit is wider, and upgraded frames may be required to accommodate it. Larger windows require more upgrading than smaller windows.
- Heavier external cladding products are more effective at reducing traffic noise break-in. If lightweight claddings are used such as plywood or PVC weatherboards, it may be difficult to comply with the requirements. Required upgrades may include extra layers of Gib plasterboard to the inside of the walls, or use of a different external cladding in these areas.
- Similarly, a traditional pitched roof with a flat ceiling below is more effective than a skillion roof with a raked ceiling.
- Rigid insulation (such as polystyrene) does not offer any additional acoustic insulation to an external wall construction; therefore, all external walls and ceiling will require fibrous insulation (such as Pink Batts, Autex Quietstuf etc.) to the cavity.

Please do not hesitate to contact us to discuss further as required.

Kind Regards,



Clare Dykes
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Acoustic Engineering Services

13 September 2017