

ATELIER CRESCENDO

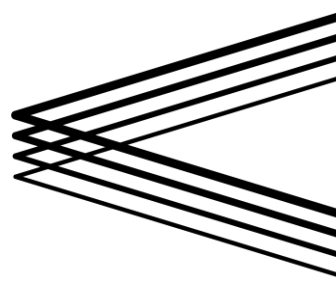
MANCHESTER DIOCESAN BOARD OF FINANCE

**WILLIAM TEMPLE CHURCH,
WYTHENSHAW**

**PLANT NOISE IMPACT ASSESSMENT REPORT
REVISION A**

12/11/2025





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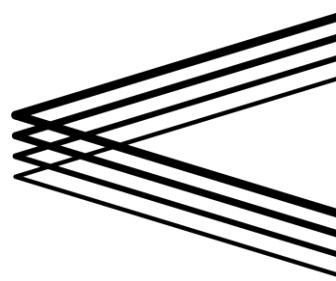
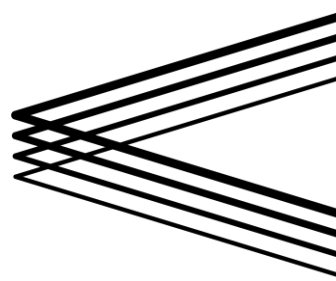


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1 EXECUTIVE SUMMARY

Two air source heat pump (ASHP) units are proposed for installation adjacent to the existing William Temple Church building. The proposed installation relates to the compliance of relevant planning conditions under application reference 142963/FO/2025.

Therefore, Atelier Crescendo have been instructed to undertake a plant noise impact assessment to determine the potential impact of the ASHP units on the nearest residential properties.

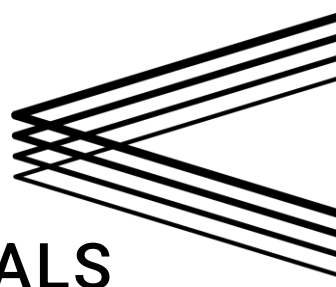
An automated background noise survey has been carried out to establish the typical background noise levels at the nearest residential premises.

Based on the results of the background noise survey, plant noise emission limits have been established. It has been assumed that the proposed ASHP units will only be operational during the daytime.

The acoustic calculations indicate that the proposed ASHP units are in excess against the derived daytime criterion by 2 dB. When interpreted in accordance with BS 4142, this corresponds to a negligible magnitude of impact and is not expected to give rise to adverse effects on residential amenity.

A modest reduction in plant noise during daytime operation can be achieved through reduced fan speed, which would be adequate to achieve full compliance with the daytime criterion.

Should evening or night-time operation is anticipated, additional attenuation (such as acoustic-rated louvred screening or a close-boarded timber screen) may be required to meet the more stringent criteria applicable during these periods.



2 SITE DESCRIPTION AND PROPOSALS

2.1 LOCATION

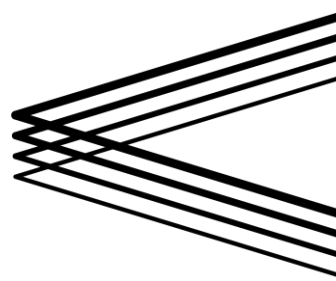
The site is located in Wythenshawe and falls within the jurisdiction of Manchester City Council.

The approximate site location is indicated on Figure 1 below.

Figure 1 – Approximate site location (in yellow)



(Imagery ©2025 Google, Imagery ©2025 TerraMetrics, Map Data ©2025 Google.)



2.2 SITE DESCRIPTION

William Temple Church is a memorial church located at Robinswood Road, Wythenshawe, M22 0BU. The site is situated within a predominantly residential area.

To the north, the site is bounded by a tram line. In wider vicinity of the site adjacent to railroad. Simmonsway, situated further north forming a part of the surrounding residential street network.

To the south and west, the site adjoins established residential properties on Summerville Road, which represent the nearest noise-sensitive receptors. To the east, the surrounding land use also comprises residential development and associated local amenities. Figure 2 below presents an aerial view of the site and surrounding noise-sensitive receptors.

