Memorandum

Project: **18-22 Haverstock Hill, Chalk Farm**
Subject: **Commercial Noise Assessment**
Prepared: **Tim Fox**
Date: **24 May 2019**
Reference: **19/0013/M2** **Revision:** **1** **Approved:** **JB**

1 Introduction

1.1 Planning permission has been granted to demolish the existing buildings at 18-22 Haverstock Hill, Chalk Farm, and construct a new building comprising seven storeys (including basement) with some commercial at ground floor with residential elsewhere, subject to conditions being met.

1.2 One of the conditions relating to noise is as follows:

12) Prior to commencement of the development of this plot, details shall be submitted to and approved in writing by the Council, of an enhanced sound insulation value $D_{nT,w}$ and $L'_{nT,w}$ of at least 5 dB above the Building Regulations value, for the floor/ceiling/wall structures separating the commercial and residential premises. Approved details shall be implemented prior to occupation of the development and thereafter be permanently retained.

1.3 This memorandum reviews the floor and wall constructions proposed between commercial and residential spaces to determine whether the requirements of the planning condition are expected to be achieved. Based upon the constructions, an assessment of maximum noise levels permissible within the commercial to achieve a suitable level within the residences is also presented.

2 Design Criteria

Sound Insulation Requirements

2.1 The sound insulation standards for new build residential dwellings as described in section 0 of Approved Document E of the Building Regulations are set out in table T1.

Building Element	Building Regulations Sound Insulation Performance (dB)
New build residential dwellings Airborne sound insulation of separating floors and stairs	$D_{nT,w} + C_{tr} \geq 45$
New build residential dwellings Airborne sound insulation of separating walls	$D_{nT,w} + C_{tr} \geq 45$
New build residential dwellings Impact sound insulation of separating floors and stairs	$L'_{nT,w} \leq 62$

T1 ADE required sound insulation standards

2.2 Therefore, achieving a 5 dB improvement on Building Regulations would be as follows:

Building Element	Required Sound Insulation Performance (dB)
New build residential dwellings Airborne sound insulation of separating floors and stairs	$D_{nT,w} + C_{tr} \geq 50$
New build residential dwellings Airborne sound insulation of separating walls	$D_{nT,w} + C_{tr} \geq 50$
New build residential dwellings Impact sound insulation of separating floors and stairs	$L'_{nT,w} \leq 57$

T2 ADE + 5 dB required sound insulation standards

2.3 Although not specified within the condition, the impact performance should not be a necessary requirement where residential is located above commercial due to the commercial being a less sensitive space. However, current proposals show impact resilience present where residential is above commercial, assumed to be due to maintaining a consistent floor construction.

Internal Noise Level within Apartments

2.4 It is currently unknown what the use of the commercial space will be. However, it is expected to be either A1 (Shops), A2 (Financial and professional services), A3 (Restaurants and cafés) or A4 (Drinking establishments).

2.5 For noise transfer internally from the commercial spaces into the adjacent flats, a noise limit of NR20 should be applied within habitable spaces. If daytime use only is expected from the commercial space, then the criterion can be relaxed by 5 dB.

3 Floor Review

3.1 The proposed floor construction between commercial and residential is as follows:

- Ceiling below (TBC)
- 225mm reinforced in-situ concrete slab
- 3-6mm Isorubber acoustic layer
- 25 EPS Underfloor heating insulation
- 70mm sand cement screed or 40mm Anhydrite Gyvion flowscreed

3.2 The construction follows similarly to that of Robust Detail E-FC-18, which is a construction provided within Robust Details to achieve Building Regulations + 5 dB.

3.3 We would recommend the ceiling system is made up of one layer of nominal 10 kg/m^2 gypsum-based board and is hung below a 150mm void. Although not necessary to meet the Robust Detail specification, we would also recommend 25mm mineral wool quilt is placed in the ceiling void to improve the performance further.

3.4 Anywhere the commercial may be located above residential, we would recommend the resilient layer should be the 6mm Isorubber system rather than the 3mm system.

4 Partition Review

4.1 The proposed partition construction between commercial and residential will be either of the following:

Type 1

- 140mm blockwork
- Independent 60mm 'I' stud wall
- 50mm Isover mineral wool insulation
- 1 x 12.5mm plasterboard

or

Type 3

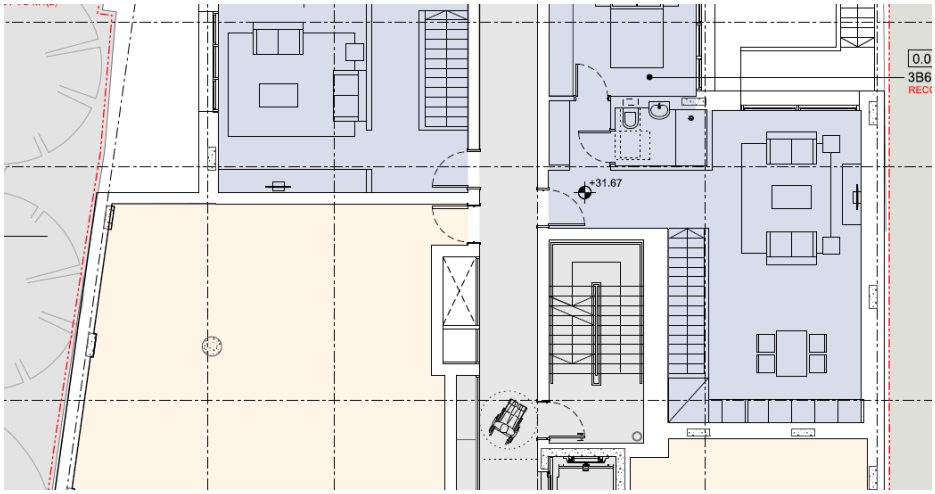
- 2 x 15mm plasterboard
- 2 x Independent 60mm 'I' stud wall within 240mm cavity
- 2 x 50mm Isover mineral wool insulation
- 2 x 15mm plasterboard

4.2 To achieve the 5 dB above Building Regulations requirement, we would recommend using the Type 3 construction. The plasterboard lining should be constructed with 2 x 15mm SoundBloc (or equivalent) each side.

4.3 There is more risk with the Type 1 construction, as performance data suggests this partition will perform not as well compared to the Type 3 construction. However, the 5 dB above Building Regulations requirement could be achieved with good workmanship. We would recommend the plasterboard lining is upped to 2 x 15mm SoundBloc (or equivalent).

5 Door Review

5.1 Current proposals show the rear of one of the commercial units has a doorset in close proximity to the front doors for two of the properties, as shown on the plan below.



5.2 To mitigate noise transfer through these doorsets, we would recommend the doorsets are specified to achieve a performance of R_w 35 dB. This can typically be achieved by a well fitted 54mm timber door. Compression or wipe seals should be used around the door's perimeter along with a threshold seal beneath.

6 Activity Noise

6.1 Calculations have been undertaken of noise breakout from the commercial spaces to the neighbouring residential apartments. Based on the use classes expected for the commercial, an assessment has been undertaken based upon the following noise levels measured within a full London restaurant, expected to be the worst case use class. Within the sample restaurant, noise levels were contributed to by a mixture of dinner speech, noise from the servery and the collecting in of crockery in addition to some background music. Kitchen noise was controlled by dish washing activity.

	Commercial Noise Level (dB) at Octave Band Centred Frequency (Hz)								
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**L_{Aeq}**
Shop end of restaurant	64	69	69	74	73	71	67	60	78
Central restaurant	64	71	73	78	76	74	70	67	81
Kitchen	69	69	69	69	68	70	69	64	76

T3 Internal noise levels implanted in calculations

6.2 The following shows the calculated noise level from each noise source activity through the proposed floor and partition construction, based upon our recommendations for each construction.

	Calculated Noise Level in Adjacent Properties, dB		
	Through Wall Type 1	*Through Wall Type 3*	*Through Floor*
Shop end of restaurant	NR6	NR16	NR14
Central restaurant	NR10	NR20	NR18
Kitchen	NR3	NR13	NR9

T4 Calculated noise levels within adjacent properties

6.3 The table shows that the NR20 target is achieved for all of the assessed activities within residential properties separated by either wall or floor from the commercial. The results also show that noise levels should not significantly exceed the activities presented in table T3, without further enhancement required to the floor construction in particular (and wall construction if necessary). Based upon the current proposals, amplified music should not be permitted within the commercial spaces. However, background music should be suitable.

6.4 Generally, it must be ensured that any background music or tannoy systems are properly designed so as to control noise transfers to the neighbouring flats. The following clause should therefore be included within the lease documentation for the commercial demise:

Any tannoy or loudspeaker systems which may be installed to provide background music or voice announcements (other than when used for emergency usage, or for those systems utilised for emergency usage only) shall be designed such that noise from the operation of such systems is NR15 within any room of any of the residential flats within the building.

6.5 To meet this requirement would need the commercial space to consider the choice and location of loudspeakers and the use of suitable mountings to control transfer of noise from the loudspeakers to the structure. Typically to meet the requirement, this would require a system

using a large number of loudspeakers distributed throughout the store, such that wherever persons are within the store, they are always close to a loudspeaker and overall volume levels are adequately controlled. Ceiling mounted speakers would need to be located in a secondary ceiling. The plasterboard ceiling mentioned above as part of the sound insulation design should not be penetrated by speakers, lights, or services.

End of Section