



Hann Tucker Associates

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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : Snell Street, Manchester
REF : HT: 28744/PTM2/R0
DATE : 5 April 2023
FROM : Jake Howarth
ISSUED TO : Alex Farmer (Artal)

RE: SNELL STREET, MANCHESTER CONDITION 15a DISCHARGE NOTE

A residential scheme on Snell Street in Manchester has been granted planning permission subject to several conditions. One of these conditions, Condition 15a, relates to noise levels within dwellings and within external amenity spaces. The specific wording is as follows:

Notwithstanding the Noise Impact Assessment - prepared by Hann Tucker Associates stamped as received by the City Council, as Local Planning Authority 28 April 2021, prior to the first occupation of the development a scheme for acoustically insulating the proposed residential accommodation against noise from the 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) 30 dB L Aeq (individual noise events shall not exceed 45 dB L Amax,F by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB L Aeq

Gardens and terraces (daytime) 55 dB L Aeq

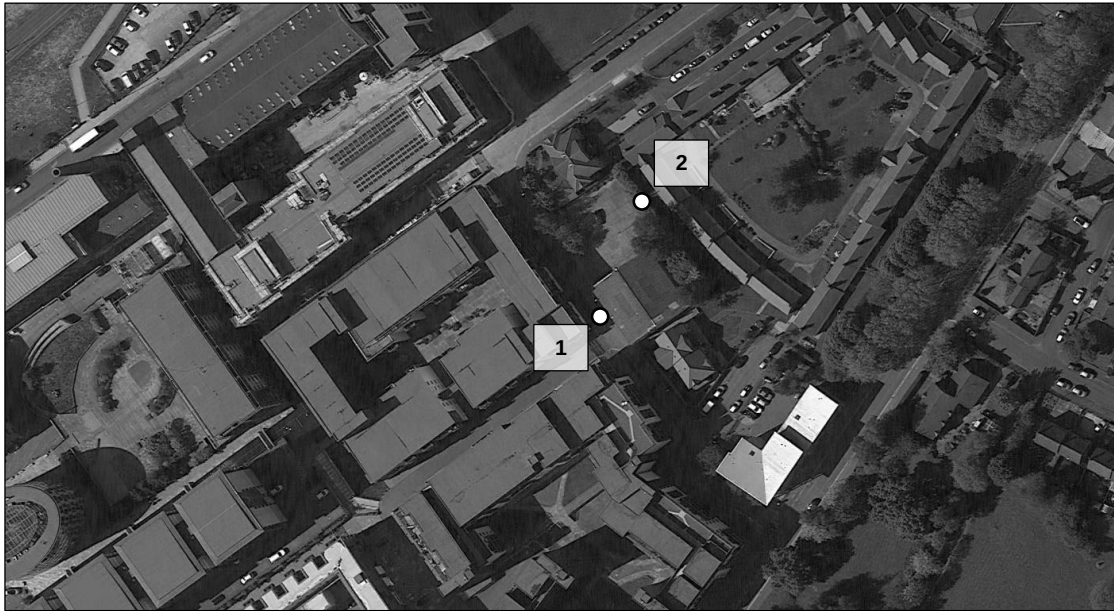
This Technical Memorandum reviews the proposed construction details with respect to the above and assesses the resultant internal and external noise levels .

1.0 Environmental Noise Survey

An environmental noise survey was carried out on site between 10:00 hours on Friday 19 March 2021 and 12:00 hours on Monday 22 March 2021 to establish typical noise levels over a typical weekday and weekend period.



For full details relating to the noise survey carried out please refer to Hann Tucker Report 28744-NIA1-JH-Rev1 dated 13 April 2021. However, measurements were carried out in the following locations:



Site Plan (© maps.google.co.uk)

A summary of the results from the noise survey, as used to inform subsequent assessments against current guidelines, is presented in the table below. All results are presented as free-field levels.

Position	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)		
	L _{Aeq,16hr}	Typical L _{A90,15min}	L _{Aeq,8hr}	Typical L _{A90,15min}	15 th highest L _{Afmax,5min}
1	54	40	50	33	71

A summary of the results from the attended noise survey, as used to inform subsequent assessments against current guidelines in relation to the use of openable windows as a means for background ventilation, is presented in the table overleaf.

All results are free-field levels.



Start Time (mm:ss)	Position	Measured Sound Pressure Levels (dB)	
		L _{Aeq,5min}	L _{AFMax,5min}
11:20	1	55	71
	2	49	58
11:25	1	57	75
	2	50	63
11:30	1	53	69
	2	49	59
11:35	1	55	74
	2	51	64

At the time the noise survey was undertaken, the UK was exiting a nationwide lockdown due to the COVID-19 pandemic. It should be noted that the lockdown had been significantly relaxed at the time the survey was completed with most commercial operations in the UK operational and advice to work from home where possible still in effect.

2.0 Proposed Construction Details

2.1 Ventilation Measures

The development is using MVHR throughout. As such, noise breaking into via the means of ventilation will be minimal.

2.2 External Walls

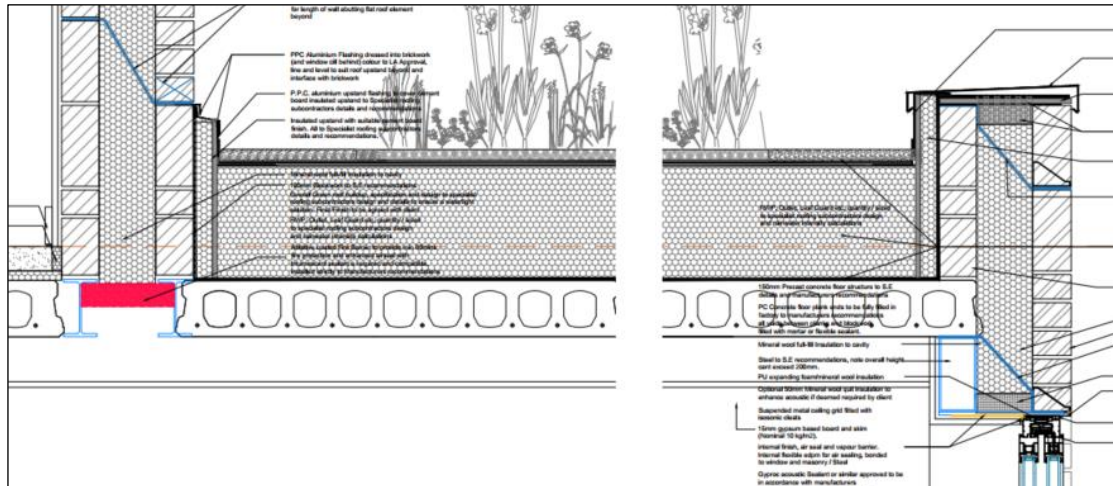
The external wall build-up is a brick and block cavity wall with full fill mineral wool. The cavity is generally 200mm with small pockets of reduction to 125/150mm for recessed brick panels. The internal finish is a 12.5mm plasterboard on dabs with a skim coat.

We would expect the external wall to achieve the following performance:

Element	Sound Reduction, R (dB) at Octave Band CF (Hz)					
	125	250	500	1000	2000	4000
External Wall	37	40	45	50	55	55

2.3 Proposed Roof

Main flat roof which contains the external amenity area is 150mm precast concrete with roofing membrane and 300mm Insulation, membrane and paving slabs on pedestals as shown below:



Proposed Flat Roof Construction

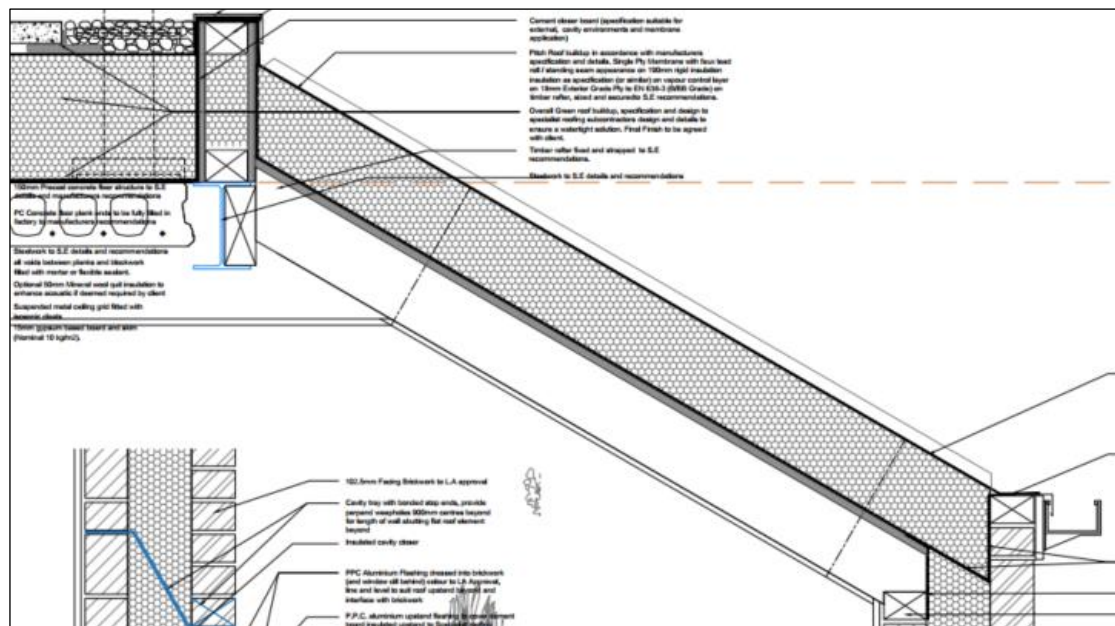
We should expect the above construction to achieve the following sound reduction indices:

Element	Sound Reduction, R (dB) at Octave Band CF (Hz)					
	125	250	500	1000	2000	4000
Flat Roof	35	40	40	50	55	60

There is a small section to the rear of the dwellings which will have a pitched roof consisting of timber joists, 18mm ply deck and 190mm rigid insulation with Sarnafil single ply membrane as shown on the plan overleaf.

We would expect the single ply roof, in conjunction with the 15mm plasterboard ceiling below to achieve the following performance:

Element	Sound Reduction, R (dB) at Octave Band CF (Hz)					
	125	250	500	1000	2000	4000
Pitched Roof	15	24	38	40	40	45



Proposed Pitched Roof Construction

2.4 Proposed Glazing

The proposed glazing is understood to be double glazed units for both the windows and external doors with the following glazing specification:

- 6.8mm laminate/16mm cavity/4mm float glass.

The above glazing has the following sound reduction provided by Guardian Glass:

Element	Sound Reduction, R (dB) at Octave Band CF (Hz)					
	125	250	500	1000	2000	4000
Glazing	23	27	34	40	41	43

Although the above is the performance of the glass only, the frames are to be aluminium and it is likely that there would be a significant reduction in performance due to the frame with this glazing configuration.

3.0 Calculated Levels of Noise Ingress

Calculations have been carried out to determine compliance with internal noise limits in the worst affected habitable room on each elevation using the detailed calculation method set out in BS8233:2014 as follows:

$$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_0}{S} 10^{\frac{-Dn,e}{10}} + \frac{S_w}{S} 10^{\frac{-R_w}{10}} + \frac{S_g}{S} 10^{\frac{-R_g}{10}} + \frac{S_r}{S} 10^{\frac{-R_r}{10}} \right) + 10 \times \log_{10} \left(\frac{S}{A} \right) + 3$$



The results are summarised below and the full calculations are enclosed for completeness.

Façade	Calculated Internal Noise Level (dB)			
	Bedroom			Liv/Kitchen
	L _{Aeq,16h}	L _{Aeq,8h}	L _{AFmax}	L _{Aeq,16h}
Snell Street	22	19	36	20
Rear Façade	26	25	38	18

It be seen from the above that the levels of noise ingress should be well within the Condition 15a criteria which the currently proposed constructions.

4.0 External Amenity Noise Levels

The design incorporates private gardens to the rear of each townhouse and roof terraces also. Given the measured noise levels on site, it expected that noise levels throughout the amenity and garden spaces on the site will be below the maximum recommended criteria of 55 dB L_{Aeq,16h}.

Yours sincerely

Jake Howarth
for HANN TUCKER ASSOCIATES

Bedroom on Snell Street Façade

External Building Fabric Calculation Sheet (BS 8233)

$$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{0,e}}{10}} + \frac{S_w}{S} 10^{\frac{-R_w}{10}} + \frac{S_g}{S} 10^{\frac{-R_g}{10}} + \frac{S_r}{S} 10^{\frac{-R_r}{10}} \right) + 10 \times \log_{10} \left(\frac{S}{A} \right) + 3$$

	Daytime	Night	Lmax
External Noise Level (Free Field)	54	50	71

< Input 0 if using a measured spectrum

	size/no.		
wall	18%	2.4488	m2
glazing	24%	3.256	m2
roof	58%	7.967704	m2
vent		0	No.

room	width (façade)/	2.377	depth/	3.352	height/	2.4
reverberation	T (s)	0.5				

Calculation Details

Project/Project No.	Snell Street
Date	05/04/2023
Eng	JH
Location	Snell St Bedroom
Notes	

Scratch Pad (For Quick Calculations)

		63	125	250	500	1000	2000	4000	8000	Description
Measured Day Leq Spectrum	A (LAeq,16h)	7	0	-5	-4	-3	-9	-15	-22	LAeq,16h
Measured Night Leq Spectrum	B (LAeq,8h)	6	2	-3	-4	-4	-7	-13	-20	LAeq,8h
Measured Lmax Spectrum	C (Night Max)	-5	-9	-10	-3	-1	-10	-22	-32	Night Max
	Calculated Spectrum Day	61	54	49	50	51	45	39	32	A-weighted Level (dB)
	Calculated Spectrum Night	56	52	47	46	46	43	37	30	54
	Calculated Spectrum Lmax	66	62	61	68	70	61	49	39	50
										71
										Performance
Wall:	C (Cavity Masonry): 43	34	37	40	45	50	55	55	60	43
Glazing:	H (6.8/16/4): Custom	23	23	27	34	40	41	43	43	Custom
Roof:	D (Flat Roof): Custom	35	35	40	40	50	55	60	60	Custom
Vent:	R (Description): Custom	0	0	0	0	0	0	0	0	Custom

	Octave Band Internal Noise Level, dB (Linear Spectrum)								dBA (63-8kHz)	dBA (125-4kHz)
Daytime, Leq	40	32	23	19	13	5	-3	-10	22	21
Night-time, Leq	34	30	21	14	7	2	-6	-12	18	18
Lmax, Lfmax	45	40	35	36	31	21	7	-3	36	36

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Bedroom on Rear Façade

External Building Fabric Calculation Sheet (BS 8233)

$$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{0,e}}{10}} + \frac{S_w}{S} 10^{\frac{-R_w}{10}} + \frac{S_g}{S} 10^{\frac{-R_g}{10}} + \frac{S_r}{S} 10^{\frac{-R_r}{10}} \right) + 10 \times \log_{10} \left(\frac{S}{A} \right) + 3$$

	Daytime	Night	Lmax
External Noise Level (Free Field)	50	48	68

< Input 0 if using a measured spectrum

	size/no.		
wall	39%	8.588	m2
glazing	10%	2.176	m2
roof	51%	11.2125	m2
vent		0	No.

room	width (façade)/	4.485	depth/	2.5	height/	2.4
reverberation	T (s)	0.5				

Calculation Details	
Project/Project No.	Snell Street
Date	05/04/2023
Eng	JH
Location	Snell St Bedroom
Notes	

Scratch Pad (For Quick Calculations)	

		63	125	250	500	1000	2000	4000	8000	Description
Measured Day Leq Spectrum	A (LAeq,16h)	7	0	-5	-4	-3	-9	-15	-22	LAeq,16h
Measured Night Leq Spectrum	B (LAeq,8h)	6	2	-3	-4	-4	-7	-13	-20	LAeq,8h
Measured Lmax Spectrum	C (Night Max)	-5	-9	-10	-3	-1	-10	-22	-32	Night Max
	Calculated Spectrum Day	57	50	45	46	47	41	35	28	A-weighted Level (dB)
	Calculated Spectrum Night	54	50	45	44	44	41	35	28	50
	Calculated Spectrum Lmax	63	59	58	65	67	58	46	36	48
										68
										Performance
Wall:	C (Cavity Masonry): 43	34	37	40	45	50	55	55	60	43
Glazing:	H (6.8/16/4): Custom	23	23	27	34	40	41	43	43	Custom
Roof:	E (Pitched Roof): Custom	15	15	24	38	40	40	45	45	Custom
Vent:	R (Description): Custom	0	0	0	0	0	0	0	0	Custom

	Octave Band Internal Noise Level, dB (Linear Spectrum)								dB(A) (63-8kHz)	dB(A) (125-4kHz)
Daytime, Leq	47	40	26	15	13	6	-4	-11	26	25
Night-time, Leq	44	39	26	12	9	5	-5	-11	25	25
Lmax, Lfmax	53	48	39	33	32	23	7	-4	38	37

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Kitchen/Diner – Snell Street Façade

External Building Fabric Calculation Sheet (BS 8233)

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	Daytime	Night	Lmax
External Noise Level (Free Field)	54	50	71

< Input 0 if using a measured spectrum

	size/no.		
wall	32%	3.468	m2
glazing	68%	7.284	m2
roof	0%	0	m2
vent		0	No.

room	width (façade)/	4.48	depth/	5.3	height/	2.4
reverberation	T (s)	0.5				

Calculation Details

Project/Project No.	Snell Street
Date	05/04/2023
Eng	JH
Location	Snell St Kitchen
Notes	

Scratch Pad (For Quick Calculations)

		63	125	250	500	1000	2000	4000	8000	Description	
Measured Day Leq Spectrum	A (LAeq,16h)	7	0	-5	-4	-3	-9	-15	-22	LAeq,16h	
Measured Night Leq Spectrum	B (LAeq,8h)	6	2	-3	-4	-4	-7	-13	-20	LAeq,8h	
Measured Lmax Spectrum	C (Night Max)	-5	-9	-10	-3	-1	-10	-22	-32	Night Max	
										A-weighted Level (dB)	Description
	Calculated Spectrum Day	61	54	49	50	51	45	39	32	54	Daytime L _{eq}
	Calculated Spectrum Night	56	52	47	46	46	43	37	30	50	Night-time L _{eq}
	Calculated Spectrum Lmax	66	62	61	68	70	61	49	39	71	Maximum Event, L _{Fmax}
										Performance	Config.
Wall:	C (Cavity Masonry): 43	34	37	40	45	50	55	55	60	43	Cavity Masonry
Glazing:	H (6.8/16/4): Custom	23	23	27	34	40	41	43	43	Custom	6.8/16/4
Roof:	D (Flat Roof): Custom	35	35	40	40	50	55	60	60	Custom	Flat Roof
Vent:	R (Description): Custom	0	0	0	0	0	0	0	0	Custom	Description

	Octave Band Internal Noise Level, dB (Linear Spectrum)								dBA (63-8kHz)	dBA (125-4kHz)
Daytime, Leq	38	30	22	16	11	3	-4	-12	20	19
Night-time, Leq	33	28	20	11	5	1	-7	-14	16	16
Lmax, LFmax	43	38	33	33	29	19	5	-5	34	34

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Living Room – Rear Façade

External Building Fabric Calculation Sheet (BS 8233)

$$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_{\text{G}}}{S} 10^{\frac{-D_{\text{G,E}}}{10}} + \frac{S_{\text{W}}}{S} 10^{\frac{-R_{\text{W}}}{10}} + \frac{S_{\text{G}}}{S} 10^{\frac{-R_{\text{G}}}{10}} + \frac{S_{\text{r}}}{S} 10^{\frac{-R_{\text{r}}}{10}} \right) + 10 \times \log_{10} \left(\frac{S}{S_{\text{A}}} \right) + 3$$

	Daytime	Night	Lmax
External Noise Level (Free Field)	50	48	68

< Input 0 if using a measured spectrum

	size/no.		
wall	11%	1.164	m2
glazing	89%	9.6	m2
roof	0%		m2
vent		0	No.

room	width (façade)/	4.485	depth/	4.1	height/	2.4
reverberation	T (s)	0.5				

Calculation Details

Project/Project No.	Snell Street
Date	05/04/2023
Eng	JH
Location	Snell St Liv
Notes	

Scratch Pad (For Quick Calculations)

		63	125	250	500	1000	2000	4000	8000	Description
Measured Day Leq Spectrum	A (LAeq,16h)	7	0	-5	-4	-3	-9	-15	-22	LAeq,16h
Measured Night Leq Spectrum	B (LAeq,8h)	6	2	-3	-4	-4	-7	-13	-20	LAeq,8h
Measured Lmax Spectrum	C (Night Max)	-5	-9	-10	-3	-1	-10	-22	-32	Night Max
	Calculated Spectrum Day	57	50	45	46	47	41	35	28	A-weighted Level (dB)
	Calculated Spectrum Night	54	50	45	44	44	41	35	28	50
	Calculated Spectrum Lmax	63	59	58	65	67	58	46	36	48
										68
										Performance
Wall:	C (Cavity Masonry): 43	34	37	40	45	50	55	55	60	43
Glazing:	H (6.8/16/4): Custom	23	23	27	34	40	41	43	43	Custom
Roof:	D (Flat Roof): Custom	35	35	40	40	50	55	60	60	Custom
Vent:	R (Description): Custom	0	0	0	0	0	0	0	0	Custom

	Octave Band Internal Noise Level, dB (Linear Spectrum)								dBA (63-8kHz)	dBA (125-4kHz)
Daytime, Leq	36	29	20	14	9	2	-6	-13	18	17
Night-time, Leq	33	28	20	11	5	1	-7	-13	17	16
Lmax, Lfmax	42	37	33	32	28	18	5	-6	33	33

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