

110-113 TOTTENHAM COURT ROAD

EXTERNAL PLANT NOISE ASSESSMENT

27 March 2025

AEC REPORT: P5506/R1/DMT

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1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been appointed by Synecore to undertake an assessment of the potential noise impacts from the proposed installation of external building services plant to serve the proposed ground floor restaurant at 110 to 113 Tottenham Court Road, London.
- 1.2 This report provides details of the noise survey that has been undertaken to determine the existing noise climate at the nearest noise sensitive properties, and an assessment of the potential noise impacts from the operation of the mechanical plant items, against relevant standards and proposed criteria. This report is required for submission to the Local Authority as part of the associated planning application.
- 1.3 Acoustic terminology used throughout this report is described in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The proposed plant includes extract fan ductwork which terminates at roof level, with the actual fan located inside the building. There will also be a supply fan intake and 4no. condenser units.
- 2.2 The nearest noise sensitive residential receptors are understood to be residential dwellings on Tottenham Court Road and Whitfield Street, as identified on Figure 2.1 below. There are also office premises around the site.
- 2.3 A plan showing the site (the indicative location of the proposed plant) and closest noise sensitive receptors, is provided on Figure 2.1, below.





Imagery @2025 Google, Imagery @2025 Airbus, CNES / Airbus, Infoterra Ltd & Bluesky, Landsat / Copernicus, Maxar Technologies, The Geoinformation Group, Map Data @2025

2.4 It is understood that the plant could operate until approximately 2300h, but it will not typically operate during the night-time period (2300-0700h).

3.0 ASSESSMENT METHODOLOGY

National Planning Policy Framework

- 3.1 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government, in March 2012, and revised most recently in December 2024.
- 3.2 The planning policies which relate specifically to noise are reproduced below:
 - "187. Planning policies and decisions should contribute to and enhance the natural and local environment by:
 - (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.
 - 198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
 - (a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
 - (b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
 - 200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."
- 3.3 Further to the above, the Governments Planning Practice Guidance (PPG) published in March 2014 and updated in September 2023 states:

'Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.'

3.4 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.

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Local Authority Criteria

3.5 The '*Camden Planning Guidance*' document for housing states that:

Amenity of neighbours – The proposal should not have a significant detrimental impact to neighbouring amenity in terms of neighbouring outlook, privacy, sunlight, daylight, **noise** or vibration.

3.6 There does not appear to be specific reference to noise limits from external building services plant. However, typically, to demonstrate that a significant detrimental impact will not occur, an assessment would be undertaken in general accordance with British Standard BS4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS4142).

BS4142: 2014+A1:2019

- 3.7 BS4142 provides methods for rating and assessing external building services plant sound by comparing the specific sound level from the plant to the prevailing background sound level (dBL_{A90,T}) over relevant periods that the plant operates.
- 3.8 It is necessary to determine the specific sound level from the industrial/commercial activities over a period of one hour during the daytime and/or 15 minutes during the night-time. The specific sound level relates to the specific commercial/industrial sound source only and has to be corrected to take account of other sound sources generally in the area, residual sound. Daytime is normally considered to be over the period 0700 to 2300 hours, and night-time 2300 to 0700 hours.
- 3.9 A 'rating' correction can be applied if the sound has specific acoustic character. Then the significance of the potential impact is indicated by the difference between the background sound level and the rating level. Typically, the greater this difference, the greater the magnitude of the impact.
 - A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low 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.
- 3.10 With regard to undertaking the assessment, BS4142 indicates that the context of the sound must be taken into consideration.

Proposed Limit

3.11 Based on the above, it is recommended that, as a minimum, the rating level from the plant does not exceed -5dBA below the background sound level at the residential receptors, and ideally, where it is reasonably practicable, the rating level would be controlled to -10dBA below.

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4.0 EXISTING NOISE CLIMATE

- 4.1 An attended baseline noise survey was undertaken between 2000h and 2300h on Thursday 20 March 2025. Noise measurements were taken at two proxy locations (A & B) representative of the most sensitive receptors to the site, shown as A on Figure 2.1 above.
- 4.2 Noise measurements were undertaken in general accordance with BS7445-1: 2003 'Description and measurement of environmental noise. Guide to quantities and procedures'. Full details of the noise survey are provided in Appendix B.
- 4.3 The noise climate was comprised of road traffic noise and distant plant noise from the top of nearby buildings. The measured noise levels are summarised provided in the following Table 4.1.

