Steyning Grammer School
Steyning
West Sussex

Plant Sound
Assessment Report
1293/PSA1
Revision 1

14 February 2025

For:

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1293/PSA1 Revision 1

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1.0 Introduction

Lighthouse Acoustics has been appointed by Nero Energy to undertake an environmental sound survey at Steyning Grammer School, Steyning, West Sussex and to assess atmospheric sound emissions from the proposed 4No. air source heat pump units.

The survey methodology, results and assessments are presented in this report.

2.0 Objectives

To establish the Local Authority's acoustic requirements for the proposed 4No. air source heat pump units.

To visit site to undertake a detailed environmental sound survey in order to establish existing environmental sound levels at the site.

To undertake an assessment of atmospheric sound emissions from the proposed 4No. air source heat pump units upon the nearest noise sensitive receptors and to propose mitigation measures where required in order to achieve the requirements of the Local Authority.

To undertake an assessment of atmospheric sound emissions from the proposed 4No. air source heat pump units upon the nearest school classroom/office/bedroom windows and to propose mitigation measures where required in order to achieve acceptable sound levels.

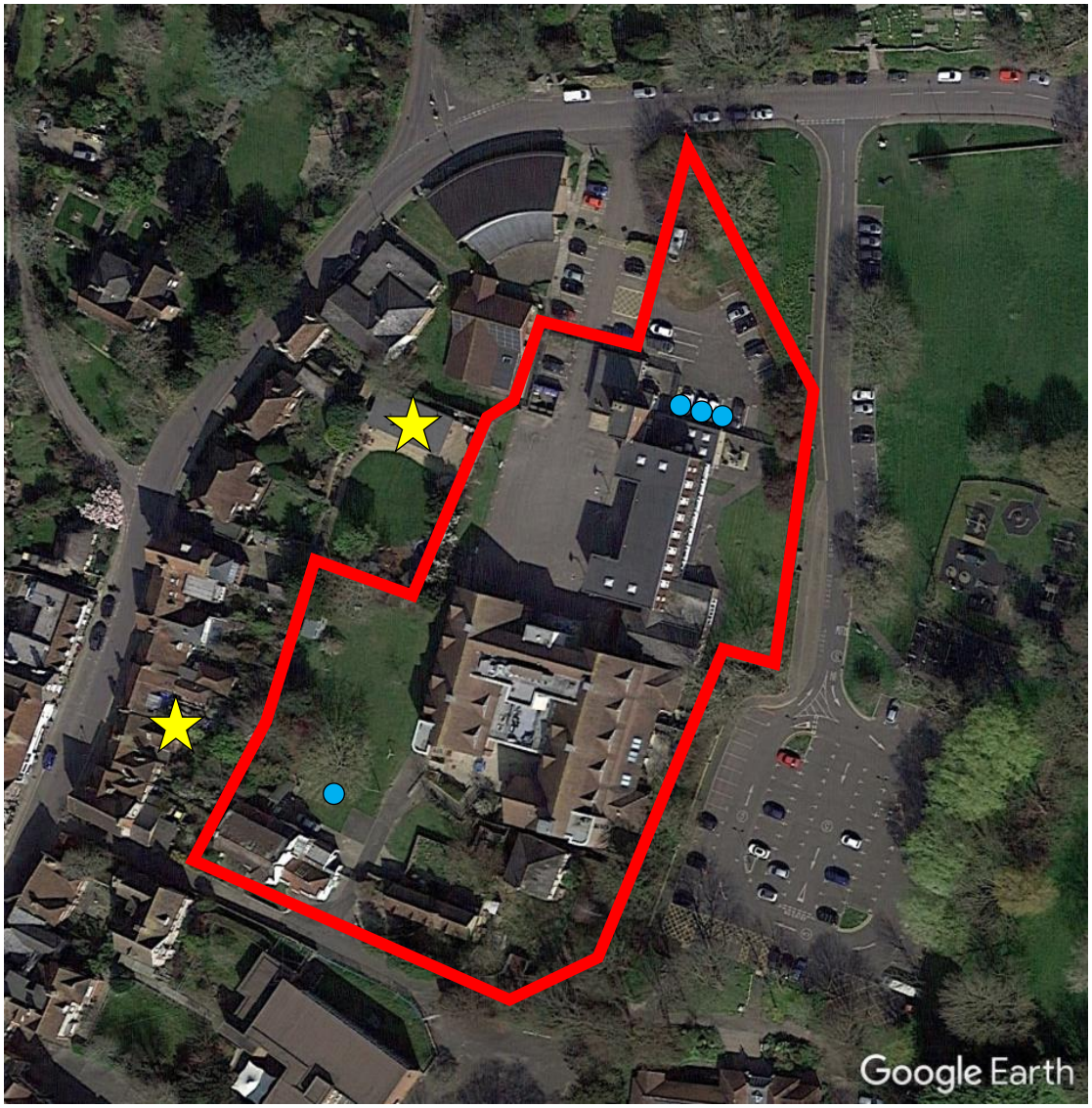
3.0 Site Description

Steyning Grammer School, Steyning, West Sussex comprises multiple 1,2 and 3 storey buildings across the site along with playground, grass area and car park.

The site is bound by the Steyning Museum and car park to the north, car park to the east, School Lane to the south and residential properties along Church Street to the west.

The proposed 4No. air source heat pump units are to be installed at ground level around the site.

The site plan below indicates the extent of the site (red line), location of the proposed 4No. air source heat pump units (blue dots), the nearest noise sensitive receptors (yellow stars) and the surrounding environment.



Site plan indicating the extent of the site and the surrounding environment

4.0 Local Authority Requirements

It is understood that Horsham District Council require building services noise to be assessed in accordance with the guidance provided in BS 4142:2014, "Methods for rating and assessing industrial and commercial sound" and that the rating level should not exceed the existing background sound level at the nearest noise sensitive receptor.

5.0 Environmental Sound Survey

5.1 Measurements

