

Sainsbury's
17-21 Camden Road
London
NW1 9LJ

**Plant Noise
Impact Assessment Report**

On behalf of
Base Build Services Ltd

Project Reference: 91287 | Revision: 00 | Date: 22nd May 2023

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1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by Base Build Services to provide a noise impact assessment for new, replacement plant serving the existing Sainsbury's store located at 17-21 Camden Road, London.
- 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. The cumulative plant noise level has been predicted at the nearest noise-sensitive receptors and assessed against recognised standards.
- 1.4. A glossary of acoustic terminology is given 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 Sainsburys store occupies a dedicated commercial building at 17-21 Camden Road, London.
- 2.2. The existing plant serving the store is located on the roof of the store. As part of the refurbishment proposals, the existing plant is to be replaced with a more efficient installation.
- 2.3. New condenser units will be sited in place of existing plant on the roof, and new false load evaporators will be positioned on a newly formed gantry within the delivery yard.
- 2.4. All new plant will potentially operate 24 hours a day, although it should be noted that these units operate as required to meet demand and that store demands for cooling are generally reduced at night.

3.0 Nearest noise sensitive receptors

- 3.1. The area surrounding the site is a mix of residential and commercial buildings.
- 3.2. The nearest noise sensitive property to the proposed plant will be the residential properties (Receptor R3) along Grand Union Walk. Although there are no windows in the south west facing façade of the dwellings, roof top terraces and skylights present noise sensitive receptors. Further noise sensitive dwellings (Receptor R1) are located to the south of the store, along Camden Road.
- 3.3. To be robust, the windows of the church (Receptor R2) located west of the Sainsburys store have been considered as a noise-sensitive receptor.

- 3.4. Additionally, the nearby office widows (Receptor R4) also located to the west of the store have been considered.
- 3.5. **Appendix C** contains an aerial photograph showing the site and surrounding area.

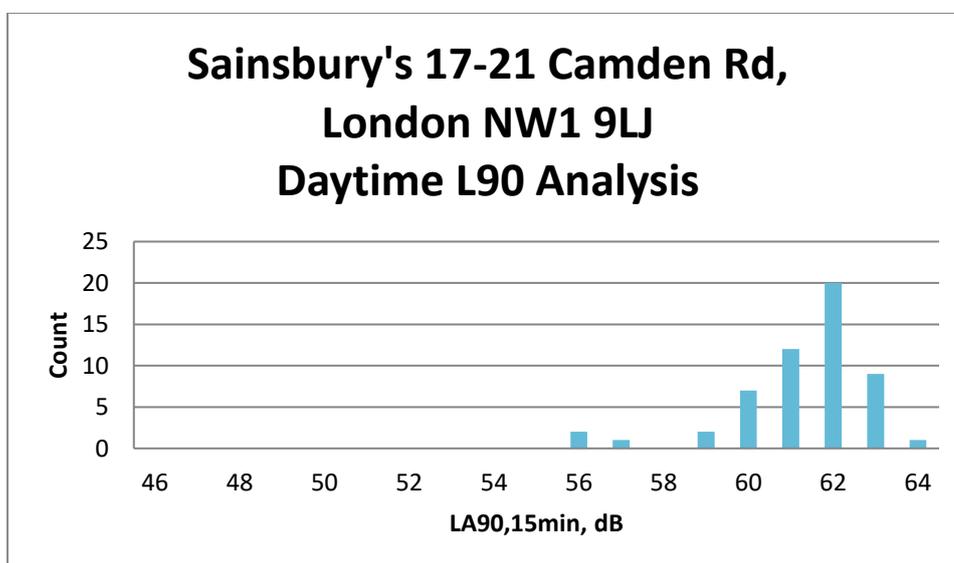
4.0 Existing noise climate

- 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 receptor to the proposed plant area during the quietest times at which the plant will operate.
- 4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in **Appendix E**.