Figure 2 – Site description



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2.3 PROPOSAL

It is proposed to install two air source heat pump (ASHP) units housed within a open slatted wooden enclosure adjacent to the western façade of the church as shown in the figures below.

Figure 3 - Proposed Plant Location (West Elevation)

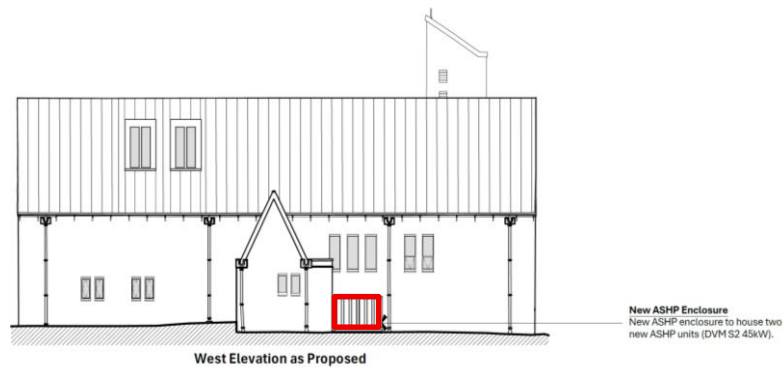


Figure 4 - Proposed Plant Location (South Elevation)

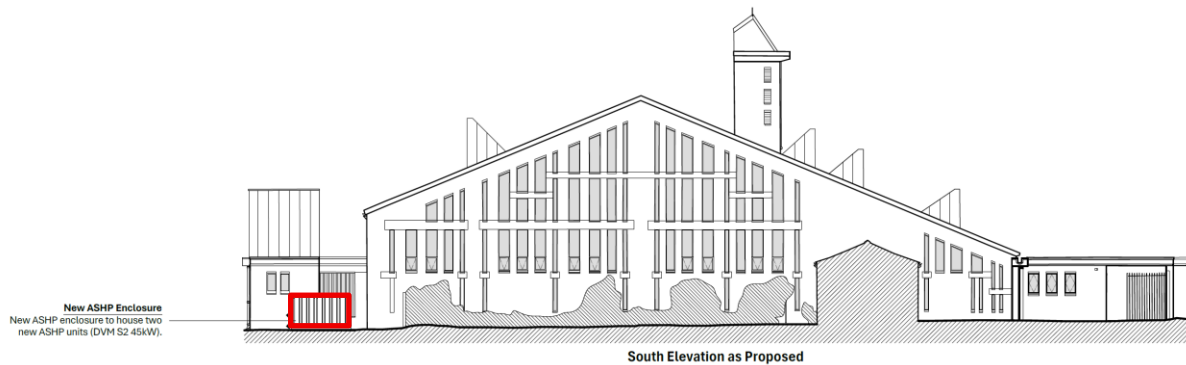
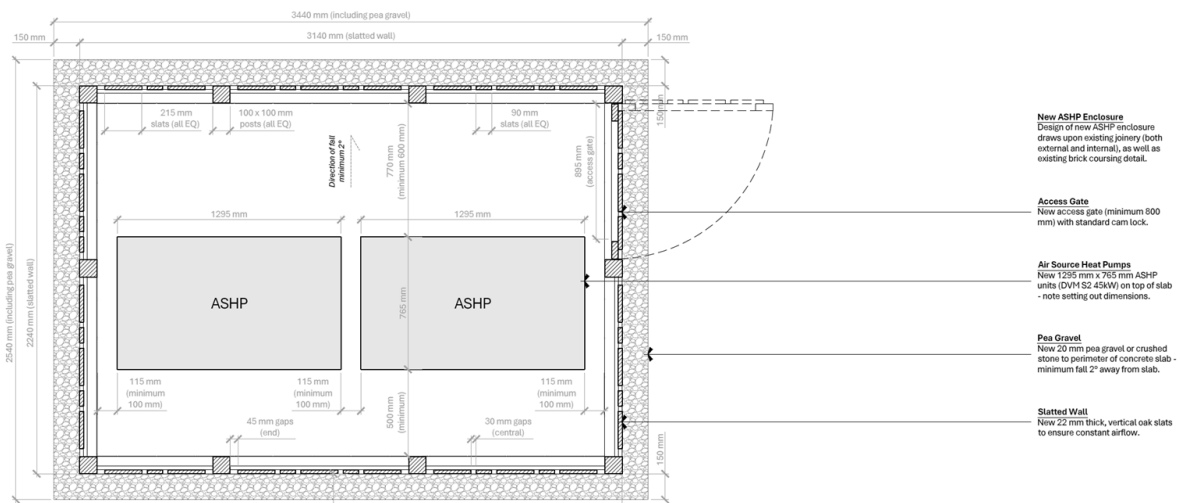
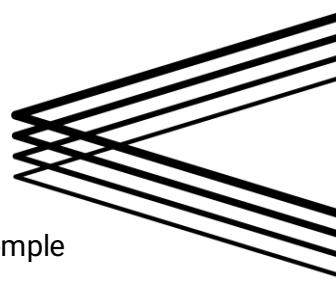