Automated environmental sound measurements were undertaken from 10:00 hours on Tuesday 1 October 2024 to 10:00 hours on Wednesday 2 October 2024. During this period the L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels were measured continuously over 15 minute periods.

5.2 Weather Conditions

At the start of the survey period there was a gentle southerly breeze (<5m/s) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 12°C.

At the end of the survey period there was a gentle southerly breeze (<5m/s) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 14°C.

Based on publicly available weather data for the survey period it is understood that weather conditions remained similar for the duration of the survey with no periods of significant rainfall or strong breezes. The weather conditions during the survey period are therefore considered to be suitable for undertaking measurements of sound levels.

5.3 Measurement Position

Environmental sound levels were measured at a single position on-site as described in the table below.

Position	Description
A	Microphone situated to the west of the site at 1.2m above ground level in free field measurement conditions.

The measurement position is shown on the site plan below.



Site plan showing measurement position

Measurement Position A was selected in order to assess typical environmental sound levels representative of those at the nearest noise sensitive receptors surrounding the site.

5.4 Equipment

The following equipment was used to undertake the environmental sound survey.

Equipment	Manufacturer	Model	Serial No.	Calibration Date
Class 1 Sound Level Meter	Casella	633C	0721320	07/11/2023
Preamplifier	Casella	495	001414	07/11/2023
Microphone	Casella	251	1025	07/11/2023
Class 1 Sound Calibrator	Casella	120/1	3864878	01/11/2023
Environmental Noise Kit	Casella	6847	-	-
Microphone Extension Cable	Casella	C6717/5	-	-
Weather Protection System	Casella	6737	-	-

Field calibration checks were performed on the sound level meter prior to and on completion of the survey and were found to be within acceptable tolerance limits.

5.5 Results

5.5.1 Time History Graph

The results of the environmental sound survey are presented on Time History Graph 1293/THG1 enclosed at the rear of the report.

5.5.2 L_{A90} Background Sound Levels

The lowest representative daytime and night-time $L_{A90,15min}$ background sound levels measured at each position during the survey period are detailed in the table below.

Position	Lowest Representative $L_{A90,15min}$ Background Sound Levels (dB)	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
A	39	34

5.5.3 Discussion of Sound Climate

At the start and end of the survey period the dominant sound source at Position A was noted to be distant road traffic from the surrounding road network.

