ACOUSTIC TECHNICAL NOTE

Reference:	13081.ATN03.COM.0
Revision:	1
Date:	18 September 2024
Project:	Richmond Royal Hospital – UKI Richmond
Subject:	Plant Noise Commissioning (Atmospheric)

1. INTRODUCTION

London Borough of Richmond Upon Thames' planning Condition NS25 (c) requires measurements to be undertaken to confirm agreed atmospheric noise emission limits have been achieved.

This note presents the results of the testing undertaken, as well as commentary on the results in relation to the project criteria.

2. CRITERIA

Planning Condition U0065616 NS25: Mechanical Services Noise Control

> *Prior to the occupation of the development hereby approved (residential and health), and before any mechanical services plant including heating, ventilation and air conditioning (HVAC) and kitchen extraction plant is used, a scheme for Mechanical Services Noise Control shall be submitted to and approved in writing by the local planning authority which demonstrates that the following noise design requirements can be complied with and shall thereafter be retained as approved:*
>
> > *a. The cumulative measured or calculated rating level of noise emitted from the mechanical services plant shall be no greater than the existing background noise level, at all times that the mechanical system etc. operates. The measured or calculated noise levels shall be determined at the boundary of the nearest ground floor noise sensitive premises or 1 meter form* (sic) *the facade of the nearest first floor (or higher) noise sensitive premises, and in accordance to the latest British Standard 4142; An alternative position for assessment /measurement may be used to allow ease of access, this must be shown on a map and noise propagation calculations detailed to show how the design criteria is achieved.*
> >
> > *b. The plant shall be isolated on adequate proprietary anti-vibration mounts to prevent the structural transmission of vibration and regenerated noise within adjacent or adjoining premises, and these shall be so maintained thereafter.*
> >
> > *c. A commissioning acoustic test and report shall be undertaken within 2 weeks of mechanical services commissioning, in order to demonstrate that condition 1 (b&c)* (sic) *above has been achieved. The results of the test shall be submitted to and approved in writing by the LPA.*

Table 17 in Section 7.7 of the planning stage acoustic report from Hoare Lea (Ref. 1010416, dated 03/03/2020) details external plant noise emissions limits (i.e. existing background levels at the site), and are summarised in Table 1 below.

Table 1 – Atmospheric Plant Noise Emission Limits

Assessment Period	External Plant Noise Limit – $L_{Aeq,T}$(dB)
Daytime (07:00 – 23:00)	41
Night-time (23:00 – 07:00)	35

3. ASSESSMENT LOCATION

In accordance with the Condition NS25, the assessment of noise impact has been undertaken at the façade of the nearest noise-sensitive receptor (NSR), identified on-site to be the rear windows of 27 Shaftesbury Rd, approximately 7.5m from the plantroom louvres. This location is also indicated on the attached Figure 1.

4. TESTING METHODOLOGY

To assess atmospheric noise emissions from the basement plant room, an attended noise survey was undertaken over the following period:

- 18:00 to 20:00 Tuesday 10 September 2024

It is understood that all units within the plant room were running at the normal operating duty for the duration of the survey period.

4.1 Measurement Positions

Simultaneous measurements were taken at the following locations:

Position 1

1m (on axis) from the plant room intake/discharge louvres. This location was chosen as a point at which plant noise emissions should dominate the noise climate, i.e. to minimise the contribution of otherwise prevailing environmental noise (road/air traffic). The measured levels could then be extrapolated to the assessment location. The microphone was mounted on a tripod approximately 1.5m above ground level.

Position 2

5m from the plant room intake/discharge louvres in the direction of the NSR. This location was chosen as a further check on plant room noise, including the effects of both increased distance and directivity between the louvres and the NSR. The microphone was mounted on a tripod approximately 1.5 m above ground level.

Position 3

Inside the plantroom itself. This location was chosen to enable any unusual internal data to be checked.

The measurement locations are shown in Figure 1 below, and photos in Figure 2.

4.1 Discussion of Noise Climate

Position 1

Even with plant within the plantroom running at normal duty, plant noise at Position 1 was only just audible. The noise climate was dominated by other environmental noise sources, even during periods between aircraft flyovers.

Position 1

The noise climate at Position 2 was completely dominated by environmental noise from road traffic movements in the area. Plant noise was completely inaudible at all times.

4.1 Assumptions and Analysis

External measurements were dominated by noise from planes passing overhead on their approach to Heathrow Airport. To assess a worst-case scenario, i.e. late at night where there are no flights overhead, the timing of each plane was noted while on-site and these events have been excluded from our calculations. Other events that may have affected the measured levels, such as individual and nearby vehicle pass-bys or pedestrians, have also been excluded.

