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Kate Halsall

From:
Sent: Wednesday 10 January 2018 18:28
To: Licensing Policy
Subject: Re: Representation request for Premises Licence application by Bada Tapas - 10 Queen Street, Godalming.
Attachments: Kit_ex1.jpeg; Kit_ex2.jpeg; Kit_ex3.jpeg; Kit_ex4.jpeg; Kit_ex5.jpeg; Noise_ log sheets.docx; Venta_acoustic_rep_flat1.pdf; Venta_acoustic_rep_flat2.pdf

To whoever it may concern,

We are a group of residents and interested parties and we would like to make a representation in regards of the Premise Licence application by Bada Tapas for the ground floor premises in 10 Queen Street, Godalming.

Our representation relates to the licensing principle of **Prevention of Public Nuisance**, as we believe the licence will likely have adverse effects on the promotion of this objective.

Premises sound insulation:

Based on past experiences with a similar type of business, a Tapas Bar, Corretto, located on 10 Queen Street that was closed last July, noise has been a problem for the flats above and around the premise. As documented by the case "Ben Westhead v Waverley Borough Council", music has been audible and caused nuisance (even when played at relatively low levels) when the premises were occupied by Corretto, both in the flats above and to the other residents of the street. After our complains to the Council, the Environmental Health services deemed necessary to issue an Abatement Notice, and since then no structural work has been carried out (that we are aware of) in the premises to address this problem. Therefore, there's no certainty the issue won't arise again as, even if the Premise Licence application by Bada Bar doesn't include the playing of music, the Licence itself allows the play of "incidental music", which will likely affect the residents nonetheless given the poor sound insulation.

As a confirmation for the fact that in general, sound insulation between the ground floor premises and the flats above does not meet the Building Regulations requirements between residential dwellings, a sound insulation test was carried out on September 2016 by Venta Acoustics. The test results state (see point "5. Discussion" in the document "Venta_acoustic_rep_flat1" attached): *"In its current form, the floor build-up is not considered acoustically fit for purpose for between dwellings, let alone to reasonably allow a restaurant or commercial premises to operate below a residential dwelling."*
A video showing how sound was perceived in flat 2 and in the communal area of 10 Queen St. during Corretto tenure is **attached**, as well as a diary recording the past nuisance problems the residents of flat 2 had.

Kitchen ventilation system:

In addition to the noise problem, there's also the issue with the premise kitchen, located in the back of the building right below flat 2 bedroom. Noise coming from the kitchen staff is very much audible inside the flat bedroom, but the main issues are caused by the ventilation system. The vent engine is attached directly to the kitchen ceiling, making vibrations to the structure very noticeable and annoying when it's turned on (see Acoustic report attached "Venta_acoustic_rep_flat2", point 4.3). Fumes and smell have also been an issue under previous owners (which was a Tapas Bar as well), and was never addressed. To our knowledge, and as suggested by the pictures **attached**, no major work has been carried out in the kitchen to solve this problem. Additionally, the pictures clearly show that the whole ventilation system (particularly the extraction canopy) doesn't seem to comply to legal standards, according to this guidance here (we realise this publication was withdrawn last September so it's not legally binding, but we think it can be taken as general guidance).

It must be noted that the same extraction system is also causing nuisance to the care home located across the garden, Jubilee House Care Home. The structure has several windows facing the garden, and the waste coming from the kitchen window regularly soiled the garden under the previous owners' tenure. More importantly, the fumes and odours coming from the premise prevented the care home patients to open their window without suffering from smells and smoke.

