

Noise Assessment prepared for

M J Stratford

Residential Plan Change - 631 Shands Road

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Introduction

1. M J Stratford has commissioned Novo Group to prepare a Noise Assessment for a Rural Residential Plan Change at 631 Shands Road, Selwyn District.
2. This report assesses the proposal with regard to relevant rules in the Selwyn District Plan Rural Volume, and also addresses potential reverse sensitivity effects on the road transport network related to traffic noise. This assessment has been carried out with appropriate consideration of accepted standards and guidelines for noise in residential environments.

The Proposal

3. It is proposed to change the zoning of 631 Shands Road from Rural - Inner Plains to Living 3 to enable a Rural Residential development at the site. The site location is illustrated in Figure 1.



Figure 1: Site Location
[Background Image courtesy of Canterbury Maps Online]

4. The indicative sub-division layout is illustrated in Figure 2 below. Novo Group's Transport Assessment (TA) for this application anticipates this development would enable approximately 26 dwellings on the site, which would generate 29 to 36 vehicle movements per hour during the peak hours and 221 to 263 vehicle movements per day.



Figure 2: Indicative Subdivision Layout

The Local Environment

- Land use zoning of the site and surrounding land is shown in Figure 3 below. The current zoning of the Plan Change land Inner Plains. The Living 3 Zone which was established by Plan Change 41 lies on the south-west boundary of the site. A rural residential subdivision on Kingcraft Drive lies between the application land and Living 1A and Z zones in Prebbleton Township to the south-east.

