

Apartment Development, Oldham Road, New Cross, Manchester M4

Noise Level Verification

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

Our Reference

21801R07SWPK
21801R07aSWPK

Your Reference

D464-ENV-ZZ-XX-RP-Y-1007
D464-ENV-ZZ-XX-RP-Y-1007

Issue Date

01/06/2023
24/07/2023

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Revision History

P01.
P02 – section 2 added.

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Executive Summary

Environoise Consulting Limited has been commissioned by GMI to provide verification testing for plant noise impact and noise breakout 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 conditions 14, 15 and 16 of the decision notice. Our findings are summarised below.

Planning Condition 14(b) – Plant Noise Impact

The noise impact from proposed rooftop plant, and equipment situated within the plant room and substation to the nearest existing noise-sensitive receptors (NSRs) has been assessed. Plant noise level measurements have been taken on site, close to plant. The predicted plant noise level at the NSRs meets the requirements of Planning Condition 14(b) with no further noise mitigation measures necessary.

Planning Condition 15(b) – Internal Noise Levels

Internal noise level measurements were taken in apartments for part of the daytime period and for the whole night-time period. The 35dB $L_{Aeq,T}$ daytime target and 30dB $L_{Aeq,8hour}$ night-time target was met in all tested apartments. In addition, the 45dB $L_{Amax,fast}$ maximum noise level target was not exceeded more than 15 times. Therefore, Planning Condition 15(a) requirements have been met.

Planning Condition 16(b) - Residential Hub Noise

Noise break-out from the Residential Hub into the nearest existing apartments has been assessed. The noise levels at the façade of the existing NSR is predicted to exceed target at 2kHz and 4kHz only; however, significantly, is still 5dB below the background noise levels. At the time of measurement, curtain walling was still to be sealed in some small areas. It is considered that the target will be met once the façade is complete.

Noise break-through from the Residential Hub into the proposed adjoining apartments on the first floor above has been assessed. Planning Condition 16(b) internal noise criteria is met with the proposed separating floor and façade constructions (with an open window to the apartment). Therefore, the requirements of Planning Condition 16(b) are considered to be satisfied.

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1 Planning Condition 14(b) – Plant Noise

1.1 Overview

- 1.1.1 Environoise Consulting Limited has been commissioned by GMI to provide verification measurements and assessment of the noise impact of plant associated with the proposed apartment development at Oldham Road New Cross, Manchester M4 to address planning condition 14(b) of the decision notice. The condition is reproduced below alongside Planning Condition 14(a) which is given for context:

14(a)

Prior to the first occupation of the development hereby approved, details of externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

14(b)

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

1.2 BS 4142+A1:2019

- 1.2.1 BS 4142:2014+A1:2019ⁱ provides a method of determining the ‘impact of specific sound’ on dwellings due to industrial and commercial noise sources through comparison between the measured background noise level (L_{A90}) and the noise source rating level ($L_{A,r,Tr}$) under consideration. The rating level is the specific noise level plus penalties of up to 18dB added for features to account for the character of the noise as follows:

- **Tonality:** +2dB penalty: Just perceptible; +4dB penalty: Clearly perceptible and +6dB penalty: Highly perceptible.
- **Impulsivity:** +3dB penalty: Just perceptible; +6dB penalty: Clearly perceptible and +9dB penalty: Highly perceptible.
- **Intermittency:** +3dB penalty: identifiable on/ off conditions.
- **Other:** +3dB penalty: where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent.

- 1.2.2 When comparing the rating plant noise level against the background noise level, BS 4142:2014 provides the following noise impact descriptors:

- +10dB(A) is likely to be an indicator of 'a significant impact, depending on the context'.
- +5dB(A) is likely to be an indicator of 'an adverse impact, depending on the context'.
- No excess of the background noise level is an indicator of 'a low impact, depending on the context'.

1.3 Plant Noise Limit

- 1.3.1 A comprehensive reporting of the night-time background noise survey is given in Environoise report ref: 21461R02SWpak (GMI ref: D464-ENV-ZZ-XX-RP-Y-1002). This has informed a plant noise limit of 37dB $L_{A,T}$ set for both the daytime (07.00 – 23.00hrs) and night-time (23.00 – 07.00) period to meet the Planning Condition criterion.

1.4 Noise Survey and Installed Plant

- 1.4.1 A noise survey was done between 15.54 and 16.27hrs on Tuesday 30th May 2023 to obtain in-situ noise level measurements of the rooftop condenser and plant room. 5 x 1-minute measurements were taken at 1m from the rooftop condenser (level with the top of the condenser) and also whilst walking within the plant room. A further measurement was taken at 0.5m from the louvred doors of the plant room to determine a 6dB louvre performance.
- 1.4.2 Details of the installed internal and external (roof-top) plant are given in Table 1.1 together with associated sound data measured on site where possible. In some instances, plant was inoperable during our visit (CHP – plant room) or inaccessible (substation) and we have therefore used manufacturers noise data. Plant room, sub-station (opening on to Marshall Street) and roof-top plant locations are shown in Figures 1.1 and 1.2.

Table 1.1: Installed plant and sound data.

Item	Location	No. of units	Measured sound pressure level at 1m [L _{Aeq,T} (dB)]	L _{WA} (dB) per unit
Internal				
Minera 1000kVA WPD Tier 2 Unit Substation	Substation, ground floor	1	-	41
EC-Power XRG1 20 combined heat and power unit (CHP)	Plant Room, ground floor	1	-	63
Ideal Evomax 2 condensing boiler		4	61*	-
Dutypoint VT3-10-055T booster set		1		-
External				
Residential Hub condenser (Toshiba MMY-MAP1606FT8P-UK)	Roof	1	70	-

*Dynamic (walking) reverberant measurement within the Plantroom.

- 1.4.3 A smoke extract fan is additionally installed; however, this is for emergency use only. Therefore, it does not serve the daily operation of the building and thus is exempt from the assessment.

