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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : Victoria House, Great Ancoats
Street, Manchester
REF : HT: 28367/PTM6
DATE : 19 January 2024
FROM : Will Robertson
ISSUED TO : Domis Construction

RE: VICTORIA HOUSE, CONDITION 17 DISCHARGE NOTE

1.0 Introduction

We understand that the above project has been granted planning permission subject to a number of conditions. Planning Condition 17 which relates to the level of noise transfer from the ground floor commercial uses to the residential accommodation above and externally. The condition is presented below:

Condition 17

“Before the development commences a scheme for acoustically insulating the ground floor commercial to ensure that there is no unacceptable level of noise transfer from the ground floor uses to the residential accommodation above shall be submitted to and approved in writing by the City Council as local planning authority. Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 10 dB below the L_{A90} (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location. 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 noncompliance shall be suitably mitigated in accordance with an agreed scheme.”



2.0 Criteria

2.1 Noise Transfer to Above

The wording of Condition 17 does not provide specific criteria with regards to noise transfer from the retail unit to the residential dwellings above.

However, in-line with the draft tenant's handbook wording noted in Hann Tucker Note "28367-PTM-5-R2-JLS" which was provided as evidence of the partial discharge of Condition 17 in the design stage the commercial unit operational noise levels should be at least 5 dB below the minimum octave band L_{90} 'background' noise level in apartments. The minimum L_{90} background noise levels are not known. However, we do know that apartments shall be designed so that internal noise levels satisfy the following limits of BS 8233.

- Living Room: 35 dB $L_{Aeq,16hr}$ (07:00-23:00)
- Bedroom: 30 dB $L_{Aeq,8hr}$ (23:00-07:00)

Apartments will be mechanically ventilated using systems that shall be specified to achieve Noise Rating NR Levels equivalent to the above dB levels (NR30 daytime & NR25 night-time). In reality, these systems tend to achieve these limits with a margin of a few dB. The mechanical services noise is also steady state, which produces very little difference in L_{eq} and L_{90} readings (1-2 dB typically).

With the above considerations, a reasonable estimate of minimum background noise levels in apartments would be not less than NR25 during the daytime and NR20 at night. By subtracting a further 5 dB in line with the criteria, we attain the following operational noise limits for our calculations.

Operational Period	Commercial Unit Operational Noise Limit in Apartments (dB) at OCBF (Hz)							
	63	125	250	500	1k	2k	4k	8k
Day (07:00-23:00)	51	41*	31	24	20	17	14	13
Night (23:00-07:00)	47*	41*	26	19	15	12	9	7

* Limit of virtual inaudibility (ref. DEFRA)

2.2 Noise Transfer to External Receptors

Based on the wording of the condition and the results set out in the Noise & Vibration ES Chapter, noise egress from the unit frontage should be controlled to not exceed the following limits at the façade of the most affected noise sensitive receptor:



Period	Commercial Noise Egress Limits (L_{Aeq})
Daytime (07:00-23:00)	46 dB
Night-time (23:00-07:00)	42 dB

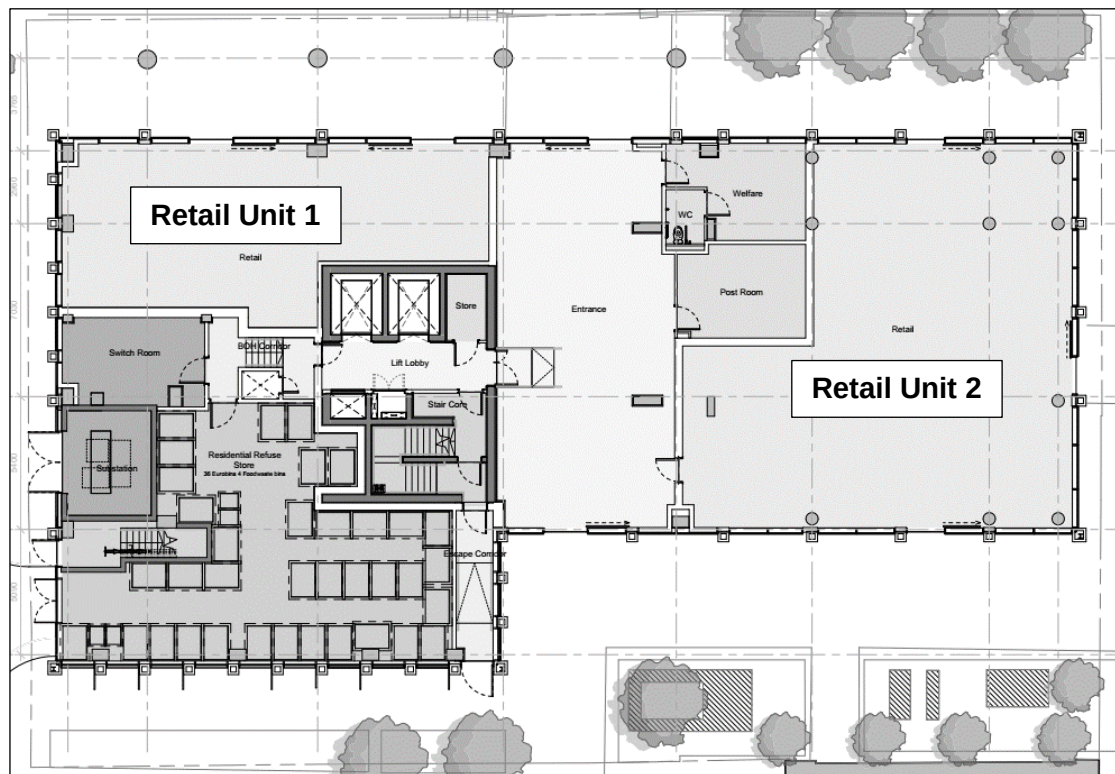
3.0 Assessment of Noise Transfer Assessment to Above

The following sections outline the findings of our noise transfer assessment based on the on-site sound insulation tests (i.e. as existing/no enhancements).

3.1 Sound Insulation Testing

3.1.1 Test Locations

Measurements of the sound insulation between the ground floor retail units and the apartments above were carried out on Monday 15 January 2024. The plan below shows the location of the Retail Units tested.



Ground Floor (commercial spaces)

The table below details the test locations.

Test Reference	Source Room	Receive Room
SIT1	Retail Unit 1	Apt 202A Living Room
SIT2	Retail Unit 1	Apt 202A Bedroom



Test Reference	Source Room	Receive Room
SIT3	Retail Unit 2	Apt 212A Bedroom
SIT4	Retail Unit 2	Apt 212A Living Room

3.1.2 Results

The measured performance of the shell unit floor constructions are as follows:

Test Reference	Sound Level Difference, D , (dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
SIT1	42	43	45	47*	53*	51*	56*
SIT2	45	44	47	52*	58*	60*	65*
SIT3	40	40	41	46*	51*	61*	67*
SIT4	44	45	44	53*	56*	58*	62*

*Result background limited at this octave band.

It should be noted that the measurements were background limited from 500 Hz and above. As such, the actual level difference between the spaces at mid to high frequencies are expected to be higher than detailed in the table above. However, for the purposes of this assessment the above will be used to assess the suitability of the retail units.

3.2 Assessment

3.2.1 Retail Unit 1

With consideration to the criteria set out in Section 2.1, and the measured level of sound reduction through the floor, we have assessed the noise transfer to the floor above. The table below outlines the permissible noise output of the lower ground commercial unit (i.e. tenant noise limits).

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Minimum Measured level difference of Floor, D , (dB)	42	43	45	47	53	51	56
Daytime Criteria in Residential (5 dB below L_{A90})	51	41*	31	24	20	17	14
Daytime Internal Tenant noise level limit in retail unit 1 (dB L_{eq})	93	84	76	71	73	68	70
Night-time Criteria in Residential (5 dB below L_{A90})	47*	41*	26	19	15	12	9
Night-time Internal Tenant noise level limit in retail unit 1 (dB L_{eq})	89	84	71	66	68	63	65



3.2.2 Retail Unit 2

With consideration to the criteria set out in Section 2.1, and the measured level of sound reduction through the floor, we have assessed the noise transfer to the floor above. The table below outlines the permissible noise output of the lower ground commercial unit (i.e. tenant noise limits).

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Minimum Measured level difference of Floor, D, (dB)	40	40	41	46	51	58	62
Daytime Criteria in Residential (5 dB below L_{A90})	51	41*	31	24	20	17	14
Daytime Internal Tenant noise level limit in retail unit 2 (dB L_{eq})	91	81	72	70	71	75	76
Night-time Criteria in Residential (5 dB below L_{A90})	47*	41*	26	19	15	12	9
Night-time Internal Tenant noise level limit in retail unit 2 (dB L_{eq})	87	81	67	65	66	70	71

3.3 Comparison with Proposed Use Cases

The following table compares the tenant noise limits calculated in Section 3.2, which are based on the currently proposed floor construction, with typical noise levels for differing use classes.

Unit	Description	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1000	2000	4000
1	Daytime Internal limit (dB L_{eq})	93	84	76	71	73	68	70
	Night-time Internal limit (dB L_{eq})	89	84	71	66	68	63	65
2	Daytime Internal limit (dB L_{eq})	91	81	72	70	71	75	76
	Night-time Internal limit (dB L_{eq})	87	81	67	65	66	70	71

Comparing the above limits with the typical operational noise levels of a number of different potential uses the following conclusions can be made:

- Typical café/restaurant, office, retail, or supermarket uses are likely suitable during the day.
- At night, using the units as a retail or supermarket would likely be suitable, however, cafes or call centres may not be suitable without enhancement works carried out by the tenant.



Description	Internal Reverberant $L_{eq,5min}$ Sound Level (dB) at OBCF (Hz)						
	63	125	250	500	1000	2000	4000
Miss Selfridge Clothes Store	60	74	66	65	69	67	70
Federal Café	71	71	74	75	73	70	69
Coop Supermarket	61	62	65	66	70	63	60
Office (Call Centre)	65	65	67	71	69	64	58

3.4 Wording in Tenant Handbook

It should be noted that the shell construction would be upgradable. A noisier tenant (e.g. bars) should be able to enhance sound insulation with the addition of plasterboard ceilings/linings. The commercial floor can be upgraded with floating floor systems by tenant's whose operations may risk impact excitation of the structure (e.g. gyms).

Prospective tenants shall be made responsible for controlling their noise/vibration output so as to not adversely impact on neighbouring commercial/residential units. This shall be secured by including a suitable form of words in either the commercial lease agreements or in tenant's handbooks, in line with the below.

Noise & Vibration Transfer to Internal Areas

Tenants shall control noise and vibration transfer from all of their sources (including mechanical services, amplified speech/music and activities) to internal areas beyond their demise such that:

- a) *It does not cause a nuisance, disturbance or annoyance.*
- b) *It does not exceed any acoustic criteria specifically agreed between the Landlord and other Tenants.*
- c) *It does not exceed the following Noise Rating (NR) levels.*

Adjacent Area	Space/Use	Criteria for MEP Services L_{eq}	Criteria for Music & Activities L_1
Residential	Within Apartment	At least 5dB below the minimum L_{90} in each octave band across the audible frequency range.	
Commercial	Office	NR30	NR35
	Retail, Bar, Restaurant, Landlord Areas	NR35	NR40

- d) *It does not give rise to audible tones or rattles.*



- e) *Vibration transfer from M&E services to internal occupied areas shall not exceed 0.01m.s^{-2} peak based on the W_b weighting as defined within BS 6472-1: 2008 "Guide to Evaluation of Human Exposure to Vibration in Buildings".*

Criterion (a) is ultimately the overriding requirement. Provided (a) is complied with in full, some relaxation of (b) (c) (d) and (e) may be permissible, but only at the Landlord's discretion. Compliance with (b) (c) (d) and (e) would however, in most cases, be considered as evidence tending to demonstrate compliance with a).

4.0 Noise Breakout Assessment to External Receptors

The following sections outline the findings of our noise breakout assessment based on the on-site façade sound insulation tests (i.e. as existing/no enhancements).

4.1 Existing Building Fabric

Following our review of the external building fabric, the construction is understood to be as follows:

- Structural columns along the façade line
- Glazing - 9.5 mm Clear Laminate – outer, 12 mm Black Warm Edge Spacer 90% Argon Filled – cavity, 6 mm Soft Coat Low "E" Clear Toughened – inner, $R_w + C_{tr}$ 35 dB.
- Sliding doors – 2No. DDA thresholds, D-STA 108 Auto Slide Operator, 1No. Hook Lock with armoured strike and faceplate at 1000 mm, 1No. Europrofile Cylinder key/key

Based on a typical window with the $R_w + C_{tr}$ value of 35 dB, the octave performance of the façade construction is likely to be as follows:

Element	Sound Reduction Indices, R_w (dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
9.5/12/6mm Glazing	25	25	27	38	48	47	55

4.2 Assessment

With consideration to the predicted façade sound insulation performance set out in Section 4.1, we have assessed the noise transfer to 1m from the external façade. The table below outlines the expected noise output of the ground floor unit and predicted external noise level from the use of the ground floor unit. It is assumed that the internal noise level will not go over the limits detailed in Section 3.2.



Location	Description	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	dBA
Retail Unit 1 (Day)	Upper Noise Limit	93	84	76	71	73	68	70	78
	Predicted Glazing $R_w + C_{tr}$ Values (dB)	25	25	27	38	48	47	55	-
	Predicted External Noise Level (dB L_{eq})	63	54	44	28	20	16	10	42
Retail Unit 1 (Night)	Upper Noise Limit	89	84	71	66	68	63	65	74
	Predicted Glazing $R_w + C_{tr}$ Values (dB)	25	25	27	38	48	47	55	-
	Predicted External Noise Level (dB L_{eq})	59	54	39	23	15	11	5	40
Retail Unit 2 (Day)	Upper Noise Limit	91	81	72	70	71	75	76	81
	Predicted Glazing $R_w + C_{tr}$ Values (dB)	25	25	27	38	48	47	55	-
	Predicted External Noise Level (dB L_{eq})	61	51	40	27	18	23	16	39
Retail Unit 2 (Night)	Upper Noise Limit	87	81	67	65	66	70	71	76
	Predicted Glazing $R_w + C_{tr}$ Values (dB)	25	25	27	38	48	47	55	-
	Predicted External Noise Level (dB L_{eq})	57	51	35	22	13	18	11	37

The comparison table above shows that with no enhancements to the existing building façade, worst-case noise levels are likely to be circa 2 dBA below the criteria set at 1m from the façade.

4.3 Sliding Doors

The acoustic performance of the sliding door is unknown; if the commercial unit is a typical café or a shop, where the doors are generally kept shut, it can be expected that the noise levels will not exceed the limits set at 1 metre from the nearest sensitive receptor.

It should be noted that if there are exceedances of the noise limit from the retail units due to the door, it is the tenant's responsibility to construct a lobby in order to mitigate the level of noise egress from their operation.



5.0 Conclusion

Based on the assessment and guidance set out within this memo, the acoustic separation between ground floor and first floor level can achieve a sufficient performance to allow typical café/restaurant, office, retail, or supermarket use in the day with minimal expected adverse impact on the adjacent residential dwelling. However, at cafe or call centre use at night may not be suitable without enhancement works carried out by the tenant.

Should a bar or any other noisy use be proposed, it would be the responsibility of the tenant (as per the wording in the tenant handbook) to increase the levels of sound insulation such that they can operate and still comply with the limits.

Yours sincerely

Will Robertson

for HANN TUCKER ASSOCIATES