

# Abbey Mount Acoustic Assessment

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Prepared for Scott Hobbs Planning

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Project reference

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## 4 Abbey Mount – Café/restaurant adjacent to existing residential use

### Acoustic Assessment

#### 1. Introduction

KSG Acoustics has been appointed by Scott Hobbs Planning on behalf of Abbey Mount Estates Ltd to provide acoustic input to the redevelopment of 4 Abbey Mount, Edinburgh.

The purpose of the acoustic assessment and recommendations is to ensure that the requirements of City of Edinburgh Council (CEC) are met with respect to operational noise from the continued use of the café/restaurant affecting existing residential use on upper floors.

This assessment relates to 4 Abbey Mount only. A change of use application is proposed for the ground floor space of 2-4 Abbey Mount, which is to be converted from existing office/community/café use to residential use with retention of the existing café/restaurant. The residential apartments located above the existing office/community/café space are to remain. This assessment provides the following to meet the operational noise standards set by CEC:

- A review of the required sound insulation performance of the separating floor construction between the ground floor café/restaurant and the residential apartments above; and
- Recommended noise level limits for any proposed externally mounted building services equipment.

#### 2. Site description

The proposed development site comprises 2 - 4 Abbey Mount which includes the rear hall located behind the tenement building. It is understood that 2 Abbey Mount and the rear hall are proposed for residential use only.

4 Abbey Mount currently comprises a café with small kitchen area at ground floor level with existing residential use above.

### 3. Assessment criteria

KSG Acoustics has consulted with CEC to agree standards and methodology for the acoustic assessment. CEC require that operational noise (entertainment noise) from the restaurant / café space should not exceed either NR15  $L_{eq,T}$ , or 10dB below existing background within the existing residential apartments above.

This requirement specifically excludes noise from fixed plant / extracts etc., noise from which should not exceed NR35 (daytime) or NR25 (night time) within the existing residential apartments above.

Operational noise from the restaurant / café affecting the residential apartments above has been assessed using representative source data to consider the party floor construction details that would be necessary to achieve NR15  $L_{eq,T}$  within the residential premises above.

In addition to designing the floor construction to provide a suitable level of sound insulation to control operational noise from the café/restaurant, the separating floor construction will also require to provide a minimum sound insulation performance of 53dB  $D_{nT,w}$  in order to comply with the minimum requirements of the Buildings (Scotland) Regulations for the conversion of existing buildings.

### 4. Typical noise levels generated within a café/restaurant

In order to specify the minimum construction requirements for the party floor, library data has been used to determine noise levels inside a typical restaurant space during operation. The following noise levels were measured within an existing café/restaurant in London on 20 May 2010. Measurements were conducted over several minutes during a busy trading period and include the noise level contributions from both patrons and ambient amplified music.

Table 1 – Operational Noise within a Typical Restaurant (Including Noise from Patrons and Ambient Music)

PARAMETER	OCTAVE BAND CENTRE FREQUENCY, Hz							
	63	125	250	500	1 k	2 k	4 k	8 k
$dB L_{1,T}$	75	73	78	84	82	79	74	67
$dB L_{eq,T}$	68	69	72	79	77	74	68	59

## 5. Recommended separating floor construction

The existing floor construction separating the café and residential premises is currently unknown. The residential premises are occupied and not under the ownership of the developer; as a result there is limited scope for amending the existing floor construction. For the purposes of this assessment, it is assumed that the existing floor construction consists of the following (as would be typical for the age of the dwelling and standard of construction):

- 22 mm softwood timber floor boards
- Timber joists (circa 150mm deep)
- 12.5 mm plasterboard hung below the joists.

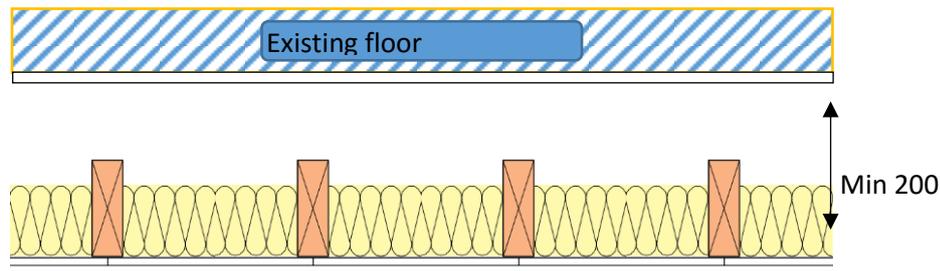
In order to allow for potential acoustic weakness in the existing floor construction, it is recommended that an additional lining of 12.5 mm plasterboard should be installed to underline the existing ceiling construction.

In order to be capable of suitably controlling operational noise anticipated from the restaurant to meet NR15  $L_{eq,T}$  within the residential apartments and to be capable of complying with the minimum sound insulation performances stated within the Buildings (Scotland) Regulations, it is recommended that an independent ceiling construction be installed below the existing floor construction. One possible construction option is provided below:

- Independent timber joists to be installed below the existing floor construction. The joists must be completely independent of the existing floor construction, supported from the structural walls. The centre spacing and the thickness of the joists to be confirmed based upon the structural requirements.
- 150 mm thick mineral fibre insulation to be installed between proposed timber joists
- 2 x 12.5 mm SoundBloc (or equivalent dense plasterboard) installed to the underside of the proposed timber joists. There should be a minimum cavity depth of 200 mm between this lining and the underside of the existing ceiling.

A sketch of this arrangement is provided in Figure 1

**Figure 1 – Recommended floor construction arrangement**



Other construction options may be viable and could be explored if required. For example it may be possible that the existing floor construction is of a more substantial construction than assumed and consequently it may be possible to reduce the extent of the requisite enhancement. However, any alternative construction would need to be reviewed by the acoustic consultant and agreed with CEC.

This arrangement is predicted to provide an airborne sound insulation performance in the region of  $60 \text{ dB } R'_w$ , although a higher performance may be achievable depending upon the performance of the existing floor construction. Assuming that the existing building structure provides suitable control of sound flanking, this performance is sufficient in order to comply with the minimum sound insulation performance requirements of the Building Standards and should ensure that operational noise from the restaurant does not exceed  $\text{NR15 } L_{\text{eq,T}}$  within the residential dwellings.

This ceiling construction is to be installed to the full extent of the restaurant space and must not be penetrated by any building services equipment serving the restaurant. Any required building services equipment must be installed below the proposed ceiling construction.

## 6. Noise limits for proposed externally mounted fixed plant

Details of any additional proposed externally mounted building services equipment are not known at this stage, although it is understood that it is intended to use the existing flue for extraction. No historic complaints have been received in this respect.

Nonetheless, care should be taken to avoid any adverse impacts associated with noise from fixed plant affecting the closest habitable rooms. This is best achieved by ensuring that noise from fixed plant does not exceed NR35 during daytime hours (0700 – 2300h) and NR25 during night time hours (2300 – 0700h).

Given the proximity of these residential premises to the restaurant / café space, mitigation measures may be required to reduce the potential noise impact from any additional externally mounted fixed plant over and above that which already exists.

Where possible, the externally mounted building services equipment should be located out of direct line of sight of any nearby residential premises. Low noise models should be procured as a matter of priority. Appropriate allowances should be included in the project for additional acoustic attenuation, if required, which may include acoustic attenuators or enclosures.

Further consideration should be given to the potential for noise impact from fixed plant during the detailed design and procurement stages to ensure that the requirements set out in this report can be met.

## 7. Conclusion

Providing due care is taken in the design then noise from operation of the proposed development, including noise from fixed plant, should not be a material consideration.