



Acoustic Assessment Report

Environmental Noise Assessment:

Proposed New Build Youth Room & Creche
Authentic City Church
Crowcroft Road
Levenshulme
Manchester M12 4QD

Report reference: AE0030

Report date: 8th June 2022

Pages: 15

Version: Issue 1

Prepared for:

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2.2 Introduction

Aether Acoustics is appointed by Authentic City Church to carry out an assessment of potential noise break-out from a proposed new youth room and creche at the rear of the church in Longsight. The new building would replace an existing timber building used for the same purposes.

It is understood that the building would typically only be used on Sundays during church service times (09:00-20:00hrs).

Air handling services associated with the scheme can be summarised as domestic type inline extractor fans for kitchen area and WC, which would only operate during the hours described above. No outdoor air handling or refrigeration units would be proposed.

This report addresses the potential impact of the proposal on nearby noise sensitive receptors. The acoustic assessment includes sections covering the following aspects:

- The results of a baseline noise survey at the site during a Sunday daytime period.
- Criteria for acceptable noise levels incident on nearby dwellings, based on recognised guidance.
- Establishment of internal noise limits for the new youth room, with comments on feasibility of compliance.
- Recommendations on sound insulation specifications for new glazing and other elements.

2.0 Baseline Noise Survey

2.1 Measurement Procedures

The instrumentation used for the environmental noise survey consisted of a Svantek SV 971 Type 1 precision sound level meter and B&K 4231 calibrator. Laboratory calibration certificates are included at the end of this report.

The equipment was calibrated before and after the noise measurements. The sound level meter measured A-weighted (fast response) noise levels as well as single octave band noise levels for all measurements recorded.

Stratton Barrett undertook all noise measurements on Sunday 22nd May 2022 at the locations shown in Figure 1 below. Weather at the time of measurement was dry with low wind speeds.



Figure 1: Aerial photograph of site area with measurement locations shown in red

2.2 Measured Background Sound Levels

Background sound levels were measured in the vicinity of Crowcroft Road and near dwellings on Slade Hall Road during an afternoon period (13:20 – 14:30).

Full results of the noise levels recorded by Aether Acoustics during the course of the noise survey are included in Appendix A of this report.

The following table summarises the results of the measurements in terms of averaged statistical noise levels.

Location	Period	Description	L_{Amax}	L_{Aeq}	L_{A90}
1	13:20 – 13:40	Front of church site, approx. 15m from Crowcroft Road	84	57	43
2	13:50 – 14:30	Slade Hall Road approx. 25m from railway	81	53	44

Table 1: Summary of averaged noise measurement results (dBA)

A statistical analysis of the measured $L_{A90,5min}$ samples would suggest that the typical background sound level is approx. 42 - 45dB for the measured period. A BSL of 42dB L_{A90} has been adopted in the assessment as a conservative figure to account for potentially quieter periods during the day when railway traffic is lighter.



2.3 Description of the Noise Climate

The noise climate in the vicinity of the church is dominated by road traffic using surrounding routes as well as frequent noise events from passing trains along the main line to the West of the site. Maximum levels up to around 84dB were measured during the survey.

3.0 Noise Assessment Criteria

In order to assess the existing noise impact of the club on nearby receptors, Aether Acoustics has reviewed the following guidance documents and standards:

- British Standard 8233: 2014
- World Health Organisation Guidelines on Community Noise
- British Standard 4142: 2014
- Manchester City Council Noise Planning Guidance

3.1 BS 8233: 2014

BS 8233 provides a code of practice for the sound insulation of a variety of building types affected by general environmental noise. It provides recommendations for control of noise in and around buildings and suggests appropriate internal ambient noise level criteria / limits for a variety of different situations including residential properties.

The following table summarises the noise limits suggested by BS 8233 applying to residential properties.

Activity	Room	Good Design Range $L_{Aeq, T}$ dB	
		07:00-23:00hrs	23:00-07:00hrs
Resting	Living rooms	35	-
Dining	Dining room / area	40	-
Sleeping (or daytime resting)	Bedrooms	35	30

Table 3: Noise limits inside residential properties suggested in BS 8233

3.2 WHO Guidelines on Community Noise

In 1980 the World Health Organisation proposed environmental health criteria for community noise including consideration of noise levels at which sleep disturbance may take place.