	Noise Level			
Location	Lowest Background dBL _{A90}	Average Ambient dBL _{Aeq}		
A (Tottenham Court Road)	53.2	59.5		
B (Whitfield Street)	49.0	56.0		

Table 4.1 – Measured Noise Levels – 20/05/2025 (between 2000-2300h)

- 4.4 The standard BS4142 states that a representative background noise level should be used and that the objective is not just to ascertain a lowest background sound level. However, in this instance the lowest measured values have been taken as a worst-case approach.
- 4.5 For the purposes of this assessment, the worst-case background noise level has been used, therefore, the determined background noise level used in the assessment is 49dBL_{A90,15min} at all nearby residential receptors.



5.0 ASSESSMENT

Source Noise Levels

- 5.1 The proposed plant comprises:
 - The flue and exhaust of the kitchen extract fan
 - Supply fan intake
 - 4 no. condenser units.
- 5.2 The source noise level data is shown in the following Table 5.1.

Source	Reference	Mode	Sound Pressure Level at 3m, dB(A)				
Air conditioning condenser unit	Mitsubishi PUZ-M200/250 YKA R32	Heating (<i>worst-case</i>)	50-52				
Supply fan	Systemair MUB 100 630EX	-	65				
Extract fan	71						
Above Extract Fan with an a (Approx. len	61*						
*Insertion Loss of attenuat	*Insertion Loss of attenuator will be reviewed to ensure minimum 10dB broadband reduction						

Table 5.1	- Plant	Source	Noise	Levels

5.3 The above noise levels are all 'on-axis' to the fan i.e. directly in line. Noise levels reduce when measured 'off-axis'. at an angle to the fan.

Predicted Noise Levels

5.4 The nearest residential properties to the exhaust of the extract fan are highlighted below.



Figure 5.1 – Site Location Plan

- 5.5 The source noise level data has been used to calculate the noise levels at the nearest residential properties, considering distance attenuation and screening.
- 5.6 There is no clear line of sight between the noise sensitive receptors and the supply fan or condensers units, which are to be located low down in the existing plant well. However, the extract exhaust will be located at high level, as indicated in the Figure 5.1 above.



5.7 The predicted noise levels at the nearest residential receptors, from the operation of the plant, are shown in the following Table 5.2 and Table 5.3.

Plant	Sound Pressure	Approximate	Approximate A	Predicted		
Fidili	Level @3m, dBA	Distance, m	Distance	Screening	dBA	
Attenuated Extract	61	40	-22	0	39	
Supply	65	40	-22	-15	28	
Condensers (x4)	58	40	-22	-15	21	
				Total	39	

Table 5.2 – Predicted Noise Level at Whitfield Street

Table 5.2 Dradiates	Noice Lovel at T	ottonhom Court I	Dood
Table 5.5 – Fredicied	NOISE Level at 1	ottennam Court i	Ruau

Plant	Sound Pressure	Approximate	Approximate A	Predicted	
Fidin	Level @3m, dBA	Distance, m	Distance	Screening	dBA
Attenuated Extract	61	45	-24	0	37
Supply	65	45	-24	-15	26
Condensers (x4)	58	45	-24	-15	19
				Total	37

The above results show that the noise from the extract fan exhaust is the main factor potentially 5.8 impacting on the nearby residential receptors.

BS4142 Sound Character Penalty

Based on the measured background and the predicted noise level, it is considered that noise from 5.9 the operation of the proposed unit would not feature characteristics that would be distinctive against the residual environment. Therefore, it is not considered necessary to apply a correction to the specific sound level to determine the rating level.

BS4142 Rating Level Assessment

5.10 The following Table 5.4 shows the specific sound level, background noise level, and rating level. The difference between the rating level and background noise level has also been provided.

	Sound Level, dB					
Receptor	Specific Sound Level, L _{Aeq,Tr}	Correction	Rating Level, L _{Ar,Tr}	Background Noise Level, L _{A90,15min}	Excess of Rating Over Background	
Whitfield Street	39	0	39	49	-10	
Tottenham Court Road	37	0	37	49	-12	

Table 5.4 – BS4142 Assessmer	Table	- 5.4 -	BS4142	Assessment	t
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5.11 The assessment above indicates that the rating level from the operation of the units would be at least -10dBA below background at the residential properties on Whitfield Street and on Tottenham Court Road. Therefore, the proposed criteria would be achieved. In accordance with BS4142, this would equate to a "low impact, depending on the context" at the nearest noise sensitive receptors.



Other Comments

- 5.12 The noise levels in the plant well will be around 60dBA at the windows of any overlooking offices, with noise levels reducing outside the windows on the higher floors. This is quieter than the noise levels on the elevation(s) overlooking Tottenham Court Road, and should not be a significant change to the existing situation. Indoor noise levels in the offices will be generally acceptable(<40dBA) when offices have their windows closed.
- 5.13 Notwithstanding the above, it is recommended that all plant items are resiliently mounted and resiliently fixed to the structure, to minmise any vibration entering the existing structures and minimise the risk of re-radiated noise. This entails anti-vibration mounts for fans/condenser units and acoustically resilient fixings for the vertical ductwork which will be fixed to the wall. (*AEC can provide further details as the scheme develops*).
- 5.14 Should there be a requirement for the extract fan be located externally then, depending on the precise location, it is likely than an acoustic enclosure would be required with acoustically treated ventilation openings. This would require review and additional input.

6.0 SUMMARY & CONCLUSIONS

- 6.1 AEC has undertaken an assessment in relation to the potential noise impact of the proposed installation of new external plant, including extract fan exhaust and condenser units, at the proposed ground floor restaurant at 110-113 Tottenham Court Road, London.
- 6.2 A baseline noise survey was undertaken in the late evening of Thursday 20 March 2025 at locations around the site, representative of general background noise levels at the nearest noise sensitive receptors.
- 6.3 A worst-case BS4142 assessment has been carried out to assess the noise impact of operation of the proposed plant. Provided an atmosphere side attenuator is included to the extract fan, the resulting rating level at the residential receptors would at least -10dB below the background sound level. In accordance with BS4142, this would equate to a *"low impact, depending on the context"* at the nearest noise sensitive receptors.
- 6.4 The assessment demonstrates that the proposed noise level criteria would be achieved, and provided the scheme is developed in line with this noise assessment report, noise should not be a limiting factor when determining planning permission.



APPENDIX A - Acoustic Terminology

General Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or frequency of the sound. The frequency is expressed in Hertz (Hz), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discreet frequency - a 'pure tone' most noise is made up of many different frequencies. The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level dBA, normally used to assess the effect of noise on people. The dBA weighting emphasizes or reduces the importance of certain frequencies within the audible range Sound / Noise Units The figure below shows an example of sound level varying with time. Because of this variation over time the same period of noise can be described by several different levels. The most common of these are described below dB evel .qn Time -**Commonly Used Descriptors for Sound / Noise** The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' LAmax,F/S meter response should be cited. Equivalent continuous A-weighted sound pressure level of the totally encompassing Ambient Sound sound in a given situation at a given time, usually from many sources near and far, at the Level, LAeg. T assessment location over a given time interval, T. A-weighted sound pressure level that is exceeded by the residual sound at the Background assessment location for 90% of a given time interval, T, measured using time weighting, Sound Level, LA90 F, and quoted to the nearest whole number of decibels. Specific sound level plus any adjustment for the characteristic features of the sound Rating Level, LAr, Tr **Residual Sound**, Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound. LAeq, T **Specific Sound** Equivalent continuous A-weighted sound pressure level produced by the specific sound Level, LAeq,Tr source at the assessment location over a given reference time interval, r. Free-field Level This refers to the sound level measured outside, away from reflecting surfaces. This refers to the sound level measured outside, at 1m from a hard reflecting surface, Façade Level typically 3dB greater than the free-field level.



APPENDIX B – Noise Survey Details

Date & Time of Survey:	2000h to 2300h Thursday 20 March 2025.						
Personnel:	David Terry (AEC).						
Equipment Used:	B&K 2250 Real Time A	nalyser (AEC Ki	t 1).				
Calibration:	The sound level analyser, which conforms to BS EN 61672-1: 2013 <i>'Electroacoustics – Sound level meters - Part 1 Specifications'</i> for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.						
Weather	Date	Period	Wet/Dry	Temp °C	Wind Direction		
Conditions:	20/03/2025	Evening	Dry	18°C	Easterly (Negligible)		
Measurement Locations:	Measurements were undertaken at two locations representative of the noise sensitive receptors, shown as A & B on Figure 2.1 and described below. A – Midford Place. B – Whitfield Street.						
Measurement Details:	Measurements were all terms of L_{eq} , L_{90} , and L_m	Measurements were all undertaken over 15-minute periods and noise levels were measured in terms of L_{eq} , L_{90} , and L_{max} .					
Façade / Free-Field:	Free-field.	Free-field.					
Measured Data:	Full 1/3 rd octave band co	entre frequency	data was obtained	d for all measur	ements.		

Table B	3.1 -	- Mea	sured	Daytime	Noise	Levels

Location	Period, h	Noise Level, dB				Commonto
		L _{Aeq}	L _{A10}	L _{A90}	L _{Amax} , F	comments
A	2000 – 2015	60.2	63.7	54.0	71.9	Road traffic noise and distant building services plant.
	2030 - 2045	59.9	62.5	54.7	70.8	
	2200 – 2215	58.3	61.2	53.2	68.0	
В	2050 - 2103	55.5	58.8	50.2	68.1	Road traffic noise and distant building services plant.
	2115 – 2130	57.2	59.7	49.9	70.6	
	2239 – 2254	55.2	59.9	49.0	70.3	