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Dear Patrick

7 RAINFORTH STREET, MANCHESTER
RETAIL UNIT

Further to our recent assessment we are pleased to present the findings as detailed below.

1.0 Introduction

The proposed development comprises the change of use of the existing 5 storey building (including basement) from commercial to form 6 residential flats at 1st, 2nd and 3rd floors with a retail unit at ground and basement floors.

Planning Permission was granted for the conversion of the upper floors to provide 6 residential flats but this permission excluded the use of the ground floor and basement. Lighthouse Acoustics provided an acoustic report to support the application for the 6 residential flats.

Lighthouse Acoustics has now been appointed to provide a brief report to support a planning application to establish retail use in a single unit, comprising the ground floor and basement space. This report will review the existing 1st floor separating floor construction between the retail unit and flats above and to propose atmospheric plant noise emission limits for any future items of building services that will serve the retail unit.

2.0 Objectives

To review the existing 1st floor separating floor construction and comment on the likelihood of achieving Requirement E1 of Building Regulations Approved Document E 2010. To advise on additional treatment if required in order to maximise the airborne sound insulation performance between retail unit and residential flats above.

Based on the results of the previous environmental sound survey to propose atmospheric plant noise emission limits for any future items of building services that will serve the retail unit in order to minimise the impact at the nearest noise sensitive receptors.

3.0 Site Description

The existing building comprises a 5 storey (including basement) end terrace building.

The existing separating floor to be retained between the proposed ground floor retail unit and proposed 1st floor residential flats above is understood to be a timber construction.

4.0 Separating Floor Construction

4.1 Requirements

The Planning & Noise Technical Guidance document (dated October 2022) produced by Manchester City Council does not state any specific sound insulation requirements between retail and residential uses.

Building Regulations Approved Document E requires a minimum airborne sound insulation performance of $D_{nT,w}$ + C_{tr} 43dB for separating floors between flats formed by material change of use and $D_{nT,w}$ + C_{tr} 45dB for separating floors between purpose built flats.

Providing the ground floor retail unit is used as retail only (no amplified music) then this may be considered to be an adequate level of sound insulation.

Should the ground floor retail unit be used as a restaurant/bar (with amplified music) then a higher level of sound insulation is likely to be required.

On the basis that the ground floor retail unit is used as retail only (no amplified music), it is proposed that the airborne sound insulation performance of the separating floor should achieve a minimum of $D_{nT,w}$ + C_{tr} 45dB. This is subject to approval by Manchester City Council.

4.2 Construction

It is understood that the existing first floor construction comprises the following build-up:

- Timber floor boards;
- Timber floor joists (unknown if any insulation present between joists);
- Plasterboard ceiling.

The above construction is unlikely to achieve the proposed minimum airborne sound insulation performance of $D_{nT,w}$ + C_{tr} 45dB.

In order to maximise the level of airborne sound insulation between the proposed ground floor retail unit and proposed 1st floor residential flats above the following treatment is proposed:

- Any gaps in existing floor boards made good;
- 18mm timber board laid on existing floor boards;
- Existing plasterboard ceiling removed;
- 100mm insulation (min. 16kg/m^3) installed between joists;
- Gypframe metal ceiling grid supported from Gypframe acoustic hangers (min. 10mm clearance to underside of existing joists);
- 200mm (min.) ceiling void containing 100mm mineral wool (min. 16kg/m^3);
- 2No. layers of 15mm SoundBloc plasterboard with staggered joints.

The ceiling shall extend up to all masonry external/internal walls and be sealed around the perimeter with a continuous bead of mastic. Penetrations of the ceiling shall be avoided where possible. Recessed lighting should be carefully considered since it can reduce the acoustic performance of the ceiling in which they are installed. Surface mounted lighting is preferable with any penetrations suitably sealed.

4.3 Entertainment Noise

Should the future tenant of the proposed ground floor retail unit intend to play amplified background music, amplified music noise levels shall be limited by means of an electronic noise limiter/compressor. The device should be capable of limiting individual octave bands over the frequency range 20Hz to 20kHz and controlling the number of speakers/zones required. The device should be lockable once set to prevent tampering. In order to set the device a commissioning survey will be required by an acoustic consultant and the requirements of Manchester City Council should be complied with. This should be undertaken upon completion of the fit out works but prior to operation of the proposed ground floor retail unit.

5.0 Atmospheric Plant Sound Emission Limits

5.1 Requirements

With regard to noise and vibration from fixed plant/equipment, Section 3.7.1.5 of the Planning & Noise Technical Guidance document (dated October 2022) produced by Manchester City Council states the following:

> *"The noise assessment should be based on BS 4142: 2014 and any application for fixed plant, equipment or machinery must demonstrate that:*
>
> ***'Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."***

5.2 Limits

Plant selections for the proposed ground floor retail unit have not been made at this stage of the development. As such, it is not possible to assess atmospheric building services sound to the nearest noise sensitive receptors.

Based on the requirements of Manchester City Council detailed in Section 5.1 and the lowest representative L_{A90} sound levels measured during the environmental sound survey (see our Acoustic Planning Report 0586/APR2 dated 29 November 2022), it is proposed that cumulative atmospheric plant sound emissions should be designed to achieve the following limits at the nearest noise sensitive receptors.

Nearest Noise Sensitive Receptor	L_{Aeq} Cumulative Atmospheric Plant Sound Emission Limits at Nearest Noise Sensitive Receptor (dB)	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
To the west of the site	52	36
To the east of the site	50	35

Plant sound emissions should be assessed in accordance with BS 4142:2014.

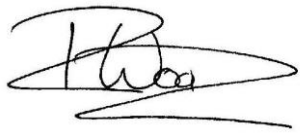
Once detailed design proposals are developed an assessment of atmospheric plant sound emissions from the proposed plant items to the nearest noise sensitive receptors should be undertaken. This will determine whether any attenuation measures are required in order to achieve the proposed limits.

6.0 Conclusions

The existing 1st floor separating floor construction has been reviewed and comments have been provided on the likelihood of achieving Requirement E1 of Building Regulations Approved Document E 2010. Advice has been provided on additional treatment where required in order to maximise the airborne sound insulation performance between retail unit and residential flats above.

Atmospheric plant noise emission limits have been proposed for any future items of building services that may serve the retail unit in order to minimise the impact at the nearest noise sensitive receptors.

Yours sincerely
for LIGHTHOUSE ACOUSTICS



Robin Wood