fisher acoustics

Flint Glass Works
64 Jersey Street
Manchester M4 6JW

0161 605 0905
info@fisheracoustics.co.uk
www.fisheracoustics.co.uk

MPF/PR0514/L03

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Jack Haw
Turley Associates
10th Floor
1 New York Street
Manchester
M1 4HD

Dear Jack

**MASSEY CHAMBERS, BOOTH STREET, MANCHESTER**

Further to recent discussions, I write in relation to the revised Planning Application for the basement of Massey Chambers to provide back of house facilities for the King Street Townhouse hotel on Booth Street.

Fisher Acoustics letter reference MPF/PR0514/L01, dated 17 April 2015, provided an acoustic assessment of noise transfer between the basement of Massey Chambers and the existing residential apartments above.

In particular, the letter provided the results of sound insulation measurements that identified the existing sound level difference between the basement and the apartments given the existing party floor construction of a substantial brick barrel vaulted ceiling with a joisted timber floor above.

Table 1 compares the measured airborne sound insulation of the party floor with the basic requirements of Approved Document E of the Building Regulations. The measurements show that the sound insulation performance of the existing party floor substantially exceeds the minimum requirements of Approved Document E.

| **Source Room** | **Receiver Room** | **Test Result** $D_{nT,w} + C_{tr}$ | **Performance Standard cited by Building Regulations 2000 Approved Document E** $D_{nT,w} + C_{tr}$ |
|---|---|---|---|
| Massey Chambers Basement | Massey Chambers Apartment 11, Bedroom 2/ dressing room | 57 dB | ≥ 43dB |
| Massey Chambers Basement | Massey Chambers Apartment 11, Bedroom 1 | 55 dB | ≥ 43dB |

**Table 1:** Separating Floor Airborne Sound Insulation Test Results

Section 0.8 of Approved Document E states that '*A higher standard of sound insulation* (than the performance standard given in the last column of Table 1 above) *may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space. Specialist advice may be needed to establish if a higher standard of sound insulation is required and, if so, to determine the appropriate level'.*

Although the basement of Massey Chambers would be occupied by a commercial use (i.e. back of house areas to a hotel), the potential activity noise levels within the proposed rooms within the basement of Massey Chambers are not beyond those that could be described as domestic in nature. It is therefore considered that no additional acoustic treatment within the basement of Massey Chambers would be required to comply with Approved Document E of the Building Regulations.

The proposed uses within the basement of Massey Chambers are as follows

- Room 1: Meeting
- Room 2: Conference
- Fridge
- Male & Female Shower/WC
- Meter Cupboard
- Circulation areas

Figure 1 shows the proposed layout of the above spaces.