Whilst we are unable to comment on dominant sound sources or individual sound events during the survey period, based on the surrounding environment it is likely that road traffic remained the dominant sound source.

6.0 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound", describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

Sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems.

It should be noted that the determination of noise amounting to a nuisance is beyond the scope of BS 4142.

The likely impact is indicated by subtracting the existing background sound level from the rating level of the industrial and/or commercial sound. The standard states that:

> *"a) Typically, the greater this difference, the greater the magnitude of the impact.*
> *b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
> *c) A difference of around +5dB 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.*
>
> *Note 2 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."*

The industrial and/or commercial sound is expressed as the specific sound level and given as a $L_{Aeq,Tr}$ sound level. Should the specific sound level exhibit any acoustic features (i.e. tonality, irregularity or impulsiveness) a character correction is applied. The rating level is the specific sound level with character correction applied (if applicable) and is given as a $L_{Ar,Tr}$ sound level.

The existing background sound level is given as a L_{A90}, T sound level.

The reference time interval, T_r, is 1 hour during the daytime period (07:00 to 23:00 hours) and 15 minutes during the night-time period (23:00 to 07:00 hours).

7.0 Residential Atmospheric Sound Emission Assessment

7.1 Plant Sound Data

Atmospheric building services sound levels have been assessed based on the manufacturers sound data received for the proposed 4No. air source heat pump units which indicates octave band sound data as detailed in the tables below.

1No. Refra FLM 105

Mode	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Daytime	-	72	70	70	69	69	67	-	75
Night-time*	-	49	47	47	46	46	44	-	52

*Manufacturer states a 23dB reduction

3No. Refra IGN 209

Mode	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Daytime	-	80	76	76	74	73	72	-	80
Night-time*	-	55	51	51	49	48	47	-	55

*Manufacturer states a 25dB reduction

Whilst it is not possible to assess plant irregularity or impulsiveness based on manufacturer's sound data, BS 4142: 2014 provides an objective method for assessing the audibility of tones in sound. The one-third octave method states that if the level of a one third octave band exceeds the level of both adjacent one third octave bands by the following amounts, then a tonal component may be identified as present:

- 15dB in the low-frequency one-third-octave bands (25Hz to 125Hz);
- 8dB in the mid-frequency one-third-octave bands (160Hz to 400Hz);
- 5dB in the high-frequency one-third-octave bands (500Hz to 10kHz).

However, one third octave band sound data (and plant irregularity or impulsiveness data) is rarely available from manufacturers as is the case in this instance.

By applying the same principal to the octave band sound data in the tables above, a review indicates that none of the above units are likely to exhibit a tonal component. As such, no character correction has been applied to the specific sound level for the above units.

Should one third octave band sound data, plant irregularity or impulsiveness data become available from the manufacturer a revised assessment should be undertaken.

7.2 Operating Hours

It is understood that the proposed 4No. air source heat pump units have the potential to operate 24 hours a day. In order to undertake a worst case assessment, it is assumed that the proposed 4No. air source heat pump units will operate for the full 1 hour daytime and 15 minute night-time assessment periods.

7.3 Plant Locations

The proposed 4No. air source heat pump units are to be installed at ground level around the site. The 1No. Refra FLM 105 air source heat pump unit is to be installed towards the south west of the site whilst the 3No. Refra IGN 209 air source heat pump units are to be installed towards the north east of the site.

7.4 Nearest Noise Sensitive Receptors

The nearest noise sensitive receptors to the proposed 4No. air source heat pump units are detailed in the table below along with the approximate distance to the boundary fence of the nearest noise sensitive receptors.

Units	Plant Location	Nearest Noise Sensitive Receptor	Approximate Distance (m)
1No. Refra FLM 105	South West	Residential property to west along Church Street	15
3No. Refra IGN 209	North East	Residential property to west along Church Street	35

7.5 Assessment

The tables below detail the calculated L_{Ar} rating levels for the proposed 4No. air source heat pump units at the nearest noise sensitive receptors along with the lowest representative daytime and night-time L_{A90} background sound levels and the differences between them.

