Bar Dos, Retail Unit 3, 76 Great Ancoats Street

Report to Discharge Manchester City Council Condition 17 (Planning Application Reference: 132489/FO/2021)

Stantec

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1 Introduction

Stantec UK Limited has been appointed by BAR DOS LIMITED to carry out an assessment of noise egress from the proposed entertainment venue at Retail Unit 3 (hereafter the 'Venue'), of the 1 Port Street development, Manchester, M4 5GU.

The assessment contained herein relates to a scheme of noise control measures within the Proposed Development in line with the requirements of Condition 17 of Manchester City Council's (MCC) planning application reference: 132489/FO/2021. Condition 17 is reproduced, in full, below.

Condition 17:

"Notwithstanding the recommendation within Port Street Manchester Environmental Noise Study December 2021 Report Reference: PR0665-REP01A-MPF by Fisher Acoustics, stamped as received on 13-12-21 before the operation of each ground floor commercial unit commences a scheme for acoustically insulating each unit to ensure that there is no unacceptable level of noise transfer from these units to the residential accommodation above or any unacceptable noise break out shall be submitted to and approved in writing by the City Council as local planning authority.

Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 10dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63HZ and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB, respectively.

The approved noise insulation scheme shall be completed before any of the approved uses commence.

Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed and effectively mitigate any potential adverse noise impacts in adjacent residential accommodation arising directly from the proposed development shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non-compliance shall be suitably mitigated in accordance with an agreed scheme.

***Reason – To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1 and DM1 of the Core Strategy and saved UDP Policy DC26*.**"

Regarding the stated criterion at the façade of the nearest sensitive location, Manchester City Council's latest Planning and Noise: Technical Guidance (October 2022) document has relaxed this requirement as per the wording below:

'Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the typical background noise level ($L_{A90)}$ in each octave band at the nearest noise sensitive location'.

As this is MCC's latest guidance for entertainment premises, it is considered suitable for this to be applied here to assess and control "unacceptable noise breakout" from the venue, as required by the condition.

This report is technical in nature, therefore, a glossary of acoustic terms is included as **Appendix A**.

1.1 Development Proposals

The proposed development is to fit out the Venue to house a late-night cocktail bar seating up to 60 customers. The Venue will operate;

Monday:
09:00 - 23:30

Tuesday:
09:00 - 23:30

Wednesday:
09:00 - 23:30

Thursday:
09:00 - 00:30

Friday:
09:00 - 01:30

Saturday:
09:00 - 01:30

Sunday:
09:00 - 23:30

2 Methodology

2.1 Assessment Methodology

This report contains an assessment of the potential noise emissions of the Proposed Development at:

- Existing Sensitive Receptors (ESRs) adjacent to the Venue, within the 1 Port Street building (structurally connected); and
- ESRs in the vicinity of the Venue that have the potential to be exposed to atmospheric noise emissions from amplified music (non-structurally connected).

Each of these receptor types has been assessed in accordance with the requirements set out in **Condition 17** as described in **Section 1** as well as following the current guidance and standards set out below.

2.2 Design Guidance and Standards

The following guidance documents have been referenced within this assessment:

- Manchester City Council (October 2022) – Planning and Noise: Technical Guidance.

A brief summary of the relevant sections of the MCC guidance is provided in **Appendix B**.

2.3 Existing Sensitive Receptors

The nearest ESRs to the Proposed Development have been identified and are set out in **Table 1** below.

Table 1: Identified Nearest Existing Sensitive Receptors to the Proposed Development

Reference	Description / Address	Approximate Co-ordinates		Approx. Distance and Bearing from Site
		X (Easting)	Y (Northing)	
ESR1	Residential apartments at first floor and above within 1 Port Street development	343880	398457	Directly above the Venue
ESR2	Residential apartments within Avro Building, Binns Pl, Manchester M4 5BY	383900	398426	25m Southwest of the Venue
ESR3	Residential apartments within MM2 Building, Great Ancoats Street, Manchester M4 5AG	384909	398476	27m northeast of the Venue

Additional receptors have been identified at distances greater than those listed above. It is considered that, due to the greater separation, potential impacts at these receptors would be reduced in comparison to the above.

3 Existing Baseline Conditions

3.1 October 2021 Environmental Noise Survey

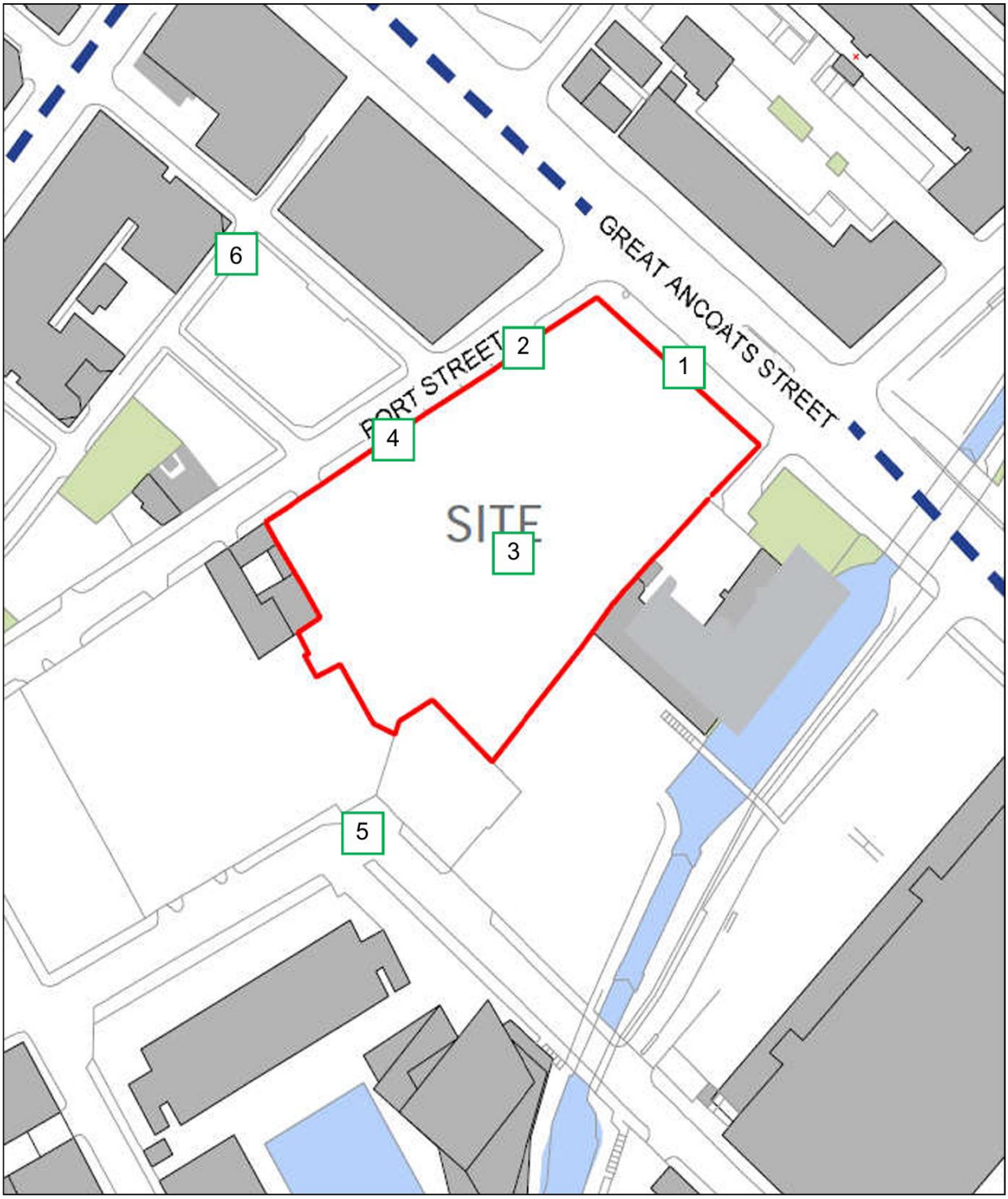
A baseline environmental noise survey was carried out by Fisher Acoustics (Report PR0665-REP01A) in proximity to 1 Port Street between 6th October and 8th October 2021. The survey comprised multiple attended Monitoring Locations (MLs) adjacent to and in the vicinity of the Venue.

Monitoring Locations (MLs) are described in **Table 2** and shown in **Figure 1**. The assessment carried out by Fisher Acoustics is included in full as **Appendix C**.

Table 2: Description of Monitoring Locations from Fisher Acoustics Report PR0665-REP01A – October 2021

Monitoring Location (see Figure 1)	Description
ML1	At proposed location of façade of the Proposed Development to Great Ancoats Street 5.7m from the kerb, at a microphone height of 1.5 metres above street level
ML2	At proposed location of closest façade of Proposed Development to Port Street, at 2.7 metres from the kerb, 20 m from Great Ancoats Street, at a microphone height of 1.5 metres above street level
ML3	At proposed location of closest façade of Proposed Development to Avro, at 10 metres from the corner of the Avro building, at a microphone height of 6 metres above site ground level
ML4	At proposed location of closest façade of Proposed Development to Port Street, at 4 metres from the kerb, 50 m from Great Ancoats Street, at a microphone height of 1.5 metres above street level
ML5	At the corner of Tariff Street adjacent to Jacksons Mills at a microphone height of 1.5 metres above street level.
ML6	Dean Street, 5m from the façade of the Wentwood residential building, at a microphone height of 1.5 metres above street level.

Figure 1: Monitoring Locations (Extracted from Fisher Acoustics Report PR0665-REP01A)



The results of the survey at each ML are summarised in **Table 3** below.

Table 3: Summary of Measured Environmental Noise Levels - Fisher Acoustics Report PR0665-REP01A

Measurement Location	Measured Noise Level dBA					
	Daytime (07:00 – 23:00)			Night-time (23:00 – 07:00)		
	$L_{eq,T}$	L_{max}	L_{90}	$L_{eq,T}$	L_{max}	L_{90}
ML1	65	75 to 85	57 to 61	64	68 to 81	45 to 61
ML2	62	69 to 89	54 to 60	59	62 to 72	45 to 57
ML3	54	59 to 81	49 to 52	54	58 to 77	45 to 50
ML4	61	70 to 87	50 to 59	55	58 to 70	44 to 53
ML5	59	69 to 75	48 to 49	46	51 to 61	44 to 44
ML6	55	69 to 71	49 to 50	52	61 to 63	46 to 47

3.2 Base Build Conditions

The Venue has a floor area of approximately 107m^2, a slab-to-soffit height of 4.6 m and is located at ground floor level of the northern elevation. The existing structural slab above the Venue is a flat reinforced concrete slab with a thickness of 250mm. Residential apartments are located on the first floor of the building directly above the Venue.

Acoustic test information was provided by the landlord for the performance of the first-floor slab into the bedrooms above. The testing was carried out in the adjacent unit is for the existing structure only with no ceiling or other additional acoustic treatment present in the retail unit.

The resulting performance of the slab is provided in **Table 4** below with the test certificate included as **Appendix D**.

Table 4: Tested Performance of First Floor Slab (Retail Unit to Residential Bedroom)

Element	Normalised Level Difference (dB D_{nT}) at Octave Band Centre Frequency (Hz)							Overall $D_{nT,w}$ (C_{tr})
	63	125	250	500	1000	2000	4000	
First Floor Structural Slab (250mm)	42	44	47	51	66	71	75	57 (-5)

Minimum acoustic glazing specifications for the 1 Port Street development have been taken from the Fisher Acoustics Report PR0665-REP01A. For all glazing on ground and first floor “Type B” from the Fisher Acoustics report was specified and reproduced below.

Table 5: Acoustic Performance of the Glazing for Ground and First Floor

Description	Laboratory-Tested Sound Reduction Index (dB R) at Octave Band Centre Frequency (Hz)							Overall R_w (C_{tr})
	63	125	250	500	1000	2000	4000	
Ground and First Floor Acoustic Glazing Specification	25	28	31	38	41	44	53	41 (-4)

4 Assessment

4.1 Limiting Criteria

Noise ingress from the Venue should not exceed the criteria set out in **Table 6** below, in line with the requirements of **Condition 17** and the results of the baseline noise survey. A 5-minute reference period has been used for these limits in line with the MCC Planning and Noise technical guidance document (see **Appendix B**).

Further to the above, and as noted in **Section 1**, Condition 17 refers to a criterion of 10 dB below the L_{90} in each octave band at the façade of the nearest noise sensitive premises (non-structurally adjoined). MCC's current Planning and Noise: Technical Guidance adopts a criterion of 5 dB below the typical background noise level (L_{90}) in each octave band. The 5 dB criterion has been adopted in this assessment on the basis that this represents MCC's current technical guidance for entertainment noise,. This approach is subject to acceptance by MCC in discharging the condition.

ESR3 is close to (<10m away from) Great Ancoats Street, the measured sound level data from the 2021 survey was provided by Fisher Acoustics for review. A representative background sound level was selected from the ML1 data and octave band limits derived as presented below.

As night-time levels are lower than or the same as the daytime levels, the assessment herein considers only the night-time period, as daytime requirements would also be met where night-time limits are complied with.

Table 6: Octave Band Noise Limiting Criteria at ESRs, dB $L_{eq,5min}$

Existing Sensitive Receptor	Period	Location	Sound Pressure Level (dB $L_{eq,5min}$) at Octave Band Centre Frequency (Hz)						
			63	125	250	500	1000	2000	4000
ESR1 (1 Port Street) (Directly above Venue)	Night-time (23:00 – 07:00)	Internal (within habitable rooms)	47	41	-	-	-	-	-
ESR2 (Avro)	Night-time (23:00 – 07:00)	External @ 1m from building façade	54	43	40	37	37	31	20
ESR3 (MM2)	Night-time (23:00 – 07:00)	External @ 1m from building façade	54	48	44	42	42	36	26

In addition to the above, the Venue is subject to additional noise limits in line with the 1 Port Street Base Build Specification. For completeness, these limits in adjoining dwellings are included in **Table 7** below. Where both criteria are relevant, the assessment has considered compliance with both.

Table 7: Base Build Noise Limiting Criteria for Residential Spaces – 1 Port Street Development

Existing Sensitive Receptor	Sound Pressure Level (dB L_{eq}) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,T}$
	63	125	250	500	1000	2000	4000	
ESR1 (1 Port Street)	42	33	26	20	16	14	12	25

4.2 Development Noise Control

The following control measures have been put in place to reduce noise breakout from the Venue:

- Installation of an acoustic ceiling below the existing soffit. The ceiling comprises:
  - » 1 no. layer 12.5mm Gyproc Soundbloc suspended from the soffit on resilient acoustic hangers (Oscar Iso-Mount Type2 fixings) at a minimum depth of 350mm from the soffit with 100mm acoustic insulation (i.e., Isover APR 1200 acoustic roll) in the cavity.
- Installation of a limiter within the sound amplification system, set to the levels stated in this report.

The Venue music limits have been set to achieve the requirements of both Condition 17 and the requirements of the base build specification. The internal music sound limits are set out in **Table 8**.

Table 8: Music Sound Limit Levels within the Venue

Description	Reverberant Sound Pressure Level (dB $L_{eq,5min}$) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,5min}$
	63	125	250	500	1000	2000	4000	
Spatial Average Music Sound Level within the Venue	88	81	81	78	76	74	65	81

In addition to the above, noise management measures will be put in place relating to access and egress from the venue. The following controls are recommended to be incorporated into the Bar Dos Noise Management Plan (NMP):

- Entrance door fitted with an effective self-closing mechanism;
- No hold-open devices to be used during periods of amplified music;
- Staff instruction that the door must remain closed other than for access/egress;
- Signage reminding staff/customers that the door must remain closed;
- Management checks during late-night operation; and
- Complaints logging and investigation procedure.

These recommendations would minimise the amount of time that the door is held open as much as practicable. The majority of door openings are therefore assumed to be of a short duration, only when customers are entering and exiting the venue.

The calculations therefore do not rely on the entrance door being permanently closed. Rather, they assume intermittent door opening, controlled through the physical and operational measures set out above

4.3 Sound Levels within Structurally Adjoined Properties – ESR1

Predicted music sound levels within the structurally adjoined residential apartments above the Venue have been calculated based on the limited internal music sound levels presented in **Table 8**.

The assessment considers the following sound transmission paths:

- Transmission via the first-floor structural slab; and
- Transmission via the breakout from the external façade of the Venue.

The predicted contributions from each transmission path have been calculated separately and combined to determine the resulting internal music sound levels within the bedrooms of ESR1. Bedrooms have been selected as the assessment location as these typically represent the most noise sensitive locations within residences, particularly during the night-time period.

Full calculation details are provided in **Appendix E**.

4.3.1 Transmission via Structural Floor

The existing structure (250mm RC slab) and proposed treatment were modelled using the Insul v9.0 software package to determine the improvement to the first-floor structural slab performance with the proposed ceiling treatment. To account for potential flanking paths around the ceiling, a correction of 5dB has been subtracted from the modelled levels in each octave band.

The predicted sound insulation performance of the slab with the proposed ceiling is presented in **Table 9**.

Table 9: Calculated Performance of First Floor Slab with Proposed Ceiling Treatment

Element	Normalised Level Difference (dB D_{nT}) at Octave Band Centre Frequency (Hz)							Overall $D_{nT,w}$ (C_{tr})
	63	125	250	500	1000	2000	4000	
First Floor Structural Slab with Proposed Ceiling Treatment	51	59	62	66	82	87	103	72 (-4)

The predicted music sound levels transmitted via the floor have been calculated and are presented in **Table 10** below.

Table 10: Predicted Music Sound Level in ESR1 Bedroom – Floor Transmission

Description	Reverberant Sound Pressure Level (dB L_{eq}) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,5min}$
	63	125	250	500	1000	2000	4000	
Music Sound Level in Bedroom of ESR1 (Floor Transmission)	37	22	19	12	-6 [1]	-13 [1]	-36 [1]	16

Notes:
[1] Negative values represent noise levels below the threshold of human hearing (0 dB re: 20 µPa)

4.3.2 Transmission via External Façade

To determine the level of sound "break back in" into the residential apartments above, and provide a robust assessment scenario, it has been assumed that the door to the Venue would be open for up to 20% of the time in a given 5-minute assessment period. Based on this, sound transmission via the open door would be dominant in comparison to breakout via the Venue façade.

The assessment has been carried out for both when the residential window is closed and when it is open. Given the existing road traffic noise climate at ESR1, the closed-window condition is considered to represent the normal acoustic design condition during the late evening and night-time period. Nevertheless, an open-window sensitivity assessment has also been undertaken.

The predicted music sound levels transmitted via the façade have been calculated and are presented in **Table 11** below.

Table 11: Predicted Music Sound Level in ESR1 Bedroom – Façade Transmission

Description	Window Open / Closed	Reverberant Sound Pressure Level (dB $L_{eq,5min}$) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,5min}$
		63	125	250	500	1000	2000	4000	
Music Sound Level in Bedroom of ESR1 (Façade Transmission)	Closed Window	37	27	24	15	9	4	-13[1]	20
	Open Window	40	33	33	30	28	26	17	33

Notes:
[1] Negative values represent noise levels below the threshold of human hearing (0 dB re: 20 µPa)

4.3.3 Assessment of Combined Internal Levels

Overall music sound levels within structurally adjoined ESRs have been calculated based on predicted levels in **Table 10** and **Table 11** and are presented in **Table 12**.

Table 12: Combined Predicted Internal Music Levels at ESR1 and Comparison with Criteria

Description	Window Open / Closed	Reverberant Sound Pressure Level (dB $L_{eq,5min}$) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,5min}$
		63	**125**	**250**	**500**	**1000**	**2000**	**4000**	
Total Music Sound Level in Bedroom of ESR1	Closed Window	39	27	24	16	8	3	-12[1]	20
	Open Window	42	34	34	30	28	26	17	34
Condition 17 Limiting Criteria		47	41	-	-	-	-	-	-
Predicted Level Minus Criteria	Closed Window	**-8**	**-14**	-	-	-	-	-	-
	Open Window	**-5**	**-7**						

Notes:
[1] Negative values represent noise levels below the threshold of human hearing (0 dB re: 20 µPa)

As demonstrated by the above, the predicted levels in the bedroom of ESR1 are below the criteria set out in Condition 17 for structurally adjoined properties. In addition to this, noise levels in each octave band are also below the requirements of the 1 Port Street Base Build Specification, where windows are closed.

4.4 Sound Levels at Non-Structurally Adjoined Properties – ESR2 and ESR3

To determine the level of sound transmission to the façade of ESR2, and provide a robust assessment scenario, it has been assumed that the door to the Venue would be open for up to 20% of the time in a given 5-minute assessment period.

Calculations have been carried out to determine sound levels at 1m from the façade of ESR2 and ESR3 and are presented in **Table 13** and **Table 14** respectively. Full calculation details are provided in **Appendix E**.

Table 13: Predicted External Music Levels at ESR2 and Comparison with Criteria

Description	Reverberant Sound Pressure Level (dB $L_{eq,5min}$) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,5min}$
	63	125	250	500	1000	2000	4000	
Music Sound Level at 1m from the Façade of ESR2	38	30	30	26	24	22	13	29
Condition 17 Limiting Criteria	54	43	40	37	37	31	20	-
Predicted Level Minus Criteria	**-11**	**-8**	**-5**	**-6**	**-8**	**-4**	**0**	**-**

As demonstrated by the above, music sound levels are at or below the targeted criteria in all octave bands at ESR2. On this basis, it is considered that the proposals comply with the requirements of Condition 17 and that impact of entertainment noise at ESR2 would be negligible.

Table 14: Predicted External Music Levels at ESR3 and Comparison with Criteria

Description	Reverberant Sound Pressure Level (dB $L_{eq,5min}$) at Octave Band Centre Frequency (Hz)							dB $L_{Aeq,5min}$
	63	125	250	500	1000	2000	4000	
Music Sound Level at 1m from the Façade of ESR3	49	42	42	39	37	35	26	27
Condition 17 Limiting Criteria	54	48	44	42	42	36	26	-
Predicted Level Minus Criteria	**-5**	**-6**	**-2**	**-3**	**-5**	**-1**	**0**	**-**

As demonstrated by the above, music sound levels are at or below the targeted criteria in all octave bands at ESR3. On this basis, it is considered that the proposals comply with the requirements of Condition 17 and that impact of entertainment noise at ESR3 would be negligible.

5 Conclusions

Stantec UK Limited has been appointed by BAR DOS LIMITED to carry out an assessment of noise egress from the proposed Venue at Retail Unit 3, 80 Port Street, Manchester. The assessment has been undertaken in order to discharge Condition 17 attached to the planning permission granted by Manchester City Council (ref: 132489/FO/2021).

Condition 17 refers to a criterion of 10 dB below the L_{90} in each octave band at the façade of the nearest noise sensitive premises (non-structurally adjoined). MCC's current Planning and Noise: Technical Guidance adopts a criterion of 5 dB below the typical background noise level (L_{90}) in each octave band. The 5 dB criterion has been adopted in this assessment on the basis that this represents MCC's current technical guidance for entertainment noise. This approach is subject to acceptance by MCC in discharging the condition.

The venue will comprise a late-night cocktail bar, operating between 09:00 and 23:30 Monday to Wednesday and Sunday, 09:00 to 00:30 on Thursday, and 09:00 to 01:30 on Friday and Saturday.

. The assessment considers potential noise transfer to residential apartments directly above the Venue (ESR1), as well as noise breakout to nearby non-structurally adjoined residential apartments (ESR2 and ESR3) .

Predicted music sound levels within the structurally adjoined residential apartments above the Venue have been calculated based on the proposed limited internal music sound levels. The assessment considers transmission via the first-floor structural slab together with transmission via the external façade.

The predicted combined music sound levels within the bedroom of ESR1 are below the Condition 17 limiting criteria of 47dB and 41dB in the 63Hz and 125Hz octave frequency bands, respectively (both with windows closed and open). The predicted levels are also below the relevant 1 Port Street Base Build Specification noise limits in each octave band (windows closed).

For non-structurally adjoined receptors, predicted music sound levels at the façade of both ESR2 and ESR3 are below the adopted target criteria (MCC Guidance).

This assessment demonstrates that, with the installation of the proposed noise control measures and the sound amplification system being limited to the levels stated in this report, the proposed Venue can operate in accordance with the requirements of Condition 17 in minimising impacts at the receptors, subject to MCC acceptance.

Therefore, it's considered that this report provides sufficient evidence to discharge Condition 17.

Appendices

Appendix A Glossary of Acoustic Terms

Term	Description
dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
LAeq	The concept of LAeq (equivalent continuous sound level) has until recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise. LAeq is defined as the (A-weighted) notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 30 minutes).
DnT,w	A single number quantity characterising the on-site airborne sound insulation performance of a construction, including transmission of sound via flanking paths (e.g. adjoining floors/walls). The higher the DnT,w of a construction, the better its airborne sound insulation performance; the higher the DnT,w requirement, the more stringent the criteria.
Rw	A single number quantity characterising the laboratory based airborne sound insulation performance of a construction, independent of transmission of sound via flanking paths. As with DnT,w, the higher the Rw, the better the sound insulation performance; the higher the Rw requirement, the more stringent the criterion.
RT,RT60, T or T60	The time, in seconds, for a sound to decay by 60dB.
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure

Term	Description
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10-6 Pascals) on a decibel scale.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
Lmax,T	A noise level index defined as the maximum noise level during the time period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L90,T or Background Noise Level	A noise level index defined as the noise level exceeded for 90% of the time over the time period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L10,T	A noise level index. The noise level exceeded for 10% of the time over the period T. L10 can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 metres
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS5969.
BNL	The Basic Noise Level is the road traffic noise at a reference distance of 10 m from the road edge, expressed in terms of the LA10 statistical level (18-hour or one-hour), and calculated according by Calculation of Road Traffic Noise (CRTN) based on the traffic flow.
AAWT	Annual Average Weekday Traffic is the total number of vehicles annually (on Monday – Fridays) divided by the total number of weekdays in this period.
Rating Level (LAr,Tr)	To BS 4142:2014+A1:2019, the rating level is defined as the equivalent continuous A-weighted sound pressure level produced by the specific sound source over a given reference time interval, Tr plus any adjustment for the characteristic features of the sound (tonality, impulsivity, etc).
NSR	A Noise Sensitive Receiver is any receiver that is classed as being sensitive to noise sources, (residential properties, churches, music studios etc).
Rw + Ctr	Weighted Sound Reduction index (Rw) with low frequency sound correction factor (Ctr). Rw + Ctr is used when increased control of low frequency sound sources is required such as amplified music, and traffic or aircraft noise

Appendix B Summary of Design Standards and Guidance

B.1 Manchester City Council Planning and Noise: Technical Guidance, October 2022

Manchester City Council's *Planning and Noise: Technical Guidance* provides guidance for applicants and consultants in relation to the assessment and control of noise within the planning process. The guidance sets out the Council's approach to avoid significant adverse impacts, mitigate and minimise adverse impacts where they arise, and, where possible, contribute to improvements in health and quality of life.

Regarding entertainment noise, the guidance notes that noise from recorded music, live bands or similar entertainment sources can result in adverse impacts at local sensitive receptors if not properly controlled. It states that assessment should not rely solely on overall A-weighted noise levels, but should also consider low frequency octave band noise, particularly at 63Hz and 125Hz, as bass noise is difficult to contain and can be particularly disturbing within residential accommodation.

The guidance sets out the recommendation that entertainment noise should be controlled so as to achieve an "inaudible" condition within habitable rooms. It defines this as a condition where the noise is at a sufficiently low level such that it is not recognisable as emanating from the source in question and does not alter the perception of the existing ambient noise environment. For structurally connected residential and entertainment uses, the guidance identifies a criterion whereby music noise levels in the 63Hz and 125Hz octave centre frequency bands, expressed as $L_{eq,5min}$, should not exceed 47dB and 41dB respectively within habitable rooms.

For new entertainment venues that are structurally detached from other noise sensitive uses, the guidance states that the proposal should demonstrate that music noise would not be audible within nearby residential properties, assuming open windows. The associated criterion is that entertainment noise, expressed as $L_{eq,5min}$, should be controlled to 5dB below the typical background noise level, L_{A90}, in each octave band at the nearest noise sensitive location. It is also noted that both the internal low-frequency criterion and the external background-related criterion may be applicable to the same development / sensitive receptor, in some circumstances.

Appendix C Fisher Acoustics Report PR0665-REP01A

fisher acoustics

Port Street, Manchester

Environmental Noise Study

December 2021

Report Reference: PR0665-REP01A-MPF

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PROJECT TITLE	PORT STREET, MANCHESTER
REPORT TITLE	ENVIRONMENTAL NOISE STUDY
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1.0 SUMMARY

Fisher Acoustics Ltd has been commissioned by Manchester (Port Street) Limited to conduct an environmental noise study relating to a proposed residential development at Port Street, Manchester.

An assessment of environmental noise around the proposed site has determined the pre-existing environmental noise levels during the day and night at and around the site.

The recommended acoustic performance of curtain wall elements and windows to achieve the recommended internal noise levels within apartment rooms has been determined. In particular, it has been determined that double glazed units that achieve specific acoustic performances would be acoustically suitable for the windows and the vision panels of the curtain wall to the proposed apartments.

The expected acoustic sound insulation performance of the solid elements of the façade are also identified.

Overall environmental noise limits have also been recommended for building services plant serving the development and in relation to noise egress from the proposed commercial units on the ground floor of the Development.

2.0 INTRODUCTION

Fisher Acoustics Ltd has been commissioned by Manchester (Port Street) Limited to conduct an environmental noise assessment relating to a full planning application for a proposed residential development at Port Street, Manchester. The proposals provide for a new residential development of a part eight and to part thirty one-storey building. The development will provide residential units (Use Clase C3) with ground floor commercial units (Use Class E), supported by amenity space for residents.

This report examines the pre-existing environmental noise conditions at the site and advises on the required sound insulation performance of façade elements to habitable rooms to achieve recommended internal noise criteria.

The steps undertaken in compiling this study are as follows:

- Assessment of daytime and night time external noise survey data to determine the typical levels of noise at the site during daytime and night time periods
- Calculation of the required sound reduction index of the vision panels and non-vision panels of the curtain wall to habitable rooms to allow the achievement of appropriate internal noise levels due to external noise sources.
- Determination of suitable overall noise limits for building services plant to safeguard residential amenity
- Calculation of noise limits relating to noise egress from the proposed commercial units at ground floor of the Development.

3.0 DESCRIPTION OF SITE

General Site Description

The Proposed Development Site ("the Site") is located on the corner of Great Ancoats Street and Port Street and is within the neighbourhood of Ancoats on the northern part of Manchester City Centre.

The Site extends to approximately 0.48 hectares (4845 sqm) and is bounded by Great Ancoats Street to the north, Brownsfield Mill ('Avro') and a surface car park to the east, surface car park to the south and Port Street to the west.

The Site is comprised of a surface level car park of low-quality hardstanding. The site levels drop by circa 2m from the northern and western boundaries to a lower level which also forms part of the car park.

There are a mixture of uses surrounding the Site. To the west of the Site there is The Astley, Oxid House and The Wentwood which are mid to high rise apartment buildings with ground floor commercial frontages as well as a surface level car park. To the north of the Site, across Great Ancoats Street is the heart of Ancoats, this is a newly regenerated area of Manchester containing a mixture of mid-rise developments including residential and commercial uses. To the east of the Site is the Rochdale Canal and Brownsfield Mill, ('Avro') a Grade II* Listed mill building which has been recently refurbished to create new apartments. To the south of the Site is a number of mid to high-rise developments comprising residential uses, which sit within the centre of the Piccadilly Basin.

Great Ancoats Street forms part of the inner ring road in Manchester. It is a major road that is heavily trafficked with HGV's, buses, coaches, cars and vans. Port Street is a side road that is trafficked by vehicles accessing local residential properties, offices and car parking areas. Tariff Street is lightly trafficked.

Figure 1 shows the Port Street Development site in the context of the surrounding roads and buildings.

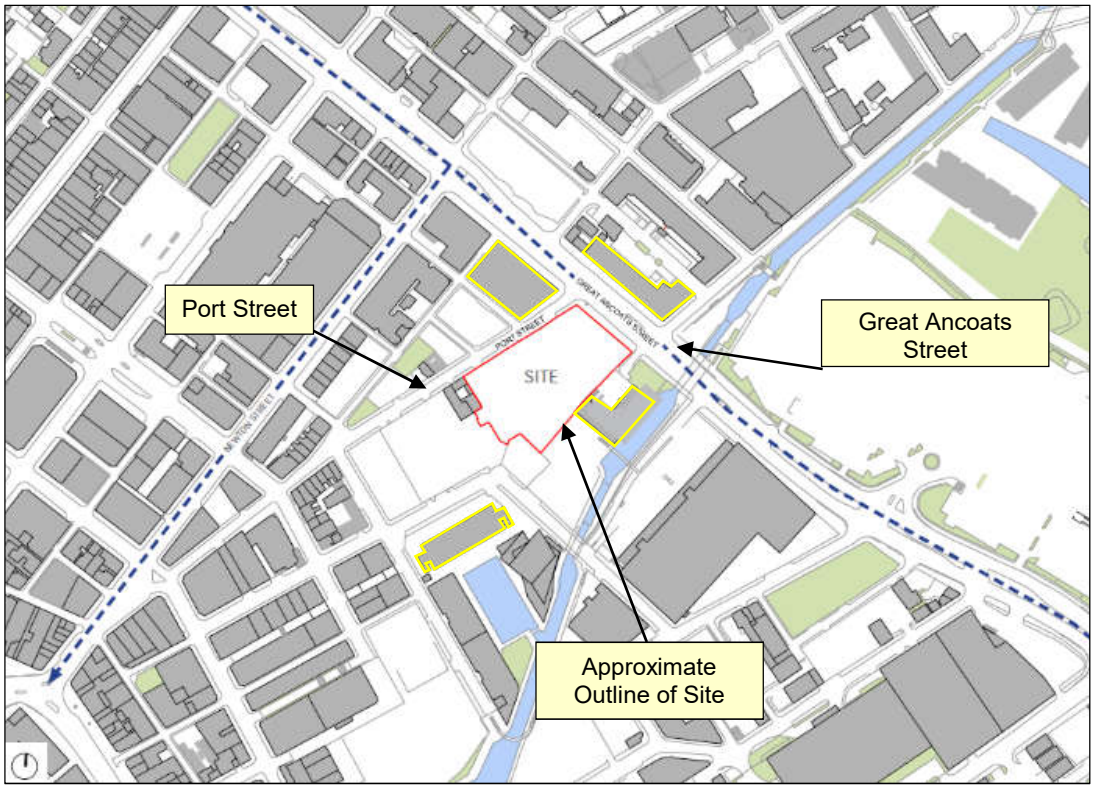


Figure 1: Site location plan

4.0 DESCRIPTION OF PROPOSED DEVELOPMENT

Specific Development Description

'Full Planning Permission for the erection of part 8 and part 34-storey building comprising residential units (Use Class C3) and associated amenity space, ground floor commercial space (Use Class E), basement, access, landscaping, and other associated works'.

The proposed uses within the building are as follows:

- Basement Level 1: Car park, bike store, plant rooms
- Ground Floor: Management Suite, Bin Store, Plant, Amenity, Retail units, Substation
- Level 01 to 06: Apartments
- Level 07: Apartments, residents amenity
- Level 08: Apartments, void over residents amenity
- Level 09 to 33: Apartments
- Level 31: Roof

Figure 2 shows the proposed floor at Level 1 of the building

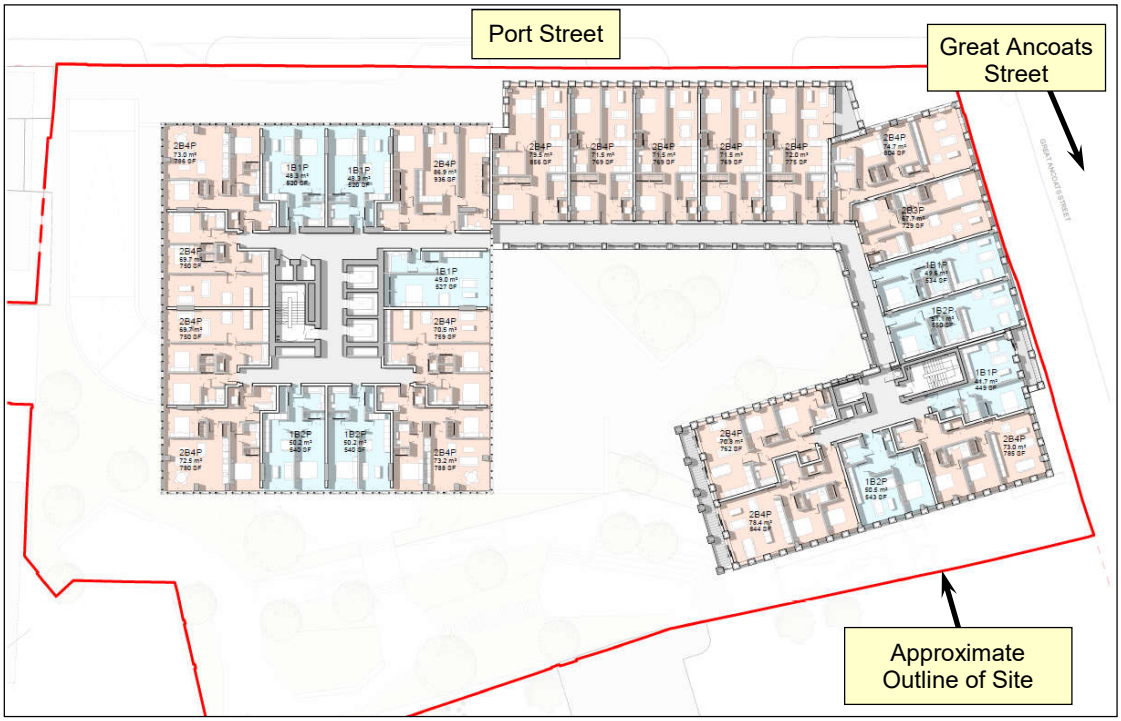


Figure 2: Proposed floor plan at Level 01

5.0 RELEVANT GUIDANCE DOCUMENTS

NATIONAL PLANNING POLICY

The National Planning Policy Framework (NPPF), published in July 2021 by the Ministry of Housing, Communities and Local Government 'sets out the Government's planning policies for England and how these should be applied'.

Clause 174 of the National Planning Policy Framework states that 'Planning policies and decisions should contribute to 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 soil, air, water or noise pollution or land instability'.

Clause 185 of the National Planning Policy Framework states:

> "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:
>
> a) 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 the quality of life;
>
> b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and
>
> c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

The National Planning Policy Framework document cross references the 'Explanatory Note to the Noise Policy Statement for England'. The 'Noise Policy Statement for England' (NPSE) was published by the Department for Environment Roof and Rural Affairs in March 2010.

The NPSE does not give suggested external noise criteria for commercial Developments. In the absence of specific criteria, reference shall be made in this document to established guidance and principles, as established in British Standards and the local Planning policy.

National Planning Practice Guidance – Noise

'Planning Practice Guidance – Noise' is a web-based resource provided by the Ministry of Housing, Communities and Local Government (last revision date 22 July 2019) which gives guidance on Planning considerations in relation to noise.

The document identifies the subjective grading of noise and the recommended actions and different effect levels. Again, as Planning Practice Guidance – Noise' does not refer to objective criteria, reference shall be made in this document to established guidance and principles, as established in British Standards and the local Planning policy

LOCAL PLANNING POLICY

Manchester City Council's Core Strategy was adopted on 11th July 2012 and is the key Development Plan Document in the Local Development Framework (LDF).

Section 13.6 'Development Management' of the Core Strategy states that 'all new developments should follow the 'Development Principles' and accord with the design guidance set out in the Supplementary Planning Documents.

Policy DM 1, 'Development Management' of the Core Strategy states that:

- All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-Effects on amenity, including …..noise, vibration…. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.

'Planning & Noise, Technical Guidance', dated December 2015 has been issued by the Environmental Protection, Environmental Health and The Neighbourhoods Service sections of Manchester City Council. The document provides guidance to applicants and consultants concerning the assessment and prediction of environmental noise associated with a particular development. Reference is also made in the document to the relevant supporting information and guidance documents that Developers are expected to refer to when submitting a planning application.

Internal noise criteria

Internal noise levels within the proposed living accommodation must be appropriate for the intended use.

With regard to noise ingress to residential dwellings, section 3.5 'National & International Standards' of the 'Planning & Noise, Technical Guidance' advises that Manchester City Council has adopted the internal noise limits for residential properties identified in Table 1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq, 16\ hours}$	-
Dining	Dining room / area	40 dB $L_{Aeq, 16\ hours}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16\ hours}$	30 dB $L_{Aeq, 8\ hours}$ 45dB LAmax (fifteen excesses over 45dB LAmax allowed per night)

Table 1: Intrusive noise criteria

Building Services Noise

With regard to external noise due to building services plant, Section 3.6.1.5.1 of 'Planning & Noise, Technical Guidance' states:

- '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 (LAeq) below the typical background (LA90) level at the nearest noise sensitive location'

Figure 3 identifies the nearest noise sensitive premises to the proposed development site.

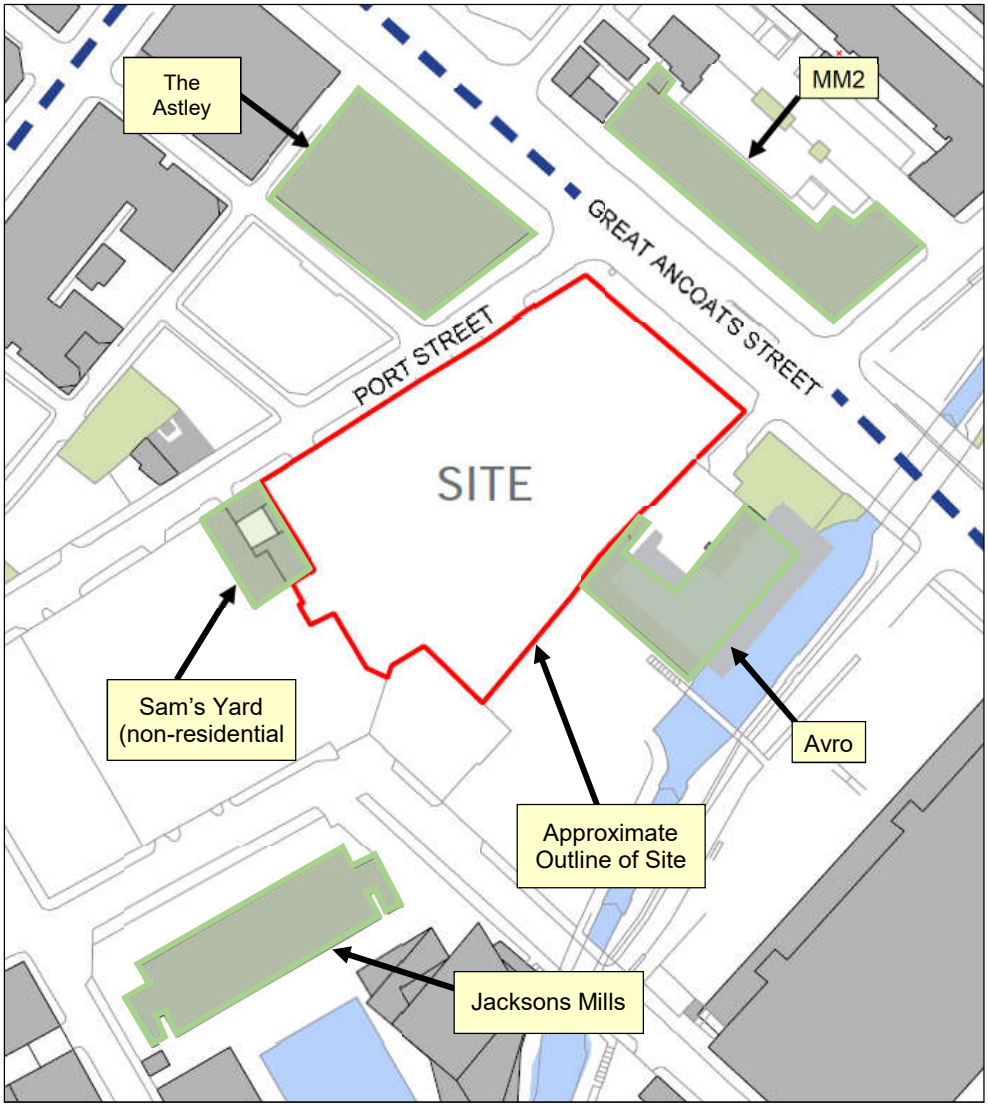


Figure 3: Nearest noise sensitive premises to Proposed Development

Noise from Commercial Operations and Amenity Areas

Noise egress from the proposed commercial units and amenity areas at the proposed development must be controlled to appropriate levels so as to avoid noise nuisance to existing sensitive receptors.

With regard to entertainment venues, 'Planning & Noise, Technical Guidance' states:

- 'When considering the potential impact of a proposal for an entertainment venue, consultants should consider the overall noise level (LAeq) and the 63 Hz and 125 Hz octave band noise levels (Leq). Music noise in the 63 Hz and 125 Hz octave bands, which is often described as "bass noise", is particularly difficult to contain and the impulsive character of this low frequency music noise is particularly disturbing for local residents exposed to it'.

- 'A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be 'audible' in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion here is:

  Entertainment noise (LAeq) should be controlled to 10dB below the background noise level (LA90) without the entertainment noise present, in each octave band at the nearest noise sensitive location'.

As the proposed commercial spaces and amenity spaces may employ music replay, it would be appropriate to establish external environmental noise limits for music noise to ensure that during design development, the building incorporates any required mitigation measures to maintain residential amenity at and around the site.

6.0 ENVIRONMENTAL NOISE SURVEY

In order to determine the prevailing ambient noise levels at and around the site, manned surveys of the existing noise environment at the Site were carried out by Fisher Acoustics Ltd from 2:00 pm to 5:30 pm on Wednesday 6th October 2021 and from 10:45 pm, Thursday 7th October 2021 to 1:00 am, Friday 8th October 2021.

The measurement locations used for the surveys are identified on Figure 4 and are representative of the positions of the façades of the proposed Development and of the nearest existing residential properties. The measured noise levels can therefore be used to assess the expected internal noise levels within the proposed buildings and also to determine acceptable levels of noise at the existing sensitive properties around the site due to noise from the Development.

The measurement locations were as follows:

- Location 1: At proposed location of façade of the Proposed Development to Great Ancoats Street 5.7m from the kerb, at a microphone height of 1.5 metres above street level
- Location 2: At proposed location of closest façade of Proposed Development to Port Street, at 2.7 metres from the kerb, 20 m from Great Ancoats Street, at a microphone height of 1.5 metres above street level
- Location 3: At proposed location of closest façade of Proposed Development to Avro, at 10 metres from the corner of the Avro building, at a microphone height of 6 metres above site ground level
- Location 4: At proposed location of closest façade of Proposed Development to Port Street, at 4 metres from the kerb, 50 m from Great Ancoats Street, at a microphone height of 1.5 metres above street level
- Location 5: At the corner of Tariff Street adjacent to Jacksons Mills at a microphone height of 1.5 metres above street level.
- Location 6: Dean Street, 5m from the façade of the Wentwood residential building, at a microphone height of 1.5 metres above street level.

