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24-28 Bloomsbury Way, Camden, London WC1

Environmental noise report

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Executive Summary

An assessment has been carried out of background noise levels and associated limiting plant levels at 24-28 Bloomsbury Way, Camden, London WC1. This report details the assessment of cumulative noise from rooftop services plant (approved by a separate planning permission, ref. 2011/1243/P, dated 23rd May 2011) and the proposed condenser at lower ground floor.

The Table below sets out limiting plant noise levels, which should not be exceeded at 1 m from the nearest residential property. For the purposes of this assessment, separate limits have been set for the front and rear sections of the rooftop area, together with plant located at lower ground floor level:

Time period	Location	Lowest measured $L_{A90,15mins}$	Maximum SPL at 1 m from residential façade
Daytime	Front	55.4	45
Night-time	Front	50.9	40
Daytime	Rear	49.2	39
Night-time	Rear	45.6	35
Daytime	Lower Ground floor	41.5	31
Night-time	Lower Ground floor	38.0	28

TABLE 1 – SUMMARY OF MEASURED NOISE LEVELS

It should be noted that these limits apply to the total contribution of all plant running simultaneously.

An assessment of proposed services plant has also been made, together with recommended mitigation measures to meet with limiting noise levels.

1.0 Introduction

Cundall Acoustics have been instructed by WPP to carry out a noise survey and assessment of a site known at 24-28 Bloomsbury Way, Camden, London WC1.

It is understood that proposals are to redevelop the existing buildings on site, including some new-build elements and general refurbishment and remodelling of office areas. Included in this redevelopment will be amended services plant arrangements.

The development falls within the London Borough of Camden (*LBC*) and, as such, is subject to their Planning policies with regards to noise. This report and assessment is therefore based on the following guidelines and assumptions (taken from Table E of Camden Development Policies 2010, DP28):

- Services plant to be no higher than 5 dB(A) below the prevailing $L_{A90,T}$ at the quietest time of operation, at the nearest noise sensitive receptor.
- Services plant that has distinct tonal and/or impulsive nature to be no higher than 10 dB(A) below the prevailing $L_{A90,T}$ at the quietest time of operation, at the nearest noise sensitive receptor.

The purpose of this assessment, therefore, is as follows:

- To determine the lowest prevailing background noise levels ($L_{A90,T}$) at the quietest time of operation
- To make an assessment of limiting plant noise levels, based on prevailing levels and LBC criteria

An assessment of proposed services plant has also been made, together with mitigation measures suggested to see that Local Authority noise criteria can be met.

2.0 Site Description

The site is located off Bloomsbury Way, Camden Town, London WC1. The site location and extent are shown below.

FIGURE 1 – SITE LOCATION

As can be seen, the site is located within a busy urban environment and, as such, is surrounded by busy roads and buildings which have roof-mounted services plant.

The roads surrounding the site are busy throughout daytime and night-time periods, although Bloomsbury Way itself is subject to one-way restrictions.

The roof of 24-28 Bloomsbury Way is split into 2 levels, with the section furthest from the road being approximately 2 m below the front section. Consequently, the rear section of roof is significantly quieter than the front.

It is understood that proposed services plant is to be housed in an enclosure on the raised section of roof, i.e. at the Bloomsbury Way end. It is further understood that the existing plant enclosure is to be replaced with a new enclosure which has a larger footprint. This therefore provides opportunity to provide an enclosure capable of achieving a higher degree of sound attenuation.

Additionally, a single condenser unit is proposed at lower ground floor level, on the external wall adjacent to the proposed Comms Room.

3.0 Noise Survey

3.1 Rooftop noise surveys

Unattended noise surveys were carried out on site on 10th, 11th and 12th January 2011, at 2 locations, as follows:

- Position 1 – located on the front section of roof, adjacent to the front facade. Measurements commenced at 14:08 hours on 10th January and ended at 10:38 hours on 12th January
- Position 2 – located on the rear section of roof, facing the rear of buildings to the north. Measurements were commenced at 14:34 hours on 10th January and ended at 14:19 hours on 11th January

A site plan showing measurement locations can be found below.