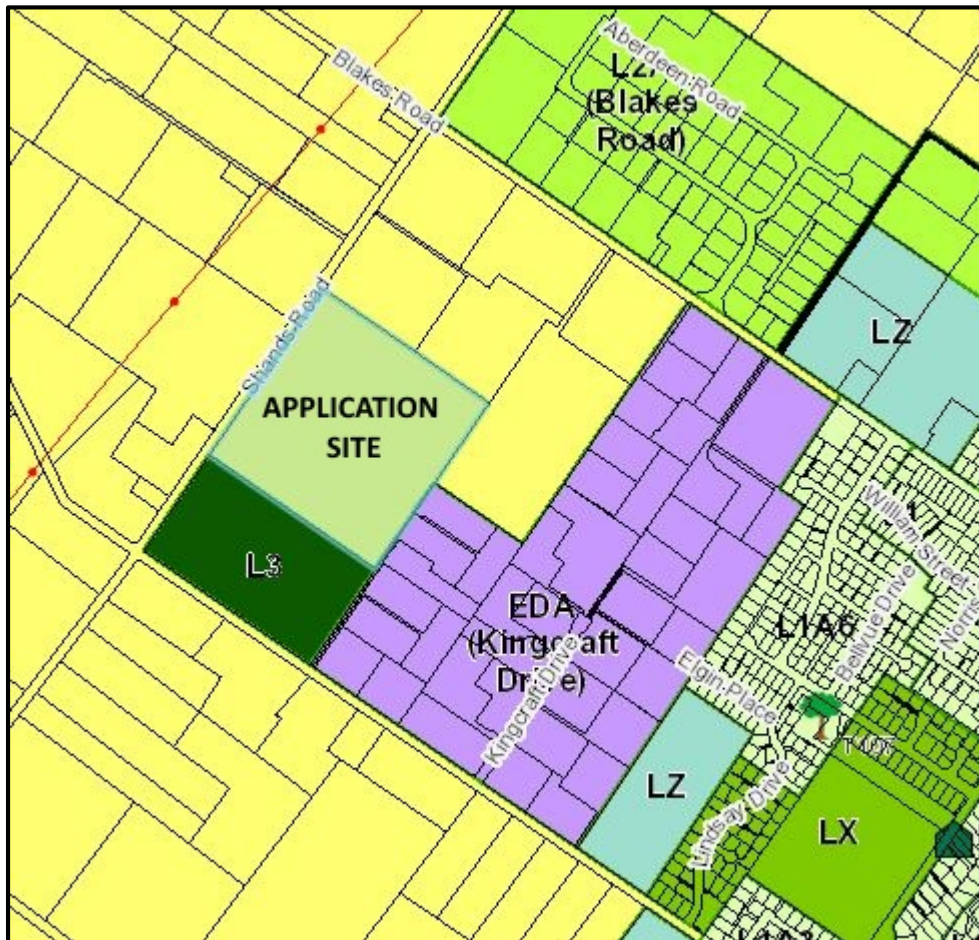


Figure 3: Current land use zoning (Source: Canterbury Maps)

Control of noise within the proposed Living 3 zone

District Plan Noise Rules

6. The site is currently zoned *Rural - Inner Plains* in the Selwyn District Plan. It is proposed to rezone the site for rural-residential purposes. This proposal is to change the zoning of the site to *Living 3*, and only for residential purposes.
7. The Plan Change would apply the noise standards for Living Zones in the Townships Volume to the application site, in place of the Rural Volume standards which currently apply, which are discussed as follows.

Rural Volume: Activities Rule 9.16

8. Rural Volume Activities Rule C9.16.1 currently controls noise from activities on the site. Rule C9.16.3 specifically states that the noise limits do not apply in any part of the district used for residential activities of a normal domestic nature. Therefore noise emitted from any residential property within the site, as currently zoned, is a permitted activity by virtue of this exclusion.

Townships Volume: Living Zones Activities Rule 10.6.1

9. This proposal is to change the zoning of the site to *Living 3*, and only for residential purposes. The noise standards in Living Zones Activities Rule 10.6.1 of the Townships Volume of the Selwyn District Plan will then apply to the site, however the rule states that those standards do not apply to any activities that are not a residential activity, spiritual activity or educational activity.
10. These provisions are consistent with the existing Rural Zone rules, which also do not apply to residential activities.
11. Noise emitted from any residential property within the Plan Change site would therefore be a permitted activity by virtue of the exclusions in Rule 10.6.1. Any non-residential activity would require resource consent to establish, and would be assessed against the Living Zone noise limits.
12. The Reasons for Rules states:
The noise rules do not apply to residential activities in Living zones, as such activities are an integral part of the environment of these zones. Irrespective of any rules in the plan, there is a duty on all persons to avoid 'unreasonable noise' under section 16 of the Act.
13. The Council has powers to enforce section 16 through abatement notices under section 322 of the Act (the RMA), however sections 326-328 of the Act are more commonly used by the Council to take immediate action on 'excessive' noise in residential inter-neighbour situations such as parties, stereos, bands, excessive use of machinery etc.
14. As the exclusions in the current noise rules in the Rural and Townships Volumes apply to residential activities in the same way, and taking the Council's powers under the RMA into account, no additional or special noise standards for this new zone are necessary for the protection of residential amenity within the zone.

Compatibility with activities in adjacent zones

15. As discussed in paragraphs 9 to 14 above, noise emitted from residential activities in a Living zone into other zones is excluded from the noise standards in the Townships volume by Living Zones Activities Rule 10.6.1. However the control of noise under sections 16, 326 and 328 of the RMA zone would avoid unreasonable or excessive noise being received at residential properties in the Rural Inner Plains zone, including in rural residential properties on Kingcraft Drive, ensuring that the amenity of residential properties in the adjacent zones will be protected.
16. Noise emissions between the proposed Living 3 zone and the adjacent Living 3 zone which was established by Plan Change 41 are expected to be compatible, as similar levels and types of noise would be generated by residential activities in each zone, and they will be controlled by the above provisions of the RMA.
17. Consideration has also been given to potential reverse sensitivity effects of the proposed residential development on permitted rural activities on adjacent sites in

the Rural IP zone on the north-east boundary of the application site and across Shands Road. However Rural volume rule C9.16.3.1 states that provided section 16 of the RMA is observed, normal farming activities are excluded from the noise standards in rule C9.16.1 Table C9.3 (which currently apply at the notional boundary of any dwelling on the application site, and potentially close to the site boundary), and also from the noise standards in Table C9.2 which would apply at the boundaries of the application site as a result of the change to Living 3 zoning. As such activities would therefore operate under the same level of control that currently applies, no reverse sensitivity effects are anticipated.

