# MANCHESTER METROPOLITAN UNIVERSITY

## PROPOSED UPS VENTILATION

## GROSVENOR LIFECYCLE REFURBISHMENT PROJECT

## NOISE IMPACT ASSESSMENT

R2447-REP01B-SJW

20 March 2026

**RED ACOUSTICS LIMITED** Unit 8 Cable Court, Pittman Way, Preston PR2 9YW
**T** 01772 722 182 **F** 01772 722 451 info@redacoustics.co.uk www.redacoustics.co.uk
Registered Company Number 6460126

# REPORT DETAILS

| | |
|---|---|
| **Project** | Grosvenor Lifecycle Refurbishment Project<br>Cavendish St,<br>Manchester M15 6BH |
| **Client** | Manchester Metropolitan University |
| **Document Reference** | R2447-REP01B-SJW |
| **Date Issued** | 20 March 2026 |
| **Revision** | Revision B |
| **Issued By** | Simon Webster BEng (Hons) MIOA<br>Red Acoustics Limited<br>Business First<br>Millennium Road<br>Preston PR2 5BL<br>T: 01772 722 182<br>F: 01772 722 451<br>M: 07775 850 378<br>simonwebster@redacoustics.co.uk |
| **Signed** |  |
| **Checked by** | Paul Clark Pg. Dip. IOA MIOA |
| **Signed** |  |

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# SUMMARY

Red Acoustics has been commissioned by Manchester Metropolitan University Ltd to provide an assessment of noise impact from the proposed installation of 2no. UPS Ventilation units in the Grosvenor East Building, Cavendish St, Manchester M15 6BH.

The existing noise climate has been assessed at a positions representative of the nearest noise sensitive on site receptors and target noise levels set in line with published guidance and Manchester City Council criteria.

This report presents the results of noise propagation modelling predictions at the proposed location based on manufacturer supplied plant noise data.

Compliance with the recommended target criteria is expected without the need for additional noise mitigation.

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# 1.0 INTRODUCTION

Red Acoustics has been commissioned by Manchester Metropolitan University Ltd to provide an assessment of noise impact from the proposed installation of 2no. UPS Ventilation units in the Grosvenor East Building, Cavendish St, Manchester M15 6BH.

Red Acoustics has been commissioned by Manchester Metropolitan University Ltd to conduct the following assessments:

- Assess the existing background noise climate at a position representative of nearby noise sensitive receptors.
- Based on the measured existing background sound levels, determine target noise limits for the proposed externally mounted mechanical plant items.
- Prepare a 3D computer noise propagation model to predict the impact of environmental noise from the proposed mechanical plant items.
- Advise as necessary on the level of mitigation required to achieve target limits to enable approval to be sought from the Local Planning Authority for installation of the proposed mechanical plant items.

This report presents the results of an environmental noise survey and details an assessment of environmental noise impact from the proposed installation.

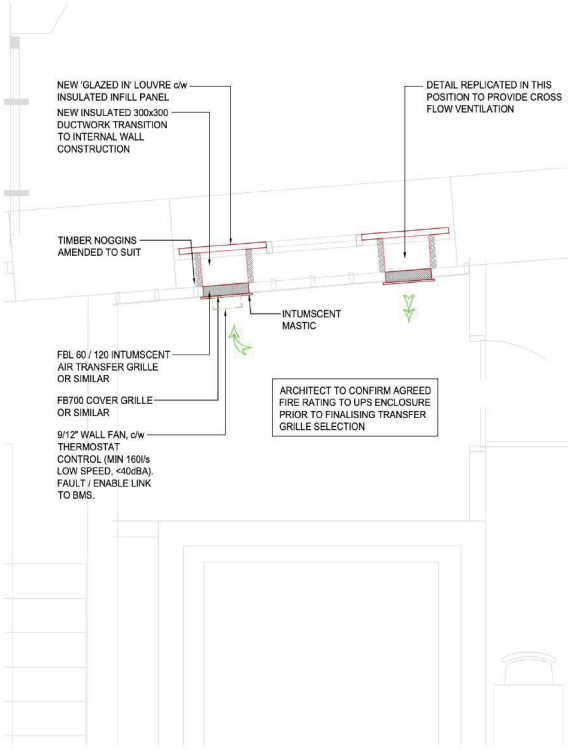
# 2.0 DETAILS OF THE PROPOSED DEVELOPMENT

The proposed development to be assessed comprises the installation of 2no. ventilation fans providing supply and extract air flow to the existing UPS room at 1st floor level of the Grosvenor East Building, Cavendish St, Manchester M15 6BH.

