



ASSESSMENT OF TRAFFIC NOISE EFFECTS

NZ Transport Agency Waka Kotahi
Mill Road Stage 1

AUGUST 2026

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QUALITY REVIEW AND APPROVAL RECORD

Item	Name	Date
Prepared by:	Siiri Wilkening, Marshall Day Acoustics	August 2026
Reviewed by:	Raditya Putra, Marshall Day Acoustics	August 2026
Approved for lodgement by:	Nicola Bishop, NZTA	August 2026

1 INTRODUCTION

Marshall Day Acoustics (**MDA**) has been engaged to prepare an Assessment of Traffic Noise Effects for Stage 1 of the Mill Road Project (**the Project**) which is described in the Substantive Application Report (**SAR**).

This assessment discusses the:

- Existing noise environment;
- Proposed changes to the designations;
- Effects of alteration of the designation from a traffic noise and vibration perspective;
- Requirements of the designation conditions relating to traffic noise and vibration, and proposed alterations to those conditions; and
- Information requirements for an Outline Plan waiver.

A glossary of technical terminology is included in **Appendix B**.

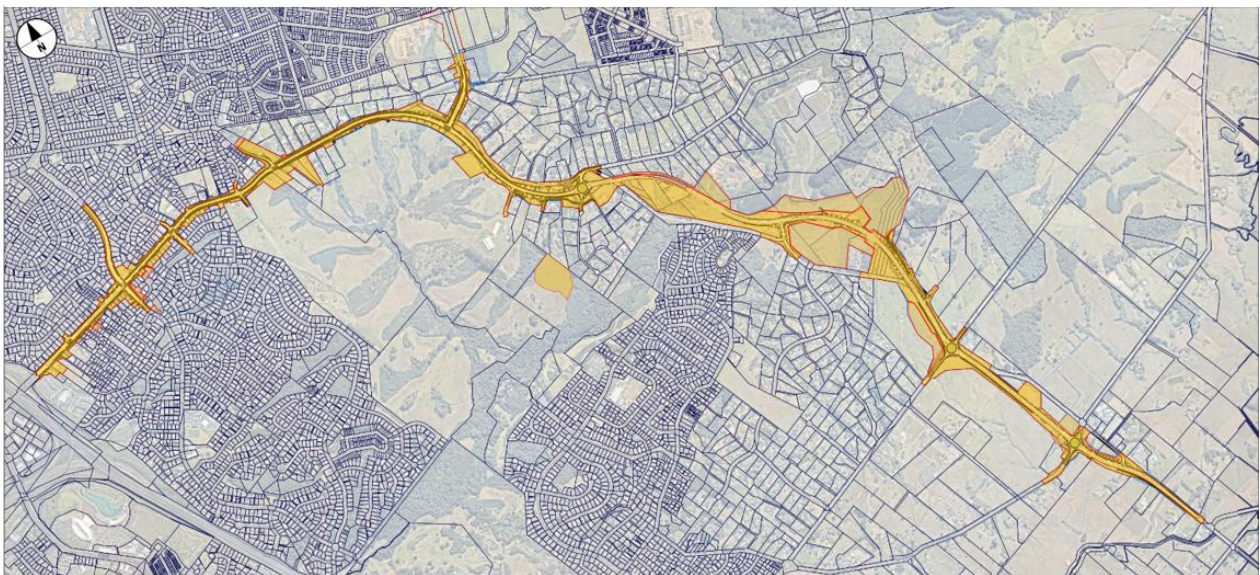


Figure 1: Extent of Mill Road Stage 1 (the Project)

2 EXISTING ENVIRONMENT

The Project incorporates three distinctly different existing environments that roughly coincide with the existing designations (referenced under Designation 6786). We have divided the designations further into assessment areas, reflecting the Noise and Vibration Assessment report (the 2015 assessment report) by AECOM, dated 16 March 2015 lodged with the NoR and any relevant amendments:

- Designation 1: Urban from its western termination close to SH1 to Hilltop Road (Areas A, B and C),
- Designation 2: Semi-rural from Hilltop Road to just north of Mill Road (Areas D, E and F), and
- Designation 3: Rural from Mill Road to the Project's eastern termination between Alfriston and Phillip Roads (Area G).

The original extent of the designations is shown in **Figure 2** below.



Figure 2: Original extents of Mill Road Designations (Designation 1, Designation 2 and Designation 3)

The assessment area extents are shown in **Figure 3** below.

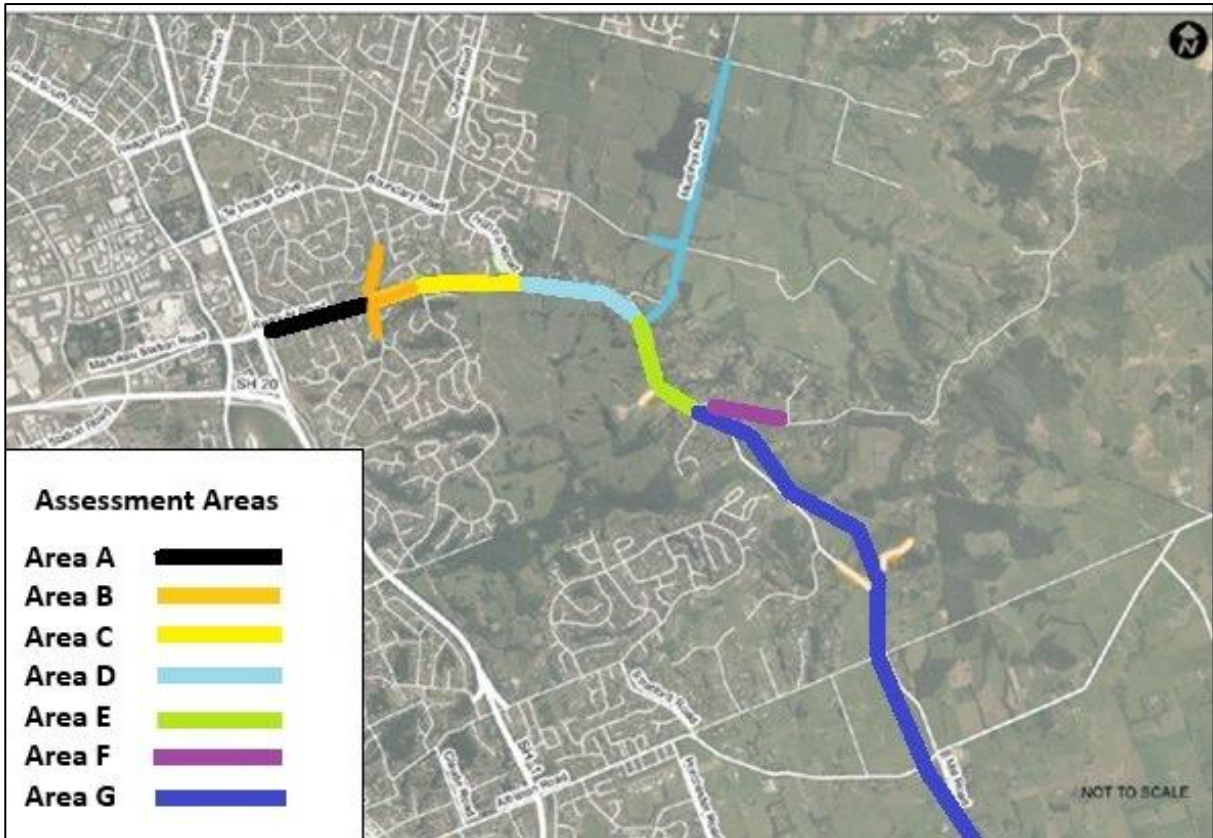


Figure 3: Assessment areas (based on 2015 assessment report)

Designation 2 covers part of Murphys Road. This section will not be implemented through this Project and has therefore not been assessed.

The noise environment in the vicinity of the Project has not materially changed from the assessment undertaken in 2014 (by up to 2 dB as discussed below). We have not undertaken traffic noise surveys during this stage of the Project.

2.1 Urban section

The current noise environment is controlled by traffic on Redoubt Road, which currently carries about 33,000¹ vehicles per day (vpd) in the section west of Hollyford Drive, and about 18,000 vpd between Hollyford Drive and Hilltop Road. The 2014 assessment suggested traffic volumes of 20,000 and 12,000 vpd for the two road sections respectively. This means that ambient traffic noise levels have increased by about 2 decibels between 2014 and 2025.

The current road surface is asphaltic concrete (**AC**), a smooth, relatively low noise generating road surface, and speed is limited to 50 km/h.

A noise survey undertaken in 2014 provided a noise level of 67 dB $L_{Aeq(24h)}$ at a house fronting Redoubt Road. Our predicted noise level of current traffic noise levels of 69 dB $L_{Aeq(24h)}$ for the survey location corresponds well with the anticipated 2 dB noise level increase due to traffic increase.

Therefore, we consider that the 2014 ambient noise level assessment is still valid, provided a 2 dB adjustment is allowed for.

2.2 Semi-rural section

The existing noise environment is controlled by traffic on Redoubt Road. In this area, the road currently carries approximately 16,000 vpd. The 2014 assessment assumed traffic volumes of around 12,000 vpd. This means that the ambient traffic noise levels would have increased by about 1 dB, a marginal and generally unnoticeable change.

The current road surface is chip seal between Hilltop Road and Murphys Road, and AC between Murphys Road and Mill Road, and the posted speed limit is 60 km/h.

The measured noise level in 2014 of 61 dB $L_{Aeq(24h)}$ was at Murphys Road, about 200m from Redoubt Road. This would have included traffic noise from Murphys Road and a smaller contribution from Redoubt Road.

Overall, we consider that the 2014 ambient noise level assessment remains valid, provided a 1 dB adjustment is applied to take account of the increase in traffic volume.

2.3 Rural section

South of Redoubt Road, following the Mill Road alignment, the controlling noise source remains traffic on Mill Road. West of the alignment, the area is rural, with very few dwellings. East of the alignment, The Gardens subdivision has been developed, with some of the closest houses having been constructed since the 2014 design. Other areas have remained largely unchanged, with large section residential use around Polo Prince Drive. Alfriston School is located on the corner of Mill and Alfriston Roads.

The current road surface is a combination of AC (placed in 2022 and therefore not included in the 2014 assessment) and chip seal. The posted speed limit is 60 km/h.

Mill Road currently carries approximately 16,000 vpd, compared with the traffic volume of 13,500 to 14,000 vpd assessed in 2014. The increase in traffic volume would result in a noise level change of less than 1 dB, which is insignificant and does not require an adjustment to previous ambient noise. This is confirmed by comparing the measured noise level in 2014 of 71 dB $L_{Aeq(24h)}$ with the predicted noise level to the same location with 2025 traffic volumes being within 1 dB of the measured level.

Parts of this section of road have undergone a more substantial change with lower noise road surface in parts which would result in an overall lower noise level.

¹ Based on information obtained through mobileroad.org

3 TRAFFIC NOISE PERFORMANCE STANDARDS

3.1 Traffic noise standard

Traffic noise is assessed in accordance with NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads. The assessment on which the existing designations were based followed the same process. This is described in the 2015 assessment report, which is referenced in the designation conditions.

In summary, the 2015 assessment report, and this traffic noise assessment, are based on the following provisions of NZS 6806:

- **Assessment Positions** are described as Protected Premises and Facilities (**PPFs**). PPFs include dwellings (including those that have building consent but are not built yet), educational facilities and their playgrounds within 20m of any school building, boarding houses, retirement villages, Marae, hospitals with in-patient facilities and motels/hotels in residential zones. For this project, PPFs are any buildings that existed as of 24 October 2014 as set out in the designation conditions. The reason is that any houses built after the designation was confirmed were aware of the designation and could incorporate measures to manage traffic noise.

Businesses are not PPFs as they are not considered noise sensitive and are often noise generators in their own right.

- **Assessment areas** as set out in the 2015 assessment report are shown in more detail in **Figure 3**.
- **Design Year** is a year 10 to 20 years after opening of the Project. While the original assessment was based on a design year of 2041, we have updated this to 2051 for the current assessment to take account of proposed future development in the area.
- **Noise Criteria Categories** are set out in the Standard for 'new' and 'altered' roads. For assessment areas A to F, the altered road criteria have been applied, and for assessment area G the new road criteria. The Noise Criteria Categories are set out in **Table 1** below.

Table 1 NZS 6806 noise criteria categories

Category	New road dB L _{Aeq} (24h)	Altered road dB L _{Aeq} (24h)
A (primary external noise category)	≤ 57	≤ 64
B (secondary external noise category)	57 – 64	64 – 67
C (internal noise category)	40 (provided the external noise level is > 64)	40 (provided the external noise level is > 67)

Given that the existing designation conditions require that the noise criteria categories of the original assessment be achieved, that was that starting point of our assessment.

- **Mitigation** is divided into structural (i.e. road surfaces and barriers) and building modification mitigation (e.g. upgrades to glazing, façades, ventilation provision). Building modification mitigation only protects the inside of houses and is only considered for houses predicted to receive noise levels in Category C.
- **Assessment Scenarios** are the various operational scenarios that we assess and compare. While the standard includes various past and future scenarios, we limited our focus to scenarios that featured the project given the presence of the existing designations:
 - **Do-minimum scenario:** consists of the Project road at the Design Year (2051), with the noise barriers recommended in the 2015 assessment report, and also including the updated road surface corrections outlined below. As discussed below, road surface corrections were updated in early 2024. The road surfaces and their respective noise corrections used for the assessment areas were:
 - PA (-1 dB) for Areas A, B and G

- AC (0 dB) for Areas C to F
- **Mitigation Option 1:** consists of the Project road, at the Design Year (2051), excludes previously recommended barriers that were not effective, but includes a new barrier where this was required to achieve the relevant noise criteria categories. This scenario also includes upgrades to the road surfaces as required by the RoNS guidelines (to the extent practicable) to reduce noise generation:
 - SMA10 (0 dB) for Areas A to C
 - LN3 (40mm EPA7) (-3 dB) for Areas D to F
 - LN5 (50mm EPA) (-5 dB) for Area G

Traffic noise is calculated using the Calculation of Road Traffic Noise by the Department of Transport, Welsh Office. This calculation method is referenced in NZS 6806. In order to calculate traffic noise levels, a multitude of factors have an effect on the results: traffic volumes, gradient, speed and road surface, for example.

Up until early 2024, the road surface corrections used in New Zealand were set out in a calculator provided by NZTA. However, after several years of studies of New Zealand road surfaces, new correction factors were published by NZTA in February 2024. While the 2015 assessment report predictions were based on the previous road surface corrections, this traffic noise assessment incorporates the new road surface corrections. This change has had a bearing on some of the results and associated Noise Criteria Categories which we discuss in the following sections.

In addition, the lowest noise generating road surfaces (LN3 and LN5) were not available in 2014 when the original assessment was undertaken. Given the Project is a RoNS, it falls under the RoNS construction guidelines which includes requirements for road surfacing (where practicable). RoNS roads in populated areas are required to provide for LN5 road surface (where practicable), and other sections of the road require LN3 surfacing. Both surfaces provide for lower noise levels than the surfaces on which the 2015 assessment report was based.

3.2 Subjective perception of noise level changes

The subjective impression of changes in noise can generally be correlated with the numerical change in noise level. While every person reacts differently to noise level changes, research shows a general correlation between noise level changes and subjective responses. **Table 2** shows indicative subjective responses to explain how a sudden noise level change may be perceived. From experience, we have found that the subjective perception of noise level change can be translated into an effect, which is generally based on people's annoyance reaction to noise level changes.

The perception of these noise level changes generally applies to immediate changes in noise level, unlike for this Project where there is an existing road that affects receivers in the area. People may subjectively have an annoyance reaction to a greater or lesser degree, depending on their perception of the Project.

Table 2 Noise level change compared with general subjective perception

Noise level change	General subjective perception
1–2 decibels	Insignificant/imperceptible change
3–4 decibels	Just perceptible change
5–8 decibels	Appreciable to clearly noticeable change
9–11 decibels	Halving/doubling of loudness

Noise is measured on a logarithmic scale, meaning that a doubling in traffic volume (e.g. from 10,000 vpd to 20,000 vpd) results in a noise level increase of 3 decibels, a just-perceptible change.

3.3 Basis of assessment

The Project is authorised through designations which contain designation conditions relating to traffic noise. Traffic noise has been assessed prior to the designations being confirmed, and the findings are described in the 2015 assessment report. The designation conditions reference the 2015 assessment report.

The existing designations require that:

- At any PPF the proposed road shall meet the relevant noise criteria categories set out in the 2015 assessment report (condition 42).
- The noise mitigation recommended in the 2015 assessment report is implemented. This mitigation consisted of low noise road surface (porous asphalt PA) and some boundary fences (condition 43).
- Any changes to the mitigation options identified during design refinements need to be tested to determine if the same noise criteria category can be achieved, or, if not, that the changed noise criteria category still represents the best practicable option (**BPO**) (condition 44).

While the conditions are generally straight forward, there are a few issues with their implementation:

- The 2015 assessment report did not set out which PPF would receive which noise criteria category, with mitigation. It only set out the noise criteria categories for each PPF without mitigation, and discussed broadly for each assessment area if PPFs were all in Category A and B, or all in Category A. This means that the condition wording of achieving “at a minimum, the same Noise Criteria Categories as for the indicative BPO mitigation options” cannot be implemented.
- The assessment recommended the use of porous asphalt as mitigation option for Areas A, B and G, and the RoNS Guidelines would require the use of LN5 for Areas A to C. From the paving specialists, we understand that porous asphalt is not a suitable surface material for high friction sections of road where cars brake, accelerate or turn, and where a high percentage of heavy vehicles are expected (such as in a bus lane). We understand from the paving specialist that for the urban area, the only practicable solution is the use of a dense asphalt surface (i.e. AC or SMA), which generates slightly higher noise levels than porous asphalt, and noticeably higher noise levels than LN5 required by the RoNS Guidelines.
- The 2015 assessment report did not show where the barriers are proposed, only referencing the addresses where barriers may be included. Therefore, it is unclear if the design from 2015 took account of site access provisions which require gaps in the barriers, therefore reducing the barriers' effectiveness.
- The 2015 assessment report also did not seem to take account of houses that are multi-storey. This means that the report appears at times to overstate the effectiveness of potential barriers as these would only protect the ground floor but not the upper level.

The three latter aspects lead to a change in noise level sufficient to cause a change in noise criteria category without changing the noise mitigation proposed in the 2015 assessment report.

Our assessment of traffic noise effects has focused on:

- Achieving the relevant noise criteria category as required by the existing designation conditions as far as practicable, taking account of building heights and making assumptions on the applicable Noise Criteria Categories based on those described for the “do-minimum” scenario in the 2015 assessment report;
- Reviewing the barriers suggested in the 2015 assessment report to verify if they achieve a meaningful noise level reduction (taking into consideration site access and building heights) and recommending barriers where they are effective, and
- Designing further mitigation that achieves these Noise Criteria Categories (as far as practicable) in the form of changed road surface, barriers and building modification mitigation.

In our opinion, the traffic noise effects will remain similar with the proposed Project to those of the designated road alignment. The only noticeable changes would occur where additional buildings are removed to construct the Project, and where the alignment has changed in the rural area. Any other changes to predicted noise levels are relatively minor and due to external factors such as the change in road surface correction and the more detailed modelling of building heights and site access arrangements.

For most PPFs, the noise levels are within the Noise Criteria Categories that would have been predicted by the 2015 assessment report, had the new road surface corrections been available at that time.

Due to the updates to the model, there are some PPFs where we predict noise levels for a higher Noise Criteria Category than was anticipated by the 2015 assessment report. These are discussed individually below.

4 ASSESSMENT OF POTENTIAL TRAFFIC NOISE EFFECTS

The proposed Project generally follows the same alignment as the designated road. Design changes such as those proposed at the Mill Road and Redoubt Road interchange, have little bearing on the traffic noise levels compared with the previous design. The design change of Puhinui Bridge and associated move of the alignment, expanding the existing designation to the north, influences the noise outcomes. We discuss any changes to mitigation required to respond to this change in Section 4.7 below.

Traffic volumes and road alignment have not materially changed, and we would therefore expect the outcome to be similar to that of the design and predictions. The greatest changes are the new road surface corrections, and the clarification that porous asphalt cannot be used in Areas A to C, which limits mitigation options in an urban environment.

4.1 Area A – SH1 to Everglade Drive

The 2015 assessment report stated that all PPFs in Area A receive noise levels in Categories A and B. The 2015 assessment report did not specify which PPFs receive which noise levels with mitigation in place. In addition, the 2015 assessment report recommended barriers at 2, 2A, 4, and 26 Redoubt Road.

We understand that porous asphalt (PA) is not a practicable road surface material for this section of road. Instead, dense asphalt (SMA1010) is proposed to be used. This results in a slightly higher noise level than the PA surface. Using the new road surface corrections, we have predicted the noise levels at all PPFs for the Do-minimum scenario (i.e. as per 2015 assessment report, including recommended barriers and road surfaces). The results show that of the 215 assessed PPFs, 13 PPFs would have received noise levels in Category C, and with the proposed SMA10 surface, 18 PPFs would receive noise levels in Category C. Should a lower noise road surface (e.g. LN5) be used in this area, fewer PPFs would receive noise levels in Category C. This will need to be confirmed during detailed design.

We have then investigated the barriers previously recommended in the 2015 assessment report, taking into consideration driveway access, dwelling height and the use of the outdoor area facing the road. These are discussed in more detail below. Predicted noise levels, noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

4.1.1 2 and 2A Redoubt Road

2 Redoubt Road is set back from Redoubt Road, providing driveway access for both 2 and 2A Redoubt Road. A barrier would have no noticeable positive effect for this dwelling. In any event, 2 Redoubt Road is predicted to receive noise levels in Category A and no further mitigation would be required.

2A Redoubt Road is double storey and fronts Redoubt Road. A barrier would have no effect on noise levels at the first floor. The ground floor is below ground level, with a retaining wall already providing shielding. A barrier would achieve a just noticeable noise level reduction at the lower floor. With or without barrier, the dwelling at 2A Redoubt Road would remain in Category C. We consider that 2 and 2A Redoubt Road would not benefit from a barrier as it would not result in sufficient noise level reduction.

4.1.2 4 Redoubt Road

4 Redoubt Road is also double storey. The site currently has no fence. The site has two driveways, to the east and west of the dwelling. This makes a barrier impractical as access to the site will need to be retained. The upper floor would not benefit from a barrier. The ground floor has the potential for a slight benefit from a barrier, which is strongly eroded by the driveway openings. The dwelling will receive noise levels in Category C with or without a barrier.

Overall, we consider that this barrier is not practicable and doesn't achieve sufficient noise level reduction.

4.1.3 26 Redoubt Road

26 Redoubt Road has an existing fence along the road boundary, with a significant opening for the driveway servicing both 26 and 26A Redoubt Road.

For 26A Redoubt Road, the façade closest to the road is a garage, and the closest habitable room is far enough from the road to already receive a noise level in Category A. With or without a barrier, 26 Redoubt Road would receive noise levels in Category B.

We do not recommend this barrier as it would not result in noticeable noise level reduction.

4.1.4 Area A analysis and recommendations

Table 3 below shows the number of PPFs in each noise criteria category for the Do-minimum and Mitigation Option scenarios.

Table 3: PPFs per noise criteria category

Category	Number of PPFs	
	Do-minimum scenario	Mitigation Option 1
A	178	176
B	24	21
C	13	18

Table 4 shows all PPFs in Area A that are currently identified to receive noise levels in Category C.

Table 4: Category C PPFs

Address	Address	Address
2 Diorella Drive	22 Redoubt Road	41B Redoubt Road
2A Redoubt Road	24 Redoubt Road	43A Redoubt Road
4 Redoubt Road	1/28 Redoubt Road	45A Redoubt Road
6 Redoubt Road	1/30 Redoubt Road	46 Redoubt Road
14 Redoubt Road	32 Redoubt Road	47A Redoubt Road
18 Redoubt Road	1/38 Redoubt Road	57A Redoubt Road

Overall, for Area A, we recommend that, in the absence of a practicable low noise road surface, building modification is offered to those PPFs receiving noise levels in Category C. These PPFs should be confirmed during detailed design (e.g. if a lower noise road surface was to be used).

The noise levels are not predicted to change significantly. The overall noise level change between the two scenarios is less than 1 decibel, reflecting the minimal changes to the alignment compared with the current design. This means that the traffic noise effects from the Project, compared with the existing designation, are small and generally unnoticeable.

4.2 Area B – Everglade Drive to Goodwood Drive

The 2015 assessment report stated that all PPFs receive noise levels in Categories A and B. The report did not specify which PPFs receive which noise levels with mitigation in place. No barriers were proposed.

Our predictions show that even for the Do-minimum scenario (as per the assessment scenario, using PA surface) nine PPFs are predicted to receive noise levels in Category C. As for Area A, PA surface is not considered practicable by the surface specialist, and an SMA10 surface is proposed. With this surface in place, 11 PPFs would receive noise levels in Category C. Of those, seven PPFs are double storey and would not benefit from a barrier. The remaining PPFs have driveways such that barriers would not be effective. Should a lower noise road surface (e.g. LN5) be used in this area, fewer PPFs would receive noise levels in Category C. This will need to be confirmed during detailed design. Predicted noise levels,

noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

Table 5 below shows the number of PPFs in each noise criteria category for the Do-minimum and Mitigation Option scenarios.

Table 5: PPFs per noise criteria category

Category	Number of PPFs	
	Do-minimum scenario	Mitigation Option 1
A	111	111
B	21	19
C	9	11

Table 6 shows all PPFs in Area B that are currently identified to receive noise levels in Category C.

Table 6: Category C PPFs

Address	Address	Address
1A Aspiring Avenue	1/27 Hollyford Drive	6 Rosewood Place
9 Hollyford Drive	68 Redoubt Road	10 Rosewood Place
1/21 Hollyford Drive	78 Redoubt Road	10A Rosewood Place
2/25 Hollyford Drive	4 Rosewood Place	

Overall, for Area B, we recommend that, in the absence of a practicable low noise road surface, building modification is offered to those PPFs receiving noise levels in Category C. These PPFs should be confirmed during detailed design (e.g. if a lower noise road surface was to be used).

The noise levels are not predicted to change significantly. The overall noise level change between the two scenarios is close to 0 (0.4 decibels), reflecting the minimal changes to the alignment compared with the current design. Based on these findings, the traffic noise effects compared with the existing designation are minimal and generally unnoticeable.

4.3 Area C – Goodwood Drive to Hilltop Road

The 2015 assessment report stated that all PPFs would receive noise levels in Category A. Barriers were proposed for 1 Santa Monica Place, 104 and 135 Redoubt Road. Our predictions for the Do-minimum scenario show that six PPFs would receive noise levels in Category C, and one in Category B. All Category C PPFs are double storey and would not benefit from barriers. Should a lower noise road surface (e.g. LN5) be used in this area, fewer PPFs would receive noise levels in Category C. This will need to be confirmed during detailed design.

The 2015 assessment report recommended AC road surface material. SMA10 (which performs similarly to AC surface) has been confirmed to be a practicable road surface for this section of road, while porous asphalt is not considered practicable by the surface specialist. The new road surface correction is slightly higher than was the case when the 2015 assessment report was prepared, resulting in an overall noise level increase.

We have investigated the recommended barriers of the 2015 assessment report and discuss each below.

Predicted noise levels, noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

4.3.1 1 Santa Monica Place

The 2015 assessment report proposed a barrier for 1 Santa Monica Place with the aim of reducing noise levels from Category B to Category A. Based on the new road surface corrections, this PPF would receive noise levels within Category C for both the Do-minimum scenario (with the proposed barrier) and the Mitigation Option 1 (without the barrier). The barrier would make no perceptible difference to the outcome.

The dwelling at 1 Santa Monica Place is double storey. The site has a solid concrete block wall (approximately 1.8m high) which would act as an acoustic barrier for the ground floor. In addition, the site has significant vegetation along the Redoubt Road boundary which, while not providing acoustic mitigation, provides visual shielding for the upper floor. The outdoor living area of this dwelling is towards the east of the building, shielded by the dwelling's U shape.

The 2015 assessment report recommended to install a timber acoustic fence. The existing block wall is of better and more durable quality than a timber fence. In addition, a significantly higher barrier would be needed to also shield the upper floor, risking taking out the existing vegetation.

Our prediction shows that a different 2m high barrier would make no difference to the Noise Criteria Category, with the PPF remaining in Category C.

We therefore recommend retaining the existing effective barrier at this site.

4.3.2 104 Redoubt Road

The 2015 assessment report recommended a barrier for 104 Redoubt Road to reduce noise levels from Category B to Category A. With the new road surface corrections, the noise levels for both the Do-minimum and Mitigation Option scenarios are in Category C.

The dwelling at 104 Redoubt Road is double storey. The site has a fence that would not provide any noise mitigation in its current condition. Two driveways enter the site along its western and eastern sides, making any fence inefficient as site access will need to be retained.

We predict a noise level increase of just over 1 decibel, generally due to the new road surface correction. Therefore, the Project does not cause any noticeable noise level change at this dwelling.

A 2m fence fronting Redoubt Road would achieve a minor noise level reduction of about 1 decibel, which would not change the noise criteria category at this PPF. This would make no meaningful difference to the noise level received at the dwelling. We therefore recommend no barrier at this site.

4.3.3 135 Redoubt Road

The 2015 assessment report recommended a barrier at this site with the aim of reducing noise levels to be within Category A. With the new road surface correction, the PPF would receive noise levels both for the Do-minimum and Mitigation option scenarios in Category C.

The dwelling at 135 Redoubt Road is double storey, with a driveway accessing the site at the west. The deck at the upper level appears to be the outdoor living area, with the other outdoor area appearing to be south of the house, away from the road. The house currently has a pool fence that does not provide any acoustic shielding.

Our predictions show that the house would receive noise levels in Category C, with the barrier making no difference to the noise level. The predicted noise level remains unchanged at 70 dB $L_{Aeq}(24h)$.

Given that the barrier has no effect on the noise level at the house, we recommend that no barrier is installed.

4.3.4 Area C analysis and recommendations

Table 7 below shows the number of PPFs in each noise criteria category for the Do-minimum and Mitigation Option scenarios.

Table 7: PPFs per noise criteria category

Category	Number of PPFs	
	Do-minimum scenario	Mitigation Option 1
A	73	73
B	1	1
C	6	6

Table 8 shows all PPFs in Area C that are currently identified to receive noise levels in Category C.

Table 8: Category C PPFs

Address	Address
1 Alexia Place	133A Redoubt Road
104 Redoubt Road	135 Redoubt Road
119A Redoubt Road	1 Santa Monica Place

Overall, for Area C, we recommend that, in the absence of a practicable low noise road surface, building modification is offered to those PPFs receiving noise levels in Category C. These PPFs should be confirmed during detailed design (e.g. if a lower noise road surface was to be used). The noise levels are not predicted to change noticeably, ranging from +1 to -1 dB. The overall noise level change between the two scenarios is 0 decibels, reflecting the minimal changes to the alignment compared with the current design, and therefore a negligible traffic noise effect.

4.4 Area D – Hilltop Road to Murphys Road

The 2015 assessment report stated that all PPFs receive noise levels in Categories A and B. We have deduced that the only PPF that was predicted to receive noise levels in Category B, is 170 Redoubt Road. (We note that 170 Redoubt Road has a garage fronting the road, and the closest habitable room is further removed, resulting in a noise level in Category A). No barriers were proposed for Area D. With the new road surface corrections, three PPFs would have received noise levels in Category B (176, 189 and 206 Redoubt Road).

The road surface proposed by the 2015 assessment report was AC10, while the RoNS guidelines recommend that use of LN3. We understand from the surface specialist that LN3 surface is practicable and have applied it for the Mitigation option scenario.

Our predictions show with LN3 that all PPFs would receive noise levels in Category A. The low noise road surface would also result in overall lower noise levels than was anticipated by the 2015 assessment report, by an average of 3 decibels.

Table 9 below shows the number of PPFs in each noise criteria category for the Do-minimum and Mitigation Option scenarios.

Table 9: PPFs per noise criteria category

Category	Number of PPFs	
	Do-minimum scenario	Mitigation Option 1
A	18	21
B	3	0
C	0	0

Predicted noise levels, noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

We recommend the use of LN3 road surface. This will achieve a noise outcome as anticipated by the current designation conditions. The road surface will achieve an overall reduction in noise level, compared with the designated design, with an average noise level reduction of 3 dB, resulting in a slight positive effect.

4.5 Area E – Murphys Road to Mill Road

The 2015 assessment report stated that all PPFs receive noise levels in Category A. No barriers were proposed.

Our predictions show that, with the new road surface correction, all PPFs would receive noise levels in Category A for both the Do-minimum and Mitigation Option scenarios. Predicted noise levels, noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

We recommend the use of LN3 road surface as required by the RoNS guidelines. This will achieve a noise outcome as anticipated by the current designation conditions. The road surface will achieve an overall reduction in noise level, compared with the designated design, with an average noise level reduction of 3 dB, resulting in a slight positive effect.

4.6 Area F – East of Mill Road/Redoubt Road intersection

The 2015 assessment report stated that all PPFs receive noise levels in Categories A and B. Barriers were proposed for 326 and 353 Redoubt Road.

Our predictions include 353 Redoubt Road in Area G as we consider this dwelling to be better assessed against the “new” road criteria. The reason is that the main noise source will move from the dwelling’s northern to its southern façade. The southern façade is currently unaffected by traffic noise. We consider this should be addressed.

Our predictions show that all PPFs would receive noise levels in Category A without a barrier in place. Predicted noise levels, noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

326 Redoubt Road has an existing hedge along the road frontage that would need to be removed for the construction of a barrier. The predicted noise level without a barrier is well below the upper limit of Category A, at 51 dB $L_{Aeq(24h)}$. Therefore, we do not recommend any barrier.

We recommend the use of LN3 road surface as required by the RoNS guidelines, and no barriers. This will achieve a noise outcome as anticipated by the current designation conditions. The road surface will achieve an overall reduction in noise level, compared with the designated design, with an average noise level reduction of 2 dB, resulting in a slight positive effect.

4.7 Area G – Mill Road south of Redoubt Road

The 2015 assessment report stated that all PPFs receive noise levels in Category A. Barriers were proposed for 1345 Alfriston Road, 140 Ranfurly Road and 222 Mill Road. PA road surface was recommended in the 2015 assessment report. With this surface and the proposed barriers in place, 15 PPFs would receive noise levels in Category B due to the new road surface corrections.

In addition to the PPFs identified in the 2015 assessment report, we have included 353 Redoubt Road in this area as discussed above. Area G is the only area that has been assessed against the “new” road criteria of NZS 6806 (refer **Table 1**).

An alignment change (and associated change of the existing designation boundary) is proposed between Mill Road and south of Puhinui Stream. Here, the realignment of the Puhinui Bridge necessitates a move of the road towards the north and closer to the PPFs at 353, 361, 371 and 375 Redoubt Road. While the road moves into a cut in the vicinity of 375 Redoubt Road, the dwelling is double storey, therefore retaining line-of-sight to the road surface.

Our predictions show that, with the use of LN5 road surface, all PPFs would receive noise levels in Category A, with the exception of 353, 361, 371 and 375 Redoubt Road.

The dwellings for which a barrier was recommended, and 353, 361, 371 and 375 Redoubt Road are discussed below.

Predicted noise levels, noise criteria categories and comments are included in **Appendix C** and noise level contours in **Appendix D**.

4.7.1 1345 Alfriston Road

The site at 1345 Alfriston Road is vacant and therefore not a PPF. No barrier or other mitigation is required.

4.7.2 140 Ranfurly Road

In the 2015 assessment report, a barrier was proposed for 140 Ranfurly Road.

The dwelling at 140 Ranfurly Road is predicted to receive noise levels in Category A. With the use of LN5 road surface, the noise levels are lower than those that were achieved with the previously proposed PA road surface and barrier.

We therefore recommend no barrier, but the use of LN5 surface.

4.7.3 222 Mill Road

In the 2015 assessment report, a barrier was proposed for 222 Mill Road.

222 Mill Road is predicted to receive noise levels in Category A. With the use of LN5 road surface, the noise levels are lower than those that would be achieved with the previously proposed PA road surface and barrier.

We therefore recommend no barrier, but the use of LN5 surface.

4.7.4 353, 361, 371 and 375 Redoubt Road

The dwellings at 353, 361, 371 and 375 Redoubt Road were predicted to receive noise levels in Category A in the 2015 assessment report. A barrier was recommended for 353 Redoubt Road.

The dwelling at 353 Redoubt Road had been assessed against the “altered” road criteria in 2014, however, we consider it more appropriate to assess all of these dwellings against the “new” road criteria, which are noticeably lower. This means that in our assessment, the four PPFs would receive noise levels in Category B (“new” road). To mitigate the noise levels, we have recommended a 2m high barrier on the northern edge of the Project alignment, extending approximately from chainage 13470 to chainage 13870. With this barrier in place, the noise level at all four PPFs will be in Category A.

4.7.5 Area G analysis and recommendations

Table 10 below shows the number of PPFs in each noise criteria category for the Do-minimum and Mitigation Option scenarios.

Table 10: PPFs per noise criteria category

Category	Number of PPFs	
	Do-minimum scenario	Mitigation Option 1
A	41	56
B	15	0
C	0	0

The noise levels are predicted reduce by an average of 3 decibels due to the low noise road surface proposed and the barrier at Redoubt Road.

We recommend the use of LN5 road surface and the installation of a 2m noise barrier along the southbound lanes approximately between chainage 13470 to chainage 13870. The noise mitigation will achieve an overall reduction in noise level, compared with the designated design, with an average noise level reduction of 3 dB, resulting in a slight positive effect.

4.8 Traffic noise assessment outcome

We consider that the Project in its currently proposed form and location would result in traffic noise levels and effects similar to a minor road upgrade of an existing major road. Where the road deviates from existing roads (i.e. south of Redoubt Road), the impact of the new road will be noticeable but will be managed through the use of the quietest road surface material LN5 and one barrier.

Any changes in outcome, e.g. the change in noise criteria category from the 2015 assessment report, are due to the current new road surface corrections, and the fact that porous asphalt is not considered practicable for Areas A to C by the surface specialist.

Due to these changes, 35 PPFs are currently predicted to receive noise levels in Category C. These PPFs should be assessed for building modification mitigation in accordance with NZS 6806, in order to receive an internal noise level of no more than 40 dB $L_{Aeq}(24h)$ With appropriate ventilation and thermal comfort

ensured. The actual number of PPFs receiving noise levels in Category C should be confirmed during detailed design, based on the latest available traffic volume data and layout.

Traffic noise effects (compared with the existing designation) range from negligible for Areas A to C, to slight positive for areas D to G. Overall, the Project will result in similar traffic noise levels to those that were anticipated by the existing designation.

5 EXISTING DESIGNATION CONDITIONS

The Project is authorised under three designations with identical associated conditions. The relevant conditions relating to traffic noise (conditions 41 to 54) require reference to a document that does not contain the details needed to successfully apply the conditions (as discussed in the Section 3.3 above). For that reason, we propose to replace the current conditions with a simplified version that requires defined mitigation measures and an assessment of those dwellings identified to receive noise levels in Category C.

Where we propose to delete, or significantly alter, existing designation conditions, these are discussed in the sections below.

5.1 Existing Condition 53 – Post construction surveys

We do not recommend post-construction noise level surveys to verify outcomes. The reason is that survey results can vary widely, particularly in urban and suburban areas where there are a multitude of noise sources unrelated to the traffic noise under consideration. For that reason, we recommend instead that a post-construction review of the mitigation measures is undertaken. That would involve visiting the length of the Project and observing the quality and type of road surface laid, and the height, material and length of barrier installed. NZTA's P40 Specification for road-traffic noise mitigation² sets out in Section 10 how the post-construction review must be undertaken. This review is in our opinion significantly more practical and valuable than noise level surveys which have a high factor of uncertainty. Therefore, a new condition is proposed (shown in Section 5.3 as condition 11).

In order to allow a feedback loop with Council, we recommend that the outcome of the mitigation option review is provided to Council for information.

5.2 Existing Condition 54 – 116 Ranfurly Road

The existing condition 54 applying to the site at 116 Ranfurly Road only, contains a number of requirements that we consider to be unsupportable. We discuss each section separately in Table 11 below.

Table 11 Existing Condition 54 and comments

Existing condition wording	Comment
54.1 Auckland Transport will, as soon as reasonably practicable, provide the owners of 116 Ranfurly Road with the noise contours for 116 Ranfurly Road which will be modelled on the basis that the Best Practicable Option (the BPO) is to be implemented.	This condition can be deleted as this information has been provided to the landowner through the property negotiation process that is currently underway. In addition, the condition does not specify at which height the noise level contours are to be provided, e.g. at ground or first floor level. We consider that the most useful information will be two sets of contours: at 2m height for the ground floor level, and at 5m height for the first floor level, in case double storey dwellings are proposed for the site.

² <https://www.nzta.govt.nz/assets/resources/noise-mitigation/docs/p40-specification-for-road-traffic-noise-mitigation.pdf>

Existing condition wording	Comment
54.2 Auckland Transport will meet the noise contours provided to the owners of 116 Ranfurly Road under condition 54.1 when the road is constructed.	This condition should be deleted as it is not technically feasible to “comply with noise contours”. Noise level contours are obtained as an interpolation of a number of prediction points. They should not be used to “read” noise levels but rather provide an overview of how noise propagates over the wider area. While noise contours are sufficient to design façade sound insulation, they cannot be “complied with” due to the interpolation uncertainty.
54.3 Any future dwellings or buildings on the balance land at 116 Ranfurly Road will be designed so that suitable internal noise levels are achieved based on the noise contours provided by Auckland Transport under condition 54.1.	This part of the condition is addressed in the SAR (see Part C) which recommends that this condition is deleted.
54.4 Auckland Transport will carry out an analysis of the BPO and implement this at Outline Plan of Works stage no more than 12 months before commencement of construction, but this will be limited to assessing the need for additional structural mitigation in the corridor adjacent to 116 Ranfurly Road.	This condition can be deleted as the analysis has already been completed as part of the current assessment.
54.5 Auckland Transport will not oppose future development of the balance land at 116 Ranfurly Road that is consistent with its Future Urban zoning under the Unitary Plan, subject to the right for Auckland Transport to provide traffic engineering input into an assessment of the adequacy of any access design. This does not constrain or prevent Auckland Transport from refusing to provide its approval to development of 116 Ranfurly Road under section 176 of the Resource Management Act 1991 or section 71 of the Public Works Act 1981 (as the case may be).	This part of the condition does not relate to noise and is addressed in the SAR (see Part C) which recommends that the condition is deleted.

5.3 Recommended designation conditions

We have recommended amended designation conditions that better reflect the current best practice approach to roading projects, giving certainty as to the mitigation that will be provided. These conditions would replace existing conditions 41 to 54.

The conditions now set out:

- The road surface to be used (as discussed in Section 4 of this report);
- The barrier to be installed (as discussed in Section 4.7.5 of this report) and
- The process of determining the building modification mitigation required for any PPF that is predicted to receive an external noise level higher than 67 dB $L_{Aeq}(24h)$.

The recommended conditions are shown in **Table 12** below.

Table 12: Recommended designation conditions

1.

Road Surface

1.1

The Requiring Authority shall implement the following road surface (or alternative surface types that achieve an equivalent or better noise performance) on the carriageways of the Project, within 12 months of opening of the state highway for public use.

Location	Chainage	Surface Type*
State Highway 1 to Hilltop Road	CH10000 – CH11600	SMA10
Hilltop Road to Mill Road	CH11600 – CH13400	LN3
Mill Road to Phillip Road	CH13400 – CH17100	LN5

* Surface types are as defined in Table A2 of NZTA 'Guide to Assessing Road-Traffic Noise' February 2024.

1.2

The requirement to install LN3 or LN5 (or equivalent or better low noise road surface) does not apply to the following high friction areas along the carriageways of the Project:

(a)

bridges;

(b)

roundabouts;

(c)

intersections; and

(d)

the approaches to roundabouts and intersections as specified below:

2.

Building Modification Mitigation

2.1.

Prior to the start of Construction Works, a SQP shall identify those PPFs where, following implementation of road surfaces in accordance with Condition 1:

(a)

The external traffic-noise level at the façade facing the Project is higher than 67dB LAeq(24h); and

(b)

Building-Modification Mitigation may be required in accordance with Conditions 2.2 to 2.7 below to achieve 40dB LAeq(24h) inside habitable spaces as far as reasonably practicable.

These PPFs re referred to as 'Category C Buildings'

2.2.

Prior to the Start of Construction in the vicinity of each Category C Building, the Requiring Authority shall write to the owner of the Category C Building requesting entry to assess the noise reduction performance of the existing building envelope.

2.3.

If the building owner agrees to entry within three months of the date of the Requiring Authority's letter, the Requiring Authority shall instruct a SQP to visit the building and assess the noise reduction performance of the existing building envelope.

2.4.

For each Category C Building identified, the Requiring Authority is deemed to have complied with Condition 2.3 above where:

(a)

The Requiring Authority's SQP has visited the building and assessed the noise reduction performance of the building envelope; or

(b)

The building owner did not respond to the Requiring Authority's letter (sent in accordance with Condition 2.2) or did not agree to entry; or

(c)

The building owner agreed to entry, but the Requiring Authority's SQP could not gain entry (including where entry was denied by the occupant); or

(d)

The building owner cannot, after reasonable enquiry, be found prior to Completion of Construction.

	If (b) – (d) above apply to a Category C Building, the Requiring Authority is not required to comply with Conditions 2.5 – 2.7 2.5. Subject to Condition 2.4 above, within six months of the assessment undertaken in accordance with Condition 2.3, the Requiring Authority shall write to the building owner of each Category C building advising: (a) Whether it is reasonably practicable to achieve 40dB L_{Aeq(24h)} inside habitable spaces of the Category C building through Building-Modification Mitigation; (b) The options available for Building-Modification Mitigation if required and reasonably practicable; and (c) That the building owner has three months to decide whether to accept the Building-Modification Mitigation and to advise which option for Building-Modification Mitigation the building owner prefers, if the Requiring Authority has advised that more than one option is available. 2.6. Once the Building-Modification Mitigation has been accepted by the building owner, it shall be implemented (including the Requiring Authority obtaining any authorisations required to implement the mitigation) by arrangement with the building owner. 2.7. Subject to Condition 2.5, where Building-Modification Mitigation is required, the Requiring Authority is deemed to have complied with Condition 2.6 above if: (a) The Requiring Authority has completed Building-Modification Mitigation to the building; or (b) An alternative agreement for mitigation is reached between the Requiring Authority and the building owner; or (c) The building owner did not accept the Requiring Authority’s offer to implement Building-Modification Mitigation within three months of the date of the Requiring Authority’s letter sent in accordance with Condition 2.5 above (including where the owner did not respond within that period); or (d) The building owner cannot, after reasonable enquiry, be found prior to Completion of Construction.						
3.	Noise Barrier 3.1. A continuous 2-metre-high noise barrier shall be installed along the carriageway in the location below prior to the Completion of Construction of the relevant Stage of Work. <table><tr><th>Location</th><th>Chainage</th><th>Road direction</th></tr><tr><td>353 and 375 Redoubt Road</td><td>CH13470 – CH13870</td><td>Southbound</td></tr></table>	Location	Chainage	Road direction	353 and 375 Redoubt Road	CH13470 – CH13870	Southbound
Location	Chainage	Road direction					
353 and 375 Redoubt Road	CH13470 – CH13870	Southbound					
4.	Maintenance of Structural Noise Mitigation 4.1. The road surface (required by Condition 1) and the noise barrier (required by Condition 3) shall be maintained to achieve their intended noise reduction performance as far as practicable.						

6 CONCLUSION

We have assessed the traffic noise effects from the proposed Project. Overall, the alignment does not change noticeably from that already designated, with the exception of a few buildings in the amended designation that will be removed, therefore reducing shielding for the remaining dwellings.

The existing designation conditions present implementation challenges as technical assumptions that underpin the 2015 assessment report are missing, and the prediction basis has been updated (specifically the road surface correction), leading to higher predicted noise levels.

Therefore, our assessment has focused on, as far as practicable, achieving as similar an outcome in terms of traffic noise exposure when comparing with the Do-minimum scenario (i.e. the scenario put forward in 2014 as the preferred mitigation option).

We have recommended the use of new mitigation options, namely the use of the most current low noise road surface (which was not available at the time the designations were obtained) for areas where they are practicable (i.e. from Hilltop Road south) and a barrier for several houses in the rural area. In addition, we recommend that all dwellings that are predicted to receive noise levels within Category C (i.e. above 67 dB $L_{Aeq(24h)}$) are assessed for building modification mitigation to ensure a suitable internal noise level of 40 dB $L_{Aeq(24h)}$ or lower.

With these mitigation measures in place, we predict that there will be generally no change to the noise effects compared with the current design, with negligible effects for areas A to C and slight positive effects for areas D to G.

APPENDIX A STATEMENT OF QUALIFICATIONS AND CODE OF CONDUCT

Qualifications

My full name is Siiri Wilkening. I am the author of the report.

I am a director of Marshall Day Acoustics and a Fellow of the Acoustical Society of New Zealand. I am also a member of the Resource Management Law Association and a member of the Institute of Directors of NZ.

I hold a Master's degree in Environmental Engineering (Land Improvement and Environmental Protection) from the University of Rostock, Germany. I have nearly 30 years' experience in acoustic engineering in Germany and New Zealand, specialising in environmental noise control with a particular focus on roads and construction.

My work and expertise relate to a wide range of environmental noise and vibration sources, such as road traffic, construction, rail, ports, quarries, industrial and power generation activities and educational facilities. I was also involved in the development and testing of NZS 6806 (the New Zealand road-traffic noise standard).

My expertise in road traffic noise, particularly in New Zealand, is extensive. I have been the lead acoustician on many major roading projects including Roads of National Significance (RoNS). Projects that were authorised through a Board of Inquiry, where I appeared as an expert witness for NZTA, are SH1 MacKays to Peka (Kāpiti Coast), East West Link, SH1 Northern Corridor Improvements, SH20 Waterview Connection and SH1 Puhoi to Warkworth (Auckland). Other examples of major roads I have been or am the lead acoustician are SH2 Takitimu North Link Stages 1 and 2 (Hawkes Bay/Tauranga), SH1 Southern Corridor from Manukau to Bombay (Auckland), several of the designations authorised through Te Tupu Ngātahi Supporting Growth (Auckland) on behalf of Auckland Transport and NZTA and SH1 Cambridge to Piarere (Waikato).

I have given evidence at council hearings, in the Environment Court, the Arbitration Court and before five Boards of Inquiry. I have also taken part in Environment Court mediations.

Code of Conduct

Although this matter is not before the Environment Court, I, Siiri Wilkening, confirm that I have read the Code of Conduct for expert witnesses as contained in section 9 of the Environment Court Practice Note 2023. I agree to comply with that Code. My qualifications as an expert are set out above. I am satisfied that the matters which I address in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

s9(2)(a)

Siiri Wilkening

August 2026

APPENDIX B GLOSSARY OF TECHNICAL TERMS

Term	Definition
Noise	A sound that is unwanted by, or distracting to, the receiver.
dB	Decibel (dB) is the unit of sound level. Expressed as a logarithmic ratio of sound pressure (P) relative to a reference pressure (Pr), where $dB = 20 \times \log(P/Pr)$.
dBA	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) to more closely approximate the frequency bias of the human ear. A-weighting is used in airborne acoustics.
L_{Aeq(24h)}	The equivalent continuous (time-averaged) A-weighted sound level commonly referred to as the average level. The suffix (t) represents the period, e.g. (24 h) would represent a period of 24 hours. This is used to describe traffic noise.
NZS 6806:2010	New Zealand Standard NZS 6806: 2010 "Acoustics – Road-traffic noise – New and altered roads"
PPF	Protected Premises and Facilities as defined in NZS 6806:2010

APPENDIX C PREDICTED TRAFFIC NOISE LEVELS

The following tables show the predicted noise levels at all PPFs. They are coloured as follows:

- Category A – green
- Category B – orange
- Category C – red

The scenarios reflect the following:

- Do minimum scenario: RoNS surface, barriers as per 2015 assessment report
- Mitigation Option 1: upgraded RoNS surface (where practicable), only effective barriers. Where barriers are marked as “not sufficient” or “ineffective”, they have been excluded from Mitigation Option 1.
- Comments are entered where barriers are discussed or where building modification mitigation is recommended to be investigated.

For each area, we have marked if they are assessed against the altered or new road criteria.

We note that in some instances, the same address is repeated in the tables below as there are multiple dwellings located on the same property.

Area A – SH1 to Everglade Drive (altered road)

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
3 Ancona Lane	62	63	
5 Ancona Lane	58	59	
6 Ancona Lane	55	56	
7 Ancona Lane	48	49	
8 Ancona Lane	47	48	
8A Ancona Lane	46	47	
2A Banksia Place	60	60	
3 Banksia Place	49	50	
4 Banksia Place	58	58	
5 Banksia Place	48	48	
6 Banksia Place	45	46	
1/7 Banksia Place	45	45	
2/7 Banksia Place	44	45	
8 Banksia Place	45	46	
9 Banksia Place	45	46	
11 Banksia Place	47	47	
13 Banksia Place	50	50	
14 Banksia Place	42	43	
15 Banksia Place	49	49	
3 Birchlea Rise	66	67	
4 Birchlea Rise	66	67	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
5 Birchlea Rise	54	55	
6 Birchlea Rise	53	54	
7 Birchlea Rise	50	51	
8 Birchlea Rise	50	51	
10 Birchlea Rise	49	50	
1A Derrimore Heights	47	48	
3 Derrimore Heights	45	46	
5 Derrimore Heights	45	46	
1/27 Derrimore Heights	47	48	
31 Derrimore Heights	51	51	
32 Derrimore Heights	49	49	
33 Derrimore Heights	50	50	
34 Derrimore Heights	51	51	
2/35 Derrimore Heights	54	55	
2/35 Derrimore Heights	52	53	
36 Derrimore Heights	51	51	
37 Derrimore Heights	66	66	
38 Derrimore Heights	50	50	
39 Derrimore Heights	64	65	
39A Derrimore Heights	52	52	
40 Derrimore Heights	50	51	
41 Derrimore Heights	49	49	
1/43 Derrimore Heights	63	63	
2/43 Derrimore Heights	54	54	
45 Derrimore Heights	57	57	
47 Derrimore Heights	57	57	
49 Derrimore Heights	57	57	
51 Derrimore Heights	63	63	
2 Diorella Drive	67	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
B/7 Diorella Drive	48	49	
8 Diorella Drive	49	49	
10 Diorella Drive	45	46	
1/12 Diorella Drive	46	47	
14 Diorella Drive	45	46	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
18 Diorella Drive	46	46	
7 Everglade Drive	56	57	
7A Everglade Drive	59	59	
11 Everglade Drive	65	65	
13A Everglade Drive	66	66	
13B Everglade Drive	50	50	
15 Everglade Drive	64	64	
17 Everglade Drive	53	54	
1/17 Everglade Drive	55	55	
20 Hollyford Drive	66	66	
22 Hollyford Drive	67	67	
24 Hollyford Drive	66	66	
26 Hollyford Drive	66	66	
28 Hollyford Drive	67	67	
30A Hollyford Drive	53	53	
32 Hollyford Drive	52	52	
32 Hollyford Drive	66	66	
36 Hollyford Drive	60	60	
1/38 Hollyford Drive	66	66	
2/38 Hollyford Drive	55	55	
1/40 Hollyford Drive	63	63	
2/40 Hollyford Drive	54	54	
42 Hollyford Drive	56	56	
44 Hollyford Drive	58	58	
46 Hollyford Drive	56	56	
48 Hollyford Drive	51	51	
50 Hollyford Drive	50	50	
2 Juvena Place	47	48	
4 Juvena Place	49	50	
6 Juvena Place	50	51	
7 Juvena Place	46	47	
8 Juvena Place	49	52	
7 Kepler Place	43	43	
1/9 Kepler Place	43	43	
10 Kepler Place	43	43	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
2 Monde Place	50	51	
3 Monde Place	52	54	
1/3 Monde Place	55	56	
2/3 Monde Place	57	58	
4 Monde Place	46	47	
5 Monde Place	48	49	
6 Monde Place	45	46	
7 Monde Place	50	51	
8B Monde Place	48	49	
9 Monde Place	49	50	
2 Redoubt Road	56	60	Existing designation included barrier; not needed as already in Category A
2A Redoubt Road	69	70	Existing designation included barrier; not effective as double storey. Building modification mitigation to be investigated.
4 Redoubt Road	56	60	Existing designation included barrier; not needed as already in Category A
4 Redoubt Road	69	71	Existing designation included barrier; not effective as double storey. Building modification mitigation to be investigated.
6 Redoubt Road	67	68	Barrier ineffective due to large driveway. Existing boundary fence could be upgraded to avoid gaps to provide a marginal benefit. Building modification mitigation to be investigated.
3/8 Redoubt Road	51	52	
3/8 Redoubt Road	51	52	
3/8 Redoubt Road	52	53	
1/10 Redoubt Road	66	67	
2/10 Redoubt Road	56	57	
12A Redoubt Road	65	66	Existing designation included barrier; 2.5 to 3m height would be needed to achieve sufficient reduction. Existing well established hedge would need to be removed
12B Redoubt Road	58	59	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
14 Redoubt Road	68	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
16 Redoubt Road	65	66	
18 Redoubt Road	67	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
19 Redoubt Road	63	64	
22 Redoubt Road	68	69	Barrier ineffective due to driveway
24 Redoubt Road	69	70	Double storey, barrier not effective. Building modification mitigation to be investigated.
26 Redoubt Road	61	66	
26 Redoubt Road	54	55	
1/28 Redoubt Road	67	69	Barrier ineffective due to driveway. Building modification mitigation to be investigated.
2/28 Redoubt Road	51	52	
30 Redoubt Road	58	59	
1/30 Redoubt Road	69	70	Double storey, barrier not effective. Building modification mitigation to be investigated.
32 Redoubt Road	68	69	Barrier ineffective due to large driveway. Building modification mitigation to be investigated.
32B Redoubt Road	56	57	
34 Redoubt Road	65	66	
36 Redoubt Road	58	59	
37 Redoubt Road	58	59	
1/38 Redoubt Road	69	70	Double storey, barrier not effective. Building modification mitigation to be investigated.
2/38 Redoubt Road	62	63	
40 Redoubt Road	65	66	
41 Redoubt Road	52	53	
41 Redoubt Road	50	51	
41B Redoubt Road	69	70	Double storey, barrier not effective. Building modification mitigation to be investigated.
41C Redoubt Road	63	64	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
43A Redoubt Road	68	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
43B Redoubt Road	54	55	
45A Redoubt Road	69	70	Double storey, barrier not effective. Building modification mitigation to be investigated.
45B Redoubt Road	61	62	
45C Redoubt Road	56	57	
45D Redoubt Road	53	54	
45E Redoubt Road	50	51	
45F Redoubt Road	49	50	
46 Redoubt Road	68	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
46A Redoubt Road	57	58	
47A Redoubt Road	68	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
47B Redoubt Road	62	63	
47C Redoubt Road	59	60	
47D Redoubt Road	55	56	
47E Redoubt Road	52	53	
48 Redoubt Road	53	54	
1/48 Redoubt Road	51	52	
49A Redoubt Road	60	61	
49C Redoubt Road	48	49	
49C Redoubt Road	46	47	
49D Redoubt Road	48	49	
52 Redoubt Road	63	64	
52 Redoubt Road	59	60	
54B Redoubt Road	67	67	
57A Redoubt Road	67	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
57B Redoubt Road	60	61	
59A Redoubt Road	55	56	
59B Redoubt Road	49	50	
59C Redoubt Road	47	48	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
61 Redoubt Road	66	67	
63 Redoubt Road	58	59	
63A Redoubt Road	50	51	
63B Redoubt Road	47	48	
63C Redoubt Road	50	50	
69A Redoubt Road	58	59	
69A Redoubt Road	63	64	
71 Redoubt Road	63	64	
2/5 Rochas Place	45	46	
7 Rochas Place	49	50	
1/8 Rochas Place	47	48	
2/8 Rochas Place	48	48	
9 Rochas Place	45	46	
9 Rochas Place	51	52	
10 Rochas Place	51	52	
11 Rochas Place	50	51	
1/12 Rochas Place	50	50	
2/12 Rochas Place	50	51	
13 Rochas Place	52	53	
8 Rotoma Rise	46	46	
10 Rotoma Rise	46	46	
12 Rotoma Rise	48	48	
14 Rotoma Rise	51	51	
2/16 Rotoma Rise	50	51	
19 Rotoma Rise	44	45	
21 Rotoma Rise	48	48	
24 Rotoma Rise	49	49	
26 Rotoma Rise	50	50	
28A Rotoma Rise	48	48	
28B Rotoma Rise	48	48	
28C Rotoma Rise	51	52	
30 Rotoma Rise	51	51	
14 Sentosa Place	45	46	
A/1 Sikkim Crescent	50	51	
2 Sikkim Crescent	57	58	

Address (Area A)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
3 Sikkim Crescent	46	47	
4 Sikkim Crescent	51	52	
1/5 Sikkim Crescent	47	48	
2/5 Sikkim Crescent	45	46	
6 Sikkim Crescent	50	51	
7 Sikkim Crescent	46	47	
8 Sikkim Crescent	52	53	
1/10 Sikkim Crescent	48	49	
2/10 Sikkim Crescent	50	51	
3/10 Sikkim Crescent	51	52	
12 Sikkim Crescent	47	48	
12 Sikkim Crescent	48	49	
4 Wilisa Rise	62	63	
1/8 Wilisa Rise	57	58	
1/8 Wilisa Rise	55	56	

Area B –Everglade Drive to Goodwood Drive (altered road)

Address (Area B)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
1A Aspiring Avenue	68	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
1B Aspiring Avenue	53	53	
2 Aspiring Avenue	59	59	
4 Aspiring Avenue	51	51	
1/6 Aspiring Avenue	47	47	
2/6 Aspiring Avenue	46	46	
10 Everglade Drive	65	65	
14 Everglade Drive	53	53	
16 Everglade Drive	51	51	
18 Everglade Drive	51	51	
1 Flamingo Court	64	64	
3 Flamingo Court	48	49	
4 Flamingo Court	56	56	
5 Flamingo Court	47	47	

Address (Area B)	Do Minimum scenario dB L _{Aeq(24h)}	Mitigation Option 1 dB L _{Aeq(24h)}	Comments
6B Flamingo Court	52	53	
8 Flamingo Court	52	53	
9 Flamingo Court	47	47	
9 Flamingo Court	50	51	
10 Flamingo Court	58	59	
11 Flamingo Court	52	52	
12 Flamingo Court	60	61	
13 Flamingo Court	52	53	
15 Flamingo Court	52	53	
16 Flamingo Court	55	56	
17 Flamingo Court	56	57	
1 Goodwood Drive	65	65	
3 Goodwood Drive	61	61	
5 Goodwood Drive	57	58	
7 Goodwood Drive	56	56	
9 Goodwood Drive	57	57	
11 Goodwood Drive	59	60	
13 Goodwood Drive	55	56	
15 Goodwood Drive	52	53	
17 Goodwood Drive	53	53	
19 Goodwood Drive	52	52	
21 Goodwood Drive	51	52	
7 Hollyford Drive	66	66	
9 Hollyford Drive	68	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
9A Hollyford Drive	58	58	
17 Hollyford Drive	67	67	
19 Hollyford Drive	67	67	
1/21 Hollyford Drive	69	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
2/21 Hollyford Drive	60	60	
23 Hollyford Drive	66	66	
1/25 Hollyford Drive	67	67	

Address (Area B)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
2/25 Hollyford Drive	68	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
1/27 Hollyford Drive	70	70	Elevated ground floor and driveway – barrier not effective. Building modification mitigation to be investigated.
2/27 Hollyford Drive	61	61	
29 Hollyford Drive	66	66	
31 Hollyford Drive	67	67	
37 Hollyford Drive	42	42	
39 Hollyford Drive	51	51	
39A Hollyford Drive	42	42	
41 Hollyford Drive	53	53	
1 Kingsclere Place	51	52	
3 Kingsclere Place	52	52	
15 Kingsclere Place	50	51	
17 Kingsclere Place	49	50	
19 Kingsclere Place	48	48	
21 Kingsclere Place	50	51	
23 Kingsclere Place	50	50	
4 Oreti Place	42	41	
6 Palmetto Place	49	49	
8 Palmetto Place	51	51	
10 Palmetto Place	51	52	
12 Palmetto Place	48	48	
14 Palmetto Place	49	49	
16 Palmetto Place	49	49	
2/1 Rakaia Rise	47	47	
3 Rakaia Rise	51	51	
4C Rakaia Rise	46	46	
5 Rakaia Rise	52	52	
9 Rakaia Rise	52	52	
10 Rakaia Rise	48	48	
11 Rakaia Rise	49	49	
2/11 Rakaia Rise	56	56	
12 Rakaia Rise	50	50	

Address (Area B)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
1/13 Rakaia Rise	48	48	
2/13 Rakaia Rise	53	54	
2/14 Rakaia Rise	49	49	
2/14 Rakaia Rise	46	46	
15 Rakaia Rise	54	54	
17 Rakaia Rise	51	52	
2/19 Rakaia Rise	49	49	
2/19 Rakaia Rise	51	51	
64 Redoubt Road	59	60	
66 Redoubt Road	54	55	
68 Redoubt Road	69	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
70 Redoubt Road	67	67	
72 Redoubt Road	66	66	
74 Redoubt Road	51	51	
76 Redoubt Road	56	57	
78 Redoubt Road	67	68	Elevated building and driveway access – barrier not effective. Building modification mitigation to be investigated.
81 Redoubt Road	66	67	
93 Redoubt Road	48	49	
95 Redoubt Road	53	54	
97 Redoubt Road	57	58	
99 Redoubt Road	60	61	
99A Redoubt Road	60	61	
1 Rosewood Place	50	51	
2 Rosewood Place	66	67	
3 Rosewood Place	49	49	
4 Rosewood Place	67	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
1/5 Rosewood Place	46	47	
2/5 Rosewood Place	46	47	
6 Rosewood Place	68	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
7 Rosewood Place	49	50	

Address (Area B)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
9 Rosewood Place	49	50	
10 Rosewood Place	68	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
10A Rosewood Place	69	70	Double storey, barrier not effective. Building modification mitigation to be investigated.
11 Rosewood Place	50	51	
12 Rosewood Place	49	50	
6 Santa Monica Place	49	49	
8 Santa Monica Place	46	47	
10 Santa Monica Place	46	46	
12 Santa Monica Place	47	47	
2/12 Santa Monica Place	45	45	
1/14 Santa Monica Place	45	45	
1/14 Santa Monica Place	44	44	
16 Santa Monica Place	46	46	
18 Santa Monica Place	46	47	
20 Santa Monica Place	48	48	
1/22 Santa Monica Place	51	52	
2/22 Santa Monica Place	53	54	
24 Santa Monica Place	51	52	
24 Santa Monica Place	49	49	
25 Santa Monica Place	48	48	
26 Santa Monica Place	50	50	
1/27 Santa Monica Place	49	49	
1/27 Santa Monica Place	51	51	
29 Santa Monica Place	47	47	
31 Santa Monica Place	48	49	
33 Santa Monica Place	54	54	
35 Santa Monica Place	65	65	
35 Santa Monica Place	63	63	

Address (Area B)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
37 Santa Monica Place	51	52	

Area C – Goodwood Drive to Hilltop Road (altered road)

Address (Area C)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
1 Alexia Place	68	68	Existing designation included barrier; double storey, barrier not practicable. Building modification mitigation to be investigated.
6 Alexia Place	57	57	
10 Bartells Drive	45	45	
17 Bartells Drive	44	43	
1 Elsted Place	53	54	
3 Elsted Place	51	51	
4 Elsted Place	61	61	
5 Elsted Place	52	52	
6 Elsted Place	63	63	
7 Elsted Place	52	52	
8 Elsted Place	63	63	
9 Elsted Place	52	52	
10 Elsted Place	61	61	
11 Elsted Place	54	54	
12 Elsted Place	63	63	
13 Elsted Place	52	53	
14 Elsted Place	56	56	
15 Elsted Place	50	50	
16 Elsted Place	61	61	
18 Elsted Place	55	55	
19 Elsted Place	50	50	
20 Elsted Place	51	51	
22 Elsted Place	53	53	
23 Elsted Place	49	49	
24 Elsted Place	54	54	
25 Elsted Place	49	49	
26 Elsted Place	53	53	

Address (Area C)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
4 Goodwood Drive	60	61	
8 Goodwood Drive	54	55	
10 Goodwood Drive	52	53	
12 Goodwood Drive	53	53	
14 Goodwood Drive	50	51	
33 Hilltop Road	43	42	
33A Hilltop Road	43	42	
37 Hilltop Road	42	41	
37A Hilltop Road	41	41	
39 Hilltop Road	44	42	
41 Hilltop Road	44	43	
49 Hilltop Road	53	52	
12 Hurstbourn Priors	50	51	
14 Hurstbourn Priors	55	55	
16 Hurstbourn Priors	55	55	
18 Hurstbourn Priors	52	53	
20 Hurstbourn Priors	53	53	
22A Lizzie Lane	43	42	
26 Lizzie Lane	44	43	
28 Lizzie Lane	45	44	
104 Redoubt Road	68	69	Existing designation included barrier; not recommended as ineffective. Building modification mitigation to be investigated.
104 Redoubt Road	52	53	
116 Redoubt Road	65	65	
119A Redoubt Road	69	69	Double storey, barrier not effective. Building modification mitigation to be investigated.
120 Redoubt Road	63	63	
124 Redoubt Road	51	51	
124A Redoubt Road	52	52	
126 Redoubt Road	50	50	
128 Redoubt Road	60	60	
132 Redoubt Road	48	48	
132A Redoubt Road	47	46	

Address (Area C)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
132B Redoubt Road	51	51	
132C Redoubt Road	48	48	
133A Redoubt Road	68	68	Double storey, barrier not effective. Building modification mitigation to be investigated.
134 Redoubt Road	62	62	
134A Redoubt Road	51	51	
134B Redoubt Road	48	48	
135 Redoubt Road	70	70	Existing designation included barrier; double storey, barrier not effective. Building modification mitigation to be investigated.
149 Redoubt Road	64	64	
152 Redoubt Road	56	56	
156 Redoubt Road	62	61	
1 San Martin Place	47	48	
2 San Martin Place	42	42	
3 San Martin Place	43	43	
5 San Martin Place	41	41	
1 Santa Monica Place	70	71	Existing designation included barrier; double storey, barrier not effective. Building modification mitigation to be investigated.
3 Santa Monica Place	56	57	
7 Santa Monica Place	51	51	
9 Santa Monica Place	48	48	
9A Santa Monica Place	45	46	
11 Santa Monica Place	46	46	
13 Santa Monica Place	46	46	
17 Santa Monica Place	43	44	

Area D –Hilltop Road to Murphys Road (altered road)

Address (Area D)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)
40 Hilltop Road	46	45
52 Hilltop Road	51	50

Address (Area D)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)
6 Murphys Road	49	46
8 Murphys Road	49	46
10 Murphys Road	49	46
12 Murphys Road	47	45
12 Murphys Road	48	45
160 Redoubt Road	56	55
162 Redoubt Road	57	56
166 Redoubt Road	60	58
170 Redoubt Road	63	61
176 Redoubt Road	65	62
182 Redoubt Road	56	53
186 Redoubt Road	55	52
189 Redoubt Road	66	63
190 Redoubt Road	60	57
200 Redoubt Road	56	53
206 Redoubt Road	66	63
208 Redoubt Road	62	59
210 Redoubt Road	62	59
210 Redoubt Road	58	55

Area E – Murphys Road to Mill Road (altered road)

Address (Area E)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)
5 Kinnard Lane	47	45
17 Murphys Road	42	39
28 Murphys Road	42	39
32 Murphys Road	43	40
34 Murphys Road	41	38
36 Murphys Road	41	38
39 Murphys Road	38	36
51 Murphys Road	40	37
228 Redoubt Road	62	59
236 Redoubt Road	60	57
246 Redoubt Road	57	54

Address (Area E)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)
246 Redoubt Road	55	52
250 Redoubt Road	59	56
256 Redoubt Road	58	55
264 Redoubt Road	57	54
272 Redoubt Road	59	56
272 Redoubt Road	58	55
280 Redoubt Road	58	55
286 Redoubt Road	48	45
298 Redoubt Road	49	46
323 Redoubt Road	52	49

Area F – East of Mill Road/ Redoubt Road intersection (altered road)

Address (Area F)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
302 Redoubt Rd	41	39	
304 Redoubt Rd	53	50	
310 Redoubt Rd	47	44	
310 Redoubt Rd	43	40	
312 Redoubt Rd	41	39	
314 Redoubt Rd	48	46	
318 Redoubt Rd	43	41	
318 Redoubt Rd	47	45	
322 Redoubt Rd	45	43	
322 Redoubt Rd	46	44	
326 Redoubt Rd	51	51	Existing designation included barrier; not needed as already in Category A
330 Redoubt Rd	48	46	
338 Redoubt Rd	49	46	
342 Redoubt Rd	49	46	
346 Redoubt Rd	49	46	
350 Redoubt Rd	49	46	
356 Redoubt Rd	48	45	

Area G – Mill Road (new road)

Address (Area G)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
1/1327 Alfriston Rd	51	48	
1373 Alfriston Rd	52	49	
1373 Alfriston Rd	52	48	
1373 Alfriston Rd	47	43	
1373 Alfriston Rd	48	45	
97 Mill Rd	43	41	
111 Mill Rd	48	46	
137 Mill Rd	46	44	
143 Mill Rd	54	52	
145 Mill Rd	52	50	
146 Mill Rd	47	45	
146 Mill Rd	55	53	
149 Mill Rd	55	53	
164 Mill Rd	50	48	
166 Mill Rd	52	49	
182 Mill Rd	55	53	
222 Mill Rd	52	49	Existing designation included barrier; not needed as already in Category A
222 Mill Rd	59	57	Existing designation included barrier; not needed as already in Category A
232 Mill Rd	60	56	
232 Mill Rd	59	55	
295 Mill Rd	60	56	
310 Mill Rd	57	53	
314 Mill Rd	59	55	
318 Mill Rd	52	48	
324 Mill Rd	61	57	
327 Mill Rd	55	52	
333 Mill Rd	57	55	
334 Mill Rd	59	56	
345 Mill Rd	52	50	
356 Mill Rd	56	54	
359 Mill Rd	54	52	

Address (Area G)	Do Minimum scenario dB L _{Aeq} (24h)	Mitigation Option 1 dB L _{Aeq} (24h)	Comments
359 Mill Rd	53	52	
5 Polo Prince Dr	50	47	
6 Polo Prince Dr	48	46	
9 Polo Prince Dr	47	45	
88 Ranfurly Rd	47	44	
88A Ranfurly Rd	47	43	
88A Ranfurly Rd	49	46	
90 Ranfurly Rd	48	45	
92 Ranfurly Rd	52	50	
92A Ranfurly Rd	51	48	
94 Ranfurly Rd	50	47	
94A Ranfurly Rd	52	50	
116 Ranfurly Rd	58	56	
140 Ranfurly Rd	57	56	Existing designation included barrier; not needed as already in Category A
337 Redoubt Rd	50	48	
341B Redoubt Rd	58	57	
343 Redoubt Rd	54	53	
343 Redoubt Rd	58	56	
353 Redoubt Rd	61	54	Proposed new 2m barrier along road edge in Mitigation Option 1
361 Redoubt Rd	62	57	Proposed new 2m barrier along road edge in Mitigation Option 1
367 Redoubt Rd	60	56	
371 Redoubt Rd	60	56	Proposed new 2m barrier along embankment edge in Mitigation Option 1
375 Redoubt Rd	61	56	Proposed new 2m barrier along road edge in Mitigation Option 1
381 Redoubt Rd	53	50	
383 Redoubt Rd	52	49	

APPENDIX D TRAFFIC NOISE LEVEL CONTOURS