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)	68-80	82-110	71-75	56-64
Night-time (23.00 – 07.00 hours)	65-76	81-104	69-76	46-60

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



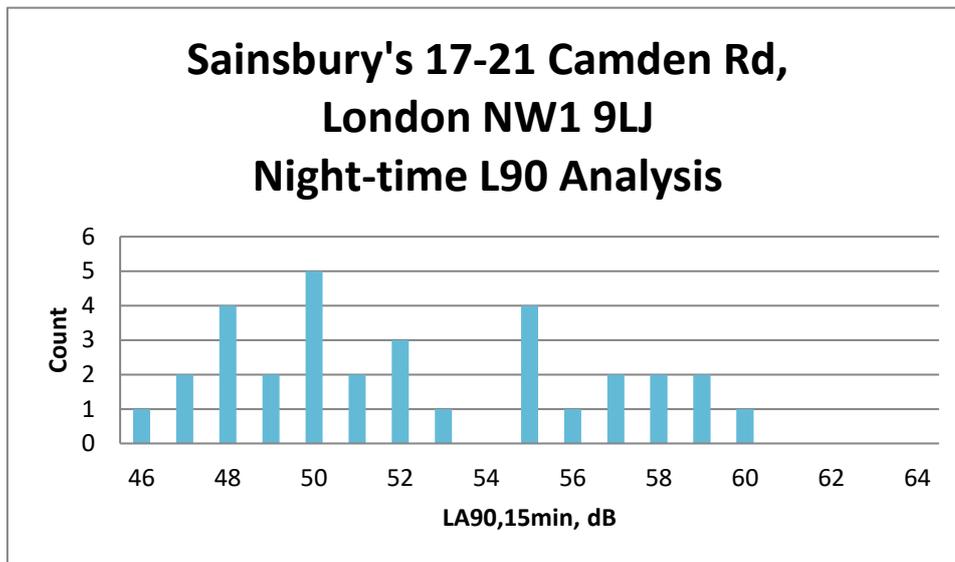
- 4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

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

dB, L_{A90} daytime period	
Mean	61
Median	62
Mode	62

4.4. 56dB L_{A90} is considered as robustly representative of the typical background sound level during the daytime period.

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



4.5. 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 $LA_{90,15min}$ levels during the night-time period

dB, L_{A90} daytime period	
Mean	52
Median	52
Mode	51

4.6. 48dB L_{A90} is considered as robustly representative of the typical background sound level during the night-time period.

4.7. Therefore, the following values are considered as representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 56dB L₉₀ during the daytime period; and
- 48dB L₉₀ 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.*

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

- 5.7. BS 4142:2014 +A1:2019 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014¹ includes "sound from fixed plant installations which comprise mechanical and electrical plant and equipment".
- 5.8. The procedure contained in BS 4142:2014 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

¹ For brevity, references to BS 4142 and BS 4142:2014 should be read as BS 4142:2014 + A1:2019

- 5.9. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 5.10. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*
- 5.11. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*
- 5.12. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
- *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.*
- 5.13. The standard does state that *"adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*
- 5.14. The standard goes on to note that: *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*
- 5.15. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

- 5.16. BS 4142:2014 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.

National Planning Policy Framework

- 5.17. A new edition of NPPF was published in July 2021 and came into effect immediately. The original National Planning Policy Framework (NPPF²) was published in March 2012, with revisions in July 2018 and February 2019 - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The 2021 revised edition contains no new directions or guidance with respect to noise, and hence, all previous references remain extant. The paragraph references quoted below relate to the July 2021 edition.
- 5.18. Paragraph 174 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by (amongst others) *"preventing both 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 stability."*
- 5.19. The NPPF goes on to state in Paragraph 185:
- "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 ...*
- 5.20. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE³).
- 5.21. 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."*
- 5.22. 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*

² National Planning Policy Framework, DCLG, March 2012

³ Noise Policy Statement for England, DEFRA, March 2010

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”.

- 5.23. Paragraph 119 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 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 5.24. This Standard provides recommended guideline values for internal noise levels within various types of building. Recommendations for places of worship are given in Table 6 of the Standard, and a design range of 30-35 dB $L_{Aeq,T}$ is recommended.

- 5.25. In addition, BS 8233 provides general guidance on the expected sound insulation performance of a given building façade, with details of how various elements can affect the overall performance. Concerning windows, it states that:

If partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15dB.

- 5.26. This implies that should windows on a noise affected façade be openable, a sound insulation value of 15dB should be applied to the whole façade to an internal room being assessed. It should be noted that a sound insulation performance of much greater than 15dB is expected for non-openable standard double-glazed windows. However, in order to assess the worst-case scenario, this report assumes that windows may be opened if desired.

- 5.27. Within the church, cumulative plant noise levels at the façade should not exceed 45-50dB L_{Aeq} .

- 5.28. For the nearest commercial receptor (R4 offices), Recommendations for office spaces, where study and work requiring concentration is required, is given in Table 6 of the Standard, and a design range of 35-40 dB $L_{Aeq,T}$ is recommended.

- 5.29. Assuming a sound reduction of 15dB for partially opened windows. It is therefore proposed that cumulative plant noise levels at the nearest office windows should not exceed 50-55dB L_{Aeq} , to give an internal sound below the guidance values in BS 8233:2014.

Proposed criteria

- 5.30. 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.
- 5.31. Furthermore, proposed criterion has been provided for the nearby church and office spaces based on guidance found in BS 8233:2014.
- 5.32. To ensure a robust assessment, all calculations of resultant sound pressure levels are to be undertaken at a distance of 1m from the assessed noise-sensitive windows.
- 5.33. Therefore, the cumulative noise level for the proposed plant should not exceed the limits shown in the table below at 1m from the assessed windows:

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

Receptor	Period	Cumulative plant noise rating level, dB(A)
Residential	Daytime (07.00 – 23.00 hours)	46
	Night-time (23.00 – 07.00 hours)	38
Place of worship (Church)	Daytime (07.00 – 23.00 hours)	45-50
	Night-time (23.00 – 07.00 hours)	n/a
Commercial (office spaces)	Daytime (07.00 – 23.00 hours)	50-55
	Night-time (23.00 – 07.00 hours)	n/a

6.0 Plant noise impact assessment

- 6.1. The cumulative plant noise levels at the most affected noise sensitive receptors have been predicted based on manufacturer's noise data for the proposed equipment. The assessment has taken into consideration distance attenuation, screening and directivity.
- 6.2. It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics providing it is well maintained. All proposed plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems.

- 6.3. Table 5 summarises the results of the assessment at the most affected properties. 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 set of calculations can be found in **Appendix F**.

Table 5 Assessment of predicted rating levels at the nearest noise sensitive receptors

Receptor	Period	Predicted rating level at receptor, L_{Aeq} (dB)	Criterion (dB)	Difference
Receptor 1	Daytime (07.00 - 23.00 hours)	31	46	-15
	Night-time (23.00 - 07.00 hours)	31	38	-7
Receptor 2	Daytime (07.00 - 23.00 hours)	43	45 - 50	-2 - -7
Receptor 3	Daytime (07.00 - 23.00 hours)	35	46	-11
	Night-time (23.00 - 07.00 hours)	35	38	-3
Receptor 4	Daytime (07.00 - 23.00 hours)	51	50 - 55	1 - -4

- 6.4. It should be noted, that at Receptor 4, although the lower limit is exceeded by 1dB, the cumulative plant noise level still comfortably falls within the upper limit. Furthermore, ambient noise levels in the area are around 70dB(A) L_{Aeq} in typical working hours, as such it is likely that windows to the office will be closed and more than 15dB of attenuation will be afforded to the offices. Resultant internal noise levels from the plant are therefore likely to be comfortably below the proposed guidance values..
- 6.5. 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.

Uncertainties

- 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 24m between the plant and the nearest 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 Base Build Services to provide a noise impact assessment for new, replacement plant serving the existing Sainsbury's store located at 17-21 Camden Road, London.
- 7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at a location representative of the noise climate outside the nearest noise sensitive receptors to the plant area.
- 7.3. The cumulative plant noise emission levels for the proposed plant have been predicted at the most affected noise sensitive receptor locations and determined to be in compliance with London Borough of Camden's usual requirements. Therefore, noise from the plant proposals should not be a reason for refusal of planning permission.