1No. Refra FLM 105 Unit to Residential Property Along Church Street

Descriptor	Period	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
Sound Power Level $L_{Aeq,T}$ (dB)	75	52
Percentage on-time (%)	100	100
On time correction (dB)	0	0
Sound Power Level $L_{Aeq,T}$ (dB)	75	52
Number of Units (#)	1	1
Correction (dB)	0	0
Distance to Receptor (m)	15	15
Distance Attenuation (dB)	-35	-35
Screening Attenuation (dB)	0	0
Reflections (dB)	0	0
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	40	17
Character Correction (dB)	0	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	40	17
Lowest Representative Background Sound Level $L_{A90,Tr}$ at Receptor (dB)	39	34
Difference (dB)	+1	-17

The calculated L_{Ar} rating levels for the proposed 1No. air source heat pump unit at the nearest noise sensitive receptor are 1dB above the lowest representative daytime L_{A90} background sound level and 17dB below the lowest representative night-time L_{A90} background sound level.

The assessment therefore indicates that atmospheric plant sound emissions from the proposed 1No. air source heat pump unit is likely to have a low impact during the daytime period and a low impact during the night-time period at the nearest noise sensitive receptor depending on the context.

The Local Authority's requirement of not to exceed the lowest background noise level is likely to be exceeded by 1dB for the daytime period and achieved for the night-time period.

3No. Refra IGN 209 Units to Residential Property Along Church Street

Descriptor	Period	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
Sound Power Level $L_{Aeq,T}$ (dB)	80	55
Percentage on-time (%)	100	100
On time correction (dB)	0	0
Sound Power Level $L_{Aeq,T}$ (dB)	80	55
Number of Units (#)	3	3
Correction (dB)	+5	+5
Distance to Receptor (m)	35	35
Distance Attenuation (dB)	-42	-42
Screening Attenuation (dB)	0	0
Reflections (dB)	0	0
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	43	18
Character Correction (dB)	0	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	43	18
Lowest Representative Background Sound Level $L_{A90,Tr}$ at Receptor (dB)	39	34
Difference (dB)	+4	-16

The calculated L_{Ar} rating levels for the proposed 3No. air source heat pump units at the nearest noise sensitive receptor are 4dB above the lowest representative daytime L_{A90} background sound level and 16dB below the lowest representative night-time L_{A90} background sound level.

The assessment therefore indicates that atmospheric plant sound emissions from the proposed 3No. air source heat pump units are likely to have an adverse impact during the daytime period and a low impact during the night-time period at the nearest noise sensitive receptor depending on the context.

The Local Authority's requirement of not to exceed the lowest background noise level is likely to be exceeded by 4dB for the daytime period and achieved for the night-time period.

7.6 Mitigation Measures

In order to achieve the Local Authority's requirement of not to exceed the lowest background noise level the proposed 1No. Refra FLM 105 air source heat pump unit require attenuation measures which can provide a reduction of at least 1dB in order to achieve a sound power level of ≤74dBA per unit.

In order to achieve this reduction, an acoustic louvred enclosure should be considered around the proposed 1No. Refra FLM 105 air source heat pump unit situated towards the south west of the site at ground level Acoustic louvres with a depth of 100mm would typically be expected to provide ~9dB attenuation, as specified in the Acoustic Specification for Acoustic Louvred Enclosure 1 which is enclosed at the rear of the report.

In order to achieve the Local Authority's requirement of not to exceed the lowest background noise level the proposed 3No. Refra IGN 209 air source heat pump units require attenuation measures which can provide a reduction of at least 4dB in order to achieve a sound power level of ≤76dBA per unit.

In order to achieve these reductions, an acoustic louvred enclosure should be considered around the proposed 3No. Refra IGN 209 air source heat pump units situated towards the north east of the site at ground level. Acoustic louvres with a depth of 100mm would typically be expected to provide ~9dB attenuation, as specified in the Acoustic Specification for Acoustic Louvred Enclosure 2 which is enclosed at the rear of the report.

8.0 Context

BS 4142: 2014 states the following with regard to the context of the industrial/commercial sound:

> *"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 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."*

In addition, BS 4142: 2014 states the following:

> *"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.*

1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

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.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:
i) facade insulation treatment;
ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
iii) acoustic screening."

