

ASDA Express Oxford Road Manchester

Environmental Noise Survey and Plant Noise Assessment Report

32026/PNA

24 December 2024

For:
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Document Control

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1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) has been commissioned by TSA Riley to undertake a noise assessment for a site in Manchester.

The site, located on Oxford Road within Circle Square, is proposing to operate as a 24-hour Asda Express store, extending its current approved operational hours of 06:00 to 00:00. The proposed scheme includes the installation and operation of external building services plant, supporting the store's continuous operations.

Hann Tucker has therefore been commissioned to undertake a detailed environmental noise survey at the site to establish baseline noise conditions, as presented herein.

Suitable plant noise emission criteria based on the requirements of the Local Authority and the application of BS 4142: 2014 + A1:2019 have been established, and a plant noise impact assessment undertaken.

2.0 Objectives

To undertake an environmental noise survey to establish the existing L_{Amax} , L_{Aeq} and L_{A90} environmental road, rail and air traffic noise levels at selected accessible positions.

The survey will enable noise emission limits from the development to be identified with reference to the requirements of the Local Authority and/or the application of BS 4142: 2014 + A1:2019 and to minimise the possibility of noise nuisance to neighbours.

To assess the noise emissions from the proposed plant, based upon data with which we are provided, and comment upon the feasibility of 24hr commercial operation.

To advise on noise control measures if required.

3.0 Acoustic Terminology

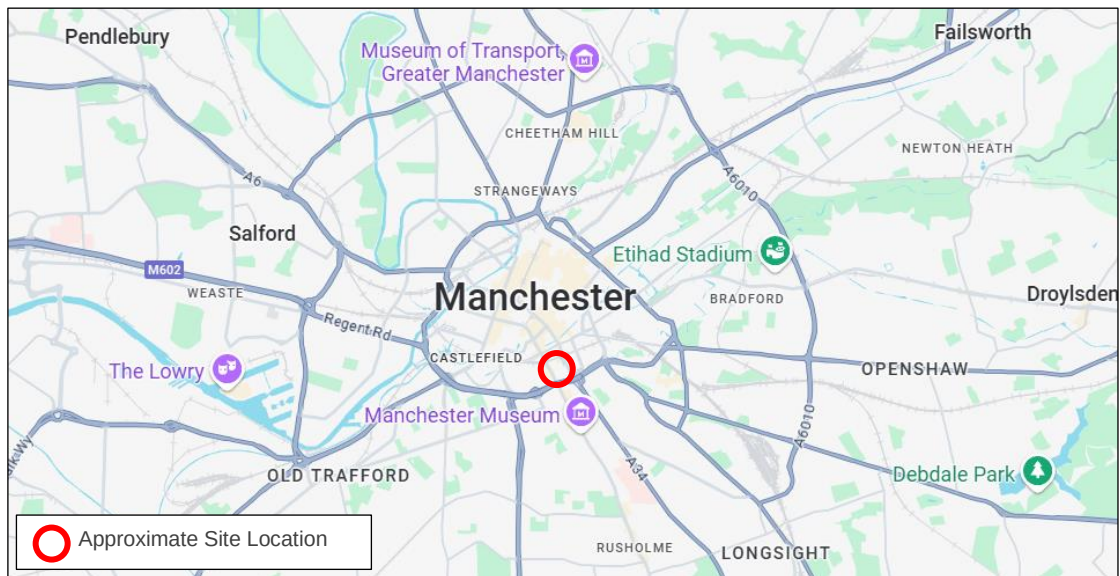
For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.



4.0 Site Description

4.1 Location

The site is located on Oxford Road in Manchester and falls within the jurisdiction of Manchester City Council. The Location Map is shown below.