Figure 1.1: Plant room and sub-station locations.

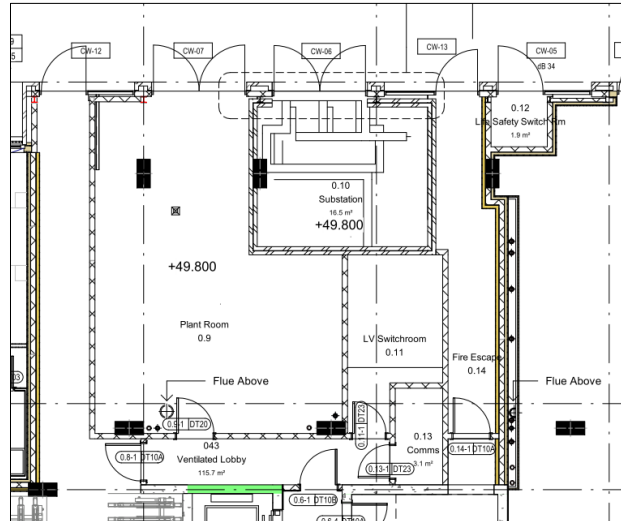
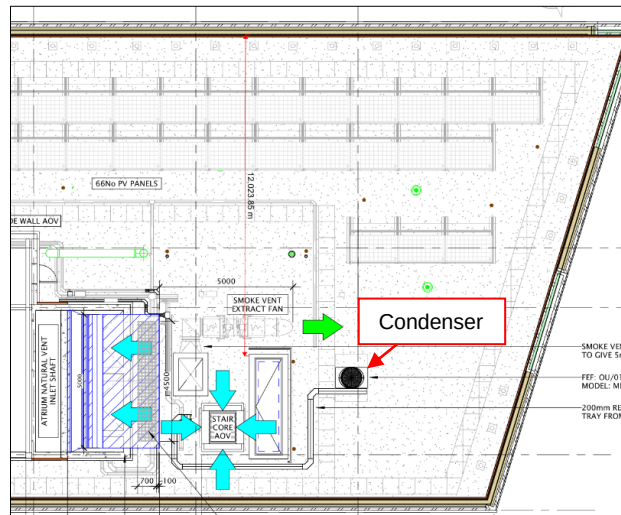


Figure 1.2: Roof-top condenser location.



1.5 Assessment

- 1.5.1 Plant noise levels cannot be disaggregated from other noise sources (e.g. road traffic) at the NSRs due to the high levels of residual noise. Therefore, plant noise levels measured close to plant on site have been predicted at the first and ninth floor level facades of the Broadside apartment building have been calculated using SoundPLAN® noise propagation software as per guidance given in ISO 9613-2 and BS 4142, see Figure A1, Appendix A. Table 1.2 summarises the plant noise impact assessment to the nearest NSRs with a comparison of the plant noise limits in section 1.1.4.
- 1.5.2 All plant has been considered to be operating continuously and simultaneously.
- 1.5.3 The 6dB attenuation provided by the non-acoustic louvred doors providing 5dB attenuation for the Plant Room have been considered.

Acoustic Features Correction

- 1.5.4 Acoustic feature corrections have been applied independently for the plant room, substation and roof-top plant noise due to the differing distances, source heights and character of the noise between the sources, see Table 1.2.

Table 1.2: BS 4142 acoustic feature corrections for plant sources.

Generator element	Acoustic feature correction
CHU & boilers	Impulsivity & intermittency: No correction due to the continuous, non-varying nature of plant equipment noise. Tonality: +6dB correction due to tonal noise associated with the booster set identified using the third-octave method.
Sub-station	Impulsivity & intermittency: No correction due to the continuous, non-varying nature of plant equipment. Tonality: +4dB correction due to clearly identifiable noise at fundamental frequency of 50Hz and harmonics of 100Hz and 200Hz.
Roof-top plant	Impulsivity & tonal: No correction due to the continuous, non-varying and broadband nature of plant equipment noise. The objective third-octave method was used to assess tonality. Intermittency: +4dB correction due to clearly identifiable on/off conditions of the condenser unit.

- 1.5.5 Table 1.3 summarises noise breakout assessments for both the Plant Room, Substation and Roof-top plant area to the nearest residential receptor against the noise limits.

Table 1.3: Plant noise impact assessment at the considered NSRs

NSR		Plant Room	Substation	Roof-top Plant
Broadside Apartment Building	Plant noise level (dBA) at NSR	32	6	27
	Acoustic features correction (dB)	+6	+4	+4
	Rating level [dB(A)]		37	31
	Plant noise limit [dB(A)]		37	37
	Level of excess (dB)		0	0 (-6)

1.6 Discussion

- 1.6.1 As shown in Table 1.3, on-site measured plant noise levels have been predicted to meet the requirements of Planning Condition 14(b) at the Broadside apartments and no further mitigation measures necessary.

2 Planning Condition 15(b) – Internal Noise Levels

2.1 Overview

- 2.1.1 Environoise Consulting Limited has been commissioned by GMI to provide verification measurements of internal noise levels in habitable apartment spaces associated with the proposed apartment development at Oldham Road New Cross, Manchester M4 to address planning condition 15(b) of the decision notice. The condition is reproduced below alongside Planning Condition 15(a) which is given for context:

15(a)

Prior to the first occupation of the residential element of the development, a scheme for acoustically insulating the proposed residential accommodation against noise from Oldham Road and local traffic network shall be submitted for approval in writing by the City Council, as Local Planning Authority. The approved noise insulation scheme shall be completed before the first occupation of the development. Noise survey data must include measurements taken during a rush-hour period and night-time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30dB L_{Aeq} (individual noise events shall not exceed 45dB $L_{Amax,f}$ by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35dB L_{Aeq}

Gardens and terraces (daytime) 55dB L_{Aeq}

15(b)

Prior to the first occupation of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority, and thereafter retained and maintained in situ.

2.2 Methodology

- 2.2.1 Internal noise level measurements were taken in apartments for part of the daytime period and for the whole night-time period. The daytime measurement period consisted of 17.00 – 23.00hrs (covering the evening rush-hour period) for Apartments 12, 17 and 47, tested at the pre-completion stage and exclude construction noise contamination. For all other apartments tested at the post-completion stage, the daytime measurement period consisted of 16.00 – 23.00hrs and 07.00 – 09.00hrs covering the morning and evening rush hour periods.

- 2.2.2 A total of 15 apartments were tested out of 144, which meets the 10% requested by Manchester City Council to satisfy Planning Condition 15(b).
- 2.2.3 The noise meters were set to measure overall fast 'A' weighted maximum and ambient noise levels for contiguous one-minute periods (i.e., $L_{Amax,fast}$ and $L_{Aeq,1min}$). All meter clocks were synchronised, and the meters were set to record all instantaneous noise levels over 45dBA. An MVHR unit was situated in a services cupboard in each apartment (see Appendix C for further information) and fresh-air ventilation was turned on during measurements. Tests were done in Apartments across different floors and at various facades of the building, with a greater concentration on lower floors where apartments are most exposed to road traffic noise.
- 2.2.4 The sound level meters were calibrated at the start and end of the noise surveys to 94dB at 1kHz. There was a recorded drift of up to ≤ 0.2 dB across the noise surveys which is acceptable.

2.3 Noise Data Summary

- 2.3.1 A summary of the measured daytime and night-time ambient noise level ($L_{Aeq,T}$) and night-time maximum noise level ($L_{Amax,fast}$) results for each tested apartment are given in Table 2.1. These are compared to the daytime and night-time internal noise level targets of 35dB $L_{Aeq,16hour}$ and 30dB $L_{Aeq,8hour}$ respectively.

Table 2.1: Measured daytime and night-time internal noise levels within tested apartments.

Date	Apartment	Elevation	Daytime	Night-time	
			Ambient noise level [$L_{Aeq,T}$ (dB)]	Ambient noise level [$L_{Aeq,8hour}$ (dB)]	No. of valid excesses over 45dB $L_{Amax,fast}$
06/02/2023 – 07/02/2023	12, 1 st Floor	Addington St	28	26	6
	17, 2 nd Floor	Marshall St	23	22	2
07/02/2023 – 08/02/2023	47, 4 th Floor	Chadderton St	28	23	0
17/07/2023 – 18/07/2023	10, 1 st floor	Addington St	28	25	5
	29, 3 rd floor	Marshall St	25	24	1
18/07/2023 – 19/07/2023	1, 1 st floor	Oldham Rd	28	26	10
	25, 2 nd floor	Addington St	26	23	5
	27, 3 rd floor	Oldham Rd	27	24	2
	33, 3 rd floor	Chadderton St	26	25	4
19/07/2023 – 20/07/2023	6 Addington St, G nd floor	Addington St	28	25	4
	54, 4 th floor	Oldham Rd	31	30	2
	57, 5 th floor	Marshall St	24	22	0
20/07/2023 – 21/07/2023	77, 6 th floor	Addington St	26	22	1
	84, 7 th floor	Oldham Rd	28	27	2
	133, 11 th floor	Chadderton St	26	26	1

2.4 Discussion of Results

- 2.4.1 As shown in Table 2.1, internal ambient noise levels met the 35dB $L_{Aeq,T}$ daytime target and 30dB $L_{Aeq,8hour}$ night-time target in all tested apartments. In addition, the 45dB $L_{Amax,fast}$ maximum noise level target was not exceeded more than 15 times. Therefore, Planning Condition 15(a) requirements have been met.
- 2.4.2 For Apartment 133, measurements were contaminated by a low-battery smoke alarm warning noise with a ‘clean’ period of data extending from 14.43 – 18.55hrs. The daytime measurements included the evening rush hour period and met the 35dB $L_{Aeq,T}$ daytime target. The daytime noise level has also been adopted for the night-time period which complies with the night-time noise targets. As such further levels of compliance will occur during the night-time period where noise levels are lower due to reduced road traffic flows as verified for the other tested apartments.

3 Planning Condition 16(b) – Residential Hub Noise

3.1 Overview

- 3.1.1 Environoise Consulting Limited has been commissioned by GMI to provide verification measurements and assessment of Residential Hub noise breakout (through the façade) and break through (through the separating floor) associated with the proposed apartment development at Oldham Road New Cross, Manchester M4 to address planning condition 16(b) of the decision notice. The condition is reproduced below alongside Planning Condition 16(a) which is given for context:

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.

- 3.1.2 The ground floor space is currently not designated a commercial unit. However, we have been advised¹ 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.
- 3.1.3 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(b) can be satisfied.

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

3.2 Residential Receptors

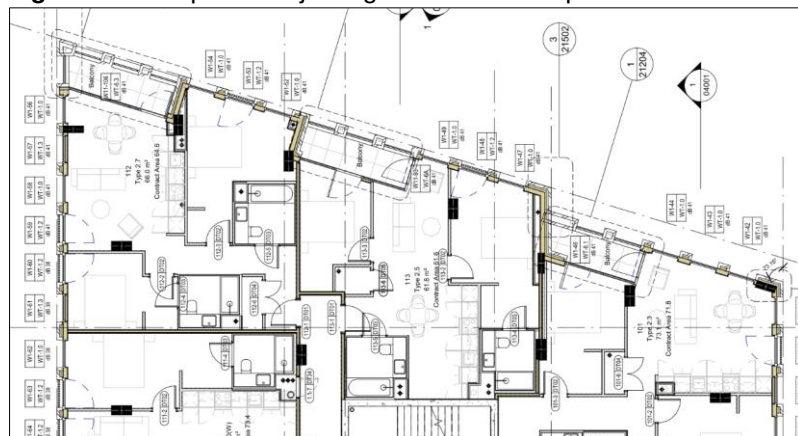
3.2.1 The nearest existing receptors are Broadside apartments 14 metres to the north-east of the site, see Figure 3.1.

