

Project	Arthur House, Chorlton Street: Discharge of Noise-related Planning Conditions		
Document Number	232366/TN/LS/001	BWB Ref	232366
Author	Luke Smith, MIOA	Status	Final
Checked	Jordan Mayes MIOA	Revision	1
Approved	Mike Barrett MIOA	Date	24/04/2025

1 Introduction

- 1.1 This Technical Note has been prepared by BWB Consulting Limited (BWB) in respect of the proposed ground floor gymnasium and roof terrace at Arthur House, Chorlton Street, Manchester.
- 1.2 A planning application has been submitted for the proposed development which was support by a Noise Impact Assessment prepared by BWB (report reference: 232366, referred to hereafter as the 'BWB NIA'). The development was granted planning consent subject to planning conditions, of which a number are related to noise. These conditions are reproduced below for reference:

Planning Condition 16b

"Within one month of the completion of the development and before first occupation of the completed development hereby approved, a verification report shall be undertaken to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that above criteria is 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 noise criteria. This report shall be submitted to and approved in writing by the City Council as local planning authority before the use becomes operational along with a timescale that confirms when any necessary changes will be implemented."

Planning Condition 17a

"Should any externally mounted ancillary plant, equipment or servicing be required for the approved gym use, it 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."

Planning Condition 17b

"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 non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria."

This Note seeks to address the requirements of the above planning conditions such that they may be discharged by Manchester City Council (MCC).

Note that Planning Condition 16b refers to '*the approved acoustic consultant's report*'. For clarity, this report is the BWB NIA, which is appended to this Note and referenced throughout.

2 Planning Condition 16b

- 2.1 Condition 16b states that '*a verification report shall be undertaken to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that above criteria is met*'.
- 2.2 The BWB NIA considered the sound insulation performance of the separating floor construction between the office spaces at first floor and the gym at ground level; and the separating floor construction between the roof terrace and the offices at sixth floor level.
- 2.3 The assessment concluded that, on the basis that the roof of the building comprises a 200 mm concrete slab, noise transfer into the 6th floor offices as a result of the use of the proposed roof terrace was not a significant concern and so no further mitigation was considered necessary.
- 2.4 With regards the assessment of noise transfer between the ground level gym and offices above, the BWB NIA outlined a requirement for the existing separating floor to be underdrawn by a layer of 15 mm Gyproc Plasterboard. The plasterboard ceiling was proposed to control noise transfer from the gym to the offices above such that the recommended criteria for airborne noise transfer between a gym and a commercial office from the ProPG: Gym Acoustics Guidance (GAG) is achieved.
- 2.5 BWB engineers attended site on 27/03/2025 and can confirm that the recommended plasterboard ceiling to the gym has been installed, as identified in **Figure 2.1**.

Figure 2.1: Plasterboard Ceiling to Gym



To verify that the sound insulation performance of the separating floor between the ground level gym and first floor offices allows the relevant criteria from the GAG to be achieved, a sound insulation test has been undertaken to determine the level difference in one-third octave bands across the separating floor.

Testing was undertaken in accordance with the methodology outlined in BS EN ISO 16283-1:2014 *Acoustics — Field measurement of sound insulation in buildings and of building elements*.

The separating floor achieved a weighted level difference of 68 dB D_w . The one-third octave band level difference values for the tested floor are presented in **Table 2.1**.

Also presented are the assumed one-third octave band sound pressure levels in the gym, which are consistent with the broadband noise levels assumed in the BWB NIA, and with the one-third octave band sound pressure level limits associated with the G35 curve from the GAG (i.e. the recommended upper limit for airborne noise levels in commercial premises, as outlined in the BWB NIA).

The results show compliance with the G35 curve values in each one-third octave band. As such, it is considered that the sound insulation performance of the separating floor has achieved the requirements set out in the BWB NIA.

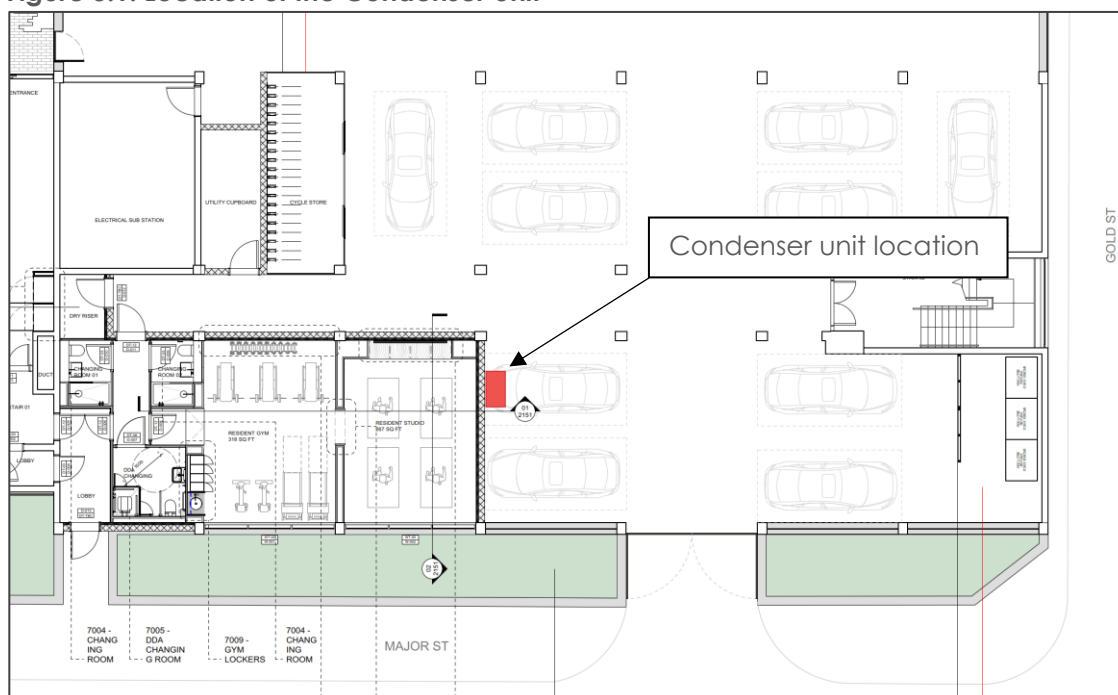
[illegible]

3 Planning Condition 17a

Introduction

- 3.1 In order to support the operational use of the proposed gym, a condenser unit is to be installed within the ground floor car park at Arthur House. The location of the condenser unit is shown in **Figure 3.1**.

Figure 3.1: Location of the Condenser Unit



- 3.2 This Note considers the potential for noise impacts associated with the installation of the condenser unit on the nearest noise sensitive receptor (NSR). The assessment has been undertaken with due regard to the relevant British Standards, and the requirements of Planning Condition 17a.
- 3.3 **Table 3.1** presents details of the manufacturer and model of the plant items, along with the sound power level.

Table 3.1: Sound Power Level for the Condenser Unit

Manufacturer	Model	Sound Power Level, dB
Samsung	AM0508XM0EREU	68

Nearest Noise Sensitive Receptor

- 3.4 The nearest NSR to the condenser unit is office space located within Bolton House approximately 21 m away, to the south east. The location of the nearest NSR is shown in **Figure 3.2**.

Figure 3.2: Location of the Nearest NSR



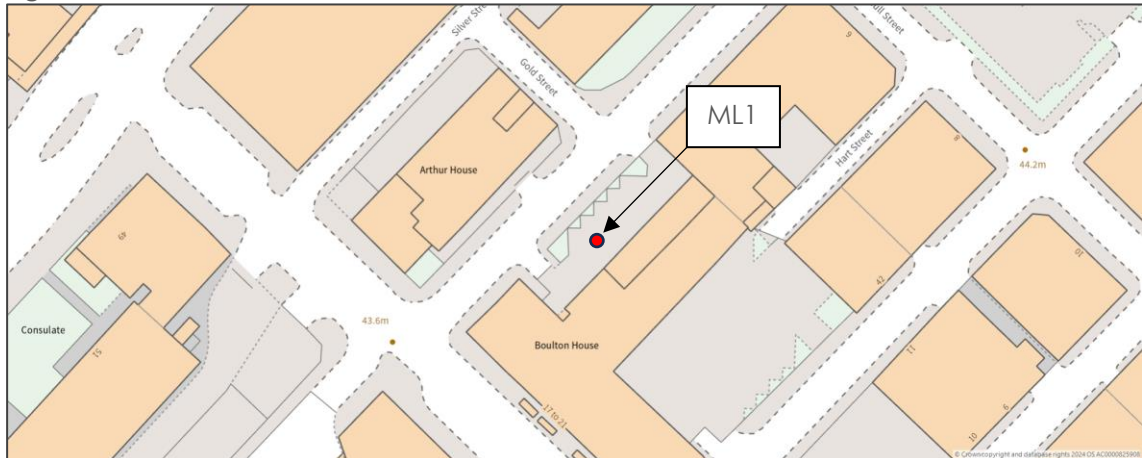
Baseline Noise Survey

- 3.5 A baseline noise survey has been undertaken to determine the prevailing background sound level at the nearby NSR.

Measurement Location

- 3.6 Measurements were undertaken at the location shown in **Figure 3.3**.

Figure 3.3: Measurement Location



Measurement Location 1 (ML1)

- 3.7 Attended measurements were undertaken at ML1 on 27th March 2025. The equipment at ML1 was installed in free-field conditions at a height of 1.5 m above local ground level at a location considered representative of the façade of Arthur House which is likely to be most affected by condenser unit noise emissions. The noise climate at ML1 was dominated by local urban road traffic.

Measurement Equipment

- 3.8 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3.2**. The equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meters, pre-amplifiers and microphones were calibrated to traceable standards within the 24 months prior to the measurements. The portable calibrators were calibrated within the 12 months preceding the date of the survey.

Table 3.2: Noise Measurement Equipment

Equipment	Make and Model	Serial Number
Sound Level Meter	01 dB Fusion	11327
Microphone	Grass 40CE	259479
Pre-amp	01 dB PRE 22	1605201
Sound Level Meter	01 dB Fusion	11327

Weather Conditions

- 3.9 The weather was generally conducive to environmental noise measurement, it being dry with negligible winds during all survey periods ($<5 \text{ ms}^{-1}$).

Measurement Results

- 3.10 The equivalent continuous sound pressure level ($L_{Aeq,T}$) and background sound level ($L_{A90,T}$) at the measurement location are presented in **Table 3.3**, below. Measurements were undertaken during the evening period to be representative of the most sensitive time of the day when the gym may be operational.

Table 3.3: Summary of Measured Sound Pressure Levels at ML1

Period	Duration	Measured Sound Pressure Level	
		dB $L_{Aeq,T}$	dB $L_{A90,T}$
Evening	15 mins	66	55

Assessment

- 3.11 Noise emissions from the condenser unit have been assessed against the rating level noise limit prescribed in Planning Condition 17a.
- 3.12 The approach taken has been to compare the predicted noise emissions during the daytime period with the adopted limit, which is 5 dB below the background sound level at the NSR.
- 3.13 As the NSR is understood to be occupied solely during typical office working hours, this assessment focusses on the potential for noise impacts during the daytime period.

- 3.14 Using the adopted background sound level shown in **Table 3.3**, the noise emission limit in accordance with Planning Condition 17a is 50 dB.
- 3.15 Using the data presented in **Table 3.1**, and assuming the standard acoustic principle of a 6 dB reduction in noise level per doubling of distance from a point source, the predicted sound pressure level at the NSR as a result of noise emissions from the condenser unit is 34 dB L_{Aeq} .
- 3.16 This calculation solely takes account of the attenuation of noise emissions from condenser unit as a result of air absorption and does not account for the likely further reductions in noise as a result of the NSR being off axis from the direction of noise emission propagation.
- 3.17 BS 4142 advises that the Specific Sound Level of the noise source being assessed is to be corrected by the application of penalties for characteristic features (such as tonal qualities and/or distinct impulses), should these features be perceptible at the receiver. Based on the broadband, continuous, steady-state nature of the noise from the units, no penalties are considered applicable to the predicted Specific Sound Level. The resulting Rating Level is therefore 34 dB $L_{A,r}$.
- 3.18 A comparison between the Rating Level at the nearest façade of the NSR and the noise limit in accordance with Planning Condition 17a indicates that the Rating Level is predicted to fall 16 dB below the limit of 50 dB.
- 3.19 It is therefore considered that noise emissions from the condenser unit meet with the requirements of Planning Condition 17a which may now be discharged.

4 Planning Condition 17b

Introduction

- 4.1 Following installation of the mechanical fixed plant for the gym, environmental noise measurements have been undertaken to verify that emissions meet with the requirements set out in Planning Condition 17a. Where it is shown that noise emissions from the plant meet the noise limit prescribed in Planning Condition 17a, it is considered that the requirements of Planning Condition 17b would also be met.
- 4.2 Section 3 of this Note presents an assessment which indicates that noise emissions from the condenser unit associated with the gym at Arthur House will fall below the limits prescribed in Planning Condition 17a (equivalent to a level 5 dB below the background sound level at the nearest NSR).
- 4.3 To verify that the noise emissions from the installed condenser unit meet with the prescribed limit, measurements have been undertaken at the nearest NSR with the condenser unit switched off and then with the condenser unit operating under typical conditions.
- 4.4 Where there is no greater than a negligible difference (<1 dB) between the measurements, it is considered that noise emissions from the plant would not exceed a

level 5 dB below the background sound level at the nearest NSR as is required in Planning Condition 17a.

Verification Measurements

- 4.5 Equivalent continuous sound pressure levels ($L_{Aeq,T}$) and background sound levels ($L_{A90,T}$) are presented in **Table 4.1**, which have been undertaken at the same location shown in **Figure 3.3**. These measurements have been undertaken both with the condenser unit switched off and then with the condenser unit operating under typical conditions.
- 4.6 The verification measurements have been undertaken at a point in the day when the office may still be occupied but when background sound levels are likely to be lowest (i.e. a more robust assessment approach).
- 4.7 During the measurement period in which the unit was operating, the attending engineer could not discern noise emissions from the installed plant above the existing noise climate.

Table 4.1: Summary of Measured Sound Pressure Levels

Measurement Date and Start Time	Measurement Period	Plant Status	Measured Sound Pressure Level, dB(A)	
			$L_{Aeq,T}$	$L_{A90,T}$
27/03/25 18:45	15-mins	On	66	55
27/03/25 19:04	15-mins	Off	66	55

- 4.8 The results presented in **Table 4.1** indicate no change in $L_{A90,15min}$ noise levels at the location considered representative of the nearest NSR with the unit both on and off.
- 4.9 Accordingly, the contribution of noise emissions from the plant can be assumed to be at least 5 dB below the $L_{A90,T}$ noise levels measured at the nearest NSR.
- 4.10 Therefore, noise emissions from the plant associated with the gym at Arthur House are considered to comply with the limit prescribed in Planning Condition 17a and, by extension, the requirements of Planning Condition 17b are deemed to have been satisfied.

5 Conclusion

- 5.1 This Technical Note has been prepared by BWB Consulting Limited (BWB) in respect of the proposed development at Arthur House.
- 5.2 Regarding Planning Condition 16b, it has been verified that the mitigation measures to control noise transfer from the Gym to offices above as outlined in BWB NIA have been installed on site. Furthermore, the results of on-site testing have been used to confirm that the design objectives outlined in the BWB NIA have been achieved.
- 5.3 For Planning Condition 17a, an assessment has been undertaken which predicts that noise emissions from externally mounted plant associated with the gym would not exceed a noise level equivalent to the prescribed limit of 5 dB below the background sound level at the nearest NSR.
- 5.4 For Planning Condition 17b, verification measurements have been undertaken at the nearest NSR which demonstrate that noise emissions from the installed plant associated with the gym meet with the prescribed limit from Planning Condition 17a.
- 5.5 Consequently, the requirements of Planning Conditions 16b, 17a and 17b are considered to have been satisfied.