"The standard is not intended to be applied to the assessment of indoor sound levels."

In order to place the industrial sound in context the following points have therefore been considered:

- Attenuation measures have been proposed where required in order to reduce the sound emissions from the proposed 4No. air source heat pump units;
- The rating levels at the nearest receptors with the incorporation of the attenuation measures will be between 8dB and 26dB below the lowest representative background sound levels;

- BS 4142:2014 only uses outdoor sound levels to assess the likely effects of sound and does not consider indoor sound levels within nearest receptors which may be significantly lower due to the sound insulation offered by the façade;
- Sound emissions from the proposed 4No. air source heat pump units are broadband and steady and are therefore unlikely to be distinguishable from the environmental sound climate.

Based on the above, it is considered that the proposed 4No. air source heat pump units are likely to have a have a low impact during the daytime and night-time periods at the nearest noise sensitive receptors with the incorporation of the proposed mitigation measures. This conclusion is reached by professional judgement, taking context into consideration.

9.0 Uncertainty

Weather conditions during the survey period are considered to be suitable for undertaking measurements of sound levels. The measurement position was selected that was representative of the nearest noise sensitive receptors.

Measurements were undertaken over a 24-hour period to establish the lowest representative environmental sound levels. Whilst environmental sound levels have the potential to be lower than those measured on some occasions, they are likely to be similar to those measured for the vast majority of the time. As such, uncertainty in the survey methodology is considered to be of marginal significance.

The survey was undertaken using Class 1 equipment which had been calibrated within the required intervals. In addition, field calibration checks were performed on the sound level meters prior to and on completion of the survey and were found to be within acceptable tolerance limits. As such, uncertainty in the survey equipment is considered to be of negligible significance.

Assessment data including sound data and operating hours has been based on manufacturers sound data, measured sound data and information received from others. A character correction has been applied as deemed appropriate. As such, uncertainty in the assessment data is considered to be of marginal significance.

Calculations have been undertaken in accordance with recognised procedures and have been performed in a spreadsheet. As such, uncertainty in the assessment is considered to be of negligible significance.

Based on the above, overall uncertainty in the assessment is considered to be of marginal significance.

10.0 School Atmospheric Sound Emission Assessment

10.1 Plant Sound Data

Atmospheric building services sound levels have been assessed based on the manufacturers sound data received for the proposed 4No. air source heat pump units which indicates octave band sound data as detailed in the table below.

1No. Refra FLM 105

Mode	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Daytime	-	72	70	70	69	69	67	-	75
Night-time*	-	49	47	47	46	46	44	-	52

*Manufacturer states a 23dB reduction

3No. Refra IGN 209

Mode	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Daytime	-	80	76	76	74	73	72	-	80
Night-time*	-	55	51	51	49	48	47	-	55

*Manufacturer states a 25dB reduction

Whilst it is not possible to assess plant irregularity or impulsiveness based on manufacturer's sound data, BS 4142: 2014 provides an objective method for assessing the audibility of tones in sound. The one-third octave method states that if the level of a one third octave band exceeds the level of both adjacent one third octave bands by the following amounts, then a tonal component may be identified as present:

- 15dB in the low-frequency one-third-octave bands (25Hz to 125Hz);
- 8dB in the mid-frequency one-third-octave bands (160Hz to 400Hz);
- 5dB in the high-frequency one-third-octave bands (500Hz to 10kHz).

However, one third octave band sound data (and plant irregularity or impulsiveness data) is rarely available from manufacturers as is the case in this instance.

By applying the same principal to the octave band sound data in the tables above, a review indicates that none of the above units are likely to exhibit a tonal component. As such, no character correction has been applied to the specific sound level for the above units.

Should one third octave band sound data, plant irregularity or impulsiveness data become available from the manufacturer a revised assessment should be undertaken.

10.2 Operating Hours

It is understood that the proposed 4No. air source heat pump units have the potential to operate 24 hours a day. In order to undertake a worst case assessment, it is assumed that the proposed 4No. air source heat pump units will operate for the full 1 hour daytime and 15 minute night-time assessment periods.

