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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : 25 Rochdale Road, Manchester
REF : HT: 27629/PTM2
DATE : 2 November 2022
FROM : Michael Hartley
ISSUED TO : Design Team

RE: 25 ROCHDALE ROAD, SALFORD PLANNING CONDITION 16 DISCHARGE NOTE

1.0 Introduction

1.1 Planning Condition 16

Planning Condition 16 requests that evidence of noise mitigation measures to ensure internal ambient noise levels in apartments satisfy agreed limits be submitted. The condition is as below.

“Notwithstanding the Noise Impact Assessment prepared by Hann Tucker Associates stamped as received by the City Council, as Local Planning Authority, on the 22 July 2020, a scheme for acoustically insulation the proposed hotel accommodation against noise from Rochdale Road (and any other sources of noise near to the site) shall be submitted for approval in writing by the City Council, as Local Planning Authority.

(b) The approved scheme shall be implemented and prior to the first use of the hotel, 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..”

This memo is provided to address part b of Condition 16.



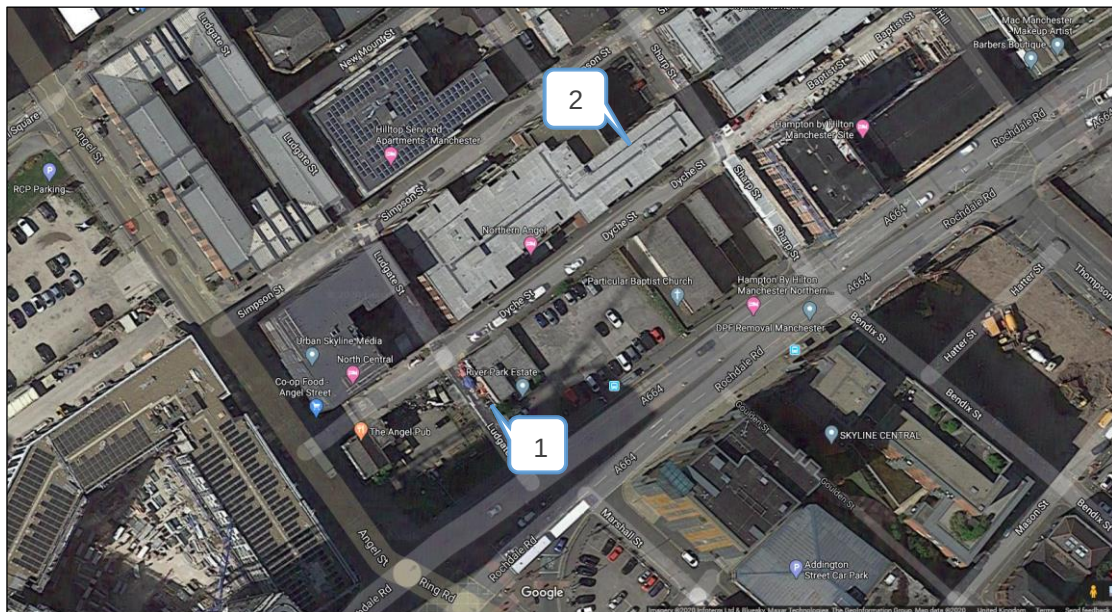
2.0 Existing Noise Levels

Early-stage advice for glazing specification types is presented in the Hann Tucker Associates Planning Report (Ref:27629/NIA1 dated 7 July 2020) alongside measured external noise levels of the general surrounding area. A summary is set out below for context.

2.1 Measurement Positions

Noise level measurements were undertaken at 4No positions as described/illustrated below.

Position	Description
1	Unattended free-field measurement approximately 3m above ground level, overlooking Dyche Street.
2	Unattended free-field measurement approximately 3m above ground level, overlooking Rochdale Road.



Site Plan showing measurement positions (© maps.google.co.uk)

The results from the environmental noise survey have been corrected to free-field values and analysed to determine indices to inform subsequent assessments. These corrected values are presented in the following table.

Position	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)		
	L _{Aeq,16h}	Representative L _{A90,15min}	L _{Aeq,8h}	Representative L _{A90,15min}	Typical Highest L _{Afmax,15min}
1	70 dB	54 dB	67 dB	50 dB	92 dB



Position	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)		
	L _{Aeq,16h}	Representative L _{A90,15min}	L _{Aeq,8h}	Representative L _{A90,15min}	Typical Highest L _{AFmax,15min}
2	63 dB	49 dB	60 dB	45 dB	84 dB

3.0 Acoustic Criteria

The hotel operator requirements are “*Premier Inn Generic Specification for a Turnkey Development –Rev H*”, dated January 2021, these are set out below. The hotel operator requirements are more onerous than MCC’s typical planning requirement and therefore in-line with the intent of the condition.

Location	Daytime (07:00-23:00)	Night time (23:00-07:00)
Bedrooms	L _{Aeq,1 hour} 35 dB	L _{Aeq,1 hour} 30 dB L _{AFmax} 42dB ^[1]
Common Parts	NR 40 L _{eq}	

Note 1 The maximum criterion applies to all vehicle and railway train passbys and all aircraft flyovers. It also applies to the noise from all street activities including those associated with patrons attending and leaving adjacent, neighbouring or connected entertainment venues; noise associated with commercial and industrial neighbouring premises including delivery activities and process equipment; seagulls and church bells. Genuinely infrequent and unpredictable sources of noise such as car alarms occurring no more than twice a night are excluded.

4.0 Glazing Design Guidance

External walls are to be constructed from external facing brickwork or rain screen cladding with an insulated cavity, with external CP board and two layers of plasterboard lining. This system should be sufficient to satisfy the acoustic requirements provided the SFS is at least 100mm thick, fully filled with mineral wool insulation (10-45 kg/m³). The internal plasterboard linings shall be 2no. layers of 12.5 mm sound rated plasterboard (minimum overall mass of 20 kg/m²).

Roofs over apartments are to be formed with solid concrete with plasterboard MF ceilings hung below. This system is considered to out-perform the minimum requirements needed to suitably attenuate external noise intrusion.

For ventilation openings, MVHR systems have been specified to all apartments so as to achieve Building Regulations Part F background ventilation rates. A boost option is to be include to mitigate against summer overheating conditions.



For windows, the required acoustic performance will vary depending on room location with respect to the principle road traffic noise sources. Acoustic specifications have therefore been assigned in zones during the design of the development, with higher specification windows to the outer facing apartments (adjacent to the road and tramline) and lower specification windows to apartments facing the courtyard.

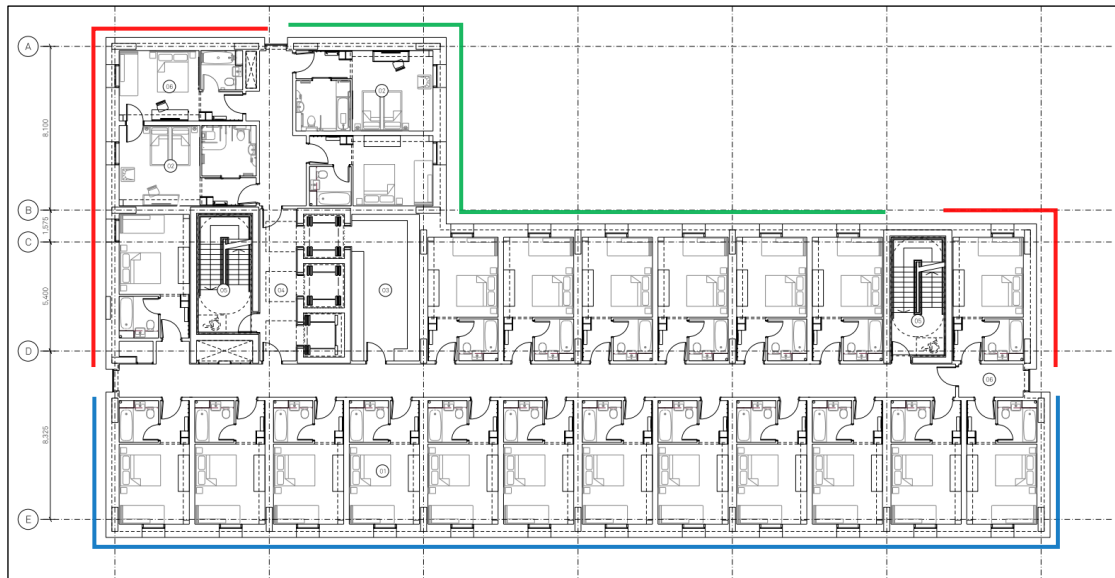
The complete cladding system shall achieve the following minimum sound reduction indices when tested in accordance with BS EN ISO 10140-2:2010

Type		Example Configuration (glass / airspace / glass)	Minimum Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						Overall (dB) $R_w + C_{tr}$ (Guidance only)
			125	250	500	1k	2k	4k	
A	Blue	10 / 200 / 10 / 16 / 6 mm secondary glazing with uprated primary unit	33	45	48	48	47	44	45
B	Red	10 / 16 / 8.8 mm laminated acoustic double glazing	28	32	40	43	40	45	38
C	Green	10 / 16 / 6 mm uprated double glazing	26	28	37	40	42	44	35

Whilst the above configurations can typically be expected to provide the required levels of sound insulation, ultimately it is critical for glazing suppliers to demonstrate compliance with the performances detailed above rather than simply offering a generic glazing configuration.

Glazing to the non-residential areas and residential common parts should be specified to achieve a sound reduction performance of $R_w + C_{tr}$ 28 dB. This performance is typical of conventional thermal double glazing.

The following sketches illustrate the extent of the above glazing zones.



Façade sound insulation performance zones (1st floor – 4th floor)



Façade sound insulation performance zones (5th floor – 10th floor)

Through compliance with the above minimum specifications, our calculations indicate compliance with the internal noise limits stipulated in Section 3.0.

4.1 Site Installations

At the time of writing no specific glazing has been selected for installation, however any glazing will achieve the above minimum specifications.



5.0 Summary of Octave Band Calculations

The tables below summarise the findings of our noise intrusion calculations, and present the calculated internal noise level with reference to the agreed internal noise criteria as a broadband value. Further octave band calculations are presented in Sections 5.1.1 to 5.1.3.

Blue Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time L_{Amax}
Worst Case External Incident Noise Level	72 dB	68 dB	90 dB
Resultant Internal Noise Level	22 dB	18 dB	40 dB

Red Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time L_{Amax}
Worst Case External Incident Noise Level	69 dB	65 dB	86 dB
Resultant Internal Noise Level	25 dB	21 dB	42 dB

Green Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time L_{Amax}
Worst Case External Incident Noise Level	61 dB	58 dB	84 dB
Resultant Internal Noise Level	20 dB	17 dB	42 dB

5.1 Example Noise Intrusion Calculations

We have calculated the resultant internal noise level within habitable rooms using the following equation (Equation G.1) contained within BS 8233:2014. For brevity we have presented the worst case habitable room calculations, detailed calculations are available for all room types upon request.:

$$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$$

To inform our worst case assessment we have looked at the highest external Daytime $L_{Aeq,16hr}$ and Night-time $L_{Aeq,8hr}$ and L_{Amax} (with associated octave band spectra) and calculated the noise break in through the worst affected apartment.

The parameters used within our assessment are presented below, for reference.



Term	Derivation	Rooms (m ²)
S_f	Façade area	9.7
S_{wi}	Window area	3.2
S_{ew}	External wall area	6.5
S	Floor area of dwelling	18

Based on the above, the following sections present our BS 8233:2014 assessment for worst case daytime $L_{Aeq,16hr}$, night-time $L_{Aeq,8hr}$, and night-time L_{AFmax} noise levels.

5.1.1 Detailed Calculation (Blue Zone)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	67	65	66	67	63	59	72 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (Specification)	33	42	45	48	48	47	45 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	35	22	18	17	13	11	23 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	63	61	62	63	59	55	68 dB $L_{Aeq,8hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	33	42	45	48	48	47	45 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	31	18	14	13	9	7	19 dB $L_{Aeq,8hr}$

Night-time $L_{A,max}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	79	84	83	86	81	83	90 dB $L_{A,max}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	33	42	45	48	48	47	45 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	47	40	35	36	31	35	41 dB $L_{A,max}$



5.1.2 Detailed Calculation (Red Zone)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	64	62	63	64	60	56	69 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	28	32	40	43	40	45	38 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	35	28	21	19	17	7	26 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	60	58	59	60	56	52	65 dB $L_{Aeq,8hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	28	32	40	43	40	45	38 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	31	24	17	15	13	3	22 dB $L_{Aeq,8hr}$

Night-time $L_{A,max}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	75	80	79	82	77	79	86 dB $L_{A,max}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	28	32	40	43	40	45	38 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	47	45	38	37	34	30	42 dB $L_{A,max}$

5.1.3 Detailed Calculation (Green Zone)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	56	54	55	56	52	48	61 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	26	28	37	40	42	44	35 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	29	23	15	13	7	-	20 dB $L_{Aeq,16hr}$

**Night-time $L_{Aeq,8hr}$**

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	53	51	52	53	49	45	58 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	26	28	37	40	42	44	35 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	26	20	12	10	4	-	17 dB $L_{Aeq,16hr}$

Night-time $L_{A,max}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	73	78	77	80	75	77	84 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	50 dB $R_w + C_{tr}$
Glazing, R (specification)	26	28	37	40	42	44	35 dB $R_w + C_{tr}$
Equivalent absorption area, A	6	6	6	6	6	6	6
Internal noise level, $L_{eq,2}$	46	47	38	37	30	29	42 dB $L_{Aeq,16hr}$

6.0 Summary

Based on our detailed environmental noise survey, the building envelope specifications should be suitable to achieve the required internal noise criteria as set out in Planning Condition 16a.

Yours sincerely

Michael Hartley
for HANN TUCKER ASSOCIATES