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dBx File Ref: 20065-L01a

Date: June 16, 2021

Mark Galbraith

Construction Solutions (North West) Limited
3 Bridgewater Street
Lymm
WA13 0AB

Dear Mark,

BLOSSOM STREET – ANCO GYM MEZZANINE ACOUSTIC TESTING

Further to my visit to site on 9th June 2021, please see below results of the acoustic testing undertaken.

CRITERIA

Adequately controlling noise from the gym is required to be demonstrated to discharge planning condition 7, reproduced below;

“7) Notwithstanding noise impact assessment prepared by dBx Acoustics and design and access statement stamped as received by the City Council, as Local Planning Authority, on the 25 February 2019, the updated noise assessment stamped as received by the City Council, as Local Planning Authority, on the 1 July 2019 and the updated noise assessment stamped as received by the City Council, as Local Planning Authority, on the 1 August 2019, in the event commercial unit 1, as indicated on drawings 0276_03_400 Rev D and 0276_03_410 Rev A stamped as received by the City Council, as Local Planning Authority, on the 25 February 2019, is occupied by D2 'gym' use, details of how the unit will be acoustically insulated and treated to limit the break out of noise shall be submitted for approval in writing by the City Council, as Local Planning Authority. This shall include a noise study of the premises and a scheme of acoustic treatment including details of the specification of the flooring. For the avoidance of doubt, where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 10 dB below the LA90 (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location.

(b) The approved scheme shall be implemented and prior to the first use of commercial unit 1 as a gym, 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 which includes testing with free weights and measuring the resultant noise within the upper floor residential accommodation. 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.”

The measurements detailed within this letter report apply to part (b) only.

Manchester City Council's (MCC) requirements for music noise are detailed in their guidance document "Planning & Noise - Technical Guidance", dated December 2015, as reproduced below:

"...a criterion that would achieve a condition of 'inaudible' / 'virtually inaudible' which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be:

'Music noise levels in the 63Hz and 125Hz octave centre frequency bands (Leq) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq), respectively'.

These limits would therefore apply to music noise transfer into adjacent apartments.

The gym is understood to operate in the daytime period (0700-2300h) only.

FLOOR AND WALL CONSTRUCTION

dBx Acoustics were not employed to review the design of the mezzanine gym, and hence the exact floor and wall constructions, and structural interface details are unknown. Indicatively, Flat 4 is understood to be separated from the gym by a blockwork wall, with a 15mm SoundBloc lining on one side, 2 layers of 15mm SoundBloc lining on the other side, the corridor, then the apartment corridor wall (blockwork and plasterboard lining and front door). The floor separating the mezzanine from the flat above is a minimum of 250mm concrete with a suspended ceiling below.

The gym itself has been provided with a 'gym floor' resilient layer, type unknown, provided by TVS Acoustics.

Based on a visual inspection only, it is understood that the mezzanine structural frame is rigidly connected directly onto the structure of the existing building.

MUSIC NOISE LEVELS

Music noise levels can fluctuate significantly between various styles/tracks. However, the music played within the gym is a radio broadcast of dance music, which is heavily limited, and hence reasonably consistent in level. Noise levels measured at the 'worst case'/highest noise levels are shown in Table 1, below, in terms of the overall, A-weighted value, and the values in the 63Hz and 125Hz octave bands, based on MCC's criterion.

Table 1 – Worst Case Music Noise Levels, Blossom Street Gym

Music Noise Level in Gym		
Overall, dBL _{Aeq,T}	63Hz, dBL _{eq,T}	125Hz, dBL _{eq,T}
84	82	93

AIRBORNE SOUND INSULATION

The airborne sound insulation performance of the floor separating the mezzanine gym from the apartment above, and the wall separating the gym from the adjacent mezzanine apartment (including a corridor) was measured. The sound insulation performances measured are shown in Table 2, below.

Table 2 - Measured Sound Insulation Performances

Sound Insulation Performance, $\text{dB}_{\text{DnT,w}} + C_{\text{tr}}$	
Wall (To Flat 4)	Floor (To Flat 13)
64	69

Both of these values are significantly in excess of the minimum requirement of Approved Document E of $45\text{dB}_{\text{DnT,w}} + C_{\text{tr}}$. Test reports are shown in Appendix A.

MUSIC NOISE LEVELS IN APARTMENTS

Music noise from the gym was barely audible in both flats, and measurements were significantly affected by background noise from road traffic breaking in via the glazing, particularly at low frequency. The measured noise levels have therefore been corrected to minimise the impact of the background noise levels, which varied significantly between tests, depending on the traffic flow on Great Ancoats Street, particularly in Flat 13 directly overlooking Great Ancoats Street, where music noise was effectively inaudible when traffic was moving.

On this basis, calculations have also been undertaken to determine the anticipated music noise levels in each apartment, based on the measured music noise levels in the gym, and the measured sound insulation performances, all as detailed in Table 3, below.

Table 3 - Measured and Predicted Music Noise Levels

	Music Noise Levels in Adjacent Flats					
	Wall (Flat 4)			Floor (Flat 13)		
	Overall, $\text{dBL}_{\text{Aeq,T}}$	63Hz, $\text{dBL}_{\text{eq,T}}$	125Hz, $\text{dBL}_{\text{eq,T}}$	Overall, $\text{dBL}_{\text{Aeq,T}}$	63Hz, $\text{dBL}_{\text{eq,T}}$	125Hz, $\text{dBL}_{\text{eq,T}}$
Measured Noise Level with Music	32	51*	44*	-	-	-
Predicted Music-Only Noise Level	28	33	39	23	35	37

* Affected by fluctuating background noise levels

As can be seen from Table 3, above, the predicted values, based on the measured sound insulation performance of the partitions, are significantly lower than MCC's criterion, which is unsurprising given the extremely high airborne sound insulation performances measured. Although the music is just perceptible when all appliances are switched off and during lulls in traffic, it was barely audible if not inaudible during periods of traffic movement, or with appliances operating. The measured and predicted noise levels are significantly lower than the daytime ambient noise level limit to promote appropriate conditions for residential amenity of $35\text{dBL}_{\text{Aeq,T}}$, as defined in BS8233.

I trust this is helpful at this stage, but if you have any further comments or queries, please call or email.

Yours sincerely,

Ben Tomlin

PRINCIPAL ACOUSTIC CONSULTANT

ben@dbxacoustics.com

Checked By: Susan Witterick (Director)

APPENDIX A – TEST RESULTS

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

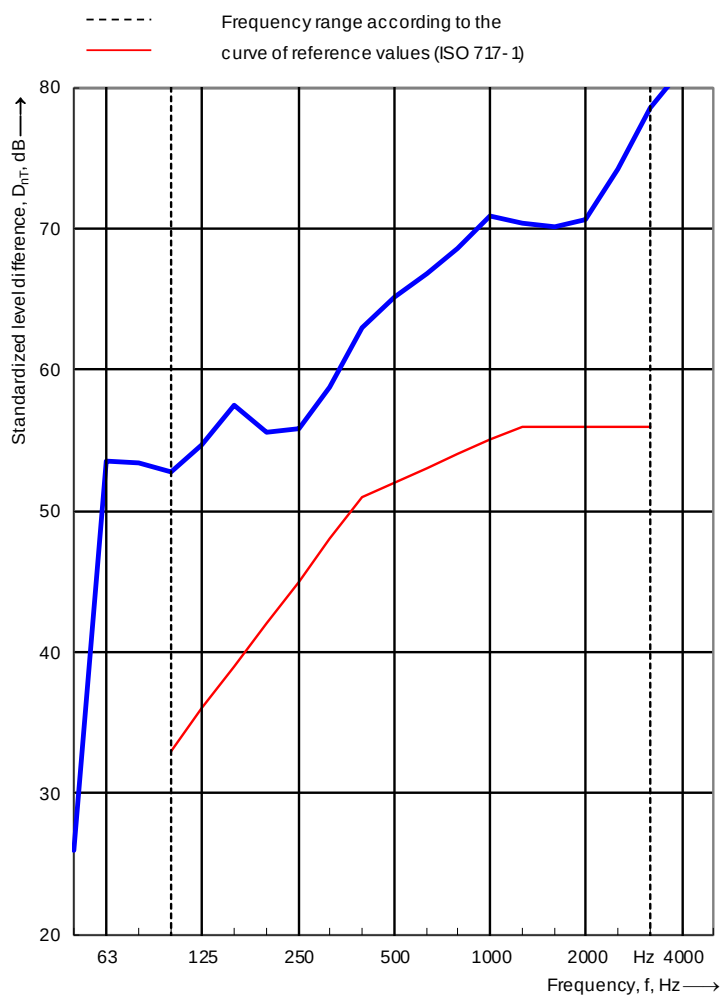
Client: Construction Solutions

Date of test: 9/6/2021

Description: Anco Gym, Blossom St

Object: Gym to Flat 4 via Wall/Corridor

Frequency f [Hz]	D_{nT} 1/3 octave [dB]
50	25.9
63	53.5
80	53.4
100	52.7
125	54.7
160	57.5
200	55.5
250	55.8
315	58.7
400	63.0
500	65.1
630	66.8
800	68.6
1000	70.9
1250	70.4
1600	70.1
2000	70.6
2500	74.2
3150	78.5
4000	81.3
5000	81.9



Rating according to ISO 717-1

$D_{nT,w}(C;C_{tr}) = 68$ (-1 ; -4) dB

Evaluation based on field measurements results obtained in one-third octave bands by an engineering method.

$C_{50-3150} = -5$ dB $C_{50-5000} = -4$ dB $C_{100-5000} = 0$ dB

$C_{tr,50-3150} = -17$ dB $C_{tr,50-5000} = -17$ dB $C_{tr,100-5000} = -4$ dB

Company:

No. of test report: 20065/W1

Date: 10/06/2021

Signature:

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

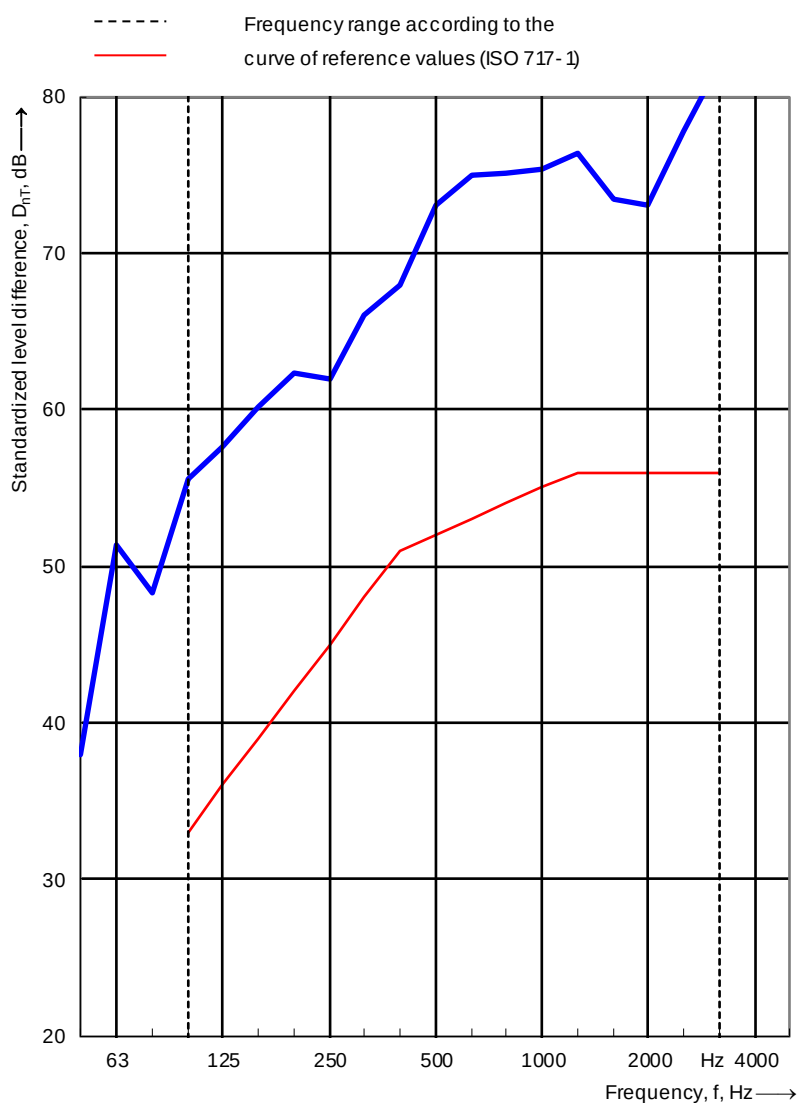
Client: Construction Solutions

Date of test: 9/6/2021

Description: Anco Gym, Blossom St

Object: Gym to Flat 13, Floor

Frequency f [Hz]	D_{nT} 1/3 octave [dB]
50	37.9
63	51.3
80	48.3
100	55.6
125	57.6
160	60.1
200	62.3
250	61.9
315	66.0
400	67.9
500	73.1
630	74.9
800	75.1
1000	75.3
1250	76.3
1600	73.4
2000	73.0
2500	77.8
3150	82.1
4000	83.2
5000	83.4



Rating according to ISO 717-1

$D_{nT,w}(C;C_{tr}) = 73 \text{ (-1 ; -4) dB}$

Evaluation based on field measurements results obtained in one-third-octave bands by an engineering method.

$C_{50-3150} = -2 \text{ dB}$ $C_{50-5000} = -2 \text{ dB}$ $C_{100-5000} = 0 \text{ dB}$

$C_{tr,50-3150} = -12 \text{ dB}$ $C_{tr,50-5000} = -12 \text{ dB}$ $C_{tr,100-5000} = -4 \text{ dB}$

Company:

No. of test report: 20065/F1

Date: 10/06/2021

Signature: