

Sainsbury's Local
Tottenham Court Road
London
W1T 1BJ

**Plant Noise
Guidance Report**

On behalf of



Project Reference: 93067 | Revision: 00 | Date: 13th February 2025

Document Information

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For and on behalf of Noise Solutions Ltd				

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1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by Cube Ltd to provide guidance on maximum noise emissions for plant to serve a proposed Sainsbury's store located along Tottenham Court Road, London W1T 1BJ.
- 1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.
- 1.3. This report contains plant noise guidance based on project information available at the time of writing and the results of a baseline noise survey.
- 1.4. To assist with the understanding of this report, a glossary of acoustic terms can be found in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

- 2.1. The store is to occupy the ground floor of an existing multi-storey building located on Tottenham Court Road, London with the upper floors being used for non-residential offices.
- 2.2. The proposed plant will be in an external plant compound on the south side of the store and will be located adjacent to the office windows on the fourth floor of the building. The plant is not visible from Tottenham Court Road and will be accessible from Gresse Street. The site location is shown in **Appendix B**.
- 2.3. The plant is expected to consist of AC units, a gas cooler and a refrigeration pack.

3.0 Nearest noise sensitive receptors

- 3.1. The area surrounding the site is both residential and non-residential in nature. The nearest noise sensitive property to the plant location are non-residential offices, the plant is located next to fourth floor office windows, Receptor R1.
- 3.2. The nearest residential dwellings, are flats on Hanway Place, Receptor R2, approximately 30 metres from the proposed plant. Receptor R3, are flats on Gresse street, approximately 45 metres away from the proposed plant location which will have full line of sight to the plant area.
- 3.3. All other residential properties and commercial are further from the plant area, with many also being screened by the buildings.

3.4. **Appendix B** contains an aerial photograph showing the site and surrounding area, including the location of the receptors identified above.

4.0 Existing noise climate

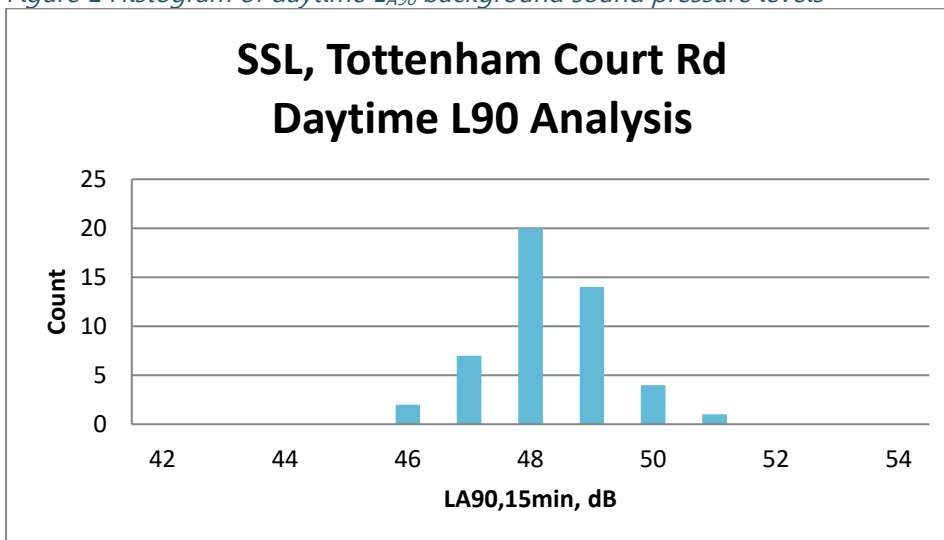
4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant room louvres, during the quietest times at which the plant will operate.

4.2. The results of the environmental sound survey are summarised in Table 1. The full set of measurement results and details of the survey methodology are presented in **Appendix C**.

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	L _{Aeq} (15mins)	L _{Amax} (15mins)	L _{A10} (15mins)	L _{A90} (15mins)
Daytime (07.00 – 23.00 hours)	53-62	67-86	56-66	46-51
Night-time (23.00 – 07.00 hours)	51-60	65-83	54-62	42-54

Figure 1 Histogram of daytime L_{A90} background sound pressure levels

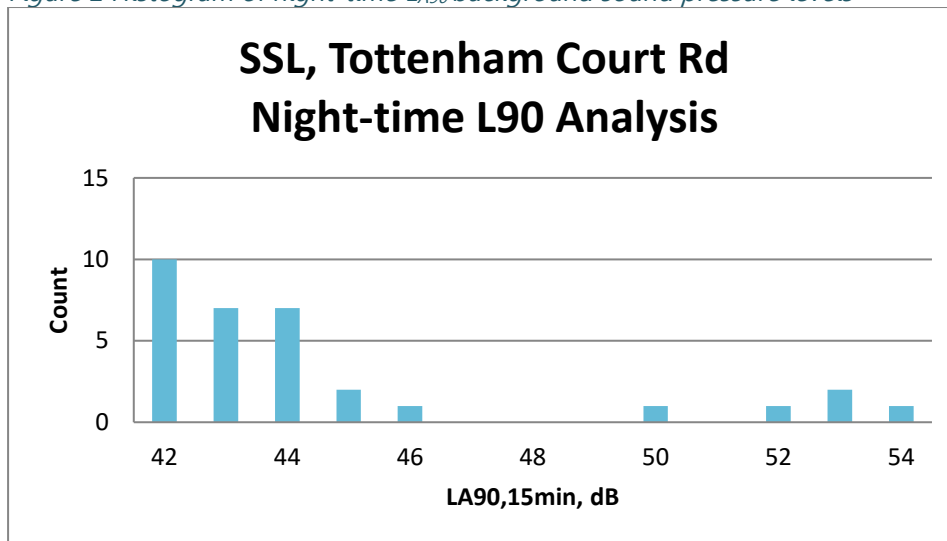


4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

Table 2 Statistical analysis of LA90,15min levels during the daytime period

dB, LA90 daytime period	
Mean	48
Mode	48
Median	48

Figure 2 Histogram of night-time LA90 background sound pressure levels



4.4. Additional statistical analysis has been undertaken. As shown in Table 3, the mean, median, and modal values have been calculated:

Table 3 Statistical analysis of LA90,15min levels during the night-time period

dB, LA90 night-time period	
Mean	44
Mode	42
Median	43

4.5. Based on the histogram analyses above, the following values have been considered as representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 48dB LA90 during the daytime period; and
- 42dB LA90 during the night-time period.

5.0 Plant noise design criteria

London Borough of Camden

- 5.1. Section 6 of the Camden Planning Guidance Amenity, published January 2021, gives guidance on noise and vibration .
- 5.2. Clause 6.8 refers to noise thresholds within Appendix 3 of the Local Plan and to the principles of No observed effect level (NOEL), Lowest observable adverse effect level (LOAEL) and Significant observed adverse effect level (SOAEL) and defines their meanings. Specifically, in the context of this report, LOAEL is defined as:

The level above which changes in behaviour (e.g. closing windows for periods of the day) and adverse effects on health (e.g. sleep disturbance) and quality of life can be detected.

- 5.3. SOEAL is defined as:

The level above which adverse effects on health and quality of life occur. This could include psychological stress, regular sleep deprivation and loss of appetite.

- 5.4. Clause 6.27 states that:

Developments proposing plant, ventilation, air extraction or conditioning equipment and flues will need to provide the system's technical specifications to the council accompanying any acoustic report. "BS4142 Method for rating Industrial and Commercial Sound" contains guidance and standards which should also be considered within the acoustic report.

- 5.5. Appendix 3 within the Camden Local Plan published 2017 states:

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion."

- 5.6. Table C of the appendix states the criteria at which development related noise levels will be acceptable:

Table C: Noise levels applicable to proposed industrial and commercial development (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dB _{L_{Amax}}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB _{L_{Amax}}	'Rating level' greater than 5dB above background and/or events exceeding 88dB _{L_{Amax}}

**10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

National Planning Policy Framework

- 5.7. A new edition of the NPPF was published in December 2024 and came into effect immediately. The original National Planning Policy Framework (NPPF¹) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2024 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2024 edition.

¹ National Planning Policy Framework, DCLG, March 2012

- 5.8. Paragraph 187 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *“preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability.”*
- 5.9. The NPPF goes on to state in Paragraph 198:
- “planning policies and decisions 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 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 ...*
- 5.10. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE²).
- 5.11. Paragraph 2 of the NPPF states that *“planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise.”*
- 5.12. Paragraph 12 of the NPPF states that *“The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed”.*

² Noise Policy Statement for England, DEFRA, March 2010

- 5.13. Paragraph 124 states that *"Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land"*.

BS 4142:2014+A1:2019

- 5.14. BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'* is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014+A1:2019 includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"*.
- 5.15. The procedure contained in BS 4142:2014+A1:2019 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains *"a tone, impulse or other characteristic"* then various corrections of can be added to the specific (source) noise level to obtain the *"rating level"*. Specifically *"Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied"*.
- 5.16. The likely effects of sound on people are assessed by subtracting the background noise level from the rating level. BS 4142:2014+A1:2019 states the following:
- 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;
 - 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 sound level, this is an indication of the specific sound source having a low impact, depending on the context.

- 5.17. BS 4142:2014+A1:2019 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

- 5.18. In order to comply with London Borough of Camden council's usual requirements, the rating level of the new plant must be at least 10dB below the background sound level at the affected nearby residential windows.
- 5.19. A summary of the recommended plant noise limits is given in Table 4

Table 4 Proposed plant noise emissions level limits at noise sensitive residential receptors

Receptor	Period	Cumulative specific plant noise level, dB(A)
Residential	Daytime (07.00 – 23.00 hours)	38
	Night-time (23.00 – 07.00 hours)	32
Office	Daytime (07.00 – 23.00 hours)	50
	Night-time (23.00 – 07.00 hours)	-

- 5.20. The above limits have not been approved by the local authority at this stage.

6.0 Outline guidance - plant noise limits

- 6.1. Plant details and locations are to be finalised.
- 6.2. Taking account of the distance between the proposed plant locations and the nearest receptors, the proposed plant should not exceed the following limits to demonstrate compliance with the criteria detailed in Table 4.

Table 5 Guidance on maximum plant noise emission limits

Plant	Period	Maximum plant noise emission level (L _{Aeq})
AC plant (total)	Daytime (07.00 – 23.00 hours)	57dB at 1m
	Night-time (23.00 – 07.00 hours)	-
Refrigeration plant (total)	Daytime (07.00 – 23.00 hours)	25dB at 10m
	Night-time (23.00 – 07.00 hours)	25dB at 10m

- 6.3. To ensure the plant meets the requirements without the need for attenuation, it is recommended that the AC plant be placed at least 2.5 meters away from Receptor R1.
- 6.4. Where possible, uncertainty in the above assessments has been minimised by taking the following steps:
- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
 - Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method.
 - Care was taken to ensure that the measurement position was representative of the noise climate outside the nearby residential dwellings and not in a position where higher noise levels were present.
- 6.5. The following should be taken into account during the design of the plant area;
- NSL should be consulted once the exact plant layout/selection is confirmed to ensure noise requirements can be achieved.
 - The local authority is anticipated to require details of the proposed plant and a noise impact assessment report as part of the planning application.

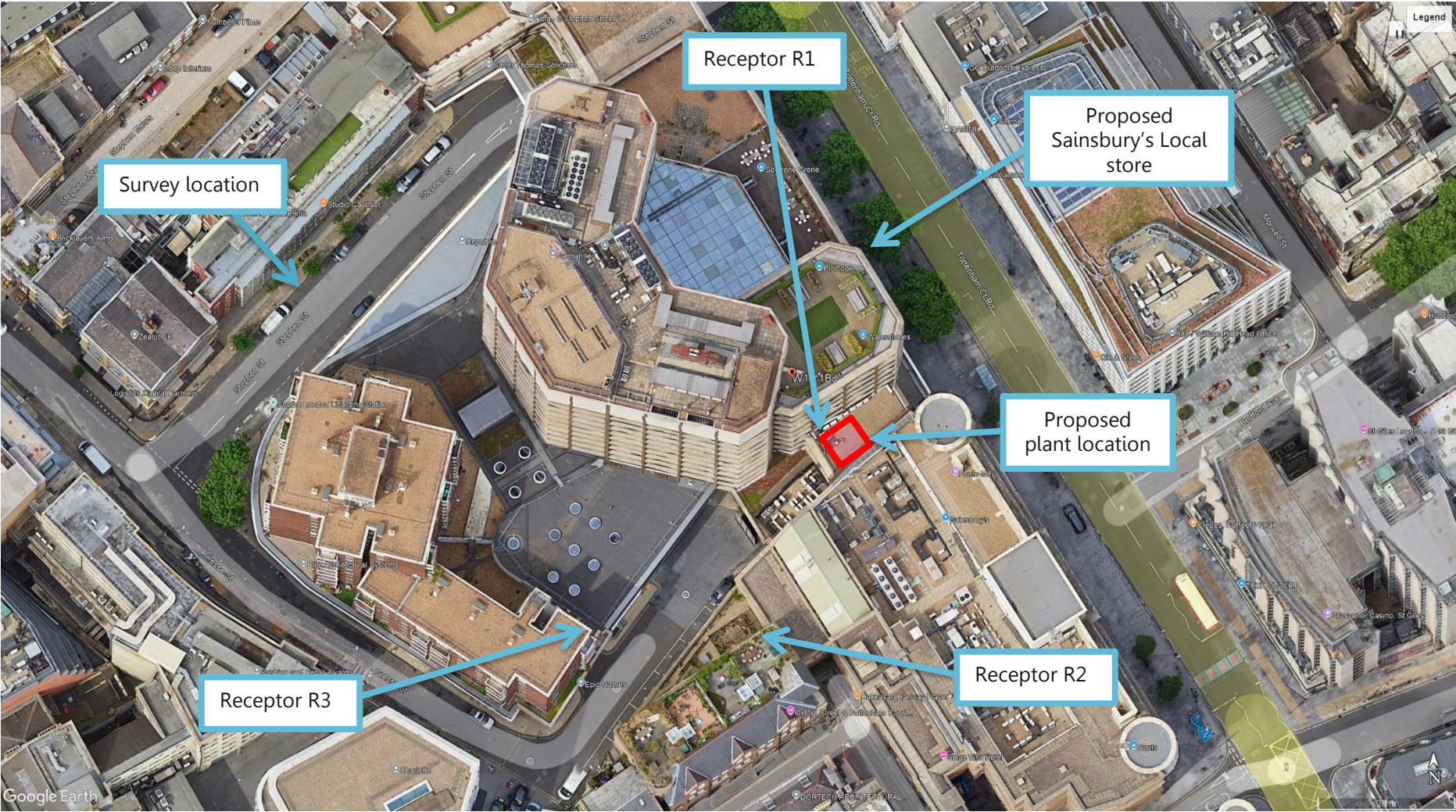
7.0 Summary

- 7.1. Noise Solutions Ltd (NSL) has been commissioned by Cube Ltd to provide guidance on maximum noise emissions for plant to serve a proposed Sainsbury's store located along Tottenham Court Road, London W1T 1BJ.
- 7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at locations representative of the noise climate outside the nearest noise sensitive receptors to the proposed plant area.
- 7.3. Guidance on the maximum noise emissions for the proposed plant has been provided. NSL should be consulted once the final layout/selections have been confirmed.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Photograph of site showing areas of interest



Appendix C Environmental sound survey

Details of environmental sound survey

- C.1 Measurements of the existing environmental sound levels were undertaken between 12.45 hours on Thursday 21st November and 13.45 hours on Friday 22nd November 2024.
- C.2 The sound level meter was programmed to record the A-weighted L_{eq} , L_{90} , L_{10} and L_{max} noise indices for consecutive fifteen-minute sample periods for the duration of the survey.

Measurement position

- C.3 The sound level meter was positioned on a lamppost along Brookfield Avenue. The approximate location of the microphone is indicated on the aerial photograph in [Appendix B](#). In accordance with BS 7445-2:1991 '*Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use*', the measurements were undertaken under free-field conditions.

Equipment

- C.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (± 0.2 dB) in the calibration level was noted.

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977D / 99071	11/05/2023	Factory conformation certificate
Condenser microphone	Microtech MK255 / 25430		
Preamplifier	Svantek SV12L / 129686		
Calibrator	Svantek SV 33B / 83850	01/11/2024	1510142-1

Weather conditions

- C.5 Weather conditions were determined both at the start and upon completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements.
- C.6 The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	Time/Date	Description	Beginning of Survey	End of Survey
As indicated on Appendix B	14.30 11 Feb – 10.45 12 Feb 2025	Temperature (°C)	4	5
<p>Cloud Cover</p> <p>Symbol Scale in oktas (eighths)</p> <p>0 Sky completely clear</p> <p>1</p> <p>2</p> <p>3</p> <p>4 Sky half cloudy</p> <p>5</p> <p>6</p> <p>7</p> <p>8 Sky completely cloudy</p> <p>(9) Sky obstructed from view</p>		Precipitation:	No	No
		Cloud cover (oktas – see guide)	8	8
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	No
		Wind Speed (m/s)	1	1
		Wind Direction	From NW	From NNE
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

- C.7 The results of the survey are considered to be representative of the background sound pressure levels at the façades of the most affected noise sensitive receptors to the plant area during the quietest times at which the plant will operate.
- C.8 The noise climate at the measurement position was dominated by distant and local road traffic with further influence to a lesser degree from birdsong, pedestrians and wind. The results of the survey are presented in a time history graph overleaf.

SSL, Tottenham Court Rd Tuesday 11 - Wednesday 12 Feb 2025

