ENVIRONOISE

Apartment Development, Oldham Road, New Cross, Manchester M4

Noise Assessment

For GMI Construction, Carvers Warehouse, 77 Dale Street Manchester M1 2HG

Our Reference	Your Reference	Issue Date	Author	Approver	Revision History
21801R06PKSW	D464-ENV-ZZ-XX-RP-Y-1006	30/03/2023	Paul Kelly MIOA	Sam Williams MIOA	P01.

Table of Contents

1 Noise Assessment 4
1.1 Overview 4
1.2 Residential Receptors 5
1.3 Constructions 6
1.4 Residential Hub Noise Levels 6
1.5 Assessment 6
1.6 Discussion 7

Appendix A: Calculations 8

References 10

Executive Summary

Environoise Consulting Limited has been commissioned by GMI to provide a review of noise from a ground floor communal area, referred to as a 'Residential Hub', affecting existing and proposed residential properties of the apartment development at Oldham Road New Cross, Manchester M4. The assessment has been done to address planning condition 16 of the decision notice.

Our findings are summarised below.

Planning Condition 16(a) - Residential Hub Noise Breakout

Noise break-out from the Residential Hub into the nearest existing apartments has been assessed. Planning Condition (a) internal noise criteria is met with the proposed facade constructions to the Residential Hub.

Planning Condition 16(b) - Residential Hub Noise Breakthrough

Noise break-through from the Residential Hub into the proposed adjoining apartments on the first floor above has been assessed. Planning Condition 16(a) internal noise criteria is met with the proposed separating floor and façade constructions (with an open window).

Planning Condition 16(b)

On-site testing will be done upon completion to demonstrate compliance with the Planning Condition 16(a) internal noise targets.

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1 Noise Assessment

1.1 Overview

1.1.1 Environoise Consulting Limited has been commissioned by GMI to assess noise (specifically noise from a ground floor communal area referred to as a 'Residential Hub' at Oldham Road New Cross, Manchester M4 to address planning condition 16 of the decision notice. This states as follows:

16(a)

…a scheme of acoustic insulation for the commercial unit shall be submitted for approval by the City Council, as Local Planning Authority. Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 10dB below the L_{A90} (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63Hz and 125Hz octave band frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB, respectively.

16(b)

Prior to the first use of the commercial unit, a verification report will be required to validate that the work undertaken conforms to the recommendations and recommendations and requirements approved as part of (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.

1.1.2 The ground floor space is currently not designated a commercial unit. However, we have been advised[1] that there is potential for the Residential Hub to be used for specific events (and thus entertainment), although for the majority of time it will predominantly be used as a co-working environment; and that events will be controlled as such that noise levels will be lower than that of a commercial bar.

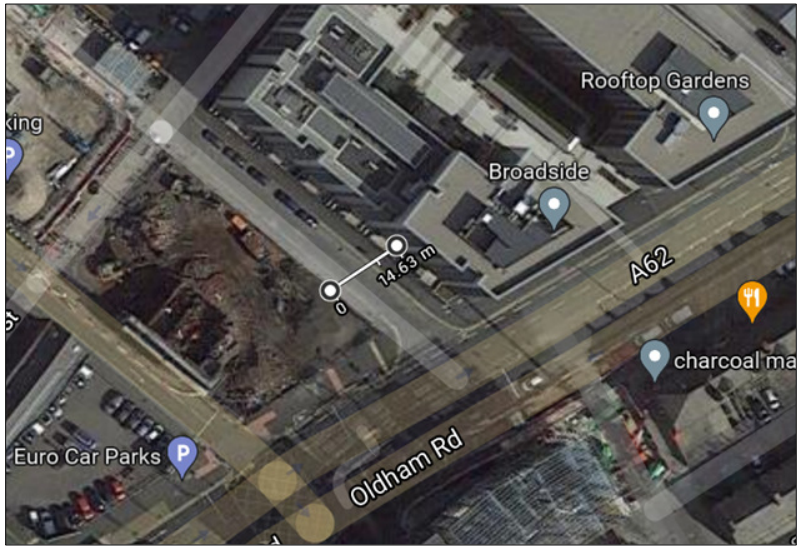
1.1.3 Assessments of Residential Hub break-out and break-through noise have been done to demonstrate that proposed constructions are sufficient so that the Planning Condition 16(a) targets can be met.

[1] E-mail from Dougie Orton, Head of Operations (North), Native Residential dated 07.03.2023.

1.2 Residential Receptors

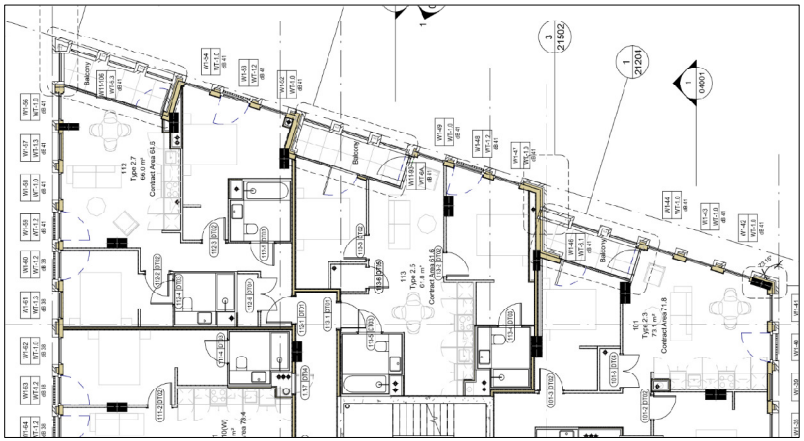
1.2.1 The nearest existing receptors are Broadside apartments 14 metres to the north-east of the site, see Figure 1.1.

Figure 1.1: Nearest existing residential receptors.



1.2.2 The adjoining receptors are proposed apartments on the first floor directly above the residential hub, see Figure 1.2.

Figure 1.2: Proposed adjoining residential receptors.



1.3 Constructions

1.3.1 Noise break-out and break-through from the Residential Hub into existing apartments and proposed adjoining apartments have been assessed using the sound insulation performances of the building façade, predominantly curtain walling and separating floor construction, see Table 1.1.

Table 1.1: Considered building envelope constructions.

Building element	Construction	Sound reduction indices [R (dB)] at octave-band frequency (Hz)							[$R_w + C_{tr}$ (dB)]
		63	125	250	500	1k	2k	4k	
Curtain walling - glazing	10mm SGG Securit pane / 16mm argon cavity / 10.8mm SGG Stadip laminated pane	20	25	27	38	48	47	55	34
Separating floor[2]	250mm pre-cast concrete slab (2400kg/m³), metal frame ceiling system forming a ≥150mm void; one layer of 12.5mm Gyproc plasterboard (≥8kg/m²).	32	45	58	65	74	80	81	59

1.4 Residential Hub Noise Levels

1.4.1 We have referred to source noise levels given in 'The Little Red Book of Acoustics: A Practical Guide'[i] for a 'Busy Restaurant' with reference to the conformed use in section 1.1.2, see Table 1.2. The reference levels at 63Hz and 125Hz have been increased by 10dB and 5dB respectively to account for low frequency content of any background music.

Table 1.2: Source noise levels.

Type of Space	Octave band (Hz) sound pressure level [L_{eq} (dB)]							Overall L_{Aeq} (dB)
	63	125	250	500	1k	2k	4k	
Residential Hub	70	75	75	75	75	75	70	80

1.5 Assessment

1.5.1 Tables 1.3 and 1.4 provides the predicted internal noise levels within the existing and proposed adjoining apartments due to the Residential Hub noise break-out and break-through with a comparison with Planning 16 criteria. The assessments consider the area of curtain walling, partially open windows (providing a 15dB reduction between external and internal levels) to the proposed habitable spaces, dimensions and a reverberation time of 0.5s in adjoining habitable

[2] Predicted using Marshall Day Acoustcs Insul sound insulation prediction software. +/-3dB margin of error. See Figure A1, Appendix A.

spaces, a -3dB correction to the separating floor sound insulation performances in Table 1.1 to account for margin of error, and octave band background (L_{90}) noise levels associated with the overall 42dB L_{A90} level reported in the Environoise report ref: 21461R02SWpak.

1.5.2 Detailed calculations are presented in Figures A2 to A4, Appendix A.

Existing Apartments

Table 1.3: Predicted internal noise levels in existing apartments due to Residential Hub noise break-out.

Existing Apartment	Octave band (Hz) sound pressure level (dB)						
	63	125	250	500	1k	2k	4k
Internal noise level in habitable space of NSR dB L_{eq} [A]	33	33	31	20	10	11	0
Background noise levels dB L_{90} [B]	52	46	41	40	37	33	26
Planning condition 16(a) criteria dB L_{90} [C = B – 10]	42	36	31	30	27	23	16
Level of excess dB [= A – C]	0	0	0	0	0	0	0

Proposed Adjoining Apartments

Table 1.4: Predicted internal noise levels in proposed adjoining apartments due to Residential Hub noise break-through.

Proposed Apartments	Octave band (Hz) sound pressure level (dB)	
	63	125
Highest predicted internal noise level in apartment (via floor) dB L_{eq} [A]	42	34
Highest predicted internal noise level in apartment (via façade) dB L_{eq} [B]	31	31
Predicted overall internal noise level in apartment [C = A log add B]	42	36
Planning condition 16(a) criteria dB L_{eq} [D]	47	41
Level of excess [= C – D]	0 (-5)	0 (-5)

1.6 Discussion

1.6.1 As shown in Tables 1.3 and 1.4, internal noise levels in the existing and adjoining proposed apartments are predicted to meet the requirements of Planning Condition 16(a). Compliance on-site testing will be done to address Condition 16(b).

Appendix A: Calculations

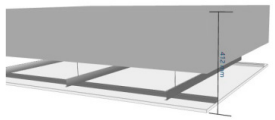
Figure A1: Separating floor sound insulation calculation

Sound Insulation Prediction (v9.0.23)

INSUL

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within Rw ±3 dB
- Key No. 5500
Job Name:
Job No.: Initials:P.Kelly
Date:28/03/2023
File Name:Floor.ixl

Notes:



Rw 68 dB
C -2 dB
Ctr -9 dB

Mass-air-mass resonant frequency = =54 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 608 kg/m²

System description

Panel 1 : 1 x 250 mm Concrete

Frame: Suspended Light Steel Grid (1.5E2 mm x 45 mm), Stud spacing 600 mm ; Cavity Width 150 mm
Panel 2 : 1 x 12.5 mm Gyproc Wallboard 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	32	
63	30	32
80	37	
100	42	
125	47	45
160	52	
200	56	
250	59	58
315	62	
400	63	
500	66	65
630	69	
800	72	
1000	74	74
1250	76	
1600	79	
2000	81	80
2500	81	
3150	77	
4000	83	81
5000	88	

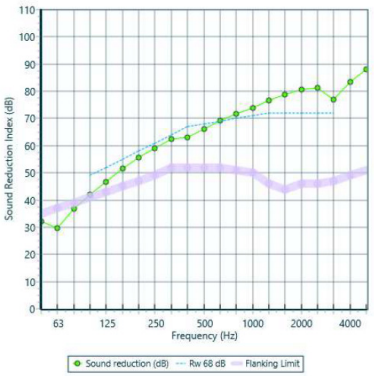


Figure A2: Residential Hub noise breakout – existing dwelling.

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Broadside Receptor

Project	Oldham Road							
Client	GMI							
Receive Room	Broadside Receptor							
Description of Source								**E 1 - All front elevation glazing**
Restaurant / bar								**E 2 - Front Doors**
								E 3 - Description
								E 4 - Description
Element 1	**All front elevation glazing**						Directivi	2
Element area	97.11 m²							
Receiver	**Description**							
Distance to Receiver	14 m							
Facade Correction	0 dB						Freefield = 0dB	
Frequency Hz	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**dB(A)**
Internal Level dB	70	75	75	75	75	75	70	80
SRI of element	20	25	27	38	48	47	55	
Additional Directivity								
Shielding								
Additional Correction								
External Freefield Level at Receiver								
Element 1	**33**	**33**	**31**	**20**	**10**	**11**	**-2**	**25**
A-weighted	8	17	23	17	10	12	-1	
Element 2	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A-weighted	-	-	-	-	-	-	-	
Element 3	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A-weighted	-	-	-	-	-	-	-	
Element 4	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A-weighted	-	-	-	-	-	-	-	
Total	**33**	**33**	**31**	**20**	**10**	**11**	**-2**	**25**
A-weighted	8	17	23	17	10	12	-1	
Criterion	42	36	31	30	27	23	16	

Figure A3: Residential Hub noise break-through (via separating floor) – proposed apartment.

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Apartment Living, 1st Floor

Project	Oldham Road							
Client	GMI							
Receive Room	Apartment Living, 1st Floor							
Source Room	**Plant room, Basement**							
Element	**Area**	**Description**	**Comments**					
Element 1	26.7 m²	Floor	Floor					
Element 2	0.0 m²	Description						
Element 3	0.0 m²	Description						
Element 4	0.0 m²	Description						
Receiving Room	**Room Name**							
Height of room	2.4 m							
Width of room	4.3 m							
Length of room	6.2 m	Volume can be manually overwritten if required						
Volume of room	64.0 m³	Use Volume Recalc button after overwriting to restore Autocalc						
Frequency Hz	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**dB(A)**
Room Name - Rev Time (sec)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	
Absorption (m2 Sabines)	20.6	20.6	20.6	20.6	20.6	20.6	20.6	
Room Correction (dB)	-7.1	-7.1	-7.1	-7.1	-7.1	-7.1	-7.1	
Frequency Hz	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**dB(A)**
Plant room, Basement - Reverberant Lp dB	70	75	75	75	75	75	70	**80**
10logS(tot) **26.66**	14.3	14.3	14.3	14.3	14.3	14.3	14.3	
Sound Power In - dB	78.3	83.3	83.3	83.3	83.3	83.3	78.3	
SRI of Element Area	32	45	58	65	74	80	81	
Floor 1 26.66								
Description 2 0								
Description 3 0								
Description 4 0								
Combined SRI -3dB	**29.0**	**42.0**	**55.0**	**62.0**	**71.0**	**77.0**	**78.0**	
Sound Power Out - dB	49.3	41.3	28.3	21.3	12.3	6.3	0.3	
Room Name - Lp dB	**42**	**34**	**21**	**14**	**5**	**-1**	**-7**	**22**
Criterion (NR at 1kHz)	47.3	35.1	26.0	19.4	15.0	11.7	9.3	
Additional SRI Required to meet15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Figure A4: Residential Hub noise break-in (via separating facade) – proposed apartment.

Proposed apartment Receptor

Project	Oldham Road
Client	GMI
Receive Room	Proposed apartment Receptor

Description of Source	**E 1 -**	**All front elevation glazing**
Restaurant / bar	**E 2 -**	**Front Doors**
	E 3 -	**Description**
	E 4 -	**Description**

Element 1	**All front elevation glazing**	Directivi	2
Element area	97.11 m²		
Receiver	**Description**		
Distance to Receiver	3 m		
Facade Correction	0 dB	Freefield = 0dB	

Frequency Hz	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**dB(A)**
Internal Level dB	70	75	75	75	75	75	70	80
SRI of element	20	25	27	38	48	47	55	
Additional Directivity								
Shielding								
Additional Correction								
External Freefield Level at Receiver								
Element 1	**46**	**46**	**44**	**33**	**23**	**24**	**11**	**38**
A-weighted	21	31	36	30	23	26	12	
Element 2	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A-weighted	-	-	-	-	-	-	-	
Element 3	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A-weighted	-	-	-	-	-	-	-	
Element 4	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A-weighted	-	-	-	-	-	-	-	
Total (-15dB)	**31**	**31**	**29**	**18**	**8**	**9**	**-4**	**38**

References

[i] R. Watson and O. Downey 'The Little Red Book of Acoustics: A Practical Guide'