The guidance suggests that an internal L_{Aeq} below 30dB is required to preserve the restorative process of sleep. This is equivalent to a free-field level of around 42 to 45dB L_{Aeq} or a façade level of 45 to 48dB L_{Aeq} , assuming open windows.

Section 4.3.1 of the document also defines reasonable outdoor noise limits with the aim of protecting outdoor amenity users from annoyance. In order to protect the majority of people from annoyance, an outdoor limit of 55dB L_{Aeq} from steady, continuous noise is recommended.



3.3 BS 4142: 2014

British Standard 4142: 2014 “Methods for assessing and rating industrial and commercial sound” describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The standard provides the following guidance as relates noise impact and the difference between the source (rating level) and background sound levels:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

BS 4142 notes that: 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.

It should be noted that BS 4142 states that the assessment method in the standard is not intended to be applied to the rating of sound from recreational activities or music and other entertainment.

3.4 Manchester City Council Policy Document GD03

The GD03 guidance document provides developers with information related to Manchester City Council policy on discharging planning conditions imposed by the City Wide Environmental and Public Protection Team. The document has specific sections covering policy on noise from entertainment venues, fixed plant and equipment etc. The document states, ‘A planning application for an entertainment venue should demonstrate that music noise from the proposal will not be audible inside residential properties nearby assuming that the residential properties in question have their windows open. The target noise criteria here should be 10dB (L_{Aeq}) below the existing L_{A90} in each octave band.’

Further to feedback from the Manchester City Council in relation to similar previous projects, it is understood that compliance with the following criteria would be acceptable in order to discharge conditions relating to entertainment noise (which in this case would replace the requirement for 10dB below the existing L_{A90} in each octave band):

- ‘ L_{Aeq} (entertainment noise) should be controlled to 10dB below the L_{A90} (without entertainment noise)’.
- ‘Noise levels in the 63Hz and 125Hz octave frequency bands should be controlled so as not to exceed (in habitable rooms) 37dB and 31dB respectively’.



4.0 Noise Assessment

4.1 Noise Sensitive Receptor Locations

The church has residential neighbours to the south of the site on Slade Hall Road. Rear façades (habitable rooms) of the dwellings are at a distance approx. 16m from the proposed new building. Figure 2 below provides a 3d aerial view showing rear façades of the neighbouring houses.



Figure 2: 3D aerial photograph indicating nearest receptors to Authentic City Church

4.2 Proposed Use and Receptor Noise Limit Criteria

It is understood that the proposal would not include a fixed sound system in the youth room and as such significant music noise break-out would not be anticipated.

It would be expected that music may be provided on a small portable system, and noise from raised voices, children playing etc. would be anticipated within the new spaces.

An external background sound level of $42\text{dBL}_{\text{A90}}$ is adopted in the assessment.

Based on the guidance presented above, the following criteria would be recommended with the aim of protecting nearby residential receptors from environmental noise:

- Noise break-out from the new building should be controlled to 10dB below the L_{A90} , at the nearest habitable room i.e. an external receptor noise limit of $32\text{dBL}_{\text{Aeq,5min}}$ during the proposed daytime operating period.



4.3 Proposed Building Envelope

External walls to the new building will be of masonry / brick construction with a traditional insulated, tiled pitched roof. Based on the proposed use, traditional walls and roof would provide sufficient sound insulation.

Glazing to large spaces comprises of large rectangular units set on the west elevation, along with roof windows in the youth room.

Large areas of glazing will be at 90 degrees to nearby dwellings and as such this will provide a degree of screening from internal noise break-out.

Users of the creche and youth room should be protected from noise break-in from passing trains. An internal ambient level within the unoccupied space of $35\text{dBL}_{\text{Aeq},30\text{mins}}$ would be recommended, which would be in line with Building Bulletin 93 (Acoustic Design of Schools) recommendations on noise control in nursery and multi-purpose rooms.

4.4 Internal Noise Limits

High sound pressure levels would not be anticipated in the new spaces; however, an indicative internal sound pressure limit is put forward.

Sound pressure levels inside youth / creche spaces should not generally exceed $86\text{dBL}_{\text{Aeq},5\text{min}}$ during daytime operating periods. This would comfortably allow for amplified music on a small portable sound system along with noise typically associated with youth / creche activities.

An internal level of 86dBA would result in an external receptor level approx. 28-30dBA, which would be >10dB below the measured background sound level.

4.5 Recommended Noise Mitigation Measures

Noise break-in from passing trains should be considered alongside potential noise break-out from users of the facility. Thus, activity rooms in the new building should have the following glazing specification:

- Large windows to activity spaces should have a sound reduction rating min. $\text{Rw}35\text{dB}$ e.g. good quality 8-12-6.8mm laminated double glazing.
- Roof windows to the Youth Room may be standard Velux or equal units.
- Windows to ancillary / circulation spaces may be standard double glazed units as required for thermal / safety performance.

Ventilation fan penetrations should be on the north elevation only (location of proposed kitchen and WCs).



5.0 Conclusions

Aether Acoustics has undertaken an acoustic assessment of the proposed new Youth Room and Creche building at Authentic City Church, Manchester.

Background sound levels in the vicinity of the church were measured as approx. 42 – 45dB_{L_{A90}} during daytime periods. Noise from road traffic and passing trains control the noise climate in the area.

While it would not be expected that activity noise within the new facility would pose a potential environmental noise issue, an internal sound pressure level limit of 86dB_{L_{Aeq,5min}} has been put forward as an indication of the upper level that may be facilitated within compliance with criteria detailed in Section 3 above.

Glazing to activity spaces in the scheme should provide a suitable level of protection from noise break-out, and also provide sufficient sound insulation from passing trains as relates users of the facility.

Plant associated with the scheme is understood to comprise of small domestic type in line extractor fans only. Kitchen and WCs would be located in a position where penetrations may be through the north wall i.e. facing away from nearby residences and screened by the building itself.



Appendix A

Full Results of Noise Survey



Location	Start	Time	LA max	LA eq	LA 90	Octave Band Centre Frequency (Hz)								Total dBA
						63	125	250	500	1k	2k	4k	8k	
1	13:20	05:00	72	54	41	62.2	51.5	51.2	50.1	50.5	45.3	38.0	32.3	54
1	13:25	05:00	84	59	43	62.8	60.5	60.0	56.6	52.9	49.8	45.8	45.2	59
1	13:30	05:00	63	52	42	60.7	53.1	50.2	46.3	48.7	44.3	38.4	33.8	52
1	13:35	05:00	82	60	44	59.7	64.2	64.6	53.1	52.9	50.3	44.3	38.1	60
2	13:50	05:00	63	53	46	62.9	55.4	51.2	48.4	49.6	45.1	38.1	32.2	53
2	13:55	05:00	81	59	42	66.5	56.7	61.7	55.5	50.3	52.2	48.5	37.4	59
2	14:00	05:00	67	49	44	53.8	49.6	51.0	46.7	43.2	40.8	37.1	35.0	49
2	14:05	05:00	50	46	45	52.1	43.0	42.0	41.7	41.9	39.1	35.7	31.5	46
2	14:10	05:00	69	51	44	56.5	54.4	47.1	43.9	45.7	45.3	40.2	34.9	51
2	14:15	05:00	54	44	42	52.0	43.4	42.3	39.5	39.9	35.7	32.9	29.5	44
2	14:20	05:00	75	54	45	64.9	55.7	53.6	50.9	50.1	46.0	41.6	38.5	55
2	14:25	05:00	66	49	44	55.8	51.3	50.7	45.4	44.5	40.3	37.3	32.7	49

Appendix A: Full results of noise measurements at Authentic City Church, 22nd May 2022



Appendix B

Calibration Documents



CERTIFICATE OF CALIBRATION

ISSUED BY Gracey & Associates BSI CERTIFICATE FS 25913
DATE OF ISSUE 26 July 2021 CERTIFICATE NUMBER 2021-0782
DATE OF CALIBRATION 26 July 2021
CALIBRATION INTERVAL 12 months

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TEST ENGINEER APPROVING SIGNATORY

Jamie Bishop

Greg Rice

Equipment **SV 971, s/n: 72598**
Description Sound Level Meter - Class 1, Svantek UK Limited
Customer Gracey & Associates

Standards
BS EN 60651

Conditions
Atmospheric Pressure 100.3 kPa
Temperature 24.0 °C
Relative Humidity 49.1 %

Calibration Reference Sources

Equipment	S/N	Last Cal	Equipment	S/N	Last Cal
Druck DPI 141	479	06-Aug-20	HP 34401	3146A16728	30-Mar-21
Vaisala HMP23	S2430007	03-Aug-20			

Notes

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.

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CERTIFICATE OF CONFORMANCE

ISSUED BY Gracey & Associates BSI CERTIFICATE FS 25913
DATE OF ISSUE 26 July 2021 CERTIFICATE NUMBER 2021-0783
DATE OF CALIBRATION 26 July 2021
CALIBRATION INTERVAL 12 months

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TEST ENGINEER APPROVING SIGNATORY
Jamie Bishop Greg Rice

Equipment **SV 18, s/n: 72295**
Description Preamplifier - 1/2", Svantek UK Limited
Customer Gracey & Associates

Standards
Manufacturer Specifications

Conditions
Atmospheric Pressure 100.3 kPa
Temperature 24.0 °C
Relative Humidity 49.1 %

Calibration Reference Sources

Equipment	S/N	Last Cal	Equipment	S/N	Last Cal
Druck DPI 141	479	06-Aug-20	HP 34401	3146A16728	30-Mar-21
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CERTIFICATE OF CALIBRATION

ISSUED BY Gracey & Associates
DATE OF ISSUE 17 December 2020
DATE OF CALIBRATION 01 December 2020
CALIBRATION INTERVAL 12 months

BSI CERTIFICATE FS 25913
CERTIFICATE NUMBER 2020-1204

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TEST ENGINEER

Jamie Bishop

APPROVING SIGNATORY

Greg Rice

Equipment **B&K 4231, s/n: 2524772**
Description Calibrator - Acoustic - Class 1, Hottinger Bruel & Kjaer UK Ltd
Customer Gracey & Associates

Standards
BS EN 60942 Class 1

Conditions
Atmospheric Pressure 102.0 kPa
Temperature 20.2 °C
Relative Humidity 42.3%

Calibration Data

Output Level 94.08 dB
Frequency 999.97 Hz

Calibration Reference Sources

Equipment	S/N	Last Cal	Equipment	S/N	Last Cal
B&K 4134 L	1675305	14-Jul-20	Druck DPI 141	479	06-Aug-20
HP 34401	3146A29376	11-Feb-20	Nor 1253	20848	14-Jul-20
Stanford DS36	33213	17-Aug-20	Vaisala HMP23	S2430007	03-Aug-20

Notes

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.

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Sound Calibrator Certificate



Calibrator: Bruel and Kjaer 4231

Serial no: 2524772

Level: 94.08 dB

Frequency: 999.97 Hz

The stated level is valid at reference conditions.
Frequency stability: 0.00 %

Measured according to IEC 60942.
The stated level is relative to 20µPa.

All results quoted are directly traceable to the National Physical Laboratory, London
with a calculated uncertainty less than 0.10 dB (2×sd).

Reference conditions:

Pressure: 101.325 kPa
Temperature: 23.0 °C
Relative humidity: 50 %RH

Measurement conditions:

Pressure: 101.98 kPa
Temperature: 20.2 °C
Relative humidity: 42 % RH

Date: 01/12/2020

Signature:

Sound Calibrator Certificate



Calibrator: Bruel and Kjaer 4231

Serial no: 2524772

Level: 94.08 dB

Frequency: 999.97 Hz

The stated level is valid at reference conditions.
Frequency stability: 0.00 %

Measured according to IEC 60942.
The stated level is relative to 20µPa.

All results quoted are directly traceable to the National Physical Laboratory, London
with a calculated uncertainty less than 0.10 dB (2×sd).

Reference conditions:

Pressure: 101.325 kPa
Temperature: 23.0 °C
Relative humidity: 50 %RH

Measurement conditions:

Pressure: 101.98 kPa
Temperature: 20.2 °C
Relative humidity: 42 % RH

Date: 01/12/2020

Signature:

Comment: