St. Gabriel's Student Accommodation, Manchester

Planning Condition 29b

9668.11

4th July 2025

Revision A

St Gabriel's Student Accommodation, Manchester

Planning Condition 29b

9668.11

Revision	Description	Issued by	Date
A	First issue	JT	4th July 2025

This report has been prepared for the sole benefit, use and information of the client for the purposes set out in the report or instructions commissioning it. The liability of Apex Acoustics Limited in respect of the information contained in the report will not extend to any third party. All concepts, data and proposals are copyright © 2025. Issued in commercial confidence.

Prepared for

McLaren Construction

Prepared by

Joseph Tony MIOA

Checked by

Tom Lucas MIOA

Apex Acoustics Limited Reg. in England no. 05656507
Design Works, William Street, Gateshead, NE10 0JP

T 0191 620 0750
E info@apexacoustics.co.uk
W www.apexacoustics.co.uk

Constructionline Gold Member

1 Contents

1 Contents 2
2 Summary 3
3 Introduction 4
4 Basis of Assessment 5
5 Verification Noise Survey 6
6 Emergency Generator Assessment 7
7 ASHP Assessment 7
8 Conclusion 9
Appendix A Professional qualifications and competence 9

2 Summary

2.1 This report has been prepared in response to Planning Condition no. 29b of Planning Application 138100/JO/2023 for the post-installation assessment of air source heat pumps (ASHP) and emergency generator at St. Gabriel's student accommodation at Oxford Place, Manchester, M14 5RP.

2.2 Condition 29b requires acoustic testing of the externally mounted plant items to verify compliance with the noise limits specified in Condition 29a.

2.3 Operational plant noise measurements have been carried out of source levels close to the ASHPs and emergency generator.

2.4 Based on these measurements, it is calculated that the requirements of the Local Authority are met. This condition can therefore be discharged.

3 Introduction

3.1 Following works at St. Gabriel's student accommodation at Oxford Place, Manchester, M14 5RP to install air source heat pumps (AHSPs) and emergency generator, Apex Acoustics has been commissioned to carry out a post-installation noise survey in support of a planning condition.

3.2 The site and external plant location is shown in Figure 1, along with the identified nearest noise sensitive receptors (NSRs).

3.3 The NSRs are identified as the residential properties on Hathersage Road to the north and the student accommodation on Oxford Place to the south of the proposed site as shown in Figure 1.

3.4 The proposed plant would be installed to the north of the site as shown in Figure 2. Therefore, the residential properties to the north are considered the worst affected NSR, the student accommodation situated to the south and further away from the proposed plant would be exposed to a lower noise impact.

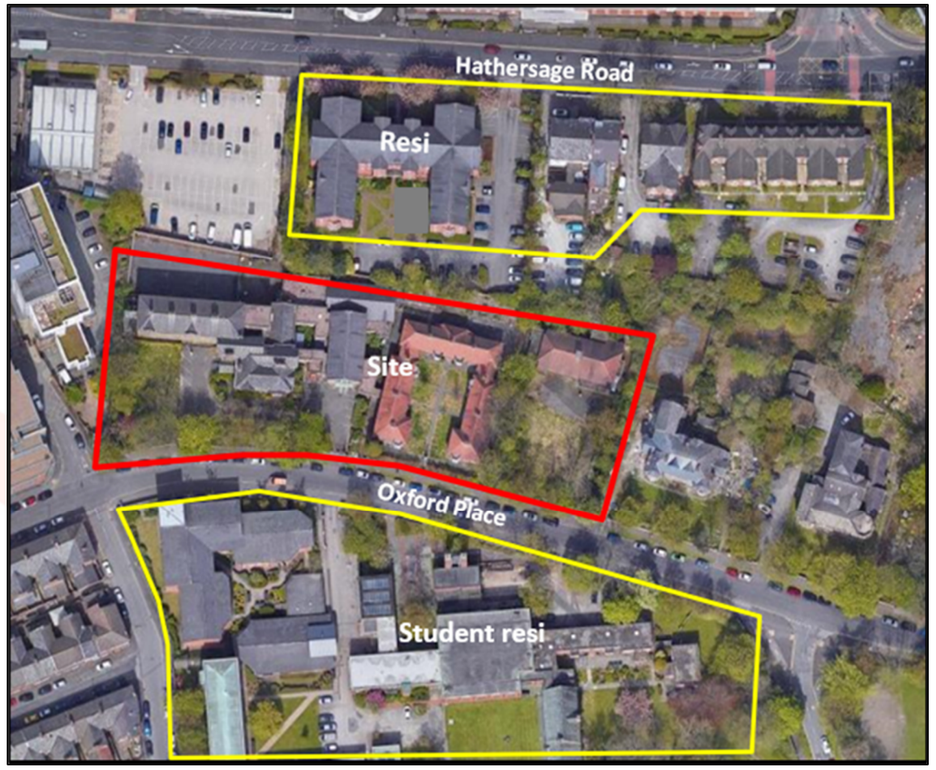


Figure 1: Site boundary outlined in red and identified NSRs outlined in yellow

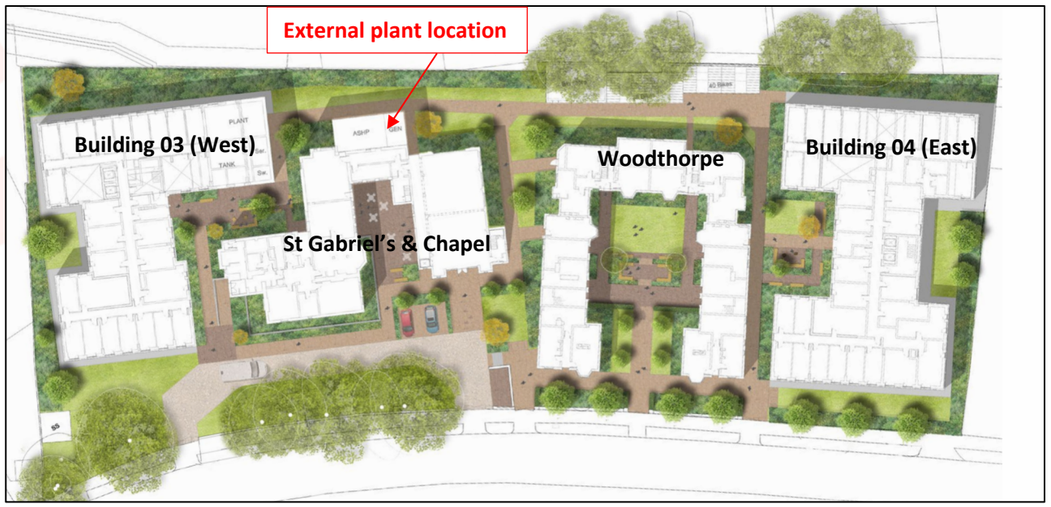


Figure 2 : Site layout (provided by the client)

4 Basis of Assessment

4.1 Planning condition 29b

4.2 Planning Condition 29b associated with the Application ref. 138100/JO/2023 for this development is shown below:

"*Prior to any externally mounted ancillary plant, equipment and servicing to be installed becoming operational, an approved 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 non - conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria*".

4.3 The approved acoustic report referenced in this condition is Apex acoustics' report ref: 9668.9A dated 5th March 2025.

4.4 The building services noise emission limits set within the report when assessed at the NSRs in accordance with BS4142:2014 are shown in Table 1.

Location	Plant Item	Period	Rated noise impact, $L_{Ar,Tr}$	Comments
Outside of noise sensitive residential facades on Hathersage Road (worst affected NSR)	Fixed Mechanical Plant	Daytime *(07:00 – 23:00)*	≤ 46 dB	BS 4142 rating level of 5 dB below the background sound level
		Night-time *(23:00 – 07:00)*	≤ 44 dB	
	Emergency Generator	Daytime *(07:00 – 23:00)*	≤ 61 dB	BS 4142 rating level of 10 dB above the background sound level

Table 1 : Noise limits for fixed mechanical plant and emergency generator

4.5 BS 4142

4.6 The principal guidance for the assessment of industrial noise impact is BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142).

