



## **APPENDIX C**

Noise Assessment Response  
Memorandum – Marshall Day  
Acoustics

MEMO

|                   |  |                      |                 |
|-------------------|--|----------------------|-----------------|
| <b>Project:</b>   | Ryman Healthcare Retirement Village Karori | <b>Document No.:</b> | Mm 001 R03      |
| <b>To:</b>        | Ryman Healthcare c/ Mitchell Daysh Ltd     | <b>Date:</b>         | 14 October 2020 |
| <b>Attention:</b> | Nicki Williams                             | <b>Project No.:</b>  | 20200396        |
| <b>From:</b>      | Bill Wood                                  | <b>No. Pages:</b>    | 4               |
|                   |  | <b>Attachments:</b>  | No              |
| <b>Subject:</b>   | Section 92 Response - Acoustics            |                      |                 |

Wellington City Council (WCC) has issued a further information request relating to noise, following submission of the resource consent application for the construction and operation of a comprehensive care retirement village at Donald Street, Karori, Wellington.

This memo (Mm 001 R03) should be read in conjunction with our operational noise assessment, Rp 001 R05 20200396, dated August 2020.

Our response to the request, along with the WCC questions, are set out below.

**ITEM 1**

*Section 4.0 ‘Operational Noise Assessment’ (page 8) of the Marshall Day Acoustics (MDA) report provides assessment of a number of primary noise sources including service vehicles and fixed plant. The MDA assessment does not provide review of operational noise from people, recreational noise or light vehicles on site such as vehicle movements from residents or visitors. Please provide further information on how light vehicle noise, recreational noise and people noise have been accounted for in the operational noise assessment.*

**Our Response**

This is an aspect for a response from Ryman Healthcare and Mitchell Daysh.

**ITEM 2**

*Section 4.3 ‘Fixed Plant’ (page 10) of the MDA report states a waste compactor will be operated onsite. The MDA report goes on to state it has provided its noise assessment based on previous ‘generic’ noise measurements; however no actual noise levels appear to be presented. Please provide the sound power level used in the assessment for the waste compactor and the expected noise levels produced from this noise source.*

**Our Response**

**Indicative Noise Source**

The calculations using “generic” data were solely for the purposes of determining whether compliance with the District Plan criterion can be practicably achieved. The waste compactor data was obtained from noise measurements undertaken in 2009 of a waste compactor at a public recycling/dumping area. These measurements provide a sound power level of  $L_{WA}$  98 dB. We note that the waste compactor measured in 2009 was a commercial model for multiple users and may be larger than the model that would be installed at the Ryman Village Site. However, we consider that this is suitable for the purposes of determining the practicability of achieving compliance with the District Plan noise Standard.

**Internal Reverberant Noise Level**

Assuming a reverberation time of 3 seconds inside the proposed waste compactor enclosure gives a calculated reverberant noise level of  $L_{pr}$  93 dB  $L_{Aeq}$  inside the enclosure.

## Adjustments

### *Special Audible Characteristics*

In accordance with Section 6.3 and Annexe B4 of New Zealand Standard NZS 6802:2008 “Acoustics - Environmental Noise” we have adjusted the predicted compactor noise level by the addition of +5 dB for special audible characteristics (SAC).

### *Duration*

Ryman has stated that the waste compactor would operate typically for 30 minutes per day. Section 6.4 of NZS 6802:2008 notes that if a sound is not continuously present, it is likely to create lesser annoyance than if it was. For sound with a duration of less than 30% of the prescribed time frame, an adjustment of 5 dB can be subtracted from the representative sound level.

## Indicative Noise Mitigation

Standard noise mitigation used in this indicative noise prediction includes:

- door seals;
- roller door selection;
- acoustic ventilation louvres;
- internal wall linings; and
- control of internal reverberation.

## Indicative Predicted Noise Levels

Table 1 sets out the indicative noise levels of the waste compactor predicted for the various residential assessment locations, for the scenario detailed above.

**Table 1: Predicted Indicative Waste Compactor Noise Levels (includes +5 dB for SAC, and -5 dB for duration adjustment).**

| Receiver Location     | Predicted Noise Level dB, $L_{Aeq(15\text{ min})}$ |
|-----------------------|--|
| 25-45 Donald St       | <30  |
| 25-51 Campbell St     | <30  |
| 6-26 Scapa St         | <30  |
| 221A & 221B Karori Rd | 41 to 44   |

Table 1 demonstrates that the operation of the waste compactor in this scenario can comply with the 45 dB  $L_{Aeq(15\text{ min})}$  daytime District Plan noise limit at all assessment properties.