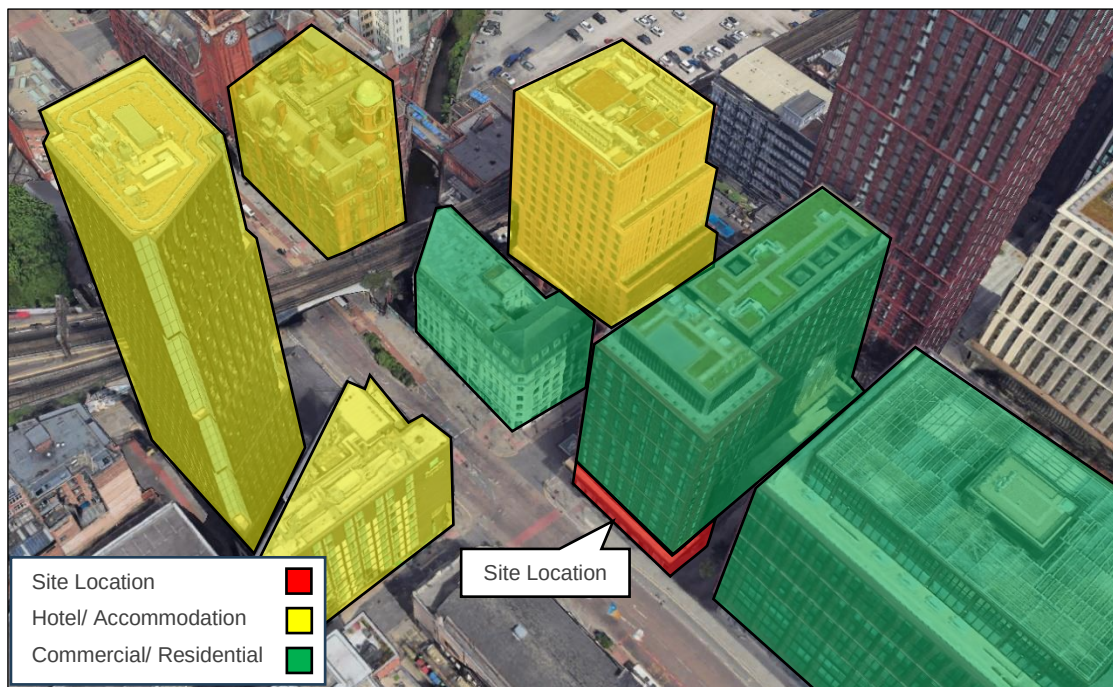


Location Map (Map data ©2024 Google)

4.2 Description

The surrounding area comprises residential apartments, hotels such as the Maldron Hotel and Kimpton Clocktower Hotel, and student accommodations. Other notable buildings in the vicinity include retail outlets, office spaces, and leisure venues such as the YES music venue. The most sensitive noise receptors include residential properties and hotels.

The site is shown in the Site Plan below.



Site Plan (Imagery ©2024 Google, Imagery ©2024 Airbus, Maxar Technologies, Map data ©2024)

5.0 Planning Policies, Standards & Guidance

5.1 Policies & Guides

In order to provide a suitable assessment a number of national planning policies have been considered.

All guidance used to form the plant noise impact assessment are taken from various standards, guidance, and Local Authority requirements as summarised below:

- Manchester City Council Local Planning Policy
- British Standard 4142:2014 + A1:2019
- Statutory Noise Nuisance

Detailed information for relevant planning policies and guidance can be found within Appendix B.

5.2 Specific Local Authority Criteria

The site lies within the jurisdiction of Manchester City Council (MCC). MCCs Planning and Noise Technical Guidance (October 2022) provides guidance the control of new fixed building services plant.



Many of the complaints Environmental Health receive about noise from plant, equipment and machinery specifically concern the character of the noise emitted. Any noise assessment needs to consider not only the overall level of noise emitted, but also its particular characteristics. The noise assessment should be based on BS 4142, and any application for fixed plant, equipment or machinery must demonstrate that:

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location”.

By designing the sound pressure level of any plant items to generate a noise impact of at least 5dB below the existing background level, any plant noise impact should be minimised to a level which should not give rise to complaints from users or occupiers of existing noise-sensitive usages. See Appendix A with regards to the expectation of how to calculate a ‘typical’ background level.”

6.0 Baseline Noise Survey

6.1 Procedure

Fully automated environmental noise monitoring was undertaken by Euan Ellis BA(Hons) from approximately 10:00 hours on Friday 29 November 2024 to 11:00 hours on Tuesday 3 December 2024, to establish existing baseline noise levels. Measurements were taken continuously of the A-weighted (dBA) L_{90} , L_{eq} , and L_{max} sound pressure levels over discrete 15-minute periods.

Additional attended measurements were performed between 10:00 hours and 12:00 hours on Tuesday 3 December 2024 with the purpose of establishing specific noise levels associated with louvres on the existing ASDA store, with the existing plant operating, as well as noise levels in the surrounding area to the store.

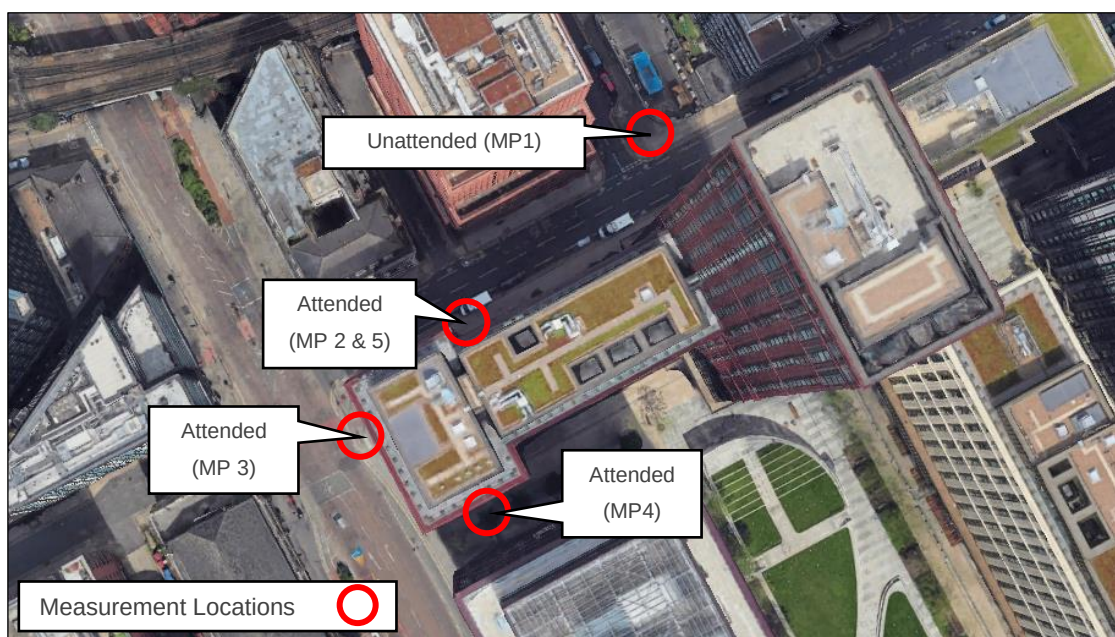


6.2 Measurement Positions

The noise level measurements were undertaken at 5No. positions as described in the table below.

Position	Type	Description
1	Unattended	To the northeast of the site, secured to a lamp post on Charles Street. Approximately 2 meters above ground level and approximately 5 meters from the nearest façade (free filed conditions)
2	Attended	15-minute measurement taken on Charles street stood approximately 2 meters from ASDA louvre vents which are located on the north façade of the site. Microphone held approximately 1.5 meters above ground level and approximately 1.5 meters from the nearest façade (free filed conditions)
3	Attended	15-minute measurement taken from the west of the site on Oxford Road approximately 3 meters from the road. Microphone held approximately 1.5 meters above ground level and approximately 2 meters from the nearest façade (free filed conditions)
4	Attended	15-minute measurement taken from the south of the site on Symphony Park approximately 5 meters from store entrance. Microphone held 1.5 meters above ground level and approximately 4 meters from the nearest façade (free filed conditions)
5	Attended	1 minute measurement taken approximately 1 metre from ASDA extract louvre on north façade of store. Microphone held approximately 1.5 meters above ground level and approximately X meters from the nearest façade (free filed conditions)

The positions are shown on the plan below.



Plan Showing Measurement Positions (Imagery ©2024 Google, Map data ©2024)



6.3 Weather Conditions

For the unattended survey Friday 29 November 2024 and Tuesday 3 December 2024, local weather reports indicated no notable periods of prolonged or heavy rainfall, with temperatures ranging from 7 °C (night) to 15°C (day) and wind speeds less than 1 m/s. During the time the engineer was in attendance on site, skies were largely clear with patchy cloud cover, wind conditions were calm and from a westerly direction and road surfaces were dry.

During the attended survey on Tuesday 3 December 2024, the weather was generally clear and dry with light winds and no periods of rainfall.

6.4 Instrumentation

The instrumentation used during the survey is presented in the table below:

Position	Description	Manufacturer	Type	Serial Number	Calibration
1	Type 1 Data Logging Sound Level Meter	Larson Davis	LxT	4568	Calibration on 30/05/2024
	Pre Amp	PCB	PRML x TL1	36021	
	Type 1 ½" Condenser Microphone	PCB	377B02	154999	
	Type 1 Calibrator	Bruel & Kjaer	4226	3070450	Calibration on 06/03/2024
2,3,4 & 5	Type 1 Data Logging Sound Level Meter	Larson Davis	LxT	4568	Calibration on 30/05/2024
	Pre Amp	PCB	PRML x TL1	070074	
	Type 1 ½" Condenser Microphone	PCB	377B02	247931	
	Type 1 Calibrator	Bruel & Kjaer	4226	3070450	Calibration on 06/03/2024

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant changes were found to have occurred (no more than 0.3 dB).

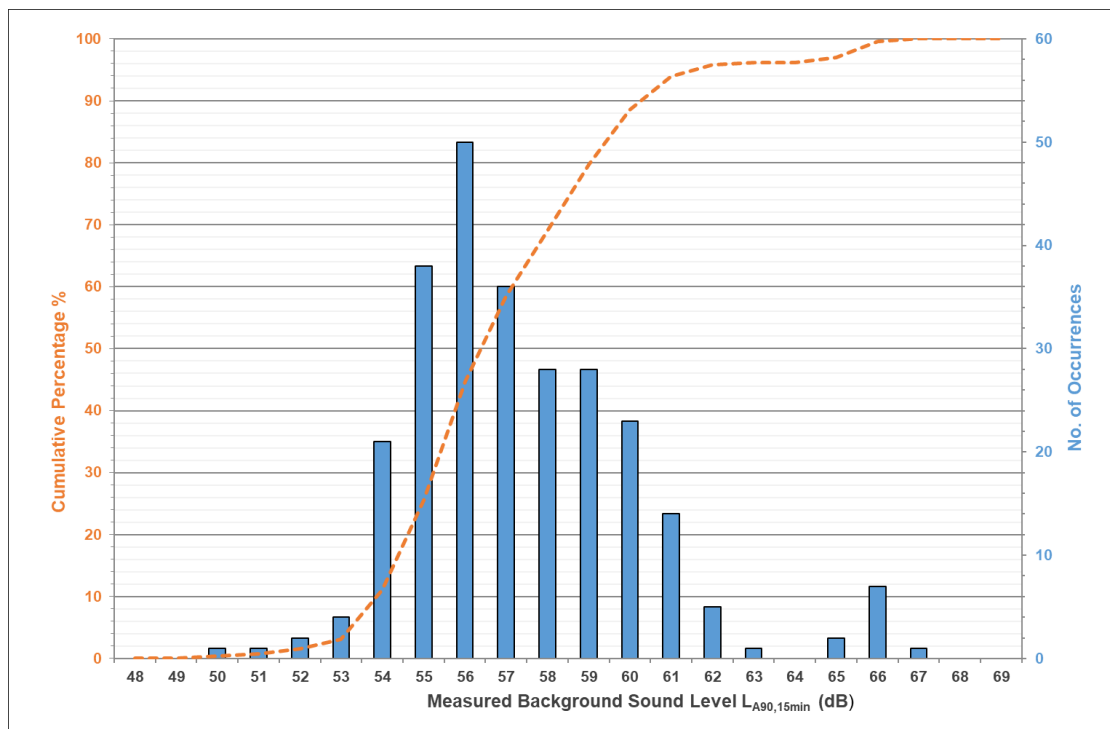
Each sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. Each microphone was fitted with a windshield.



