ATELIER **CRESCENDO**

DIOCESE OF MANCHESTER

WILLIAM TEMPLE CHURCH, WYTHENSHAWE

Plant Noise Impact Assessment Report

Revision B

17/07/2026

Document Version	Date	Author	Comments
A	10/11/2025	Marc Fuzellier-Hart	-
B	17/07/2026	Marc Fuzellier-Hart Francis Goodall	Added commissioning testing results (Planning Condition 4(b) compliance)

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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.

Revision B of this report adds the commissioning plant noise measurements that have been carried out upon completion of the ASHP installation. This demonstrates that the Planning Condition criteria are achieved for the operational time periods, i.e. daytime, of the plant.

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 2.1 below.

Figure 2.1 – Approximate site location (in yellow)



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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 railway 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 2.2 – Site description



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2.3 PROPOSAL

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

Figure 2.3 - Proposed Plant Location (West Elevation)

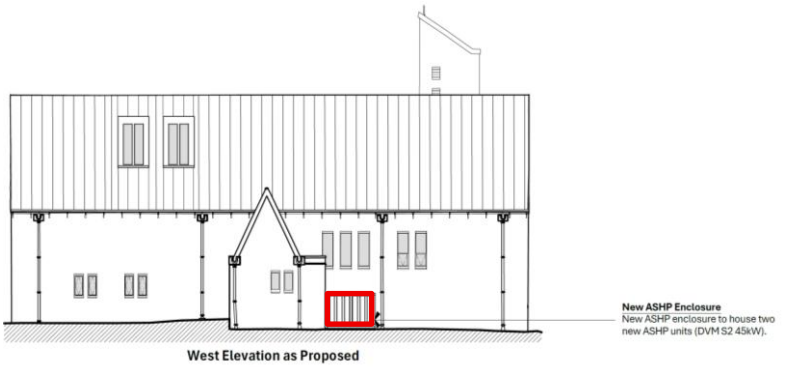


Figure 2.4 - Proposed Plant Location (South Elevation)

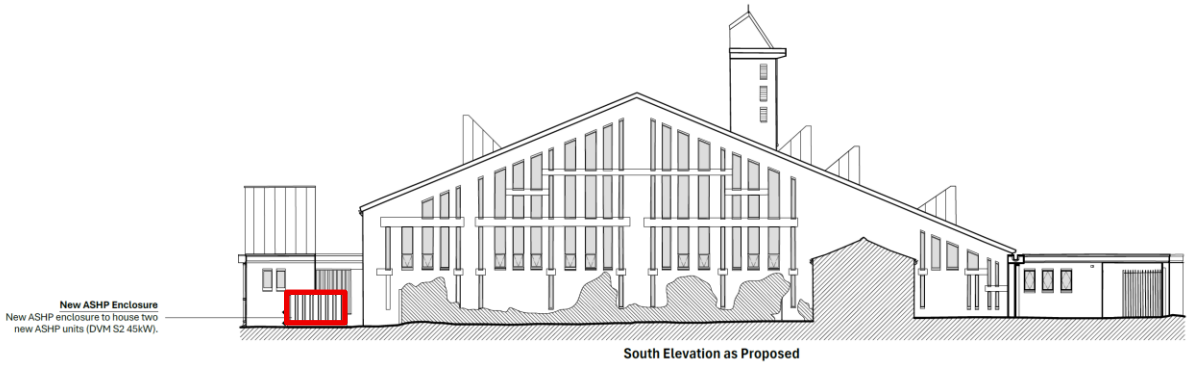
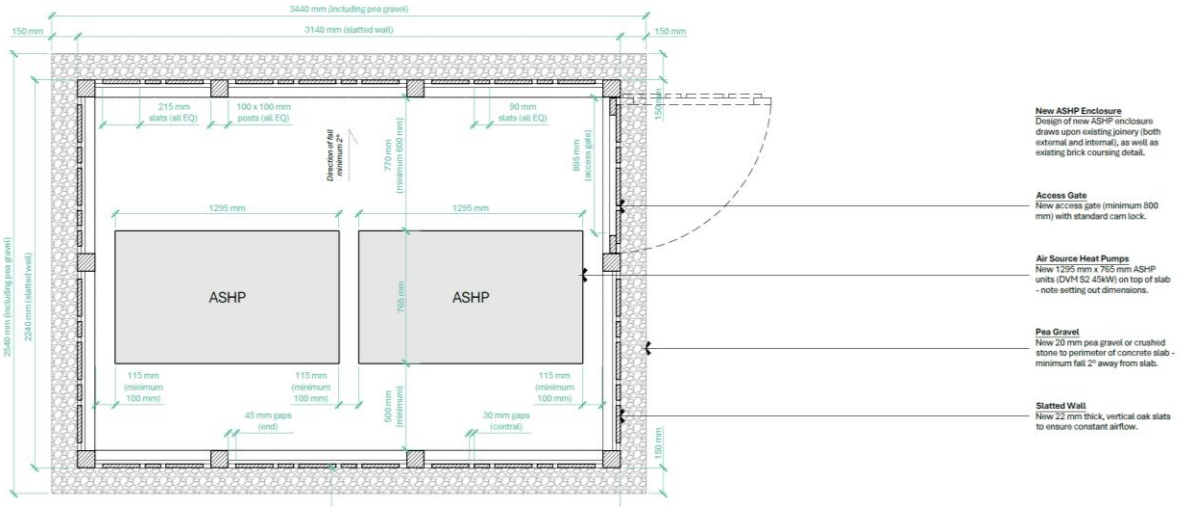