## ITEM 3

*Section 4.3 Fixed Plant (page 10) of the MDA report states a 1 MVA transformer and a 500 kVA transformer are proposed to be operated onsite. The report goes on to state it has provided its noise assessment based on previous ‘generic’ noise measurements; however no actual noise levels appear to be presented. Please provide the sound power levels used in the assessment for the two transformers and the expected noise levels from these two noise source.*

## Our Response

For our assessment, we used a sound power of **67 dB  $L_{WA}$**  for each of the proposed transformers. Although we have carried out many measurements of the noise from various transformers over the years, we used

some recent measurements of a 2.5 MVA transformer, carried out in accordance with IEC 60076 – 10 “Power transformers – Part 10: Determination of sound levels”. While the 2.5MVA transformer is considerably larger than the proposed models at the Proposed Village, these measurements provided the most recent in our database for transformers anywhere near that small size. We considered that if (when combined cumulatively with other sources) the noise from these transformers complied with the 45 dB  $L_{Aeq(15\ min)}$  daytime and 40 dB  $L_{Aeq(15\ min)}$  night time District Plan noise limits, then the noise from any actual, smaller transformers would also comfortably comply.

Note also that these transformers are to be housed in an enclosure. At the time of our assessment, we did not have any details regarding the design of this enclosure. Consequently, we have not included any barrier effect that may be provided by an enclosure. This may be up to 10 dB depending on the design, thus reducing the predicted transformer noise further by that amount. We therefore consider the compliance assessment of the transformer to be conservative.

On this basis, and with the addition of +5 dB for SAC, the predicted transformer noise levels are set out in Table 2:

**Table 2: Predicted Transformer Noise Levels (includes +5 dB for SAC)**

| Receiver Location     | Predicted Noise Level dB, $L_{Aeq(15\ min)}$ |
|-----------------------|--|
| 21-45 Donald St       | <30 to 31                                    |
| 25-51 Campbell St     | <30  |
| 6-26 Scapa St         | <30 to 33                                    |
| 221A & 221B Karori Rd | <30  |

#### ITEM 4

*The MDA report provides assessment of individual noise sources only. Please provide further information relating to an assessment of cumulative operational noise effects.*

#### Our Response

We have been instructed that Mitchell Daysh will separately address cumulative noise.

#### ITEM 5

*The MDA report provides assessment of  $L_{Aeq}$  noise levels but no single event levels ( $L_{AFmax}$ ). Please provide further information relating to an assessment of  $L_{AFmax}$  noise levels and related noise effects.*

#### Our Response

The 65 dB  $L_{AFmax}$  limit for noise from power generation, heating, ventilation or air conditioning systems etc. (Standard 5.6.1.2.1) only applies during night-time hours (10pm to 7am). Additionally, it only applies to fixed plant noise. For such mechanical plant, the  $L_{AFmax}$  level is typically 1 to 2 dB above the  $L_{Aeq}$  level. Therefore, fixed plant producing noise levels that are compliant with the 40 dB  $L_{Aeq(15\ min)}$  District Plan night-time limit would comfortably comply with the  $L_{AFmax}$  limit.

#### ITEM 6

*The MDA report does not assess construction noise. Please provide further information relating to an assessment of construction noise effects, including (but not limited to) a review of any effects related to demolition, piling or earthworks (where applicable).*

#### Our Response

We will respond to this question separately.

## ITEM 7

*The MDA report makes a number of assumptions and comments regarding achieving compliance with the District Plan noise limits including assumptions around 'conventional noise treatments' that may be adopted if required. Please provide further information regarding the actual proposed noise control methods which will be adopted by the Applicant in line with s.16 Best Practical Option (BPO) of the Resource Management Act.*

### **Our Response**

At the time of preparation of the report, the detailed design of the Proposed Village had not developed sufficiently, and assumptions were necessary to prepare a noise compliance assessment. The purpose of the Report is to demonstrate that the Proposed Village can comply with the District Plan noise limits. The ability to show compliance with the noise limits needs to be considered early on to ensure that any future mitigation measures are practical.

The Proposed Village design is not yet at a level of detail where specific mitigation measures can be recommended (for example, we cannot specify attenuators or screening until final plant selection has been adopted). Therefore, the assumptions included in the Report have not changed. Note that some potential noise mitigation measures to be considered are listed in our response to Item 2.

## ITEM 8

*Section 5.13.1 of the AEE (Page 77) states with regard to non-compliance of noise effects from the rubbish trucks at 29 Campbell Street noise effects 'will be negligible and have a less than minor adverse effect'. Please provide further information on how this assumption of noise effects has been determined.*

### **Our Response**

This is an aspect for a response from Ryman Healthcare and Mitchell Daysh.