NSL
Noise Solutions Ltd

Sainsbury's Local
Tottenham Court Road
London
W1T 1BJ

Plant Noise
Impact Assessment

On behalf of

CUBE
construction & property consultants

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	Name	Qualifications	Initials	Date
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Revision	Date	Description	Prepared	Reviewed/ Approved

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Appendices

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. Noise emissions from proposed plant have been predicted at the most affected noise sensitive receptors and assessed in accordance with the typical requirements of the local authority.

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 a VRF air conditioning (AC) unit and a refrigeration gas cooler. The VRF unit will be installed within a bespoke acoustic housing.

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

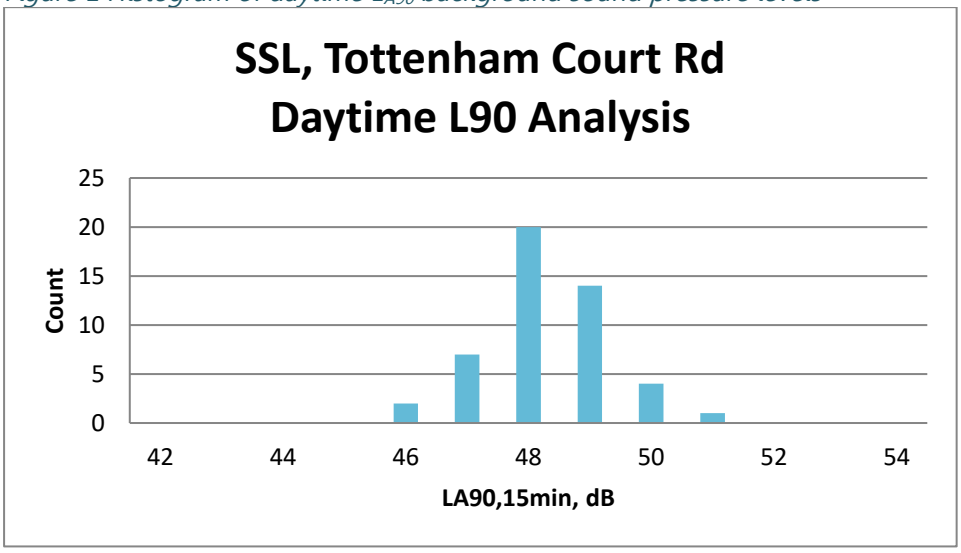
4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant room louvres, during the quietest times at which the plant will operate.

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

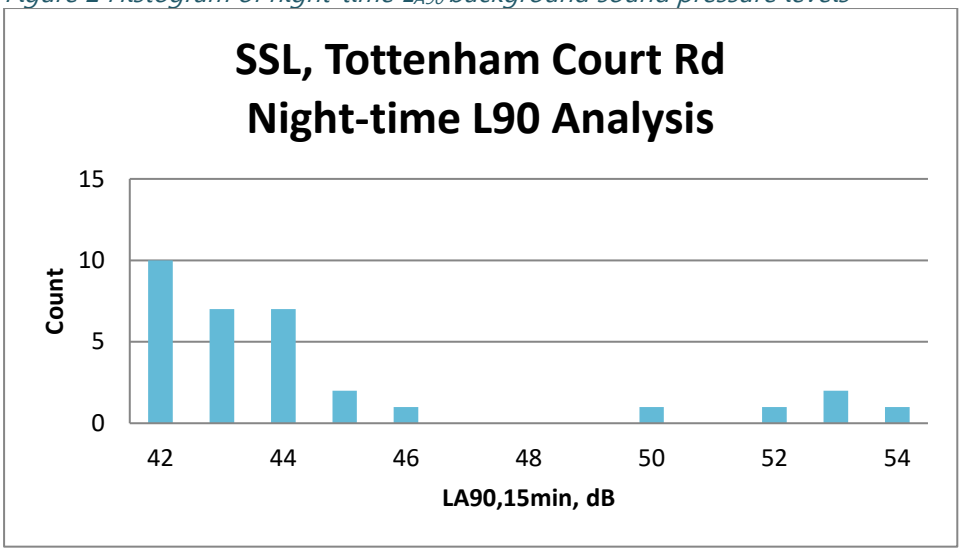


4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

Table 2 Statistical analysis of $L_{A90,15min}$ levels during the daytime period

dB, L_{A90} daytime period	
Mean	48
Mode	48
Median	48

Figure 2 Histogram of night-time L_{A90} 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 $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} 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 L_{A90} during the daytime period; and
- 42dB L_{A90} 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 57dBL_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dBL_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dBL_{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 (NPPF[1]) 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 (NPSE[2]).

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 Plant noise impact assessment

6.1. Plant noise levels at the most affected noise sensitive receptors have been predicted based on the manufacturer's noise data for the approved equipment.

6.2. It should be noted that the proposed ventilation plant will operate during operational hours only and is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. All proposed external plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems. To provide a robust assessment, a 3dB acoustic feature correction as described in BS 4142:2014+A1:2019 for the possible presence of "*...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...*".

6.3. Plant rating levels have been predicted externally at the nearest noise sensitive receptors. The assessment has taken account of the distance between the plant and the nearest receptors,

orientations, screening, reflections and other propagation effects. Internal specific plant noise levels have been predicted, assuming an overall noise reduction of 15dB provided by a partially open window.

6.4. Table 5 summarises the results of the assessment outside the nearest noise-sensitive dwellings. All other nearby receptors benefit from increased distance/screening to the plant such that resulting noise levels will be lower than at the receptors considered. The full calculations are presented in **Appendix E**.

Table 5 Predicted plant noise levels at receptors

Receptor	Period	Predicted rating level at receptor, L_{Aeq} (dB)	Criterion (dBA)	Difference (dBA)
R1 (Office)	Daytime (07.00 – 23.00 hours)	49	50	-1
	Night-time (23.00 – 07.00 hours)	-	-	-
R2 (Residential)	Daytime (07.00 – 23.00 hours)	24	38	-14
	Night-time (23.00 – 07.00 hours)	13	32	-19

Context and uncertainties

6.5. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment is undertaken at the nearest residential window. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.
- The assessment has been made with all plant operating at maximum capacity, as this is not always the case, the assessment is an absolute worst case scenario.

6.6. 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.

- Calculations are based on a minimum distance of 3m between the plant and the nearest residential receptor.

- 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.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned by Cube Ltd to provide a noise impact assessment for plant to serve a proposed Sainsbury's store located along Tottenham Court Road, London W1T 1BJ.

7.2. 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 receptor to the site.