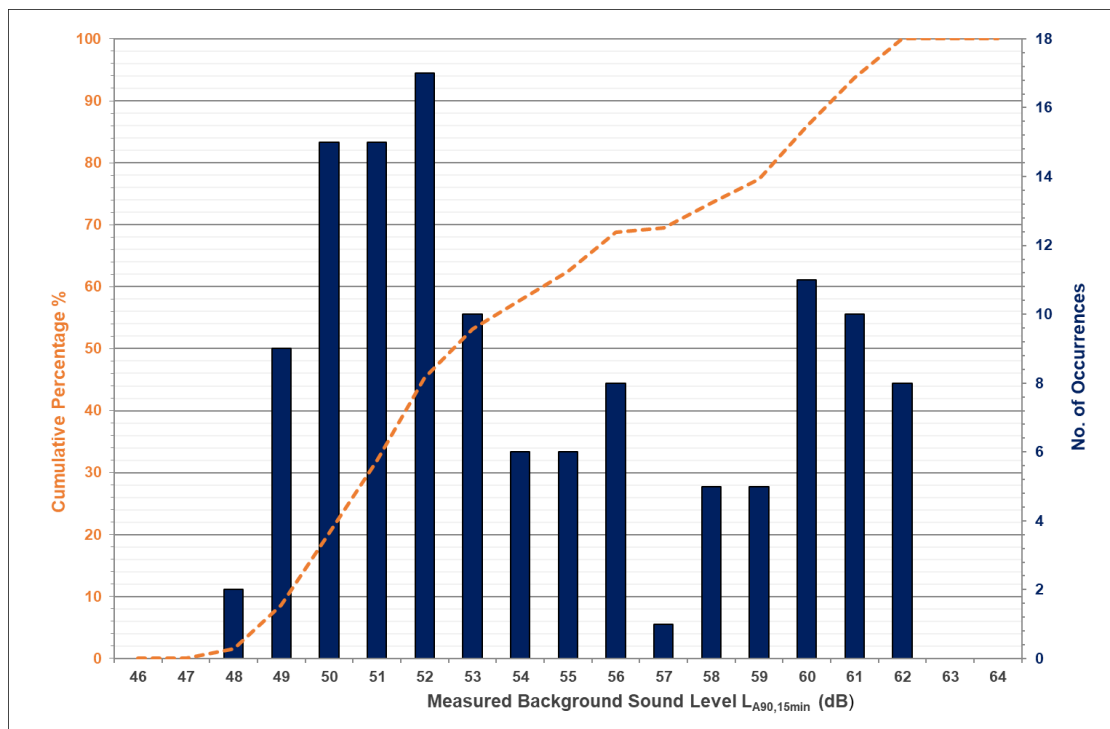
6.5 Results

The results have been plotted on Time History Graph 32026/TH1 enclosed which presents the 15-minute A-weighted (dBA) L_{90} , L_{eq} and L_{max} levels at the single unattended measurement position throughout the duration of the survey.

BS 4142 states that “the background sound level must be reliable and suitably represent the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.” Taking this into account, the following histograms have been created which display the occurrence of each sound level (L_{A90}) for the day and night-time periods.



Measured daytime background noise levels (07:00 – 23:00 hours)



Measured night-time background noise levels (23:00 – 07:00 hours)

Based on the above plots the L_{A90} values presented below are considered to be the 'representative' background sound levels determined through statistical analysis of the 15-minute readings.

Position	Representative Measured $L_{A90(15min)}$ Background Sound Level (dB re 2×10^{-5} Pa)	
	Daytime (07:00 – 23:00) Hours	Night-Time (23:00 – 07:00) Hours
1	54	50

The following table summarises noise levels recorded at each of the attended measurement positions.

Position	Date	Period	Sound Pressure Level, L_{Aeq} (dB)	Engineer Observations
2	03/12/2024	10:15:00 – 10:30:00	65	Road traffic noise dominant, chatter from public walking past, existing plant noise barely perceptible.
3		10:30:28 – 10:45:28	71	Road traffic noise dominant, chatter from public walking past, existing plant noise imperceptible.
4		11:00:00 – 11:15:00	66	
5		11:16:18 – 11:17:20	64	Road traffic noise dominant, chatter from public walking past, existing plant noise audible but quiet.



6.6 Discussion Of Noise Climate

Due to the nature of the survey, i.e. unattended, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic noise.

7.0 Plant Noise Emission Criteria

Building services plant external noise emission levels will need to comply with local planning/environmental authority requirements and statutory noise nuisance legislation.