10.3 Plant Locations

The proposed 4No. air source heat pump units are to be installed at ground level around the site. The 1No. Refra FLM 105 air source heat pump unit is to be installed towards the south west of the site whilst the 3No. Refra IGN 209 air source heat pump units are to be installed towards the north east of the site.

10.4 Nearest School Windows

The nearest school classroom/office/bedroom windows to the proposed 4No. air source heat pump units are detailed in the table below.

Units	Plant Location	Nearest School Windows	Approximate Distance (m)
1No. Refra FLM 105	South West	Wykeham Cottage North Facade	5
3No. Refra IGN 209	North East	Bennett House North Facade	7

10.5 External Sound Target

It is assumed that the existing school classrooms/offices/bedrooms rely on opening windows for ventilation and summer cooling. BB93 states that indoor ambient noise levels within typical school classrooms should achieve L_{Aeq} 40dB with natural ventilation. BS 8233:2014 states that indoor ambient noise levels within bedrooms should achieve L_{Aeq} 35dB during the daytime period and L_{Aeq} 30dB during the night-time period.

BS 8233:2014 states a loss of approximately 15dB for a façade with a partially open window.

This would therefore result in an external sound target of L_{Aeq} 55dB at the nearest school classroom/office windows, L_{Aeq} 50dB at the nearest school bedrooms during the daytime period and L_{Aeq} 45dB at the nearest school bedrooms during the night-time period.

10.6 Assessment

The tables below detail the calculated L_{Ar} rating levels for the proposed 4No. air source heat pump units at the nearest school classroom/office/bedroom windows along with the external sound target and the differences between them.

1No. Refra FLM 105 Unit to Windows in Wykeham Cottage North Facade

Descriptor	Period	
	Daytime (07:00–23:00)	**Night-time (23:00–07:00)**
Sound Power Level $L_{Aeq,T}$ (dB)	75	52
Percentage on-time (%)	100	100
On time correction (dB)	0	0
Sound Power Level $L_{Aeq,T}$ (dB)	75	52
Number of Units (#)	1	1
Correction (dB)	0	0
Distance to Receptor (m)	5	5
Distance Attenuation (dB)	-25	-25
Screening Attenuation (dB)	0	0
Reflections (dB)	0	0
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	50	27
Character Correction (dB)	0	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	50	27
External Sound Target $L_{Aeq,Tr}$ (dB)	55 / 50	45
Difference (dB)	-5 / 0	-18

The calculated L_{Ar} rating level for the proposed 1No. air source heat pump units at the nearest school classroom/office windows is 5dB below the external sound target, at the nearest school bedroom window is 0dB below the external daytime target and 18dB below the external night-time target.

With the incorporation of the attenuation measures detailed in Section 7.6 (~9dB reduction) that are required in order to achieve the requirements of the Local Authority at the nearest noise sensitive receptor, the external sound target should be achieved by ~14dB, ~9dB and ~27dB respectively.

3No. Refra IGN 209 Units to Windows in Bennett House North Facade

Descriptor	Period	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
Sound Power Level $L_{Aeq,T}$ (dB)	80	55
Percentage on-time (%)	100	100
On time correction (dB)	0	0
Sound Power Level $L_{Aeq,T}$ (dB)	80	55
Number of Units (#)	3	3
Correction (dB)	+5	+5
Distance to Receptor (m)	7	7
Distance Attenuation (dB)	-28	-28
Screening Attenuation (dB)	0	0
Reflections (dB)	0	0
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	57	32
Character Correction (dB)	0	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	57	32
External Sound Target $L_{Aeq,Tr}$ (dB)	55 / 50	45
Difference (dB)	+2 / +7	-13

The calculated L_{Ar} rating level for the proposed 1No. air source heat pump units at the nearest school classroom/office windows is 2dB above the external sound target, at the nearest school bedroom window is 7dB above the external daytime target and 13dB below the external night-time target.

With the incorporation of the attenuation measures detailed in Section 7.6 (~9dB reduction) that are required in order to achieve the requirements of the Local Authority at the nearest noise sensitive receptor, the external sound target should be achieved by ~7dB, ~2dB and ~22dB respectively.

11.0 Conclusion

The Local Authority's acoustic requirements for the proposed 4No. air source heat pump units have been established.