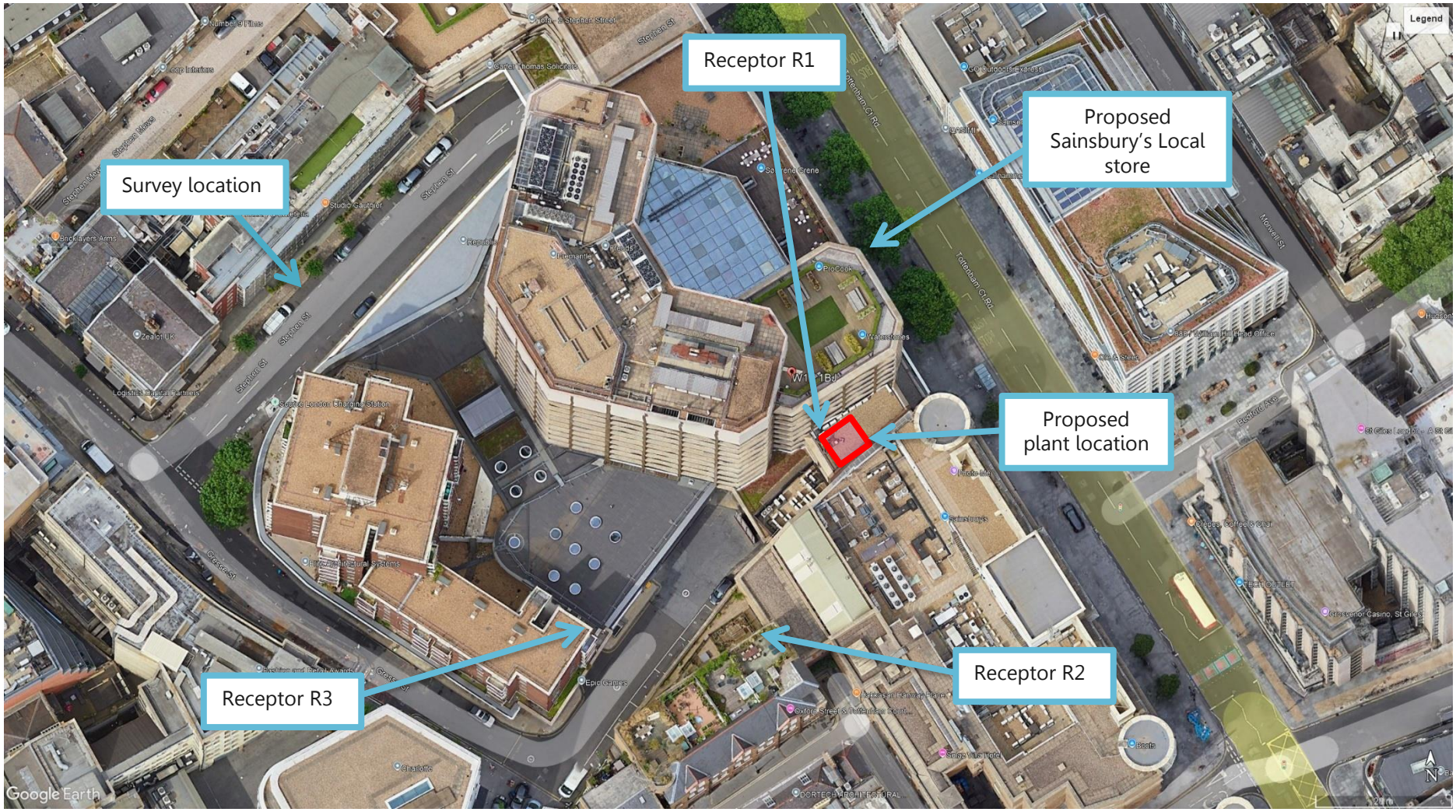
7.3. Cumulative plant noise emission levels for the plant have been predicted at the most affected noise sensitive receptors and assessed against the local authority's usual requirements.

7.4. The noise level predictions demonstrate that cumulative noise emissions from the proposed plant will comply with the proposed limits at the nearest noise sensitive properties, inclusive of a suitable acoustic enclosure fitted to the proposed VRF AC unit. Noise from fixed plant should not be grounds for refusal of planning permission.

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 s1 and s2 is given by 20 $\log_{10}$ (s1/s2). 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 20μPa. 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 14.30 hours on Tuesday 11th February and 10.45 hours on Wednesday 12th February 2025.

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

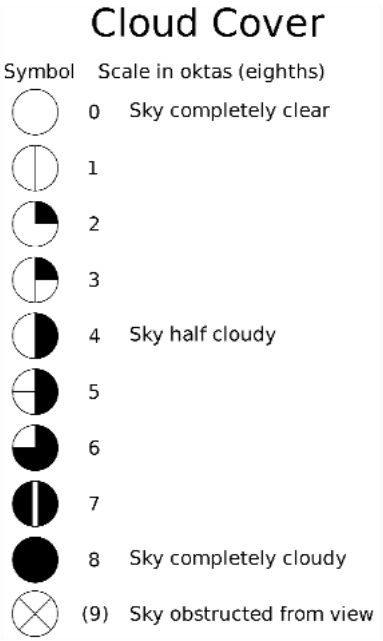
C.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

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.