5. RESULTS

5.1 Measured Noise Levels

The results of the survey are summarised in Table 2.

Table 2 – Measured Levels

Position 1 – Measured External Ambient Levels (L_{Aeq})	Position 2 – Measured External Ambient Levels (L_{Aeq})	Position 3 – Measured Internal Ambient Levels (L_{Aeq})
49	49	58

As detailed in section 4.1, atmospheric noise emissions from the plant room were barely audible at Position 1, and completely inaudible at Position 2.

5.2 Predicted Noise Levels at NSR

The noise levels measured at Position 1, when extrapolated to the NSR at a distance of 7.5m, are predicted to be 31 dBA.

6. DISCUSSION

When the measured level at Position 1 is extrapolated to 1m from the NSR by applying distance attenuation, the resulting predicted level would be 31 dBA. This is comfortably within the noise emission limits for both daytime and night-time periods (41 dBA and 35 dBA, respectively).

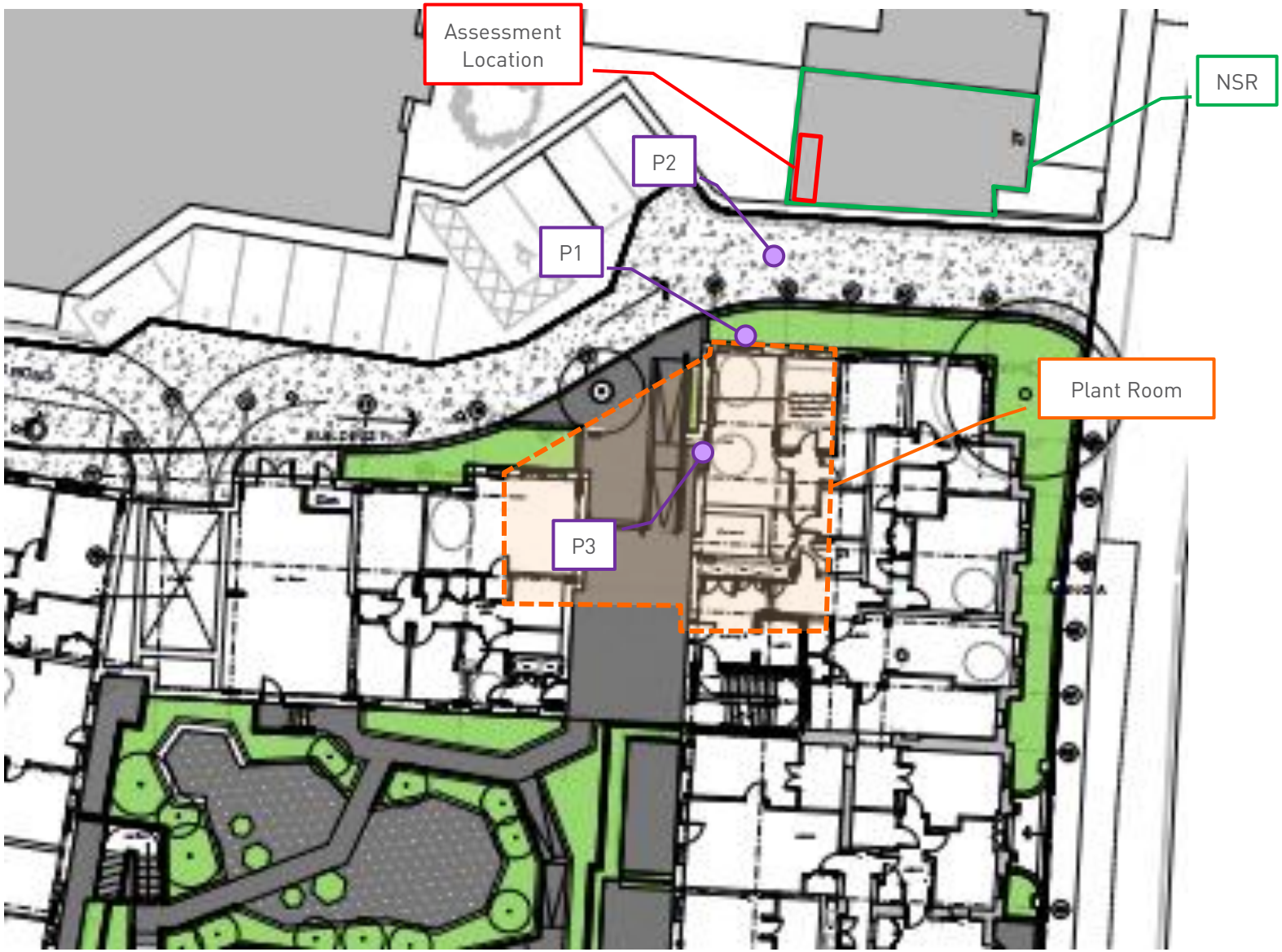
It should be noted that, given plant room noise levels were barely audible at Position 1, the noise levels which we have extrapolated to the NSR consist primarily of external (environmental) sources of noise rather than being dominated by atmospheric noise emissions from the plant room itself. The contribution to the predicted level at the NSR of plant room noise is therefore likely to be significantly lower than 31 dBA and this is, therefore, a very much worst-case assessment.

It is also worth noting that Position 2, where atmospheric noise emission from the plant room were completely inaudible, recorded an almost identical noise level to that at Position 1.

7. CONCLUSION

RBA Acoustics has undertaken commissioning measurements of atmospheric noise emissions from the basement plant room at Richmond Royal Hospital. Units within the plant room were understood to be running at the typical required duty for the development.

Noise levels meet the requirements for *Planning Condition U0065616 NS25 (c): Mechanical Services Noise Control*.



Richmond Royal Hospital – UKI Richmond

Measurement Locations

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Figure 1

18 September 2024

Not to Scale

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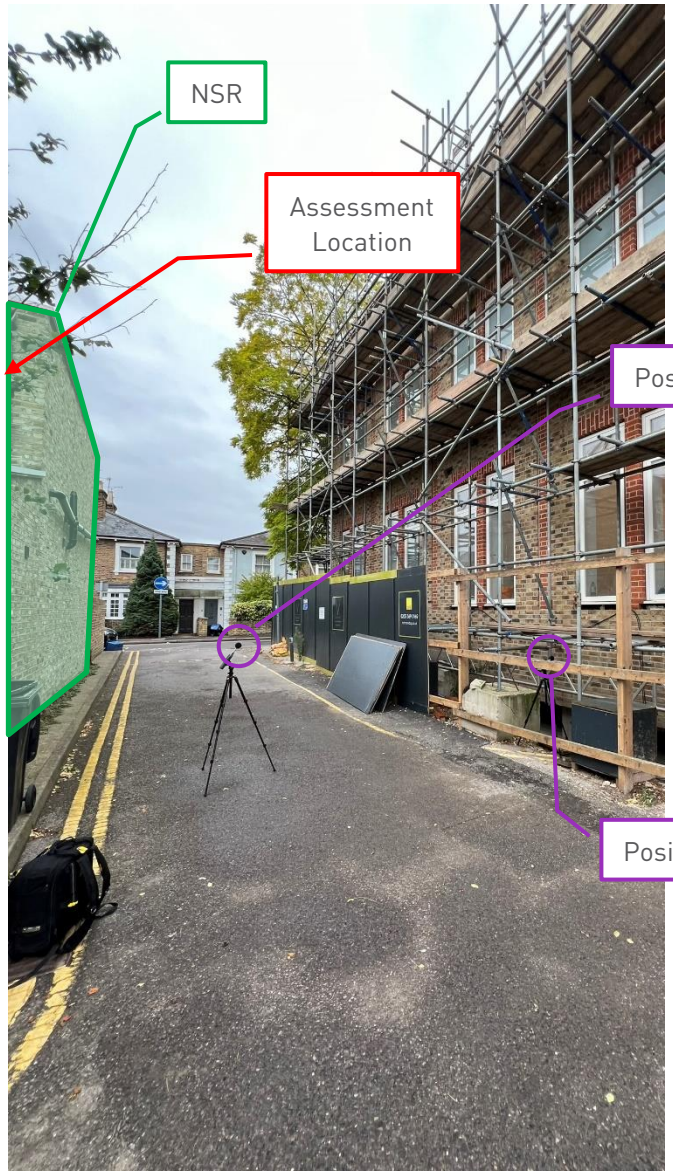