18. This exclusion in rule C9.16.3.1 does not apply to audible bird scaring devices, which are controlled by specific standards in rule C9.15 that apply at any point within a Living zone, or at the notional boundary of any rural dwelling. Those standards would apply to any permitted rural dwelling on the site which could be constructed with a minimum setback 5 m from the site boundary in accordance with Rural rule C3.13.1.1 under the existing zoning. Under the proposed rezoning, the minimum setback is 2 m under Living rule C4.9.2, which is not materially less in terms of noise mitigation, therefore any new dwelling under the proposed development would be protected consistently with a dwelling that is currently permitted.
19. "Noise" also includes vibration by definition in the RMA. Under Rural zone rule C9.17, vibration generated on adjacent sites in the Rural zone is controlled by reference to relevant New Zealand and Australian standards which include criteria for the protection of residential activities in the rural which apply notwithstanding this proposed plan change.
20. No additional or special noise standards for this new zone are therefore considered necessary for the protection of residential amenity within the zone or other zones, or from noise intrusion from the Rural IP zone.

Road Traffic Noise Effects

21. Noise from road traffic on Shands Road has potential to adversely affect residential amenity within the new Living 3 zone, unless it is mitigated appropriately. Traffic volumes on Trents Road can be disregarded, as they are much lower than Shands Road, and would not contribute significantly to traffic noise received in the Plan Change area.
22. The road traffic noise mitigation measures that apply in Part C4 Rule C4.9.17 of the Townships Volume for the adjacent Living 3 zone on the south west boundary of the site are considered to provide an appropriate basis for this Plan Change. Rule C4.9.17 states:

Living 3 Rural Residential – Shands Road, Noise Mitigation

4.9.17 For the purpose of protection against traffic noise intrusion from Shands Road any dwelling, family flat and any rooms within accessory buildings used for sleeping or living shall be located at least 25 metres from Shands Road and physical acoustic barriers shall be established in the locations indicated on the Outline Development Plan, Trents Road, Prebbleton in Appendix 19. The finished height of any acoustic barrier shall be no less than 3 metres above the adjacent

ground level of any residential lot. The mass of any acoustic barrier shall be 8-10 kg/m² and shall be constructed and maintained with no gaps in the barrier construction or at ground level.

23. Those provisions were adopted by the Council on the recommendation of the Commissioner for Plan Change 41, acting on the advice of the author of this report, to achieve an external level of 55 dBA Leq (24 hr) in the vicinity of buildings within the plan change area. Taking into account that typical building construction achieves 15 dBA noise attenuation with windows open, this in turn would ensure that internal sound levels in the dwellings with doors and windows closed would be consistent with the maximum internal design sound level of 40 dBA Leq (24 hr) recommended in AS/NZS 2107:2000 *Acoustics – Recommended design sound levels and reverberation times for building interiors*. This took into consideration the levels of noise that would be generated by projected growth in traffic using this stretch of Shands Road at year 2041 (i.e. the “design year” of the Christchurch Southern Motorway Stage 2 within the meaning of NZS6806:2010 *Acoustics – Road-traffic noise – New and altered roads*.) An external level of 55 dBA Leq (24 hr) and internal level of 40 dBA Leq (24 hr) are acceptable levels for the reasonable protection of residential amenity and avoidance of serious annoyance within the recommendations of those standards.
24. A rule with similar wording to Rule C4.9.17 for this Plan Change is recommended in the conclusions for this report. Appendix 1 of this report indicates the location of the acoustic barrier on the application site within the 25 m minimum building setback from Shands Rd, and with a 25 m return at its north end to minimise noise flanking around the end of the barrier.
25. In terms of suitable construction materials and methods, an earth mound or mound and acoustic barrier fence combination at least 3 m high would be equally effective in achieving the acceptable external and internal noise criteria. Materials that meet the prescribed mass for the acoustic barrier fence include 20 - 25mm thick timber, or other materials such as concrete, Hardiflex or Titan Board. A common solution is H3 treated timber, nailed through overlaps or “board and batten”, with a H4 fillet along the base at ground level to stop gaps.
26. Referring to Appendix 1, a gap in the barrier will be necessary to preserve the existing road access to the existing domestic dwelling on the site. While this gap will reduce the amount of noise attenuation provided by the barrier to some extent, the remainder of the barrier will still reduce current traffic noise in the vicinity of the existing dwelling to below 55 dB LAeq (24 hr), taking into account the dwelling is more than 100 m from the road.
27. The gap in the barrier could also reduce noise attenuation at any future dwelling on land adjacent to the north boundary of the existing dwelling site. This would be avoided by either constructing the barrier as close as is practicable to the existing road access or, if that is not practicable (e.g. because it could affect existing trees), then a 25 m return could be constructed as to minimise noise flanking around the end of the barrier as shown in Appendix 1.

Objectives and Policies Assessment

28. The following Objectives and Policies of the Selwyn District Plan have been taken into consideration in the assessment of this Plan Change:

Rural Volume Part B

- Objective B2.1.2

An integrated approach to land use and transport planning to manage and minimise adverse effects of transport networks on adjoining land uses, and to avoid “reverse sensitivity” effects on the operation of transport networks.

29. The Explanation and Reasons for Rural Objective B2.1.2 state that:

.. residents living near transport networks sometimes object to effects such as noise, dust and vibration from the network. Objectives B2.1.1 to B2.1.3 are centred on ensuring transport networks operate safely and efficiently while not adversely affecting people living nearby.

30. Part B2 Objective B2.1.2 in the Townships Volume and related explanation and reasons are identically worded.

31. In both volumes, **Policy B2.1.9** gives effect to Objective B2.12:

Ensure buildings are set back a sufficient distance from road boundaries to maintain good visibility for all road users including motorists, cyclists and pedestrians, and to allow safe access and egress and to mitigate reverse sensitivity effects on land adjoining the State Highway.

32. The Explanation and Reasons for Townships Policy B2.1.9 state further that:

Setbacks are also required to mitigate reverse sensitivity arising from road noise. This can also be achieved through a combination of building insulation and physical works such as fencing and mounding. Implementation of this policy is through rules along State Highways with a speed limit of 70km/h or greater and through rezoning land from rural to urban along the State Highway network in Selwyn.

33. Although this Plan Change is not adjacent to a State Highway, reverse sensitivity arising from road noise is an equally important consideration for new residential developments close to busy Arterial roads, such as Shands Road. The traffic noise mitigation measures that are recommended in this report will protect the road network from reverse sensitivity effects to the same extent as applies to the adjacent Living 3 zone under Plan Change 41, and is consistent with the intent of this Objective and Policy.

- Objective B3.4.1

The District’s rural area is a pleasant place to live and work in.

- Objective B3.4.2

A variety of activities are provided for in the rural area, while maintaining rural character and avoiding reverse sensitivity effects.

34. The Explanation and Reasons for Rural Objective B2.1.2 state that:

The rural area of Selwyn District is a pleasant place to live and work in. Objective B3.4.1 is to maintain this quality of the environment. It is achieved by policies and rules to manage effects such as noise, vibration, outdoor signage; glare

and odour. The policies and rules allow for day to day farming and other activities which have effects typical of a rural area, but manage activities that have potentially stronger effects. The policies and rules are not as stringent as those for Living zones. The Rural zone is recognised principally as a business area rather than a residential area, in the Plan.

