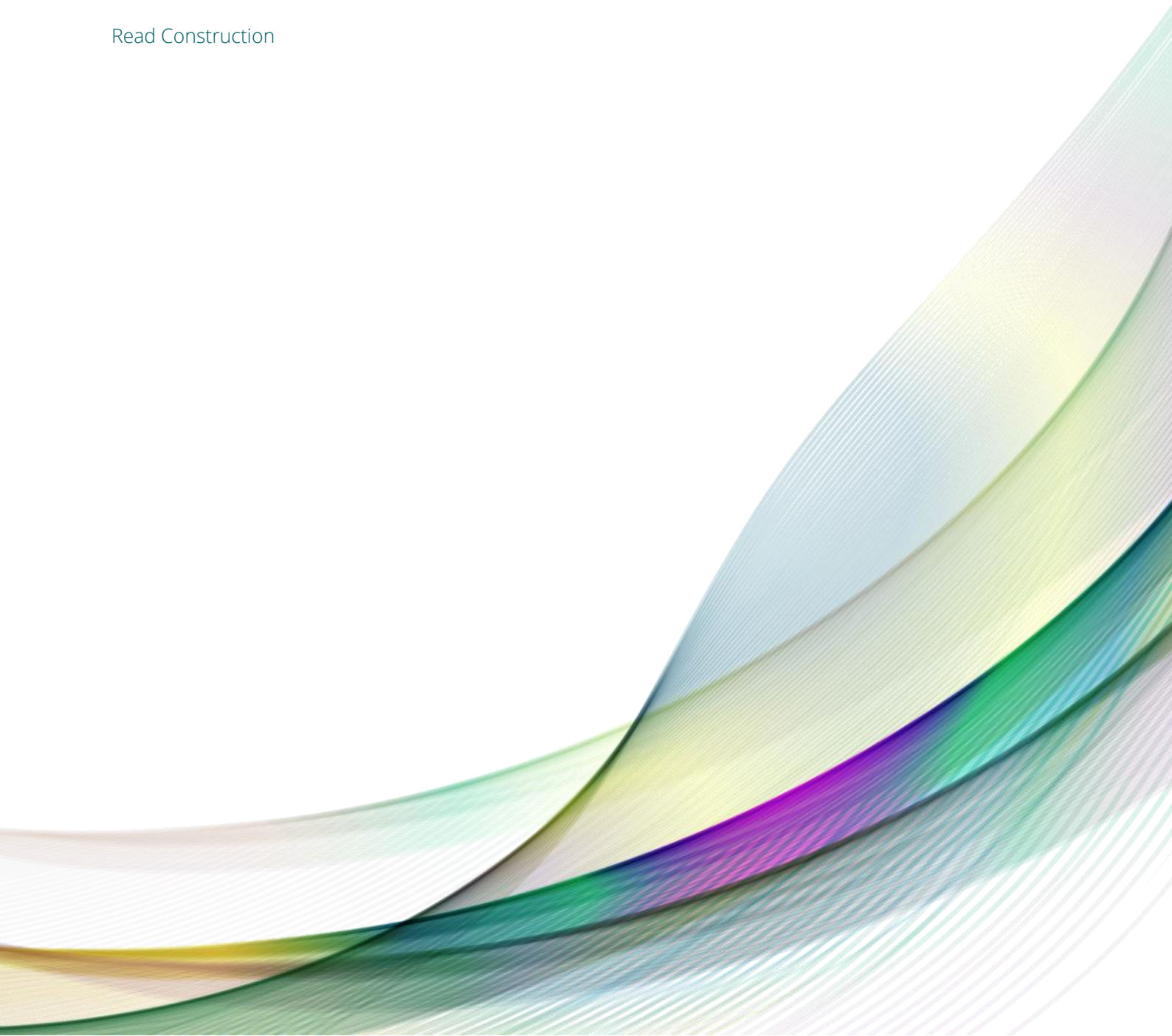
MACH GROUP

THINKING DIFFERENTLY

YSGOL I D HOOSON

Plant Noise Impact Assessment

Read Construction



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1.0 INTRODUCTION

MACH has been appointed by Read Construction to undertake a noise impact assessment at the proposed site of Ysgol I D Hooson in Rhosllanerchrugog, Wrexham.

The development is a new build extension to the existing school building which includes 8 new classrooms. This impact assessment undertaken is required to assist with the following:

- Determine appropriate background noise levels representative of nearby noise sensitive receivers appropriate for a BS4142:2014 plant noise impact assessment.
- Assess the noise impact of the proposed mechanical plant equipment at the nearby noise sensitive receivers.

Details of the noise survey which facilitated this assessment is presented within APPENDIX A.

2.0 SITE DESCRIPTION

The proposed development is located on Heol Caradoc. The surrounding buildings include residential dwellings to the north, south, and east. The site in relation to its surroundings and nearby noise sensitive receivers is presented in Figure 2.1

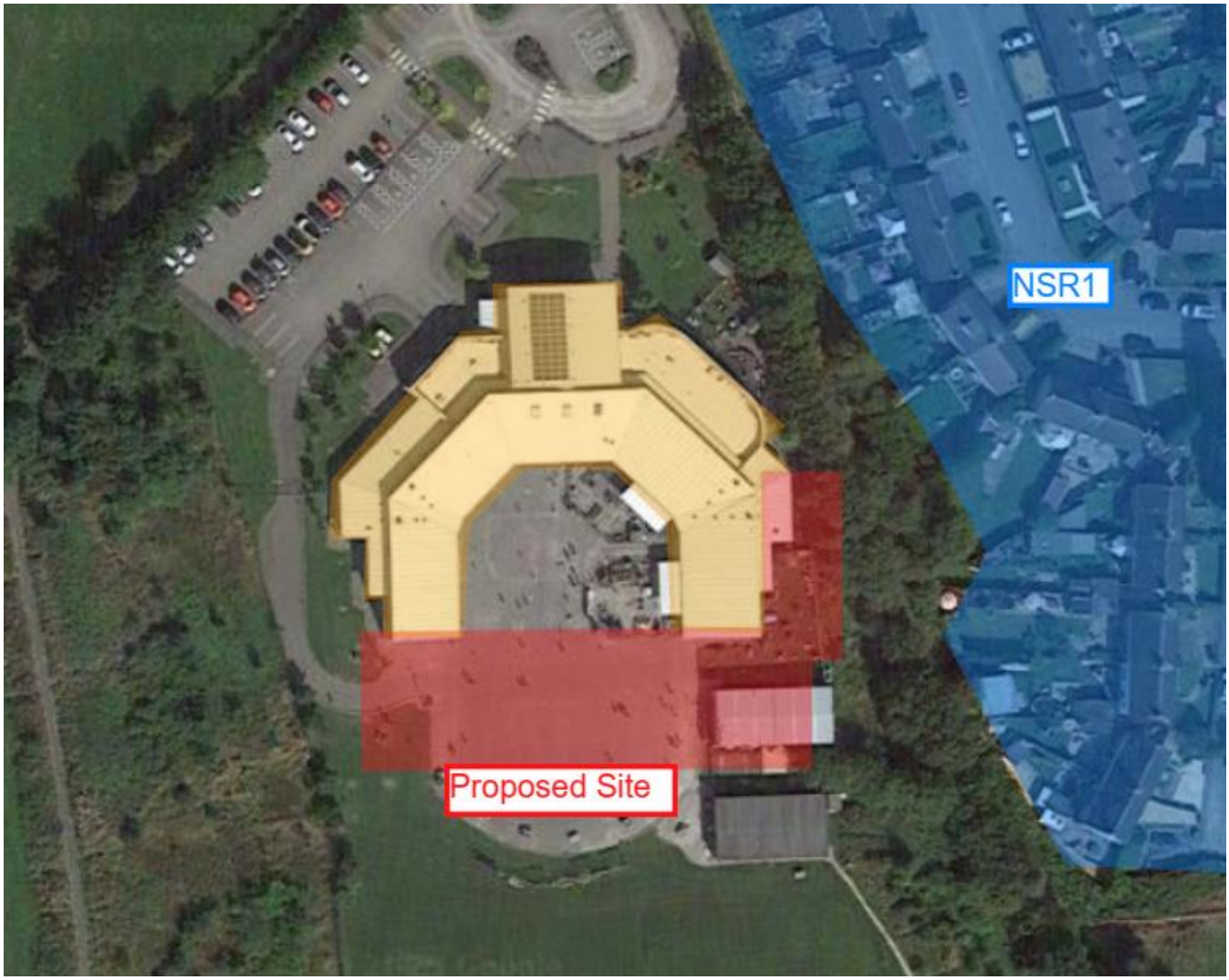


Figure 2.1 - Proposed Development (Red), Existing school site (Orange) and Nearest Noise Sensitive Receivers (Blue)

2.1 Noise Sensitive Receivers

Locations that are noise sensitive receivers (NSR), which will be assessed within this exercise are listed below.

NSR Reference	Location	Type	Distance from Plant Installation (m)
NSR 1	Glanrafon	Residential window	100

Table 2.1: Worst-affected noise sensitive receivers

3.0 PLANNING POLICY WALES

Planning Policy Wales (PPW) Edition 10 introduced in December 2018 has the primary objective of ensuring that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation. PPW is supplemented with a number of Technical Advice Notes (TAN), where TAN 11 covers noise.

3.1 Technical Advice Note (TAN) 11 : Noise

TAN 11 has a dedicated section to noise from industrial and commercial developments, establishing the following:

> *"B17. The likelihood of complaints about noise from industrial development can be assessed, where the Standard is appropriate, using guidance in BS 4142: 1990. Tonal or impulsive characteristics of the noise are likely to increase the scope for complaints and this is taken into account by the "rating level" defined in BS 4142. This "rating level" should be used when stipulating the level of noise that can be permitted. The likelihood of complaints is indicated by the difference between the noise from the new development (expressed in terms of the rating level) and the existing background noise. The Standard states that, 'A difference of around 10 dB or higher indicates that complaints are likely. A difference of around 5 dB is of marginal significance'. Since background noise levels vary throughout a 24 hour period it will usually be necessary to assess the acceptability of noise levels for separate periods (e.g. day and night) chosen to suit the hours of operation of the proposed development. Similar considerations apply to developments that will emit significant noise at the weekend as well as during the week. In addition, general guidance on acceptable noise levels within buildings can be found in BS 8233: 1987."*

Based on the above, the following subsections outline how noise break out from the development will be assessed.

TAN 11 makes reference to the standard BS4142 for assessing noise impact from industrial and commercial developments. To enhance the robustness of the assessment, MACH has also considered the guidance provided within the National Planning Policy Guidance – Noise for England as this has been used previously in similar assessments and is regarded as a robust assessment methodology.

4.0 ASSESSMENT CRITERIA

4.1 BS4142 and Lowest Observed Adverse Effect Level (LOAEL) & Significant Observed Adverse Effect Level (SOAEL)

A summary of the BS4142:2014 assessment method is included in APPENDIX D. Within it, it describes the likely level of adverse impact in relation to the comparative difference between the background noise level and the noise rating level predicted at the receiver. These relate to the descriptions within assessment method described in PPG – Noise, presented in Table 7.5 (APPENDIX C) and therefore the following values can be applied to LOEAL & SOAEL;

Difference	BS4141 Description	PPG – Noise
+10 dB	Significant Adverse Impact	SOAEL
0 dB	Does not exceed background is an indication of low impact	LOAEL

Table 4.1: BS4142:2014 and LOAEL & SOAEL

4.2 Design Criteria

Based on the latter, the design criterion has been set to be equal to the existing background noise levels to avoid an adverse effect on the nearest receivers.

4.3 Summary of Criteria

In summary of the criteria requirements above, if the targeted rating level from noise is equal to the existing background noise, then the design criteria will be achieved.

5.0 EXISTING BACKGROUND NOISE LEVELS

To establish the existing background noise levels on site, a noise survey was conducted between 12:05 on the 04/02/2025 and 12:05 on the 07/02/2025 by Aaron Andrews and in accordance with BS 7445-1: 2003.

More information on the methodology of this survey, site information and survey data, is presented in APPENDIX A.

When considering the existing background levels of a site, BS 4142:2014, "Methods for Rating and Assessing Industrial and Commercial Sound" states that the background sound level used for the assessment should be representative of the period being assessed.

BS4142:2014 goes on to state:

"To obtain a representative background sound level a series of either sequential or disaggregated measurements ought to be carried out for the period(s) of interest, possibly on more than one occasion. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

The table below presents measured noise levels of the $L_{A90,T}$ values measured on site. For the purpose of this assessment, the modal $L_{A90,5minute}$ was considered representative of the existing background noise level on site, in line with the requirements of the Local Authority.

Measurement Position	$L_{A90,T}$ Method	Background Noise Level $L_{A90,T}$	
		Daytime (07:00 – 23:00)	Night Time (23:00 – 07:00)
Fixed Measurement (F1)	Mode	34	28

Table 5.1: $L_{A90,T}$ background noise levels for plant noise break-out assessment

6.0 PLANT NOISE IMPACT ASSESSMENT

Our assessment has been based on the following information.

6.1 Noise Sensitive Receivers

The noise impact generated by the new plant installation has been assessed at the worst-affected NSR's which are described in Section 2.1 of this report.

6.2 Items of Noise Generating Plant

Information on the proposed plant installations have been provided by Saba Consult sM&E engineers. The items of plant within each group, along with their locations and operational hours are as follows:

Reference	Type of Source	Manufacturer/ model	Location	Operational Hours
AWHP-01	Air to Water Reversible Heat Pump/ Case Breakout	Daikin/ EWYE060CZP-A2	External plant compound (external)	24-hours[1]
AWHP-02	Air to Water Reversible Heat Pump/ Case Breakout	Daikin/ EWYT064CZPBA2	External plant compound (external)	24-hours[1]
AWHP-03	Air to Water Reversible Heat Pump/ Case Breakout	Daikin/ EWYT090CZPBA2	External plant compound (external)	24-hours[1]
1: For the purpose of this assessment in order to provide a robust evaluation, it is assumed that the AWHP units will operate for 24 hours as a worst case scenario				

Table 6.1: Proposed items of noise generating plant

The following site plan shows the proposed plant installation.

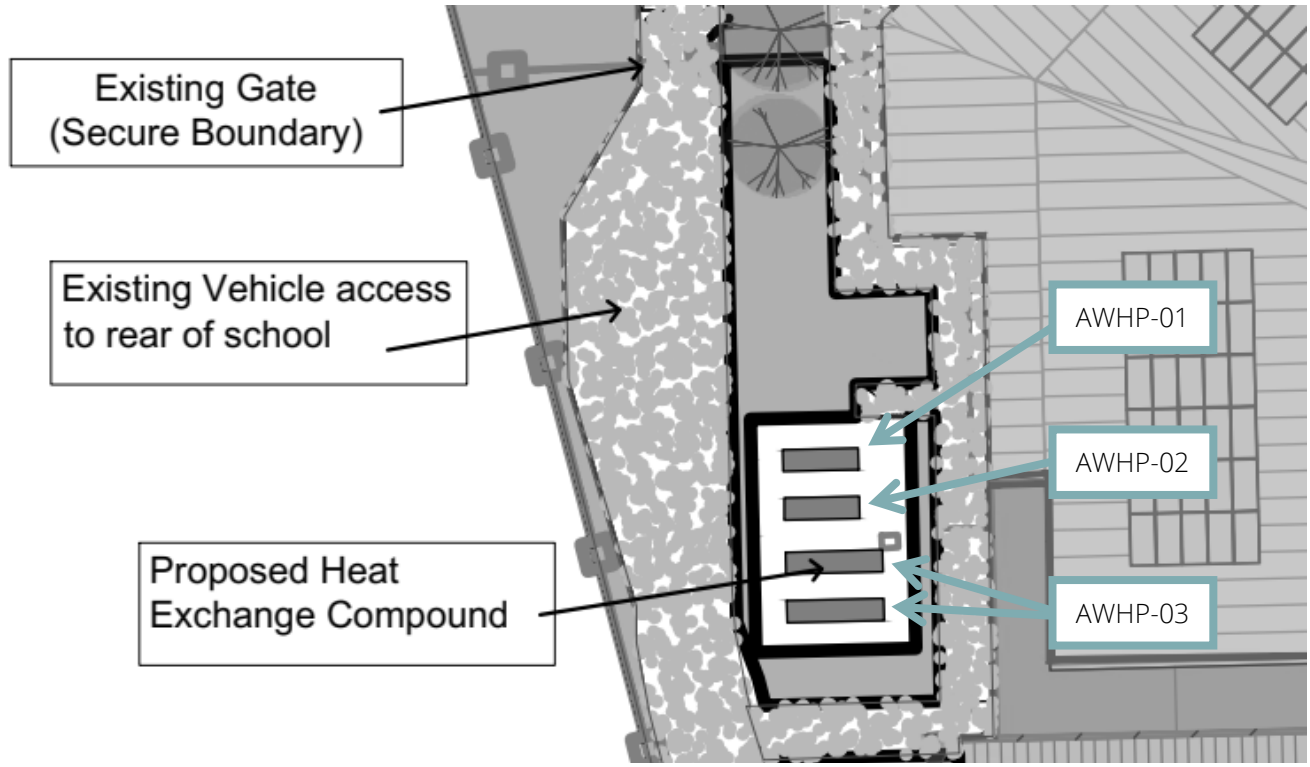


Figure 6.1: Site plan showing proposed plant layout

6.3 Plant Noise Data

The following noise levels for the individual items of plant are presented below. All data is based on manufacturers data. All plant noise data sheets are included within APPENDIX B.

Unit Reference	Noise Data Type	Duty Rate	Sound Levels, dB, at Octave Band Centre Frequencies, Hz							
			63	125	250	500	1000	2000	4000	dB(A)
AWHP-01	Breakout L_p @ 1m	Cooling Mode (Full Load Operation)	72	73	68	65	63	61	58	69
AWHP-02	Breakout L_p @ 1m	Cooling Mode (Full Load Operation)	75	71	65	61	59	59	52	65
AWHP-03	Breakout L_p @ 1m	Cooling Mode (Full Load Operation)	75	71	66	63	61	61	53	67

Table 6.2: Plant equipment data

6.4 3D Acoustic Model

A 3D acoustic model of the development has been constructed in CadnaA such to accurately predict noise break out from individual items of plant from the development at nearby noise sensitive receivers. CadnaA is an industry standard noise modelling software which calculates how sound travels over distance. The model considers reflections off hard surfaces, ground absorption, acoustic screening, and geometrical spreading. The calculations are performed in accordance with ISO 9613: Attenuation of sound during propagation outdoors.

The following assumptions have been made in the model, based on observation of the site and proposed development has identified the following features. These features will be included within the calculation model including any other additional parameters stated.

- Ground absorption has been set to acoustically hard.
- Screening from existing site topography.
- Order of reflections has been set to 3.

A screenshot of the 3D noise model is illustrated below.

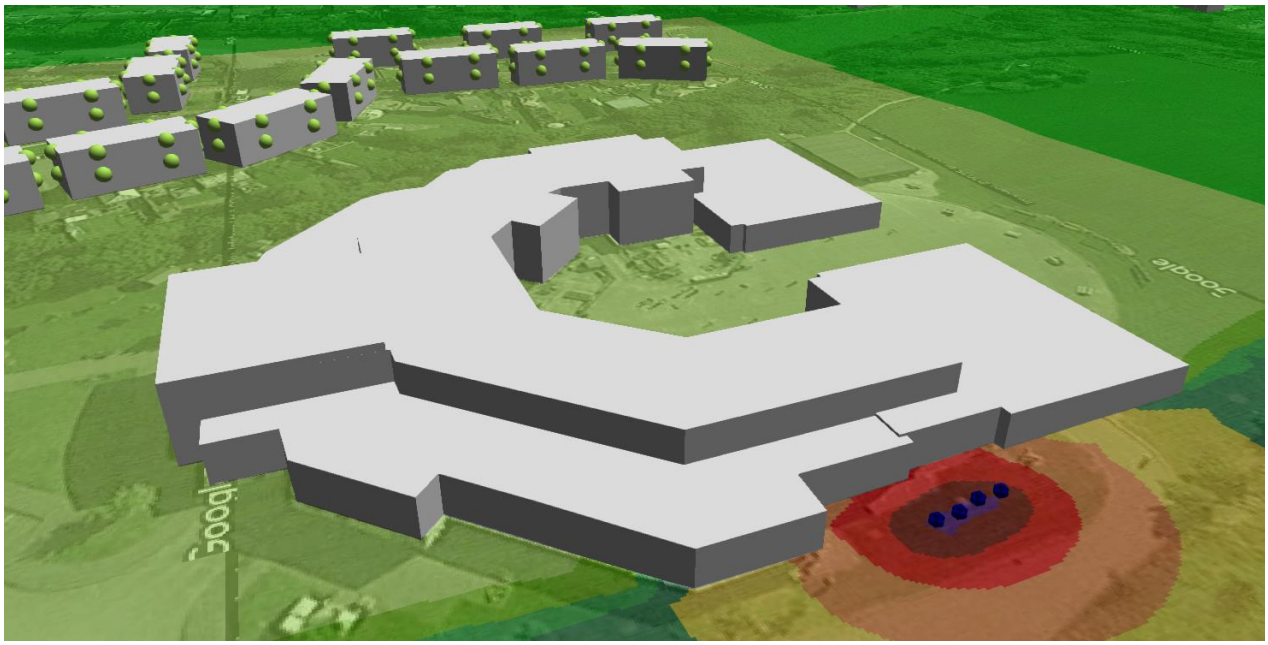


Figure 6.2: 3D Acoustic model with noise sources

6.5 Noise Impact Assessment (Proposed Installation)

The resultant noise map which calculated the combined specific noise level at each receiver is presented below. Additionally, the table below provides the calculated rating levels at the worst-affected noise sensitive receptors. The image below represents the relevant operational time of the plant equipment as described in Table 6.1.

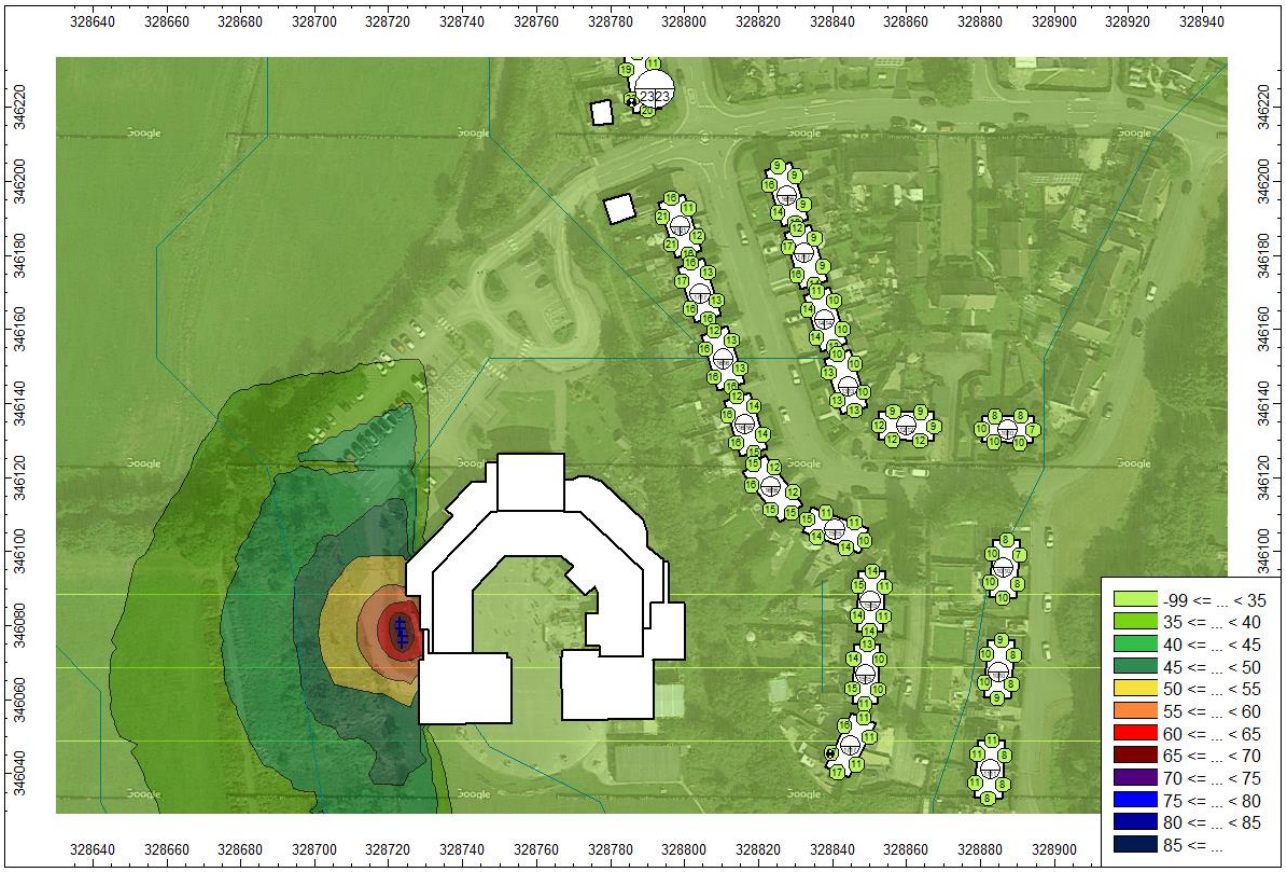


Figure 6.3: Noise map

NSR Reference	Time Period	Background Noise Level (dB $L_{A90,T}$)	Criteria (dB)	Specific Noise Level (dB $L_{Aeq,T}$)	Feature Correction	Rating Level (dB $L_{Ar,Tr}$)	Assessment Outcome
NSR 1	07:00–23:00	34	Equal to Background	23	+0	23	-11
	23:00-07.00	28		23	+0	23	-5

Table 6.3: BS4142 assessment outcome

6.5.1 Acoustic Feature Correction

The following acoustic feature corrections have been considered in regard to the rating level, $L_{Ar,Tr}$ at the affected NSR's.

6.5.1.1 Intermittency

The proposed condenser units are seen to be intermittently operating; however, as the predicted specific noise level of these units are 10 dB or greater, below the measured background noise level, the intermittency is seen to be inaudible. Therefore, the acoustic feature correction for intermittency has not been applied.