Figure 2.5 - Proposed Plant and Enclosure (Plan)



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 only be operation during daytime hours (07:00–23:00).

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 that 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) L_{90} 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 below and shown on Figure 4.1 below.

Table 1 - Description of the measurement location

Measurement Location	**Description**
1	The sound level meter was located externally within the existing central courtyard, 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 south of the site.

Figure 4.1 - 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

Equipment	Manufacturer & Model	Serial Number	Calibration Due Date
Sound level meter	Svantek Type 971a	121113	07/03/2025
Pre-amplifier	Svantek SV 18A	123672	
Microphone	Svantek Type 7152	84672	
Calibrator	Svantek SV33B	139040	23/02/2024

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

Time period	**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=1hour 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

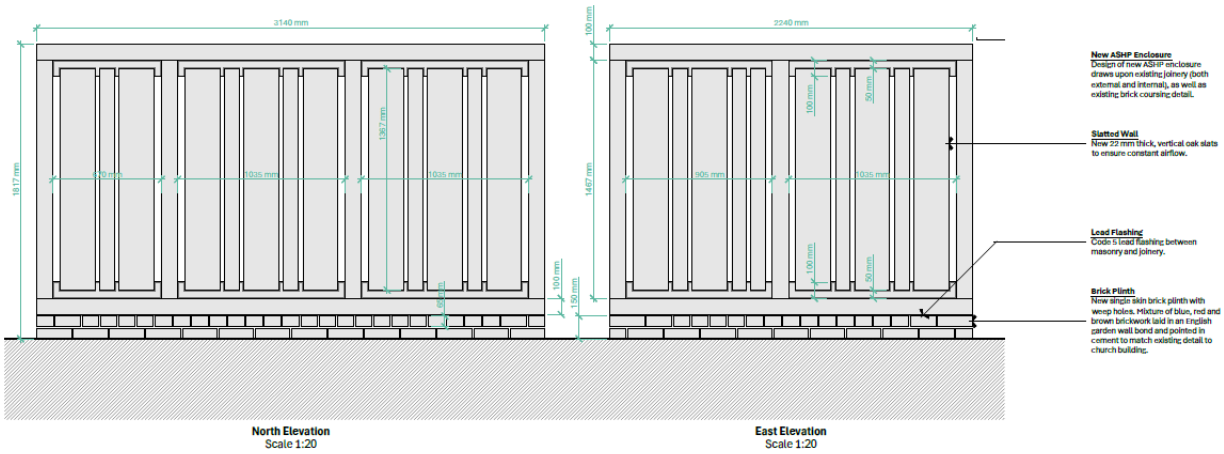
Time period	**Plant Noise Emission Limits** **(to be achieved at 1m from any noise sensitive window)** **$L_{Ar,Tr}$***
Daytime (09:00 – 19:00)	36 dB
Evening time (19:00 – 23:00)	32 dB
Night-time (23:00 – 07:00)	23 dB

*Tr=1hour for daytime and evening time periods; Tr=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 5.1 – 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 that frequency spectrum data were not available within the manufacturer's acoustic specification. As such, the assessment will be undertaken using overall sound pressure level at 1m.

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

Noise-Sensitive Receptor	**Plant Distance to 1 m from NSR Façade**
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 the table below.

Table 7 – Plant noise calculation

	Description	**Resultant**
[1]	*Sound Pressure Level of a single ASHP Unit - L_{pA}*	62 dBA
[2]	*Sound Pressure Level of two 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
[6]	Distance Attenuation (r=33 m)	- 30 dBA
[7]	Acoustic Feature Penalty	0 dBA
[8]	Total Sound Pressure Level at 1m from NSR façade $L_{Aeq,T}$ =[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 criteria is presented in the table below.

Table 8 – Assessment against Planning Condition Criteria

	Assessment against Noise Criteria		
NSR	**Day**	**Evening**	**Night**
Calculated Plant Noise Level at 1m from NSR Façade		38 dBA	
Measured Background Noise Level	41 dBA	37 dBA	28 dBA
Plant Noise Limits – Design Criteria	36 dBA	32 dBA	23 dBA
Difference against Criteria	+ 2 dBA	+ 6 dBA	+ 15 dBA
Compliance	Exceeds	Exceeds	Exceeds

Operational hours for the ASHPs have yet to be confirmed; however, for the purposes of this assessment it has been assumed that the units will operate during daytime periods only (07:00 – 19:00). 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 COMMISSIONING TESTING

Acoustic commissioning tests have been carried out on the installed plant at the site in order to verify the noise emissions of the installation in accordance with Planning Condition 4(b). The testing took the form of the following measurement steps:

- 5-minute measurement of ambient noise (with plant off) to verify measurements);
- 1-minute measurement of plant in steady-state operation at set distance from plant;
- Comparison of measured noise level at set distance to those set out within the original assessment calculations (Table 7, calculation step [5])

Details on the commissioning testing are provided in the following sections, with subsequent discussion on the results and outcomes.

Due to the arrangement of plant, including the visual screening plant enclosure (no acoustic screening assumed to be provided), measurements have been carried out at a distance of 1.5m from the plant, which corresponds to 1m outside the plant enclosure. This is accounted for within the results discussion set out in Section 6.4.

6.1 MEASUREMENT EQUIPMENT

Table 9 presents the details of the instrumentation used to undertake the measurements.

Table 9 - Details of measurement instrumentation

Equipment	**Manufacturer & Model**	**Serial Number**	**Calibration Due Date**
Sound level meter	Svantek Type 971a	121113	22/06/2027
Pre-amplifier	Svantek SV 18A	123672	
Microphone	Svantek Type 7152	84672	
Calibrator	Svantek SV33B	139040	22/06/2027

The microphone was fitted with a suitable windshield throughout the measurements.

The equipment was calibrated prior to and on completion of the measurements. No significant deviation in calibration occurred.

A photograph of the noise measurement equipment in-situ is presented in Figure 6.1.

Figure 6.1 Commissioning testing sound level meter location



6.2 Meteorological Conditions

Weather conditions were sunny, with no clouds or rain, and no measurable wind speed throughout the commissioning measurements.

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

6.3 Discussion of Noise Climate

During attendance on site, the dominant noise sources at the measurement location were observed to be road traffic on the nearby road network.

6.4 Survey Results

Table 10 below details the commissioning testing results.

Table 10 – Commissioning testing results

Measurement	Measurement duration, T (mins)	Noise measurement result, $L_{Aeq,T}$ (dB)
Ambient noise measurement (without plant)	*5*	*47*
Plant source measurement (1.5m from both plant items in operation)	*1*	*57*

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

Plant noise measurements have been verified by the comparison with the measured ambient noise levels at the microphone location (specific noise levels of plant of $L_{Aeq,T}$ 57 dB, i.e. 10 dB above the ambient noise level).

In order to facilitate direct comparison with the initial project assessment, the measured noise level at 1.5m has been corrected to 1.0m within the assessment steps set out in Table 11.

Table 11 – Plant noise verification

	Description	Result
[1]	Measured sound pressure level at 1.5m, $L_{Aeq,1min}$ (dB)	57
[2]	Corrected sound pressure level at 1.0m, $L_{Aeq,1min}$ (dB)	61
[3]	Previously predicted sound pressure level at 1.0m, $L_{Aeq,1min}$ (dB)	68
[4]	Difference =[3]-[2]	-7
[5]	Previously predicted noise level at NSR facades $L_{Ar,Tr}$ (dB)	38
[6]	Corrected sound pressure level at NSR facades $L_{Ar,Tr}$ (dB) =[5]-[4]	31

Based on the updated calculations using the in-situ measurements of plant installed at the site, the source noise levels at 7 dB below the level previously assumed.

Table 12 – Assessment against Planning Condition Criteria

	Assessment against Noise Criteria		
NSR	**Day**	**Evening**	**Night**
Plant Noise Level at 1m from NSR Façade, L_{ArTr} *(dB)*		31	
Measured Background Noise Level, $L_{A90,T}$ (dB)	41	37*	28*
Plant Noise Limits – Design Criteria L_{ArTr} (dB)	36	32*	23*
Difference against Criteria (dB)	-5	-1*	+8*
Compliance	Complies	Complies*	Exceeds*

*Note: daytime operation only, evening and night time provided for context only

The results of the commissioning testing in accordance with Planning Condition 4(b) show that during the proposed operational periods, i.e. daytime, the planning condition criteria are met.

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.

Further to the initial plant noise assessment, commissioning tests have been carried out at the site upon completion of the plant installation. The resulting noise levels and associated predicted noise levels at the facades of noise sensitive receptors during operational times of plant demonstrate that the requirements of Planning Condition 4(b) have been met.

