

Acoustic Associates Sussex Ltd

Desktop Assessment – Discharge of Planning Condition

Site: **Unit 5, Worten Drive, Reading, Berkshire. RG2 0TG.**
Client: **Rygor Commercial Vehicles Limited**

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH PGDip: Acoustics MIOA

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Issue 1



**Acoustic Associates
Sussex Ltd.**



Sound Insulation Testing - Acoustic Design of Buildings - BS4142 - PPG24 - Schools Acoustics BB93 -
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Issue 1	21/11/2022	Initial Issue
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1 Introduction and Executive Summary

Acoustic Associates have been appointed to undertake an acoustic assessment to support a discharge of planning condition. Specifically, condition 10 of planning consent 220017 which was issued on 21st October 2022 relates to an assessment of external plant.

Standards and guidance referenced for this assessment include:

- BS4142:2014 – Methods For Rating And Assessing Industrial And Commercial Sound
- Acoustics Ventilation and Overheating Guidance (AVOG), Jan 2020
- BS8233 (Sound insulation and noise reduction for buildings) 2014
- ISO9613 (Attenuation of sound during propagation outdoors) 1996

Three new pieces of external plant are being added to the showroom exterior. These are at significant distances to the nearest residential receptor and will only run during the daytime period (07:00-23:00 hours). The resulting predicted sound pressure level at the receptor location has been rounded to 17dB(A) which through an open window would equate to a further reduction of 13dB to 4dB(A) internally, which would not be audible. On the basis of the information provided, the local planning authority may consider discharging condition 10 of 220017.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

The client, Rygor Mercedes Benz Limited has recently acquired and moved onto the site as detailed in Figure 1 below. The planning application allowed a change of use from B2 Industrial to a Suis generis van Showroom and associated truck and van workshop at Unit 5, Worton Drive, Reading, RG2 0TG.



Figure 1. Site Location Plan

Condition 10 of the planning permission states as follows:

10. No mechanical plant shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by the Local Planning Authority. The assessment shall be carried out for in accordance with BS4142:2014 methodology. The predicted specific sound level (LAeq,TR) (with reference to BS:4142) as measured at a point 1 metre external to the nearest noise-sensitive facade shall be at least 10dB below the pre-existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The predicted rating level, LAr,Tr (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise-sensitive façade (habitable window of a dwelling) shall not exceed the pre-existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The plant shall thereafter only be installed in accordance with the assessment and shall thereafter be maintained so that it operates to the same standard.

REASON: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CC8 and EN17 of the Reading Borough Local Plan 2019.

2.2 Proposal

Three pieces of external plant are proposed with these being as follows:

- Toshiba Heat Pump - MUP2201 HT8P-E
- Toshiba Heat Pump - MUP0801 HT8P-E
- Toshiba Air Conditioning Outdoor Unit - RAV-GM801 ATP-E

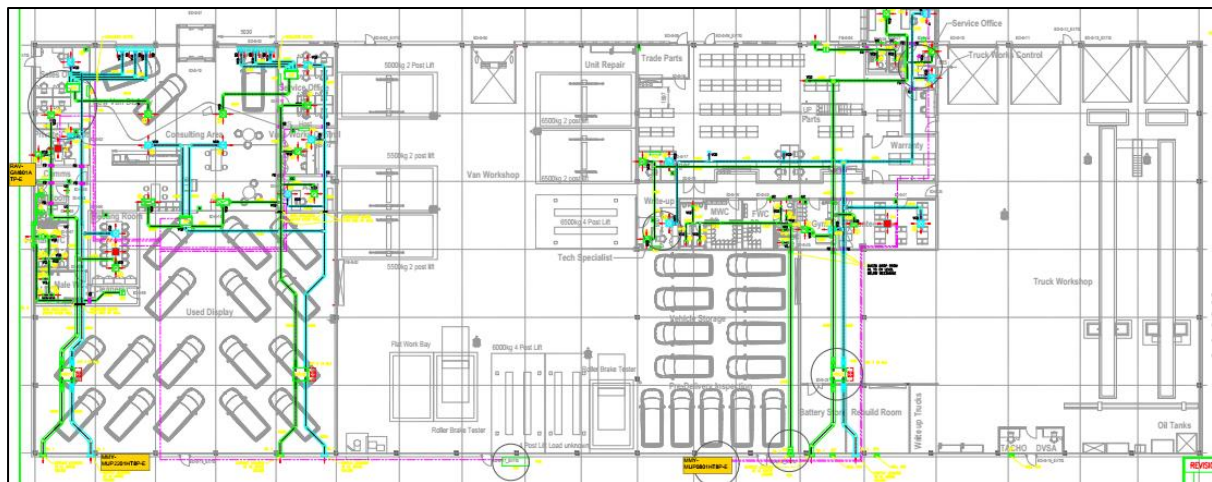


Figure 2. Proposed Building Layout and Amended External Locations

Two pieces of plant are located on the back wall and the third on the furthest elevation facing South West, which is furthest from residents.

2.3 Hours of Plant Operation

Presently, the office and showroom will be open from 07:00 to 18:00 hours with the workshop continuing to 22:00 hours. Plant would not run outside of these hours.

2.4 Nearest Residential Receptor (NSR)

The nearest residential receptors identified are those at Basingstoke Road to the North East approximately 257m in distance. Due to the tree screens in place, there is no direct line of sight. Additional distance has been added for the siting of the plant along the building boundary.

2.5 Relevant/Applicable Standards

2.5.1 BS4142:2014-A1:2019 – Methods for Rating and Assessing Industrial and Commercial Sound

This document provides a means of assessing the impact of industrial or commercial sound upon nearby noise-sensitive receptors, including residential properties.

It does this by comparing the Rating Level of the noise from the industrial or commercial source with the pre-existent L_{90} background noise level affecting the same noise-sensitive premises. The Standard provides guidance that:

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact, depending on the context.

2.5.2 BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

Table 4 of BS8233:2014 provides the following guideline values:

Activity	Location	Time period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Figure 3. Table 4 Values from BS8233:2014

2.6 Methodology

The principal of a desktop assessment to assess the plant was agreed with Julie Williams of the Local Planning Authority at Reading. It is relevant to note that the site does not propose or have any external jet washing bay and the premise of the report is to consider only the three pieces of external plant and their potential impact on residential amenity.

Given the relatively small amount of plant (3 items), it is not considered necessary to populate a noise model, the data can be computed based on distances and simultaneous operation of all three pieces of plant.

Manufacturer's data will be used to consider the measurement distances and the relevant sound emissions from the respective pieces of plant.

To ensure a robust assessment, and given that background sound pressure levels have not been quantified at the site, the desktop assessment will consider the impact on residents with open windows and against an internal criterion as stated by BS8233:2014.

3 Plant

3.1 Plant

The proposed plant is as follows with the corresponding sound pressure levels, confirmed through discussions with the manufacturers/suppliers and detailed in Figure 4 below.



Figure 4. Proposed External Plant

3.2 Plant Sound Pressure Levels

Sound Pressure Levels were all measured at 1m and this was confirmed with the Manufacturer. Due to the likely placement of the plant on the rear wall, a 3dB correction has been applied for reflections.

To present a worst-case assessment, the plant has been considered operating simultaneously. The worst-case heating cycles have been applied as these generate the increased sound pressure levels from the plant.

Model	Sound Pressure Level-dB $L_{Aeq,T}$	Cycle	Manufacturer Distance Measured at	Corrections for Reflections	Distance to Receptor	Predicted Sound Pressure Level at Receptor ($L_{Aeq,T}$)
MUP2201 HT8P-E	67	Heating	1m	3	351.5	16.1
MUP0801 HT8P-E	56	Heating	1m	3	299	6.5
RAV-GM801 ATP-E*	52	Heating	1m	3	362	-9.2
Total Sound Pressure Level at Receptor Location						16.6
*Due to the location of the plant, an additional 10dB reduction has been applied for the massing effect of the building						

Figure 5. Predicted External Sound Pressure Levels

3.3 Consideration of an Open Window

The Industry Standard for attenuation of sound energy passing through a partially open window is 13dB, taken from the Acoustics, Ventilation and Overheating Guidance dated Jan 2020. With a rounded specific sound pressure level of 17dB externally (freefield), inside, with an open window, this is predicted to be 4dB(A) which would not be audible and not capable of being measured.

For completeness, the requirements of BS8233:2014 (as per section 2.5.2 above) for an internal residential soundscape during the daytime period are 35dB $L_{Aeq, 16 \text{ hour}}$. The results of the 3 pieces of plant running simultaneously are comfortably below this and would not be capable of being measured with a sound level meter.

3.4 Condition 10 Wording

Condition 10 is carefully worded in that the specific sound pressure level attributable to the external plant shall be at least 10dB below background. The Rating Level is stated as being equivalent to or below the measured background.

These definitions come from BS4142:2014-A1:2019. The specific sound is the sound attributable to the new plant.

The rating level is the specific sound pressure level, but adjusted for penalties which might be either tonality, intermittency or impulsivity, which are considered with how the sound is perceived at the receptor location. Given the large distances involved, and the new plant, tonality is not likely.

Similarly, intermittency is where a receptor might detect the plant cycling in and out of service and at such significant distances, this is not likely to be the case. Impulsivity is not likely to be a concern with new air conditioning plant.

The only other correction to be considered is that the plant will not likely run for the whole of the daytime 1 hour reference period and accordingly, an ontime correction might be applied. For the sake of a robust assessment, no on time correction has been applied and this presents a worst case, albeit desktop assessment.

The Rating Level will therefore remain as the specific sound pressure level.

Whilst background sound pressure levels have not been measured, it is strongly likely that with the B3031 running in between the industrial estate and the nearest properties that the sound generated and contributed by the new three pieces of plant will not be a problem.

4 Conclusion

Three new pieces of external plant are being added to the showroom exterior. These are at significant distances to the nearest residential receptor and will only run during the daytime period (07:00-23:00 hours). The resulting predicted sound pressure level at the receptor location has been rounded to 17dB(A) which through an open window would equate to a further reduction of 13dB to 4dB(A) internally, which would not be audible. On the basis of the information provided, the local planning authority may consider discharging condition 10 of 220017.