



Client: The Standard P Ltd

Site: The Standard P, 23 Sea Road, East Preston, Littlehampton, BN16 1JN

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Project: Sound Insulation of separating ceiling and predicted internal value

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The building in question is located within a terrace of buildings with commercial units at Ground Floor & residential dwellings above. The separating floor comprises of a concrete system with currently no suspended ceiling in place. The residential dwelling is located at 1st floor level.

The proposal is to convert the Ground Floor into a micro-pub. Micro-pub are not like traditional pubs with a vastly different atmosphere, they are focused on a variety of drinks and there will be no music played at all within the venue.

Internal sound levels have been taken from a similar venue in Southampton, this venue was near to capacity, offering a very fair reflection of the internal noise levels to be expected at the proposed venue. An airborne sound test was also performed on the separating floor between the Ground & 1st floors to establish the sound attenuation on offer between the floors.

The current ceiling system comprises of:

1. Existing flooring bonded to floor
2. Circa 150mm block & beam concrete floor

This type of ceiling will achieve a relatively high level of sound attenuation, but further works are recommended to ensure that suitable internal levels can be ensured at 1st floor level.

A similar ceiling system, albeit with a tile and grid ceiling below has been tested for airborne sound insulation and the ceiling achieved a $D_{nT,w}$ & C_{tr} of 53dB -5 = 48dB. This data can be used to establish the calculated levels within the 1st floor dwelling. Please Note – The recommended suspended ceiling will vastly improve the sound attenuation of the ceiling so the internal values listed later in this report will be a lot lower once this ceiling has been installed.

The proposed separating floor will comprise of:

1. Existing floor
2. Concrete Floor
3. Void
4. MF/Timber suspended ceiling
5. RW3 mineral wool slab insulation placed on top of ceiling
6. 2 x acoustic/fire rated plasterboard fixed to the underside of the ceiling
7. Plaster Finish

The above ceiling detail has been tested many times and should achieve a $D_{nT,w} + C_{tr}$ in excess of 50dB which is higher than the values used within this document. This ceiling should ensure the 1st floor dwelling is not adversely affected by the proposed micro-pub at ground floor level.

The local authority has stated that the criteria set out in table 4 of BS8233: 2014 should be applied at first floor level. The premises will close at 2200hrs so it will not be open during the night time period and thus the day time values shown below will apply. In addition, the air conditioning unit will be located internally so it will not be located outside of the building and thus will not have an adverse impact on the residential dwelling and a BS4142: 2014 assessment was not required.

BS8233: Table 5 – Indoor Ambient noise levels in spaces when they are unoccupied.

Activity	Location	0700-2300	2300-0700
Resting	Living Rooms	35dB LAeq,16hour	-
Dining	Dining Room/Area	40dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35dB LAeq,16hour	30dB LAeq,8hour

The table below shows the comparison between predicted and measured internal noise levels based on the levels measured within The Bookshop Alehouse and the sound attenuation offered by the separating floor.

<i>Frequency</i>	<i>63</i>	<i>125</i>	<i>250</i>	<i>500</i>	<i>1000</i>	<i>2000</i>	<i>4000</i>	<i>8000</i>	<i>L_{Aeq}</i>
Internal (Leq) – The Bookshop	68	68	70	76	73	68	62	51	77dBA
Attenuation of ceiling (dB) - measured	33	40	46	47	53	62	69	67	53-5 = 48dB
Predicted Dwelling Leq values	35	28	24	29	20	6	-7	-16	27dBA

The above table indicates that the internal values within the dwelling will be 27dB (based on a ceiling tested that will not be as robust as the proposed) which meets the required guidelines of BS8233: 2014. In addition to the internal L_{Aeq} the calculated NC curve value is shown below. Many LPA require and NC curve of NC25.

<i>Frequency</i>	<i>63</i>	<i>125</i>	<i>250</i>	<i>500</i>	<i>1000</i>	<i>2000</i>	<i>4000</i>	<i>8000</i>	<i>L_{Aeq}</i>
Internal (Leq)	68	68	70	76	73	68	62	51	77dBA
Attenuation of ceiling (DnT)	33	40	46	47	53	62	69	67	53-5 = 48dB
Dwelling Leq values	35	28	24	29	20	6	-7	-16	NC23
Calculated NC Curve	NC23								

The above table indicates that even with a ceiling that will not offer as much attenuation as the proposed system the recommended internal criteria can be achieved. It is anticipated that once the acoustic and fire rated ceiling is installed at ground floor level the sound attenuation will be even higher and thus the internal levels at 1st floor even lower, indicating no adverse impact at 1st floor level.

Conclusion:

The calculated values indicate that the use of the Ground floor as a micro-pub should not have an adverse impact on the residential dwelling located at 1st floor once the suspended ceiling has been installed. The venue will close at 2200hrs so it will not be in operation during the night time period and thus sleep disturbance will not be an issue.

The client has already indicated that they will not play any music whatsoever so there will be no issue with music noise, this combined with the standard use of a micro-pub should ensure that the Ground floor unit should not have an adverse impact on the residential dwelling located directly above.

The calculated values also indicate that the 1st floor dwelling will have a Noise Criteria (NC) curve of **NC23** which is very low and should ensure a reasonable standard of living at 1st floor.

The plant associated with the venue will be located internally so this will not have an adverse impact on the 1st floor residential dwelling as the noise will be located internally at ground floor and thus mitigated by the acoustic ceiling to be installed.