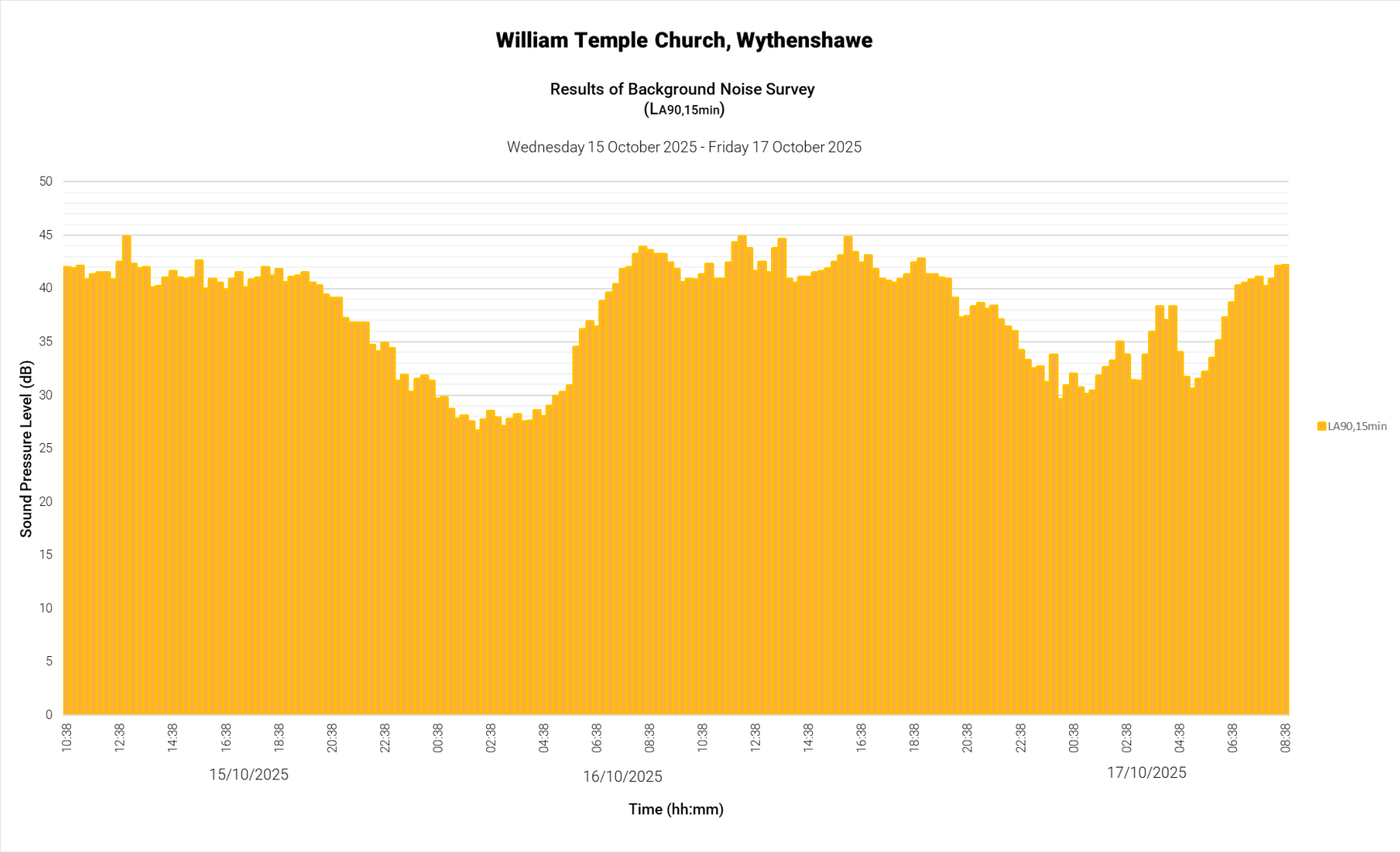
Appendix A

Acoustic Terminology

Terminology	**Description**
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Decibel (dB)	Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
A-weighting, dB(A)	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.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L_{max}	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.
L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L90 is the level exceeded for 90% of the time and as such can be regarded as the background noise level'.
Façade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Octave Band	Octave Band A range of frequencies whose upper limit is twice the frequency of the lower limit.

Appendix B

Time History Graph


William Temple Church, Wythenshawe
Results of Background Noise Survey
(LA90,15min)
Wednesday 15 October 2025 - Friday 17 October 2025
Sound Pressure Level (dB)
50
45
40
35
30
25
20
15
10
5
0
10:38
12:38
14:38
16:38
18:38
20:38
22:38
00:38
02:38
04:38
06:38
08:38
10:38
12:38
14:38
16:38
18:38
20:38
22:38
00:38
02:38
04:38
06:38
08:38
15/10/2025
16/10/2025
17/10/2025
Time (hh:mm)
LA90,15min