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Consultants in Acoustics, Noise & Vibration

11301-R12-A

24 July 2014

Centre Point

Retail to residential acoustic separation

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Version	Date	Comments	Author	Reviewer
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1 Introduction

Sandy Brown Associates (SBA) have been commissioned by Almacantar to provide acoustic design advice to the proposed development known as Centre Point, in London.

The London Borough of Camden has granted planning permission for the development in the document reference *2013/1957/P* dated 29 October 2013 subject to a number of conditions. This report addresses condition number 22 and summarises the design measures that have been incorporated in the development to control the transfer of noise from the new retail spaces to the existing residences in Centre Point House.

2 Planning condition 22

Planning condition 22 from London Borough of Camden's document reference 2013/1957/P states the following:

"Before the Class A1 or A3 or A4 floorspace at Centre Point House and the bridge link commences is occupied sound insulation shall be provided in accordance with a scheme to be submitted to and approved in writing by the local planning authority prior to the commencement of development. The use shall thereafter not be carried out other than in complete compliance with the approved scheme"

3 Criteria

British Standard 8233:1999 Guidance on sound insulation and noise reduction for buildings and the World Health Organization (WHO) provide criteria for indoor ambient noise levels within dwellings as summarised in Table 1 below. Noise levels resulting from the use of the retail spaces are to be limited to be no greater than L_{Aeq} 25 dB in the existing residences. This is 5 dB better than the recommended 'Good' design standard from BS 8233.

Table 1 Indoor ambient noise levels for dwellings from BS 8233:1999 and the WHO

Internal space	Design range, L_{Aeq} (dB)		
	BS8233 "Reasonable"[1]	BS8233 "Good"[1]	WHO
Living rooms	40	30	30/35[2]
Bedrooms[3]	35	30	30[2]

[1] The design range given in BS8233 refers to criterion for "reasonable resting/sleeping conditions" in both living rooms and bedrooms. No time periods are specified.

[2] WHO do not differentiate between different types of living spaces, but recommend L_{Aeq} 30 dB in relation to sleep disturbance and L_{Aeq} 35 dB in relation to speech intelligibility. WHO provides a 16 hour time base when referring to speech intelligibility and an 8 hour time base when referring to sleep disturbance.

[3] BS8233 indicates that individual noise events should not normally exceed L_{AFmax} 45 dB during night time, which is broadly in line with the guidance given by the WHO. However, Section 3.4 of the WHO guidelines suggests that good sleep will not generally be affected if internal levels of L_{AFmax} 45 dB are not exceeded more than 10-15 times per night.

4 Design measures

In order to control noise transfer from the retail spaces to the existing residential premises sound insulating ceilings and sound absorbent treatment have been incorporated into the design. In addition, retail tenants will be required to comply with specified maximum noise levels.

4.1 Sound insulating ceilings

Retail unit R05 is located below the existing residences in Centre Point House. A sound insulating ceiling is to be provided to enhance the sound insulation provided by the existing 225 mm thick concrete slab to ensure a sound insulation performance of at least $D_{nT,w}+C_{tr}$ 55 dB between the retail and residential spaces.

The ceiling comprises three layers of dense plasterboard supported on resilient ceiling hangers with 100 mm of mineral wool. The ceiling hangers shall be selected to provide a maximum natural frequency of the suspended ceiling of 12 Hz

4.2 Limitation of noise levels in retail units

In addition to the provision of sound insulating ceiling, tenant noise levels in the retail space will be limited. Taking into account the performance of the enhanced ceiling described above, the maximum noise levels permitted at the retail space have been established so noise levels within the residential units does not exceed L_{Aeq} 25 dB.

These limits are displayed in Table 2 and are compatible with the expected uses.

Table 2 Maximum retail noise levels

	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Maximum retail sound pressure levels, L_{Aeq} (dB)	75	79	79	79	79	79	79

Tenants that need to make more noise than this must be required as part of their lease agreement to provide enhancements to the sound insulation to the residences above.

4.3 Sound absorbent treatment

4.3.1 Retail R04a

Retail space R04a is the entrance lobby to the retail space R04 in Centre Point Link and is open to the underside of the 225 mm thick concrete slab to an existing residence in Centre Point House above. To reduce the reverberant noise levels from the use of the space and control noise transfer to the residence, 69 m^2 of minimum Class B sound absorbent treatment will be provided in the space. This allows a pessimistic assumption of up to 10 people talking in loud voices in the lobby without exceeding L_{Aeq} 25 dB above in Centre Point House.

The sound absorbent treatment in R04a will be provided by the landlord.

4.3.2 Retail R05

In addition to the sound insulating ceiling, sound absorbent treatment will be provided in retail unit R05 in order to control reverberant noise levels and allow the specified limiting noise levels to be more easily achieved.

The treatment will take the form of a minimum of 230 m^2 of Class A treatment to the underside of the ceiling. It will be a requirement for the retail tenant to provide this.

5 Conclusion

Mitigation measures have been incorporated into the design. Noise limits within the tenant's units have also been established in order to ensure an internal noise level of L_{Aeq} 25 dB, 5 dB better than the 'Good' criteria from BS 8233 will be achieved in the residences. The maximum specified noise levels are compatible with typical retail use. Should a tenant require higher noise limits, they will be required to provide enhancements to the existing sound insulation.