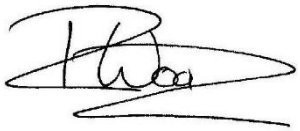
A detailed environmental sound survey has been undertaken in order to establish existing environmental sound levels at the site.

An assessment of atmospheric sound emissions from the proposed 4No. air source heat pump units upon the nearest noise sensitive receptors has been undertaken.

Taking context into consideration, the proposed 4No. air source heat pump units are likely to have a low impact during the daytime and night-time periods at the nearest noise sensitive receptors and achieve the Local Authority's acoustic requirements with the incorporation of the proposed mitigation measures.

An assessment of atmospheric sound emissions from the proposed 4No. air source heat pump units upon the nearest school classroom/office/bedroom windows has been undertaken.

The proposed 4No. air source heat pump units are likely to achieve the external sound target at the nearest school classroom/office/bedroom windows with the incorporation of the proposed mitigation measures.



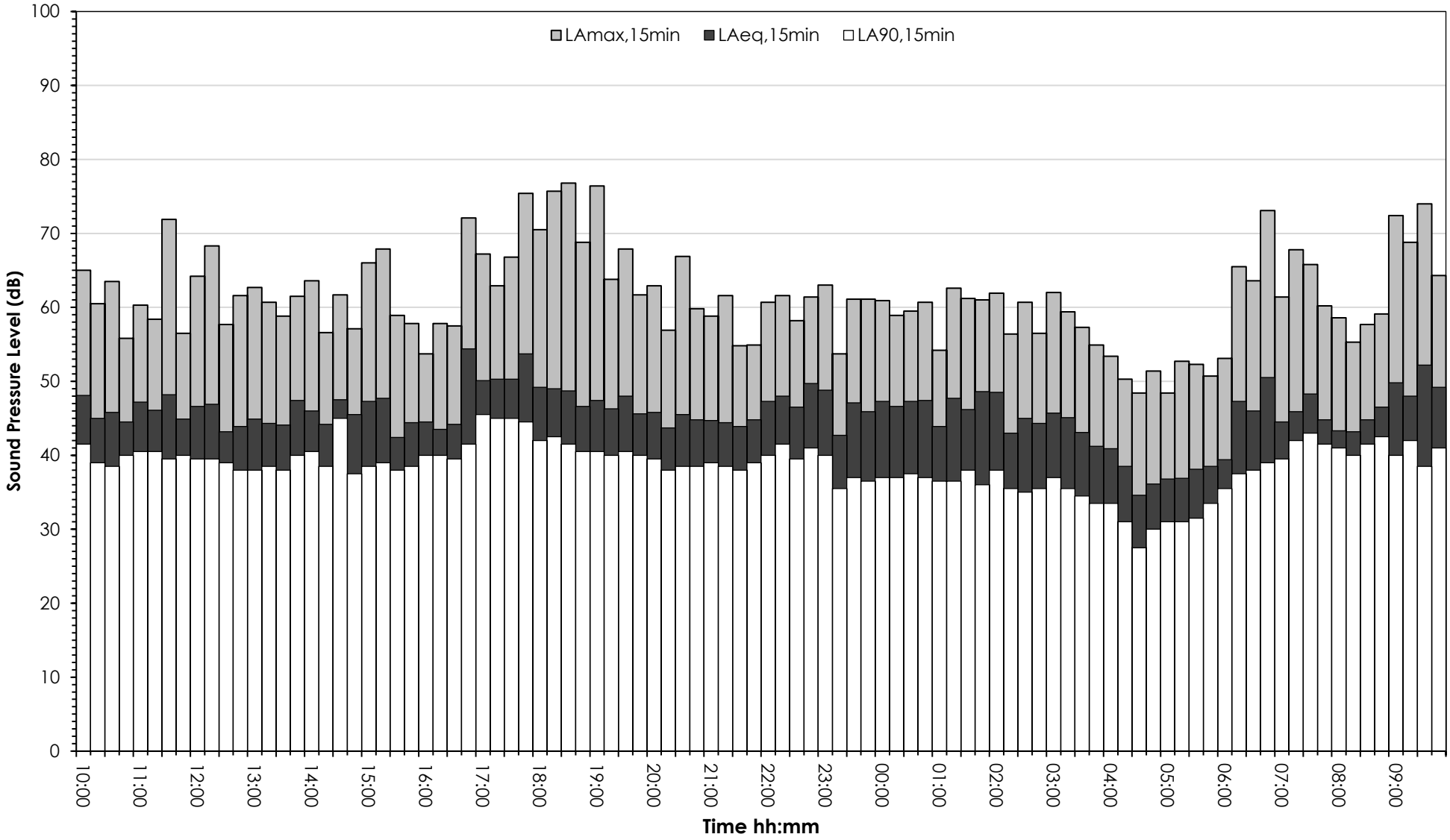
Robin Wood
LIGHTHOUSE ACOUSTICS

1293/THG1

Steyning Grammer School, Steyning, West Sussex

Time History Graph - Tuesday 1 October 2024 to Wednesday 2 October 2024

$L_{Amax,15min}$, $L_{Aeq,15min}$ & $L_{A90,15min}$ Noise Levels at Position A



Steyning Grammer School
Steyning
West Sussex

Acoustic Specification for Acoustic Louvred Enclosure 1

LIGHTHOUSE ACOUSTICS

2nd Floor 3 Hardman Square
Spinningfields Manchester M3 3EB

☎ 0161 457 0515 ▪ 07415 151 901
✉ Enquiry@LighthouseAcoustics.co.uk
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Location

The acoustic louvred enclosure shall fully enclose the 1No. Refra FLM 105 air source heat pump unit situated to the south west of the site at ground level on all sides. It should extend from ground level up to a height at least equal to that of the highest air source heat pump unit. The lid to the enclosure may be formed from either acoustic louvres or an imperforate construction with a minimum mass per unit area of 15kg/m^2.

Sound Insulation

The acoustic louvred enclosure shall provide the following minimum sound transmission loss performance when tested in accordance with BS EN ISO 10140-2:2010.

Sound Transmission Loss (dB) at Octave Band Centre Frequency (Hz)							
63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
5	4	5	6	9	13	14	13

Construction

The acoustic louvres shall typically have a depth of 100mm and be constructed from galvanised/plastic coated steel or aluminium with perforated galvanised/plastic coated steel or aluminium to the lower blade face.

The sound absorbent infill shall have a density of at least 45kg/m^3. It should be non-hygroscopic, incombustible, chemically inert and be faced with a protective membrane to prevent fibre migration.

All joints between the panels of the acoustic louvres and at junctions between the acoustic louvred enclosure and adjacent structures shall be made good and sealed with non-setting mastic.

The acoustic louvred enclosure shall be designed and constructed to withstand appropriate wind and snow loads and shall be suitably weatherproofed.

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Acoustic Specification for Acoustic Louvred Enclosure 2

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2nd Floor 3 Hardman Square
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Location

The acoustic louvred enclosure shall fully enclose the 3No. Refra IGN 209 air source heat pump units situated to the north east of the site at ground level on all sides. It should extend from ground level up to a height at least equal to that of the highest air source heat pump unit. The lid to the enclosure may be formed from either acoustic louvres or an imperforate construction with a minimum mass per unit area of 15kg/m^2.

Sound Insulation

The acoustic louvred enclosure shall provide the following minimum sound transmission loss performance when tested in accordance with BS EN ISO 10140-2:2010.

Sound Transmission Loss (dB) at Octave Band Centre Frequency (Hz)							
63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
5	4	5	6	9	13	14	13

Construction

The acoustic louvres shall typically have a depth of 100mm and be constructed from galvanised/plastic coated steel or aluminium with perforated galvanised/plastic coated steel or aluminium to the lower blade face.

The sound absorbent infill shall have a density of at least 45kg/m^3. It should be non-hygroscopic, incombustible, chemically inert and be faced with a protective membrane to prevent fibre migration.

All joints between the panels of the acoustic louvres and at junctions between the acoustic louvred enclosure and adjacent structures shall be made good and sealed with non-setting mastic.

The acoustic louvred enclosure shall be designed and constructed to withstand appropriate wind and snow loads and shall be suitably weatherproofed.