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**VINCENTIAN PRESBYTERY
FLOWER LANE, MILL HILL
NW7 2JB**

**ENVIRONMENTAL SOUND SURVEY
& PLANT SOUND LIMITS**

Client: Congregation of the Mission (Charity No: 233777)

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Approved by



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1.0 Introduction

- 1.1 An environmental sound survey has been undertaken to determine the prevailing background sound levels at the worst affected noise sensitive receiver with regard to the proposed air source heat pump (ASHP) at the rear of the proposed new presbytery at Sacred Heart & Mary Immaculate Church at 2 Flower Lane, Mill Hill, NW7 2JB. The ASHP is to be installed as part of the works in constructing a new presbytery.
- 1.2 This report serves to support the planning application regarding the new ASHP by setting noise control limits based upon pre-application information with respect of the likely noise control criterion.
- 1.3 The local authority is the London Borough of Barnet.

2.0 Site Description

- 2.1 The proposed plant is to be located at ground level in a cycle store to the rear of the new presbytery.
- 2.2 The worst affected noise sensitive receiver is identified as 4 Flower Lane approximately 5 metres away from the proposed ASHP location. Refer to Appendix 1 for site location and layout and Appendix 2 for measurement and proposed ASHP location.

3.0 Site Sound Survey

- 3.1 Instrumentation: A Svan 948 integrating real time sound and vibration analyser was installed on the boundary of the application site with Rees Farm at the location shown in Figure 1. The instrument was field calibration checked immediately prior to the commencement of the survey, and also upon completion. No calibration drift was recorded. The instrument was used in accordance with manufacturer's instructions.
- 3.2 Location: The sound monitor was located on a pole at a height of approximately 3 metres above local ground level. Refer to Appendix 1 for the measurement location and Appendix 3 for the survey measurement data in graph form.
- 3.3 Periods: Sound level monitoring was continuous from approximately 12:25 hours on Wednesday 21st April 2021 to approximately 13:10 hours on Monday 26th April 2021. The sound level meter was configured to monitor sound levels continuously in fifteen-minute and one minute intervals.
- 3.4 Weather: Prevailing weather conditions over the survey period were dry and calm. Wind speed, although not recorded, was considered to be less than 5 m/s throughout the survey period.
- 3.5 Site Sound Characteristics: The ambient noise level was characterised by road traffic noise from The Broadway and Flower Lane. It is considered that no unusual events occurred during the survey period, and the data are a true representation of background sound levels in the area.
- 3.6 Surveyor: Bernard Templeman MIOA

- 3.7 Results: The results of the survey are summarised below in Table 1, which shows the recorded values of background sound (L_{A90} dB).

Table 1: Summary of Sound Measurement Results

Description	Lowest Measured Background Sound Level
Day (07:00 – 19:00)	34 dB L_{A90} (15 minutes)
Evening (19:00 – 23:00)	29 dB L_{A90} (15 minutes)
Night-time (23:00 to 07:00)	26 dB L_{A90} (15 minutes)

- 3.8 Refer to Appendix 3 for a glossary of terms.

4.0 Plant Noise Criteria

- 4.1 Based upon pre-application discussions with the local planning authority it is understood that the noise limit criteria for mechanical plant associated with the proposed development would be as set out below;

"Evidence that the level of noise emitted from the any proposed plant shall be at least 5dB(A) below the background level, as measured from any point 1 metre outside the window of any room of a neighbouring residential property. If the noise emitted has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or distinct impulse (bangs, clicks, clatters, thumps), then it shall be at least 10dB(A) below the background level, as measured from any point 1 metre outside the window of any room of a neighbouring residential property."

- 4.2 Typically, sound associated with an air source heat pump is broadband in nature and does not have clicks, whines etc., which would make it particularly distinctive. It is also the case that, should the sound limit criteria be met, sound from the unit would tend towards inaudibility and consequently intermittency would not be an issue.
- 4.3 It is suggested therefore the appropriate criterion is for sound from the proposed ASHP be limited to at least 5 dBA below the background sound level.