Full survey details are given in Appendix A. Appendix A also contains a summary of the results obtained from the surveys.

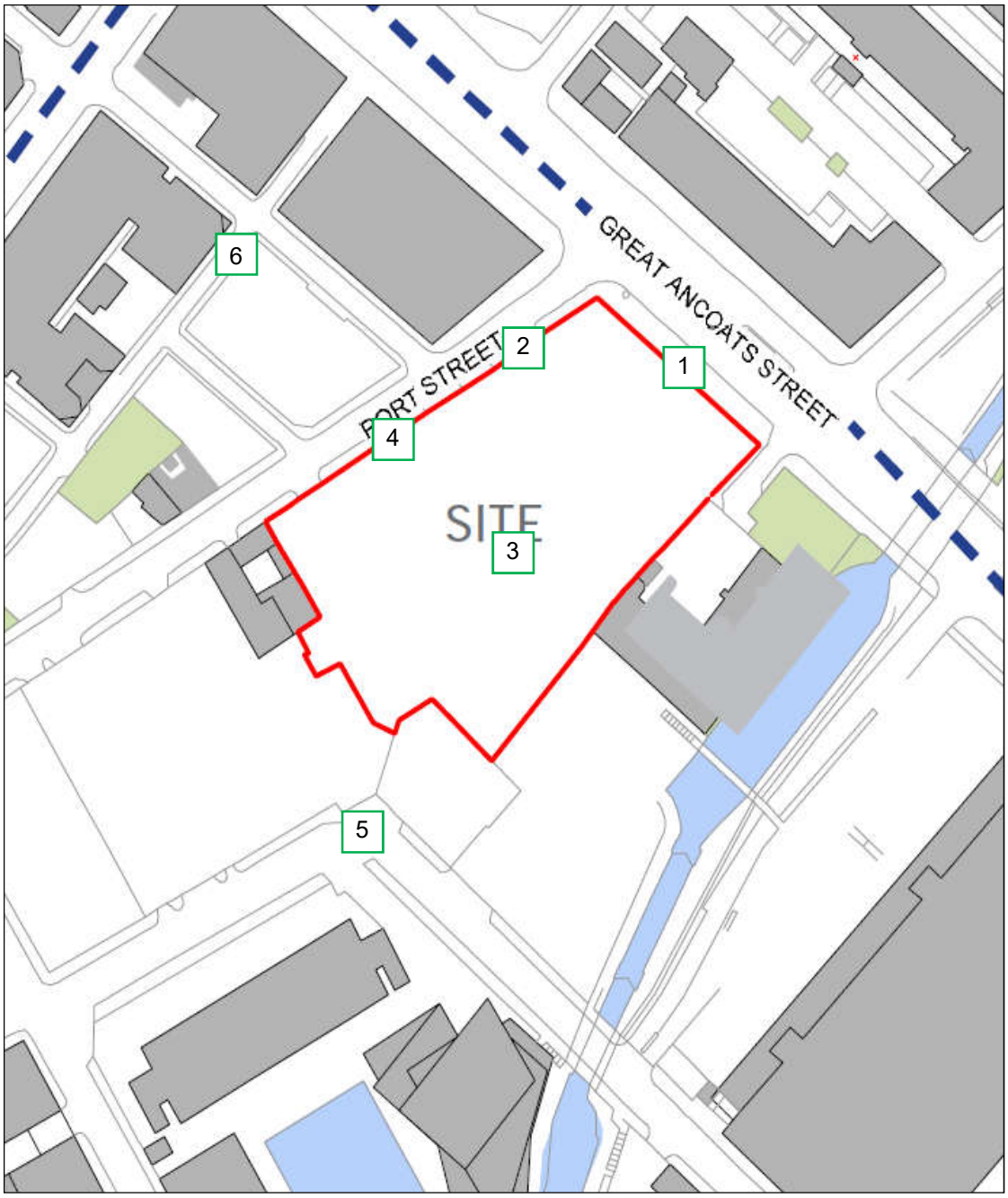


Figure 4: Noise survey measurement locations

The long-term noise environment around the Application Site is currently determined by road traffic on Great Ancoats Street, with a lesser contribution from road traffic on Port Street.

The noise levels measured during the noise surveys are summarised in Table 2.

Measurement Location	Measured Noise Level					
	Daytime (defined as 7 am to 11 pm)			Night time (defined as 11 pm to 7 am)		
	dB, L_{Aeq}	dB, L_{Amax}	dB, L_{A90}	dB, L_{Aeq}	dB, L_{Amax}	dB, L_{A90}
1	65	75 to 85	57 to 61	64	68 to 81	45 to 61
2	62	69 to 89	54 to 60	59	62 to 72	45 to 57
3	54	59 to 81	49 to 52	54	58 to 77	45 to 50
4	61	70 to 87	50 to 59	55	58 to 70	44 to 53
5	59	69 to 75	48 to 49	46	51 to 61	44 to 44
6	55	69 to 71	49 to 50	52	61 to 63	46 to 47

Table 2: Summary of measured environmental noise levels

The statistical noise levels ('LAmax' and 'LA90') given in Table 2 show the range of noise levels measured over the sample periods. The quoted average (LAeq) noise levels are the average noise levels measured over the full measurement periods in question at each measurement position.

With reference to noise survey data gathered for the planning application relating to The Astley residential development on Port Street (planning reference 109287/FO/2015/C2), the free field noise level measured on Great Ancoats Street is approximately 5dB lower than was the case in 2015. During the October 2021 survey, there was heavy but slow moving road traffic on Great Ancoats Street during the full duration of the daytime noise survey. Since 2015, improvement works have been carried out to Great Ancoats Street. These works have included new crossing points, both controlled and uncontrolled, for pedestrians and people on bikes and a new road surface that is designed to reduce from road vehicles. The improvement works may have reduced traffic speeds which would explain the slow-moving traffic that was encountered during the 2021 noise survey.

Figure 5 shows the external daytime average (LAeq) free field noise levels expected to be incident upon the lower residential levels of the various façades of the proposed building.

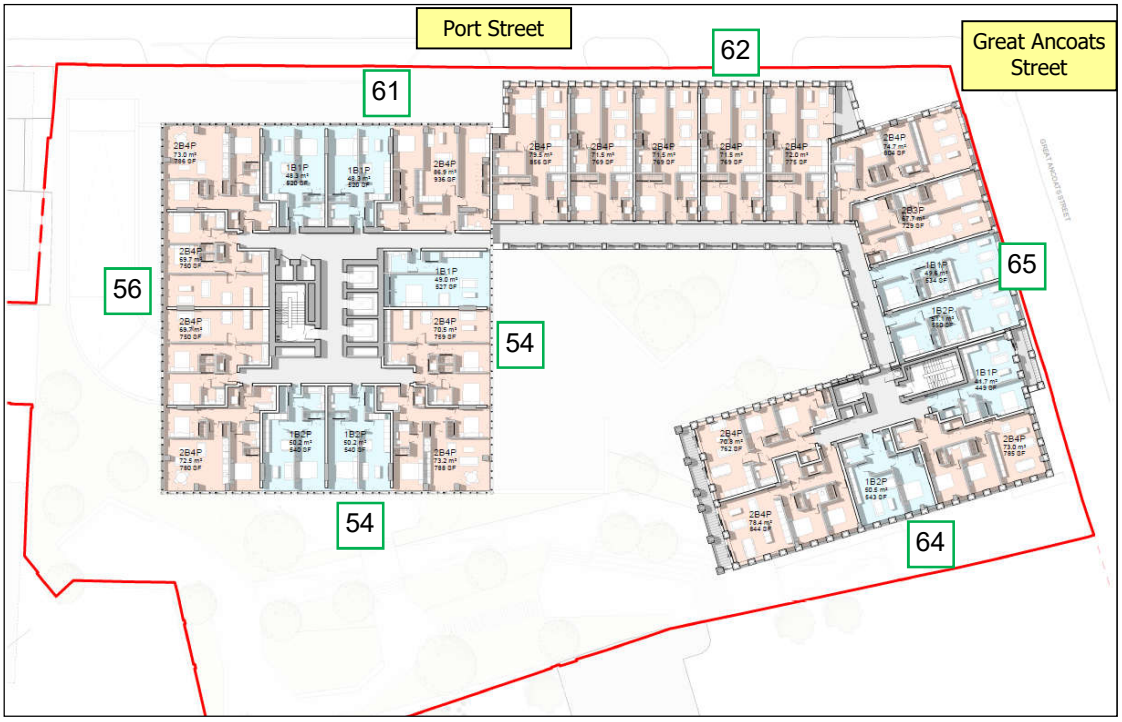


Figure 5: Summary external daytime noise levels at lower floor levels at each façade (dB LAeq)

7.0 NOISE INGRESS

The external noise survey data have been used to calculate the required sound insulation performance of façade elements to achieve the internal noise criteria within apartment rooms due to external noise. The calculations are based on the 'more rigorous' calculation method identified in Annex G.2.1 of BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.

The calculations take into account the measured levels of noise at the site, the areas of individual façade elements, (e.g. glazing, curtain wall framing and openable purge vent panels) identified in the drawings submitted for planning purposes and the expected reverberation time of the apartment rooms.

The apartments of the proposed development are to be provided with continuously running supply and extract ventilation in order to achieve the background ventilation requirements of Approved Document F of the Building Regulations. Therefore, no passive trickle ventilators are required within the façade of the proposed habitable rooms. Purge ventilation is to be achieved through via opening purge vents.

Windows and Vision Panels

It has been determined that a range of acoustic specifications for the windows and vision panels to the proposed apartment rooms will be required to achieve the internal noise criteria detailed in Section 5 of this report. Figures 6 to 11 identify the locations of the various recommended specification types. Table 3 identifies the minimum recommended sound reduction index of the window and vision panel types. The performance values in Table 3 relate to the composite performance of the full window or vision panel assembly including glazing, frames and seals.

Vision panel/purge panel type	Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
TYPE A	25	28	35	40	44	46	53
TYPE B	25	28	31	38	41	44	53
TYPE C	22	26	27	35	38	38	45
TYPE D	20	24	24	31	37	37	37

Table 3: Minimum Recommended Sound Reduction Index of vision panels and windows, including frame

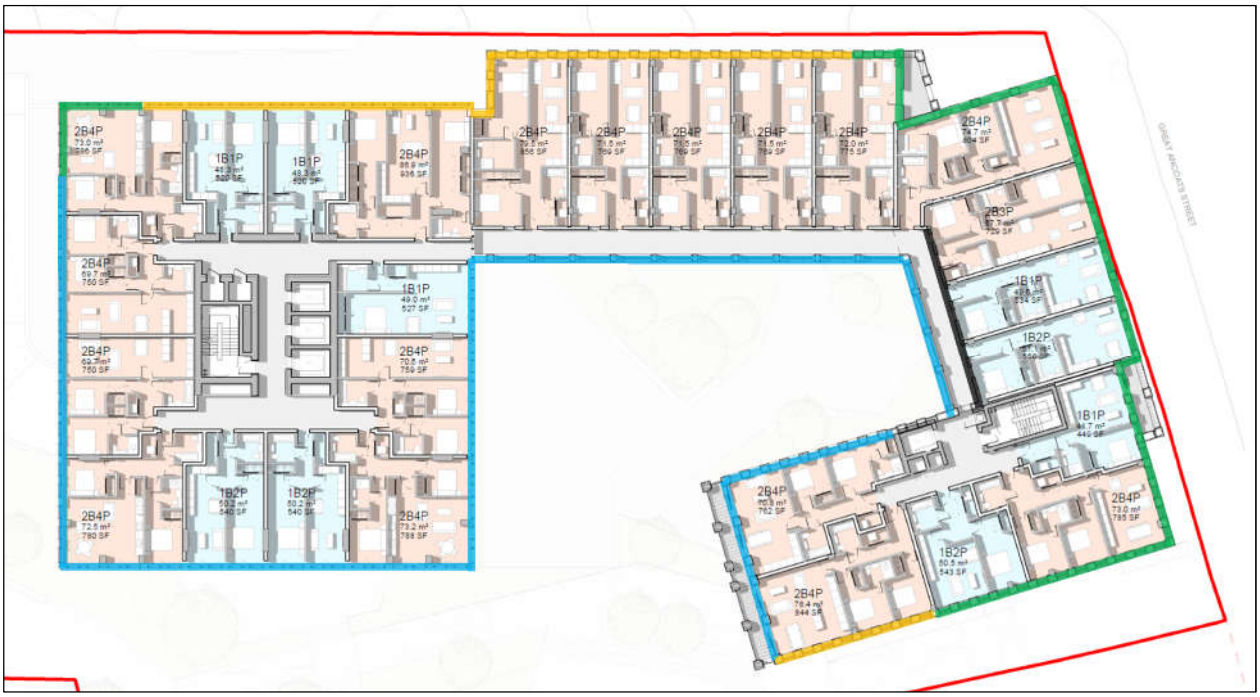


Figure 6: Acoustic specification location plan, Ground Floor Level 01 to Level 06

Key

Acoustic Specification A

Acoustic Specification B

Acoustic Specification C

Acoustic Specification D

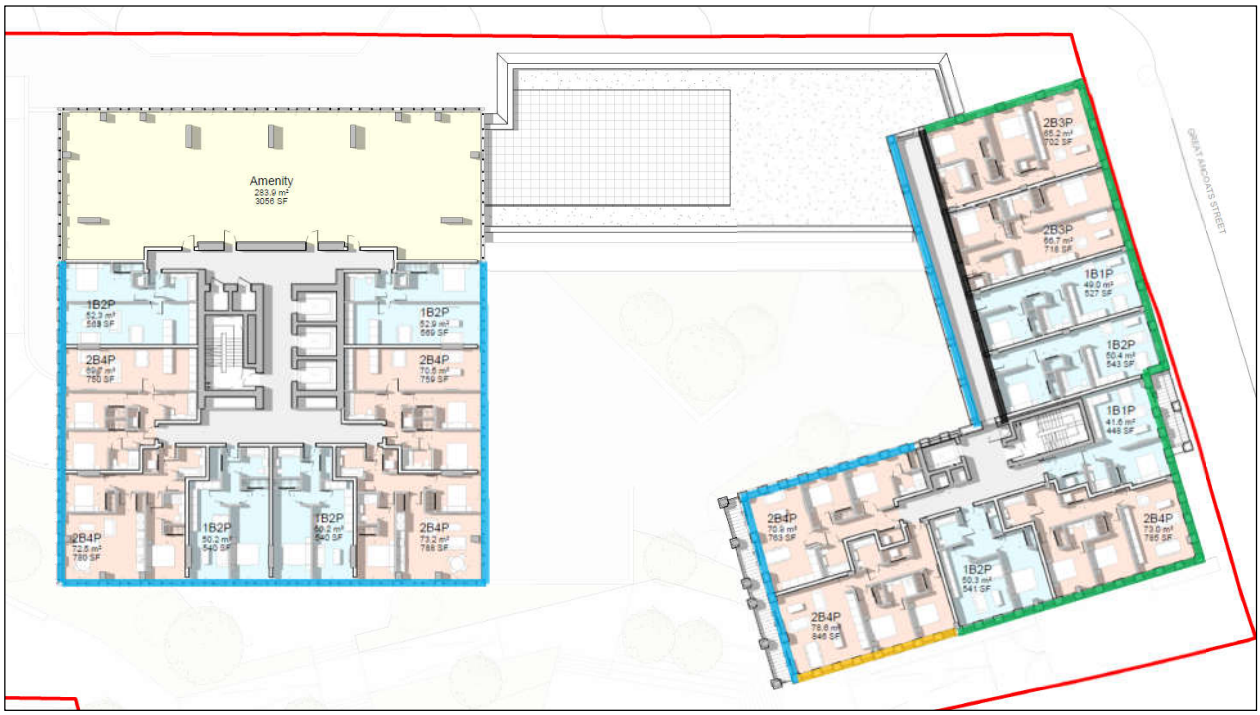


Figure 7: Acoustic specification location plan, Ground Floor Level 07 and Level 08

Key

Acoustic Specification A

Acoustic Specification B

Acoustic Specification C

Acoustic Specification D



Figure 8: Acoustic specification location plan, Ground Floor Level 09

Key

Acoustic Specification A

Acoustic Specification B

Acoustic Specification C

Acoustic Specification D

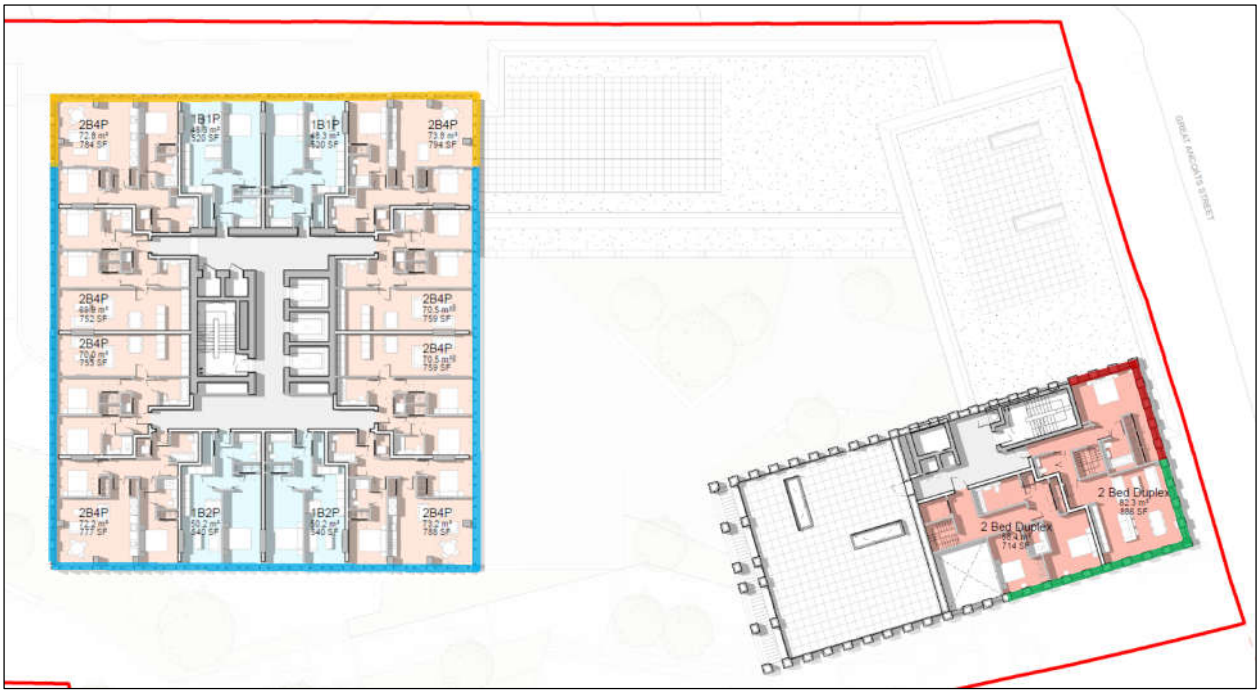


Figure 9: Acoustic specification location plan, Ground Floor Level 10

Key

Acoustic Specification A

Acoustic Specification B

Acoustic Specification C

Acoustic Specification D

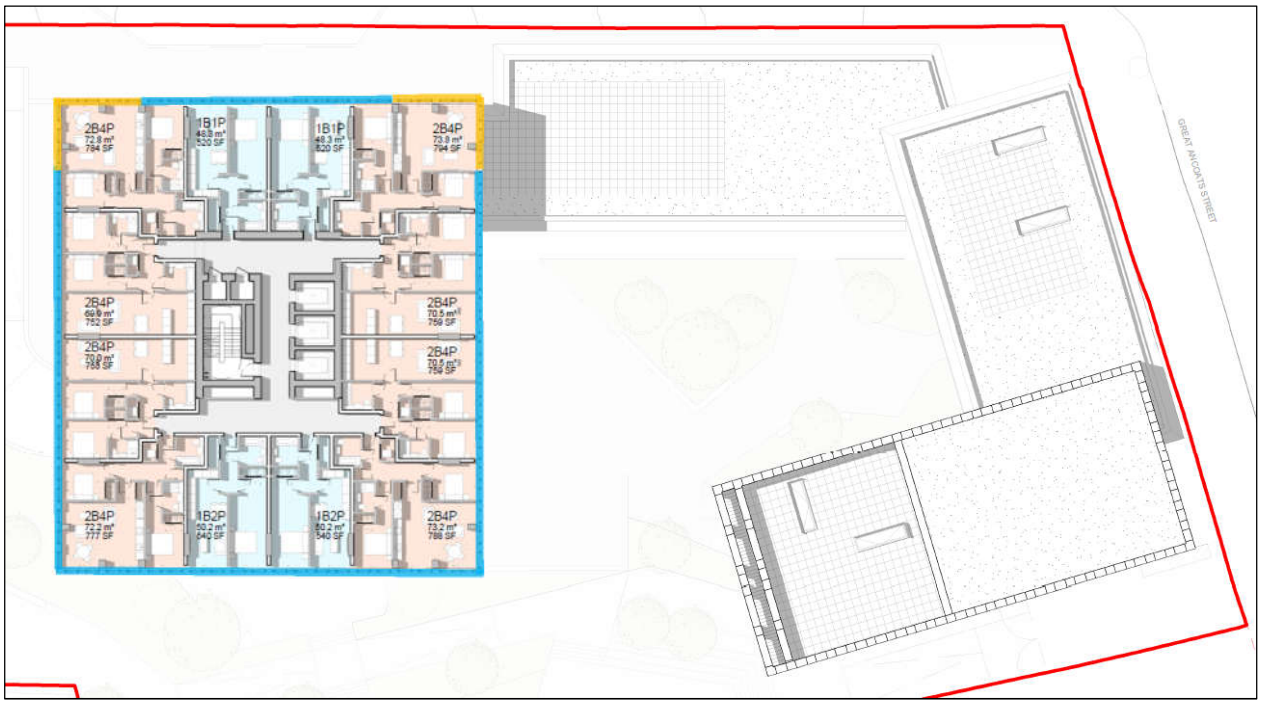


Figure 10: Acoustic specification location plan, Ground Floor Level 11 to Level 20

Key

Acoustic Specification A

Acoustic Specification B

Acoustic Specification C

Acoustic Specification D

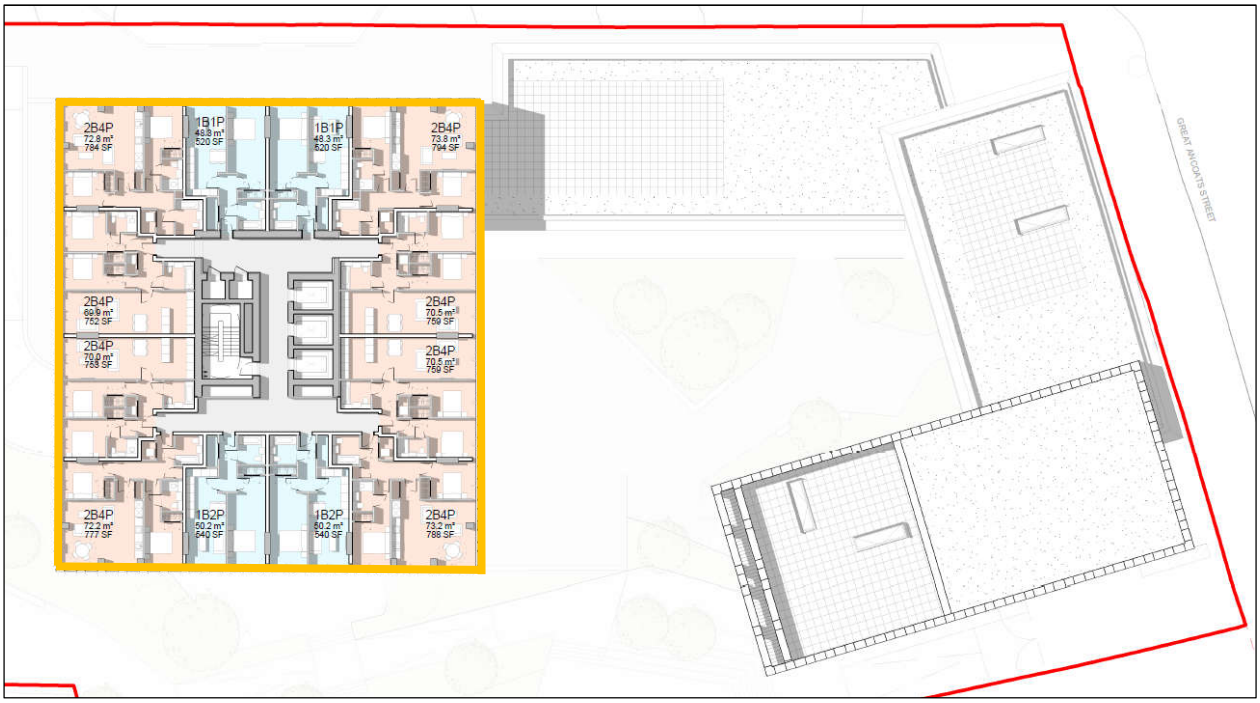


Figure 11: Acoustic specification location plan, Ground Floor Level 21 to Level 30

Key

Acoustic Specification A

Acoustic Specification B

Acoustic Specification C

Acoustic Specification D

Purge panels

In order to provide rapid (purge) natural ventilation, the curtain wall of the Tower includes inward-opening solid doors within apartment bedrooms and living rooms. The door is to be an insulated aluminium panel. A fixed perforated panel will be positioned on the outer frame that incorporates the opening door.

Table 4 identifies the minimum recommended sound insulation performance of the purge panels to the proposed apartment rooms to achieve the recommended internal noise levels. The recommended performance values in Table 4 relate to the composite performance of the purge panel, the panel frame and the acoustic seals around the perimeter of the opening panel.

Purge Vent Type	**Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)**						
	63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1kHz**	**2kHz**	**4kHz**
Standard purge vent	17	20	30	37	42	45	45

Table 4: Minimum sound reduction index of purge vents to habitable rooms

External Wall (Podium)

It is understood that the external wall of the proposed podium apartments is to comprise areas of brickwork and metal panels fixed to an SFS frame drylined internally.

Table 5 identifies the minimum recommended sound reduction index of the external wall to the podium apartments.

External Wall Construction	**Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Brickwork, SFS system drylined internally	25	32	39	48	50	50	50
Insulated metal panel, SFS system drylined internally	20	30	39	48	50	50	50

Table 5: Minimum recommended Sound Reduction Index of external wall construction (podium)

Non-vision panels of curtain wall (Tower)

Table 6 identifies the minimum recommended sound insulation performance of the non-vision panels of the curtain wall to the proposed apartment rooms within the Tower to achieve the recommended internal noise levels. The recommended performance values in Table 6 relate to the composite performance of the non-vision panels and the panel frame and include the benefit of the internal drylining.

Element Type	Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)						
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz
Non-vision panel, drylined	17	28	38	45	50	50	50

Table 6: Minimum sound reduction index of purge vents to habitable rooms

Roof

The principle acoustic elements of the proposed roof of the development are a concrete slab and a ceiling that comprises a single layer of 12.5 mm wallboard fixed to a suspended metal frame. The expected minimum weighted sound reduction index of the roof construction is 60dB Rw. This performance is fully commensurate with the achievement of the target internal noise levels within the proposed apartments.

External noise ingress via MVHR ductwork

It is possible that in-line ductwork silencers would need to be introduced to some of the proposed apartment MVHR systems to reduce external noise ingress via the atmosphere terminations of the MVHR systems (i.e. the intake and exhaust of the MVHR fans) and to achieve the recommended internal noise.

As the detailed design progresses, the acoustic requirements of any in-line ductwork silencers will need to be assessed.

Conclusion

Compliance with the recommended sound insulation performances of the façade and roof elements is expected to allow full compliance with the daytime and night time 'average' noise level criteria identified in Section 5 above.

Given the recommended sound insulation performances given above for the façade and roof, compliance with the recommendations of the World Health Organisation in relation to maximum (LAmax) internal noise events is expected.

8.0 EXTERNAL NOISE LEVELS DUE TO BUILDING SERVICES

The measured background noise levels around the site can be used to establish the acceptable level of noise from plant serving the development. Final plant selections have not been made at this early design stage. In the absence of specific selection of plant items, overall plant noise limits can be provided.

With reference to the discussion in Section 5, the cumulative rating level due to all simultaneously operating non-emergency plant must be at least 5dB lower than the typical pre-existing background noise level at the nearest residential receptors to the site.

Table 7 identifies the allowable combined free-field noise level at the nearest residential receptors to the development, due to all simultaneously-operating non-emergency building services plant and equipment.

Location	**Rating noise level (dB L_{Aeq})**	
	Daytime (07:00 hrs to 23:00 hrs)	**Night time (23:00 hrs to 07:00 hrs)**
Proposed Development, Great Ancoats Street Elevation	53	42
Proposed Development, Port Street Elevation	46	40
Proposed Development, internal elevation	44	40
The Astley, Port Street	49	42
MM2, Great Ancoats Street	53	42
Jacksons Mills, Tariff Street	43	39
Avro, Great Ancoats Street	44	40

Table 7: Environmental noise limits for non-emergency building services plant

Emergency plant

If any emergency plant is required at the Development, it is expected that such plant would only operate during emergencies and during periodical test runs (perhaps test runs of thirty minutes every two months).

On this basis, it is not considered appropriate to require emergency plant to comply with the noise limits for continuously operating non-emergency plant. It is therefore suggested that the noise level from any emergency plant is no more than 10 dB(A) greater than the ambient noise level (measured as an LAeq) at any residential receptor.

It is therefore recommended that the noise level at any residential façade during operation of any emergency plant does not exceed the daytime noise levels given in Table 8.

Location	Daytime noise level (dB L_{Aeq})
Proposed Development, Great Ancoats Street Elevation	75
Proposed Development, Port Street Elevation	72
Proposed Development, internal elevation	64
The Astley, Port Street	72
MM2, Great Ancoats Street	75
Jacksons Mills, Tariff Street	69
Avro, Great Ancoats Street	64

Table 8: Environmental noise limits for emergency building services plant

The above noise limits for non-emergency and emergency plant must be forwarded to the project's Mechanical Engineer to allow the selection of appropriate equipment and any associated noise control hardware. Building services equipment must also be provided with appropriate vibration isolation to minimise the risk of disturbance to the building occupants by structureborne noise.

9.0 NOISE EGRESS FROM COMMERCIAL UNITS AND AMENITY SPACES

In order to avoid potential noise nuisance to the existing and proposed noise-sensitive buildings around the site, activity noise egress from the proposed commercial units and amenity spaces must be controlled. As the proposed Planning Class for the commercial units includes food & beverage, it is recommended that environmental noise limits relating to music noise are established.

As detailed in Section 5 above, Manchester City Council suggests that external music noise levels (measured as an L_{eq} noise level) external to a residential property due to an entertainment venue should be 10 dB lower than the prevailing background noise level in each octave band.

Octave band noise limits at the nearest noise sensitive receptors have been determined by reference to the results of the noise survey.

Table 9 identifies the recommended maximum allowable cumulative daytime and night time free-field noise levels at the closest residential façades due to music noise from the commercial units and amenity spaces within the proposed development to comply with the guidance of Manchester City Council.