4.7 This method involves the determination of a specific sound level, and subsequently a rating level, due to the source in question at the NSR.

4.8 According to BS 4142, typically, the greater the difference between the rating level and the background sound level, the greater the magnitude of the impact.

- "A difference of around +10 dB or more is likely to be an indication of a significant adverse impact";
- "A difference of around + 5dB 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 source having a low impact".

4.9 BS 4142 requires a rating level to be calculated based on the character of the specific sound.

4.10 The rating level is calculated by adding a character correction to the specific sound.

5 Verification Noise Survey

5.1 Methodology

5.2 A noise survey was carried out at the site on Friday 20th June 2025 and Tuesday 01st July 2025 to measure noise from the emergency generator unit and ASHP units in operation.

5.3 Measurements were taken at locations close to the plant with the plant both running and switched off.

5.4 The measurement positions around the ASHPs and generator are shown in Figure 3 below. The NSR is located approximately 20 m to the north of the plant area.

5.5 Due to the forced running of the plant only one ASHP was operating during the measurement period. It is understood that the unit was operating under 'standard' operating mode.

5.6 Positions P1 is at 7 m from the emergency generator and Position P2 is at 3 m from the ASHPs. Both measurement positions are 1.5 m above the ground.

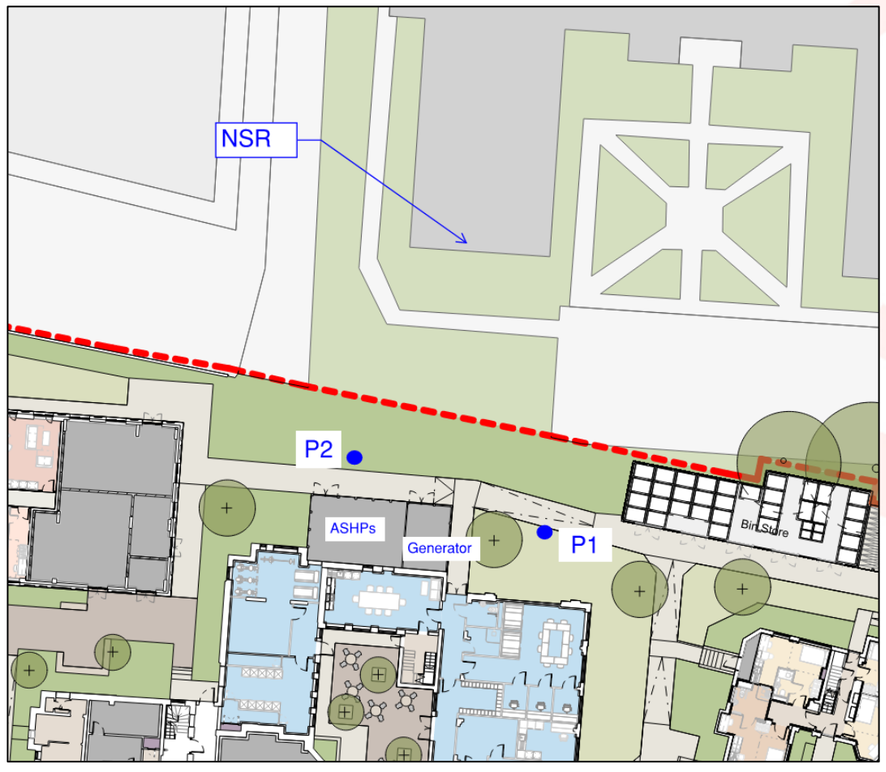


Figure 3: Measurement locations around ASHPs and emergency generator

5.7 Data was recorded in third-octave band frequencies at one-second intervals throughout the measurement period.

5.8 The equipment used is listed in Table 2.

Measurement Position	Equipment	Model	Serial no.
P1	Sound Level Meter	Norsonic NOR140	1403423
	Calibrator	Norsonic	32198
P2	Sound Level Meter	NTi XL2	A2A-11084-E0
	Calibrator	Larson Davis CAL 200	10665

Table 2: Equipment used

5.9 Both meters and calibrators had current calibration certificates traceable to national standards. The sound level meters had been calibrated within the last two years and calibrator had been calibrated within the last year in accordance with the guidance of BS 4142; calibration certificates are available on request.

5.10 The equipment was field-calibrated before and after the measurements with no significant drift in sensitivity noted.

5.11 Weather conditions during the measurement periods were generally scattered clouds and dry. Wind speeds were within suitable parameters for the measurement of environmental noise (i.e., generally under 5 ms^{-1}). The microphone was protected with a windshield for the duration of the survey.

5.12 Operational plant noise measurement results

5.13 The locations and measured levels of the ASHP unit and the emergency generator are shown in Table 3.

Measurement Position (Figure 3)	Condition	Un-weighted sound pressure level (dB) at octave band centre frequency (Hz)								Total dB(A)
		63	125	250	500	1k	2k	4k	8k	
P1	Plant ON	72	78	74	58	59	57	52	50	**69**
	Plant OFF	60	55	50	46	43	35	31	38	**49**
P2	Plant ON	59	59	46	46	44	44	39	34	**50**
	Plant OFF	53	53	47	43	40	37	32	31	**46**

Table 3: Measurement summary

6 Emergency Generator Assessment

6.1 Planning Condition 29b associated with the Application ref. 138100/JO/2023 for this development requires that the external plant items should be designed to meet the requirements shown in Table 1.

6.2 The measured sound pressure level from the units in operation can be distance corrected to derive the specific sound level at the NSR as shown in Table 4 below.

6.3 One emergency generator (Vital Power VPC88-UKS) is installed with manufacturer's rated sound pressure of 71 dB L_{pA} at 7m.

6.4 Table **4** below presents predicted specific sound level at NSR based on the specific sound level of the generator measured at 7 m.

Description	Un-weighted sound pressure level (dB) at octave band centre frequency (Hz)								Total dB(A)
	63	125	250	500	1k	2k	4k	8k	
Measured SPL at 7 m	72	78	74	58	59	57	52	50	**69**
Background noise	60	55	50	46	43	35	31	38	**49**
Corrected SPL at 7 m	72	78	74	58	59	57	52	50	**69**
Distance correction, 20 log (r2/r1) r2 =19 m, r1=7 m	-9	-9	-9	-9	-9	-9	-9	-9	
Predicted generator specific sound levels at NSR	63	70	66	49	51	48	43	41	**60**

Table 4 **: Predicted specific sound levels from generator at NSR**

6.5 It can be seen from Table **4** that the specific sound level of the installed emergency plant meets the requirements shown in Table 1. Generator noise is typically broadband in nature and the operation is understood to be continuous during the maintenance and test runs. Apex are not aware of any other features of the noise that necessitate penalties; therefore the rating level would be equal to specific sound level.

6.6 On this basis, the installed emergency plant is compliant with the requirements of Planning Condition 29b.

7 ASHP Assessment

7.1 Three ASHPs (Q-Ton) are installed in the ASHP plant area with manufacturer's sound power level of 70 dB L_{wA} during 'standard' operation mode. Due to the forced running of the plant only one ASHP was operating during the measurement period. On this basis, an appropriate correction is included within the assessment.

7.2 It is understood that the unit was operating under 'standard' operating mode.

7.3 Table 5 below presents the calculated specific sound level at the NSR based on the measured level at measured at 3 m.