Figure 5 - Proposed Plant and Enclosure (Plan)



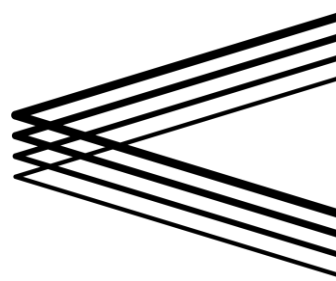


Publicly available information indicates the following routine activities at William Temple Church:

- > Sunday worship service at 10:30 hours, typically of around 1 hour duration.
- > Weekly community session ("Place of Welcome") on Thursdays at 13:00 hours for approximately 2 hours, held at an associated local venue.
- > No additional routine weekday opening hours, regular building access times or programmed activities are formally published at the time of assessment.

Accordingly, it is assumed that activity at the church generally occurs during standard daytime hours, with only occasional community use.

On this basis, it is noted that the proposed ASHP units will not be required to operate during night-time hours (23:00–07:00).



3 LEGISLATION AND GUIDELINES

3.1 LOCAL AUTHORITY REQUIREMENTS

The site falls within the jurisdiction of Manchester City Council.

Planning permission for the installation of two external ASHP units has been granted under application ref. 142963/FO/2025, which includes conditions relevant to plant noise control.

The noise control requirements relevant to this assessment are defined under Condition 4(a) and 4(b) of the planning permission:

*"4a) Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of **5dB (LAeq) below the typical background (LA90)** level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.*

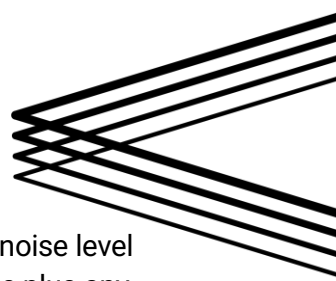
4b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of nonconformity with the recommendations in the verification report shall be detailed along with any measures required to be undertaken prior to operation of the scheme to ensure compliance with the agreed noise criteria."



Note: this report addresses the design and prediction stages only. Post-completion testing is not included at this stage and will need to be undertaken following installation, in accordance with Condition 4(b).

3.2 BRITISH STANDARD 4142 - METHOD FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

BS 4142:2014 describes methods for rating and assessing the effects of outdoor sound levels, of an industrial and/or a commercial nature, *"on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident"*.



The impact of a specific sound is indicated by subtracting the existing background noise level from the rating level (i.e. noise level from the proposed items of plant/machinery/etc plus any acoustic feature corrections).

The standard states that:

- > "a difference of around +10dB or more is likely to be an indication of a significant adverse impact";
- > "a difference of around +5dB is of marginal significance is likely to be an indication of an 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".

The noise from the ASHP units is expressed in terms of a rating level and given as a $L_{Aeq, T}$ noise level. The existing background noise level is expressed in terms of a $L_{A90, T}$ noise level.