Based on the results of the noise survey and the requirements of the Local Authority (as outlined in Section 5.2), we propose that the following plant noise emission criteria be achieved incident at the nearest noise sensitive residential windows, in free field conditions with all plant operating simultaneously.

As the ASDA store is proposed to extend its operating hours throughout the full night-time period, it is necessary to assess to night-time emission limits only.

Position	BS 4142 Plant Noise Rating Limit, $L_{A,T,r}$ (dB)
	Night-time (23:00 – 07:00 hours)
1	45

The above criteria are to be achieved with all of the proposed plant operating simultaneously.

Noise shall be assessed in accordance with BS 4142:2014 with corrections applied for any plant emitting noise of a tonal or irregular quality.

It should be noted that the above are subject to the final approval of the Local Authority.

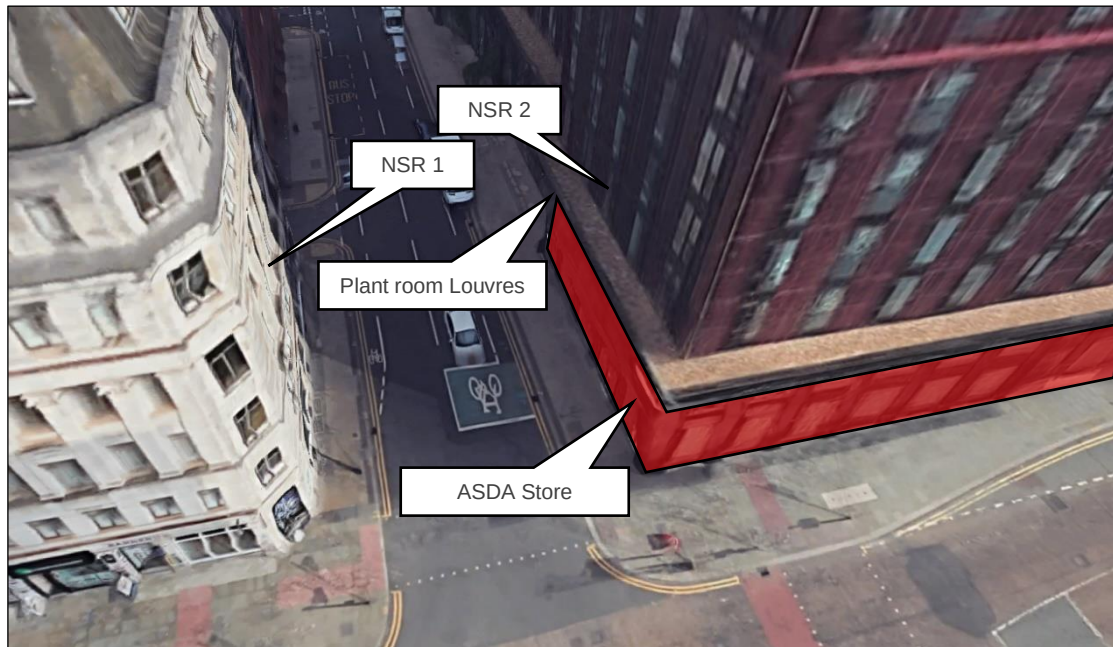
For life safety standby plant, only used in emergencies and occasional testing - e.g. smoke extract fans and life safety generators - relaxations of the internal and external criteria are normally acceptable but should comply with local authority and occupational requirements and must not interfere with internal audible emergency alarms.



8.0 Currently Operational Plant

8.1 Plant Location

The image below shows the location of the louvres on the exterior of the ASDA store.



Plant location (Imagery ©2024 Google, Imagery ©2024 Airbus, Map data ©2024)

8.2 Plant Operation

It is understood that the current plant at the site is operational from 06:00-00:00 hours and is proposed to operate 24 hours per day. As such, the current planning permission already allows for the operation of this plant into the night-time period.

8.3 Plant Noise Data

We understand the manufacturer's noise data for the equipment to be as follows:

Plant Description	Sound Power Level (dB) at 1 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1000	2000	4000	8000	
Daikin/ RYYQ14U	86	81	79	79	73	69	68	67	80



8.3.1 Attended Measurement Noise Data

The following table shows the noise level data for the 1 minute attended measurement taken 1 metre away from the louvres (Position 5).