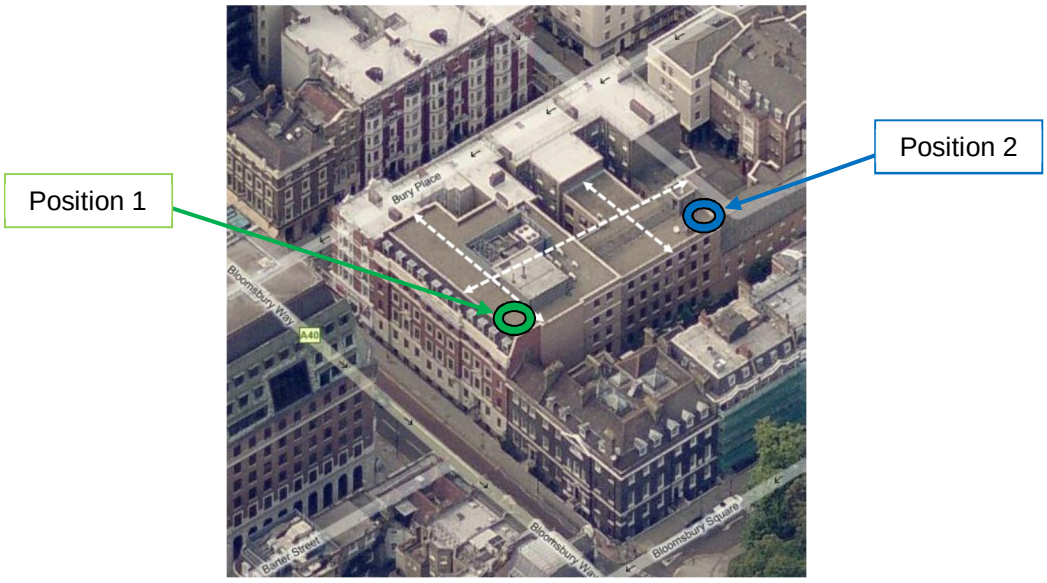

FIGURE 2 – LOCATION OF MEASUREMENT POSITIONS 1 & 2

Measurements were carried out using the following equipment:

- Rion NL-32 Class 1 Serial No. 00840861 (Position 1)
- Rion NA-28 Class 1 Serial No. 00370311 (Position 2)
- Rion Calibrator Type NC-74 Class 1, Serial No. 00410215

Meters were calibrated before and after the surveys, with no discernible drift witnessed.

Measurements were made of various noise descriptors, sequentially over a time reference of 15 minutes, but the key ones used in this assessment are as follows:

- $L_{Aeq,T}$ – the average A-weighted noise level exposure over a given time period, *T*
- $L_{A90,T}$ – the A-weighted noise level exceeded for 90% of the measurement period, *T*, commonly accepted as being the 'background' noise level

Weather conditions during the surveys were generally cold, dry and overcast, but with occasional gusts of wind and showers.

A summary of measurement results is shown below. For the purposes of this assessment, 'daytime' is taken as being 07:00 to 23:00 hours, with 'night-time' being 23:00 to 07:00 hours. All measurements are in dB(A).

Position	Period	Averaged $L_{Aeq,T}$	Lowest $L_{A90,T}$
1 (front)	Daytime	66.3 (Log)	55.4
1 (front)	Night-time	62.5 (Log)	50.9
2 (rear)	Daytime	54.9 (Log)	49.2
2 (rear)	Night-time	50.3 (Log)	45.6

TABLE 2 – SUMMARY OF MEASURED NOISE LEVELS

A full time history of results at each Position can be found in Appendix 1 below.

3.2 Lower Ground Floor noise surveys

An additional noise survey was carried out (Position 3) between 13th and 14th June 2012 at lower ground floor level, within the external service corridor adjacent to where the proposed condenser unit is proposed.

The following Figure shows the indicative location of Position 3.