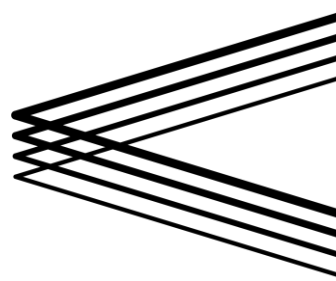
T is the assessment time interval, 1 hour for operations during daytime (07:00 – 23:00) and 15-minutes for operations during night-time hours (23:00 to 07:00 hours).

BS 4142:2014 states that if a noise source contains an 'acoustic feature', such as tonality, intermittency or impulsiveness, a penalty should be applied.

A penalty of between 0 dB and +6 dB can be applied for tonality, and the standard states, *"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"*.

A penalty of up to +9dB can be applied for impulsivity, and the standard states. *"Subjectively, this can be converted to a penalty of +3 dB for impulsivity which is just perceptible at the noise receptor, +6dB where it is clearly perceptible, and +9 dB where it is highly perceptible"*.

A penalty of +3dB can be applied for intermittency, and the standard states: *"When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."*



4 BACKGROUND NOISE SURVEY

4.1 OVERVIEW

A fully automated background noise survey was undertaken from Wednesday 15 October 2025 until Friday 17 October 2025.

The purpose of the noise survey was to determine representative background noise levels at the nearest residential properties over daytime (07:00 – 19:00), evening time (19:00 – 23:00) and night-time (23:00–07:00) periods.

The results of the survey have been used to inform a plant noise assessment at the nearest noise sensitive properties.

Measurements were taken of the A-weighted (dBA) L₉₀ sound pressure levels continuously over periods of 15 minutes.

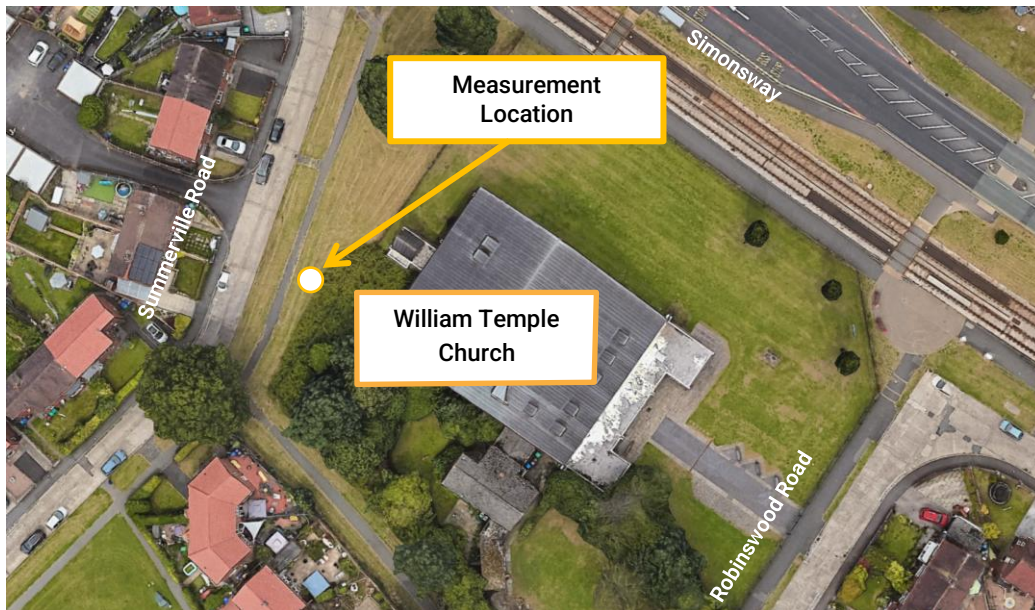
4.2 MEASUREMENT LOCATION

The noise level measurements were undertaken at a single position as described in the Table 1 below and shown on Figure 6 below.

Table 1 - Description of the measurement location

<i>Measurement Location</i>	Description
1	The sound level meter was located externally at the back of the church, at approximately 1.5 meters above ground level. This location was selected to obtain the typical daytime, evening time and night-time background noise levels representative of those that would be measured at the nearest noise sensitive property to the north west of the site.

Figure 6 - Noise Measurement Location



4.3 MEASUREMENT EQUIPMENT

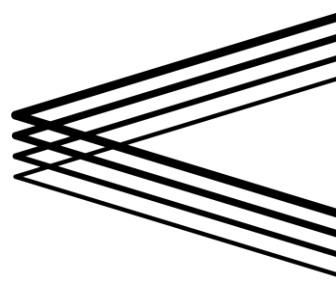
The Table 2 below presents the details of the instrumentation used to undertake the measurements.

Table 2 - Details of measurement instrumentation

<i>Equipment</i>	<i>Manufacturer & Model</i>	<i>Serial Number</i>	<i>Calibration Due Date</i>
<i>Sound level meter</i>	Svantek Type 971a	121113	07/03/2026
<i>Pre-amplifier</i>	Svantek SV 18A	123672	
<i>Microphone</i>	Svantek Type 7152	84672	
<i>Calibrator</i>	Svantek SV33B	139040	23/02/2026

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

The equipment was calibrated prior to and on completion of the survey. No significant deviations occurred (no more than 0.1 dB).



4.4 SURVEY RESULTS

For the purpose of the assessment, Table 3 below details the typical background noise levels measured during daytime (07:00–19:00), evening time (19:00–23:00) and night-time (23:00–07:00) periods.

Table 3 – Results of background noise survey at the measurement location

<i>Time period</i>	Typical Background Noise Level
	$L_{A90,T}^*$
Daytime (07:00–19:00)	41 dB
Evening time (19:00–23:00)	37 dB
Night-time (23:00–07:00)	28 dB

*T=1 hour for daytime and evening time periods; T=15min for night-time period

Appendix B includes the Time History Graph. It presents the 15-minute A-weighted (dBA) L_{90} background noise levels measured throughout the duration of the survey.

4.5 METEOROLOGICAL CONDITIONS

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire duration of the survey.

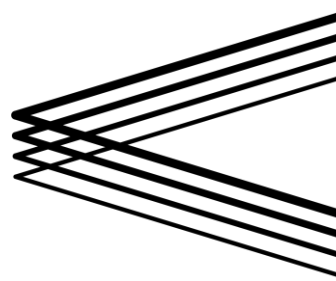
However, at the beginning and the end of the survey, the ground was identified to be dry under foot and the wind conditions were perceived lower than 5 m/s.

The local temperature was recorded as approximately 10-12°C during the day and 10°C at night.

These conditions were considered suitable to undertake accurate and reliable environmental noise measurements around the site.

4.6 DISCUSSION OF NOISE CLIMATE

During attendance on site, the dominant noise sources at the measurement location were observed to be road traffic on Simmonsway and periodic rail movements on the nearby rail line.



5 PLANT NOISE ASSESSMENT

5.1 OVERVIEW

As outlined in Section 2.3, the proposal includes the installation of two ASHP units to serve the primary internal areas of the building. The units are to be positioned on the western façade of the church.

Based on the results of the background noise survey set out above, the following section defines the plant noise emission criteria to ensure compliance at the nearest residential receptors during operation.

5.2 PLANT NOISE EMISSION LIMITS

As required by the planning condition, noise from the proposed plant must be controlled such that the BS 4142 rating level is at least 5 dB below the prevailing background sound level at the nearest noise-sensitive properties.

Using the background sound levels established in Section 4.4, the following table sets out the cumulative plant noise emission limits not to be exceeded at the nearest residential receptors during the daytime (07:00–19:00), evening (19:00–23:00) and night-time (23:00–07:00) periods.

Table 4 – Plant noise emission limits

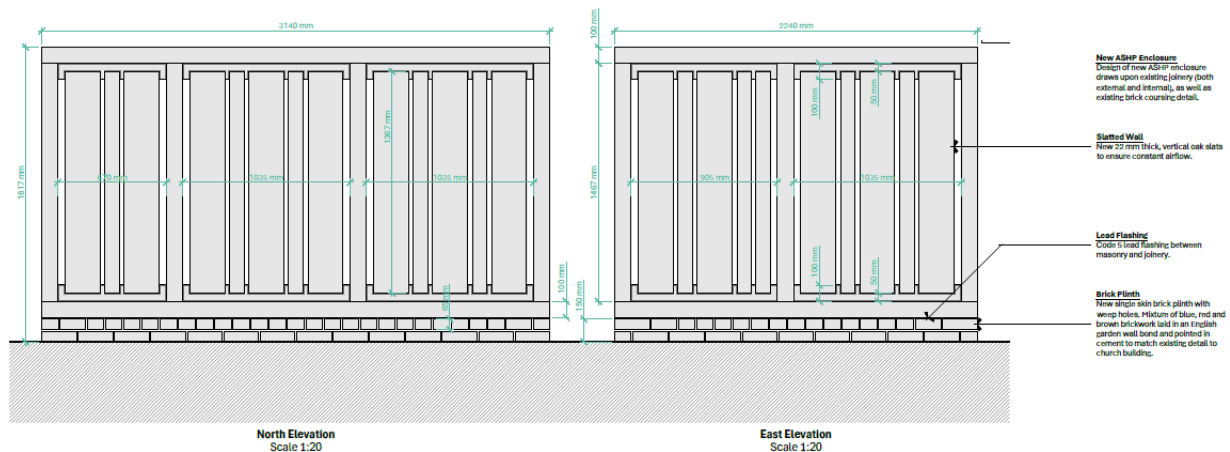
<i>Time period</i>	Plant Noise Emission Limits
	(to be achieved at 1m from any noise sensitive window) L_{A,T_r}^*
Daytime (09:00 – 19:00)	36 dB
Evening time (19:00 – 23:00)	32 dB
Night-time (23:00 – 07:00)	23 dB

* T_r =1hour for daytime and evening time periods; T_r =15 min for night-time period

5.3 ENCLOSURE DESIGN

The ASHP units are proposed to be installed on a reinforced concrete slab. A timber slatted enclosure comprising 22 mm vertical oak slats with gaps for ventilation is proposed to surround the units as shown in the figure below.

Figure 7 – Proposed enclosure design



The slatted construction incorporates open gaps resulting in negligible reduction of airborne noise, is therefore widely considered acoustically transparent when compared to purpose-designed acoustic enclosures.

On this basis, no meaningful acoustic screening effect is to be anticipated.

5.4 PROPOSED PLANT SELECTION

The proposed ASHP unit together with the manufacturer-supplied model information and associated sound pressure (L_{pA}) level per single unit is presented in the table below.

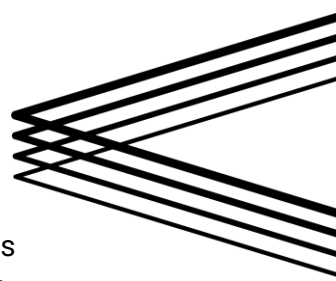
Table 5 – Plant description and noise emission data

Plant Description / Model	Plant Dimensions	L_{pA} at 1m *
Samsung DVM S2 45kW AM160AXVAGH	1295 x 1695 x 765 (WxHxD in mm)	62 dB

*Per single unit



Note 1: frequency spectrum data was not explicitly available within the manufacturer's acoustic specification. As such, the assessment will be undertaken using overall sound pressure level at 1m.



Note 2: from previous experience and projects using similar equipment, it is understood that the proposed ASHPs are likely to be free from any tonality.

5.5 PLANT DISTANCE TO NEAREST RESIDENTIAL PREMISES

The nearest noise-sensitive receptors have been determined through a review of the site layout and surrounding built environment (Figure 2).

Distances have been measured from the proposed ASHP location to the points 1 m from residential façades are detailed in the table below.

Table 6 – Plant distance to nearest residential premises

<i>Noise-Sensitive Receptor</i>	<i>Plant Distance to 1 m from NSR Façade</i>
27 Summerville Road	34 m
29 Summerville Road	33 m
44 Summerville Road	35 m

Based on measured distances, 29 Summerville Road is the closest residential receptor to the proposed plant location and is therefore considered the nearest noise-sensitive receptor for the purposes of this assessment.

5.6 PLANT NOISE CALCULATION RESULTS

Plant noise calculations have been carried out using the manufacturer's A-weighted sound pressure level at 1 m for the ASHP units, with logarithmic summation applied to represent simultaneous full-duty operation.

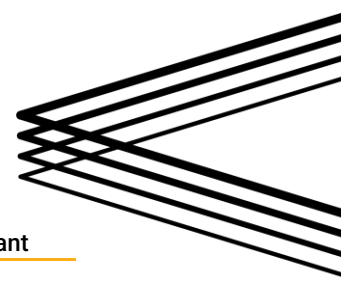
A +3 dB source-side reflection allowance has been included to reflect the close proximity (~1m) of the units to an adjacent hard building façade.

Distance attenuation has then been applied to determine the resultant sound levels at the nearest residential façades.

The calculation results are presented in Table 7 below.

Table 7 – Plant noise calculation

	<i>Description of calculation item</i>	<i>Resultant</i>
[1]	Sound Pressure Level of 1 No. ASHP Unit - L_{pA}	62 dBA
[2]	Sound Pressure Level of 2 No. ASHP Units - L_{pA}	65 dBA
[3]	Source-side reflection from adjacent hard surface	+ 3 dBA
[5]	Total Sound Pressure Level at 1m from plant = [2]+[3]	68 dBA



	Description of calculation item	Resultant
[6]	Distance Attenuation (r=33 m)	- 30 dBA
[7]	Acoustic Feature Penalty	0 dBA
[8]	Total Noise Rating Level at 1m from NSR façade $L_{A,r,Tf} = [5] + [6] + [7]$	38 dBA

5.7 ASSESSMENT AGAINST PLANNING CONDITION CRITERIA

The predicted plant noise levels at the nearest residential façade have been compared against the design criterion requiring plant-related sound to be at least 5 dB below the prevailing background sound level.

The comparison between the predicted plant noise levels and the planning condition daytime criteria is presented in Table 8 below.

Table 8 – Assessment against Planning Condition Criteria

NSR	Assessment against Noise Criteria
	Day
Calculated Plant Noise Level at 1m from NSR Façade	38 dBA
Measured Background Noise Level	41 dBA
Plant Noise Limits – Design Criteria	36 dBA
Difference against Criteria	+ 2 dBA
Compliance	Exceeds

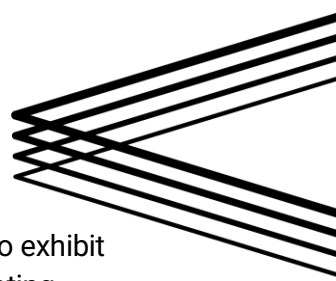
Operational hours for the ASHPs are understood to be only daytime (between 07:00 and 19:00 hours).

On this basis, the assessment indicates a **2 dB excess** against the Planning Condition 4(a) during daytime operation.

5.8 BS4142 ASSESSMENT OF ACOUSTIC IMPACT

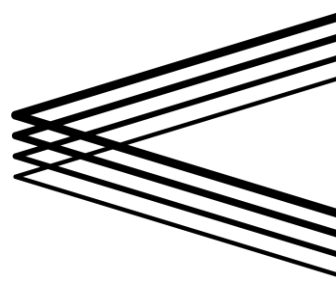
In accordance with BS 4142:2014+A1:2019 (see Section 3), a rating difference of +1 to +2 dB is typically considered to be not significant and unlikely to be perceptible.

The standard states that where the rating level does not exceed the background level, the specific sound source has a low impact, and where it only marginally exceeds the background (e.g., by 1–2 dB), the acoustic impact is generally regarded as negligible.



No acoustic feature penalty has been applied, as the ASHP units are not expected to exhibit distinct tonality, impulsivity, or intermittency at the residential receptors when operating continuously. The rating level is therefore treated as equal to the specific sound level.

On this basis, while the calculated plant noise marginally exceeds the Planning Condition, the magnitude of impact is considered negligible, and no adverse effect on residential amenity is expected.



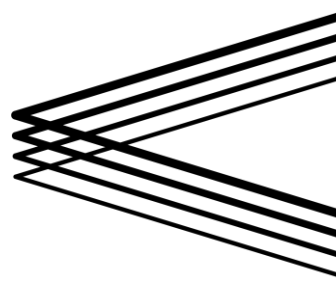
6 MITIGATION CONSIDERATIONS

In accordance with the BS 4142:2014+A1:2019 assessment presented above, the predicted exceedance of 2 dB against the daytime plant noise criterion corresponds to a negligible magnitude of impact and is not expected to give rise to adverse effects on residential amenity. Notwithstanding this, a modest reduction in plant noise would be sufficient to ensure full compliance with Planning Condition 4(a).

A number of proportionate mitigation measures are available to achieve the required reduction. The most practical approach is the implementation of reduced fan speed (i.e. quiet mode) operation, which is generally supported by the selected ASHP model. This operational setting typically reduces fan rotational speed and/or compressor duty, yielding a reduction in the order of 2-3 dB, which would be adequate to achieve compliance with the daytime plant noise emission limit. This needs to be verified with the ASHP manufacturer.

Should evening or night-time operation be required (such as for occasional events), greater reductions would be required in order to comply with the more stringent criteria applicable to those periods. In these circumstances, a higher-performance acoustic enclosure would be necessary. For example, acoustic-rated louvred screening can provide insertion losses in the range of 15–30 dB, subject to panel depth, internal absorptive lining, and open area ratio.

As an alternative to an acoustic-rated louvred enclosure, a close-boarded timber screen of approximately 2.0 m in height, positioned no less than 2.0 m from the ASHP units to maintain adequate airflow, may provide a cost-effective means of line-of-sight attenuation. The screen would only be required to the western and southern elevations of the plant area, thereby obstructing the primary propagation paths to nearby residential receptors.



7 CONCLUSION

A plant noise impact assessment has been undertaken for the proposed ASHP installation at William Temple Church, in accordance with the methodology set out in BS 4142, to determine the potential impact at the nearest noise-sensitive receptors.

The plant noise calculation result identifies a 2 dB exceedance of the daytime plant noise criterion derived from Planning Condition 4(a), being 5 dB lower than the measured background noise levels at site. This margin corresponds to a negligible magnitude of impact under BS 4142 and is not expected to give rise, hence result in an adverse effect on nearest noise-sensitive residential premises.

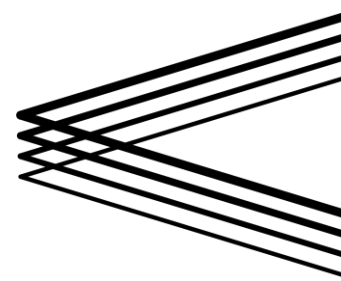
A modest reduction in plant noise, achievable through minor operational adjustments (i.e., reduced fan speed) or a small enhancement to the proposed physical screening, would be sufficient to achieve full compliance with the planning condition.

Should evening or night-time operation be anticipated, higher-performance screening options should be considered to ensure compliance with the more stringent criteria applicable to those periods.

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APPENDIX A

ACOUSTIC TERMINOLOGY



<i>Terminology</i>	<i>Description</i>
<i>Sound Pressure</i>	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
<i>Decibel (dB)</i>	Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
<i>A-weighting, dB(A)</i>	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
<i>$L_{eq,T}$</i>	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.
<i>L_{max}</i>	L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.
<i>L_{90}</i>	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{90} is the level exceeded for 90% of the time and as such can be regarded as the background noise level'.
<i>Façade</i>	At a distance of 1m in front of a large sound reflecting object such as a building façade.
<i>Octave Band</i>	Octave Band A range of frequencies whose upper limit is twice the frequency of the lower limit.

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APPENDIX B

TIME HISTORY GRAP