5.0 Mechanical Plant Sound Emission Limits

- 5.1 Given the sound criterion set out above, the sound control limits for the ASHP, at 1 metre from any residential window, would be as indicated below;

Table 2: Summary of Plant Sound Limits per Hours of Operation

Description	Typical Measured Background Sound Level
Day (07:00 – 19:00)	29 dB LAeq 1hr
Evening (19:00 – 23:00)	24 dB LAeq 1 hr
Night-time (23:00 to 07:00)	21 dB LAeq 5 min

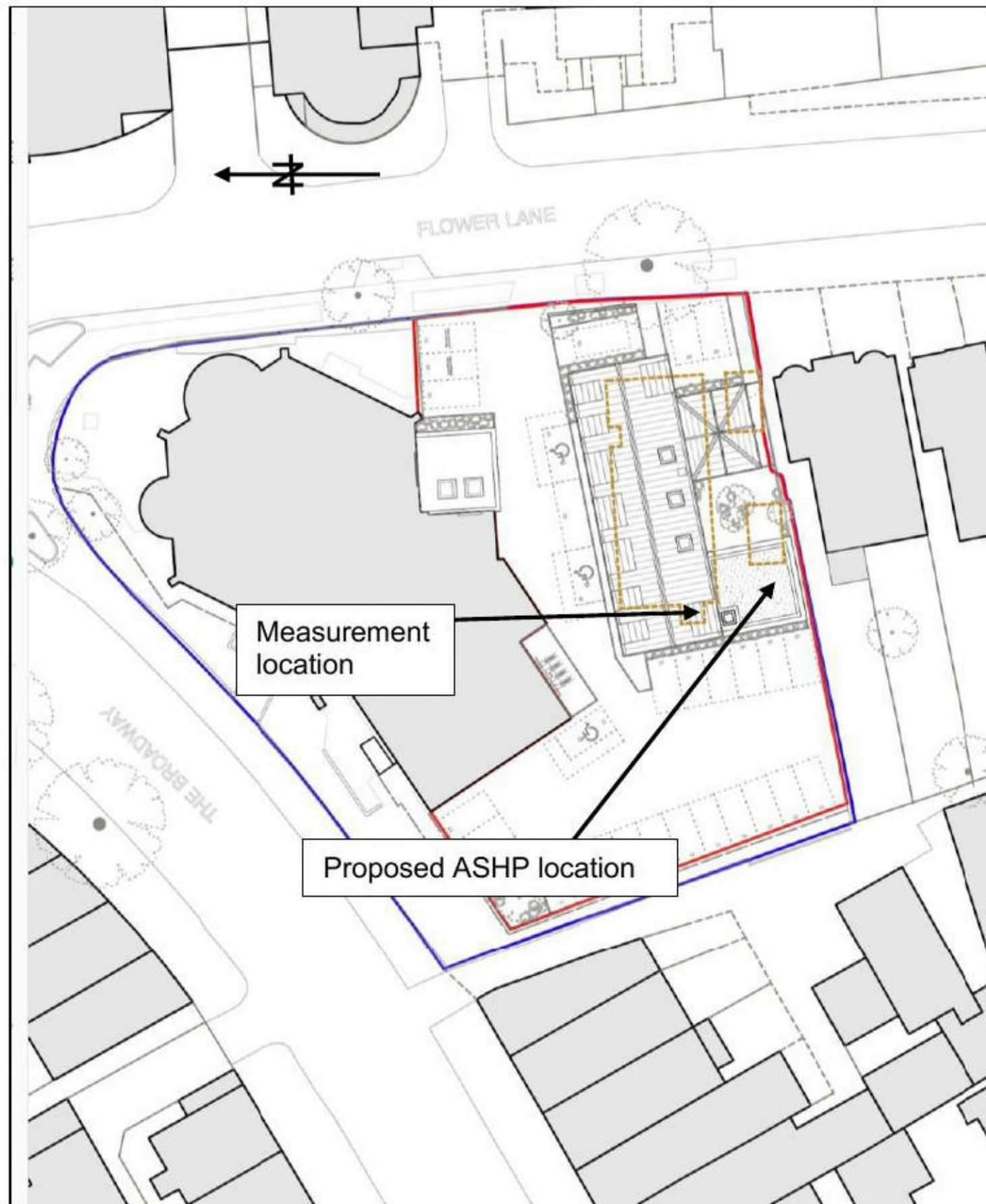
6.0 Conclusion

- 6.1 An environmental sound monitoring survey has been undertaken in the vicinity of the proposed ASHP installation at the Presbytery, 2 Flower Lane, Mill Hill, NW7 2JB in order to establish representative prevailing background sound levels at the worst affected noise sensitive receiver(s), considered to be the residential property at 4 Flower Lane.
- 6.2 Plant sound limits have been established for the proposed ASHP based upon the criterion it is understood is likely to be imposed should consent be granted for the construction of a new presbytery on the site.
- 6.3 Given the measured background sound levels and the likely sound control criterion the sound limits for the proposed ASHP would be as indicated in Table 2 above.