Figure 3.1: Nearest existing residential receptors.



3.2.2 The adjoining receptors are proposed apartments on the first floor directly above the residential hub, see Figure 3.2.

Figure 3.2: Proposed adjoining residential receptors.



3.3 Noise Survey and Constructions

- 3.3.1 A noise survey and sound insulation test was done between 17.02 and 18.03hrs on Tuesday 30th May 2023. 4 x 30 second measurements were taken internally within the Residential Hub with the loudspeaker generating pink noise and also at 1m external to the Residential Hub with the loudspeaker remaining on to determine a level difference (D). A further 4 x 30 second measurements were taken at the same external position but with the loudspeaker turned off to enable a correction to be applied for residual noise.
- 3.3.2 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. Level differences (D) have been measured for the curtain walling (see Table 3.1) and standardised level differences (D_{nT}) have been determined for the separating floor through an on-site sound insulation test, see Table 3.2.

Table 3.1: Considered building envelope constructions.

Building element	Construction	Measured level difference [D (dB)] at octave-band frequency (Hz)						
		63	125	250	500	1k	2k	4k
Curtain walling - glazing	10mm SGG Securit pane / 16mm argon cavity / 10.8mm SGG Stadip laminated pane	12*	16	26	30	29	30	35

* Value not able to be determined on site due to high residual noise level at the 63Hz octave band – therefore, a conservative estimate has been considered.

Table 3.2: Considered building envelope constructions.

Building element	Construction	Standardised level difference [D_{nT} (dB)] at octave-band frequency (Hz)						
		63	125	250	500	1k	2k	4k
Separating floor	250mm pre-cast concrete slab (2400kg/m ³), metal frame ceiling system forming a ≥150mm void; one layer of 12.5mm Gyproc plasterboard (≥8kg/m ²).	35	47	55	64	74	79	78

3.4 Residential Hub Noise Levels

- 3.4.1 We have referred to source noise levels given in ‘The Little Red Book of Acoustics: A Practical Guide’ⁱⁱ 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 3.3: 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

3.5 Assessment

- 3.5.1 Tables 3.3 and 3.4 provides the predicted Residential Hub noise levels at the façade of the existing NSRs and internally within 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 spaces and octave band background (L₉₀) noise levels associated with the overall 42dB L_{A90} level given in Environoise report ref: 21461R02SWpak.
- 3.5.2 Detailed calculations are presented in Figures B2 to B4, Appendix B.

Existing Apartments

Table 3.3: Predicted internal noise levels at 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
Noise level at façade of existing NSR dB L _{eq} [A]	41	36	31	28	29	28	17
Background noise levels dB L ₉₀ [B]	52	46	41	40	37	33	26
Planning condition 16 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	5	1

Proposed Adjoining Apartments

Table 3.4: Predicted internal noise levels in proposed adjoining apartments due to Residential Hub noise break-through.

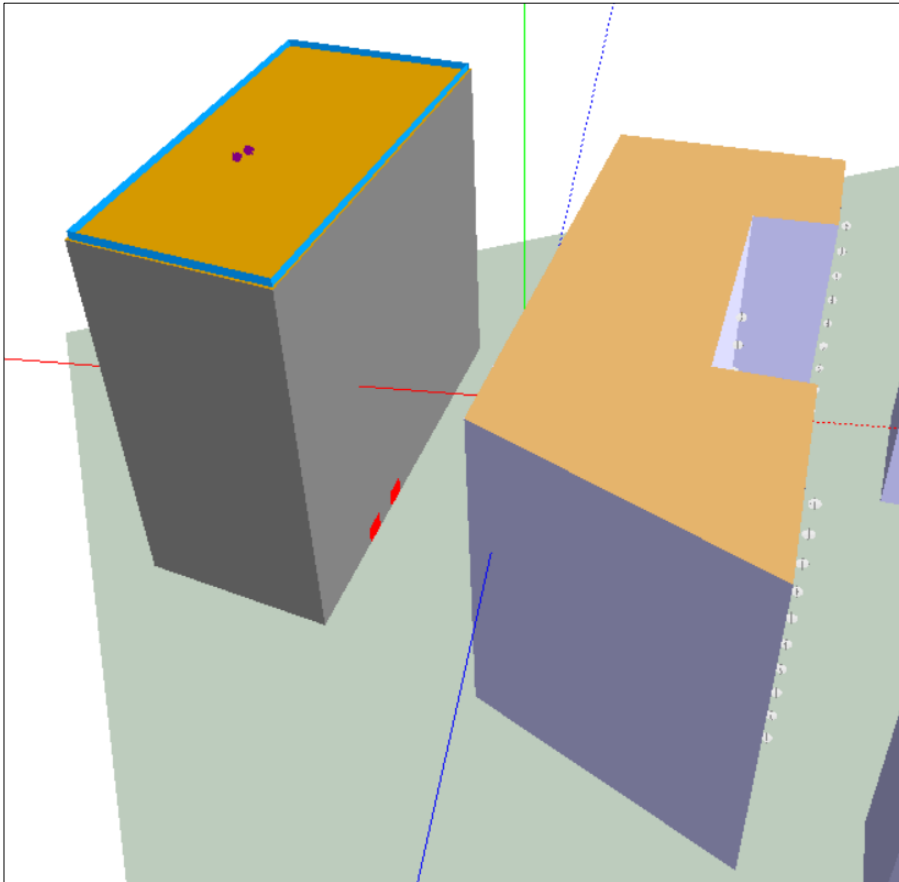
Proposed Apartments	Octave band (Hz) sound pressure level (dB)	
	63	125
Highest predicted internal noise level in apartment (via floor) dB L _{eq} [A]	39	34
Highest predicted internal noise level in apartment (via façade) dB L _{eq} [B]	39	40
Predicted overall internal noise level in apartment [C = A log add B]	42	36
Planning condition 16 criteria dB L _{eq} [D]	47	41
Level of excess [= C – D]	0 (-5)	0

3.6 Discussion

- 3.6.1 As shown in Table 3.3, the noise levels at the façade of the existing NSR (Broadside Apartments) is predicted to exceed target at 2kHz and 4kHz only; however, significantly, is still a minimum of 5dB below the background noise level. At the time of measurement, curtain walling was still to be sealed in some small areas. It is considered that the target will be met once the façade is complete.
- 3.6.2 As shown in Table 3.4, the internal noise levels in the adjoining proposed apartments meet the requirements of Planning Condition 16(b) which is therefore considered to be satisfied.

Appendix A: SoundPLAN Model

Figure A1: 3D view of SoundPLAN model



Appendix B: Calculations

Figure B1: Separating floor sound insulation calculation

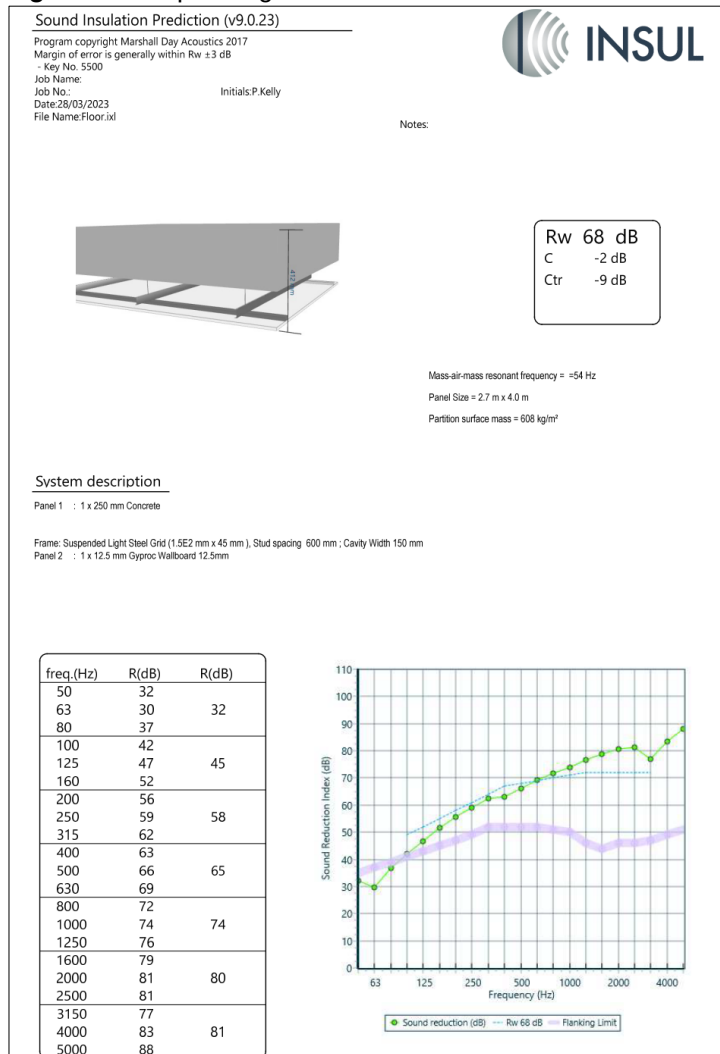


Figure B2: Residential Hub noise breakout – existing dwelling.

ENVIRONOISE									
Receptor									
Project		Oldham Road							
Client		GMI							
Receive Room		Receptor							
Description of Source Restaurant / bar						E 1 - All front elevation glazing			
						E 2 - Front Doors			
						E 3 - Description			
						E 4 - Description			
Element 1		All front elevation glazing				Directiv		4	
Element area		32.76 m²							
Receiver		Description							
Distance to Receiver		14.6 m							
Facade Correction		0 dB				Freefield = 0dB			
Frequency Hz		63	125	250	500	1000	2000	4000	dB(A)
Internal Level dB		70	70	75	75	75	75	70	80
SRI of element		12	16	27	30	29	30	36	
Additional Directivity									
Shielding									
Additional Correction									
External Freefield Level at Receiver									
Element 1		39	35	29	26	27	26	15	32
A-weighted		14	19	21	23	27	27	16	
Element 2		36	32	27	23	24	23	13	29
A-weighted		11	16	18	20	24	24	14	
Element 3		-	-	-	-	-	-	-	-
A-weighted		-	-	-	-	-	-	-	
Element 4		-	-	-	-	-	-	-	-
A-weighted		-	-	-	-	-	-	-	
Total		41	37	31	28	29	28	17	33
A-weighted		15	21	23	24	29	29	18	
Criterion		42	36	31	30	27	23	16	

Figure B3: Residential Hub noise break-through (via separating floor) – proposed apartment.

ENVIRONOISE

Apartment Bedroom, 1st Floor

Project

Oldham Road

Client

GMI

Receive Room

Apartment Bedroom, 1st Floor

Source Room

Plant room, Basement

Element	Area	Description	Comments
Element 1	14.1 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

2.9 m

Length of room

4.8 m

Volume of room

33.8 m³

Volume can be manually overwritten if required

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)	10.9	10.9	10.9	10.9	10.9	10.9	10.9	
Room Correction (dB)	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3	

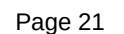
Frequency Hz	63	125	250	500	1000	2000	4000	dB(A)
Plant room, Basement - Reverberant Lp dB	70	75	75	75	75	75	70	80
10logS(tot)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
Sound Power In - dB	75.5	80.5	80.5	80.5	80.5	80.5	75.5	
SRI of Element	35	47	55	64	74	79	78	
Floor 1	14.064							
Description 2	0							
Description 3	0							
Description 4	0							
Combined SRI -5dB	32.0	42.0	52.0	61.0	71.0	76.0	75.0	
Sound Power Out - dB	43.5	38.5	28.5	19.5	9.5	4.5	0.5	

Room Name - Lp dB	39	34	24	15	5	0	-4	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 B4: Residential Hub noise break-in (via facade) – proposed apartment.

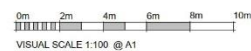
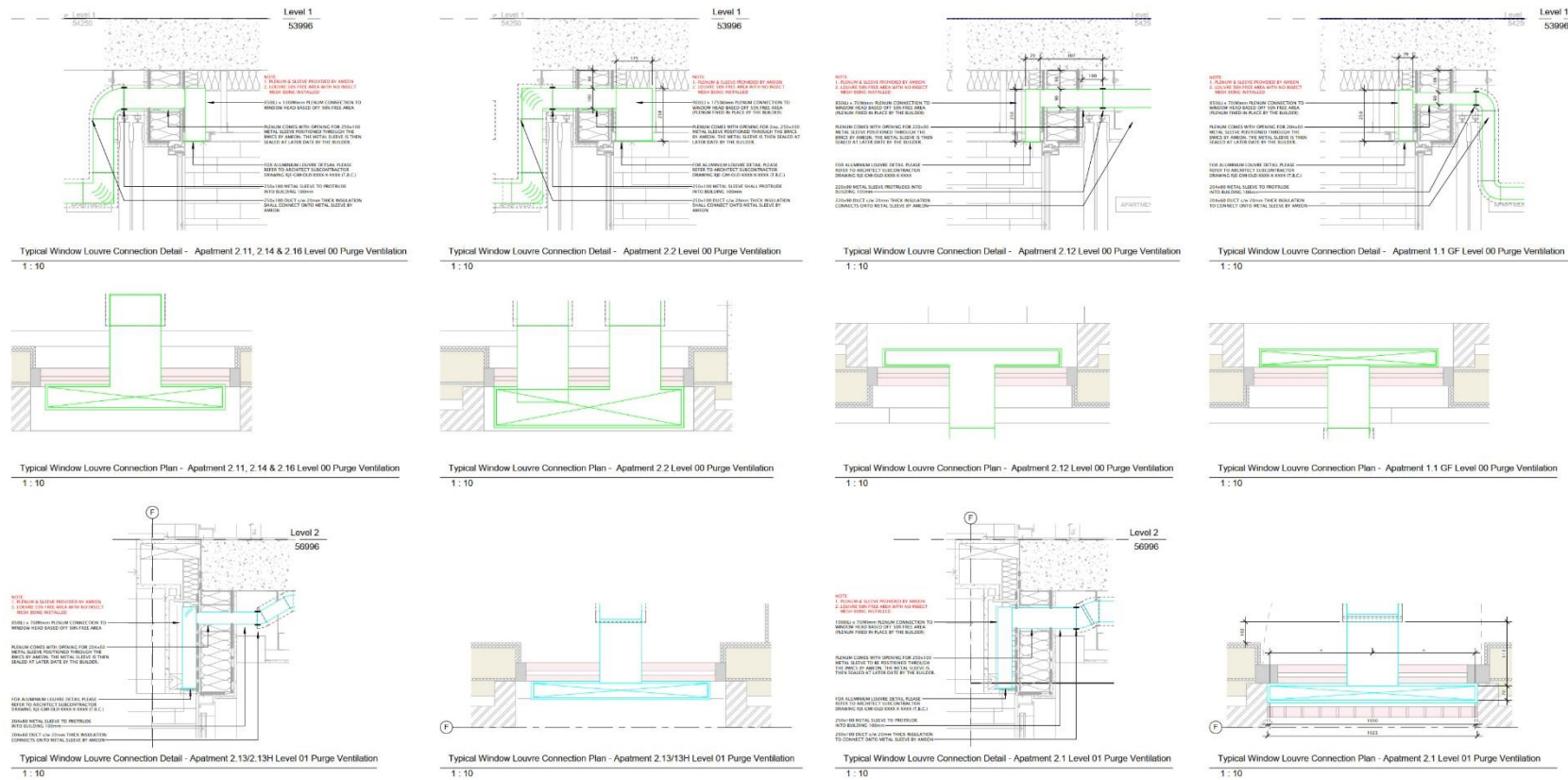
ENVIRONOISE		Proposed apartment Receptor							
Project		Oldham Road							
Client		GMI							
Receive Room		Proposed apartment Receptor							
Description of Source Restaurant / bar						E 1 - All front elevation glazing			
						E 2 - Front Doors			
						E 3 - Description			
						E 4 - Description			
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		12	16	26	30	29	30	35	
Additional Directivity Shielding									
Additional Correction									
External Freefield Level at Receiver									
Element 1		54	55	45	41	42	41	31	48
A-weighted		29	40	37	38	42	43	32	
Element 2		-	-	-	-	-	-	-	-
A-weighted		-	-	-	-	-	-	-	
Element 3		-	-	-	-	-	-	-	-
A-weighted		-	-	-	-	-	-	-	
Element 4		-	-	-	-	-	-	-	-
A-weighted		-	-	-	-	-	-	-	
Total (-15dB)		39	40	30	26	27	26	16	48

Figure C1: Mechanical ventilation detail drawings.



NOTES:
All dimensions must be checked on site and not scaled from this drawing.

Ref.	Date	Revisions	By
CR1	09.06.23	CONSTRUCTION RECORD ISSUE	J.B.



Revit File: W:\00-044\00-Revit Local Models\Cameron Parkin\Revit
2020\0444-AME-ZZ-ZZ-M3-M-0031_Af_Ameon_CParkin.rvt

Client 	Job Title New Cross, Oldham Road	Drawing Title Typical Purge Ventilation Louvre Connection Detail	Date JUNE 2023	Drawn by J.R.	Check by J.R.
Scale 1 : 10		Status CONSTRUCTION RECORD	Drawing Number D464-AME-ZX-XX-DR-M-5711		
Revision CR1					

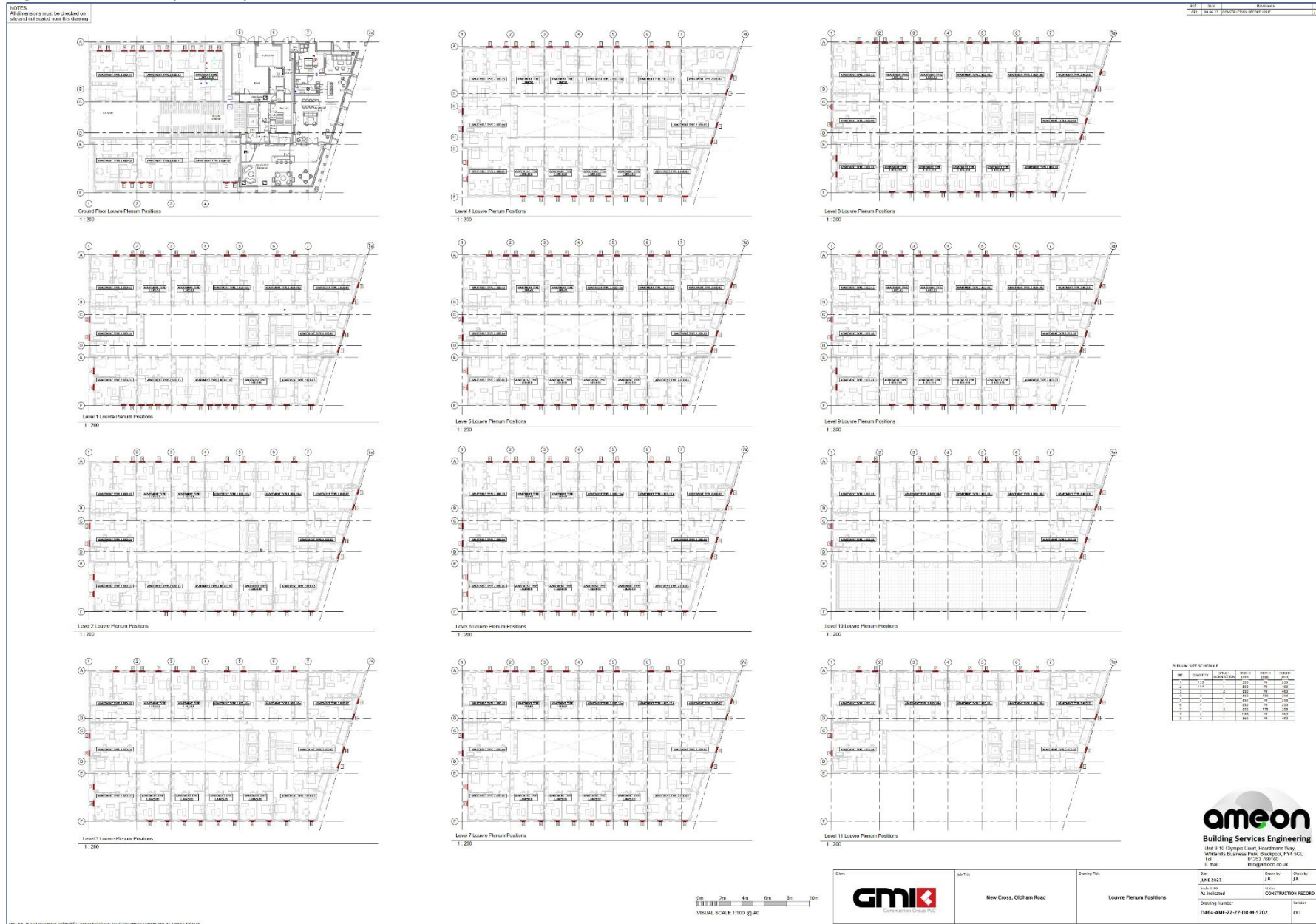
Figure C3: Louvre plenum positions.