35. Policy B3.4.21 gives effect to those Objectives:

Protect existing lawfully established activities in the Rural zone from potential for reverse sensitivity effects with other activities which propose to establish in close proximity.

36. There is no specific objective relating to vibration, however Policy B3.4.15, and rule C9.17 discussed in paragraph 19 above, control vibration in the Rural zone.

Policy B3.4.15

Avoid, remedy or mitigate adverse effects caused by excessive or prolonged vibration associated with people's activities.

37. As discussed in paragraphs 15 to 20 above, the rules of the District Plan and provisions of the RMA that control noise and vibration from adjacent sites for the protection of residential amenity under the proposed zoning are consistent with those that apply under the current zoning, therefore farming activities should not be constrained to any greater extent than currently applies. On this basis no reverse sensitivity effects on adjoining sites are anticipated.

Townships Volume Part B

- Objective B3.4.3

"Reverse sensitivity" effects between activities are avoided

- Policy B3.4.39

Avoid rezoning land for new residential development adjoining or near to existing activities which are likely to be incompatible with residential activities, unless any potential 'reverse sensitivity' effects will be avoided, remedied or mitigated.

38. The Explanation and Reasons for Policy B3.4.39 states that:

Rezoning land for new residential development around townships should not create 'reverse sensitivity' issues with existing activities in any zone. [The Policy] does not preclude rezoning of land for residential development adjoining ... sites in the Rural Zone which have activities with incompatible effects provided appropriate methods are used to address potential 'reverse sensitivity' issues. Appendix 14 suggests information on activities in the surrounding area be included with any plan change request to rezone land.

39. Again referring to paragraphs 15 to 20 above, the rules of the District Plan that control noise and vibration from adjacent sites for the protection of residential amenity under the proposed zoning are consistent with those that apply under the current zoning, therefore farming activities should not be constrained to any greater extent than currently applies. On this basis no reverse sensitivity effects on adjoining sites are anticipated.

Conclusions and Recommendations

40. This assessment has considered the proposed Plan Change to create a new Living 3 zone with specific regard to the control of noise that is generated within the application site and on adjacent land, including potential reverse sensitivity effects on established activities and on the road network. This has included consideration of specific relevant provisions of the Selwyn District Plan Rural and the Resource Management Act.
41. For the reasons set out in this report it is concluded that:
42. No new additional or special noise standards for this new zone are considered necessary for the protection of residential amenity within the new zone or the adjacent Living 3 zone, or reverse sensitivity on established activities in the Rural Inner Plains zone.
43. Reverse sensitivity on the road network would be avoided by including the following new rule in the Townships Volume:

Living 3 Rural Residential – 631 Shands Road, Noise Mitigation

*For the purpose of protection against traffic noise intrusion from Shands Road any dwelling, family flat and any rooms within accessory buildings used for sleeping or living shall be located at least 25 metres from Shands Road and physical acoustic barriers shall be established in the locations indicated on the Outline Development Plan, 631 Shands Road, Prebbleton in Appendix 19. The finished height of any acoustic barrier shall be no less than 3 metres above the adjacent ground level of any residential lot. The mass of any acoustic barrier shall be 8-10 kg/m² and shall be constructed and maintained with no gaps in the barrier construction or at ground level.*

Advice note:

In terms of suitable construction materials and methods, an earth mound or mound and acoustic barrier fence combination at least 3 m high would be equally effective in achieving the acceptable external and internal noise criteria. Materials that meet the prescribed mass of the acoustic barrier fence include 20 - 25mm thick timber, or other materials such as concrete, Hardiflex or Titan Board. A common solution is H3 treated timber, nailed through overlaps or "board and batten", with a H4 fillet along the base at ground level to stop gaps.

44. The location of the barrier is shown in Appendix 1 of this report.

Indicative location of acoustic barrier within 25 m minimum building setback from Shands Rd, location of existing road access, and 25 m barrier returns.

