

20 Sollershott West
Letchworth Garden City
SG6 3PX

**Plant Noise
Impact Assessment**

On behalf of



Project Reference: 93479 | Revision: 01 | Date: 18th August 2025
Revised Date: 22nd August 2025

T: 01252 519881
W: noisesolutions.co.uk
E: hello@noisesolutions.co.uk

Noise Solutions Ltd, Alton, Hampshire (Head office); Knutsford, Manchester. Reg no. 3483481



Document Information

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	Name	Qualifications	Initials	Date
Prepared by:	Zach Jensen	MPhys (Hons)	ZJ	18 th August 2025
Reviewed and approved by:	Nigel Chandler	BSc(Hons), MIOA	NAC	19 th August 2025
For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved
01	22 nd Aug 2025	Change in operating times	ZJ	DMB

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Reg no. 3483481 Head office: Unit 5 Oriel Court, Omega Park, Alton, Hampshire, GU34 2YT
 Manchester office: 17 King Street, Knutsford, WA16 6DW

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1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned to undertake a noise impact assessment for new plant serving a residential property at 20 Sollershott West, Letchworth Garden City.
- 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 plant will be located outside an outbuilding in a renovation of an existing property at 20 Sollershott West, Letchworth Garden City. The site location is shown in [Appendix B](#).
- 2.2. New plant will be installed by northern façade of the outbuilding and is to comprise a 1No. air conditioning unit (ACU). The ACU is to be fitted within an acoustic enclosure.
- 2.3. The plant may operate at all times and may run at reduced duty at night when cooling demands are lower.
- 2.4. Manufacturer noise data for the equipment is given in [Appendix D](#). The proposed plant layout is shown in [Appendix F](#).

3.0 Nearest noise sensitive receptors

- 3.1. The area surrounding the site is mainly residential in nature. The closest residential dwellings will be the residence along High Avenue (Reference R1) approximately 19m from the proposed plant.
- 3.2. [Appendix B](#) contains an aerial photograph showing the site and surrounding area, including the location of the receptors identified above.

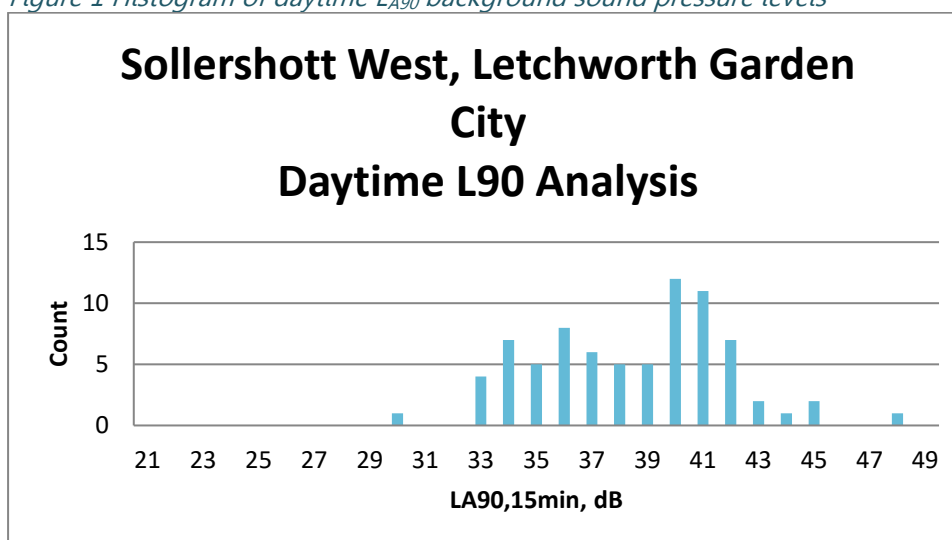
4.0 Existing noise climate

- 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 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. 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)	37-67	46-81	39-72	30-48
Night-time (23.00 – 07.00 hours)	26-45	35-66	28-47	22-34

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



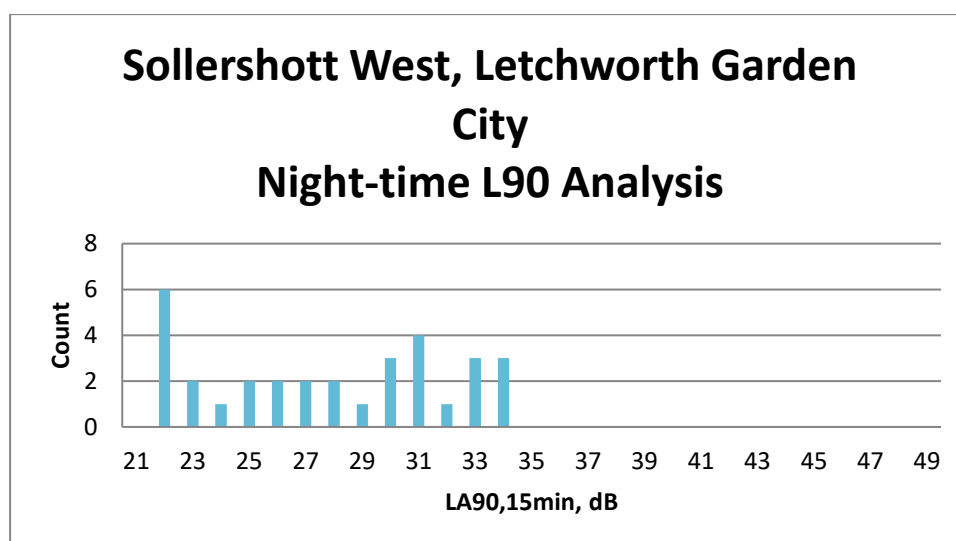
- 4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

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

dB, L _{A90} daytime period	
Mean	38
Mode	40
Median	39

- 4.4. From the histogram analysis, 34dB has been selected to be a robust representation of the background noise level during the daytime period.

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



- 4.5. Further statistical analysis has been carried out on the data and the mean and median values are shown in Table 3 below.

Table 3 Statistical analysis of $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} night-time period	
mean	28
modal	22
median	28

- 4.6. From the histogram analysis, 22dB has been selected to be a robust representation of the background noise level during the daytime period.
- 4.7. Therefore, the following values are considered to be the lowest existing background sound pressure levels at nearby noise sensitive premises:
- 34dB L_{A90} during the daytime period; and
 - 22dB L_{A90} during the night-time period.

5.0 Plant noise design criteria

North Hertfordshire District Council

- 5.1. North Hertfordshire District Council has conditioned the following criteria in previous planning applications:

"Prior to the commencement of the development the developer shall carry out a noise survey following the guidelines set out by BS4142: 2014. This survey shall take into account all proposed plant as part of the development and shall include noise control measures which should be submitted for written approval by the Local Planning Authority (LPA). No plant shall be installed and operated at the site until the noise survey has been approved by the LPA. Noise mitigation measures shall be such as to achieve 5dB below existing background noise levels.

Reason: to protect the residential amenities of existing residents."

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

- 5.2. 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 4142:2014 includes "sound from fixed plant installations which comprise mechanical and electrical plant and equipment".
- 5.3. The procedure contained in BS 4142:2014+A1:2019 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.
- 5.4. 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.
- 5.5. 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."
- 5.6. 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."
- 5.7. 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.*
- 5.8. 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.”
- 5.9. 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.”
- 5.10. 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.”*
- 5.11. 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

- 5.12. In accordance with the methodology presented in BS 4142:2014 and the usual guidelines North Hertfordshire District Council, it is proposed that the rating level of the plant should be 5dB below the existing background noise level at the nearest receptor.
- 5.13. In view of the low background sound levels, and as described in BS 4142:2014, it is proposed that noise from the new plant is limited to a rating level of 30 dB(A) outside the nearest residential windows. This would typically result in an internal noise level of around 15dB(A) with windows open, a level below that produced by refrigerators and similar items within the nearest houses.

- 5.14. Therefore, it is recommended that the plant noise does not exceed the levels shown in Table 4 below.

Table 4 Plant noise emissions limits at the nearest noise sensitive receptor

Period	Cumulative plant noise rating level, (dB L _{Ar,Tr})
Daytime (07.00 – 23.00 hours)	30
Night-time (23.00 – 07.00 hours)	30

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

6.0 Plant noise impact assessment

- 6.1. The cumulative plant sound level at the most affected noise sensitive receptors has been predicted. The assessment has taken into consideration distance attenuation, directivity corrections, and an acoustic enclosure.
- 6.1. It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided 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. However, a penalty of 3dB as described in BS 4142:2014 has been applied for the possible presence of "...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...".
- 6.2. Table 5 summarises the predicted noise levels at the nearest receptors. Full calculations are given in [Appendix E](#).

Table 5 Predicted plant noise levels at receptor

Receptor	Period	Predicted rating level at receptor, L _{Aeq}	Criterion, dBA	Excess, dB
R1	Daytime (07.00 – 23.00 hours)	27	30	-3
	Night-time (23.00 – 07.00 hours)	27	30	-3

Context and uncertainties

- 6.3. 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 windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.
- The noise level predictions are based on the proposed equipment running at maximum duty. The plant will not run in this manner at all times (for example, when demands for heating/cooling are lower) and, therefore, this is a robust assessment.
- The proposed refrigeration plant is replacing similar equipment in the same location.

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.

7.0 Summary

- 7.1. Noise Solutions Ltd (NSL) has been commissioned to undertake a noise impact assessment for new plant serving a residential property at 20 Sollershott West, Letchworth Garden City.
- 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 rating levels for the proposed plant have been predicted at the most affected noise sensitive receptor locations. The predicted levels have been assessed taking into consideration the typical requirements of North Hertfordshire District Council and found to be in compliance, inclusive of all proposed mitigation. 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 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 12.15 hours on Thursday 7th August and 15.30 hours on Friday 8th August 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 within the garden of 20 Sollershott West. 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 971A / 124660	23/05/2025	1512162-1
Condenser microphone	ACO Pacific 7052E / 81197		
Preamplifier	Svantek SV18A / 130661		
Calibrator	Svantek SV33B / 125546	23/05/2025	1512162-2

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 generally 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.

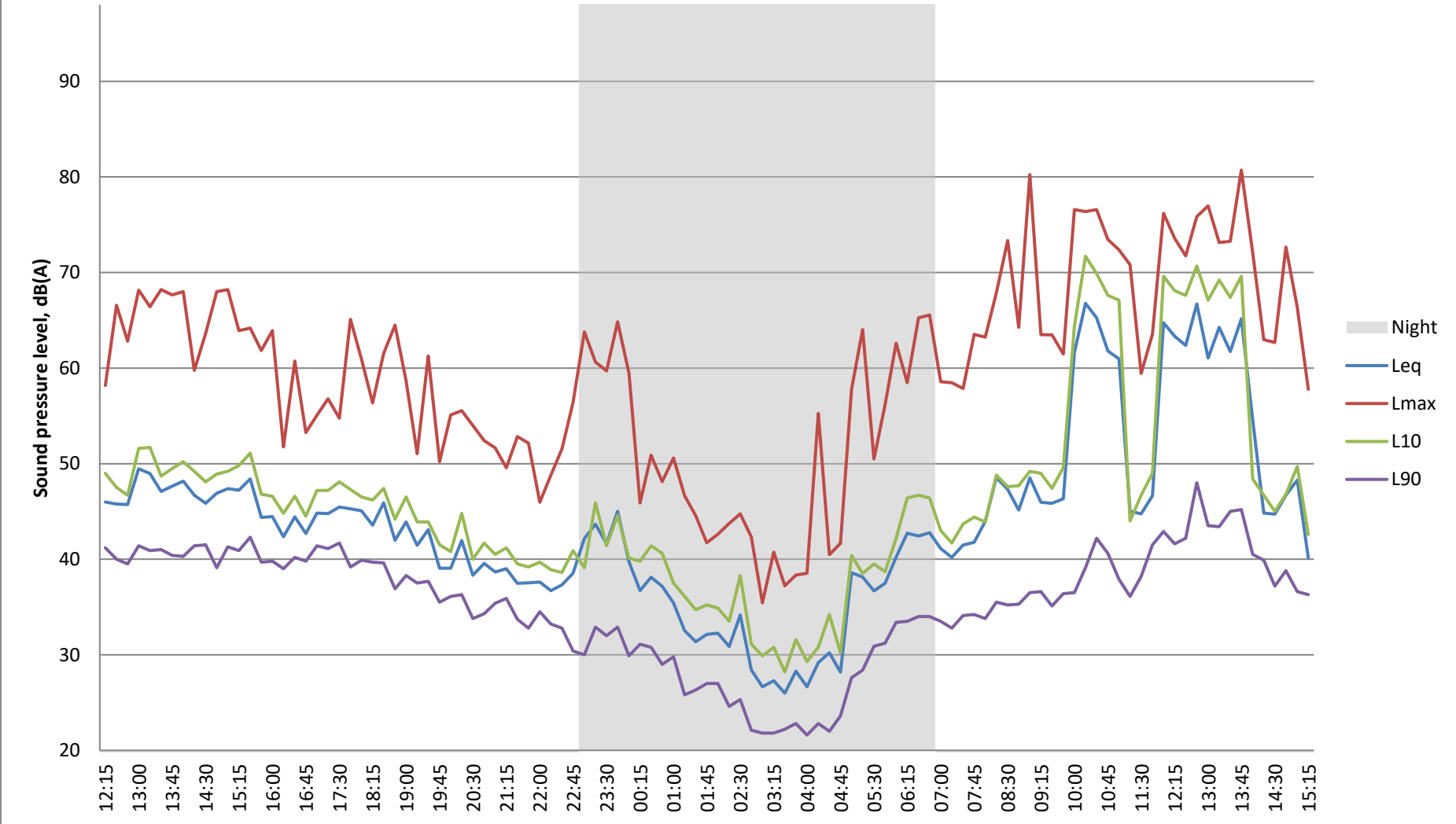
Weather Conditions				
Measurement Location	Time/Date	Description	Beginning of Survey	End of Survey
As indicated on Appendix B	12.15 7 Aug - 15.30 8 Aug 2025	Temperature (°C)	21	24
Cloud Cover Symbol Scale in oktas (eighths)  0 Sky completely clear  1  2  3  4 Sky half cloudy  5  6  7  8 Sky completely cloudy  (9) Sky obstructed from view		Precipitation:	No	No
		Cloud cover (oktas – see guide)	7	1
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	No
		Wind Speed (m/s)	1	2
		Wind Direction	W	DW
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

- C.7 The results of the environmental survey are considered to be representative of the background sound pressure levels at the façades of the nearest noise sensitive receptors during the quietest times at which the plant will operate. Upon the setup and collection of the noise level meter, the noise climate was dominated by distant road traffic, with occasional noise from local road traffic, aircraft, pedestrians, and birdsong.
- C.8 The results of the survey are presented in a time history graph overleaf.

Sollershott West, Letchworth Garden City

Thursday 07 - Friday 08 Aug 2025



Appendix D Manufacturer's Noise Data

Plant	Make / Model	No. of units	Description	Level (dBA)
ACU	Fujitsu / AOEG36KBTB	1	Sound power level	70

Appendix E Sound level predictions

Receptor R1 – Day- and night-time

Plant	PLANT NOISE LEVEL AT SOURCE		DISTANCE		Directivity	Attenuation	BS4142 FEATURE	Rating Level at Receptor (dB)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
ACU	70	L _w	19	-34	3	-15*	3	27
Combined rating level at receptor								27

* *acoustic enclosure*

Appendix F

Proposed plant layout



Ocean Design Studio Architects Ltd
 Ocean Design Studio Architects Ltd is a limited liability company registered in England and Wales, incorporated on 14/05/2014. The company is a private company limited by guarantee. The company is a member of the Architects' Regulation Board (ARB) and is a member of the Royal Institute of British Architects (RIBA). The company is a member of the Architects' Regulation Board (ARB) and is a member of the Royal Institute of British Architects (RIBA). The company is a member of the Architects' Regulation Board (ARB) and is a member of the Royal Institute of British Architects (RIBA).

Company Details
 Company Name: Ocean Design Studio Architects Ltd
 Company Number: 11111111
 Company Type: Private company limited by guarantee
 Company Status: Active
 Company Address: 123 High Street, London, EC1A 1AA
 Company Email: info@ocean-design-studio.co.uk
 Company Phone: 020 1234 5678

Project Details
 Project Name: New Office Building
 Project Address: 123 High Street, London, EC1A 1AA
 Project Type: Commercial
 Project Status: Active
 Project Start Date: 01/01/2020
 Project End Date: 31/12/2020

Client Details
 Client Name: ABC Corporation
 Client Address: 123 High Street, London, EC1A 1AA
 Client Email: info@abc-corp.co.uk
 Client Phone: 020 1234 5678

Design Team
 Design Team Name: Ocean Design Studio Architects Ltd
 Design Team Address: 123 High Street, London, EC1A 1AA
 Design Team Email: info@ocean-design-studio.co.uk
 Design Team Phone: 020 1234 5678

Project Description
 The project is a new office building for ABC Corporation, located at 123 High Street, London, EC1A 1AA. The building is a three-story structure with a total floor area of 10,000 sqm. The building is designed to be a modern, sustainable office space that meets the needs of ABC Corporation. The building is designed to be a modern, sustainable office space that meets the needs of ABC Corporation. The building is designed to be a modern, sustainable office space that meets the needs of ABC Corporation.

Design Services
 Design Services Provided: Architectural design, structural design, MEP design, interior design, landscape design, project management, construction management, etc.

Design Fees
 Design Fees: £100,000 (plus VAT)

Design Schedule
 Design Schedule: 12 weeks

Design Deliverables
 Design Deliverables: Architectural drawings, structural drawings, MEP drawings, interior design drawings, landscape design drawings, project management reports, construction management reports, etc.

Design Contact
 Design Contact: Mr. John Smith, Director of Design, Ocean Design Studio Architects Ltd, 123 High Street, London, EC1A 1AA, Email: john.smith@ocean-design-studio.co.uk, Phone: 020 1234 5678

Design Approval
 Design Approval: The design has been approved by the Architects' Regulation Board (ARB) and the Royal Institute of British Architects (RIBA).

Design Signature
 Design Signature: Mr. John Smith, Director of Design, Ocean Design Studio Architects Ltd, 123 High Street, London, EC1A 1AA, Email: john.smith@ocean-design-studio.co.uk, Phone: 020 1234 5678

Design Stamp
 Design Stamp: The design has been approved by the Architects' Regulation Board (ARB) and the Royal Institute of British Architects (RIBA).

Design Notes
 Design Notes: The design is a preliminary design and is subject to change. The design is a preliminary design and is subject to change. The design is a preliminary design and is subject to change.