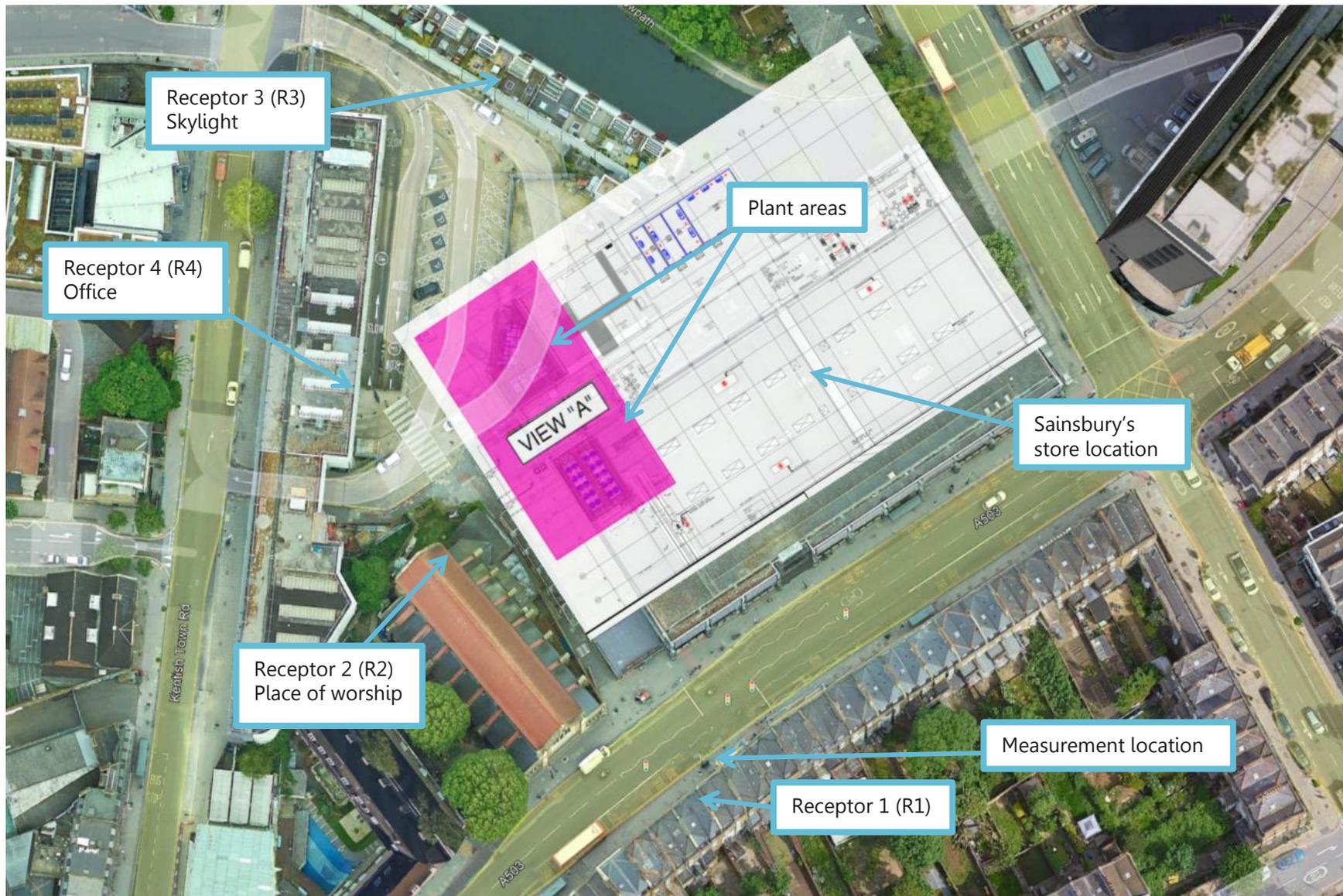
Appendix A Acoustic terminology

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 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 Plant information and manufacturer published sound pressure levels

Plant Reference	Unit/Model	No. of units	L _w dB(A)	dB(A)
Condensing unit	Searle/ PC250G3H-091M-AMHE-10FPI	2	-	35 at 10m
False Load Evaporator	Gunter/ GACV CX 909.1JE/4E-70.A	2	77	-

Appendix C Photograph of site showing areas of interest



Photograph 1 Courtesy of Google Earth 2023

Appendix E Environmental sound survey

Details of environmental sound surveys

- E.1 Measurements of the existing background sound levels were undertaken between 14.00 hours on Monday 23rd January and 11.30 hours on Tuesday 24th January 2023.
- E.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

- E.3 The representative measurement position was located on a lamppost along Camden Road (location indicated on the site plan in [Appendix C](#)). In accordance with BS 7445-2:21991 '*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

- E.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 (+/-0.3 dB) in the calibration level was noted.

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 971 / 111624	23/11/2022	1503962-1
Condenser microphone	ACO Pacific 7052E / 80036		
Preamplifier	Svantek SV 18 / 112639		
Calibrator	Svantek SV 33B / 83850	24/10/2022	1503647-1

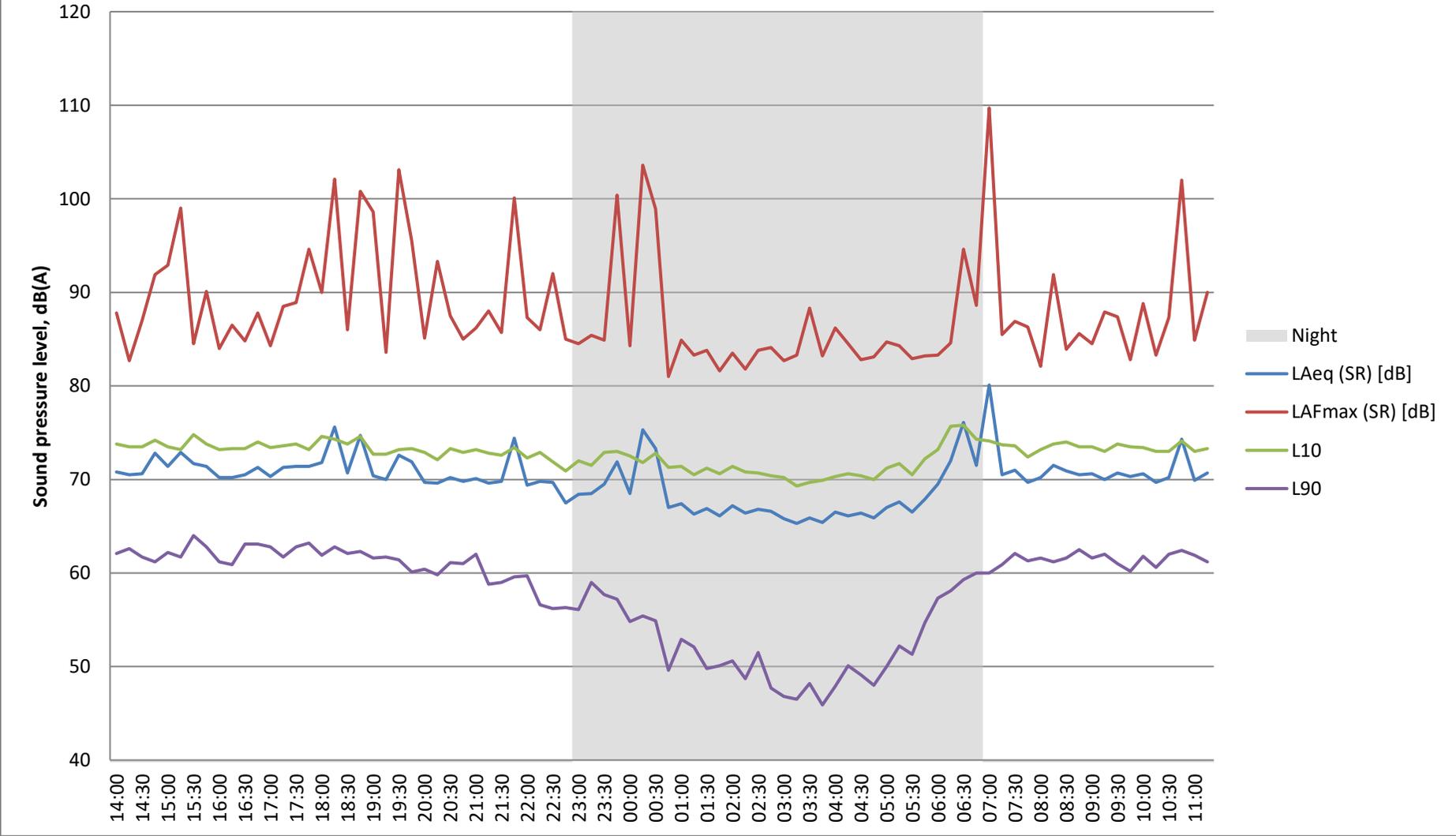
- E.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	Time/Date	Description	Beginning of Survey	End of Survey
As indicated on Appendix C	14.00 23/1/23 - 11.30 24/1/23	Temperature (°C)	4	4
<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)	6	7
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	No
		Wind Speed (m/s)	1	2
		Wind Direction	SW	NE
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	-	-

Results

- E.6 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.
- E.7 The noise climate at the measurement position was dominated by local traffic. Plant noise, speech noise, and noise from the pedestrian crossing were also audible during the installation and/or removal of the sound level meter although to a lesser degree.
- E.8 The results of the survey are presented in a time history graph overleaf.

Sainsbury's 17-21 Camden Rd, London NW1 9LJ Monday 23 - Tuesday 24 Jan 2023



Appendix F Noise level predictions

Receptor R1 (Residential) At any time

Plant	Maximum plant noise level at source		DISTANCE		Directivity (dB)	Screening (dB)	BS 4142:2014 feature correction	Plant rating noise level at receptor (dBA)
	L _p (dBA)	Distance (m)	Distance (m)	Correction (dB)				
Condenser - 1	35	10	50	-14	3	0	0	24
Condenser - 2	35	10	51	-14	3	0	0	24
FLE - 1	77	L _w	73	-45	0	-5	0	27
FLE - 2	77	L _w	78	-46	0	-5	0	26
Cumulative rating level (At any time)								31

Receptor R2 (Place of worship) Daytime

Plant	Maximum plant noise level at source		DISTANCE		Directivity (dB)	Screening (dB)	BS 4142:2014 feature correction	Plant rating noise level at receptor (dBA)
	L _p (dBA)	Distance (m)	Distance (m)	Correction (dB)				
Condenser - 1	35	10	23	-7	0	0	N/A	28
Condenser - 2	35	10	27	-9	0	0	N/A	26
FLE - 1	77	L _w	28	-37	0	0	N/A	40
FLE - 2	77	L _w	31	-38	0	0	N/A	39
Cumulative rating level (Day)								43

Receptor R3 (Residential) At any time

Plant	Maximum plant noise level at source		DISTANCE		Directivity (dB)	Screening (dB)	BS 4142:2014 feature correction	Plant rating noise level at receptor (dBA)
	L _p (dBA)	Distance (m)	Distance (m)	Correction (dB)				
Condenser - 1	35	10	61	-16	0	-5	0	14
Condenser - 2	35	10	60	-16	0	-10	0	9
FLE - 1	77	L _w	50	-42	0	-6	0	29
FLE - 2	77	L _w	41	-40	3	-6	0	34
Cumulative rating level (At any time)								35

Receptor R4 (Commercial) Daytime

Plant	Maximum plant noise level at source		DISTANCE		Directivity (dB)	Screening (dB)	BS 4142:2014 feature correction	Plant rating noise level at receptor (dBA)
	L _p (dBA)	Distance (m)	Distance (m)	Correction (dB)				
Condenser - 1	35	10	36	-11	0	0	N/A	24
Condenser - 2	35	10	43	-13	0	0	N/A	23
FLE - 1	77	L _w	24	-36	6	0	N/A	47
FLE - 2	77	L _w	23	-35	6	0	N/A	48
Cumulative rating level (Day)								51