Description	Un-weighted sound pressure level (dB) at octave band centre frequency (Hz)								Total dB(A)
	63	125	250	500	1k	2k	4k	8k	
Measured SPL at 3 m	59	59	46	46	44	44	39	34	**50**
Background noise	53	53	47	43	40	37	32	31	**46**
Corrected SPL at 3 m	58	58	46	42	41	43	38	30	**49**
Correction for 3 units	+5	+5	+5	+5	+5	+5	+5	+5	
Distance correction, 20 log (r2/r1) r2 =19 m, r1=3 m	-16	-16	-16	-16	-16	-16	-16	-16	
Predicted ASHP specific sound levels at NSR	46	46	35	31	30	31	27	19	**38**

Table 5 : Predicted specific sound levels from ASHPs at NSR

7.4 Based on the above calculated specific sound level, a BS4142 assessment for the plant as installed is presented in Table 6 below.

Parameter	Daytime assessment	Night-time assessment	Commentary
Background sound level	51 dB $L_{A90,\ 15\text{-}min}$	49 dB $L_{A90,\ 15\text{-}min}$	Considered representative of the assessment period based on statistical analysis.
Plant noise limit	46 dB $L_{A90,15min}$	44 dB $L_{A90,15min}$	BS 4142 rating level of 5 dB below the background sound level.
Specific sound level $L_{s,}$ due to all sources for the required assessment interval	38 dB $L_{Aeq,\ 1\text{-}hr}$	38 dB $L_{Aeq,\ 15\text{-}min}$	Based on measurements made at 3 m from plant, with corrections for distance as appropriate.
Acoustic feature correction	0 dB	0 dB	A subjective assessment to determine acoustic features is undertaken, and the following penalties are considered applicable: • Tonality – 0 dB; • Impulsivity – 0 dB; • Intermittency – 0 dB; • Other – 0 dB;
Rating level, $L_{Ar,Tr}$	38 dB	38 dB	The specific sound level of any one source at the receptor is more than 10 dB the background sound level and it is therefore considered unlikely that the combined sound level would contain acoustic features which are readily distinctive against the residual acoustic environment. No rating penalty is therefore considered to be applicable and the rating level is equal to the specific sound level.
Uncertainty of assessment	-	-	Background data was obtained over a 2-day period, accounting for the changing acoustic environment. Uncertainty in the calculated impact has been reduced by the use of a calculation method in accordance with ISO 9613-2.
Excess of $L_{Ar,Tr}$ over background sound level	-13 dB	-11 dB	The calculated rating level is at least 5 dB below the background sound level and therefore complies with Planning Condition 29b.

Table 6: BS 4142 assessment results, based on current proposals

7.5 It is be seen from Table 6 that the rating level of the installed plant is at least 5 dB lower than the existing background sound level measured during the daytime and the night-time respectively, and is therefore compliant with the Planning Condition requirements.

7.6 It is understood from the design team that the ASHPs will be scheduled to operate on a 'Silent Mode' during the night-time period, around 6 dB lower than the above measured noise levels. On this basis, the predicted ASHP specific sound level at NSR is expected to be much lower than shown in Table 6 during the night-time hours.

8 Conclusion

8.1 Following works at St. Gabriel's student accommodation at Oxford Place, Manchester, M14 5RP to install AHSPs and emergency generator, Apex Acoustics has been commissioned to carry out a post-installation noise survey in support of a planning condition.

8.2 Operational plant noise measurements have been carried out of source levels close to the ASHPs and emergency generator.

8.3 Based on these measurements, it is calculated that the requirements of the Local Authority are met and therefore Planning Condition 29b can be discharged.

Appendix A Professional qualifications and competence

A.1 All Apex Acoustics consultants work under the close supervision of a member who holds qualification in acoustics and is a member of the IOA.

A.2 This can be verified by searching the Institute of Acoustics' list of Members, available here, with the surname of the consultant.

http://www.ioa.org.uk/membership-check

A.3 Apex Acoustics is a member of the Association of Noise Consultants (ANC). The ANC is a trade organisation which seeks to raise the standards of acoustic consultancy and as such there are barriers to entry to ensure member's competency.

A.4 This report has been checked by an appropriately qualified and experienced acoustic consultant.