6.5.1.2 Tonality

The tonality of the proposed M&E items could not be assessed as third octave noise data is required for the assessment and only octave band noise data was available at the time of writing. However, the proposed M&E items are typically broadband in character. Based on previous projects, in our experience extract fans, air source heat pumps and condenser units are broadband in nature.

6.6 Plant Noise at Nearest Teaching Window Noise

Please note that the plant noise level at the proposed development itself is outside the scope of planning. However, the further plant noise impact assessment looking at the effect on the proposed development has also been carried out, which is solely for the use of the client.

The resultant noise map which calculated the noise levels at the proposed development is presented below.

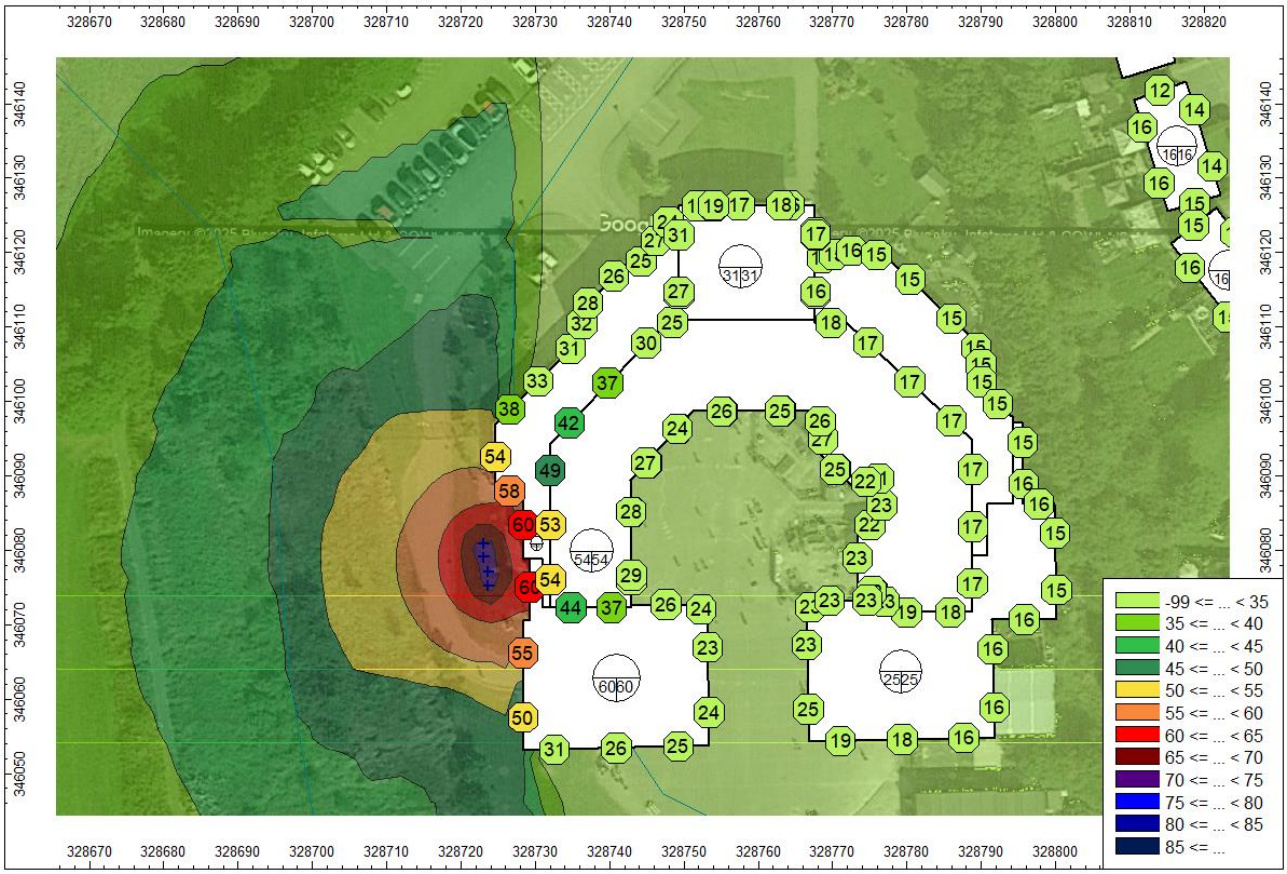


Figure 6.4: Noise map – proposed development

It can be seen that the plant noise from current proposals exceed internal noise ambient levels as outlined within BB93. As such, further noise mitigation should be incorporated in the design in order to achieve compliance. Noise mitigation strategy recommendations are presented below.

6.6.1 Acoustic Screening

Our assessment shows acoustic screening will be required, as outlined below. The height stated for the ground floor plant compound is from ground level.

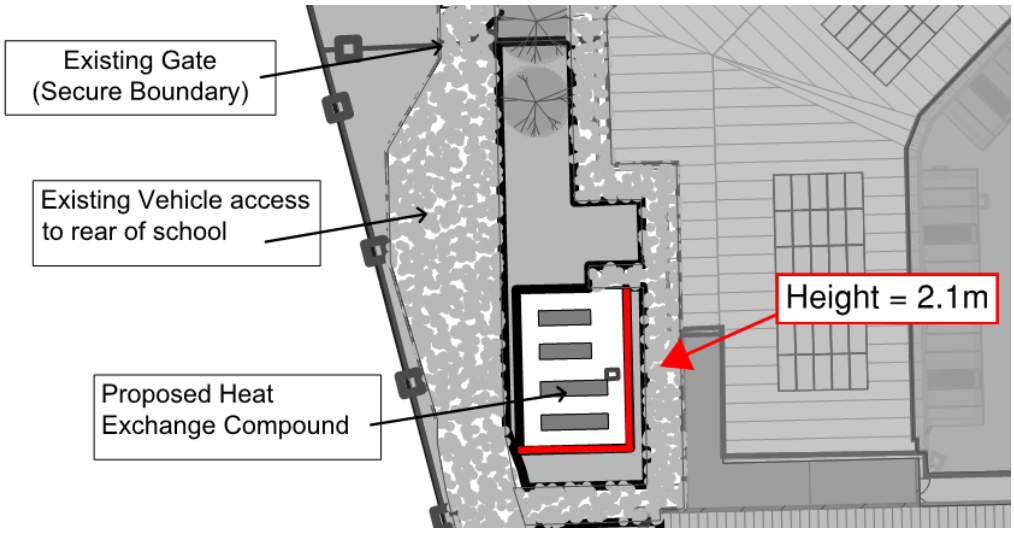


Figure 6.5: Proposed acoustic screens (red)

Where acoustic screens have been specified these should meet the following specification:

- Barrier height of 2100mm.
- Be a solid construction.
- Have no gaps between the floor and the acoustic screen.
- Must be non-permeable and thus have no gaps within the acoustic barrier.
- Have a surface mass of ≥12kg/m^2. Typical suitable materials include 10mm cement particle board, 2mm sheet steel or 18mm plywood.

The noise map below provides the calculated noise levels at the proposed development with the mitigation strategies implemented.

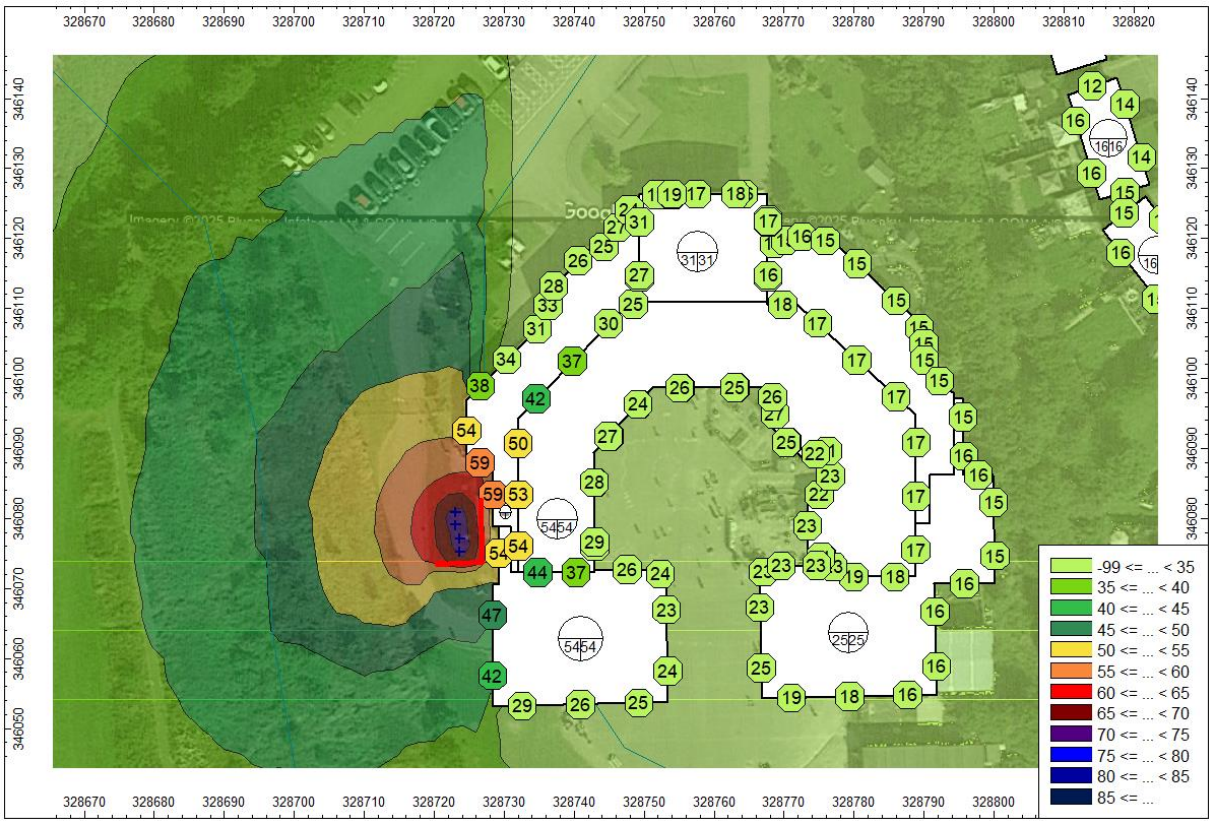


Figure 6.6: Noise map – proposed development with mitigation strategies

6.7 Vibration Control

Although not necessarily related to planning matters, It is also important to consider the potential transfer of structure borne noise to the development itself, in the form of vibration.

It is typically recommended that condenser units and fans or anything generating vibration are isolated from the supporting structure by either steel spring isolators or rubber footings. Where there are particularly sensitive locations nearby, or when equipment is mounted on lightweight structures, consideration to use caged restrained type anti-vibration mounts should be made.

In addition, it is critical that the isolation is not “short-circuited” by associated ductwork or pipework. As such, flexible connectors should be introduced between the plant and any associated pipework or ductwork. Associated pipework and ductwork should be resiliently mounted, as appropriate.

6.8 Uncertainty

Consideration of the potential uncertainties involved in the sound level measurements and the assessment methodology have been made to ensure a high level of confidence in the outcome of the assessment. Annex B of BS4142:2014 presents a range of factors and good practice methods which should be made, and these have been considered in this assessment.

7.0 CONCLUSION

In summary the following points set out the conclusions of this report;

- A noise survey has been conducted at the proposed site in order to establish representative background noise levels (L_{A90}) at the nearby noise sensitive receivers. These background noise levels are presented in Section 5.0 of this report and the details of the noise survey itself are included in Appendix A.
- The assessment criteria to be used for the purpose of planning has been established and is provided Section 4.3.
- Details of the plant equipment have been provided to us, including location, hours of operation, noise data has been presented in Sections 6.2 and 6.3 of this report.
- Calculations have shown that the criteria for the purpose of planning submission has been achieved where this report demonstrates compliance.
- Plant noise level at the proposed development itself is outside the scope of planning. However, a further plant noise impact assessment looking at the effect on the proposed development has also been carried out, which is solely for the use of the client.
- Calculations have shown that to protect classrooms from plant noise further acoustic mitigation should be implemented. The suggested mitigation strategy is provided in Section 6.6.1

APPENDIX A ENVIRONMENTAL NOISE SURVEY

To establish the existing environmental noise levels on site, a noise survey was conducted between 12:05 on the 04/02/2025 and 12:05 on the 07/02/2025.

This site assessment was undertaken by Aaron Andrews of MACH Group.

A.1 Site Description

The site is located at Heol Caradoc, Rhosllanerchrugog LL14 2DS, and is situated to the West of a residential area in rural Wales.

A.1.1 Subjective Noise Climate (On-site)

Noise Type	Noise Characteristics	Sources
Dominant	A primary contributor of noise levels on the site.	Road Traffic
Other Noise Contributions	Contributors to the remainder of the noise climate on site.	School Children, Residences

Table A.1.1 Subjective Summary of the Noise Sources

A.1.2 Non-Representative Noise Sources

During the survey, no noise events occurred which would be deemed as atypical of the site location.

A.2 All Measurement Locations

To help with the understanding of the site and measurement locations all the measurement positions are presented on the map below. Photos of the locations in situ are in the following sections.

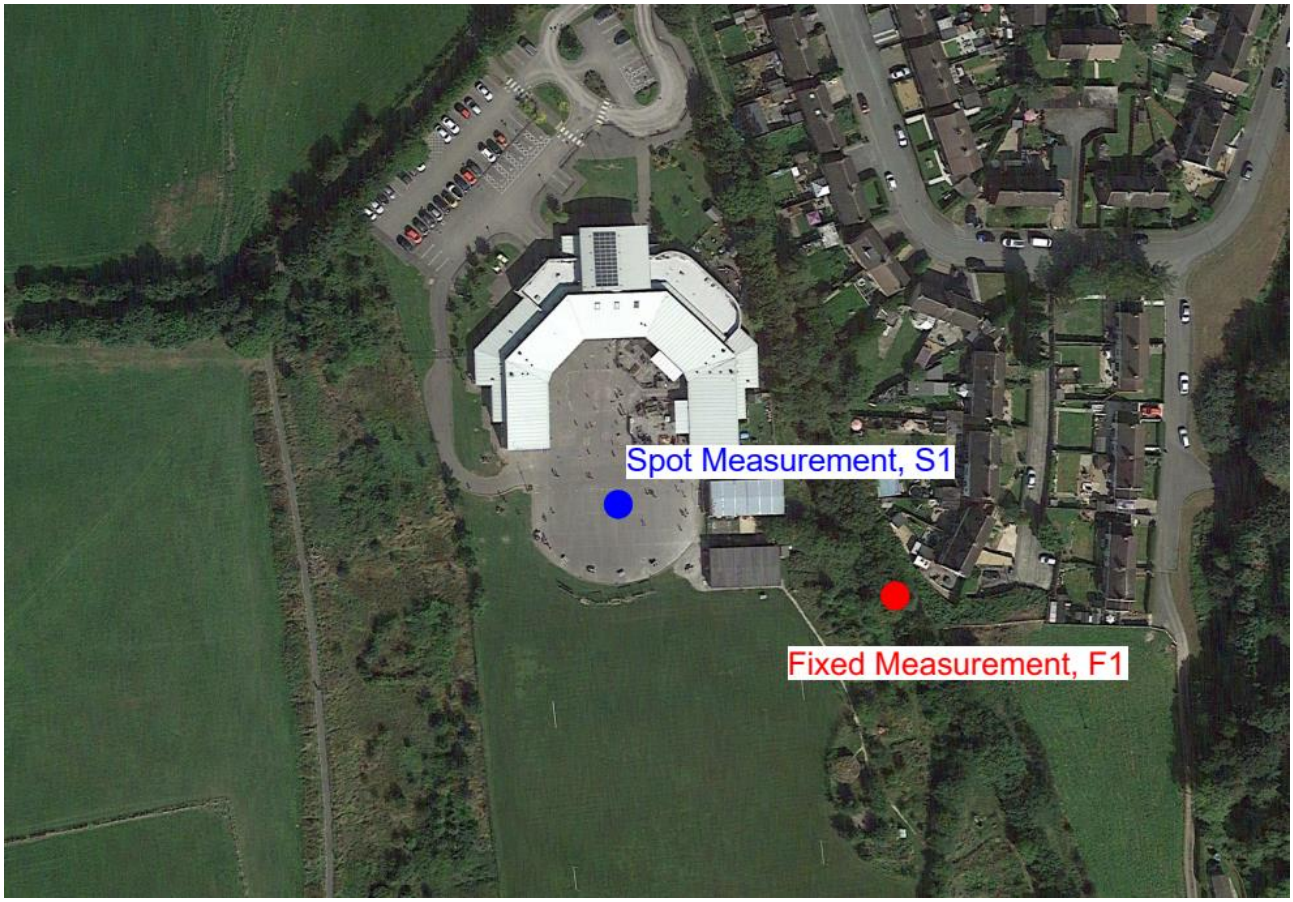


Figure A.2.1 All Measurement Locations on a Map

A.3 Fixed Measurement

A fixed microphone position was used to record noise levels between 12:05 on the 04/02/2025 and 12:05 on the 07/02/2025, where the fixed long-term meter was set to measure consecutive 'A' weighted 5-minute time samples.

To help with the understanding of the site and the measurement locations, the figures below present the location of the microphone position(s) in situ.

A.3.1 Fixed Measurement Location – F1



Figure A.3.2 Fixed measurement F1 location in situ

A.3.2 Fixed Measurement Results – F1

The following graph presents the noise levels recorded over the measurement period at the fixed location (F1).

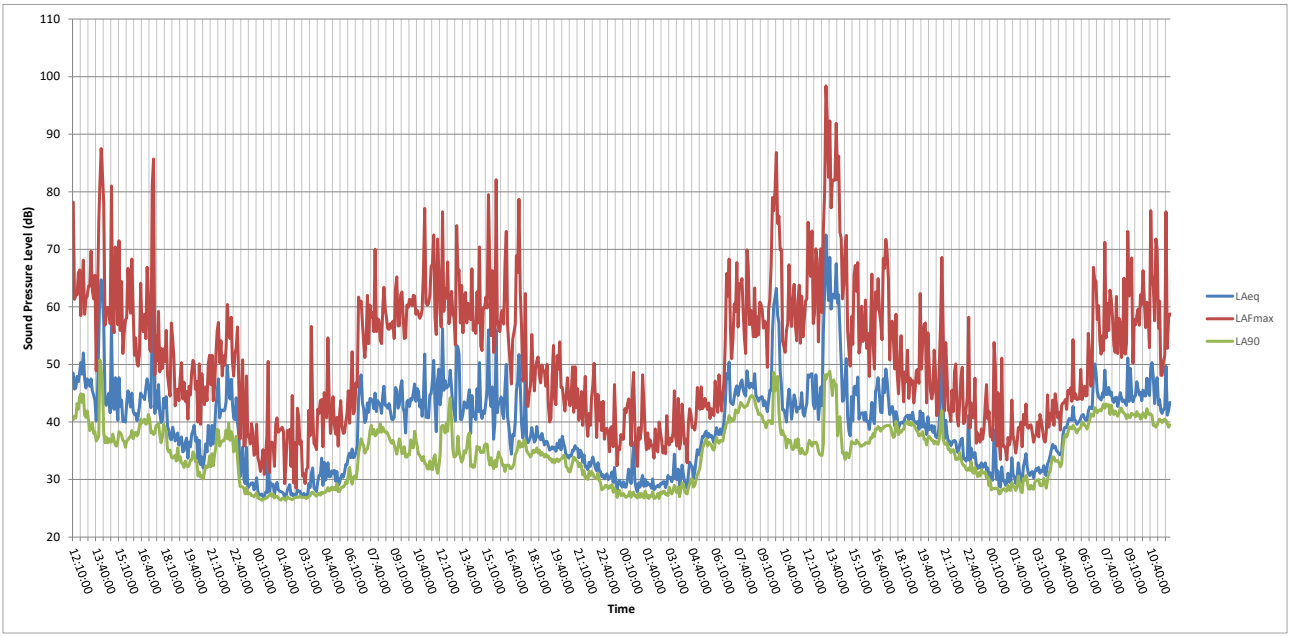


Figure A.3.3 Sound Pressure Level at fixed location, F1

A.4 Spot Measurement

Spot measurements help quantify existing noise levels at different points around the site.

The figures below present the location of the microphone position(s) in situ.

The results of the measured levels at these location(s) are also presented in section A.5 Table A.5.2.

A.4.1 Spot Measurement - S1

This spot measurement was taken between 12:10 and 12:12 on 04/02/2025.



Figure A.4.4 - Spot Measurement S1 in situ

A.5 All Spot Measurement Results

The L_{Aeq}, L_{AFmax}, and L_{A90} levels measured from all spot measurements are shown in Table 4.2 below.

Spot Measurement Position	Date	Start	End	Duration	$L_{Aeq,T}$ (dB)	L_{AFmax}	L_{A90}
S1	04/02/2025	12:10	12:12	2:04	46.9	67.1	39.7

Table A.5.2 - Spot Measurement 1 Results Table

A.6 Measurement Equipment

Item	Serial No.	Certificate No.	Last Calibration
NTI Precision Sound Analyser XL2 TA	A2A-13314-E0	207923	02/02/2024
NTI Pre-amplifier MA220	7677	207923	02/02/2024
NTI Microphone Capsule MC230A	A14417	207907	26/01/2024
Svantek Acoustic Calibrator SV33A	64140	229003	13/12/2024
NTI Precision Sound Analyser XL2 TA	A2A-18713-E0	190661	13/04/2023
NTI Pre-amplifier MA220	9517	190661	13/04/2023
NTI Microphone Capsule MC230A	A19763	190545	11/04/2023
Svantek Acoustic Calibrator SV33A	64140	229003	13/12/2024

Table A.6.3 Measurement Equipment

A.7 Meteorological Conditions

Data Taken from: https://www.timeanddate.com/weather/

Date	Time (hh:mm)	Temperature (High / Low) (°C)	Humidity (%)	Pressure (hPa)	Wind Speed (m/s)	Wind Direction	Conditions
04/02/2025	12:00	11/9	71	1016	7.2	SW	Scattered showers
	18:00	9/6	74	1021	5.8	SW	Passing clouds
05/02/2025	06:00	8/2	78	1036	2.2	WSW	Passing clouds
	12:00	8/3	70	1040	3.1	NW	Passing clouds
	18:00	2/0	87	1043	0.8	N	Clear
06/02/2025	06:00	4/-4	94	1046	0.8	N	Passing clouds
	12:00	9/3	72	1044	1.1	N	Sunny
	18:00	4/-2	82	1043	1.1	SSE	Clear
07/02/2025	06:00	5/0	88	1034	2.8	N	Partly sunny
	12:00	5/4	67	1028	5.8	ENE	Partly sunny

Table A.7.4 Meteorological Conditions

APPENDIX B PLANT NOISE DATA

B.1 AWHP-01

Acoustic information

Sound pressure level at 1 m from the unit (rif. 2 x 10-5 Pa)								
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
71.5	72.5	67.8	65.4	63.0	61.1	58.0	53.7	68.9

Values referred to Evap. IN/OUT 12/7°C and 35°C Amb, full load operation, to base unit without additional options. Sound pressure level calculated from sound power level. Sound pressure in octave band is for intended as guideline only and not considered binding.

B.2 AWHP-02

Acoustic information

Sound pressure level at 1 m from the unit (rif. 2 x 10-5 Pa)								
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
75.0	70.8	64.9	61.3	58.9	58.6	52.4	46.2	65.3

Values referred to Evap. IN/OUT 12/7°C and Cond. IN/OUT 30/35°C, full load operation, standard unit configuration without options. Sound pressure level calculated from sound power level. Sound pressure in octave band is for information only and not considered binding.

B.3 AWHP-03

Acoustic information

Sound pressure level at 1 m from the unit (rif. 2 x 10-5 Pa)								
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
75.2	71.3	65.7	62.6	60.7	61.3	52.7	46.2	67.0

Values referred to Evap. IN/OUT 12/7°C and Cond. IN/OUT 30/35°C, full load operation, standard unit configuration without options. Sound pressure level calculated from sound power level. Sound pressure in octave band is for information only and not considered binding.

APPENDIX C NATIONAL PLANNING LEGISLATION

C.1 National Planning Policy Framework

The current National Planning Policy Framework (NPPF), December 2024, sets out the Government's planning policies for England.

With regards to noise impact, Paragraph 198 of the NPPF states the following:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[60];

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; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation. "

Paragraph 200 goes on to state:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

C.2 Noise Policy Statement for England

The aim of the Noise Policy Statement for England (NPSE) is to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion. The NPSE applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

Noise Policy Vision: Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

Noise Policy Aims: Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life

Observed Effect Level: In order to fit an objective assessment of "significant adverse" and "adverse" impacts, the NPSE introduced the concept of categorising the impact from noise pollution into different observed effect level categories. This has been expanded further within the more recent document "National Planning Policy Guidance – Noise".

C.3 National Planning Policy Guidance - Noise

Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The current guidance contained in the NPPG is summarised in the table below. This advice has not changed since the introduction of the 2018 version of the NPPF.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the	Observed Adverse Effect	Mitigate and reduce to a minimum

Perception	Examples of Outcomes	Increasing Effect Level	Action
	area such that there is a perceived change in the quality of life.		
Significant Observed Adverse Effect Level (SOAL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 7.5: Noise Exposure Hierarchy

C.3.1 Summary of National Guidance

The first two aims of the NPSE and the table from NPPG-Noise (Table 7.5) require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

> "... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur"

Therefore, taking an overview of national policy it is clear that when considering the impact of noise, one must consider the significance of any impact. The presence of an adverse impact in itself is not sufficient to refuse permission.

APPENDIX D BS 4142:2014

BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. As such, an assessment to BS 4142 is typically called for within planning conditions. The likelihood of complaints in response to a noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level.

BS 4142 states that one should 'obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level and consider the following:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on the context.
d) 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 aforementioned rating level is based upon the specific noise level of the noise source in question. A correction should be applied to the specific noise level to obtain an increased rating level if 'a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources. To summarise, BS4142 Section 9.2 advises the following with regards to corrections for acoustic characteristics:

- Tonality – for sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. 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.
- Impulsivity – A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level., 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.
- Other sound characteristics – 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
- Intermittency – When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.