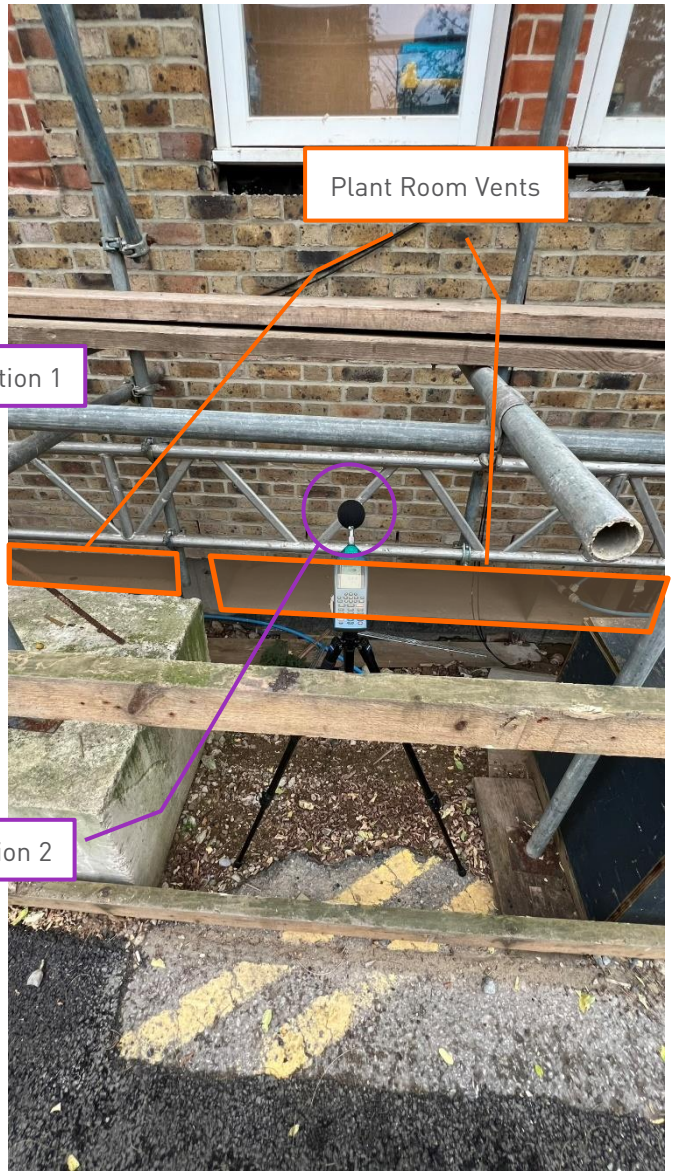

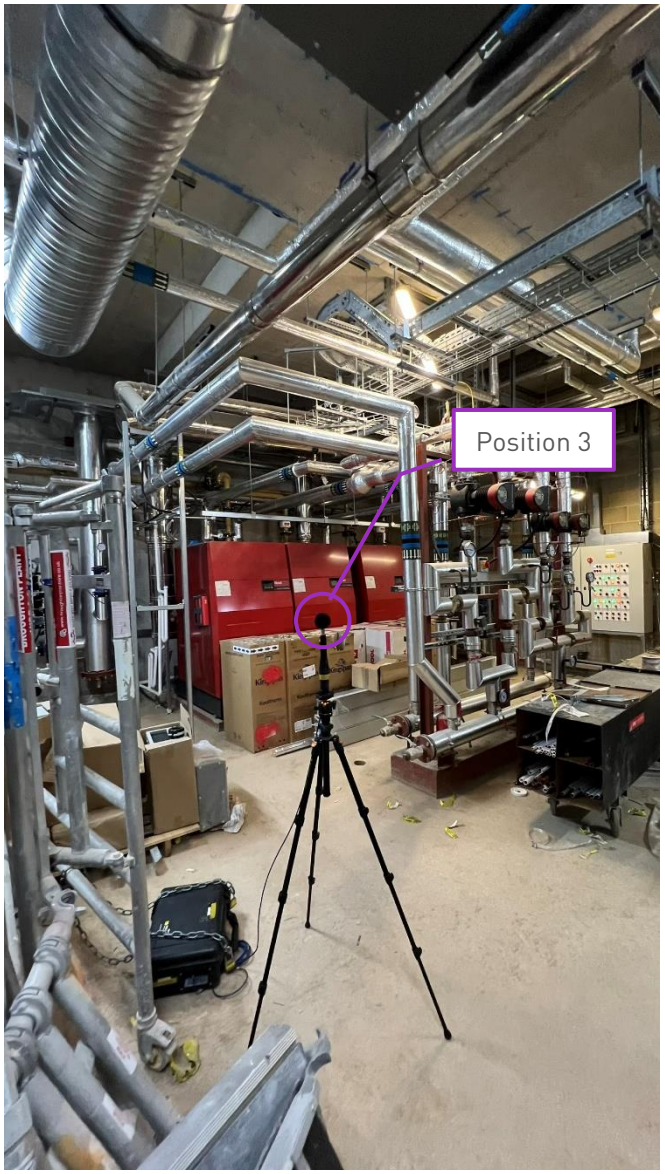

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Photos of Measurement Locations

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Figure 2

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Not to Scale

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