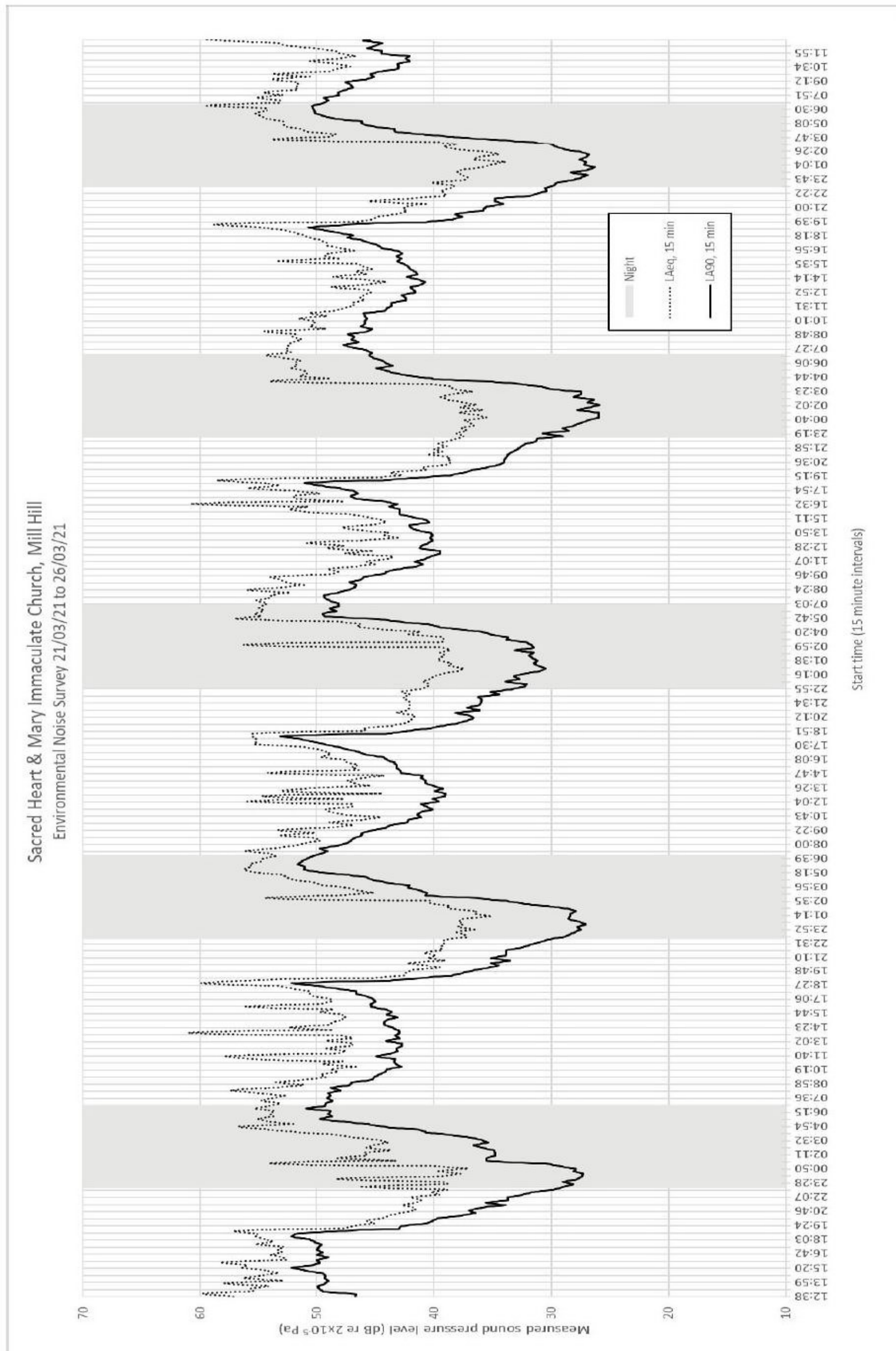
Appendix 1: Site Location



Appendix 2: Measurement and Proposed ASHP Location



Appendix 3: Site Noise Survey Results



Appendix 4: Glossary of Terms

Term	Description	Explanation
	Sound	Unwanted sound. In the explanation given below the words 'sound' and 'sound' can often be used interchangeably, depending on context.
dB	The decibel scale	The decibel (or dB) scale is the scale on which sound pressure levels are commonly measured. It is a logarithmic scale and is used for convenience to compress the audible range of sound pressures into a manageable range, from 0 dB to 140 dB. The zero of the scale, 0 dB, corresponds to the threshold of hearing, 0.00002 Pa, and the upper limit, 140 dB, corresponds to 20 Pa, the threshold of pain.
	Sound pressure	Sound is a disturbance or fluctuation in air pressure, and sound pressure, measured in pascals (Pa), is used as a measure of the magnitude of the sound. The human ear can detect sound pressures in the range from 0.00002 Pa to 20 Pa. This is an enormously wide range and so for convenience sound pressures are commonly measured on a decibel (dB) scale.
L _p	Sound pressure level	Instantaneous value of Sound Pressure Level (L _p).
	Sound power	The sound energy radiated per unit time by a sound source, measured in watts (W)
L _w	Sound power level	Sound power measured on a decibel scale: $L_w = 10\log(W/W_0)$, where W_0 is the reference value of sound power, 10^{-12} W.
f	Frequency	The frequency of a musical note is what gives it its pitch. It is the number of cycles of the fluctuating sound pressure which occur each second, and is measured in cycles per second, or Hertz (Hz). The human ear can detect frequencies in the range 20 to 20 000 Hz. Most sounds and sounds are a mixture of all frequencies, called broad-band sound.
	Octave bands Octave band spectra	In order investigate the frequency content of broad band sounds, called its frequency spectrum, measurements of sound pressure are carried out over a range of frequency bands. The most common method is to split the audio frequency range into 8 or 9 octave bands. An octave is a frequency range from one particular frequency to double that frequency.
	Free-field	A free field sound level measurement is one which is unaffected by the presence of any sound reflecting surfaces. In an outdoor situation this is usually taken to mean with no sound reflecting surfaces within 3 m. of the source.
	Facade correction Factor	The difference between the façade level and the free field level (in the absence of the façade) is called the façade correction factor.
