

Didsbury Point Manchester

Acoustic Assessment Report -
Planning Condition 19 (Acoustic Insulation Scheme)

Client:

Bridgestone Construction Limited
Hyde Park House, Cartwright St, Hyde, SK14 4EH

Date:

31 October 2025

Our Ref:

22015-RP-2-R0

Client Ref:

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**JAMESON
ACOUSTICS**

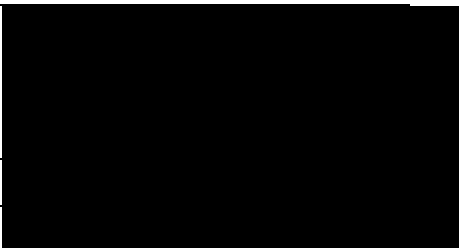
Consultants in acoustics,
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Document Control

Revision	Date	Author	Description
0	31-10-2025	AJ	-

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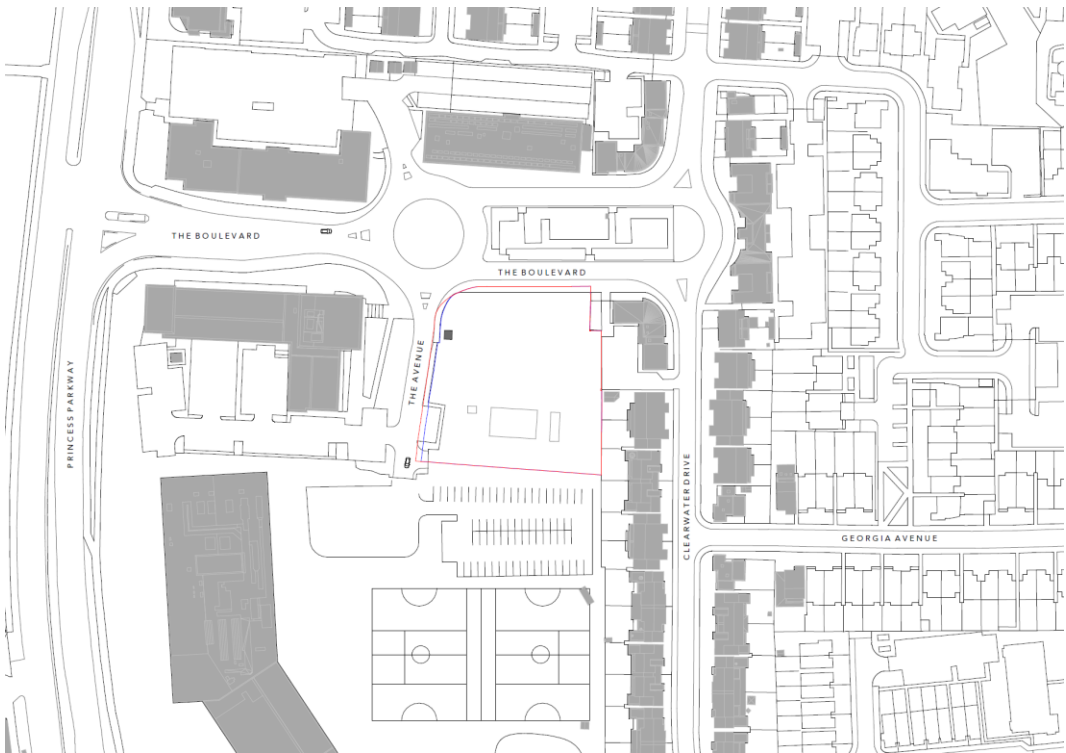
1.0 Introduction

Jameson Acoustics Limited has been commissioned by Bridgestone Construction Limited to provide acoustic design services to assist in the discharge of Part A of Planning Condition 19 pertaining to the consented residential and medical centre development at Didsbury Point in Manchester. The condition is as follows.

No	Wording
19	<p>a) The development shall be acoustically insulated in accordance with the approved Noise Impact Assessment and Substation Noise Assessment set out in condition 1 of this decision notice.</p> <p>b) Prior to first occupation of the residential units, a verification report shall be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that the internal noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.</p>

2.0 Project & Assessment Overview

The development comprises a Part 8 and Part 6 storey building to form 76 no. residential apartments (Class C3) with ground floor medical centre use (Class E(e)) with associated car parking provided on a two-tiered decked car park, landscaping and infrastructure. See below site location plan and proposed site plan.



Site location plan



Typical upper floor plan

The assessment shall assess the ‘*for construction*’ design proposals/specifications against the acoustic performance requirements set out in the approved Hann Tucker Associates’ *Noise Impact Assessment Report* Ref. 28562/NIA1 (Rev 6) dated 15 February 2021 [‘the Hann Tucker Report’]. Based on the acoustic insulation requirements set out in this report, our assessment will cover:

- **Residential façade solutions** – to demonstrate sufficient acoustic insulation is provided to combat external noise ingress and achieve acceptable internal noise levels in dwellings,
- **Medical centre façade solutions** – to demonstrate sufficient acoustic insulation is provided to control operational noise egress,
- **Commercial to residential floor solution** – to demonstrate the party floor construction will provide sufficient acoustic insulation to mitigate medical centre operational noise transfer to dwellings above,
- **Sub-station noise control**– to demonstrate the proposed substation will be sufficiently acoustically insulated to control external noise egress (to all nearby noise sensitive receptors) and internal noise transfer to dwellings above.

3.0 Residential Façade Solutions

3.1 Requirements

The Hann Tucker Report fails to provide definitive internal noise criteria for the scheme but does reference the design guidance set out by MCC, BS 8233 and WHO. In line with those documents, facades to the residential accommodation have been designed to achieve the following internal noise levels.

Area	Location	Daytime (07:00-23:00)	Night time (23:00-07:00)
Apartment/Townhouse	Living Room	35 dB $L_{Aeq,16hr}$	-
	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB* L_{Amax}

* Not to be regularly exceeded by scheduled noise events (e.g. trains, buses, etc.).

In line with the Hann Tucker Report, the above shall be achieved with conventional double glazed windows (achieving min. 26 dB $R_w + C_{tr}$) punched in to brick/clad and SFS external walls. Ventilation would be provided by MVHR systems which shall remove the need for passive ventilators (e.g. trickle ventilators).

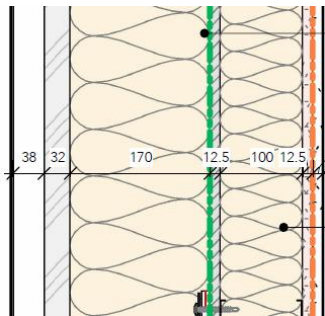
For overheating conditions, the Hann Tucker Report refers to AVO guidance (noting that Building Regulations ADO was not published at the time). Their Report confirms the site lies in a low/negligible noise risk zone and reliance on openable windows to assist in the overheating strategy should be suitable for all residential facades. A Level 2 assessment is not required.

3.2 Residential Façade Specifications

3.2.1 External Walls

The external walls comprise outer brick or cladding onto SFS with internal plasterboard linings. The build-up is as specified below.

Type	Sketch	Build-Up
Brick (health centre & residential lower levels)		<ul style="list-style-type: none"> 102.5mm traditional brick. ~200mm external cavity with 150mm mineral wool insulation (30-60 kg/m³). 12.5 mm (min.) sheathing board (min. 10 kg/m²). 100 mm (min.) SFS frame with full fill mineral wool insulation (10-30 kg/m³). 2 layers of plasterboard (min. 8 kg/m² per board, e.g. 2 x 12.5 mm Wallboard).

Type	Sketch	Build-Up
Cladding (residential upper levels)		<ul style="list-style-type: none">• Standing seam cladding on steel frame.• ~170mm external cavity with 170mm mineral wool insulation (30-60 kg/m³).• 12.5 mm (min.) sheathing board (min. 10 kg/m²).• 100 mm (min.) SFS frame with full fill mineral wool insulation (10-30 kg/m³).• 2 layers of plasterboard (min. 8 kg/m² per board, e.g. 2 x 12.5 mm Wallboard).

The sound reduction performance of the above constructions were estimated to provide a sound reduction performance of not less than 53 dB $R_w + C_{tr}$, which far exceeds the requirements to satisfy the noise limits presented in Section 3.1 and exceeds the performance assumed by Hann Tucker in their analysis (ref. Section 7.1 of the Hann Tucker Report).

3.2.2 Windows

Framed window/door systems to residential apartments were specified to be capable of achieving the following minimum sound reduction performance specification, in line with the Hann Tucker Report.

Façade Zone	Min. Required Sound Reduction $R_w + C_{tr}$ (dB)	Example Glass Configuration
All (Purple)	26	6 / 16 / 6 mm



Acoustic Façade Zones (All Levels)

The cladding contractor has provided the following performance certificate for the final window systems installed. The windows will be triple glazed with a configuration of 8.8 [lam.] / 16 / 4 / 16 / 6 mm to all dwellings. The estimated glass performance is 38 dB $R_w + C_{tr}$.



Acoustic Performance

Glazing Configuration

8.76mm (44.2) LamiGlass (PVB)
16mm Cavity
4mm Float Glass
16mm Cavity
6mm Float Glass

Sound Reduction Indices

Frequency, Hz / dB*						Rw	C	Ctr	OTC	STC
125	250	500	1000	2000	4000	43	-1	-5	34	44
25	32	43	49	43	60					

*The values expressed in the frequency table correspond to the central values of the 1/3 octave band

Disclaimer: The acoustic performance data provided in the reports is based on a test protocol or an estimation and may be used if user actual glazing is identical to input data described herein. Acoustic performance data herein is only applicable for glazing dimensions 1,23 m x 1,48 m (as per testing standard). Estimation of acoustic performance is based on component-similarity assumptions which are derived from measured data and interpolation to expand the database of values from test protocols. Due to inherent variations in acoustic performance when testing in accordance with EN ISO 10140-3/EN ISO 10140-2, some variation in the calculated performance can also be expected. As such, the weighted performance, R_w , and adaptation terms, C and C_{tr} , should typically be considered to be accurate within ± 2 dB. However, wider deviations can occur. Actual performance may vary according to the glazing dimensions, frame system, noise sources and many other parameters. The acoustic performance data herein should not be used as a substitute for tests of actual glazing. For more information, please consult Assumptions and Terminology section in Guardian Acoustic Assistant. By accessing this calculator, you agree not to alter or modify the generated report data and information, by any means. Any manual alteration will be your own responsibility and will annul all the content of the report.

Wednesday, October 15, 2025 | Acoustic database 20221229 | Certified

Whilst this is an estimated certificate of performance, the proposed triple glazed system will clearly perform better than is required on this project. Our review of the estimated data against actual test data for similar configuration systems suggests the numbers are realistic. Note, the overspecification in terms of acoustics is due to other requirements (e.g. thermal and safety/security) dictating the final solution.

The above relates to the performance of the glass only and does not account potential performance degrade when in a framed system. We have therefore carried out a calculation based on the worst-case window scenario which has a frame to window ratio of circa 1:5 (~20% frame, ~80% glass). The calculation considers known sound reduction performance of the proposed aluminium window frame type. See below.

Element	Config	63	125	250	500	1k	2k	4k	Sample Test Area m2
1 Glass, R	8.8-16-4-16-6mm	-	25	32	43	49	43	60	3
Correction	Reference	63	125	250	500	1k	2k	4k	
1 Panel size / rigidity	Sewells Correction	0	0	0	0	0	0	0	
Element	Config	63	125	250	500	1k	2k	4k	Project Panel Area m2
1 Glass, R	As above	-	25	32	43	49	43	60	3.492
2 Frame, Dne	Technal frame - Alu. (conservative)	44	50	55	54	58	65	67	1.008
3 Timber surround, R	N/A	33	34	30	36	42	47	53	0
Dn,k (inc change in glass size)									
		A0	63	125	250	500	1k	2k	4k
		10	-	29	36	47	53	47	64
		10	34	40	45	44	48	55	57
		10	99	99	99	99	99	99	99
Dn (comp)									
		-	29	36	42	47	47	56	
		R'	-	25	32	39	43	43	53
		Change in R	-	0	0	-4	-6	0	-7
									36 Rw+Ctr

The results indicate the complete window system is expected to achieve a performance of 36 dB $R_w + C_{tr}$, which is 10 dB better than the minimum requirement specification, thus demonstrating acceptability.

3.2.3 Ventilation Systems

All apartments will be provided with MVHR (whole house) ventilation systems. These systems will provide background ventilation in line with Building Regulations ADF without the need for any passive ventilators/openings that could degrade the acoustic performance of the façades.

The MVHR systems will comprise sealed, ducted air inlet/outlet grilles terminating at the façade. The following calculation considers external noise flanking into apartments through the grilles, into the ductwork and radiating through ceilings in the habitable room. The calculations are conservative to determine worst-case (lowest) $D_{n,e}$ performance values for inclusion in our BS 8233 composite façade calculations.

	Value	63	125	250	500	1k	2k	4k	dBA	Notes
Normalised spec shape		0	0	0	0	0	0	0		
Incident external Lp	100	100	100	100	100	100	100	100		
duct opening width (m)	0.24									
duct opening height (m)	0.09									
Lw into duct (+10*log10A)		77	77	77	77	77	77	77		< arbitrary in-duct
Silencer loss										<900mm Calce attenuator
ceiling void duct width (m)	0.24									
ceiling void duct height (m)	0.09									
length of duct in room, L (m)	9									
number of duct runs	1									Always one duct per room
Transmission coefficient duct -10lg(1/T)		-17.0	-18.0	-20.0	-20.0	-20.0	-23.0	-25.0		See below from ASHRAE
SRL calculation corrections:										
Length effect		0.0	0.0	0.0	0.0	0.0	0.0	0.0		SRL book page 282, relatively short run & high transmission coefficient correction = 0
+10lg correction		9.5	9.5	9.5	9.5	9.5	9.5	9.5		
Lw breakout of duct, LwB:		70	69	67	67	67	64	62		
Room width (m)	6									
Room length (m)	4									
Room height (m)	2.5									
Receiver distance (m)	1									
Reverberation time (s)	0.5									
Ceiling loss:		-5	-7	-9	-13	-16	-18	-18		plasterboard ceiling
Room Corrections:										
Near field correction short		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		
Near field correction long		-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0		
Near field loss taken		-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0		
10lg(Q/4πr²), Q=4		-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0		
+10lgN		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Correction (tight to soffit, corner position)		1.0	1.0	0.5	0.0	0.0	0.0	0.0		Ref. BS 12354-3
Direct Lp =		56.9	53.9	49.4	44.9	41.9	36.9	34.9		
+10*log(T/V)+14		-5.7	-6.0	-6.4	-6.8	-6.8	-6.8	-6.8		
+10lgN		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Correction (tight to soffit, corner position)		1.0	1.0	0.5	0.0	0.0	0.0	0.0		Ref. BS 12354-3
Reverb Lp =		60.2	56.9	52.0	47.1	44.1	39.1	37.1		
Total Lp in Room:		62	59	54	49	46	41	39	52	55
In-duct Lw to Lp in room - TF		15	19	23	28	31	36	38		
Outside to Inside		38	41	46	51	54	59	61		
Dn,e performance of vent route		35	38	43	48	51	56	58		

3.3 Composite Façade Calculations

The following calculations sheets present our BS 8233 assessments of internal noise levels in an apartment living room and bedroom on the worst-case (noisiest) façade based on incident noise levels presented in the Hann Tucker Report. The three calculation sheets are for living room daytime $L_{Aeq,16hr}$, bedroom night-time $L_{Aeq,8hr}$ and bedroom night-time L_{Amax} . The assessment considers sound reduction performance data for all elements in the final ‘for construction’ proposals. NB: Roof constructions are excluded, as all roofs are concrete.

Living room daytime $L_{Aeq,16hr}$

$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_2}{S} 10^{-\frac{D_{n,e}}{10}} + \frac{S_{wR}}{S} 10^{-\frac{R_{wR}}{10}} + \frac{S_g}{S} 10^{-\frac{R_g}{10}} + \frac{S_r}{S} 10^{-\frac{R_r}{10}} \right) + 10 \times \log_{10} \left(\frac{S_A}{S_A} \right) + 3$									
external noise level (free-field)		56	dB						
size/no.									
wall		4.00	m2	0.4	%				
glazing		6.00	m2	0.6	%				
roof		0.00	m2						
vent		2.00	No.						
room	w (façade)/	4	l/	6	h/	2.5			
reverberation	T (s)	0.5							
corrected RT		0.65	0.6	0.55	0.5	0.5	0.5	0.5	0.5
		63	125	250	500	1k	2k	4k	8k
normalised spectrum	road	6	2	-2	-4	-4	-7	-13	-17
shifted spectrum		62	58	54	52	52	49	43	39
Wall:	clad/SFS	35	40	45	50	55	60	65	65
Glazing:	A	23	25	32	39	43	43	53	53
Roof:	masonry	35	40	45	50	55	60	65	65
Vent:	C	35	38	43	48	51	56	58	58
Internal Noise Levels		39	32	21	13	9	5	-9	-13
		20.1							
(63-8kHz)									
		19.2							
(125-4kHz)									

Bedroom night-time $L_{Aeq,8hr}$

$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_{10}}{S} 10^{\frac{-D_{N,e}}{10}} + \frac{S_{W1}}{S} 10^{\frac{-R_{W1}}{10}} + \frac{S_{G1}}{S} 10^{\frac{-R_{G1}}{10}} + \frac{S_{R1}}{S} 10^{\frac{-R_{R1}}{10}} \right) + 10 \times \log_{10} \left(\frac{S}{A} \right) + 3$									
external noise level (free-field)		48	dB						
size/no.									
wall		3.00	m2	0.4	%				
glazing		4.50	m2	0.6	%				
roof		0.00	m2						
vent		2.00	No.						
room reverberation	w (façade)/ T (s)	3 0.5	l/ 	3 	h/ 	2.5 			
corrected RT		0.65	0.6	0.55	0.5	0.5	0.5	0.5	
		63	125	250	500	1k	2k	4k	8k
normalised spectrum	road	6	2	-2	-4	-4	-7	-13	-17
shifted spectrum		54	50	46	44	44	41	35	31
Wall:	clad/SFS	35	40	45	50	55	60	65	65
Glazing:	A	23	25	32	39	43	43	53	53
Roof:	masonry	35	40	45	50	55	60	65	65
Vent:	C	35	38	43	48	51	56	58	58
Internal Noise Levels		34	28	17	8	4	0	-13	-17
									15.4 (63-8kHz)
									14.4 (125-4kHz)

Bedroom night-time L_{Amax}

$Lp(int) = Lp(ext) + 10 \times \log_{10} \left(\frac{A_{10}}{S} 10^{\frac{-D_{N,e}}{10}} + \frac{S_{W1}}{S} 10^{\frac{-R_{W1}}{10}} + \frac{S_{G1}}{S} 10^{\frac{-R_{G1}}{10}} + \frac{S_{R1}}{S} 10^{\frac{-R_{R1}}{10}} \right) + 10 \times \log_{10} \left(\frac{S}{A} \right) + 3$									
external noise level (free-field)		68	dB						
size/no.									
wall		3.00	m2	0.4	%				
glazing		4.50	m2	0.6	%				
roof		0.00	m2						
vent		2.00	No.						
room reverberation	w (façade)/ T (s)	3 0.5	l/ 	3 	h/ 	2.5 			
corrected RT		0.65	0.6	0.55	0.5	0.5	0.5	0.5	
		63	125	250	500	1k	2k	4k	8k
normalised spectrum	road	6	2	-2	-4	-4	-7	-13	-17
shifted spectrum		74	70	66	64	64	61	55	51
Wall:	clad/SFS	35	40	45	50	55	60	65	65
Glazing:	A	23	25	32	39	43	43	53	53
Roof:	masonry	35	40	45	50	55	60	65	65
Vent:	C	35	38	43	48	51	56	58	58
Internal Noise Levels		54	48	37	28	24	20	7	3
									35.4 (63-8kHz)
									34.4 (125-4kHz)

The results demonstrate compliance with the limits presented in Section 3.1.

4.0 Medical Centre Façade Solutions

4.1 Requirements

The Hann Tucker Report confirms operational noise egress from the operation of the medical centre should achieve the following noise limit at the nearest noise sensitive receptors.

With regards to noise break-out MCC request that noise egress from any commercial unit is 5 dBA below the typical background noise level. As such, for this site the day-time noise egress level would be L_{Aeq} 37 dB.

In line with the Hann Tucker Report, noise breakout shall be assessed to the dwellings highlighted green below, which are regarded as the nearest noise sensitive properties.



The Hann Tucker Report advises on worst-case internal reverberant noise levels anticipated within the medical centre (in a busy concourse) as follows.

Description	Estimated Worst-case Reverberant Noise Levels (dB $L_{eq,1hr}$) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
Busy Concourse	55	66	60	59	59.	59	62	67

4.2 Medical Centre Façade Specifications

4.2.1 External Walls

The external walls will comprise outer brick with SFS and internal plasterboard linings. The build-up is the same as specified for the residential areas, as per Section 3.2.1.

4.2.2 Windows

Windows to the health centre will be of the same specification as provided for residential apartments, detailed in Section 3.2.2.

4.2.3 Ventilation

The medical centre will be ventilated by local (internal) heat recovery units. The façade will not contain passive ventilation openings. During normal operating conditions, windows would be closed.

4.3 Noise Breakout Calculation

We have calculated noise egress in line with the following equation.

$$SPL_{out} = SPL_{in} - SRI + 10 \log_{10} \left(\frac{S}{r^2} \right) - 14$$

Where:

SRI is the composite SRI of the façade

S is the total area of the façade

r is the distance between façade and receptor

The composite sound reduction of the façade (to a typical medical room) has been determined as follows.

Element	Area (m2)	63	125	250	500	1k	2k	4k
External wall	6.3	35	40	45	50	55	60	65
Window	14.7	23	25	32	39	43	43	53
Composite	21	24	27	34	40	44	45	54

The following table presents our noise egress calculation.

Desc.	Index	63	125	250	500	1k	2k	4k	dBA
Internal noise level, dB	Leq	55	66	60	59	59	59	62	67
Composite SRI, dB	R	24	27	34	40	44	45	54	-
Distance, radiation propagation, dB	(25metres)	-15	-15	-15	-15	-15	-15	-15	-
Correction, dB	-	-14	-14	-14	-14	-14	-14	-14	-
Noise level at receptor, dB	Leq	2	10	-3	-10	-14	-15	-21	7
Criteria, dB	Leq	-	-	-	-	-	-	-	37
Level difference, dB	Leq	-	-	-	-	-	-	-	-30

The results indicate compliance with the MCC requirement given in Section 4.1.

In the summer months, windows may be open. The sound reduction afforded by the façade with a partially opened window would reduce to circa 13-14 dB. The following table presents our noise egress calculation with windows open.

Desc.	Index	63	125	250	500	1k	2k	4k	dBA
Internal noise level, dB	Leq	55	66	60	59	59	59	62	67
Composite SRI, dB	R	13	14	14	14	14	14	14	-
Distance, radiation propagation, dB	(25metres)	-15	-15	-15	-15	-15	-15	-15	-
Correction, dB	-	-14	-14	-14	-14	-14	-14	-14	-
Noise level at receptor, dB	Leq	13	23	17	16	16	16	19	23
Criteria, dB	Leq	-	-	-	-	-	-	-	37
Level difference, dB	Leq	-	-	-	-	-	-	-	-14

The results with windows open also indicate compliance with the MCC requirement given in Section 4.1.

5.0 Commercial-to-Residential Floor Solution

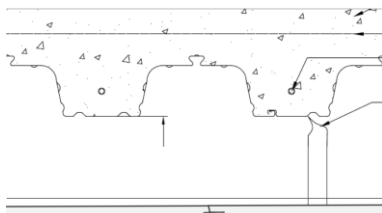
5.1 Requirements

The Hann Tucker Report confirms that, with typical office use in the medical centre, achieving the minimum standards of Building Regulations ADE should be sufficient. This standard is a minimum in-situ airborne sound insulation performance of **45 dB $D_{nT,w} + C_{tr}$** .

However, to ensure operational noise transfer control, we shall provide calculations based on the worst-case operational noise levels presented in Section 4.1 with aim of ensuring resultant L_{eq} noise levels in apartments above is at least 5 dB lower than the anticipated background L_{90} noise level in each octave band, with absolute low frequency limits of 47 dB L_{eq} at 63 Hz and 41 dB L_{eq} at 125 Hz. These requirements align with MCC requirements.

5.2 Floor Specification

The party floor between the L0 medical centre and L1 apartments comprises a composite deck slab with ceiling, as below.

Type	Min. Acoustic Rating	O.S.D (min.)	Construction
Party Floor	45 dB $D_{nT,w} + C_{tr}$ (on-site)	400 mm	 <ul style="list-style-type: none"> Floor Finish with resilient layer. 140mm MD60 composite deck concrete (ca. 2,300 kg/m³). 150 mm (min.) ceiling void. KCS Thermatex/Mediguard Acoustic (Class C, 4.3 kg/m²).

The sound reduction performance of the floor is estimated, based on experience, historic test data for similar systems and with use of Insul software, to achieve the following.

Element	Est. Sound reduction, R (dB) at OBCF (Hz)							R_w (C_{tr}), dB
	63	125	250	500	1k	2k	4k	
Floor	32	38	46	52	57	67	69	55 (-5)

5.3 Assessment

This floor is expected to be capable of satisfying the minimum ADE requirement of 45 dB $D_{nT,w} + C_{tr}$. The floor will be subject to pre-completion testing for Building Control.

The following calculation of noise transfer to apartments above considers a typical bedroom with an anticipated background noise level noise level of ~NR 22 (3 dB below the design limits of NR 25 for services). The calculation therefore sets a receive room criteria of NR 17 with absolute limits at 63 Hz and 125 Hz. The calculation determines maximum permissible noise levels in the medical centre which are then compared against the worst-case operational noise levels set in the Hann Tucker Report.

Medical Centre to Apt (NR17) - Floor										
	L		W		H					
Receive room dimensions:	4	m	3	m	2.5	m		SPL2 = SPL1 + 10log(S/A) - SRI		
	L		W							
Interface dimensions:	4	m	3	m						
Frequency	63	125	250	500	1k	2k	4k	dBA	NR (Full)	NR (250-4k)
Receive Room Criteria	47	41	28	21	17	14	11	28	22	17
Receive Room RT	0.7	0.6	0.5	0.5	0.5	0.5	0.5			
Wall/Floor SRI	32	38	46	52	57	67	69	< Floor: Proposed		
Flanking: Amp. Music (N/A)	0	0	0	0	0	0	0			
Limiting Source Room Lp	77	77	73	72	73	80	79	84		
Hann Tucker Max Leq	55	66	60	59	59	59	62	66		
Level Difference	-22	-11	-13	-13	-14	-21	-17			

The results demonstrate compliance with the MCC requirements by a comfortable margin.

6.0 Substation Noise Control

Please see our Technical Note 22163-TN-1-R0.

The results indicate compliance with all relevant acoustic requirements.

7.0 Conclusion

Jameson Acoustics Limited has been commissioned by Bridgestone Construction Limited to provide acoustic design services to assist in the discharge of Part A of Planning Condition 19 pertaining to the consented residential and medical centre development at Didsbury Point in Manchester.

The report confirms the design intent/specifications to achieve an acoustic insulation scheme in line with the approved Hann Tucker Report and MCC requirements.

Appendix A – Acoustic Terminology

dB	Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted (e.g. $L_{Aeq,T}$ in dB). Noise levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is only just perceptible.
$L_{Aeq,T}$	$L_{Aeq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time measurement period, T .
$L_{10,T}$	L_{10} is the noise level exceeded for 10% of the measurement period T (i.e. the quietest 10% of the measurement) and has, for many years, been used in the assessment of road traffic noise.
$L_{90,T}$	L_{90} is the noise level exceeded for 90% of the measurement period T (i.e. the quietest 10% of the measurement) and is often used to describe the 'background' noise level.
L_{max}	L_{max} is the maximum sound pressure level recorded over the measurement period, T . L_{max} is often used in assessing scheduled environmental noise 'events' (such as train passbys), particularly at night where such events may cause sleep disturbance.
R_w	The weighted sound reduction index, R_w , is a single figure description of sound reduction as defined in BS EN ISO 717-1. It is single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The R_w is calculated from sound insulation measurements taken in an acoustic laboratory. Sound insulation ratings derived from site measurements are invariably lower than the laboratory figures and are referred to as the apparent weighted sound reduction index, R'_w .
$D_{n,e,w}$	The weighted element-normalised level difference, $D_{n,e,w}$, is a single figure description of the sound insulation performance of small building elements, such as a trickle ventilator.
C_{tr}	C_{tr} is correction term applied against the sound insulation single-number values (e.g. R_w) to provide a weighting against low frequency performance. The reference values used within the C_{tr} calculation are based on urban traffic noise.