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AUDIO SCHEMES LTD

16 CURZON ROAD, OFFERTON

FAÇADE SOUND INSULATION TESTING

7 APRIL 2021

1328-AF-00001-01

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DOCUMENT REFERENCE: 1328-AF-00001-01

REVIEW AND AUTHORISATION			
Authored and approved by Adrian Finn	**Position** Director	**Signature** 	**Date** 07/04/2021

AMENDMENT HISTORY			
Issue	**Status**	**Description**	**Date**
01	Draft	Report issued as draft	07/04/2021

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1. INTRODUCTION

1.1.1 AF Acoustics was commissioned by Audio Schemes Ltd to undertake a façade sound insulation test to ascertain the acoustic performance of the newly installed studio at 16 Curzon Road, Offerton, Stockport.

2. TESTING SCHEDULE

2.1.1 The façade sound insulation testing was undertaken on 6 April 2020 by by Adrian Finn, MIOA.

2.1.2 The sound insulation tests detailed in this report were undertaken in full accordance with BS EN ISO 16283-3:2016 “Acoustics — Field measurement of sound insulation in buildings and of building elements Part 3: Façade sound insulation.” The global loudspeaker method was used and the level difference calculated.

2.1.3 This report records the results of the sound insulation tests and details the procedures used throughout the measurement and post-processing phases.

3. METHODOLOGY

3.1 Global loudspeaker method

Outdoor sound pressure level measurements near the façade

3.1.1 High volume “pink” noise was generated at one loudspeaker positions and the average outdoor sound pressure level at a distance 2m in front of the façade was measured of the resulting one-third octave band noise levels between 50 Hz and 5000 over a minimum period of 60 seconds.

3.1.2 The loudspeaker was placed outside the studio on the ground, 7m from the centre of the façade of the building that was subject to the façade sound insulation test.

3.1.3 The results of the tests were rated in accordance with BS EN ISO 717-1: 1997 “Rating of sound insulation in buildings and of building elements. Part 1 Airborne sound insulation”

Indoor measurements

3.1.4 With the loudspeaker in the same position outside, generating High volume “pink” noise the indoor noise levels were measured between 100 Hz and 5000 over a minimum period of 60 seconds, using the manually scanned microphone technique.

3.1.5 As the volume of the room was smaller than 25m^3, in order to calculate the 50 Hz, 63 Hz, and 80 Hz one-third octave bands levels, sound pressure level measurements were taken close to the corners of the room to identify the corner with the highest level in each band. For the low-frequency procedure, a fixed microphone shall be positioned in room corners at a distance of 0.3 m to 0.4 m from each room boundary that forms the corner. A minimum of four corners were measured using a manually-held microphone. Two corners were at ground level and two corners should be at ceiling level. For the low-frequency procedure, the averaging time at each individual microphone position shall be at least 15 s.

3.2 Reverberation Time

3.2.1 Reverberation time measurements were taken following the procedure described below in order to correct the receiver levels for room characteristics.

3.2.2 A minimum of 6 reverberation times were measured in each room using a minimum of 3 microphone positions at each of the two loudspeaker positions in accordance with BS EN ISO 354:2003 (also complies with BS EN 20354).

3.3 Background Noise

3.3.1 The background noise levels in the receiver rooms were measured during the tests and the receiving room levels corrected in accordance BS EN ISO 16283-3:2016.

3.3.2 The main source of background noise observed during the tests was local traffic noise from adjacent roads.

4. INSTRUMENTATION

4.1.1 The instrumentation used during testing is shown in Table 4.1 below.

Name	Serial Number	Last Calibrated
Norsonic 118 Class 1 Sound Level Meter	31382	February 2020
Norsonic 1206 Pre-amplifier	30416	February 2020
Gras 40AF Microphone	150690	February 2020
Norsonic 1251 Sound Calibrator	30900	March 2021

TABLE 4.1: INSTRUMENTATION USED DURING TESTING

5. TESTS

5.1.1 Details of the façade tested are shown in Table 5.1 below.

Test Element	Room	Construction
Facade	Studio	The façade wall construction is unknown.

TABLE 5.1: - ROOM DETAILS

6. RESULTS

6.1.1 The results of the testing are summarised in the tables below. For airborne tests, the higher the value, the better the performance.

6.2 Façade Sound Insulation Tests

6.2.1 The summarised results of façade airborne tests are shown in Table 6.1.

Test Element	Receiver	Test Result
Facade	Studio	70 dB $D_{ls,2m,nT}$

TABLE 6.1: PRE-WORKS FAÇADE SOUND INSULATION TEST RESULTS

7. NOISE BREAKOUT

7.1.1 A worst-case scenario of the noise levels in a similar studio was measured. The measured noise level was approximately 6 dB louder than the engineer would typically listen to. The measured noise level is shown below in Table 7.1. This is considered a worst-case scenario.

Function	Sound Pressure Level, dB							
	Octave band mid-frequency, Hz							
	63	125	250	500	1000	2000	4000	dBA
Control Room	82.1	81.5	75.6	76.6	71.3	63.2	60.8	77

TABLE 7.1: MEASURED NOISE LEVEL IN THE CONTROL ROOM

7.1.2 Using the noise levels shown above in Table 6.1 the noise levels at the residential receptor which is the main residential building of 16 Curzon Street, 10.2m away from the studio have been calculated to be <10dB, which would be inaudible in most circumstances.

8. DISCUSSION AND CONCLUSION

8.1.1 AF Acoustics was commissioned by Audio Schemes Ltd to undertake a façade sound insulation test to ascertain the acoustic performance of the newly installed studio at 16 Curzon Road, Offerton, Stockport.

8.1.2 The façade sound insulation test show a sound insulation of 70 dB $D_{ls,2m,nT}$.

8.1.3 To put a 70 dB sound insulation of the façade into context, noise conventionally is measured in decibels (dB). The decibel is a logarithmic unit and decibel levels do not add and subtract arithmetically. An increase or decrease of 3 dB in the level of a steady noise is about the smallest that is noticeable by most human ears. It represents a doubling or halving of noise energy. An increase or decrease of 10 dB represents a ten-fold change in noise energy, and is perceived as a doubling or halving of loudness. A reduction of 70 dB is a SPL reduction of 100% and a human perceived volume reduction of 99%.

8.1.4 Test certificates are given in Appendix B.

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APPENDIX A: LIMITATIONS TO THE REPORT

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorisation of AF Acoustics Ltd. AF Acoustics Ltd accepts no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/or AF Acoustics Ltd and agree to indemnify AF Acoustics Ltd for any and all loss or damage resulting therefrom. AF Acoustics Ltd accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned.

The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations AF Acoustics Ltd reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

APPENDIX B: FIGURES

Apparent sound reduction index measured in accordance with ISO 16283-3
Field measurements of facade sound insulation

Client: Audio Schemes Ltd Date of test: 06/04/2021

Description and identification of the building construction and the test arrangement, direction of measurement:

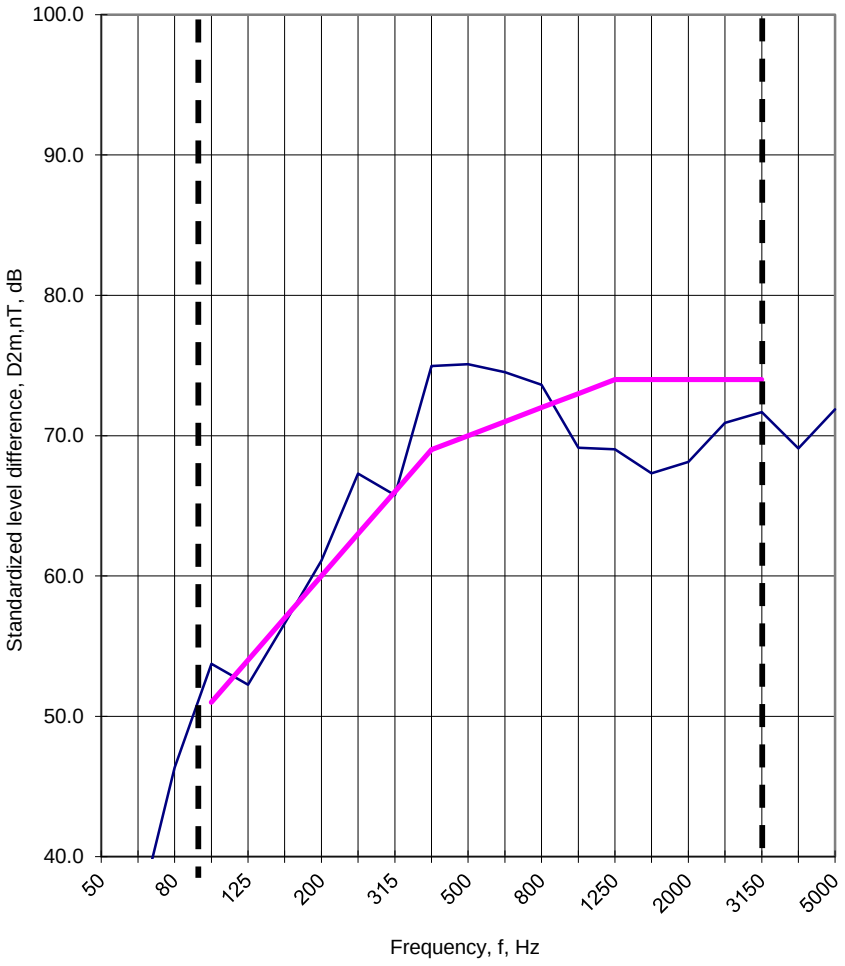
Facade, External to Studio
Construction details: The façade constructionis unknown.

Area of common partition 10 m^3
Receiving room volume: 22 m^3

Frequency range according to the curve of reference values (ISO 717-1)

Frequency f Hz	D_{2m} (one-third octave) dB
50	21.9
63	35.7
80	46.3
100	53.7
125	52.2
160	56.6
200	61.1
250	67.3
315	65.8
400	75.0
500	75.1
630	74.5
800	73.6
1000	69.1
1250	69.0
1600	67.3
2000	68.1
2500	70.9
3150	71.7
4000	69.1
5000	71.9

* Signifies value at limit of measurement



Rating according to ISO 717-1

$D_{ls,2m,nT}$ (C;Ctr) = 70 (-2 ; -4) dB

$C_{50-3150}$	-9 dB	$C_{50-5000}$	-9 dB	$C_{100-5000}$	-1 dB
$C_{tr,50-3150}$	-23 dB	$C_{tr,50-5000}$	-23 dB	$C_{tr,100-5000}$	-4 dB

Evaluation based on field measurement results obtained by an engineering method

Name of test company : AF Acoustics
Signature: