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TECHNICAL MEMORANDUM

Project	11863 Grundon Services, Banbury		
Date	2 September 2019	**Memo No**	M001
Memo to	Mark Berry (JSA Planning)	**Copies to**	
From	Mat Tuora MIOA	**Checked by**	Adrian James FIOA
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REPLIES TO QUERIES ARISING FROM REPORT 11863/2A

This memorandum set out our replies to questions raised by Trevor Dixon of Cherwell District Council. Questions are in regard to our report 11863/2a. For continuity, replies were provided in the first instance by Michael Chong who was the consultant who undertook the site measurement and compiled the report. For ease of reference we have numbered the questions which were originally issued as a list of bullet points.

Question 1

Section 4.3 Paragraphs 2 and 3. It's not clear how the 'representative' background levels have been arrived at?

Reply 1

The representative background sound level for both day and night periods were selected by taking the $L_{AF90,T}$ for the entire daytime and night-time periods respectively. In other words, the daytime background sound level was obtained by selecting the level exceeded for 90% of the time covering all eight daytime periods.

Question 2

Paragraph 3 should refer to Figure 9 not 8 and the time period should be 8 not 16 hours. The last sentence should also read 'night-time and not 'daytime'.

Reply 2

That is correct and has been remedied in the attached revision, Report 11863/2b.

Question 3

The night time background level is 6dB higher than the day time, is that correct? You thought it might be to do with the LMD but see query below.

Reply 3

That is correct and is a result of the LMD. As stated in Section 4.2 of our report, the train line and Light Maintenance Depot were the dominant sources of noise, and noise from diesel locomotives idling in the Light Maintenance Depot occurred between 18:30 and 06:30 hours.

Question 4

Paragraph 7 (2nd paragraph on page 14) gives the night time levels without the LMD. The background level dropped by 2dB but is still higher than the day time background? The night time background was 51dB in paragraph 3 so a 2dB drop would give a level of 49dB and not 48 as shown.

Reply 4

The night-time background sound level without the LMD is 49 dB $L_{AF90,T}$. This is correctly stated in Paragraph 8, but incorrectly as 48 dB in Paragraph 7. Although it is unusual for the night-time noise levels to be higher than the daytime, this is because of higher levels of night-time noise from the LMD and specifically from noise diesel locomotives idling in the LMD at night, as stated in Section 4.2 of our report. It should be noted that the residual sound level (ambient sound level with the LMD excluded) is also 2 dB higher at night. As Section 4.3 of the report states:

> "Using the post processing software to exclude all noise sources attributable to the rail line and Light Maintenance Depot produced background sound levels of 45 and 49 dB $L_{AF90,T}$ and residual sound levels of 53 and 55 dB $L_{Aeq,T}$ for day and night respectively, indicating that road traffic noise appears to be the principal contributor to the noise environment in the absence of rail noise.

The background sound level in terms of $L_{AF90,T}$ is an underlying level of sound over a given time period and excludes transient and intermittent events. It is generally governed by continuous or semi-continuous sounds such as constant road traffic noise. The background sound can also be significantly affected by meteorological conditions, particularly where the main sources of residual sound are remote from the assessment location as is the case with the M40.

In any case, while we consider that it is important to understand the overall noise climate in terms of both background and ambient noise, the relatively high levels of ambient sound in terms of $L_{Aeq,T}$ for both day and night periods are of more significance to this noise assessment than the background sound levels in terms of $L_{AF90,T.}$ This is because the local authority has specified that the noise levels within dwellings and in external amenity areas should not exceed the levels set out in BS 8233:2014, which are specified in terms of $L_{Aeq,T}$ and $L_{AF,max}$. but not $L_{AF90,T.}$ These criteria are set out in Section 8.1 of our report.

Question 5

With all noise sources removed attributable to the rail line and the LMD (paragraph 1 top of page 15) the night time background is still 49dB and still higher than the day time level. In the next paragraph it mentions the M40 as another residual noise, however I would expect the noise from this to be lower at night.

Reply 5

We do not agree. Firstly, night-time road traffic on motorways and trunk roads can contain a greater proportion of Large Goods Vehicles than during the day, with a corresponding increase in low frequency noise. For this reason noise levels can show a slight increase, particularly at large distances over which low frequency noise is less attenuated by screening, soft ground attenuation and air absorption.

Secondly, only noise attributable to the LMD was excluded and not noise from trains passing along the main line. Of course, when the LMD was operating trains passing along the main line would have been excluded as well, but when the LMD was not operating those trains passing by were included as they were not a part of the LMD operation. In our considerable experience of rail noise, it is not unusual for sites close to rail lines to have higher ambient and background sound levels at night when more freight trains pass along the line than during the day.

Question 6

Last paragraph on page 15, the start of the third line needs to be deleted. Probably a copying and pasting typo from the paragraph above.

Reply 6

That is correct and has been remedied in Report 11863/2b.

Question 7

Section 4.5. As the first bullet point above [Question 1], *how have the 'Ambient' and 'Background' levels been arrived at in Table 3? Are they the average of all the hourly and 15 minute readings for day and night respectively? What is the range i.e. max and min? The night time background should be 49 according to previous calculations in the report.*

Reply 7

This has been answered in our reply to Question 1 for background sound. For ambient sound the ranges are shown in figures 8, 9, 10 and 11. As stated in the first paragraph of Section 4.5, both the day and night ambient sound levels showed very little variation with most periods recording levels between 64 and 66 dB $L_{Aeq,T}$ with the exception of the night of the 20th April (Easter Monday).

Question 8

Section 5.3. Should a higher penalty be applied to account for all the acoustic characteristics of the noise from trains idling in the LMD and not just the air brakes?

Reply 8

We do not agree that a higher penalty should be applied as the noise from idling engines was broadband and continuous with very little fluctuation in level over each 15-minute time period. The sound was not incongruous to the soundscape (a site next to a main rail line).

Question 9

Section 8.3. Can you confirm, as it's not that obvious from the figures showing the modelled data in section 7.4, that acceptable internal levels can only be achieved with the glazing specifications detailed in section 8.3 and with windows closed, in which case alternative ventilation other than trickle vents will be required?

Reply 9

As stated in Section 9 of our report,

> "Due to the relatively high noise levels across the site the dwellings cannot be ventilated by openable windows and meet the internal noise criteria set out by the council".

We believe that this makes it clear that the specified noise criteria can only be achieved with the windows closed. There would be no point in specifying the sound insulation of the windows if it were possible to achieve acceptable noise levels with these windows open.

We should make it clear that it is not for us to specify whether the dwellings should be ventilated using a mechanical, passive or hybrid system. We have specified in Section 8.3 and 8.4 the acoustic performance required of passive acoustically attenuated ventilators if a passive ventilation strategy is used. These are certainly challenging targets for passive ventilation, but whether they are achievable depends on the airflow rates required and on the airflows achievable with specific makes and models of passive ventilator. The design of these units is constantly evolving so we do not consider that we should rule out the possibility of a passive or hybrid solution that meets the noise criteria.

As stated in Section 8.3 of our report, domestic mechanical ventilation and heat recovery (MVHR) units may be used to provide ventilation if required. One reason for such a requirement would be if the M&E designers conclude that the required ventilation rates cannot be achieved through acoustically attenuated passive ventilators with the performances specified in Section 8.3 and 8.4 of our report.

We consider that the residential amenity of future residents would be safeguarded by a planning condition requiring noise levels to achieve the criteria set out in Section 8.1 of our report. We do not consider that it is necessary at this stage to constrain unnecessarily the ventilation system used to achieve this.

Question 10

Octave band data is shown for the glazing specifications but not for the measured data.

Reply 10

That is correct. Listing all of the measured data in octave bands would have unnecessarily increased the length of the report. All of the measured data and calculation results are of course available in octave bands. In summary, we created a computer model of the site using proprietary modelling software (CadnaA by DataKustik Gmbh). The software allows us to assess noise propagation across the proposed site and determine noise levels at the facades of the proposed dwellings. We used as an input the measured octave band data taken from the unattended measurement position and the output from the model included the following façade levels at 7.5m height:

External levels at facades facing the rail line (at 7.5m height)								
	A	63	125	250	500	1k	2k	4k
Day $L_{eq,16\ hours}$	56.3	55.1	56.8	54.2	52.1	52.3	48.6	42.8
Night $L_{eq,\ 8\ hours}$	56.8	54.0	52.5	49.9	49.9	52.6	51.3	45.2
Night $L_{F\ Max,T}$	77.0	64.9	71.5	66.3	72.1	74.1	69.7	61.8
External levels at facades facing away from the rail line (at 7.5m height)								
Day $L_{eq,16\ hours}$	53.2	68.1	57.3	51.5	45.2	50.5	44.1	28.6
Night $L_{eq,\ 8\ hours}$	49.8	64.2	53.4	47.5	41.6	46.9	41.5	29.5
Night $L_{F\ Max,T}$	63.1	64.6	60.0	54.4	58.7	60.4	55.6	46.0

These levels include the attenuation provided by the 6m high barrier.

Report Status

Revision	Date	Prepared by	Checked by
-	2 September 2019	Mat Tuora MIOA	Adrian James FIOA

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