Goulden Street (Peeler's Yard), Manchester

Acoustic Design Review

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26001-R01A-BT Goulden Street

Client: CERT Property

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REVISION HISTORY

Revision	Date	Revision Details	Author	Checked
R01	07/06/2026	Initial issue	Ben Tomlin BSc MIOA	Susan Witterick BSc MIOA
R01A	27/08/2026	Updated based on comments received	[redacted] Ben Tomlin BSc MIOA	[redacted] Susan Witterick BSc MIOA

1 INTRODUCTION

1.1 dBx Acoustics Ltd has been appointed by CERT Property UK Ltd. (CERT) to undertake an acoustic design review for the proposed Goulden Street residential development.

1.2 The development comprises a new build 8-storey residential apartment block, to form 82 apartments.

1.3 The development has been granted planning permission, with conditions, under Manchester City Council planning reference 125678/FO/2019. An updated planning application was made to reflect the replacement of ground floor commercial units with apartments, and given approval under decision notice reference 135818/JO/2022. 135818/JO/2022 was later amended by 142177/NMC/2025 to make further design amendments and increase the number of units to the currently approved quantum of 82."

1.4 Planning Conditions 12 and 13 of this decision relate to acoustics.

1.5 Plant noise egress is considered based on discharging planning condition 12.

1.6 The acoustic requirements of the external envelope are assessed in terms of noise ingress to the apartments, to meet the requirements of and hence discharge Planning Condition 13.

1.7 An assessment of internal sound insulation, and reverberation control for common areas, which need to comply with the requirements of Approved Document E (ADE) of the Building Regulations (but are not planning conditions) is also undertaken.

1.8 This report updates the previous acoustic design report (ref 2*4033-R01-BT* dated 04/06/2024, undertaken for Big Red Construction) to consider the latest design revisions, and the outcome of a new noise survey undertaken in 2026 by dBx Acoustics for CERT.

1.9 The Tim Groom Architects (TGA) drawings used in the assessment are detailed below;

- 0321-TGA-XX-XX-DR-A-23001-C01 Floor Types 02
- 0321-TGA-XX-XX-DR-A-27000-P04 Roof Types
- 0321-TGA-XX-XX-DR-A-35000-P02 Ceiling Types
- 0321-TGA-XX-XX-DR-A-21000-C01 Wall Types
- 0321-TGA-XX-XX-DR-A-21001-C01 Wall Types Sheet 02
- 0321-TGA-XX-XX-DR-A-22000-P03 Internal Wall Types
- 0321-TGA-XX-XX-DR-A-23000-C01-Floor Types

1.10 A glossary of acoustic terminology has been supplied in Appendix A to assist the reader.

2 ASSESSMENT CRITERIA

Manchester City Council – Planning Conditions

2.1 Manchester City Council's requirements in terms of noise are detailed in Decision Notice 135818/JO/2022, conditions 12 and 13, as confirmed below.

Condition 12

2.2 Condition 12 relates to plant noise emissions, and is reproduced below.

"12) Notwithstanding the noise impact assessment stamped as received by the City Council, as Local Planning Authority, on the 23 December 2019,

(a) Prior to the first occupation of the development hereby approved, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted 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 5 db (Laeq) below the typical background (La90) level at the nearest noise sensitive location.

(b) Prior to the first occupation of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met.

In instances of non conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority, and thereafter retained and maintained in situ.

Reason - To minimise the impact of plant on the occupants of the development pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995)."

Condition 13

2.3 Condition 13 relates to external noise ingress into the apartments, and is reproduced below.

"13) Notwithstanding the noise impact assessment stamped as received by the City Council, as Local Planning Authority, on the 23 December 2019, (a) prior to the first occupation of the residential element of the development, a scheme for acoustically insulating the proposed residential accommodation against noise from Oldham Road and local traffic network shall be submitted for approval in writing by the City Council, as Local Planning Authority. The approved noise insulation scheme shall be completed before the first occupation of the development.

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events shall not

exceed 45 dB LAmax,F by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq

Gardens and terraces (daytime) 55 dB LAeq

(b)Prior to the first occupation of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met.

In instances of non conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority, and thereafter retained and maintained in situ.

Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance pursuant to policies SP1, H1 and DM1 of the Core Strategy (2007) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995)."

Internal Acoustics (Building Control)

Building Regulations 2010 – Approved Document E Requirements

Sound Insulation

2.4 The development falls under the classification of "purpose-built dwelling houses and flats" per the Building Regulations 2010 Approved Document E (ADE). The relevant criteria set out within Approved Document E are presented in Table 1, below.

Table 1: Sound Insulation Criteria set out in Approved Document E.

Description		Minimum Airborne Sound Insulation $D_{nT,w} + C_{tr}$ dB	Maximum Impact Sound Pressure Level $L'_{nT,w}$ dB
Purpose built dwelling-houses and flats	Walls	45	-
	Floors and stairs	45	62

2.5 These criteria are to be achieved on site, and must be demonstrated by a program of pre-completion testing (unless Robust Details are used).

2.6 Under ADE, internal floors, and internal walls which do not contain a door should achieve a minimum laboratory value for airborne sound insulation of 40dBR_w. Corridor walls which are not compromised by a door should be designed as separating walls.

Doors

2.7 Doors to common areas should achieve a minimum performance of 29dBR_w.

Reverberation Control - Corridors and Stairwells

2.8 Reverberation control in the common parts of residential buildings is prescribed in Approved Document E. Two methods of compliance are presented which are discussed later in this report.

Acoustics, Ventilation and Overheating: Residential Design Guide 2020 (AVO)

2.9 AVO outlines a two-level procedure to estimate the potential impact on occupants in the case of the overheating condition.

2.10 The AVO Level 1 assessment is used to determine the 'Potential Effect without Mitigation' and to establish if there is a requirement for a Level 2 Assessment.

2.11 A level 1 assessment is undertaken by comparing the external noise levels measure to the values shown on Table 3-2 of AVO, reproduced as Figure 1, below.

Figure 1: AVO Table 3-2, Guidance for Level 1 Site Risk Assessment

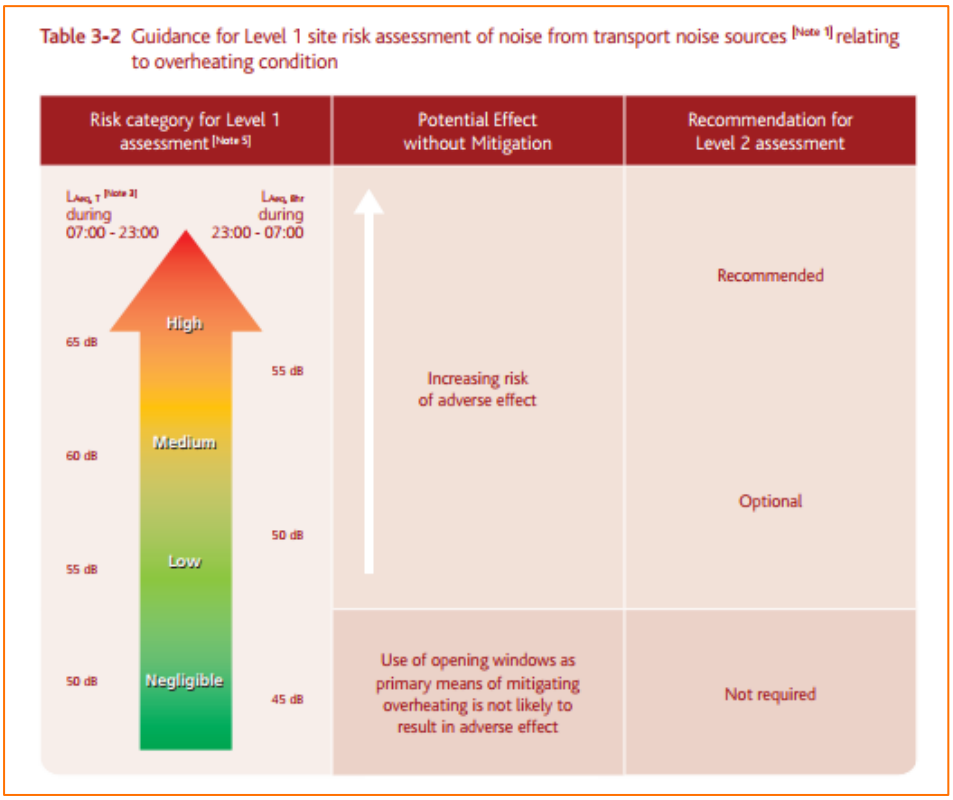


Table 3-2 Guidance for Level 1 site risk assessment of noise from transport noise sources [Note 1] relating to overheating condition

Risk category for Level 1 assessment [Note 5]	Potential Effect without Mitigation	Recommendation for Level 2 assessment
$L_{Aeq,T}$ [Note 3] during 07:00 - 23:00 / $L_{Aeq,8hr}$ during 23:00 - 07:00		
High: 65 dB / 55 dB	Increasing risk of adverse effect	Recommended
Medium: 60 dB / 50 dB		Optional
Low: 55 dB / 50 dB		
Negligible: 50 dB / 45 dB	Use of opening windows as primary means of mitigating overheating is not likely to result in adverse effect	Not required

2.12 If required, a Level 2 assessment is then undertaken by comparing the predicted internal noise levels to Table 3-3 of AVO, reproduced as Figure 2, below.

Figure 2: AVO Table 3-3, Guidance for Level 2 Assessment

Table 3-3 Guidance for Level 2 assessment of noise from transport noise sources[Note 1] relating to overheating condition

Internal ambient noise level [Note 2]			Examples of Outcomes [Note 5]	
$L_{Aeq,T}$ [Note 3] during 07:00 – 23:00 [Note 6]	$L_{Aeq,8h}$ during 23:00 – 07:00	Individual noise events during 23:00 – 07:00 [Note 4]		
> 50 dB	> 42 dB	Normally exceeds 65 dB $L_{Af,max}$	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time	Avoiding certain activities during periods of intrusion. Having to keep windows closed most of the time because of the noise. 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.
			Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods. As noise levels increase, small behaviour changes are expected e.g. turning up the volume on the television; speaking a little more loudly; having to close windows for certain activities, for example ones which require a high level of concentration. Potential for some reported sleep disturbance. Affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life. At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time. [Note 8]
≤ 35 dB	≤ 30 dB	Do not normally exceed $L_{Af,max}$ 45 dB more than 10 times a night	Noise can be heard, but does not cause any change in behaviour	Noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response[Note 9]. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.

2.13 It can be seen from the figures above that there are no strict numerical limits for an acceptable level of noise within residences during the overheating condition.

2.14 Table 3-3, however, does suggest that daytime noise levels of ≥50dB$L_{Aeq,8hour}$, and night-time noise levels of ≥42dB$L_{Aeq,8hour}$, or 65dB$L_{Amax,F}$ can be considered upper limits for acceptable noise levels in rooms in which overheating is controlled by the use of open windows.

3 NOISE SURVEYS

3.1 Noise surveys were previously undertaken in 2018 and 2019 around the site.

3.2 As there have been significant changes in the buildings and infrastructure around the site, an updated noise survey was undertaken in 2026.

3.3 Noise levels were measured between around 14:30 and 17:30h during the daytime period of 28th January 2026, which includes the rush hour period, in accordance with Manchester City Council's requirements.

3.4 Night-time noise levels were measured continuously between 23:00h and 07:00h on 28th-29th January 2026.

3.5 All measurements were undertaken in accordance with BS 7445-1:2003 *Description and Measurement of Environmental Noise*, with microphones located at approximately 1.5 metres above the local ground level and at least 3.5 metres away from reflective surfaces other than the ground which can be considered as in free field conditions.

3.6 The daytime measurements were carried out generally in accordance with the shortened measurement procedure detailed in the *Calculation of Road Traffic Noise* (CRTN) document (Department of Transport (Welsh Office), 1988).

3.7 At the time of the visit, all four roads around the site were closed to road traffic, due to the construction activities. There was also significant site activity work, along with a large generator operating, which meant measuring noise levels around the site in the daytime was impossible.

3.8 On this basis, and because the dominant source of noise is road traffic on Oldham Road, the noise survey in the daytime period was repeated at two locations (1 and 6) where the original noise survey was originally undertaken, as indicated in Figure 3, below.

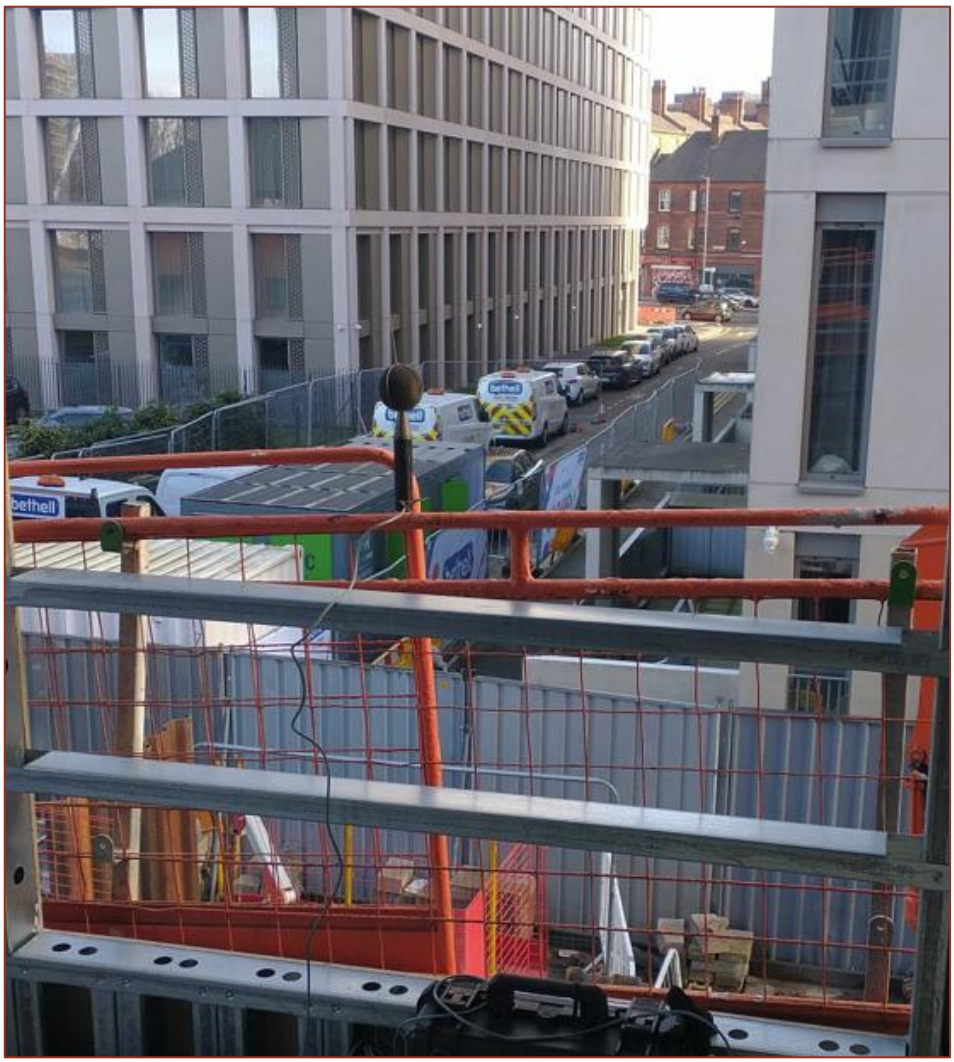
Figure 3: Survey Locations



3.9 For the night-time measurements, a long-term logger was located on the first floor at a new measurement location (7), indicated in Figure 3, above.

3.10 The microphone was fixed to the perimeter fencing on the first floor overlooking Bendix Street with a clear line of sight to Oldham Road, in free-field conditions, as indicated in Figure 4, below.

Figure 4: Long Term Monitoring Location



Survey Results

Daytime

3.11 The pertinent noise levels measured during the daytime are shown in Table 2, below.

Table 2: Daytime Noise Survey Results

Location	Period, h	Ambient Noise Level, $dBL_{Aeq,T}$	10th Percentile, $dBL_{A10,T}$
1	14:44-14:59	62	64
	15:44-15:59	62	64
	16:44-16:59	61	64
		Log Average = 61	**Average = 64**
6	14:24-14:39	69	71
	15:24-15:39	67	71
	16:24-16:39	69	72
		Log Average = 68	**Average = 71**

3.12 Based on the CRTN methodology, the L_{A10} data shown in Table 2, above, can be used to determine the 16-hour daytime ambient noise levels.

3.13 The arithmetic average of the $dBL_{A10,1hour}$ values provides the 3-hour average, $dBL_{A10,3hour}$. This is converted to the 18-hour $dBL_{A10,18hour}$ value by subtracting 1dB. This is then converted to the 16-hour ambient noise level, $dBL_{Aeq,16hour}$, by subtracting a further 2dB.

3.14 Based on the CRTN assessments, the daytime ambient noise levels are calculated to be 61$dBL_{Aeq,16hour}$ at Location 1, and 68$dBL_{Aeq,16hour}$ at Location 6.

3.15 These are therefore the same as the short-term ambient noise level measurements.

3.16 A comparison to the noise levels measured in 2018/19 is shown in Table 3, below.

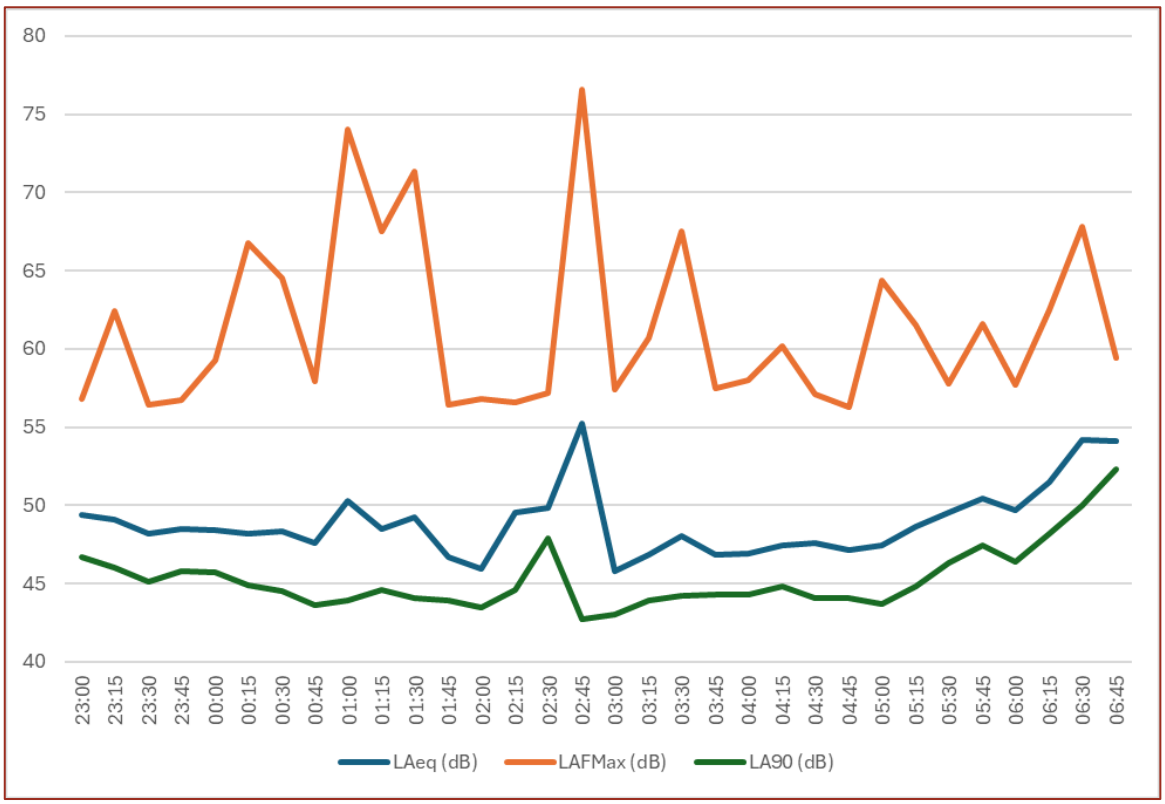
Table 3: Comparison of Previous and Current Daytime Noise Levels

Location	Daytime L_{Aeq} (2019)	Daytime L_{Aeq} (2026)	Difference, dB
Location 1 – Thompson Street	66	61	-5
Location 6 – Oldham Road	73	68	-5

Night-time

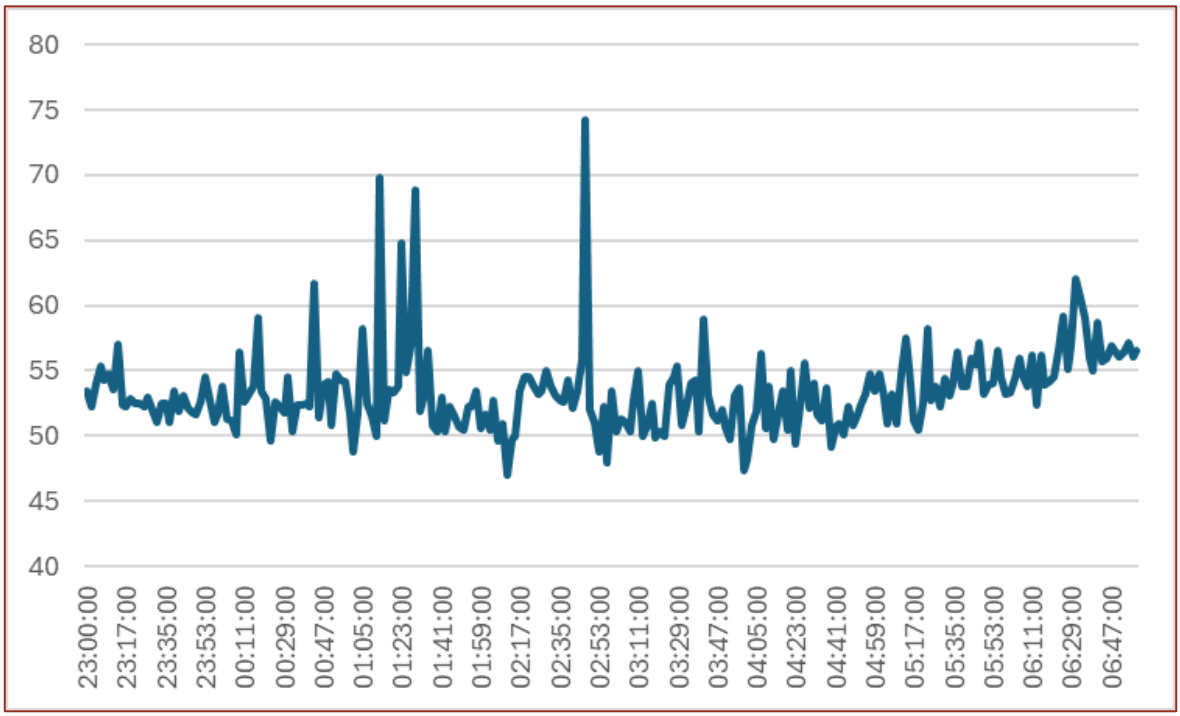
3.17 The noise levels measured at Location 7 over the period 23:00h-07:00h are shown in Figure 5, below.

Figure 5: Night-time Noise Levels



3.18 The night-time maximum noise levels, in 2-minute periods, are shown as Figure 6, below.

Figure 6: Night-time Maximum Noise Levels, 2min



3.19 Removing the highest 10-15 events, in line with MCC guidance, results in a typical maximum noise level of 59dB$L_{Amax,F}$.

3.20 Numerically, the values measured at this location (Bendix St.) are shown in Table 4, below, compared to the previous survey data.

Table 4: Comparison of Previous and Current Night-time Noise Levels

L_{Aeq} (2019)	L_{Aeq} (2026)	Difference, dB	LAmax (2019)	LAmax (2026)	Difference, dB
57	50	-7	62	59	-3

3.21 **It should be noted that the recent measurements were undertaken with all of the roads around the site closed.** Although not heavily trafficked, noise levels at the facades, particularly maximum noise levels from car pass-bys, will likely be higher than reported here when the roads are reopened.

Overall

3.22 Overall, based on the noise levels measured in 2026, it would appear that daytime noise levels, dominated by road traffic on Oldham Road (and excluding construction and generator noise), are around 5dB lower than those measured in 2019, while night-time ambient noise levels are around 7dB lower, and maximum noise levels are around 3dB lower.

4 NOISE INGRESS (CONDITION 13)

4.1 Table 5, below, shows the worst-case predicted external façade noise level at each façade based on the survey data and subsequent noise model created in 2019.

Table 5: External Noise Level by Façade Location (2019).

Façade	Daytime $L_{Aeq,T}$ (dB)	Night-time $L_{Aeq,T}$ (dB)	Night time $L_{Amax,F}$ (dB)
Cross Keys Street	65	57	67
Goulden Street	63	61	76
North east (alley between Bendix St and Cross Keys St)	63	53	62
Bendix Street (south east)	63	57	62

4.2 Using the corrections detailed above, the likely noise levels on each façade are as shown in Table 6, below.

Table 6: External Noise Level by Façade Location (2026).

Façade	Daytime $L_{Aeq,T}$ (dB)	Night-time $L_{Aeq,T}$ (dB)	Night time $L_{Amax,F}$ (dB)
Cross Keys Street	60	50	64
Goulden Street	58	54	73
North east (alley between Bendix St and Cross Keys St)	58	46	59
Bendix Street (south east)	58	50	59

4.3 Using this data, typical octave band spectra derived from the measured data, and the latest floor plans and elevations provided by Tim Groom Architects, the requirements for the glazing and ventilation have been determined.

4.4 It is understood the preferred trickle vent is a Brookvent Airvent SM1000+, which has a sound insulation performance of 29dB$D_{n,e,w}$ in the open position, based on the manufacturer's literature.

4.5 On this basis, the minimum sound insulation performances for the glazing are shown in Table 7, below.

Table 7: Required Glazing Sound Insulation Performance to Achieve Target Internal Noise Levels.

Façade	Room Type	Glazing Sound Insulation Performance	Example Glazing Build-up, mm
Goulden Street	Living Rooms, day	$36dBR_w$ and $29dBR_w+C_{tr}$	10/TC/4
Goulden Street	Bedrooms, Night	$36dBR_w$ and $29dBR_w+C_{tr}$	10/TC/4
All other facades	Living Rooms, day	$31dBR_w$ and $25dBR_w+C_{tr}$	4/TC/4
All other facades	Bedrooms, Night	$31dBR_w$ and $25dBR_w+C_{tr}$	4/TC/4

TC = Thermal Cavity

4.6 Using the above minimum glazing specifications with the proposed ventilators should therefore achieve Manchester City Council's indoor ambient noise level criteria for day and night.

4.7 On the basis of the glazing specifications calculated, the external wall and roof will need to achieve a sound insulation performance of at least 10dB higher than the glazing, i.e. at least $46dBR_w$.

External Walls

4.8 There are six external wall types shown on TGA drawing *0321-TGA-XX-XX-DR-A-21000 REV C01*.

EW-101

4.9 EW-101 is comprised of 103mm brick, with a 55mm cavity, 115mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 15mm Fireline. This wall has a predicted sound insulation performance of at least $55dBR_w$.

EW-101A

4.10 EW-101 A is comprised of 103mm brick, with a 50mm cavity, 100mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS and 2 layers of plasterboard (type unspecified). 100mm SFS with 100mm mineral fibre, and 2 layers of 15mm Fireline. This wall has a predicted sound insulation performance of at least $55dBR_w$.

4.11 These two proposed external walls will therefore meet the $46dBR_w$ requirement, and hence will be acceptable in all locations, and could be reduced if desirable (e.g. one layer of plasterboard, replace mineral fibre with rigid insulation, etc.).

EW-102

4.12 EW-102 is comprised of 103mm brick, with a 170mm cavity, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm with 100mm mineral fibre, 100mm SFS, 12.5mm cementitious board, a 170mm cavity and 103mm brick. This wall has a predicted sound insulation performance of at least $65dBR_w$. One of the layers of CPB could be removed, if desired.

EW-201

4.13 EW-201 is comprised of the existing masonry/ashlar wall (thickness varies – 300mm drawn as an example), with a minimum 50mm cavity, 100mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 15mm Fireline. This wall has a predicted sound insulation performance of at least 55dBR$_w$.

EW-201

4.14 EW-201 is comprised of the existing masonry/ashlar wall, with a variable cavity, 100mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 15mm Fireline. This wall has a predicted sound insulation performance of at least 55dBR$_w$.

EW-202

4.15 EW-202 is comprised of 103mm brick, with a 55mm cavity, 115mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 12.5mm WallBoard. This wall has a predicted sound insulation performance of at least 55dBR$_w$.

EW-202A

4.16 EW-202A is comprised of 103mm brick, with a 50mm cavity, 100mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 12.5mm WallBoard. This wall has a predicted sound insulation performance of at least 55dBR$_w$.

EW-203

4.17 EW-203 is comprised of 103mm brick, with a 55mm cavity, 115mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 15mm Fireline. This wall has a predicted sound insulation performance of at least 55dBR$_w$.

EW-203A

4.18 EW-203A is comprised of 103mm brick, with a 55mm cavity, 115mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 100mm SFS with 100mm mineral fibre, and 2 layers of 15mm Fireline. This wall has a predicted sound insulation performance of at least 55dBR$_w$.

EW-401

4.19 EW-401 comprises a rainscreen cladding panel, 80mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 150mm SFS and 2 layers of 12.5mm WallBoard. This wall has a predicted sound insulation performance of around 55dBR$_w$.

EW-401A

4.20 EW-401A comprises a rainscreen cladding panel, 80mm rigid insulation, 12.5mm cementitious board (assumed density ~1100kg/m^3), 150mm SFS and 2 layers of 12.5mm WallBoard. This wall has a predicted sound insulation performance of around 55dBR$_w$.

Roofs

4.21 There are four proposed roof types shown on TGA drawing reference *0321-TGA-XX-XX-DR-A-27000 Rev P04*.

RT-101

4.22 RT-101 comprises an inverted roof system, comprising paving slabs on rigid insulation on 65mm screed, 18mm cement particle board, with a ceiling comprising 2 layers of plasterboard (type unspecified) with at least 400mm cavity. This roof has a predicted sound insulation performance of at least 60dBR_w (worst case, based on two layers of 12.5mm WallBoard) and is hence acceptable.

RT-102

4.23 RT-102 comprises an inverted roof system, comprising 40mm ballast on rigid insulation on 65mm screed, 18mm cement particle board, with a ceiling comprising 2 layers of plasterboard (type unspecified) with at least 400mm cavity. This roof has a predicted sound insulation performance of at least 60dBR_w (worst case, based on two layers of 12.5mm WallBoard) and is hence acceptable.

RT-201

4.24 RT-201 comprises a steel standing seam roof, 135mm cavity, 18mm cement particle board, with a ceiling comprising 2 layers of plasterboard (type unspecified) with at least 400mm cavity. This roof has a predicted sound insulation performance of at least 55dBR_w (worst case, based on two layers of 12.5mm WallBoard) and is hence acceptable.

RT-202

4.25 RT-202 comprises an aluminium rainscreen cladding roof, 135mm cavity, 18mm cement particle board, with a ceiling comprising 2 layers of plasterboard (type unspecified) with at least 400mm cavity. This roof has a predicted sound insulation performance of at least 55dBR_w (worst case, based on two layers of 12.5mm WallBoard) and is hence acceptable.

4.26 Although there are no criteria in terms of rain noise for residential accommodation, the proposed roofs would all be expected to adequately control rain noise in the apartments below.

Overall

4.27 Overall, the sound insulation performance of the proposed external envelope elements would control noise ingress to meet MCC's requirements in all habitable rooms, and hence Planning Condition 13(a) can be discharged.

Overheating

4.28 At this stage, it has not been established whether the overheating condition will occur.

Level 1 Assessment

4.29 The AVO Level 1 Assessment is used to determine the 'Potential Effect without Mitigation' and to establish if there is a requirement for a Level 2 Assessment.

4.30 The Level 1 Assessment (based on Figure 1, above) is summarised in Table 8, below.

Table 8: Level 1 Assessment

Façade	Daytime L_{Aeq} (dB)	Night-time L_{Aeq} (dB)	Night time L_{Amax} (dB)	Risk Category
Cross Keys Street	60	50	64	Medium
Goulden Street	58	54	73	Medium
North east (alley between Bendix St and Cross Keys St)	58	46	59	Medium
Bendix Street (south east)	58	50	59	Medium

4.31 AVO indicates that a Level 2 assessment is 'optional'.

4.32 On this basis, a Level 2 assessment has been undertaken for all 4 facades.

Level 2 Assessment

4.33 AVO specifies an expected reduction from external to internal noise levels of 13dB when a window is open.

4.34 On this basis, the Level 2 assessment is shown in Table 9, below.

Table 9: AVO Level 2 Assessment

Facade	Period	External Noise Level, dB	Reduction, open window, dB	Internal Noise Level, dB	Upper Limit Outlined in AVO, dB	Exceedance, dB
Cross Keys Street	Day, $dBL_{Aeq,16hr}$	60	-13	47	50	-3
	Night, $dBL_{Aeq,8hr}$	50	-13	37	42	-5
	Night, $dBL_{Amax,F}$	64	-13	51	65	-14
Goulden Street	Day, $dBL_{Aeq,16hr}$	58	-13	45	50	-5
	Night, $dBL_{Aeq,8hr}$	54	-13	41	42	-1
	Night, $dBL_{Amax,F}$	73	-13	60	65	-5
North east	Day, $dBL_{Aeq,16hr}$	58	-13	45	50	-5
	Night, $dBL_{Aeq,8hr}$	46	-13	33	42	-9
	Night, $dBL_{Amax,F}$	59	-13	46	65	-19
Bendix Street	Day, $dBL_{Aeq,16hr}$	58	-13	45	50	-5
	Night, $dBL_{Aeq,8hr}$	50	-13	37	42	-5
	Night, $dBL_{Amax,F}$	59	-13	46	65	-19

4.35 It can therefore be seen that openable windows is a suitable mitigation strategy for the overheating condition.

External Amenity

4.36 There is a private courtyard proposed on the corner of Goulden Street and Chadderton Street.

4.37 External noise levels within this area have been predicted, and will be below 55dB$L_{Aeq,T}$ during the daytime as indicated in Figure 7, below.

Figure 7: Daytime Noise Map of External Amenity Area



5 INTERNAL ACOUSTICS / APPROVED DOCUMENT E

Walls

5.1 The internal wall types are shown on TGA drawing reference *0321-TGA-XX-XX-DR-A-22000-P03 Internal Wall Types*.

Separating Walls

Frameclad

5.2 IW-201 is a separating wall and hence needs to achieve a sound insulation performance of $45dBD_{nT,w}+C_{tr}$ on site, and is tested at PCT Stage.

5.3 The proposed construction comprises 2 layers of 15mm Fireline each side of twin/independent studs, forming a cavity of 200mm, with no mineral fibre. The plasterboard has a nominal 3mm plaster skim coat.

5.4 Based on Frameclad data, this wall has a predicted sound insulation performance of $50dBR_w+C_{tr}$, which would therefore achieve around $43dBD_{nT,w}+C_{tr}$ on site. This does not meet the requirements of Approved Document E.

5.5 Adding a layer of 50mm or thicker mineral fibre to the cavity is predicted to increase the performance by around 4dB, and hence the requirements would be met.

5.6 IW-202 is an internal wall and hence needs to achieve a laboratory performance of $40dBR_w$, and is not tested on site.

5.7 The wall comprises 2 layers of 15mm Fireline each side of a 100mm stud, with no mineral fibre in the cavity. This wall has a predicted sound insulation performance of $53dBR_w$ and is therefore acceptable.

British Gypsum

IW-301

5.8 IW-301 is a separating wall and hence needs to achieve a sound insulation performance of $45dBD_{nT,w}+C_{tr}$ on site, and is tested at PCT Stage.

5.9 The wall comprises two layers of 15mm SoundBloc each side of twin metal studs, forming a cavity of 200mm, with 50mm mineral fibre.

5.10 Based on information in the British Gypsum (BG) project pack, this partition has a laboratory tested performance of $56dBR_w+C_{tr}$, and hence should achieve around $49dBD_{nT,w}+C_{tr}$ on site, which is 4dB greater than the required performance, hence allowing some tolerance.

IW-302

5.11 IW-302 is BG ref A216010 (B) and is also a separating wall, and is used around the stair core, and would therefore also need to achieve a sound insulation performance of $45dBD_{nT,w}+C_{tr}$.

5.12 The proposed construction comprises 2 layers of 15mm Fireline each side of twin/independent studs, forming a cavity of 200mm, with 50mm mineral fibre. The plasterboard has a nominal 3mm plaster skim coat.

5.13 Based on information in the British Gypsum (BG) project pack, this partition has a laboratory tested performance of 53dBR_w+C_{tr}, and hence should achieve around 46dB$D_{nT,w}$+C_{tr} on site, which is 1dB greater than the required performance. There is therefore little tolerance and good workmanship and detailing is essential.

IW-303 - Corridor Wall

5.14 IW-303 is an internal wall, BG reference A206251 and comprises two layers of 15mm Fireline each side of a 70mm metal stud. This wall has a tested sound insulation performance of 46dBR_w and hence meets the requirements of ADE.

IW-304 – Shaft Wall

5.15 This wall is used around the lift shafts, including areas adjacent to habitable rooms. It is comprised on one layer of 19mm Coreboard on one side of a 38mm stud, with 3 layers of 15mm Fireline on the other. To bedrooms, this is supplemented with an independently support lining, IW-101, which comprises 2 layers of 12.5mm SoundBloc on a 70mm stud, with 25mm mineral fibre.

5.16 This wall has a predicted airborne sound insulation performance of 65dBR_w, and hence should adequately control lift noise (and structure borne vibration).

IW-305 - Corridor Wall

5.17 IW-305 is BG reference A206004 and comprises two layers of 15mm WallBoard each side of a 70mm metal stud. This wall has a tested sound insulation performance of 45dBR_w and hence meets the requirements of ADE.

IW-306 - Apartment Internal Walls

5.18 IW-306 is BG reference A206164 and comprises one layer of 12.5mm SoundBloc each side of a 70mm metal stud. This wall has a tested sound insulation performance of 40dBR_w and hence meets the requirements of ADE.

IW-307 - Apartment Internal Walls - Moisture Resistant

5.19 IW-306 is BG reference A206164 MR1 and comprises one layer of 12.5mm SoundBloc each side of a 70mm metal stud (one side moisture resistant). This wall has a tested sound insulation performance of 40dBR_w and hence meets the requirements of ADE.

Doors

5.20 Apartment doors to corridors should achieve a sound insulation performance of at least 29dBR_w. Seals should be provided to the head, jambs and threshold.

Floors

5.21 The proposed separating floor types are shown on TGA drawing reference *0321-TGA-XX-XX-DR-A-23000 rev C01*, and assessed below.

FT-201 - Typical Level 1 Floor

5.22 FT-201 separates apartments from apartments, and comprises a 150mm profiled concrete slab, with a cavity of around 660mm, with 50mm mineral fibre insulation, and a ceiling comprising two layers of 15mm WallBoard.

5.23 Assuming normal weight concrete (~2,400kg/m^3), this floor has a predicted airborne sound insulation performance of 58dBR_w+C_{tr}, and hence should achieve around 53dB$D_{nT,w}$+C_{tr} on site, assuming good detailing and workmanship. This is around 8dB higher than the required performance of 45dB$D_{nT,w}$+C_{tr}, and hence should be acceptable, with a good tolerance.

5.24 The predicted impact sound insulation performance is around 59dB$L_{nT,w}$ which is 3dB lower (better) than required. While it should meet the requirements, this is a very low tolerance for impact sound, and is likely to be subjectively perceived poorly.

5.25 It is proposed to use an acoustic backed vinyl product, iD Comfort Acoustic, for which the 3.15mm thick version has a tested sound insulation performance of 19dBΔL_w ('delta L_w'). This would therefore comfortably control impact sound to below.

FT-202 - Internal Insulated Floor

5.26 FT-202 separates apartments from back of house areas – generator room, bike store, bin store, water storage, switch room and substation.

5.27 There are therefore no impact sound insulation requirements for this floor.

5.28 In terms of airborne sound insulation, this should achieve the same performance as floors separating apartments from apartments. It is understood that the generator would only operate in emergency conditions.

5.29 FT-202 comprises a 150mm profiled concrete slab, with a cavity of around 760mm and a ceiling comprising one layer of 12.5mm, with 100mm mineral fibre in the cavity. .

5.30 Assuming normal weight concrete (~2,400kg/m^3), this floor has a predicted airborne sound insulation performance of 60dBR_w+C_{tr}, and hence should achieve around 55dB$D_{nT,w}$+C_{tr} on site, assuming good detailing and workmanship. This is around 10dB higher than the required performance of 45dB$D_{nT,w}$+C_{tr}, and hence should be acceptable.

FT-301 – Apartments

5.31 This floor comprises a 65mm screed on a Lewis deck, with a cavity of around 200mm and a ceiling comprising two layers of 15mm Fireline. Below this is a second ceiling, with a cavity of around 270mm, 50mm mineral fibre, and two layers of 15mm WallBoard.

5.32 This floor has a predicted airborne sound insulation performance of around 60dBR_w+C_{tr} and hence should achieve around 55dB$D_{nT,w}$+C_{tr} on site, assuming good detailing and workmanship. This is around 10dB higher than the required performance of 45dB$D_{nT,w}$+$C_{tr,}$ and hence should comfortably achieve the requirements. .

5.33 With the proposed iD Comfort Acoustic vinyl, the predicted impact sound insulation performance is around 45dB$L'_{nT,w}$ which comfortably meets the requirements.

FT-302 – Corridors

5.34 This floor is the same as FT-301 but with a Class C mineral fibre ceiling to the underside.

5.35 There are no sound insulation performance standards to be achieved between corridors. On this basis, the central ceiling can be reduced to one layer of plasterboard, if possible.

5.36 Reverberation control in common areas of residential buildings (e.g. lobbies and hallways) is however prescribed in Approved Document E.

5.37 Two methods of compliance are presented. The simplest means of compliance (Method A) is to provide a Class C acoustically absorptive ceiling throughout all common areas. Alternatively, calculations can be undertaken based on the proposed finishes (Method B).

5.38 The proposed Class C ceiling therefore complies with this requirement.

CT-301 – Plantroom

5.39 CT-301 separates the plant area from apartments, and comprises a 150mm profiled concrete slab, with a cavity of around 760mm, and a ceiling comprising one layer of 12.5mm WallBoard.

5.40 The plant comprises a Hyundai DHY34KSE generator and a Grundfos MCP-E 2 CRIE 20-6 pump.

5.41 The noise levels of the generator are unclear. Hyundai claim “72dB measured at 1m (75% load) and 67dB at 7m (75% load).”. Hyundai are unable to provide any more detailed information.

5.42 These two values are contradictory; estimating a sound power level from the two values stated gives a sound power level of around either 80dBL_{WA} or 92dBL_{WA}, depending on which you use.

5.43 Octave band data is not provided. For calculation purposes therefore, published octave band data for a similar generator has been used, and corrected to match the estimated Hyundai sound power levels.

5.44 The pumps have a sound pressure level of 65dB$L_{Aeq,T}$ @ 1m. As they operate in run and standby mode, only one will operate at once.

5.45 On this basis, the predicted sound pressure level in the room above is around 24-39dB$L_{Aeq,T}$.

5.46 The expected indoor ambient noise level in the apartment above, due to external noise ingress, is around 35dB$L_{Aeq,T}$.

5.47 On this basis, generator noise would be audible, if the worst-case noise levels are correct, or likely inaudible otherwise.

5.48 Adding a layer of 50mm mineral fibre to the cavity would improve this by around 5dB, resulting in noise levels of up to 34dB$L_{Aeq,T}$. This would almost certainly result in inaudibility at all times. This is dominated by the generator, which is understood to only be used in emergencies, other than occasional testing in daytime hours. The pump is around 6dB quieter than the generator, and hence would likely be inaudible at all times.

Sound Flanking

External Wall

5.49 Based on drawing *0321-TGA-XX-XX-DR-A-21302 rev P01*, the inner linings of the external wall are not continuous between floors, and a cavity barrier is to be located at floor level in the external wall cavity. Overall, therefore, sound flanking via the external wall would be adequately controlled vertically.

Horizontally (Beneath Walls)

5.50 The floated screed has a mass significantly greater than 25kg/m^2, and hence, assuming the floated layer is isolated from the walls, sound flanking horizontally would be adequately controlled.

Services Penetrations

5.51 Where services pass through separating floors or walls, they should be wrapped with 25mm (min) mineral wool quilt (10-36 kg/m^3) and boxed in with plasterboard achieving a minimum mass of 165g/m^2. It is acceptable to internally line the enclosure with mineral fibre if preferable, rather than wrapping the services. Any gaps at the floor/wall penetration should be fully sealed with mastic, or a pattress if larger than around 10mm.

Socket in Separating Walls

5.52 Where sockets, switches etc are located within separating walls they should be staggered. Two or more layers of plasterboard (min 22kg/m^2) should fully enclose the rear of the electrical boxes, or appropriate putty pads should be used.

Downlighters and Recessed Lighting

5.53 Provided there is a minimum ceiling void of 75mm, downlighters or recessed lighting may be installed in the ceiling;

- At no more than one light per 2m2 of ceiling area in each room;
- At centres not less than 750mm;
- Into openings not exceeding 100mm diameter or 100x100mm.

6 PLANT NOISE EMISSION LIMITS (CONDITION 12)

6.1 Manchester City Council requires that 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 below the typical background $L_{A90,T}$ level at the nearest noise sensitive location.

6.2 The nearest noise sensitive locations to the site have been identified as the Turning Point residential treatment facility to the north west of the site, and the apartments currently under construction on Bendix Street.

6.3 Based on the requirements of MCC and the typical background noise levels measured during the noise surveys, the rating noise level for building services plant should not exceed the following levels when assessed at the noise sensitive receptors;

Table 10: Plant Noise Emission Limits, $L_{Ar,Tr}$

Location	BS 4142 Rating Level	
	Day (07:00-23:00)	Night (23:00-07:00)
All NSRs	51dB$L_{Ar,Tr}$	41dB$L_{Ar,Tr}$

6.5 As detailed above, the plant comprises a Hyundai DHY34KSE generator and a Grundfos MCP-E 2 CRIE 20-6 pump. These are located within LGF plantrooms on the northern elevation of the building.

6.6 The nearest NSRs are the rear of the houses on Turner Street, which are around 12m from the plant outlet.

6.7 On this basis, the predicted noise level at the NSRs is as shown in Table 11, below.

Table 11: Plant Noise Calculation

	Distance, m	Generator	Pump
Sound Power Level, dBL_{WA}		92	73
SRI plantroom wall		-35	-35
Distance	12	-30	-30
SPL @ NSR, dB$L_{Aeq,T}$		27	8

6.8 Based on the noise data provided by the manufacturers, the predicted noise level at the nearest noise sensitive receptors comfortably meets the requirements of MCC, and planning condition 12(a) can be discharged.

7 SUMMARY AND CONCLUSIONS

7.1 dBx Acoustics Ltd has been appointed by CERT Property UK Ltd. (CERT) to undertake an acoustic design review for the proposed Goulden Street residential development.

7.2 The development comprises a new build 8-storey residential apartment block, to form 82 apartments.

7.3 The development has been granted planning permission, with conditions, under Manchester City Council planning reference 125678/FO/2019. An updated planning application was made to reflect the replacement of ground floor commercial units with apartments, and given approval under decision notice reference 135818/JO/2022. 135818/JO/2022 was later amended by 142177/NMC/2025 to make further design amendments and increase the number of units to the currently approved quantum of 82.

7.4 Planning Conditions 12 and 13 of this decision relate to acoustics.

7.5 The acoustic requirements of the external envelope have been assessed in terms of noise ingress to the apartments, which meet the requirements of and hence discharge Planning Condition 13.

7.6 An assessment of internal sound insulation, and reverberation control for common areas, which need to comply with the requirements of Approved Document E (ADE) of the Building Regulations has also been undertaken.

7.7 A review of the plant has been undertaken and noise emissions are acceptably controlled to adjacent apartments and to external noise sensitive receptors. Planning Condition 12 can therefore be discharged.

7.8 On this basis the proposed design should meet all Planning and Building Control requirements.

APPENDIX A – GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (Lp) the reference quantity is 2x10-5 N/m2. The sound pressure level existing when microphone measured pressure is 2x10-5 N/m2 is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (L_p) or Sound Power Level (L_w).
Frequency	Number of cycles per second, measured in hertz (Hz), related to sound pitch.
A-weighting	Arithmetic corrections applied to values of L_p according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of L_p actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of L_p actually measured.
$L_{n,T}$	L_p which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
L_{Fmax}	The instantaneous maximum sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
L_{AFmax}	The instantaneous maximum A weighted sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
$L_{Ar,Tr}$	The rating level: the equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise.
Reverberation Time, T	The time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped. The descriptor *T,* often includes other nomenclature to describe the type of reverberation time measurement or if the reverberation time is an average taken for specific frequencies. For example, a T_{mf} is the mid-frequency reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Class, A - E	Classification of sound absorbers into Sound Absorption Classes A-E, according to BS EN ISO 11654, including frequencies 200-5000 Hz
NRC	A single-number rating system used to compare the sound-absorbing characteristics of building materials. A measurement of the acoustical absorption performance of a material, calculated by averaging its Sound Absorption Coefficients at 250, 500, 1000 and 2000 Hz
STI	**Speech Transmission Index**, Metric ranging between 0 and 1 representing the transmission quality of speech with respect to intelligibility by a speech transmission channel
R	**Sound Reduction Index,** the laboratory measured sound insulation properties of a material or building element in octave or third octave bands.
R_w	**Weighted Sound Reduction Index**, a single number which represents the sound reduction of a material. It is derived by plotting the sound reduction index against a set of reference curves. The curves are shifted until a best-fit is established and the curve which best fits the sound reduction spectrum is used to represent the single figure value.
D_w	**Weighted Level Difference**, the weighted level difference between a pair of rooms, stated as a single figure.

D_{nT}	**Standardised Level Difference,** a frequency-dependent measurement of airborne sound insulation, calculated using the following formula: $D_{nT} = L_1 - L_2 + 10\log(T/T0)$ dB Where: L_1 is the energy-averaged sound pressure level due to the pink noise source measured in the source room using a sweep technique. L_2 is the energy-averaged sound pressure level measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (= 0.5s for dwellings).
$D_{nT,w}$	**Weighted Standardised Level Difference,** a single-figure value of airborne sound insulation performance, derived according to procedures in BS EN ISO 717-1, based on the D_{nT} values at different frequencies (100-3150 Hz third octave bands).
$D_{n,F,w}$	**Weighted, Normalised Flanking Level Difference,** the normalised, weighted difference in sound level between a pair of rooms via a flanking element, such as mullion or ceiling detail. The level difference in octave bands is first normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
D_{ne}	**Normalised Element Level Difference**. The normalised difference in sound level between a pair of rooms via a small element such as a trickle ventilator. The level difference in octave bands is normalized to a reference amount of absorption.
$D_{n,e,w}$	**Weighted, Normalised Element Level Difference**. The normalised, weighted difference in sound level between a pair of rooms via a small element such as a trickle ventilator, stated as a single figure. The level difference in octave bands is normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
C_{tr}	**Spectrum Adaptation Term** , a correction term applied to the sound insulation single-number values (R_w, D_w, and $D_{nT,w}$) in accordance with BS EN ISO 717-1. Applying the C_{tr} penalises a construction's performance if its low frequency performance is poor in relation its performance at higher frequencies.
Impact Sound	The noise generated by an impact on a structure. This is normally used to describe the noise created by people walking or moving furniture on a floor structure.
L_{nT}	**Standardised Impact Sound Pressure Level,** a frequency dependent measurement of impact sound insulation, calculated using the following formula: $L_{nT} = L_1 + 10\log(T/T0)$ dB Where: L1 is the mean sound pressure level due to the tapping machine measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T30 measured in seconds). T_o is the reference reverberation time (0.5s for dwellings)
$L'_{nT,w}$	**Weighted Standardised Impact Sound Pressure Level,** a single-figure value (@ 500 Hz) of impact sound insulation, performance, derived according to BS EN ISO 717-2, based on the L_{nT} values at different frequencies (100Hz- 3150 Hz third octave bands).
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence.
NR	The **Noise Rating level**. This is a single figure value derived by plotting a noise spectrum against a set of curves. The curve under which the spectrum fits is the resulting NR level.

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