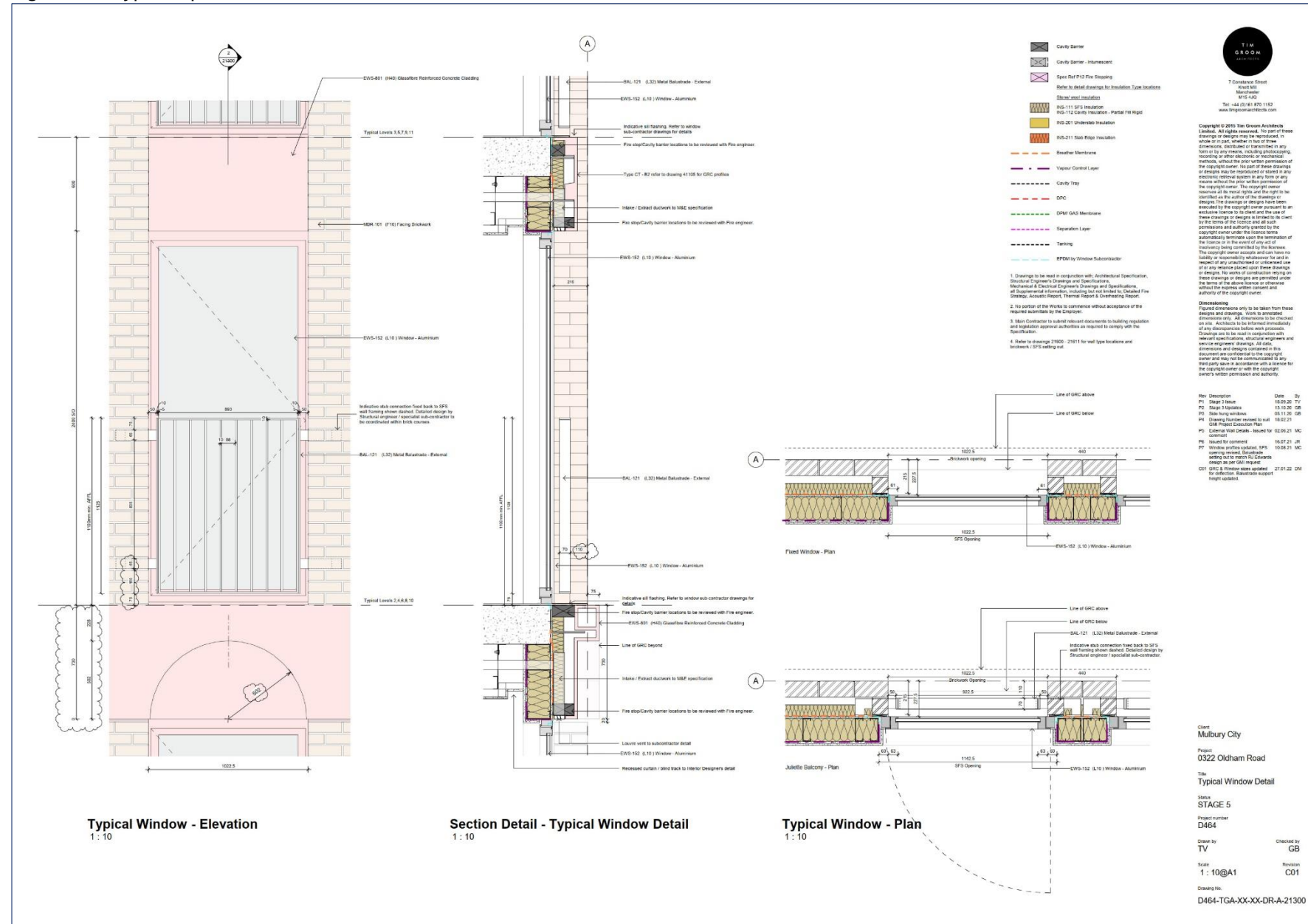
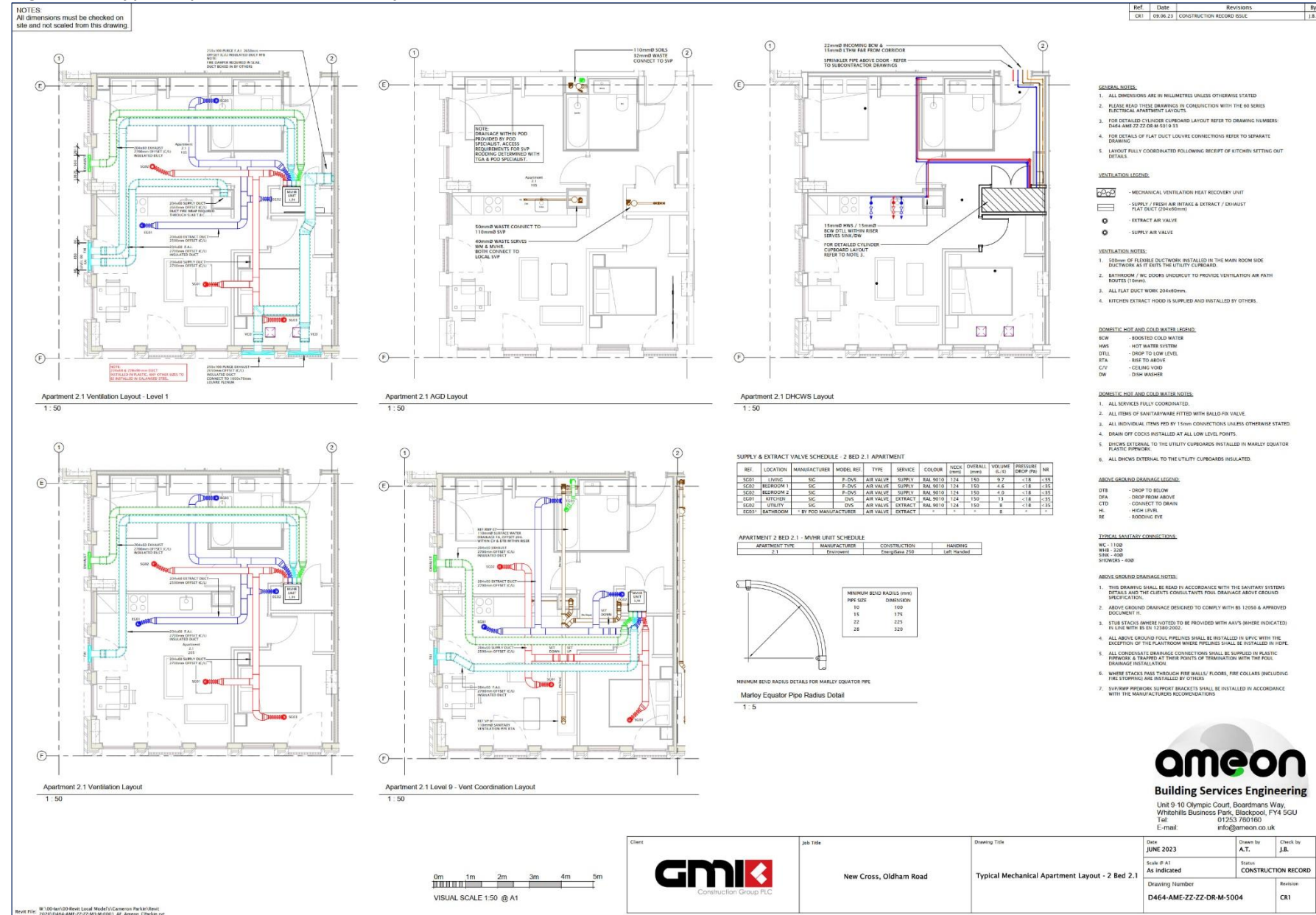
Figure C4: Typical apartment window detail.

Figure C5: Typical apartment mechanical layout – 2-bed.

References

- ⁱ BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.
- ⁱⁱ R. Watson and O. Downey 'The Little Red Book of Acoustics: A Practical Guide'