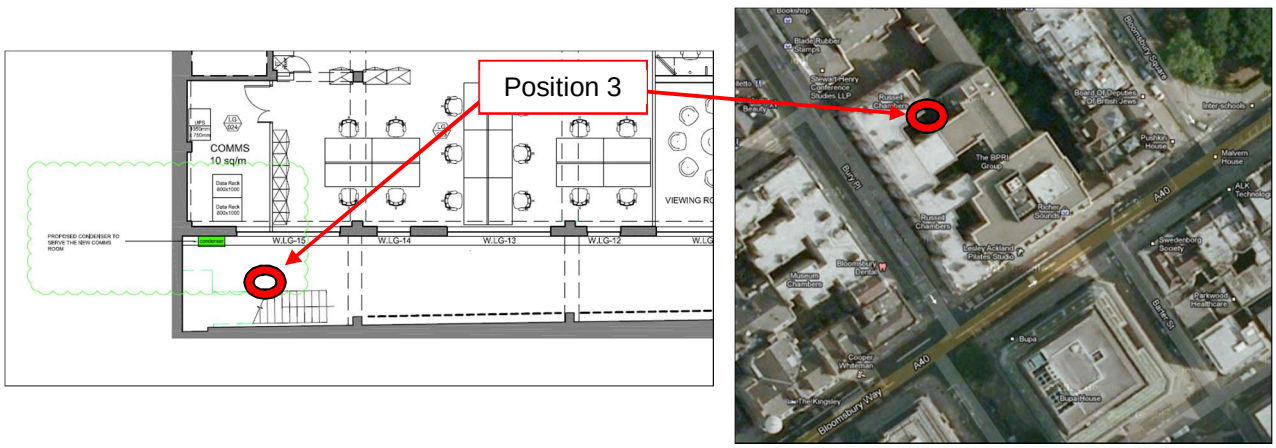

FIGURE 3 – LOCATION OF MEASUREMENT POSITION 3

Measurements were carried out using the following equipment:

- Casella CEL Sound Level Meter, Serial No. 1211404

The meter was calibrated before and after the surveys with no discernible drift witnessed.

Weather conditions during the survey was clear and dry.

A summary of the background measurement results is shown below. For the purposes of this assessment, 'daytime' is taken as being 07:00 to 23:00 hours, with 'night-time' being 23:00 to 07:00 hours. All measurements are in dB(A).

Period	Lowest $L_{A90,T}$
Daytime	41.5
Night-time	38.0

TABLE 3 – BACKGROUND NOISE LEVELS

The following Graph shows the time history of measured noise levels at Position 3.

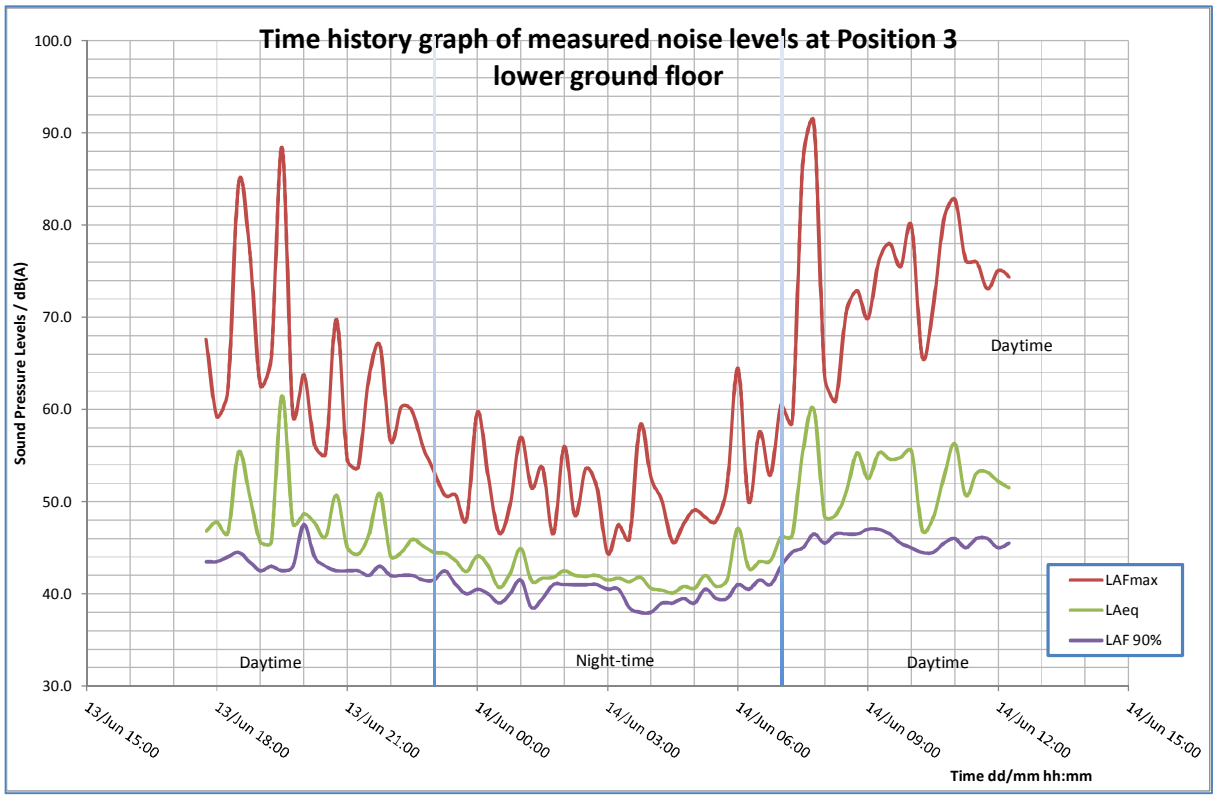

FIGURE 4 –GRAPH OF MEASUREMENT DATA FROM POSITION 3

4.0 Limiting Plant Noise Levels

Results from the noise survey, as summarised on Section 3.0 above, show the following:

- The differential between average ($L_{Aeq,T}$) and background ($L_{A90,T}$) noise levels at the front of the building is significantly greater than to the rear, demonstrating how much more affected the front section is by temporal events such as passing traffic
- There is approximately a 5 dB(A) difference in background noise levels between the front and rear sections of the rooftop, resulting in tighter restrictions on noise from new plant on the rear section

4.1 Limiting services plant noise

As stated in Section 1 above, LBC require noise from any new services plant to not exceed 10 dB(A) below prevailing background levels, at the quietest time of operation.

The Table below sets out limiting plant noise levels, which should not be exceeded at 1 m from the nearest residential property. For the purposes of this assessment, separate limits have been set for the front and rear sections of the rooftop area:

Time period	Roof section	Lowest measured $L_{A90,15mins}$	Maximum SPL at 1 m from residential facade
Daytime	Front	55.4	45
Night-time	Front	50.9	40
Daytime	Rear	49.2	39
Night-time	Rear	45.6	35

TABLE 4 – LIMITING NOISE LEVELS FOR SERVICES PLANT

It should be noted that these limits apply to the total contribution of all plant running simultaneously.

5.0 Services plant noise assessment

An assessment has been made of the anticipated noise impact of proposed services plant in relation to the limiting noise levels, as set in Section 4.0 above.

5.1 Rooftop Plant Area

It is understood that all new items of plant are to be located in a new enclosure, on the site of the existing plant compound, although it is understood that the new enclosure will have a larger footplate than existing.

The following Figure shows the proposed location of services plant (MAZE drawing ref. ME11/1260/M008, rev C1) with associated noise levels. The noise levels do not take into consideration directivity or reverberation build up within the enclosure (considered to be minimal due to the open top nature).