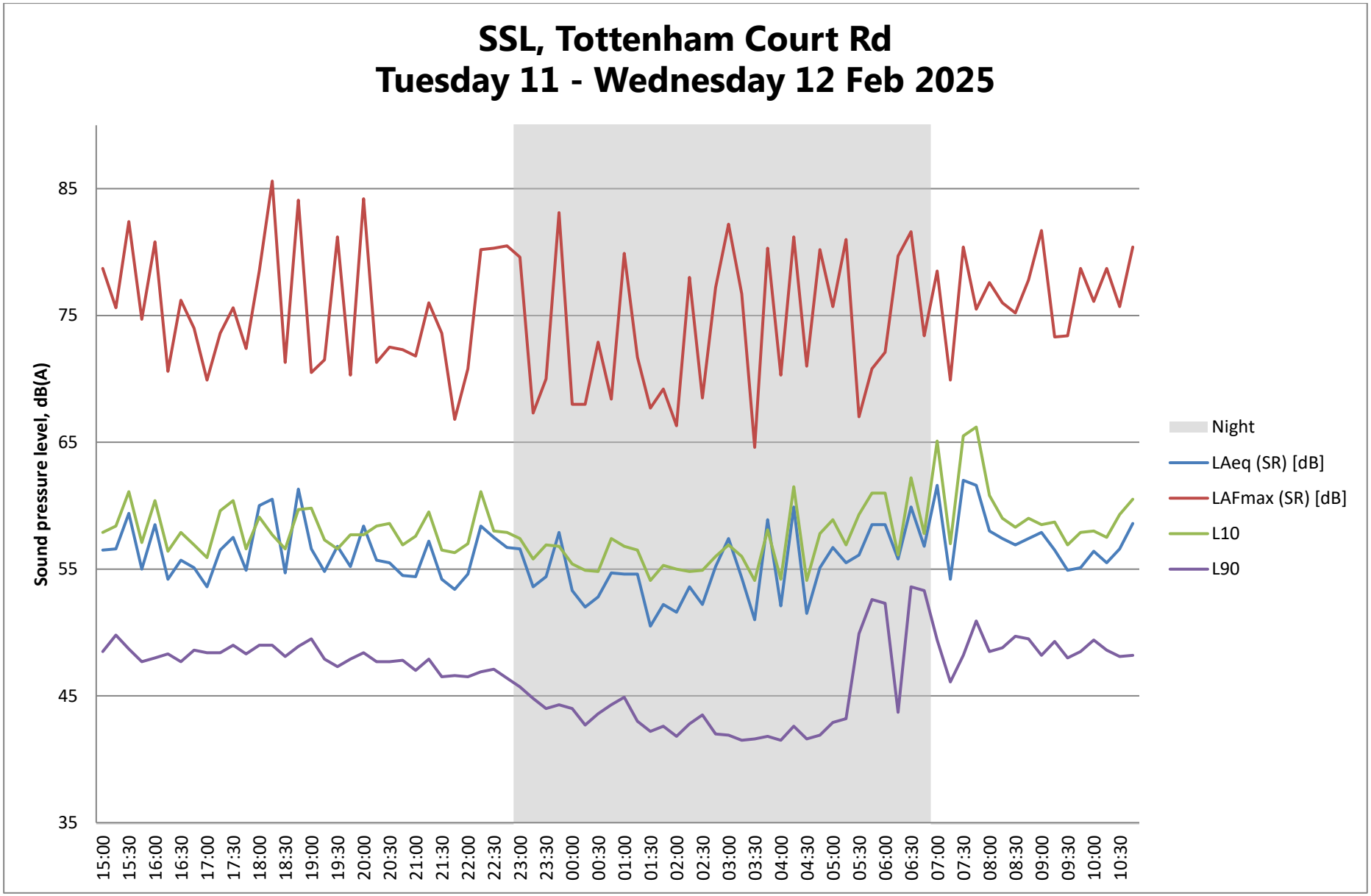
C.6 The table below presents the weather conditions recorded on site at the beginning and end of the survey.

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
		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
Sound pressure level, dB(A)
85
75
65
55
45
35
15:00
15:30
16:00
16:30
17:00
17:30
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05:30
06:00
06:30
07:00
07:30
08:00
08:30
09:00
09:30
10:00
10:30
Night
LAeq (SR) [dB]
LAFmax (SR) [dB]
L10
L90

Appendix D Manufacturer noise data

Plant	Unit/Model	No. of units	Description	Level (dBA)
Gas cooler	Kelvion / GF-NC102G5H-091R-AMHE-10FPI	1	Sound pressure level @ 10m	19
AC	Mitsubishi/ PURY-P300YNW	1	Sound power level	86

Appendix E Noise level predictions

Receptor 1 – Daytime

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	Resultant at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	19	10	4.7	7	0	0	26
AC	See separate calculation						**49**
						Cumulative external specific level:	49

Receptor 1 – AC Daytime

Description	Notes	Sound level (dB) at octave band centre frequency								L_{Aeq} (dB)
		63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Plant room										
Intake										
Reverberant level in plant room	Rev L_p	86	80	76	70	59	54	48	42	72
All plant running										
Opening area (m^2)	1.88	3	3	3	3	3	3	3	3	
SRI of opening	I.L.	-7	-14	-23	-36	-43	-43	-41	-34	
Inside-outside correction		-6	-6	-6	-6	-6	-6	-6	-6	
L_w of opening	L_w	75	62	50	31	13	8	4	5	51
R1										
Directivity correction	(1500,0° x 1250,90°)	1	1	1	-4	-7	-7	-7	-7	
Distance correction (m)	1.5	-12	-12	-12	-12	-12	-12	-12	-12	
Screening (d = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		3	3	3	3	3	3	3	3	
Resultant at receptor R1	L_p @ R1	65	52	38	16	-5	-11	-15	-14	41
Discharge										
VRF Unit Discharge										
Sound power	L_w	93	89	87	84	79	75	71	67	86
End reflection	1.875	-3	-1	0	0	0	0	0	0	
SRI of opening	I.L.	-9	-16	-26	-38	-45	-45	-44	-37	
L_w of opening		81	72	61	46	34	30	27	30	60
R1										
Directivity correction	(1500,0° x 1250,90°)	1	1	1	-4	-7	-7	-7	-7	
Distance correction (m)	1.5	-12	-12	-12	-12	-12	-12	-12	-12	
Screening (d = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
Resultant at receptor R1	L_p @ R1	71	61	50	31	16	12	8	11	49

Receptor 2 – Daytime

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	Resultant at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	19	10	28	-9	0	0	10
AC	See separate calculation						**21**
						Cumulative external specific level:	21
						BS 4142 feature correction:	3
						Cumulative external rating level:	24

Receptor 2 – Night time

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Screening	Resultant at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	
Gas Cooler	19	10	28	-9	0	0	10
						Cumulative external specific level:	10
						BS 4142 feature correction:	3
						Cumulative external rating level:	13

Receptor 2 – AC Daytime

Description	Notes	Sound level (dB) at octave band centre frequency								L_{Aeq} (dB)
		63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Plant room										
Intake										
Reverberant level in plant room	Rev L_p	86	80	76	70	59	54	48	42	72
All plant running										
Opening area (m^2)	1.88	3	3	3	3	3	3	3	3	
SRI of opening	I.L.	-7	-14	-23	-36	-43	-43	-41	-34	
Inside-outside correction		-6	-6	-6	-6	-6	-6	-6	-6	
L_w of opening	L_w	75	62	50	31	13	8	4	5	51
R2										
Directivity correction	(1500,0° x 1250,315°)	-1	-3	-7	-8	-8	-8	-8	-8	
Distance correction (m)	29	-37	-37	-37	-37	-37	-37	-37	-37	
Screening (d = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
Resultant at receptor R1	L_p @ R1	37	23	6	-15	-32	-37	-41	-40	12
Discharge										
VRF Unit Discharge										
Sound power	L_w	93	89	87	84	79	75	71	67	86
End reflection	1.875	-3	-1	0	0	0	0	0	0	
SRI of opening	I.L.	-9	-16	-26	-38	-45	-45	-44	-37	
L_w of opening		81	72	61	46	34	30	27	30	60
R2										
Directivity correction	(1500,0° x 1250,315°)	-1	-3	-7	-8	-8	-8	-8	-8	
Distance correction (m)	29	-37	-37	-37	-37	-37	-37	-37	-37	
Screening (d = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS 4142 Correction		3	3	3	3	3	3	3	3	
Resultant at receptor R1	L_p @ R1	43	32	18	1	-11	-15	-18	-15	20

Appendix F Plant layout