Location/period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Proposed Development, Great Ancoats Street Elevation (0700 to 2300)	56	50	46	44	42	40	35
Proposed Development, Great Ancoats Street Elevation (2300 to 0700)	49	42	37	34	33	27	17
Proposed Development, Port Street Elevation (0700 to 2300)	54	48	43	40	38	36	30
Proposed Development, Port Street Elevation (2300 to 0700)	49	43	38	34	32	27	17
Proposed Development, Internal elevations (0700 to 2300)	49	40	38	36	35	30	22
Proposed Development, Internal elevations (2300 to 0700)	49	38	35	32	32	26	15
The Astley (07:00 to 23:00)	54	48	43	40	38	36	30
The Astley (23:00 to 07:00)	49	43	38	34	32	27	17
MM2 (07:00 to 23:00)	56	50	46	44	42	40	35
MM2 (23:00 to 07:00)	49	42	37	34	33	27	17
Jacksons Mills (07:00 to 23:00)	49	40	36	35	33	27	19
Jacksons Mills (23:00 to 07:00)	49	39	34	32	28	21	11
Avro (07:00 to 23:00)	49	40	38	36	35	30	22
Avro (23:00 to 07:00)	49	38	35	32	32	26	15

Table 9: Maximum allowable external music noise levels due to proposed commercial units

Internal Noise transfer- amenity areas to apartments

There are residential apartments directly above the proposed amenity areas and commercial units. There is therefore the possibility of internal noise transfer between these areas and the apartments above via the party floor structures. In order to avoid potential noise nuisance, it is recommended that the internal noise levels within an apartment due solely to music replay in the amenity areas and commercial units do not exceed the values given in Table 10.

Room	**Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Apartment Unit 3B	40	30	23	20	17	15	12

Table 10: Maximum recommended noise levels in apartments due to music replay in amenity areas

During the detailed design stages, the sound insulation requirements of the party floor to comply with the above noise limits will be determined.

APPENDIX A: NOISE SURVEY DETAILS AND SUMMARY RESULTS

LOCATION

Port Street, Manchester

DATES AND TIMES

2:20am to 5:30pm, Wednesday 6 October 2021
10:50 pm to 0:50am, Thursday 7 October 2021to Friday 8 October 2021

WEATHER DURING SURVEYS

Wednesday 6 October 2021 (Day time)	1/8 cloud cover, 3 m/s wind, no rain, 17°C
Thursday 7 October 2021 (Night time)	1/8 cloud cover, 2 m/s wind, no rain, 15°C

PERSONNEL PRESENT DURING SURVEY

Matt Fisher – Fisher Acoustics
Lee Copley – Fisher Acoustics

INSTRUMENTATION

Norsonic Type 118 IEC 60651 Type 1 Integrating-Averaging Sound Level Meter (serial no. 31498)
Norsonic Type 140 IEC 60651 Type 1 Integrating-Averaging Sound Level Meters (serial no. 1406387)
Norsonic Type 140 IEC 60651 Type 1 Integrating-Averaging Sound Level Meters (serial no. 1403193)
Norsonic Type 1251 IEC 60942-1997 Class 1 Sound Calibrators (x2) (serial nos. 31971, 27878)

MEASUREMENT METHODOLOGY

Before and after the noise survey the sound level meters were check calibrated to an accuracy of ±0.3dB using the Norsonic Type 1251 Calibrators - no drift in sensitivity was detected. The measurement microphones were installed at the locations identified in this report. All survey measurements were in 'free field' conditions.

Figure 12 to Figure 14 identify the free-field noise levels measured around the Site. Measurement locations are shown in Figure 4 and described below.

The measurement locations were as follows:

- Location 1: At proposed location of façade of the Proposed Development to Great Ancoats Street 5.7m from the kerb, at a microphone height of 1.5 metres above street level
- Location 2: At proposed location of closest façade of Proposed Development to Port Street, at 2.7 metres from the kerb, 20 m from Great Ancoats Street, at a microphone height of 1.5 metres above street level

- Location 3: At proposed location of closest façade of Proposed Development to Avro, at 10 metres from the corner of the Avro building, at a microphone height of 6 metres above site ground level
- Location 4: At proposed location of closest façade of Proposed Development to Port Street, at 4 metres from the kerb, 50 m from Great Ancoats Street, at a microphone height of 1.5 metres above street level
- Location 5: At the corner of Tariff Street adjacent to Jacksons Mills at a microphone height of 1.5 metres above street level.
- Location 6: Dean Street, 5m from the façade of the Wentwood residential building, at a microphone height of 1.5 metres above street level.

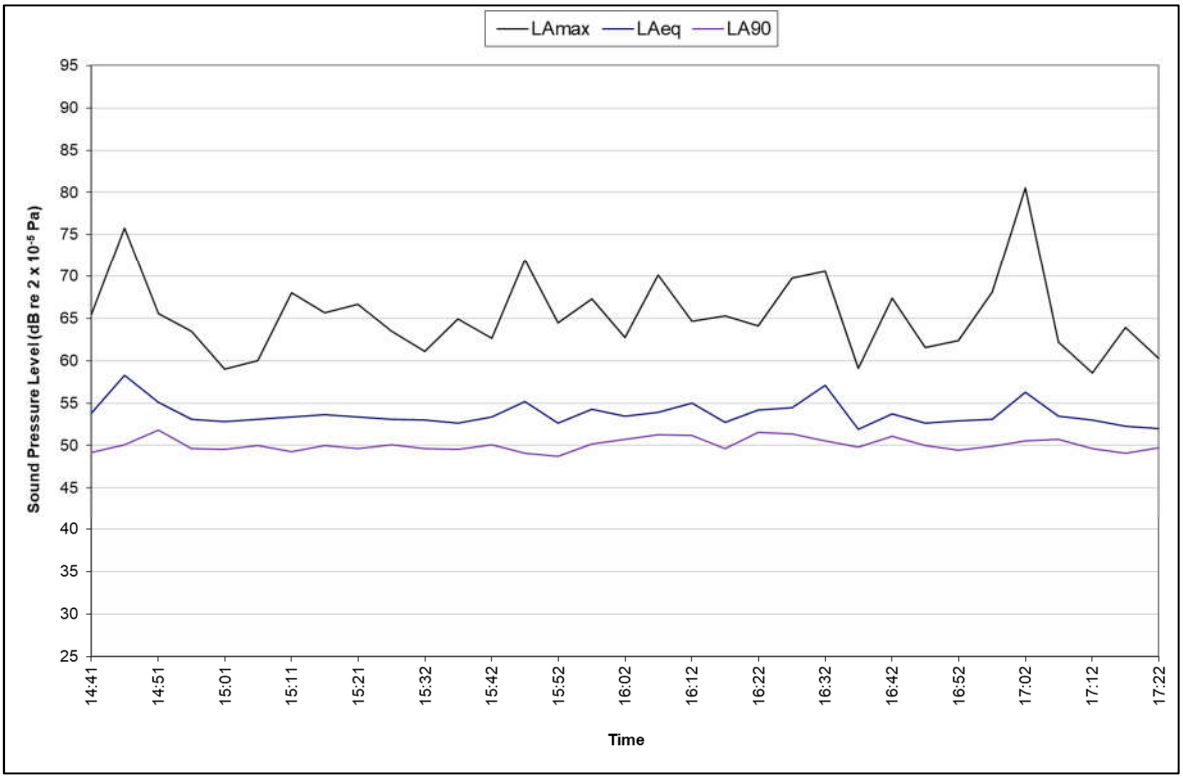


Figure 12: Position 3 daytime noise measurements, Wednesday 6 October 2021 - maximum (LAmax), average (LAeq) and background (LA90) noise levels

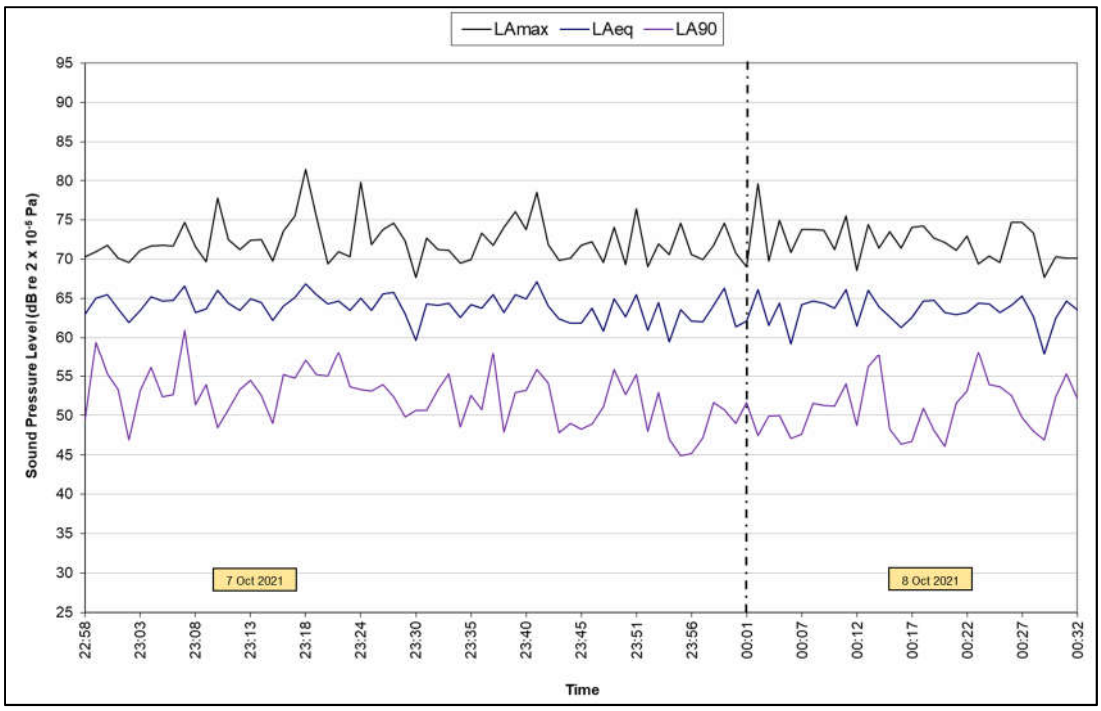


Figure 13: Position 1 night-time noise measurements, Thursday 7 October 2021 to Friday 8 October 2021 - maximum (LAmax), average (LAeq) and background (LA90) noise levels

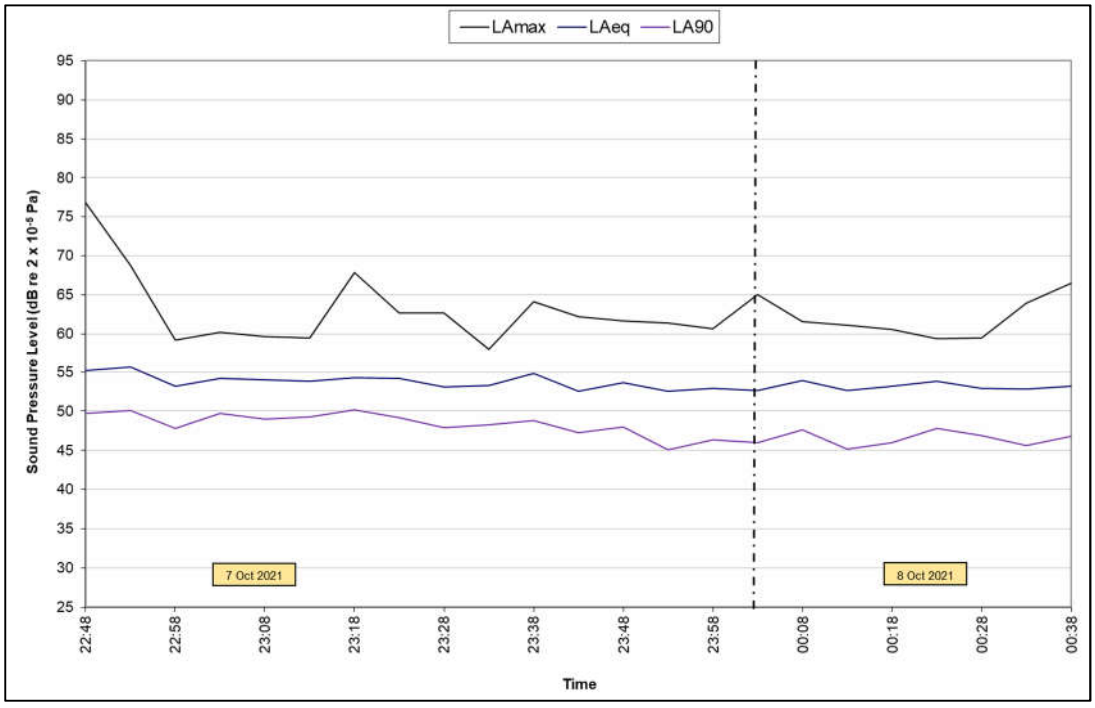


Figure 14: Position 3 night-time noise measurements, Thursday 7 October 2021 to Friday 8 October 2021 - maximum (LAmax), average (LAeq) and background (LA90) noise levels

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
1	14:23	65.0	82.2	58.5	Road traffic, Pedestrian crossing beeping
1	14:29	63.2	74.8	58.7	"
1	14:34	65.6	79.1	58.8	"
1	14:58	65.4	78.2	58.7	"
1	15:03	65.4	76.5	59.2	"
1	15:08	66.1	78.7	59.4	"
1	15:31	65.5	78.8	58.6	"
1	15:36	64.9	75.4	59.2	"
1	15:41	65.2	74.6	60.9	"
1	16:03	64.5	75.6	59.5	"
1	16:08	64.9	78.7	59.7	"
1	16:13	68.5	85.2	60.6	"
1	16:38	64.0	76.0	58.4	"
1	16:43	65.3	85.3	58.8	"
1	16:48	65.1	76.3	60.1	"
1	17:13	64.4	78.1	57.8	"
1	17:18	62.5	76.9	58.1	"
1	17:23	63.9	77.3	57.3	"

Table 11: Summary Statistical Noise Levels, Position 1 – Daytime, 6th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
1	14:23	65.0	73.4	66.4	64.1	61.8	60.7	56.3	51.4
1	14:29	63.2	72.5	65.4	61.9	59.5	58.4	55.3	51.3
1	14:34	65.6	74.0	67.1	64.1	62.1	60.8	57.6	53.5
1	14:58	65.4	72.8	67.0	63.8	60.8	60.5	58.6	53.2
1	15:03	65.4	73.3	66.4	62.6	61.7	60.7	58.1	52.6
1	15:08	66.1	72.1	66.4	64.5	62.0	61.1	58.4	55.3
1	15:31	65.5	72.6	66.8	62.9	61.3	60.1	57.9	56.1
1	15:36	64.9	73.0	67.6	64.6	61.2	59.8	57.2	52.8
1	15:41	65.2	74.0	67.6	63.7	60.9	59.9	57.8	54.7
1	16:03	64.5	73.1	68.1	64.9	60.9	58.9	55.8	50.9
1	16:08	64.9	72.3	68.0	63.4	61.3	59.4	56.7	53.6
1	16:13	68.5	74.0	66.7	65.0	64.8	63.6	61.2	56.4
1	16:38	64.0	72.0	67.0	60.7	60.6	58.8	55.7	52.5
1	16:43	65.3	73.3	67.2	63.2	61.0	59.6	58.9	50.8
1	16:48	65.1	76.2	72.2	66.3	61.8	59.4	55.7	50.2
1	17:13	64.4	73.0	68.1	62.9	59.7	59.7	56.5	51.9
1	17:18	62.5	71.3	65.6	61.5	58.7	57.3	54.2	50.3
1	17:23	63.9	72.1	64.5	61.3	60.3	59.6	56.1	50.4

Table 12: Measured Octave Band L_{eq} Noise Levels, Position 1 – Daytime, 6th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
2	15:14	59.8	74.5	53.6	Road traffic, pedestrian crossing beeping
2	15:19	60.1	70.5	55.1	"
2	15:24	60.4	69.0	54.7	"
2	15:47	63.4	85.3	55.8	"
2	15:52	60.3	74.7	54.6	"
2	15:57	60.3	77.8	54.5	"
2	16:19	62.4	80.8	53.9	"
2	16:25	64.6	81.2	59.8	"
2	16:30	66.4	89.1	55.4	"
2	16:55	59.8	69.3	55.6	"
2	17:00	61.5	76.3	58.3	"
2	17:06	65.2	88.5	57.5	"
2	17:30	59.8	73.2	56.0	"

Table 13: Summary Statistical Noise Levels, Position 2 – Daytime, 6th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
2	15:14	59.8	70.7	64.5	60.3	55.8	54.3	50.8	44.9
2	15:19	60.1	71.4	64.5	58.6	56.3	55.3	52.4	47.1
2	15:24	60.4	70.6	64.2	59.0	57.2	55.5	52.4	47.3
2	15:47	63.4	70.3	63.3	57.8	60.8	59.2	54.2	49.4
2	15:52	60.3	74.2	63.5	60.2	57.1	54.9	51.6	48.1
2	15:57	60.3	69.9	62.3	57.9	56.4	56.3	52.6	46.5
2	16:19	62.4	70.1	62.8	59.1	59.3	57.5	55.1	49.1
2	16:25	64.6	71.9	66.6	66.7	60.5	58.4	55.9	52.2
2	16:30	66.4	72.3	66.1	61.4	60.9	61.8	61.0	54.3
2	16:55	59.8	74.5	64.5	58.7	55.8	54.8	51.9	47.0
2	17:00	61.5	71.1	65.0	59.9	58.2	55.9	53.7	50.8
2	17:06	65.2	70.8	64.9	63.4	62.7	60.7	56.6	54.0
2	17:30	59.8	71.1	64.5	58.6	57.5	54.2	50.7	46.5

Table 14: Measured Octave Band L_{eq} Noise Levels, Position 2 – Daytime, 6th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
4	14:50	60.1	73.8	52.7	Road traffic
4	14:55	61.4	76.6	53.4	"
4	15:00	60.4	80.7	50.5	"
4	15:05	57.4	70.2	52.1	"
4	15:10	57.7	70.7	51.3	"
4	15:15	59.9	77.4	52.8	"
4	15:23	59.4	73.1	52.8	"
4	15:44	59.0	69.9	52.7	"
4	15:49	59.4	82.8	54.9	"
4	15:54	59.4	72.2	50.6	"
4	15:59	61.8	80.7	52.5	"
4	16:04	61.3	75.3	53.9	"
4	16:24	63.4	79.8	59.0	"
4	16:29	61.8	76.4	52.2	"
4	16:34	60.0	73.2	50.9	"
4	16:40	60.3	76.3	52.2	"
4	16:45	60.4	78.2	53.5	"
4	16:58	62.3	87.1	53.9	"
4	17:03	60.9	76.1	53.5	"
4	17:08	61.6	78.9	56.4	"
4	17:14	58.6	72.9	50.3	"

Table 15: Summary Statistical Noise Levels, Position 4 – Daytime, 6th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
4	14:50	60.1	67.2	61.3	58.2	56.8	55.9	52.3	45.4
4	14:55	61.4	68.3	63.0	59.1	57.5	57.3	53.8	47.7
4	15:00	60.4	69.1	65.8	60.9	57.6	55.5	50.7	44.8
4	15:05	57.4	66.1	58.6	54.8	54.2	53.5	49.2	42.5
4	15:10	57.7	66.9	60.3	56.4	53.6	53.6	49.8	43.6
4	15:15	59.9	67.8	63.8	57.4	56.2	56.2	51.7	44.0
4	15:23	59.4	66.9	60.9	56.1	55.6	55.4	52.0	45.3
4	15:44	59.0	68.2	61.4	58.2	55.7	54.6	50.9	45.0
4	15:49	59.4	68.2	62.0	55.9	55.0	54.8	51.3	48.6
4	15:54	59.4	69.2	62.4	58.7	55.6	55.5	51.1	43.8
4	15:59	61.8	70.8	69.6	58.4	57.4	57.2	53.9	48.7
4	16:04	61.3	67.6	61.8	58.5	57.3	57.5	53.5	47.6
4	16:24	63.4	70.0	65.0	64.3	59.9	58.2	55.5	50.8
4	16:29	61.8	69.0	64.1	59.5	58.0	57.6	54.4	48.2
4	16:34	60.0	66.9	62.2	58.6	55.1	55.7	53.3	46.7
4	16:40	60.3	66.8	62.1	57.4	57.1	56.7	52.2	44.4
4	16:45	60.4	68.5	61.8	57.9	56.5	56.5	52.1	45.9
4	16:58	62.3	69.1	63.4	57.7	56.4	54.6	53.0	58.0

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
4	17:03	60.9	67.1	61.8	58.9	57.6	56.9	52.7	45.9
4	17:08	61.6	69.4	66.3	62.0	58.2	56.6	53.1	48.1
4	17:14	58.6	66.1	60.5	56.2	54.4	55.0	50.7	43.6

Table 16: Measured Octave Band L_{eq} Noise Levels, Position 4 – Daytime, 6th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
5	15:32	59.7	74.7	49.0	Road traffic
5	15:37	58.9	73.1	48.3	"
5	16:52	56.5	69.4	47.7	"

Table 17: Summary Statistical Noise Levels, Position 5 – Daytime, 6th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
5	15:32	59.7	65.9	61.7	56.1	55.4	55.6	52.4	47.0
5	15:37	58.9	66.2	59.0	56.8	55.7	55.0	50.5	45.1
5	16:52	56.5	65.0	59.2	56.7	53.1	52.4	47.9	41.1

Table 18: Measured Octave Band L_{eq} Noise Levels, Position 5 – Daytime, 6th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
6	16:10	55.1	69.1	49.7	Road traffic
6	16:15	55.0	71.1	49.0	"

Table 19: Summary Statistical Noise Levels, Position 6 – Daytime, 6th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
6	16:10	55.1	64.3	58.0	54.5	52.0	51.0	46.3	38.9
6	16:15	55.0	62.5	55.9	54.3	51.9	50.9	46.7	39.0

Table 20: Measured Octave Band L_{eq} Noise Levels, Position 6 – Daytime, 6th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
2	23:02	55.4	61.8	47.2	Road traffic
2	23:03	57.7	65.8	51.9	"
2	23:04	60.1	65.8	55.0	"
2	23:05	58.7	65.5	51.7	"
2	23:06	58.6	68.6	51.3	"
2	23:07	61.3	69.7	56.5	"
2	23:08	57.4	64.3	51.2	"
2	23:09	59.7	68.4	51.6	"
2	23:10	58.6	65.3	48.1	"
2	23:11	61.7	71.2	51.8	"
2	23:12	57.1	63.5	50.1	Loud music (bass) from car on Port St
2	23:13	58.3	66.2	52.2	Road traffic
2	23:14	59.8	67.9	49.4	"
2	23:15	58.9	71.6	53.2	"
2	23:18	59.8	66.9	52.4	"
2	23:37	59.2	65.8	51.9	"
2	23:38	59.2	65.9	48.3	"
2	23:39	60.7	69.7	48.4	"
2	23:40	58.6	67.2	49.5	"
2	23:41	62.1	72.0	51.5	"
2	23:42	59.4	65.9	52.2	"
2	23:43	56.0	62.6	48.0	"
2	23:44	56.7	62.2	47.9	"
2	23:45	57.6	66.2	49.6	"
2	23:46	57.2	63.3	47.8	"
2	23:47	58.4	69.6	48.2	"
2	23:48	59.0	67.9	48.7	"
2	23:49	60.6	70.1	55.2	"
2	23:50	56.5	62.7	51.0	"
2	23:51	59.2	67.0	48.7	"
2	23:52	57.1	62.8	50.5	"
2	00:10	60.1	66.7	50.7	"
2	00:12	58.6	66.8	47.3	"
2	00:13	59.4	66.9	51.0	"
2	00:14	57.2	63.7	52.5	"
2	00:15	59.2	69.7	49.8	"
2	00:16	54.4	62.2	45.2	"
2	00:17	54.9	64.1	45.6	"
2	00:18	59.7	67.7	50.1	"
2	00:19	58.0	64.9	46.4	"
2	00:20	56.4	64.8	45.2	"
2	00:21	57.1	63.8	48.6	"
2	00:22	57.6	64.0	49.4	"
2	00:23	60.1	72.0	52.1	"
2	00:24	59.0	69.6	49.0	"
2	00:25	60.1	67.0	53.2	"

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
2	00:26	60.3	69.8	51.6	“

Table 21: Summary Statistical Noise Levels, Position 2 – Night time, 7th & 8th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
2	23:02	55.4	61.7	57.2	52.9	51.2	52.6	46.6	36.7
2	23:03	57.7	66.0	58.3	55.6	53.5	54.6	49.3	41.5
2	23:04	60.1	66.0	57.8	57.2	56.5	57.2	51.6	42.7
2	23:05	58.7	64.6	58.2	55.6	54.3	55.4	50.7	45.4
2	23:06	58.6	65.6	59.9	57.3	54.5	55.8	49.2	39.3
2	23:07	61.3	66.6	61.3	60.7	57.5	58.4	51.8	41.6
2	23:08	57.4	64.0	57.8	54.5	53.0	54.2	49.7	39.9
2	23:09	59.7	63.5	58.0	56.2	55.4	57.1	51.0	40.2
2	23:10	58.6	62.9	59.2	57.1	54.6	55.4	49.9	41.2
2	23:11	61.7	68.2	64.5	61.9	58.5	57.8	51.5	45.3
2	23:12	57.1	63.9	59.5	55.8	53.6	53.8	48.0	38.0
2	23:13	58.3	64.4	59.8	56.5	54.6	55.2	49.2	40.0
2	23:14	59.8	64.4	59.1	56.5	55.9	57.0	51.3	41.3
2	23:15	58.9	67.3	58.5	56.0	56.0	55.7	50.0	40.8
2	23:18	59.8	63.5	58.3	56.7	55.5	57.0	51.5	40.4
2	23:37	59.2	60.1	55.8	55.6	52.7	51.8	46.1	35.2
2	23:38	59.2	60.8	56.2	55.0	53.2	53.9	48.4	39.9
2	23:39	60.7	61.8	55.7	51.6	51.1	51.1	45.2	34.4
2	23:40	58.6	61.1	55.7	53.6	53.0	54.1	47.8	39.3
2	23:41	62.1	64.3	56.3	53.1	51.9	52.9	46.9	36.7
2	23:42	59.4	61.5	55.1	52.1	51.2	52.1	47.0	37.3
2	23:43	56.0	61.4	54.9	52.3	50.7	51.5	45.5	34.9
2	23:44	56.7	64.2	56.4	53.2	52.3	51.8	47.5	39.6
2	23:45	57.6	71.1	59.6	57.7	54.7	52.8	47.1	38.8
2	23:46	57.2	60.8	54.3	50.7	49.8	49.4	43.1	33.4
2	23:47	58.4	62.3	56.3	52.7	51.9	53.1	47.9	40.2
2	23:48	59.0	62.2	55.8	54.2	53.9	54.6	48.8	39.0
2	23:49	60.6	61.6	55.3	54.5	52.1	53.0	47.2	38.8
2	23:50	56.5	60.6	54.7	51.7	51.3	50.8	44.7	34.3
2	23:51	59.2	61.9	54.7	50.7	49.1	49.3	43.6	34.7
2	23:52	57.1	60.7	56.8	54.3	52.7	52.6	46.6	38.6
2	00:10	60.1	66.9	60.0	58.0	55.1	55.9	51.0	42.4
2	00:12	58.6	63.3	58.9	57.3	55.0	56.2	50.6	41.5
2	00:13	59.4	64.8	61.9	61.6	57.8	56.6	51.7	41.3
2	00:14	57.2	66.2	58.9	55.7	55.8	55.3	49.6	39.9
2	00:15	59.2	65.1	66.4	65.7	57.6	57.8	51.9	42.7
2	00:16	54.4	63.9	58.9	56.7	54.9	56.5	50.8	41.5
2	00:17	54.9	60.8	55.8	52.1	51.7	53.2	47.6	38.5
2	00:18	59.7	66.7	59.1	55.0	52.4	53.4	48.4	40.4
2	00:19	58.0	62.3	57.0	54.0	53.4	54.8	49.4	38.1

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
2	00:20	56.4	61.9	56.2	53.8	52.8	54.6	48.6	37.3
2	00:21	57.1	67.1	59.7	55.3	53.9	55.3	50.5	41.3
2	00:22	57.6	64.7	62.4	56.4	54.8	55.8	50.3	42.3
2	00:23	60.1	71.7	61.7	57.6	55.6	56.4	54.3	44.3
2	00:24	59.0	64.0	57.2	54.2	52.3	53.1	48.6	39.6
2	00:25	60.1	64.7	60.2	58.5	55.0	56.1	50.3	42.3
2	00:26	60.3	62.5	57.6	55.7	52.8	54.0	49.0	39.1

Table 22: Measured Octave Band L_{eq} Noise Levels, Position 2 – Night time, 7th & 8th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
4	23:20	57.0	65.5	49.5	Road traffic
4	23:21	54.2	58.1	49.6	“
4	23:22	56.8	67.0	49.8	“
4	23:23	55.8	65.0	48.1	“
4	23:24	55.2	65.2	48.8	“
4	23:25	54.5	62.1	47.2	“
4	23:26	55.6	65.0	48.0	“
4	23:27	57.2	65.5	48.5	“
4	23:28	52.7	58.1	47.5	“
4	23:29	56.1	64.2	49.5	“
4	23:30	57.5	69.5	49.1	“
4	23:31	56.0	62.2	47.0	“
4	23:32	54.1	60.9	48.2	“
4	23:34	52.6	59.1	48.4	“
4	23:35	56.0	64.7	47.1	“
4	23:54	51.8	59.1	46.1	“
4	23:55	53.7	60.9	44.8	“
4	23:56	55.7	66.5	44.4	“
4	23:57	56.0	64.1	46.1	“
4	23:58	54.5	63.6	50.1	“
4	23:59	56.5	62.1	49.2	“
4	00:00	52.5	61.7	45.6	“
4	00:01	54.9	62.6	47.1	“
4	00:02	52.6	58.7	45.6	“
4	00:03	54.8	64.4	46.1	“
4	00:04	55.2	62.4	46.8	“
4	00:05	56.8	65.0	48.4	“
4	00:06	54.6	63.0	45.4	“
4	00:07	53.5	63.4	46.2	“
4	00:08	55.4	62.7	47.0	“
4	00:28	54.6	63.4	45.5	“
4	00:29	54.4	67.3	44.4	“

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
4	00:30	55.6	65.1	47.5	“
4	00:31	54.4	60.5	48.3	“
4	00:32	58.0	64.4	53.0	“
4	00:33	53.2	61.0	43.8	“
4	00:34	52.0	61.0	44.9	“
4	00:35	52.5	61.1	45.7	“
4	00:36	58.2	68.0	47.2	“
4	00:37	52.2	58.5	45.4	“
4	00:38	52.0	59.7	44.8	“
4	00:39	53.5	60.6	46.1	“
4	00:40	57.0	67.5	45.9	“
4	00:41	54.8	64.2	46.0	“
4	00:42	55.2	67.2	44.3	“
4	00:43	57.0	67.7	45.4	“
4	00:44	54.5	64.7	44.9	“
4	00:45	53.4	59.3	47.1	“

Table 23: Summary Statistical Noise Levels, Position 4 – Night time, 7th & 8th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
4	23:20	57.0	60.8	56.2	55.0	53.2	53.9	48.4	39.9
4	23:21	54.2	61.8	55.7	51.6	51.1	51.1	45.2	34.4
4	23:22	56.8	61.1	55.7	53.6	53.0	54.1	47.8	39.3
4	23:23	55.8	64.3	56.3	53.1	51.9	52.9	46.9	36.7
4	23:24	55.2	61.5	55.1	52.1	51.2	52.1	47.0	37.3
4	23:25	54.5	61.4	54.9	52.3	50.7	51.5	45.5	34.9
4	23:26	55.6	64.2	56.4	53.2	52.3	51.8	47.5	39.6
4	23:27	57.2	71.1	59.6	57.7	54.7	52.8	47.1	38.8
4	23:28	52.7	60.8	54.3	50.7	49.8	49.4	43.1	33.4
4	23:29	56.1	62.3	56.3	52.7	51.9	53.1	47.9	40.2
4	23:30	57.5	62.2	55.8	54.2	53.9	54.6	48.8	39.0
4	23:31	56.0	61.6	55.3	54.5	52.1	53.0	47.2	38.8
4	23:32	54.1	60.6	54.7	51.7	51.3	50.8	44.7	34.3
4	23:34	52.6	61.9	54.7	50.7	49.1	49.3	43.6	34.7
4	23:35	56.0	60.7	56.8	54.3	52.7	52.6	46.6	38.6
4	23:54	51.8	61.7	54.1	49.3	48.2	48.7	43.2	32.1
4	23:55	53.7	61.9	55.3	51.0	50.1	50.6	45.1	35.4
4	23:56	55.7	61.8	56.5	53.3	50.4	53.3	46.8	35.2
4	23:57	56.0	63.8	56.0	54.7	52.3	52.8	47.0	36.5
4	23:58	54.5	65.5	57.3	55.5	51.8	50.2	45.0	35.5
4	23:59	56.5	66.3	57.4	56.2	53.1	52.9	47.3	38.5
4	00:00	52.5	61.7	55.3	51.7	49.0	48.9	43.6	36.1
4	00:01	54.9	62.4	54.5	53.0	51.2	51.4	47.1	37.3
4	00:02	52.6	62.4	53.2	49.5	48.7	49.6	44.3	33.7
4	00:03	54.8	62.0	55.7	52.5	51.2	51.8	45.8	36.1

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
4	00:04	55.2	62.0	54.8	52.1	51.4	52.1	46.8	37.9
4	00:05	56.8	64.1	55.8	54.5	53.0	53.5	48.7	40.7
4	00:06	54.6	63.8	56.6	54.8	51.6	50.8	44.5	36.3
4	00:07	53.5	62.1	55.7	55.9	50.6	49.0	42.6	33.6
4	00:08	55.4	64.0	55.1	53.5	52.6	51.8	46.1	38.5
4	00:28	54.6	61.1	55.1	53.4	53.0	50.4	44.9	36.2
4	00:29	54.4	59.0	52.6	52.0	49.4	52.0	45.7	36.0
4	00:30	55.6	60.6	55.9	53.2	51.3	52.3	47.6	38.8
4	00:31	54.4	64.2	55.7	53.2	51.0	50.9	45.6	35.2
4	00:32	58.0	67.5	60.3	57.6	55.3	53.9	48.9	41.6
4	00:33	53.2	60.3	53.2	51.3	49.9	49.8	44.3	34.7
4	00:34	52.0	59.0	52.9	48.9	48.5	48.9	43.2	34.0
4	00:35	52.5	59.9	52.7	49.7	48.8	49.7	43.8	32.8
4	00:36	58.2	66.5	56.5	56.4	54.2	54.3	50.8	44.4
4	00:37	52.2	61.2	53.8	50.3	48.6	48.7	44.1	34.7
4	00:38	52.0	58.2	53.7	50.7	48.5	48.8	43.2	32.6
4	00:39	53.5	62.7	53.2	51.2	50.7	50.1	44.4	34.6
4	00:40	57.0	60.5	54.3	54.5	52.9	54.3	48.3	36.8
4	00:41	54.8	61.4	54.0	51.8	50.6	51.8	46.3	35.5
4	00:42	55.2	59.0	53.6	52.3	51.0	52.4	46.8	36.2
4	00:43	57.0	61.3	58.2	54.2	54.9	52.8	48.1	42.3
4	00:44	54.5	61.0	54.3	51.7	50.5	51.7	45.6	34.9
4	00:45	53.4	60.1	54.5	51.0	50.1	50.1	44.5	34.6

Table 24: Measured Octave Band L_{eq} Noise Levels, Position 4 – Night time, 7th & 8th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
5	01:01	45.5	50.5	43.9	Road traffic
5	01:03	46.4	61.1	43.5	“

Table 25: Summary Statistical Noise Levels, Position 5 – Night-time, 7th & 8th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
5	01:01	45.5	57.5	50.9	46.1	43.4	40.8	34.9	26.0
5	01:03	46.4	57.7	52.3	46.6	43.7	42.2	36.4	27.0

Table 26: Measured Octave Band L_{eq} Noise Levels, Position 5 – Night-time, 7th & 8th October 2021

Measurement Position	Start Time	Measured Noise Levels, dB			Noise sources
		L_{Aeq}	L_{Amax}	L_{A90}	
6	00:47	53.0	62.9	46.5	Road traffic
6	00:51	51.7	61.4	46.1	"

Table 27: Summary Statistical Noise Levels, Position 6 – Night-time, 7th & 8th October 2021

Measurement Position	Start Time	Noise Level, dB LAeq	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
			63	125	250	500	1k	2k	4k
6	00:47	53.0	57.5	56.0	52.5	49.5	48.9	44.9	37.0
6	00:51	51.7	58.9	53.1	49.8	48.4	48.2	42.7	35.3

Table 28: Measured Octave Band L_{eq} Noise Levels, Position 6 – Night-time, 7th & 8th October 2021

Appendix D Floor Slab Acoustic Test Data

Standardized level difference in accordance with Approved Document E (2003)
Field measurements of airborne sound insulation between rooms

STROMA BUILT ENVIRONMENT

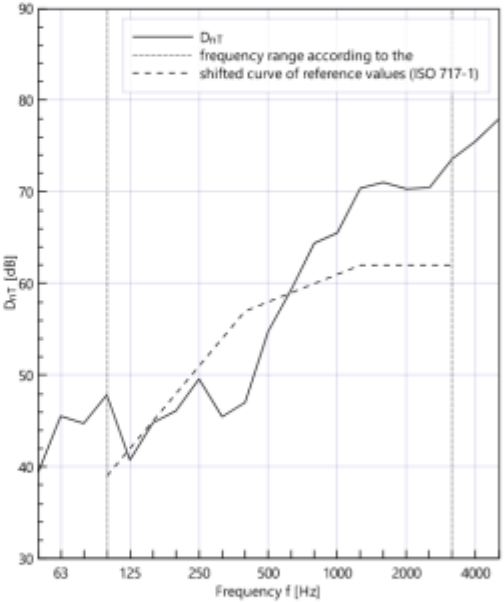
Client: Fisher Acoustics

Date of test: 03/12/2025

See sections 3 & 4 of report for test details

Source room volume: 400.00 m³
Receiving room volume: 30.00 m³

Frequency f Hz	D_{nT} 1/3 octave dB
50	39.3
63	45.6
80	44.8
100	47.9
125	40.8
160	44.8
200	46.1
250	49.6
315	45.5
400	47.0
500	54.8
630	59.3
800	64.4
1000	65.5
1250	70.4
1600	71.0
2000	70.3
2500	70.5
3150	73.6
4000	75.5
5000	77.9



Rating in accordance with ISO 717-1:

$D_{nT,w}(C;C_{tr})$ = 58 (-2; -5) dB

$C_{50\text{-}3150}$ = -2 dB; $C_{50\text{-}5000}$ = -1 dB; $C_{100\text{-}5000}$ = -1 dB

$C_{tr,50\text{-}3150}$ = -6 dB; $C_{tr,50\text{-}5000}$ = -6 dB; $C_{tr,100\text{-}5000}$ = -5 dB

Evaluation based on field measurement using results obtained by an engineering method.

Report No.: OP-D672N18A3

Name: Richard Reeve

Date: 12/12/2025

Appendix E Full Details of Calculations

Sound Transmission to ESR1 via Floor

Item / Description		Rating/Broadband/Input Rating	dB	dB(A)	Octave Band Centre Frequency, Hz 31.5	63	125	250	500	1k	2k	4k	8k
Tested SI Floor Performance	Converted Attenuation from 1/3 (DnT)	Rw(C;Ctr) 57(-1;-5)				42.3	43.5	46.7	50.9	66.1	70.6	75.3	
Insul calculated Rw Performance of 250mm Slab		Rw(C;Ctr) 62(-2;-6)				46.0	46.0	50.0	58.0	64.0	69.0	74.0	
Insul calculated Rw Performance of 250mm Slab + Ceiling	Ceiling 1x layer 12.5mm soundbloc on resilient hangers with 100mm insulation in cavity (350mm)	Rw(C;Ctr) 82(-2;-6)				60.0	66.0	70.0	78.0	85.0	90.0	107.0	
Difference (-5dB MoS)						9.0	15.0	15.0	15.0	16.0	16.0	28.0	
Floor Performance with Ceiling		Rw(C;Ctr) 72(-1;-4)				51	59	62	66	82	87	103	
Music Noise Limits in Bar Dos Venue	Based on Typical Music Noise Spectrum			81.1		88.0	81.0	81.0	78.0	76.0	74.0	65.0	
‡ Break in to Room Above	Assumes receiver space (bedroom) is the same as that used during the base slab testing	NR 8		16		37	22	19	12	-6	-13	-38	

Job No.	Job Title			
	Bar Dos, Ancoats			
Date Created	By	Date Revised	Rev	Sheet
30 Apr 2026	PM	22 Jun 2026	1	1
Date Reviewed	By	Review Type	Review Status	

Sound Transmission to ESR1 (internal) via Façade Breakout

Item / Description		Rating/Broadband/Input		dB(A)	31.5	Octave Band Centre Frequency, Hz 63	125	250	500	1k	2k	4k	8k
Music Noise Limits in Bar Dos Venue	Based on Typical Music Noise Spectrum			81.1		88	81	81	78	76	74	65	
Sound Reduction Index of Door Opening	Assumed Fully Open					0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time Correction -10log(T/Tr)	Corrected to be open 20% of the time in 5-min period	60.0 s	300.0 s		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Cd	Diffusivity Term					-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	
Surface Area	Open Door Area					2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Opening Segments						1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Substitute Point Source Sound Power Level	From ISO 12354-4					85.0	78.0	78.0	75.0	73.0	71.0	62.0	
Point Source Propagation Loss		5.5 m	3.0 dB			-22.8	-22.8	-22.8	-22.8	-22.8	-22.8	-22.8	
Level at Nearest Window				48		55	48	48	45	43	41	32	
Open Window Attenuation						-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	
‡ **Internal Level With Window Opwn**				33		40	33	33	30	28	26	17	
Glazing Performance	Acoustic specification B from MF Acoustics planning report PR0665-REP01A-MPF		2.0 m²	Rw(C;Ctr) 41(-1;-4)		25.0	28.0	31.0	38.0	41.0	44.0	53.0	
Assumed Wall Performance	Example Wall from BS8233 (Brick and Block)		2.0 m²	Rw(C;Ctr) 51(-1;-4)		36.0	40.0	44.0	45.0	51.0	56.0	58.0	
Assumed Internal Reverberation Time						0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Composite Transmission Loss				Rw(C;Ctr) 43(-1;-4)		27.7	30.7	33.8	40.2	43.6	46.7	54.8	
Facade Noise Break-In - Type: Reverberant, Receiver Room: Low Absorption - Area of Facade: 4m²	Window Closed		25 m³	12.7		31	20	17	8	3	-3	-20	
‡													
=													

Sound Transmission to 1m from ESR2 Façade via Open Door

Item / Description		Rating/Broadband/Input		dB(A)	31.5	Octave Band Centre Frequency, Hz 63	125	250	500	1k	2k	4k	8k
Music Noise Limits in Bar Dos Venue	Based on Typical Music Noise Spectrum			81.1		88	81	81	78	76	74	65	
Sound Reduction Index of Door Opening	Acoustic specification B from MF Acoustics planning report PR0665-REP01A-MPF					0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time Correction -10log(T/Tr)	Corrected to be open 20% of the time in 5-min period	60.0 s	300.0 s			7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Sound Level at 1m from Entrance Door		1 m	2 m²	#NAME?		70	63	63	60	58	56	47	
Barrier Attenuation - Theory: Maekawa, Source Height: 0 m, Receiver Height: 22 m	Screening of noise from open door by corner of 1 Port Street Building	2.0 m	1.0 m	25.0 m		-6.2	-7.1	-8.7	-10.9	-13.6	-16.5	-19.5	
Point Source Propagation Loss		24.0 m	3.0 dB			-35.6	-35.6	-35.6	-35.6	-35.6	-35.6	-35.6	
‡ Screened Sound Level at Nearest ESR2 Window	Screened Sound level at nearest window			#NAME?		28	20	19	14	9	4	-8	
Reflection Strength (Relative to Direct) - CNOSSOS Theory, Reflector Width: 50 mSource Height: 1 m, Receiver Height: 1.5 m, With Distance Loss, Propagation: Point Source	Sound Reflection Gain from Building Opposite	15.0 m	27.0 m	45.0 m		-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	
Reflection Loss (ISO 9613)	Structured Façade (-2dB)					-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
‡ Reflected Sound Level at ESR2 Window	Direct Sound + Reflection Losses	24 m	2 m²	#NAME?		36	29	29	26	24	22	13	
Result Music Sound Level at ESR2 Window	Sound Transmission via Open Door					37	30	30	26	24	22	13	

Sound Transmission to 1m from ESR2 Façade via Façade Breakout

Item / Description		Rating/Broadband/Input		dB(A)	Octave Band Centre Frequency, Hz 31.5	63	125	250	500	1k	2k	4k	8k
Music Noise Limits in Bar Dos Venue	Based on Typical Music Noise Spectrum			81.1		88	81	81	78	76	74	65	
Façade Glazing Performance				Rw(C;Ctr) 41(-1;-4)		-25.0	-28.0	-31.0	-38.0	-41.0	-44.0	-53.0	
Level at 1m from Façade		1 m	44 m²	#NAME?	2.4	65	55	52	42	37	32	14	
Plane Source Propagation Loss - Point Source Region		20.0 m	4.6 m	9.5 m	-34.1	-34	-34	-34	-34	-34	-34	-34	
Music Sound Level at ESR2 Window	Sound level at nearest window	1 m	2 m²	#NAME?		31	21	18	8	3	-2	-20	

Job No.	Job Title			
	Bar Dos, Ancoats			
Date Created	By	Date Revised	Rev	Sheet
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Date Reviewed	By	Review Type	Review Status	

Total Sound Transmission to 1m from ESR2 Façade

	Item / Description		Rating/Broadband/Input Rating	dB	dB(A)	Octave Band Centre Frequency, Hz 31.5	63	125	250	500	1k	2k	4k	8k
‡	Music Sound Level at ESR2 Window	Sound Transmission to 1m from ESR2 Façade via Open Door			29		37	30	30	26	24	22	13	
‡	Music Sound Level at ESR2 Window	Sound Transmission to 1m from ESR2 Façade via Façade Breakout			13		31	21	18	8	3	-2	-20	
=	Total Music Sound Level at ESR2 Window				30		38	30	30	26	24	22	13	

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Job No.	Job Title			
	Bar Dos, Ancoats			
Date Created	By	Date Revised	Rev	Sheet
17 Jun 2026	LB	22 Jun 2026	3	5
Date Reviewed	By	Review Type	Review Status	

Sound Transmission to 1m from ESR3 Façade via Façade Breakout

			Rating/Broadband/Input			Octave Band Centre Frequency, Hz							
Item / Description		Rating	dB	dB(A)	31.5	63	125	250	500	1k	2k	4k	8k
Music Noise Limits in Bar Dos Venue	Based on Typical Music Noise Spectrum			81		88	81	81	78	76	74	67	
Sound Reduction Index of Door Opening	Acoustic specification B from MF Acoustics planning report PR0665-REP01A-MPF					0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time Correction -10log(T/Tr)		60.0 s	300.0 s			7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Music Sound Level at ESR3 Window		26 m	2 m²	42 (A)		49	42	42	39	37	35	28	
+ Limits	From MF survey data ML1 (night-time between 23:00-00:30)			45		54	48	44	42	42	36	26	
=													

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