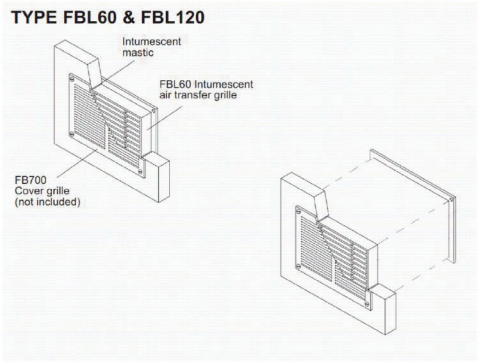
Figure 2.1 shows the proposed layout of the UPS room and the location off the 2 no. ventilation fans. Figure 2.1 shows the proposed facade of the building.

Figure 2,3 shows an aerial view of the Grosvenor East Building, location of the proposed facade ventilation units and the location of nearby on site receptors. Figure 2.3 indicates the nearby noise sensitive receptors are University education spaces and offices within the Chatham Building, 15m from the UPS room ventilation facade.

**Figure 2.1:** Proposed UPS Room Layout




UPS ROOM - PROPOSED VENTILATION DETAILS
(SCALE 1:25)




GILBERTS 'FB' INTUMESCENT LOUVRE
DETAIL OR SIMILAR APPROVED

**Figure 2.2:** Proposed UPS Room Facade

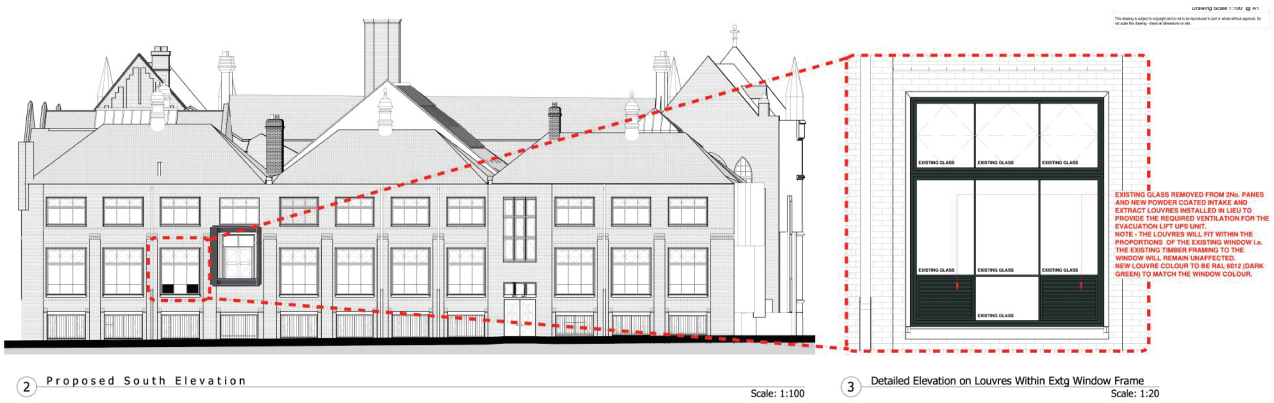
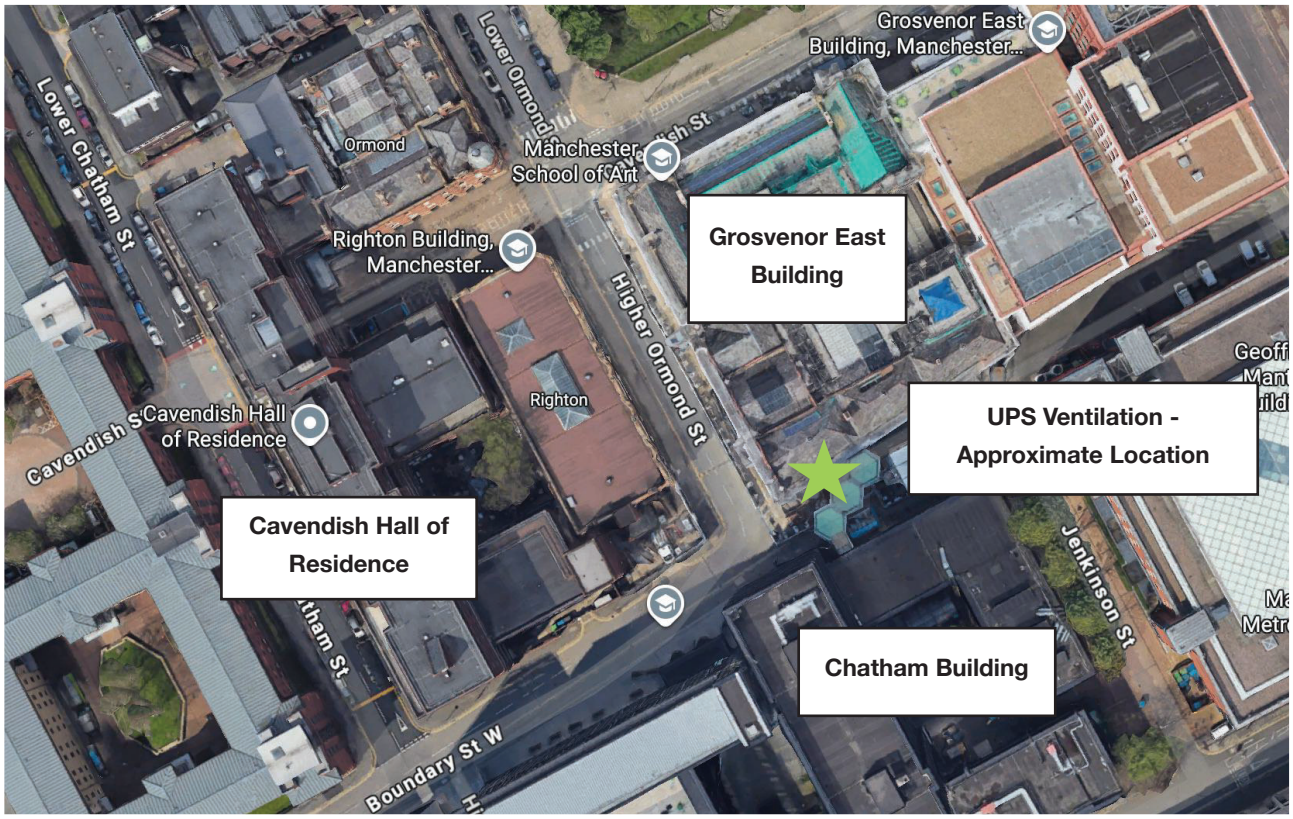



**Figure 2.3:** Location of the Proposed Ventilation Units & Nearby Receptors



## Proposed Ventilation Units

The proposal is to install 2no. facade mounted ventilation fans, connected to the facade via ventilation louvres in place of two existing window panes.

The ventilation units comprise Greenwood CD9 fans.

In order to assess the potential for noise impact to the surrounding environment, manufacturer supplied broadband sound noise level data has been used. The supplied data indicates a maximum sound pressure level of 44dBA at 3m

**Figure 2.4:** Fan Noise Data

| Product code | | Performance to BS 848 Pt1 in free air (m³/h) | | Sound pressure level @ 3m dB(A) | | Consumption (W) | |
|---|---|---|---|---|---|---|---|
| | | Boost | Eco | Boost | Eco | Boost | Eco |
| CD6 | 6" commercial fan - installed within a wall kit specification* | 445 | 245 | 42 | 41 | 38 | 20 |
| CD9 | 9" commercial fan - installed within a wall kit specification* | 918 | 820 | 39 | 44 | 50 | 37 |
| CD12 | 12" commercial fan - installed within a wall kit specification* | 1820 | 1341 | 45 | 47 | 100 | 70 |

*See components table above Note: figures are extract only

# 3.0 PLANNING POLICY & DESIGN TARGETS

## Planning Policy

### National Planning Policy Framework

The National Planning Policy Framework (NPPF[1]) was updated in 2021 and sets out the Government's planning policies for England and how these should be applied. Where issues of noise impact are relevant the NPPF provides guidance. In paragraph 174 it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

*'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution'.*

Paragraph 185 also advises:

*'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impacts on health and quality of life'.*

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NSPE) which reinforces and supplements the NPPF guidance.

### Noise Policy Statement for England

The Noise Policy Statement for England[2] (NPSE) sets out the long term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This vision is supported by the following aims:

- Avoid Significant adverse impacts on health and quality of life.
- Mitigate and minimise adverse impacts on health and quality of life.
- Where possible, contribute to the improvement of health and quality of life.

[1] National Planning Policy Framework. Ministry of Housing, CoManchester Metropolitan Universitynities & Local Government (2021)

[2] Noise Policy Statement for England - Department for Environment, Food & Rural Affairs (2010)

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL - No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL - Lowest Observed Adverse Effect Level : This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL - Significant Observed Adverse Effect Level : This is the level above which significant adverse effects on health and quality of life occur.

According to the explanatory notes in the statement, where a noise level falls between LOAEL and a level which represents SOAEL then:

*'all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur'.*

## Planning Practice Guidance on Noise

Planning Practice Guidance (PPG) - Noise[3] is an online www.gov.uk resource (last updated 2019) to provide additional guidance on the NPPF. It discusses:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur and;*
- *whether or not a good standard of amenity can be achieved.*

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, inline with the NPSE, no objective noise levels are provided although the PPG states that:

*'the subjective nature of noise means that there is not a simple relationship between noise levels and impact on those effected. This will depend on how various factors combine in any particular situation'*

Table 3.1 below summarises the PGG noise expose hierarchy.

[3] Planning Practice Guidance on Noise (https://www.gov.uk/guidance/noise--2). Ministry of Housing, CoManchester Metropolitan Universitynities & Local Government

**Table 3.1:** Explanation of Noise Exposure Hierarchy - PPG

| Perception | Examples of Outcomes | Increasing Effect Levels | Action |
|---|---|---|---|
| **Not noticeable** | No Effect | No Observed Effect | No specific measures required |
| **Noticeable and not intrusive** | Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life. | No Observed Adverse Effect | No specific measures required |
| | | Lowest Observed Adverse Effect Level | |
| **Noticeable and intrusive** | Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life. | Observed Adverse Effect | Mitigate and reduce to a minimum |
| | | Significant Observed Adverse Effect Level | |
| **Noticeable and disruptive** | The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area. | Significant Observed Adverse Effect | Avoid |
| **Noticeable and very disruptive** | Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory | Unacceptable Adverse Effect | Prevent |

## British Standard 4142

BS 4142:2014+A1:2019[4] presents methods for rating and assessing the potential impact of commercial and industrial sound upon noise sensitive receptors. In order to assess impact using BS 4142, the Rating Level of the new sound source is compared with the existing contextual Background Sound Level.

- Typically, the greater this difference, 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, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- 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.

The Rating Level is determined by assessing the Ambient Sound Level, distinguishing the Specific Sound Level from the Residual Sound Level and applying any sound specific penalties for acoustic features that would subjectively cause the sound to be perceived differently.

The Specific Sound Level of the commercial / industrial sound source is determined by either; measurement or calculation with regard to the appropriate reference time interval (for daytime or night-time periods). The standard requires separate analysis for daytime and night-time periods, evaluating the Rating Level over an appropriate reference time interval ($T_r$) of: 1hr for daytime (07:00 - 23:00 hrs) and 15min for night time (23:00 - 07:00 hrs). The Specific Sound Level is defined as equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, *T* (determined either by calculation or deducting the measured Residual Sound Level from the measured Ambient Sound Level).

'Ambient sound' is defined as the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far (The ambient sound comprises the residual sound and the specific sound when present).

'Residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.

[4] BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

Where appropriate, a rating penalty can be applied to the specific sound level to account for the character of the sound, namely: tonality, impulsivity and intermittency. Such acoustic feature corrections can be added together linearly.

Tonality can be determined objectively (using adjacent third octave band analysis or the Joint Nordic method) or subjectively as described below:

- +2dB penalty: Just perceptible
- +4dB penalty: Clearly perceptible
- +6dB penalty: Highly perceptible

Impulsivity can be determined objectively (using Fast Fourier Transform analysis) or subjectively as described below:

- +3dB penalty: Just perceptible
- +6dB penalty: Clearly perceptible
- +9dB penalty: Highly perceptible

Where intermittency is present, a +3dB penalty can be applied. Where the acoustic feature characteristics are neither tonal nor impulsive, but are clearly distinguishable against the residual sound, a +3dB penalty can be applied.

## Manchester City Council Guidance

Manchester City Council has published comprehensive guidance in relation to noise impact due to new development. The MCC Planning and Noise Technical Guidance document was updated in October 2022 and discusses the assessment of environmental noise from new development of plant items in the vicinity of nearby noise sensitive uses. The published guidance forms the basis for the decision making process when assessing planning applications within the Council's boundaries and provides design targets. With reference to:

**Application 2: 144741/FO/2025 (Planning Permission) Pre-Commencement Conditions Condition 4a states:**

*Condition 4a*

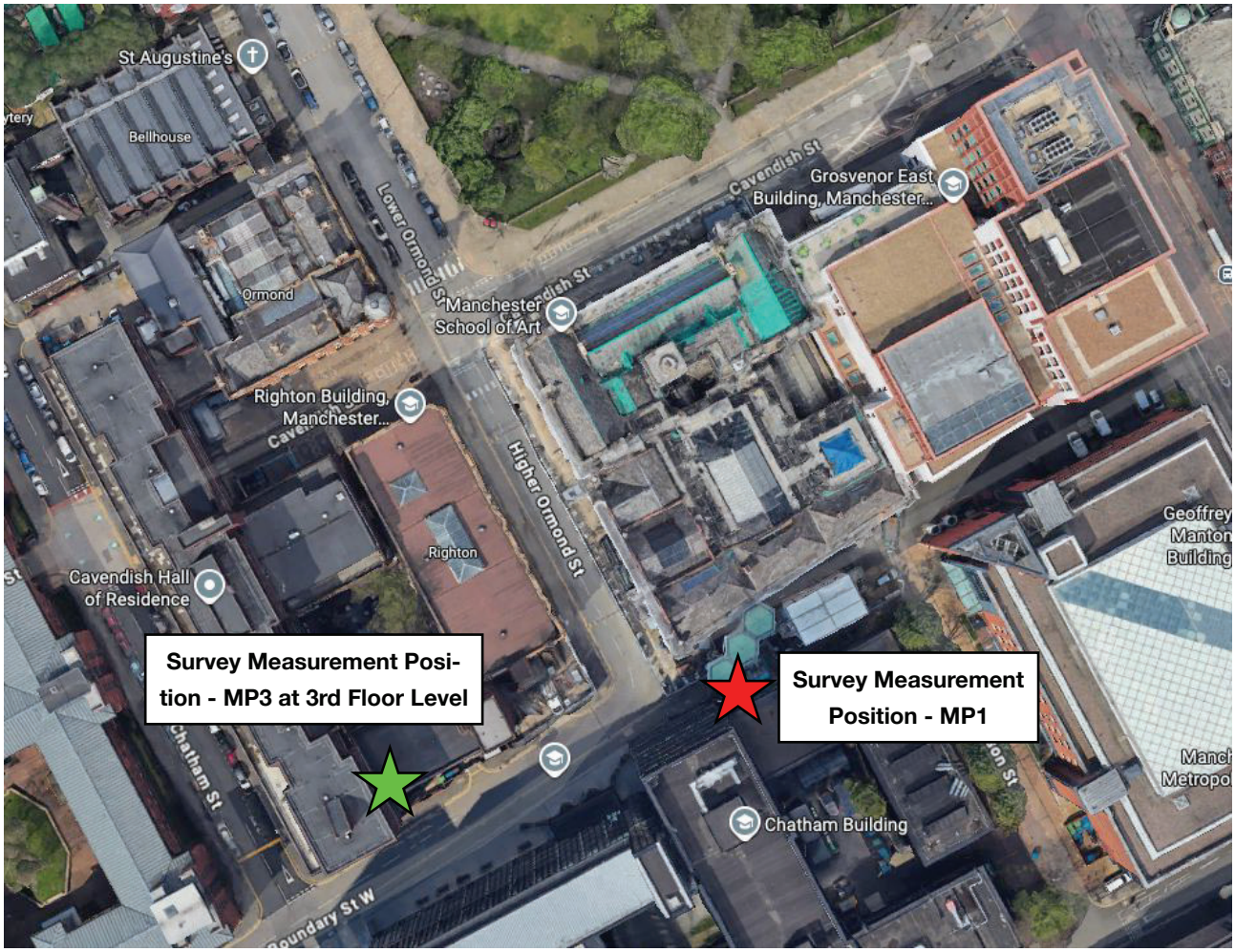
*(Noise Impact Assessment & Louvres): Prior to the installation of the two extract louvres on the South Elevation, a scheme must be submitted to and approved in writing by the Local Planning Authority. This scheme must either demonstrate that any plant/equipment venting through the louvres will achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise-sensitive location, or show a method to acoustically treat/insulate plant equipment to achieve the same noise level.*

# 4.0 ENVIRONMENTAL NOISE SURVEY

## Environmental Noise Survey

In order to determine the prevailing environmental noise levels at the site, representative manned measurements were taken during a quiet morning period (10:00hrs to 10:20hrs) on 25th November 2025 at MP1 and unmanned over a full 24hr period at position MP2 between 18-19 March 2026, where MP2 is representative of the nearby halls of residences, Cavendish Hall. The measurement locations used during the survey are shown in Figure 4.1 below.

**Figure 4.1:** Noise Survey Measurement Locations



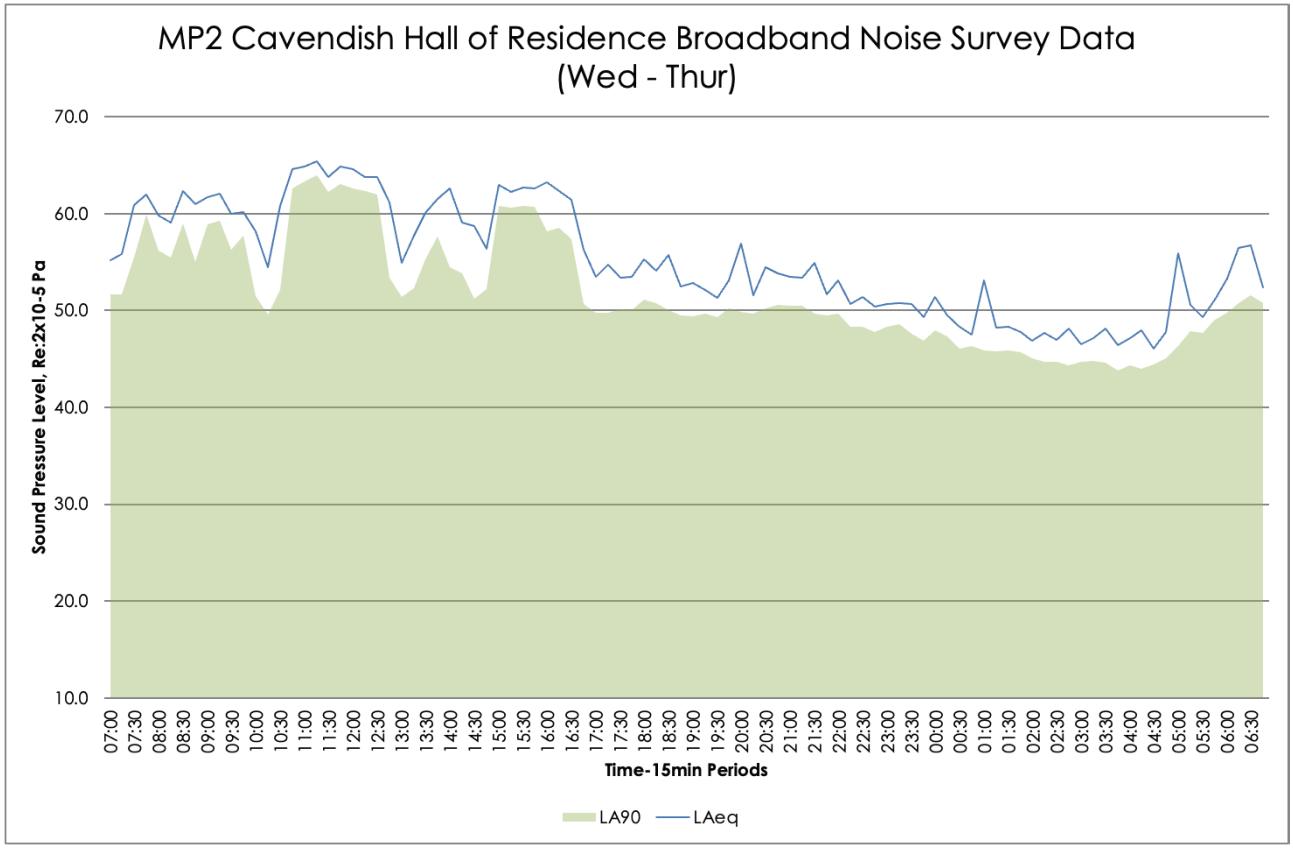
During the measurement period at MP1, the noise climate for the site was driven by residual low level traffic noise. Figure 4.2 below shows the broadband noise survey data at the monitoring position MP1 presented in both 5 minute periods and 1 minute periods to establish typical external noise levels. The measured data shown has been used to determine the typical sound levels when the University buildings will be occupied during quieter daytime periods.

**Figure 4.2:** Broadband Noise Survey Data - MP1



Figure 4.3 below shows the 24hr broadband noise survey data at the monitoring position MP2 presented in 15 minute periods. The measured data shown has been used to determine the typical background noise levels at the location of the nearest residential receptors.

**Figure 4.3:** Broadband Noise Survey Data - MP2




Based on the measured survey data, Table 4.1 below identifies the recommended $L_{Aeq}$ plant noise limits for the proposed installation at the nearest noise sensitive receptors. The assessments are based on the typical measured $L_{A90}$ during the relevant daytime/night-time periods and Manchester City Council guidance.

**Table 4.1:** Plant Noise Limits at Nearest Noise Sensitive Facades

| | Measured Noise Levels & Target Noise Limits | | | |
|---|---|---|---|---|
| | Day Time (07:00 - 23:00) | | Nighttime (23:00 - 07:00) | |
| Location | Typical Measured $L_{A90}$, dB | Target Noise Limit, dB $L_{Aeq}$ | Typical Measured $L_{A90}$, dB | Target Noise Limit, dB $L_{Aeq}$ |
| Nearest Daytime Noise Sensitive Facade MP1 | 51 | ≤ 46 | - | - |
| Nearest Residential Facade MP2 | 50 | ≤ 45 | 45 | ≤ 40 |

An assessment of predicted noise impact on the nearby residential receptors is presented is section 5.0 below.

## Internal Noise Survey

In order to determine noise levels within nearby receptors, broadband measurements were taken in a number of internal spaces within the Chatham Building. These are presented in Table 4.2 below.

**Table 4.2:** Internal Noise Levels

| Location | Typical Measured LA90, dB |
|---|---|
| Art Studio Window Closed | 39 |
| Room 206 - Window Open | 41 |
| Room 206 - Window Closed | 31 |

## Internal UPS Noise Survey

In order to determine typical noise levels within the existing UPS room, broadband measurements were taken with the UPS fully operational. The typical internal level within the UPS room was 70dBA.

# 5.0 CADNAA NOISE PROPAGATION MODELLING

To predict noise levels from the proposed Air Source Heat Pump installation to the surrounding environment and the nearest noise sensitive receptors, the latest version of CadnaA 3D noise propagation modelling software has been used, which implements the calculation procedure specified within ISO9613-2. CadnaA is considered to be the industry leading standard in noise propagation modelling software.

The model has been generated using the manufacturer supplied noise source sound power data presented in Section 2.0. The modelling of the surrounding environment was undertaken by modelling the existing buildings and the surroundings using Google Earth imagery and site inspection notes with ground heights set using 1m digital terrain height data obtained from the DEFRA data services platform.

Noise propagation is predicted from the proposed location of the facade mounted ventilation fans to assess both fan noise propagation and UPS noise egress via the proposed ventilation louvered units. Noise impact is predicted to all facades of the nearby noise sensitive uses with the highest predicted facade level used for the purpose of the assessment.

The results of the noise propagation modelling are presented below. Figure 5.1 below shows the highest predicted facade levels for the nearest noise sensitive spaces.

The predicted level represents the Specific Sound Level in terms of BS4142:2014+A1:2019. It can be seen in Figure 5.1 below that the highest predicted Specific Sound Level at the nearest University educational facades is 34dBA with both fans operating simultaneously and 16dBA at the nearest residential receptor.

**Figure 5.1:** Predicted Specific Sound Level (dBA)



# 6.0 BS4142 PLANT NOISE IMPACT ASSESSMENT

To undertake an impact assessment on the proposed development in accordance with BS4142:2014+A1:2019, measured data at the proposed development site has been employed to determine the existing Background Sound Level. The manufacturer supplied broadband sound power level as discussed in Section 2.0 above has been used within the CadnaA noise propagation model to predict the impact of the Specific Sound Level to the nearest NSPs. Table 6.1 below presents the BS4142 assessment for the educational facades during a quiet daytime period. Tables 6.2 and 6.3 presents the BS4142 assessment for the residential facades during daytime and nighttime periods respectively.

**Table 6.1:** BS4142 Assessment Table - NSP Worst Case Facade (Daytime period)

| | Daytime | Commentary |
|---|---|---|
| Ambient Sound Level | NA | Prediction method to be used. |
| Residual Sound Level | NA | |
| Specific Sound Level (predicted from plant sound power data) | 34 dBA | Highest predicted facade level. |
| Corrections | 0 dBA | No penalty corrections as impact is not expected to be readily distinguishable in context. |
| Rating Level dB | 31 dBA | |
| Typical Existing Background $L_{A90,t}$ | 51 dBA | |
| Difference | -17 dBA | |
| Target | -5 dBA | |
| Comments | No further mitigation proposed | Rating level is below target. |
| Conclusion | Low Impact | |

In addition if we consider that the existing openable windows to the Chatham Building spaces, provide a reduction of 12dB between internal and external noise, the predicted UPS ventilation noise will be 22dBA within Room 206 with a window open and thereby falling comfortably below the background noise level within the room also.

The assessments indicate that no further mitigation is required for the proposed UPS ventilation installation.

**Table 6.2:** BS4142 Assessment Table - NSP Worst Case Facade (Daytime period)

| | Daytime | Commentary |
|---|---|---|
| Ambient Sound Level | NA | Prediction method to be used. |
| Residual Sound Level | NA | |
| Specific Sound Level (predicted from plant sound power data) | 16 dBA | Highest predicted facade level. |
| Corrections | 0 dBA | No penalty corrections as impact is not expected to be readily distinguishable in context. |
| Rating Level dB | 16 dBA | |
| Typical Existing Background $L_{A90,t}$ | 50 dBA | |
| Difference | -34 dBA | |
| Target | -5 dBA | |
| Comments | No further mitigation proposed | Rating level is below target. |
| Conclusion | Low Impact | |

**Table 6.3:** BS4142 Assessment Table - NSP Worst Case Facade (Nighttime period)

| | Nighttime | Commentary |
|---|---|---|
| Ambient Sound Level | NA | Prediction method to be used. |
| Residual Sound Level | NA | |
| Specific Sound Level (predicted from plant sound power data) | 16 dBA | Highest predicted facade level. |
| Corrections | 0 dBA | No penalty corrections as impact is not expected to be readily distinguishable in context. |
| Rating Level dB | 16 dBA | |
| Typical Existing Background $L_{A90,t}$ | 45 dBA | |
| Difference | -29ddBA | |
| Target | -5 dBA | |
| Comments | No further mitigation proposed | Rating level is below target. |
| Conclusion | Low Impact | |

# 7.0 CONCLUSIONS

An assessment has been carried out to evaluate the noise impact from the proposed installation of two ventilation fans, providing supply and extract airflow to the existing first-floor UPS room at the Grosvenor East Building, Cavendish Street, Manchester M15 6BH. The purpose of the assessment is to determine the likely noise effects on the nearest noise sensitive receptors.

Based on noise data provided by the equipment manufacturer, internal UPS noise survey measurements and an environmental noise survey to determine the typical background sound climate during the relevant operational period, a CandaA noise propagation model has been used to assess potential noise impact.

Based on the current proposal, impact is predicted to be low and no further mitigation measures are proposed.

# APPENDIX A:
# NOISE MEASUREMENT DETAILS

## Location

Grosvenor East Building, Cavendish Street, Manchester M15 6BH

## Survey Date

25 November 2025

18-19 March 2026

Weather during the relevant survey period was noted to be dry with wind speeds below 5m/s

## Survey Conducted By

Simon Webster BEng (Hons) MIOA - Equipment Setup

## Instrumentation

**Table A1:** List of Instrumentation Used

| Equipment Description | Type Number | Serial Number | Date of Last Calibration | Calibration Certificate Number |
|---|---|---|---|---|
| Sound Level Meter | XL3 | A3A-00480-D1 | 21 March 2025 | UK-25-033 |
| Preamplifier | MA220 | 11390 | 21 March 2025 | UK-25-033 |
| Microphone Capsule | MC230A | A24694 | 21 March 2025 | UK-25-033 |
| Sound Calibrator | Type 1251 IEC 60942-1997 Class 1 | 31040 | 31 October 2025 | 52541 |

## Methodology

Before and after the measurements the XL3 was check calibrated to an accuracy of ±0.3dB using the Norsonic Type 1251 Sound Calibrator. The calibrator produces a sound pressure level of 114 dB re 2x10-5 Pa @ 1kHz.