A	A-weighting	One of the three frequency weightings (A, C and Z) used in sound level meters, and defined in BS EN ISO 61672-1; a very widely used method of producing a single figure measure of a broad band sound which takes into account, in an approximate way at least, the frequency response of the human hearing system. The idea is that sound levels measured in this way should give an indication of the loudness of the sound.
L _A (dBA)	A- weighted sound pressure level	The value of the sound pressure level, in decibels, measured using an A-weighting electronic circuit built into the sound level meter. The vast majority of sound measurements are carried out in this way.
L _{Aeq,T}	Equivalent continuous sound level	It represents a measure of the 'average' sound level over the measurement period. It corresponds to the steady level of sound which, over the same period of time, T, would contain the same amount of (A-weighted) sound energy as the time varying sound. Also known as the Average sound level. This is the most common method of measuring time varying sound, and within certain limits gives the best correlation with human response to sound, for example with annoyance.

<p>$L_{AN,T}$</p>	<p>Statistical percentile sound levels</p>	<p>$L_{AN,T}$ is the sound level, usually A-weighted, which is exceeded for N% of the measurement period, T. The most commonly used values are $L_{A10,T}$ used for the measurement and assessment of traffic sound, and $L_{A90,T}$, commonly used as a measure of background sound. $L_{A1,T}$ and $L_{A99,T}$ are also occasionally used to give an indication of the highest and lowest sound levels occurring during the measurement time interval.</p>
	<p>Background sound</p>	<p>Ambient sound which remains at a given site when occasional and transient bursts of higher level ambient sound levels have subsided to typically low levels; it is the sound normally present for most of the time at a given site. It is usually described by the L_{A90} value.</p>
<p>$L_{A90,T}$</p>	<p>Background sound level</p>	<p>Defined in BS 4142 as the value of the A-weighted residual sound at the assessment position that is exceeded for 90 % of a given time interval, T, (i.e. $L_{A90,T}$) measured using time weighting, F, and quoted to the nearest whole number of decibels. (Also see under residual sound). Background sound itself often varies with time and so the $L_{A90,T}$ is almost universally used as the best measure of the 'more or less always present' sound level which underlies short term variations from other sources of sound.</p>