Plant Description	Sound Pressure Level (dB re 2x10 ⁻⁵ Pa) at 1 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1000	2000	4000	8000	
Daikin/ RYYQ14U	75	66	65	61	58	55	51	43	64

As alluded to in Section 6.5, in this position the HTA engineer noted that even though noise from plant (associated with Asda) was audible, the measured noise level was dominated by road traffic noise..

Due to the prevailing noise climate and the nature of the plant, it has been determined that accurate source noise data was not obtained from the above measurement, and as such, to provide a more accurate assessment the manufacturer's data has been used to assess the noise impact on nearby sensitive receptors.

8.3.2 Installed Attenuation

The following table details the insertion losses for the attenuation that is understood to be installed in the already operating store.

Attenuator	Attenuation (dB) Octave Band Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Plantroom VRV Discharge	3	4	6	14	18	15	13	12

9.0 Plant Noise Impact Assessment

As measured data has been procured by Hann Tucker, and the source measurement was deemed unreliable, an assessment using the manufacturer's data has been undertaken. It should be noted that the previous assessment conducted by NSL demonstrated compliance and has already been granted permission to operate within the night-time hours of 23:00-00:00 hours and 06:00-07:00 hours.



9.1 Manufacturer's Data Assessment

The following tables summarises the predictions of atmospheric noise emissions from the currently operating plant to 1-metre from the nearest identified noise sensitive receptor.

NSR 1	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1000	2000	4000	8000	
Sound Power Level (SWL)	86	81	79	79	73	69	68	67	80
Plantroom Attenuator	-3	-4	-6	-14	-18	-15	-13	-12	-
Distance Correction (15m)	-35	-35	-35	-35	-35	-35	-35	-35	-35
Barrier Correction	-	-	-	-	-	-	-	-	-
BS:4142 Acoustic Feature Correction (Intermittency)	+3	+3	+3	+3	+3	+3	+3	+3	+3
Calculated Rating Noise Level at Receptor	37								
BS 4142 Plant Noise Rating Limit, $L_{A,r,Tr}$ (dB)	45								
Exceedance	-8								

NSR 2	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1000	2000	4000	8000	
Sound Power Level (SWL)	86	81	79	79	73	69	68	67	80
Plantroom Attenuator	-3	-4	-6	-14	-18	-15	-13	-12	-
Distance Correction (1.4m)	-15	-15	-15	-15	-15	-15	-15	-15	-15
Barrier Correction (Exterior ledge floor separation)	-7	-8	-10	-12	-15	-18	-21	-25	-
BS:4142 Acoustic Feature Correction (Intermittency)	+3	+3	+3	+3	+3	+3	+3	+3	+3
Calculated Rating Noise Level at Receptor	44								
BS 4142 Plant Noise Rating Limit, $L_{A,r,Tr}$ (dB)	45								
Exceedance	-1								

The above calculations indicate that the installed plant, in conjunction with the installed attenuation, should be capable of achieving 8 dB below the proposed plant rating limit at NSR 1 and 1 dB below the proposed plant rating limit at NSR 2. This indicates a likelihood of a low-impact and therefore should be acceptable under the requirements of BS:4142.



10.0 Noise Transfer

It is understood that the current floor build-up has not changed since the previous assessment in relation to noise transfer to the above residential living areas.

Section 4.10 and 5.4 of the NSL Sound Insulation Test Report (2023) details that the current separating floor build-up between the commercial and residential areas are sufficient to mitigate noise transfer to meet the requirements of BS 8233:2014. The results of the NSL internal noise survey can be seen in the table below.

Activity	Location	Measured L_{Aeq} , dB	Measured L_{Amax} , dB
Full cage on sales floor	Sales Floor	51	59
	Flat 107 Living Room	< 30	< 39

Within the NSL report, it is stated that noise intrusion “would not cause sound levels within the flat to be in excess of the BS 8233:2014 guidance levels for bedrooms at night.” For clarity, the above “<” symbol indicates that the measurement was limited by the background level within the receiver room. As such the noise impact from the cage on the sales floor is understood to be below 30 dB in Flat 107.

Further to the above, the results of the NSL airborne noise floor test can be seen in the table below.

Source Room	Receiver Room	Measured Sound Insulation	Required Minimum Performance
ASDA Sales Floor	Flat 107 Living Room	59 dB $D_{nT,w} + C_{tr}$	45 dB $D_{nT,w} + C_{tr}$

11.0 Discussion

11.1 Plant Noise Assessment

Hann Tucker attended site with the purpose of capturing the current night-time background noise levels, as well as measuring the source noise levels associated with the currently operating plant. Whilst on site, Hann Tucker observed that the plant was nearly imperceptible, and calculations show that the currently operating plant should achieve the proposed criteria. As such, the site should be suitable for 24-hour operation, subject to approval from MCC.



11.2 Sound Insulation (Noise Transfer)

As demonstrated in Section 10.0, the separating floor is sufficient to meet the internal noise level requirements of BS 8233:2014 during the night-time period. Further to this, the store is already granted permission to operate in night-time hours (from 23:00-00:00 hours and 06:00-07:00 hours), which further demonstrates the plausibility of extending operational hours throughout the night-time period.

As such, noise transfer to residential should not be a reason for refusal for the proposed extended hours of operation; this is subject to the discretion of MCC.

12.0 Conclusions

An environmental noise survey has been undertaken in order to establish the currently prevailing noise levels.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

An assessment has been carried out to determine the predicted plant noise emissions at the nearest identified noise sensitive windows.

Referencing the 2023 Sound Insulation Test Report produced by NSL, noise transfer between the commercial and residential areas has been discussed in context of the extended operational hours.

The assessment indicates that the emissions from the currently installed plant noise and noise transfer through the floor build-up, with reference to the NSL Sound Insulation Test Report, should be capable of achieving the criteria proposed and referenced throughout this report. As such, the site is deemed to be suitable for 24-hour operation, subject to approval from MCC.

Appendix A

The acoustic terms used in this report are defined as follows:

dB	Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).
dBA	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.
L _{90,T}	L ₉₀ is the noise level exceeded for 90% of the period <i>T</i> (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.
L _{eq,T}	L _{eq,T} is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, <i>T</i> .
L _{max}	L _{max} is the maximum sound pressure level recorded over the period stated. L _{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L _{eq} noise level.

Sound Pressure Level (L_p) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

Appendix B

Planning Policies, Standards & Guidance

B.1 BS 4142:2014 + A1:2019

When setting plant noise emission criteria reference is commonly made to BS 4142:2014 *“Methods for rating and assessing industrial and commercial sound”*.

The procedure contained in BS 4142:2014 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 can be added to the specific (source) noise level to obtain the “rating level”.

BS 4142 states that: *“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs”. An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:*

- *“Typically, the greater this difference, the greater the magnitude of the impact.”*
- *“A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.”*
- *“A difference of around +5dB 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.”*

The determination of the “rating level” and the “background level” are both open to interpretation, depending on the context.

B.2 Statutory Noise Nuisance

S79(1)(g) of the Environmental Protection Act 1990 defines a statutory nuisance as “*noise emitted from a premises so as to be prejudicial to health or a nuisance*”. A duty is placed on the Local Authority to serve an abatement notice under S80 if it becomes satisfied that a statutory nuisance exists.

There is however no quantitative definition/objective method in determining statutory noise nuisance, and as such we are not able to definitively advise or determine on such matters. Noise nuisance is subjective and requires multiple factors to be considered, including but not limited to:

- Straining to hear something is *generally* considered not a nuisance, however,
- Noise level (of source and relative to background), timing, duration, type of noise, frequency, location, continuous or repetitive, all factor into judging nuisance.

To mitigate against, though not remove entirely, the risk of a statutory noise nuisance, a noise assessment should be undertaken by a Suitably Qualified Acoustician. Adoption of appropriate and relevant industry standards/guides can provide a structured framework for such assessments, improving the credibility of mitigation efforts. It is also important to also recognise that ongoing management (both active and passive) may also be necessary depending on the context of the situation.

Appendix C

Time History Graph

Oxford Road

Position 1

L_{eq} , L_{max} and L_{90} Noise Levels

Friday 29 November 2024 to Tuesday 3 December 2024

- LAmax
- LAeq
- LA90