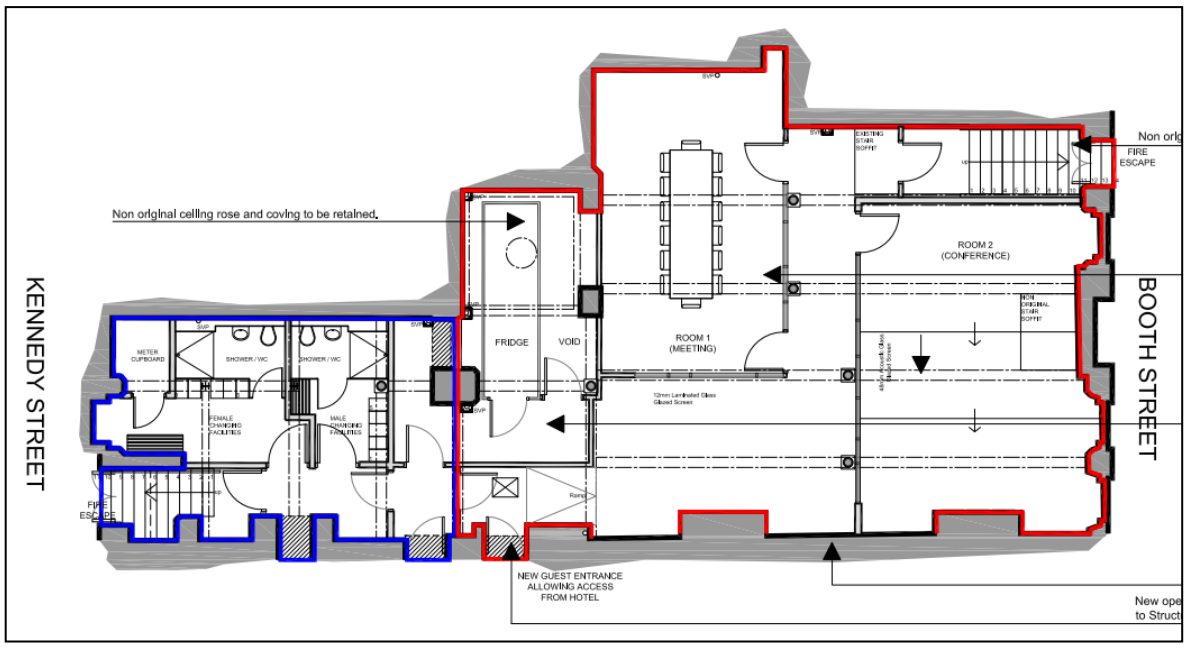



**Figure 1:** Proposed floor plan, basement of Massey Chambers

From the measurements of the sound insulation of the party floor, it is possible to derive the recommended noise level in the basement such that disturbance of the apartments above can be avoided.

This assessment can be carried out with reference to the frequency content of noise. In particular it is recommended that within the 63 Hz and 125 Hz octave bands, the residual noise level within apartments is at least 5dB below the pre-existing background noise level. (With the caveat that the threshold of hearing at 63 Hz and 125 Hz is 40dB and 25dB respectively. Therefore, residual sound levels of 35dB at 63Hz and 20dB at 125Hz should be inaudible and are considered to be lowest required residual noise levels at these frequencies).

At 250 Hz and above, it is recommended that the residual noise level within apartments is no greater than the pre-existing background noise level in each octave band.

Tables 2 and 3 identify the steps taken in determining the maximum recommended activity noise level in the basement of Massey Chambers.

| | **dB @ Octave Band Centre Frequency (Hz)** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **63** | **125** | **250** | **500** | **1k** | **2k** | **4k** |
| Measured sound level difference between basement and Apartment 11 Bedroom 1 | 36 | 45 | 51 | 60 | 68 | 73 | 80 |
| Measured background L90 noise level in Apartment 11 Bedroom 1 | 30 | 19 | 17 | 12 | 10 | 10 | 12 |
| Maximum recommended residual Leq noise in Bedroom 1 | 35 | 20 | 17 | 12 | 10 | 10 | 12 |
| Maximum recommended Leq noise level in basement area below Apartment 11 Bedroom 1 | 71 | 65 | 68 | 72 | 78 | 83 | 92 |

**Table 2:** Assessment of maximum allowable internal noise levels within basement - to Apartment 11, bedroom 1

| | **dB @ Octave Band Centre Frequency (Hz)** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **63** | **125** | **250** | **500** | **1k** | **2k** | **4k** |
| Measured sound level difference between basement and Apartment 11 Bedroom 2 | 37 | 48 | 54 | 61 | 70 | 71 | 81 |
| Measured background L90 noise level in Apartment 11 Bedroom 2 | 30 | 19 | 14 | 9 | 10 | 10 | 12 |
| Maximum recommended residual Leq noise in Bedroom 2 | 35 | 20 | 14 | 9 | 10 | 10 | 12 |
| Maximum recommended Leq noise level in basement area below Apartment 11 Bedroom 2 | 72 | 68 | 68 | 70 | 80 | 81 | 93 |

**Table 3:** Assessment of maximum allowable internal noise levels within basement - to Apartment 11, bedroom 2

The principal sound path between the basement area and the apartment above was found to be the vertical flanking sound path provided by the masonry party wall between Massey Chambers and the King Street Townhouse (this is the wall at the bottom of Figure 1).

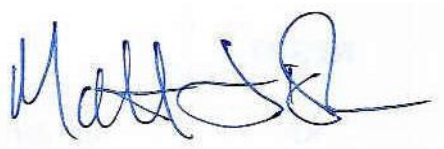
Only the proposed Conference Room and circulation area are adjacent to this flanking wall. The potential noise levels within the Conference Room and the circulation area are not expected to exceed the allowable noise levels stated in Tables 2 and 3.

The remaining areas of the proposed basement are the Male & Female Shower/WC, Fridge and Meeting Room. The maximum allowable noise levels given in Tables 2 and 3 are not expected to be exceeded by the potential activities within the rooms.

Therefore, it is expected that no remedial measures to improve the sound insulation of the existing party floor would be required to maintain the amenity of the residential apartment above or to comply with Approved Document E of the Building Regulations.

If there is any aspect of the above that you would like to discuss then please do not hesitate to contact the undersigned.

Yours sincerely



MATT FISHER CEng, BEng, MIOA
For and on behalf of Fisher Acoustics Limited