

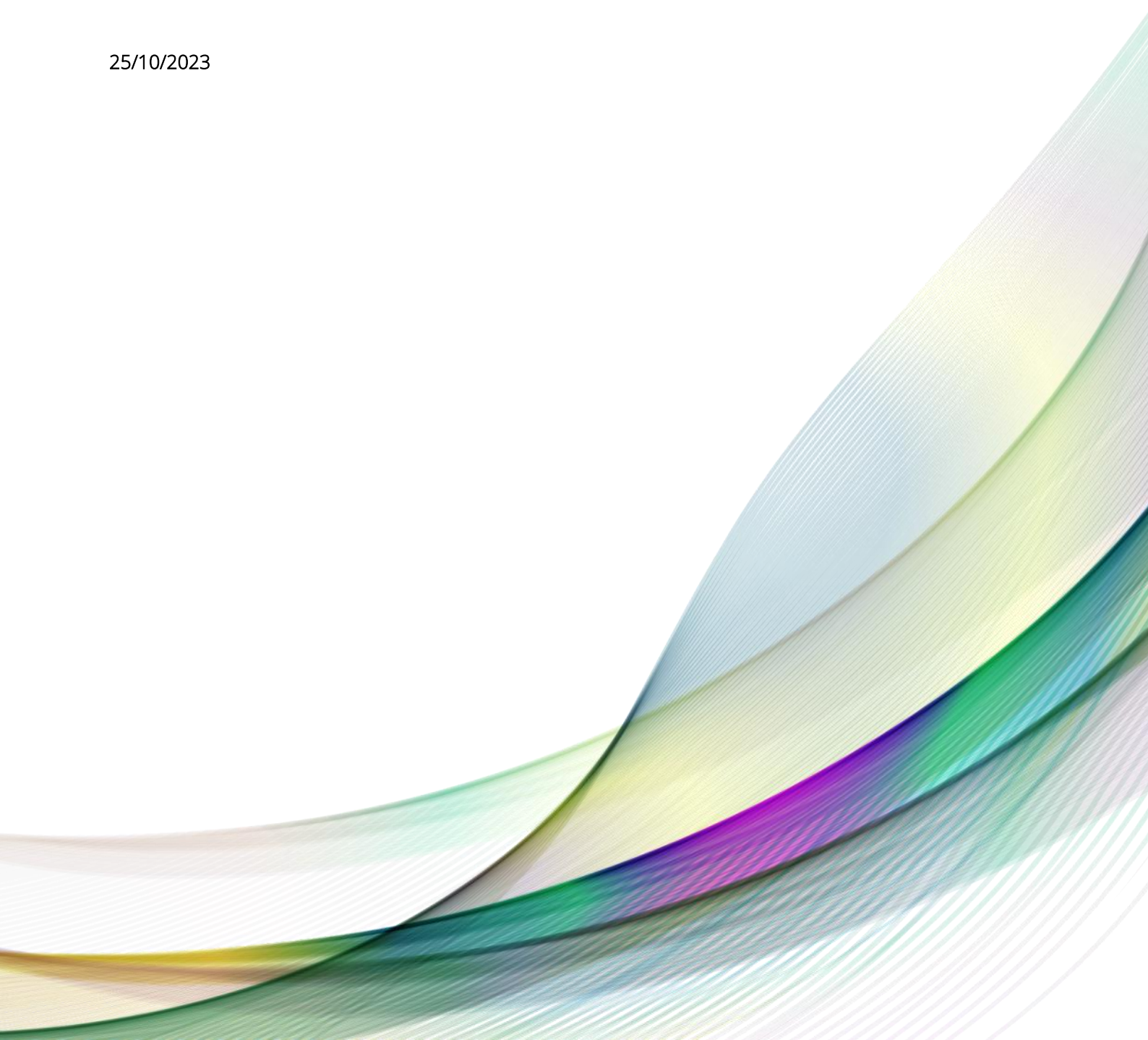


# HNCC C BLOCK

---

## PART-E SOUND INSULATION TEST REPORT

25/10/2023



Revision	Description	Issued by	Checked By	Issue date
-	Part E Test Results	Chase Bartlett	Ze Nunes	25/10/2023

Signed: Signed: 

ANC Member Number 179

ANC Task Number 76631

ANC Password CK1P0N

Client Name FARRANS

Full Client Address 25 Bertram St, London N19 5DQ

Full Site Address 25 Bertram St, London N19 5DQ

Test Date 16/10/2023

**MACH Acoustics Ltd**3rd Floor 1 York Court  
Upper York Street  
Bristol  
BS2 8QF  
0117 944 1388Eagle House  
163 City Road  
London  
EC1V 1NR  
0203 488 4559info@machacoustics.com  
www.machgroup.com



## Notice to Building Control Officer

### Certification of Test Results

ANC operates an online, secure, paperless certification system for sound insulation tests.

The online verification (certification) system means that Building Control Bodies will need to follow the steps below to verify the results quoted in the relevant test report:

1. Go to the ANC secure server at [www.theanc.co.uk](http://www.theanc.co.uk)
2. Navigate to the [ADvANCE](#) page which links to the ANC site available for use by BCOs.
3. Enter the following in the spaces provided:  
  
Task Number: **76631**                      Task Password: **CK1P0N**
4. Select role "Building Control Officer" and press "Login"
5. You will then see a summary list of results of all the Tests undertaken to date for this project (Task) as held on the secure primary server and you can print this table for your records.

---

**TABLE OF CONTENTS**

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>5</b>
<b>2.0</b>	<b>SOUND INSULATION PERFORMANCE STANDARDS .....</b>	<b>5</b>
<b>3.0</b>	<b>TESTING REQUIREMENTS .....</b>	<b>6</b>
<b>4.0</b>	<b>TEST PROCEDURE .....</b>	<b>6</b>
4.1	Deviations from Test Procedure .....	6
<b>5.0</b>	<b>MEASUREMENT EQUIPMENT .....</b>	<b>6</b>
5.1	Calibration .....	6
<b>6.0</b>	<b>RESULTS .....</b>	<b>7</b>
6.1	Airborne Wall Tests .....	7
6.2	Description of Constructions Tested .....	7
6.3	Background Noise .....	8
<b>7.0</b>	<b>CONCLUSION .....</b>	<b>9</b>
<b>8.0</b>	<b>REFERENCES .....</b>	<b>10</b>
<b>APPENDIX A - TEST PROCEDURE .....</b>		<b>11</b>
<b>APPENDIX B - ANALYSIS PROCEDURE .....</b>		<b>13</b>
<b>APPENDIX C – TEST CERTIFICATES .....</b>		<b>15</b>

## 1.0 INTRODUCTION

MACH Group was engaged to carry out sound insulation tests on a residential development at HNCC C Block. This report is an ANC registered report with the unique registration number 76631 (MACH - ANC registered number 179 at the time of testing). Tests were undertaken by Jos Melliush of MACH on the 16/10/2023. All the procedures in Annex B of the Approved Document E to the building regulations have been followed.

## 2.0 SOUND INSULATION PERFORMANCE STANDARDS

The adopted standard for 'Approved Document E (ADE) Resistance to the Passage of Sound' of the Building Regulations (England and Wales) came into force in 1st July 2003. This document stipulates minimum requirements for the sound insulation levels within residential dwellings. Approved Document E states:

*"In the Secretary of State's view, the normal way of satisfying Requirements E1 will be to build separating walls, separating floors and stairs that have a separating function, together with associated flanking construction, in such a way that they achieve the sound insulation values for dwelling-houses and flats set out in Table 1a, and the values for residential purposes set out in Table 1b."*

Table 1a of ADE 2003 summarises the sound insulation performance standards for dwelling houses and flats.

Table 1a: Dwelling-houses and flats – performance standards separating walls, separating floors, and stairs that have a separating function.		
	Airborne sound insulation $D_{nT,w}+C_{tr}$ dB (Minimum Values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum Values)
<b>Purpose built dwelling houses and flats</b>		
Walls	45	-
Floors and stairs	45	62
<b>Dwelling-houses and flats formed by material change of use</b>		
Walls	43	-
Floors and stairs	43	64

**Table 2.1 – ADE 2003 sound insulation performance standards – Dwelling houses and flats (Table 1a)**

### 3.0 TESTING REQUIREMENTS

Approved Document E states that at least one set of tests per 10 dwellings in a group or sub-group should be undertaken. Where applicable, one set of tests should comprise of 6 individual sound insulation tests (2 airborne wall tests, 2 airborne floor tests and 2 impact floor tests).

The development consists of:

- Two new build houses.

In order to satisfy the requirements of Approved Document E, 2 individual sound insulation tests have been carried out (2 airborne wall tests, 0 airborne floor tests and 0 impact floor tests).

### 4.0 TEST PROCEDURE

The sound insulation testing was carried out in full accordance with the procedure described in BS EN 140 'Acoustics – Measurement of Sound Insulation in Buildings and of Building Elements'. All of the procedures in Annex B of the Approved Document E to the building regulations have been followed. Appendix A provides further information of the test procedure used along with a list of standards followed.

#### 4.1 Deviations from Test Procedure

None.

### 5.0 MEASUREMENT EQUIPMENT

The following equipment was used to carry out the sound insulation testing.

Item	Serial No.	Last Calibration	Certificate No.	Calibration Due
NTI Precision Sound Analyser XL2 TA	A2A-15207-E0	02/02/2023	186910	02/02/2025
NTI Pre-amplifier MA220	7856	02/02/2023	186910	03/02/2025
Cirrus Microphone Capsule MK:224	215285E	02/02/2023	186889	01/02/2025
Svante Acoustic Calibrator SV31	32527	05/12/2022	184229	05/12/2023
01dB & Sound Solutions Products Limited TM01 Tapping Machine	TP02335	14/10/2022	TP02335/10/22	14/10/2024
QTX Speakers x 2	-	-	-	-

Table 5.1 - Test equipment used on site.

#### 5.1 Calibration

The Sound Level Meter was calibrated on site, at the start and end of the measurement sequence, to a level of 114.0 dB at 1000Hz. No drift was noted.

## 6.0 RESULTS

The test procedures in Annex B of ADE have been followed in full. The results of these tests are summarised below:

### 6.1 Airborne Wall Tests

Test	Source Room	Approx. Volume (m <sup>3</sup> )	Receiver Room	Approx. Volume (m <sup>3</sup> )	ADE Requirement dB D <sub>nT,w</sub> + C <sub>tr</sub>	Measured Sound Insulation	Pass / Fail
ABW 1	Mews House 01 kitchen	30	Mews House 02 kitchen	30	DnTw + Ctr ≥ 45	54	Pass
ABW 2	Mews House 01 Living/Dining	65	Mews House 02 Living/Dining	65	DnTw + Ctr ≥ 45	53	Pass

Table 6.1 - Results of airborne walls sound insulation testing

The table indicates all tested areas have passed.

### 6.2 Description of Constructions Tested

The party wall construction tested has been identified as 15mm Gyproc SoundBloc, Adhesive Dabs, 100mm Blockwork (SM: 130kg/m<sup>2</sup>), 75mm Cavity fully filled with Isover APR 1200, 100mm Blockwork (SM: 130 kg/m<sup>2</sup>), Adhesive Dabs and 15mm Gyproc SoundBloc.

### **6.3 Background Noise**

Construction noise constitutes the main source of noise on site, Background noise levels are intermittent due to construction noise during the test procedure.

Where receiver room measurements are between 6 and 10 dB above measured background noise levels, a correction has been applied as outlined in ISO 140-4. Where 1/3 octave results are seen to be at the limit of measurement, a correction has also been applied in line with ISO 140-4. All 1/3 octave results at the limit of measurement have been indicated within the test certificates presented in Appendix C. Procedure for correction is outlined in Appendix B.



## **7.0 CONCLUSION**

In order to demonstrate compliance with the requirements of Approved Document E (ADE), sound insulation testing has been undertaken at HNCC C Block. The sound insulation testing was carried out in full accordance with the procedure described in BS EN 140-4 and BS EN 140-7 'Acoustics – Measurement of Sound Insulation in Buildings and of Building Elements'.

## 8.0 REFERENCES

Approved Document E – The Building Regulations 2010 – Resistance to the passage of sound, July 2003

BS EN ISO 140-4:1998 – Acoustics – Measurement of sound insulation in buildings and of building elements  
– Part 4: Field measurements of airborne sound insulation between rooms.

BS EN ISO 140-7:1998 – Acoustics – Measurement of sound insulation in buildings and of building elements  
– Part 4: Field measurements of impact sound insulation between rooms.

BS EN ISO 717-1: 1997: Acoustics - Rating of sound insulation in buildings and of building elements –  
Airborne sound insulation.

BS EN ISO 717-2: 1997: Acoustics - Rating of sound insulation in buildings and of building elements –  
Impact sound insulation.

## APPENDIX A - TEST PROCEDURE

The sound insulation testing was carried out according to the procedure described in Annex B of Approved Document E and in full accordance with the following standards:

- BS EN ISO 140-4: 1998: Field measurements of airborne sound insulation between rooms.
- BS EN ISO 140-7: 1998: Field measurements of impact sound insulation of floors.

**Note:** All measurements described below were undertaken using simultaneously recorded 1/3 octave frequency bands between 100 – 3150 Hz.

### A.1 Airborne Sound Insulation - Testing Procedure

1. Two sources of white noise were placed in the 'source' room such that a diffuse sound field was created within the room.
2. Spatially averaged noise levels were recorded in the 'source' room using the moving microphone method for a minimum sample period of 45 seconds.
3. Noise levels were recorded in the 'receiver' room at 5 discrete locations, for a minimum sample period of 6 seconds at each location. The following minimum separating distances were used between measurement locations;
  - 0.7 m between microphone positions
  - 0.5 m between any microphone position and the room boundaries
  - 1.0 m between any microphone position and the sound source.

The 5 samples measured in the 'receiver' room were then logarithmically averaged to give the 'receiver' room noise level. Although a moving microphone has been employed within the 'source' room, discrete locations have been employed in the 'receiver' room in order to avoid measurement of unwanted noise (eg movement of the engineer).

4. Reverberation time measurements were undertaken within the 'receiving' room using an interrupted noise method (loudspeaker). 6 measurements of reverberation time were undertaken at discrete positions within the room. The following minimum separating distances were used between measurement locations;
  - 0.7 m between microphone positions
  - 0.5 m between any microphone position and the room boundaries
  - 1.0 m between any microphone position and the sound source.
5. Finally, background noise measurements were taken at 6 fixed microphone positions in the 'receiver' room, for a sample period of 6 seconds at each position. These were logarithmically averaged to establish the background noise level.

## A.2 Impact Sound Insulation - Testing Procedure

1. A single tapping machine was used, positioned at 4 different locations. 6 fixed microphone positions were measured. A minimum duration of 6 seconds was used for each measurement. The average sound pressure level in the receiver room was determined by logarithmically averaging the samples recorded.

Where the floor construction has an anisotropic construction (with ribs, beams etc.). The hammer connecting line has been orientated at 45° to the direction of the ribs/beams.

The following minimum separating distances have been used:

- 1.0 m between microphone and the upper floor being excited by the tapping machine.
  - 0.7 m between microphone positions
  - 0.5 m between any microphone position and the room boundaries
2. Reverberation time measurements were undertaken within the 'receiving' room using an interrupted noise method (loudspeaker). 6 measurements of reverberation time were undertaken at discrete positions within the room. The following minimum separating distances are used between measurement locations;
    - 0.7 m between microphone positions
    - 0.5 m between any microphone position and the room boundaries
    - 1.0 m between any microphone position and the sound source.
  3. Finally, background noise measurements were taken at 6 fixed microphone positions in the 'receiver' room, for a sample period of 6 seconds at each position. These were logarithmically averaged to establish the background noise level.

## APPENDIX B - ANALYSIS PROCEDURE

The sound insulation testing analysis was carried out according to the procedure described in Annex B of Approved Document E and in full accordance with the following standards:

- BS EN ISO 717-1: 1997: Acoustics - Rating of sound insulation in buildings and of building elements – Airborne sound insulation.
- BS EN ISO 717-2: 1997: Acoustics - Rating of sound insulation in buildings and of building elements – Impact sound insulation.

### B.1 Airborne Sound Insulation - Analysis Procedure

If the sound pressure levels in the receiver room are less than 10 dB above the background noise levels (but still greater than 6 dB above the background noise), the following correction will be applied to the measured receiver room levels:

$$L = 10 \log(10^{L_{sb}/10} - 10^{L_b/10}) \text{ dB}$$

Where:

- L = adjusted signal level, dB
- $L_{sb}$  = level of signal and background noise combined, dB
- $L_b$  = background noise level, dB

If the sound pressure levels in the receiver room are 6 dB or less above measured background noise, the correction 1, 3 dB is applied, corresponding to a difference of 6 dB.

Noise levels within the receiver room are then subtracted from the measured noise levels in the source room, thus providing the sound level difference in each 1/3 octave band.

Sound level differences are then corrected for reverberation time in the receiver room to a standardised time of 0.5 seconds, which is considered to be typical of reverberant conditions in most domestic properties.

The following formula describes the above process for each 1/3 octave band centre frequency:

$$D_{nT} = D + 10 \log\left(\frac{T}{T_0}\right)$$

Where:

- $D_{nT}$  = Standardised level difference
- D = Measured sound level difference
- T = Measured reverberation time in the 'receive' room
- $T_0$  = Reference reverberation time (0.5 seconds)

Each 1/3 octave band  $D_{nT}$  value is then compared against a standard curve, as defined in BS EN ISO 717-1 and shifted in 1 dB increments, until a point is found where the value of deviations on the measured curve from the standard curve is as close to 32 dB as possible, without exceeding this value. The value of the

shifted standard curve in the 500 Hz 1/3 octave band centre frequency band is then taken to be the single figure weighted standardised level difference ( $D_{nT,w}$ ).

A further low frequency correction is then calculated from the same 1/3 octave band values in full accordance with BS EN ISO 717-1 and this value is added to the previous value. This gives an overall standardised level difference of  $D_{nT,w} + C_{tr}$  which may then be directly compared against the minimum airborne sound insulation requirements in Approved Document E of the Building Regulations.

## B.2 Impact Sound Insulation - Analysis Procedure

If the sound pressure levels in the receiver room are less than 10 dB above the background noise levels (but still greater than 6 dB above the background noise), the following correction will be applied to the measured receiver room levels:

$$L = 10 \log(10^{L_{sb}/10} - 10^{L_b/10}) \text{ dB}$$

Where:

- L = adjusted signal level, dB
- $L_{sb}$  = level of signal and background noise combined, dB
- $L_b$  = background noise level, dB

If the sound pressure levels in the receiver room are 6 dB or less above measured background noise, the correction 1, 3 dB is applied, corresponding to a difference of 6 dB.

The noise levels in the receiver room are then corrected for the reverberation time in the 'receiver' room to a standardised time of 0.5 seconds, which is considered to be typical of reverberant conditions in most domestic properties.

The following formula describes the above process for each 1/3 octave band centre frequency:

$$L'_{nT} = L_i - 10 \log\left(\frac{T}{T_0}\right)$$

Where:

- $L'_{nT}$  = Standardised impact sound level
- $L_i$  = Measured impact sound level
- T = Measured reverberation time in the 'receive' room
- $T_0$  = Reference reverberation time (0.5 seconds)

Following the above, each 1/3 octave band  $L'_{nT}$  value is compared against a standard curve, as defined in BS EN ISO 717-2 and shifted in 1 dB increments until a point is found where the value of deviations on the measured curve from the standard curve is as close to 32 dB as possible but does not exceed this value. The value of the shifted standard curve in the 500 Hz 1/3 octave band centre frequency band is then taken to be the single figure weighted standardised impact sound pressure level ( $L'_{nT,w}$ ). This figure may be directly compared against the minimum impact sound insulation requirements in Approved Document E of the Building Regulations.

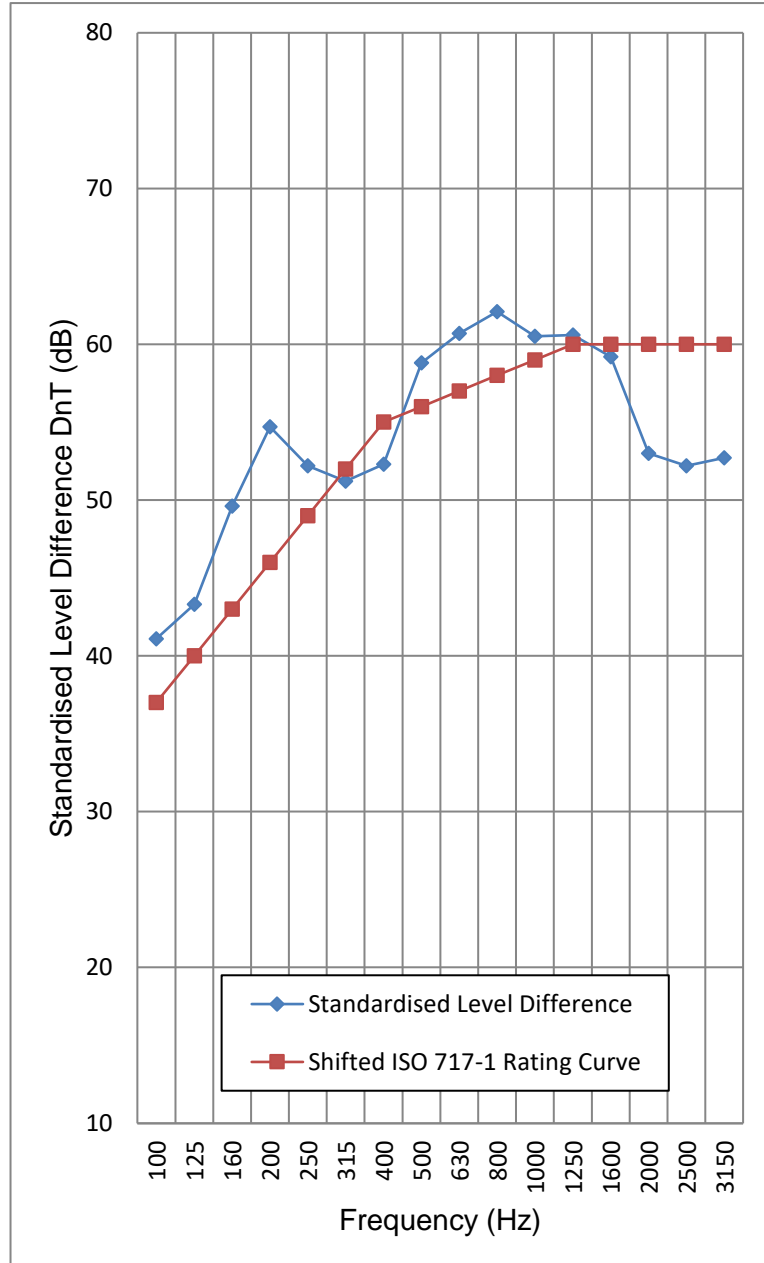
## APPENDIX C – TEST CERTIFICATES

Test certificates for all tests conducted are provided below.

**Standardized level difference according to ISO 16283-1. Field measurements of airborne sound insulation between rooms**

Site: HNCC C Block      Test date: 2023-10-16      Test No: 179 : ABW1  
Client: FARRANS  
Source Room: Mews House 01 kitchen      Receiver Room: Mews House 02 kitchen  
Volume (m3): 30      Volume (m3): 30  
Construction: .

Frequency f (Hz)	DnT (1/3 Octave) dB
50	29.6
63	31.6
80	35.9
100	41.1
125	43.3
160	49.6
200	54.7
250	52.2
315	51.2
400	52.3
500	58.8
630	60.7
800	62.1
1000	60.5
1250	60.6
1600	59.2
2000	53
2500	52.2
3150	52.7
4000	52.6
5000	51.3



Rating according to ISO 717-1

**DnT,w = 56 dB**  
Ctr = -2 dB

**DnT,w + Ctr = 54 dB**

**Dw = 56 dB**

DnT,w + C = 55 dB

DnT,w + Ctr 50-3150 = 49 dB

DnT,w + Ctr 50-5k = 49 dB

DnT,w + C 50 - 5k = 54 dB

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

No. of Test Report: 1180

Name of Test Institute: MACH

Date: 2023-10-16

Signature:

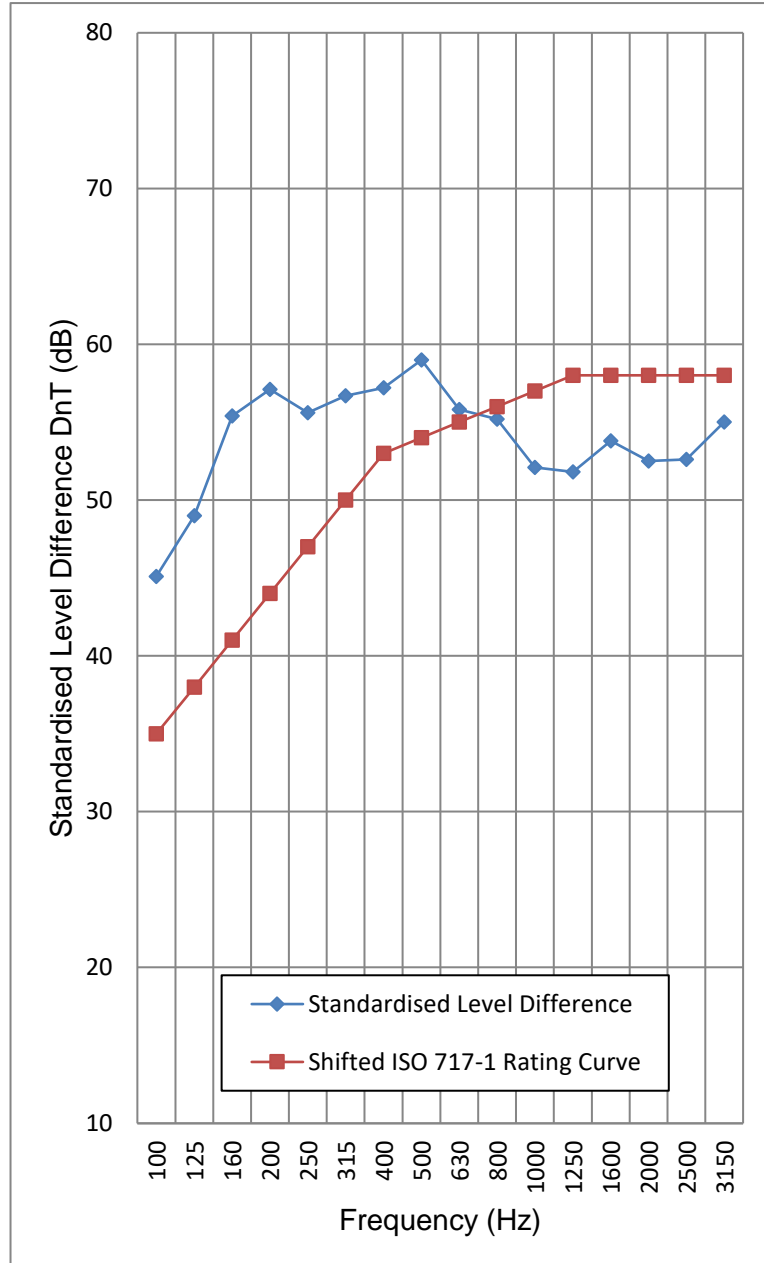
*[Signature]*



**Standardized level difference according to ISO 16283-1. Field measurements of airborne sound insulation between rooms**

Site: HNCC C Block      Test date: 2023-10-16      Test No: 179 : ABW2  
Client: FARRANS  
Source Room: Mews House 01 Living/Dining      Receiver Room: Mews House 02 Living/Dining  
Volume (m3): 65      Volume (m3): 65  
Construction: .

Frequency f (Hz)	DnT (1/3 Octave) dB
50	27.8
63	34.9
80	43.3
100	45.1
125	49
160	55.4
200	57.1
250	55.6
315	56.7
400	57.2
500	59
630	55.8
800	55.2
1000	52.1
1250	51.8
1600	53.8
2000	52.5
2500	52.6
3150	55
4000	57.2
5000	58.2



Rating according to ISO 717-1

**DnT,w = 54 dB**  
Ctr = -1 dB

**DnT,w + Ctr = 53 dB**

**Dw = 54 dB**

DnT,w + C = 53 dB

DnT,w + Ctr 50-3150 = 49 dB

DnT,w + Ctr 50-5k = 49 dB

DnT,w + C 50 - 5k = 54 dB

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

No. of Test Report: 1180

Name of Test Institute: MACH

Date: 2023-10-16

Signature:

*Barthel*