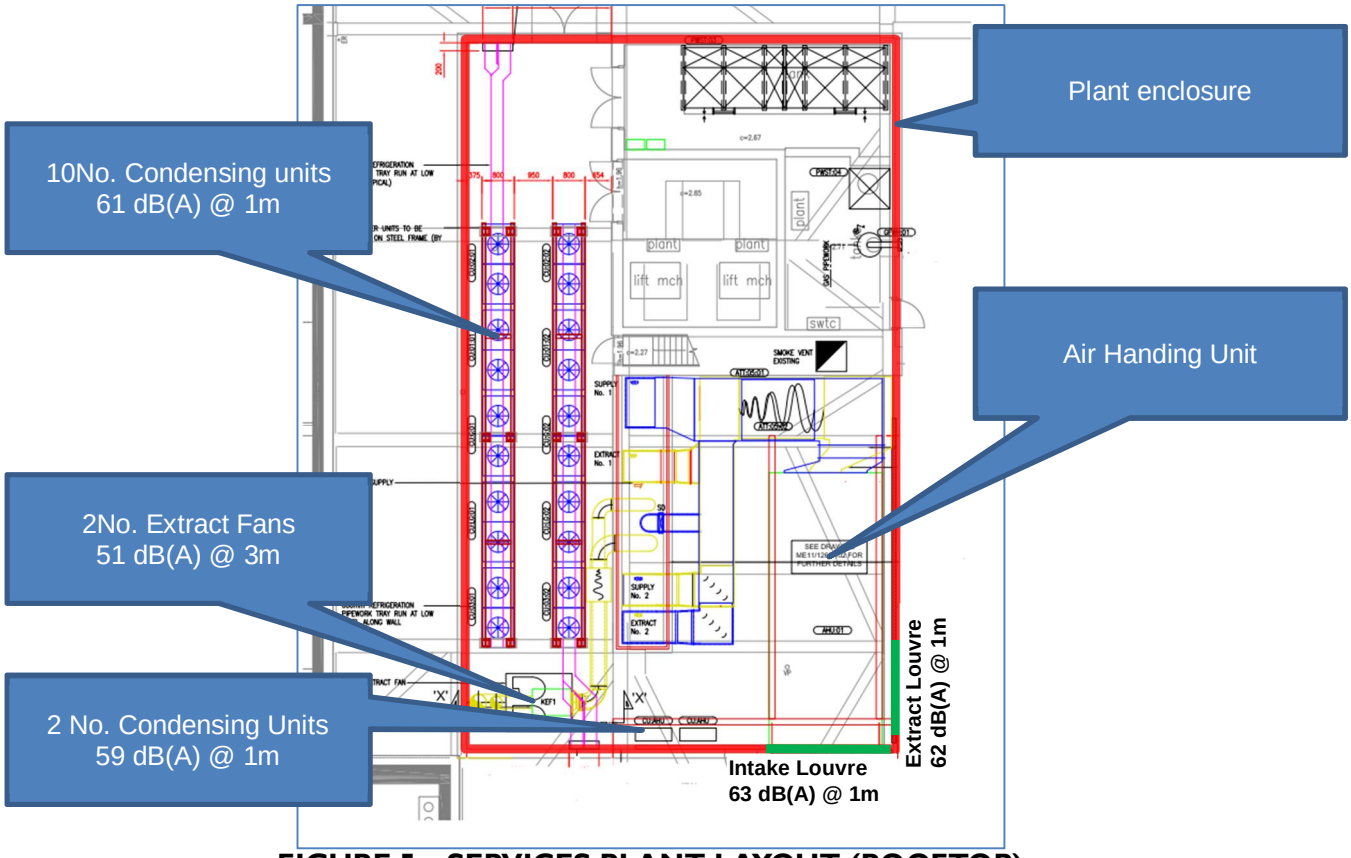

FIGURE 5 – SERVICES PLANT LAYOUT (ROOFTOP)

The following screenshot from Google Maps shows the site in relation to adjacent buildings with the nearest noise sensitive receptors marked on. Although the London Borough of Camden only require

the assessment to be made in relation to nearby residential properties, the 3D modelling also included nearby commercial premises.

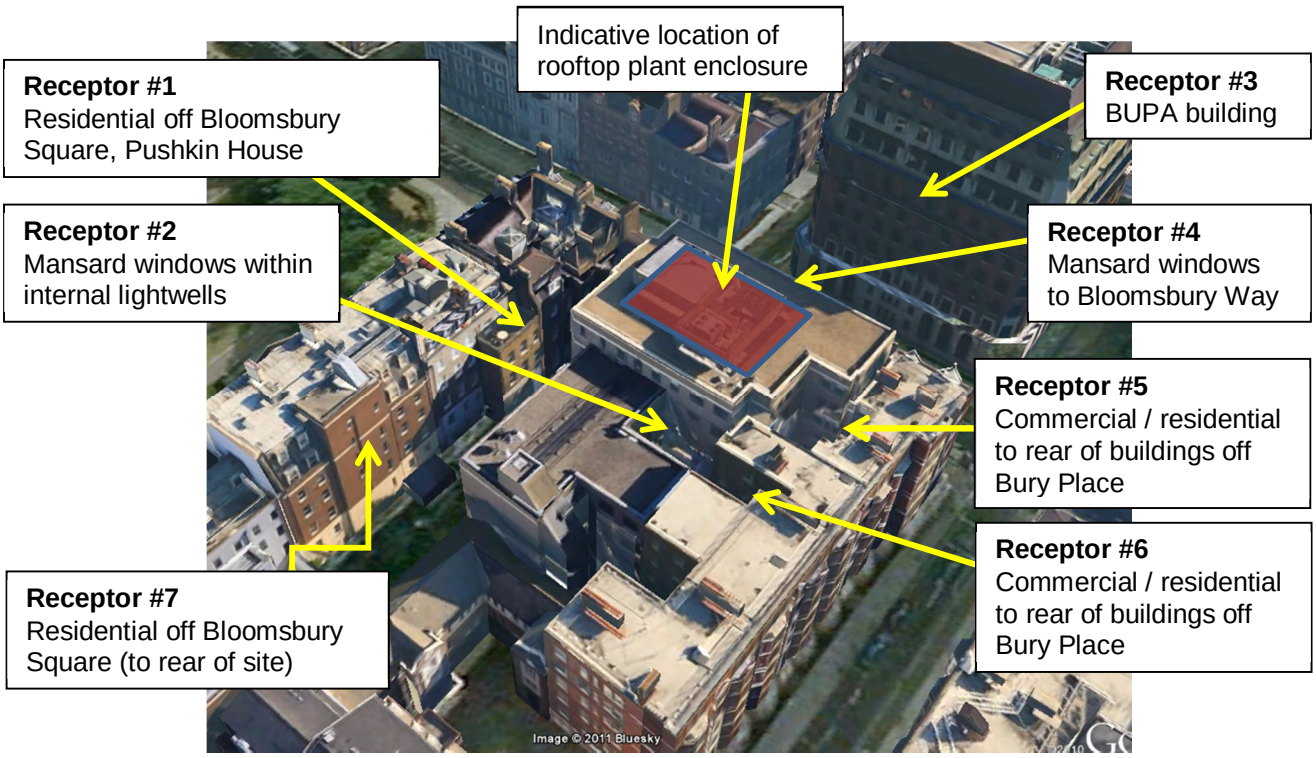

FIGURE 6 – NEAREST NOISE SENSITIVE RECEPTORS

5.2 Lower Ground Floor plant

In addition to the above, a small condensing unit is also proposed at lower ground floor level to serve the proposed Comms Room. The location of this Unit is shown in the following Figure along with the corresponding noise levels:

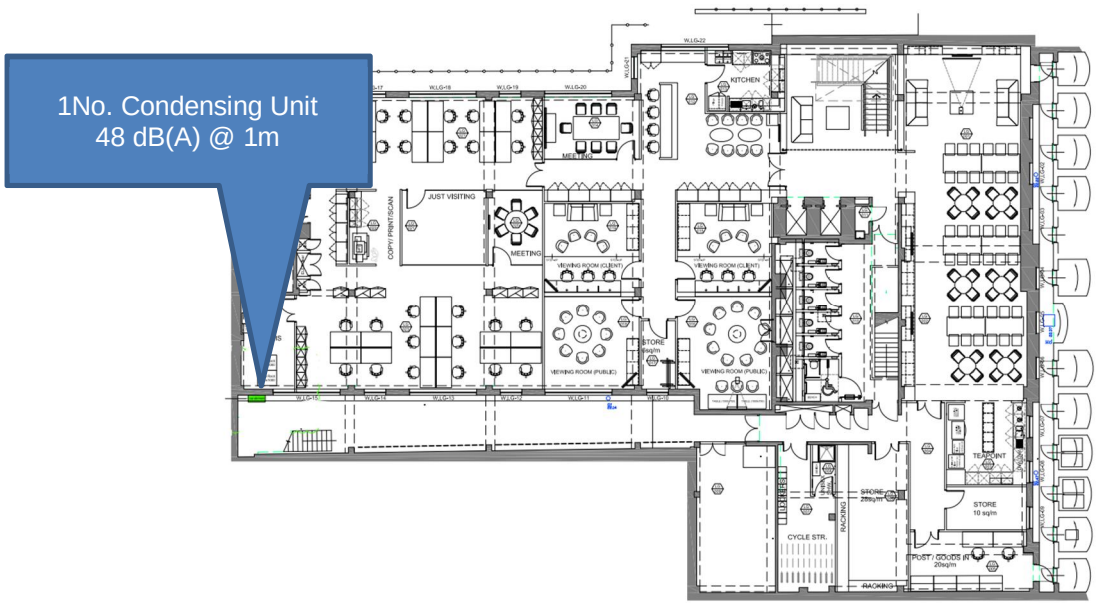

FIGURE 7 – LCOATION OF LOWER GROUND FLOOR CONDENSING UNIT

It is understood that the nearest noise sensitive receptor to the proposed unit will be residential dwellings overlooking the light well at 2nd floor level. The distance between the proposed unit and nearest window is approximately 6 m. It is also noted that the noise source (fan) is horizontal (i.e. the source of noise is perpendicular to the direction of the nearest noise sensitive receiver. A correction of -3 dB has therefore been applied to take this into account.

The calculated noise impact from the unit at the nearest noise sensitive window is therefore 29 dB(A)

$$[\text{Noise at NSR} = 48 - (20.\log_{10}(6/1) - 3]$$

The lowest measured background noise level of 38 dB(A), the contribution from the proposed unit would increase the background noise level to 38.5 dB(A). Based on the measured noise data, this would result in the existing background noise being exceeded by up to 0.5 dB on 2 occasions. The following graph illustrates this[1].

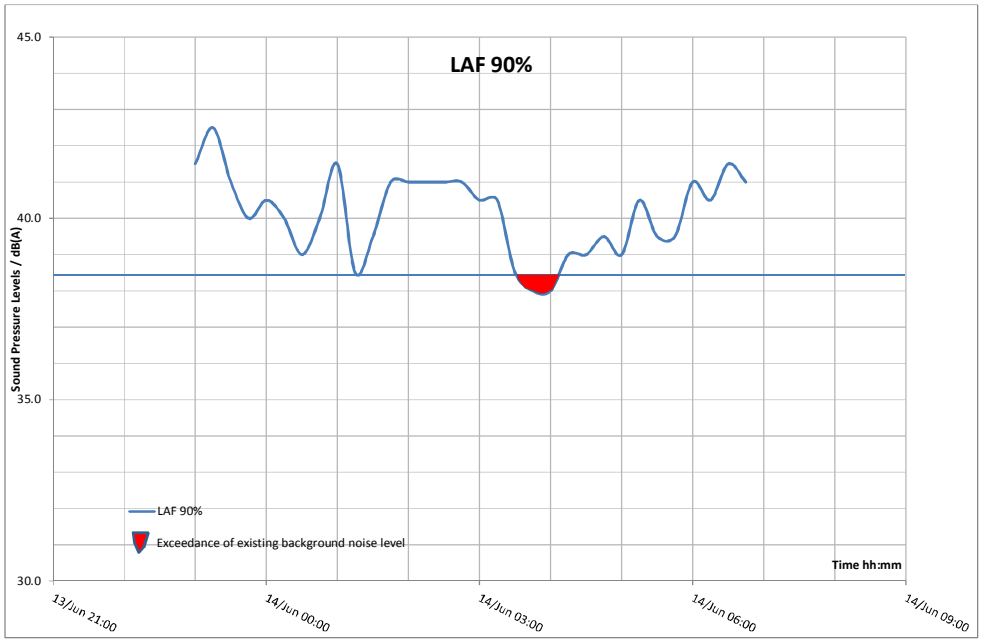

FIGURE 8 – GRAPH SHOWING EXCEEDANCE OF BACKGROUND NOISE LEVEL

5.3 3D noise model

In order to assess the noise impact from proposed services plant (rooftop and lower ground floor), a 3D noise model has been created using SoundPlan, version 7.1.

The noise impact at each of the above receptor points has been assessed, based on the manufacturers' data. Receptor points were located at each floor level to assess the maximum noise

[1] It is noted that designing to 10 dB below the background would still result in an exceedance of 0.4 dB.

impact on each façade. Results below only show the worst case predicted noise impact. For calculations, all plant was running simultaneously.

The model included a 2.5 m high, solid (> 20 kgm^{-2}) enclosure, elevated above the roof level by 500 mm (to allow airflow under the enclosure), i.e. the top of the enclosure was 3 m above roof top level.

The following Table summarises the maximum calculated noise exposure at each noise sensitive façade highlighted above (values rounded up to nearest integer).

Main Noise Source	Receptor ID	Receptor location	Predicted noise impact
Rooftop plant	1	Pushkin House	32 dB(A)
	2	Mansard windows within internal lightwell	33 dB(A)
	3	BUPA building	40 dB(A)
	4	Mansard windows to Bloomsbury Way	33 dB(A)
	5	Rear façade to Bury Place	32 dB(A)
	6	Rear façade to Bury Place	34 dB(A)
	7	Residential off Bloomsbury Square (to rear of site)	34 dB(A)

TABLE 5 – PREDICTED NOISE IMPACT FROM SERVICES PLANT

As can be seen, the maximum noise exposure calculated is to the BUPA building, on the opposite side of Bloomsbury Way, at 40 dB(A). This is within the limiting noise level (for the front façade of site) calculated from the lowest measured background noise level (refer to Section 4.0 above).

The maximum noise exposure on the nearest residential dwelling is 34 dB(A), on Receptor #6, Pushkin House. The limiting noise level criteria at this location (front façade) is 39 dB(A) and 35 dB(A) for daytime and night-time periods respectively.

The maximum noise exposure on the nearest residential dwelling to the rear of 24-28 Bloomsbury Way is 34 dB(A), Position #7. The limiting noise level criteria at this location (rear façade) is 45 dB(A) and 40 dB(A) for daytime and night-time periods respectively.

The following Figure shows a screen show from the 3D modelling software showing the predicted noise impact at each receiver.

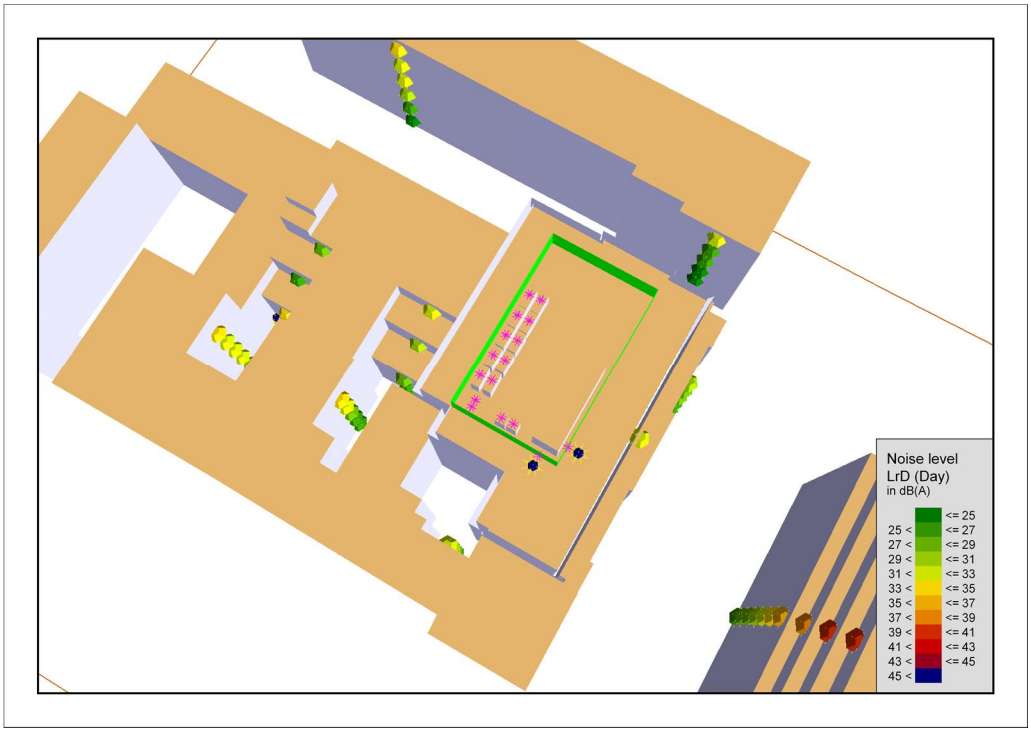

FIGURE 9 – PREDICTED NOISE IMPACT

6.0 Conclusions

Due to the differing background noise levels to the front and rear of the site, two sets of limiting plant noise levels have been established.

Separate limits have been set for daytime and night-time periods.

It is considered that, providing these noise limits are adhered to then services plant operation will meet with LBC criteria.

Based on proposed services plant, including a 3 m solid enclosure, it is considered that the limiting services plant noise levels will be met.

APPENDIX 1 – Survey Time Histories

All measurements are made in dB(A). The time period, *T*, was set to 15 minutes for each measurement.