

BUPA CARE SERVICES

25 ULYATT ROAD, NAPIER

ASSESSMENT OF NOISE EFFECTS

Report No 17198

Prepared for:

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1 INTRODUCTION

It is proposed to develop a BUPA Care Services Retirement Village & Care Home at 25 Ulyatt Road, Napier. This report sets out the design to satisfy the requirements of the Napier City Council District Plan.

Figure 1 shows the proposed layout of the Retirement Village & Care Home.



Figure 1. Location of Proposed Development

2 DESIGN CRITERIA

As shown in Figure 2 the site is located in Main Rural Zone in the City of Napier District Plan.

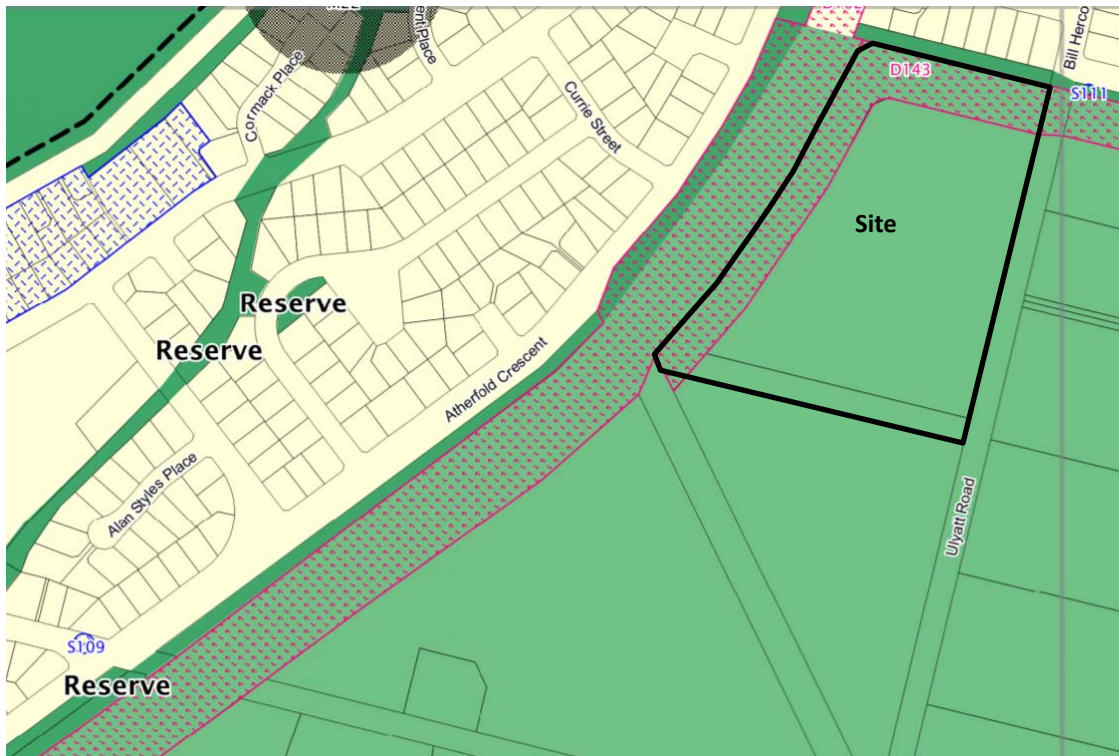


Figure 2. Site Zoning

Source: District Plan Map 15

Rule 34.25.2 of the District Plan requires:

The following acoustic insulation conditions shall apply to all new noise sensitive activities within the Expressway Noise Boundary:

- a) Where any building used for a noise sensitive activity is to be located within the Expressway Noise Boundary as shown on the planning maps:
 - (i) The habitable room within the noise sensitive activity shall achieve a minimum External Sound Insulation Level of the building envelope of $D_{tr,2m,nTw} + C_{tr} > 30\text{dB}$ for outside walls of any habitable rooms.

- (ii) Where it is necessary to have windows closed to achieve the acoustic design requirements, an alternative ventilation system shall be provided. Any such ventilation system shall be designed to satisfy the requirements of the Building Code and achieve a level of no more than NC30 in any habitable room.
- b) The standard in (a) above does not apply to noise sensitive activities which can comply with the following:
 - (i) The habitable room within the noise sensitive activity is greater than 80 metres from the edge of the road carriageway; or
 - (ii) Noise screening (such as a noise barrier fence) is constructed so that noise levels measured at the location of the building housing the noise sensitive activity in accordance with NZS6801:2008, do not exceed 55dB $L_{Aeq(24hour)}$ outdoors.
- c) An acoustic design report must be provided to the Council prior to any building consent being granted or where no building consent is required, prior to the commencement of the use. The acoustic design report must be prepared by a person qualified and experienced in acoustics. The report is to indicate the means by which the noise limits specified in this standard will be complied with and is to contain a certificate by its author that the means given therein will be adequate to ensure compliance with the acoustic design requirements specified in this standard.
- d) Prior to any person requesting a Certificate of Compliance, an acoustic design certificate prepared by a person qualified and experienced in acoustics must be supplied, verifying compliance with the standards in (a) above.

3 PREDICTED NOISE LEVELS

Based on the above the traffic noise contours from the Napier – Hastings Expressway (State Highway 50) have been predicted based on an annual average daily traffic flow of 27,000vpd, which is based on the 2016 traffic flows expanded to 2028 using a 3% compound growth rate. The current 6.4% heavy commercial vehicle count has been adopted with a design speed of 100km/hr and a medium grade chip seal road surface. The calculations have been based on the requirements of the CRTN calculation standard taking into account the recommendations of the Transit New Zealand Research Report No. 28, 1994 and road surface requirements in accordance with the NZTA “Guide to State Highway Road Surface Noise” report.

The calculations have been undertaken using the Brüel & Kjær Predictor programme v11.10. This is a powerful environmental noise calculation software package that uses a digital terrain model with the ground conditions modelled and each of the noise sources modelled at their various locations on the ground. Calculations are undertaken in accordance with the requirements of ISO 9613-1/2 Acoustics – Attenuation of Sound during Propagation Outdoors. For this project a 2m grid has been adopted to calculate the noise contours. The traffic noise is calculated at each grid point and the noise contours have been drawn based on these levels assuming a 1.5m receiver height and ground absorption factor of 0.7. All calculations have been undertaken assuming a slightly positive meteorological effect at the receiver position.

The resulting noise contours are shown on Figure 3. From these contours it is shown the noise level at the most exposed façade of the closer units is between 55dB and 60dB $L_{Aeq(24hr)}$ so where the external level exceeds 55dB $L_{Aeq(24hr)}$ the units will need to be designed to satisfy the requirements of Rule 34.25.2(a)(i).

As shown in Figure 3, the screening effects of the front row of units adjacent to the expressway boundary results in the external noise exposure for all other units on the site being less than 55dB $L_{Aeq(24hr)}$. Thus, as set out in Rule 34.25.2(b)(ii) no acoustic treatment will be necessary to these units as they are within the traffic noise design requirements.

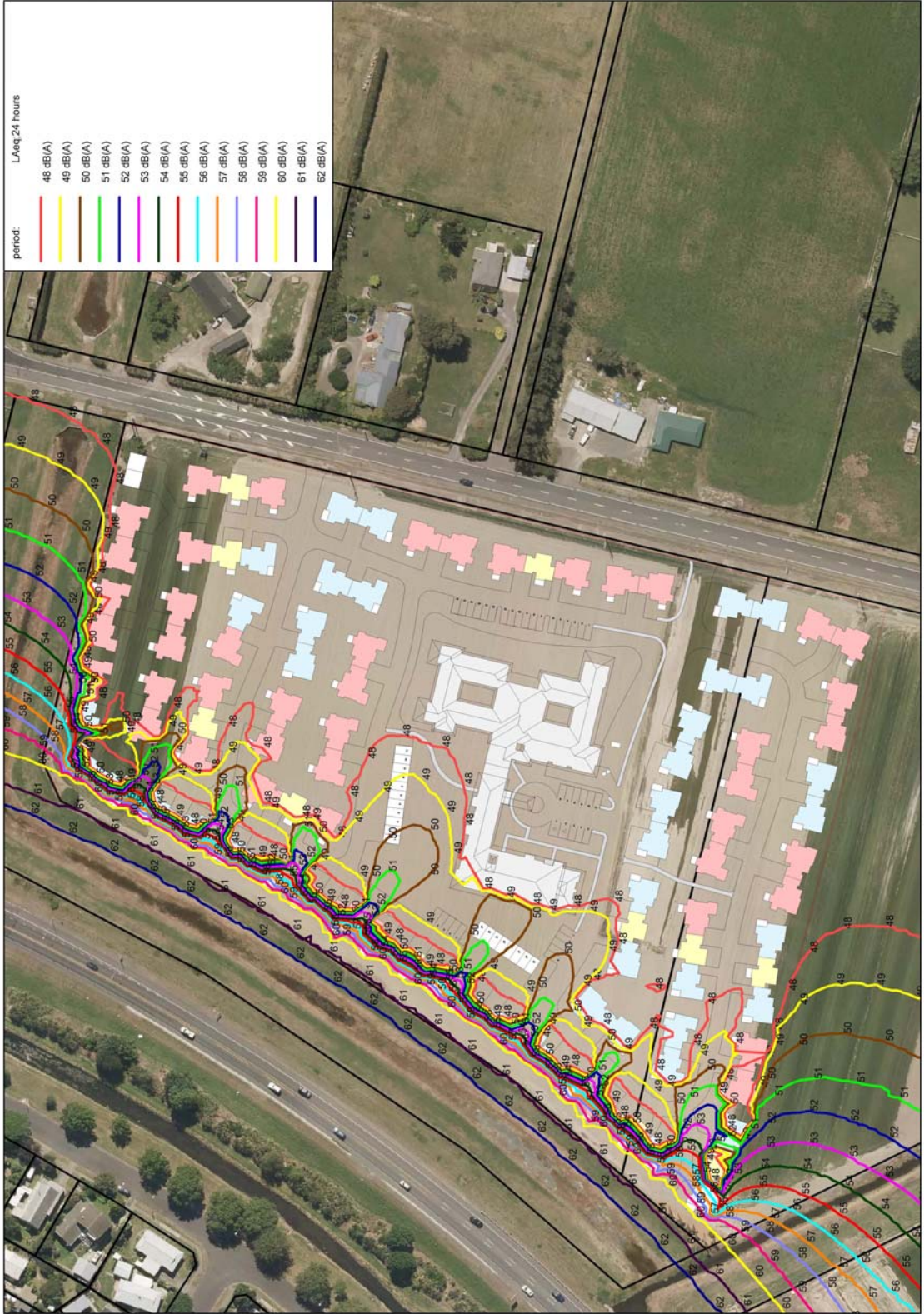


Figure 3. Noise Contours for Daytime in 2028, dB L_{Aeq}

4 BUILDING DESIGN

Based on the above a preliminary building design has been undertaken to ensure the requirements of Rule 34.25.2 are practical to comply with. That is, where the external noise level exceeds 55dB $L_{Aeq(24hr)}$ the external sound insulation level of the building envelope must achieve $D_{tr,2m,nTw} + C_{tr} > 30dB$ for outside walls of any habitable rooms.

4.1 Façade Design

Based on the highest façade exposure of 60dB $L_{Aeq(24hr)}$ the glazing would need to be a minimum 1 x 6.38 laminated glass with a 12mm air gap and 4mm float glass assuming double glazing will be used for the construction.

For the façade, most cladding materials with a 10mm standard Gib plasterboard lining and insulation in the wall cavity will achieve the design criteria. Similarly, most roof/ceiling designs will achieve the design criteria without any specific upgrading.

4.2 Ventilation

To achieve the requirements of Rule 34.25.2, where the external level exceeds 55dB $L_{Aeq(24hr)}$ the windows and external doors of any habitable room will need to be kept closed. It may therefore be necessary to provide an alternative ventilation system.

5 CONCLUSIONS

The above shows the 2028 traffic noise contours and enables a preliminary acoustic design to be undertaken in accordance with the requirements of Rule 34.25.2. From this assessment it has been shown there are practical design options to achieve the requirements of Rule 34.25.2.

Once consent has been obtained for the project a detailed design assessment will be undertaken to determine the exact façade design for the different units to comply with the requirements of Rule 34.25.2.

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