Late night traffic and parking issues:

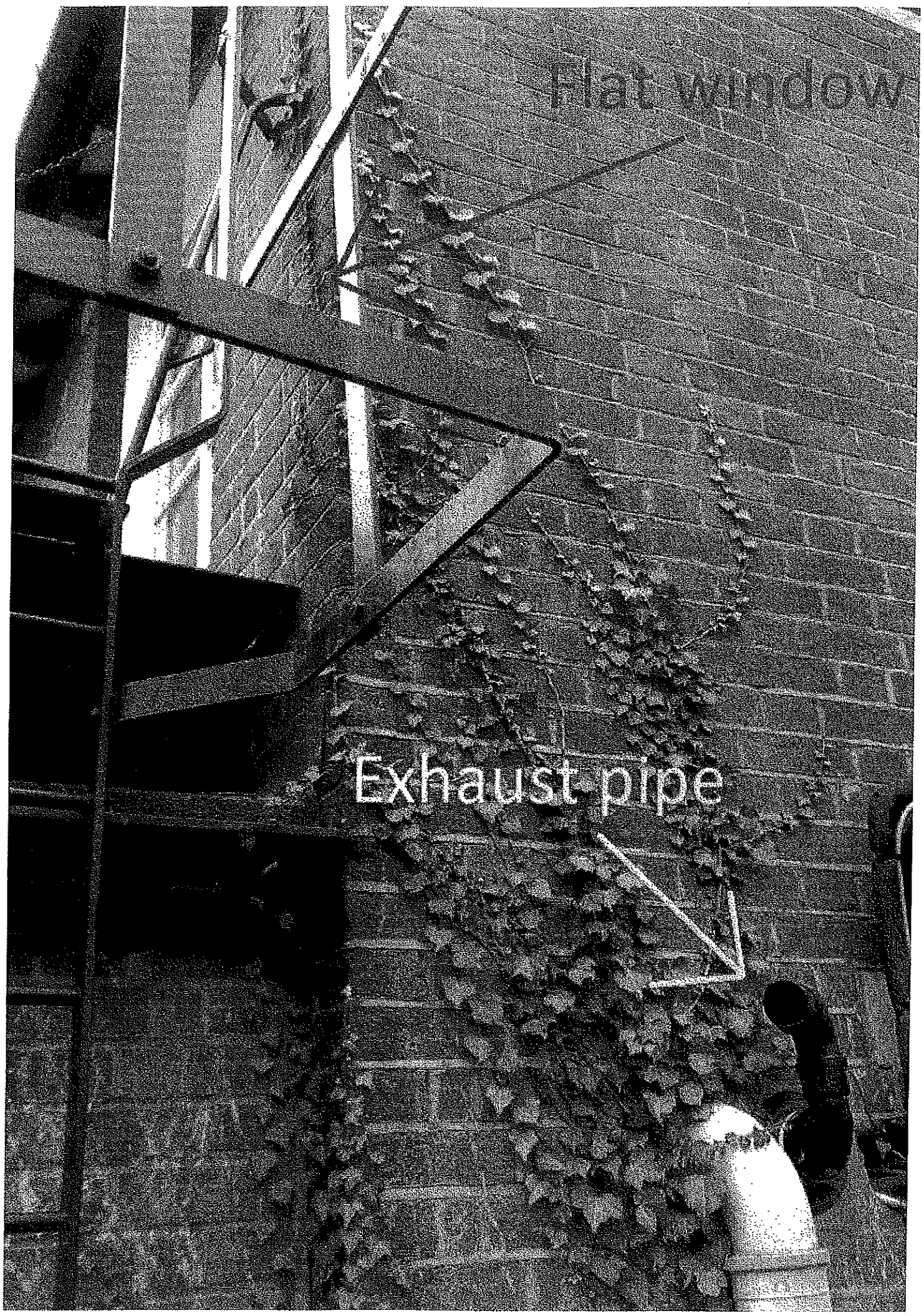
One last issue worth mentioning is the heavy traffic and parking problem in the street.
The presence of a late-night bar in the street, a cul-de-sac which already has a chronic lack of parking spaces and traffic issues, is very likely going to worse these issues. Considering also the fact that as residents, we still have no access to dedicated resident parking, we feel a business of this kind will make things even worse. A business where alcohol is served with opening hours up until midnight will also generate (as we experienced with Corretto) the usual nuisance generated by people leaving the premises (taxis, doors slamming, chatting and smoking outside), which is very antisocial.

For all the above reasons we ask the Waverley Licensing Authority to consider our representation regarding the Premise Licence application by Bada Tapas.
We residents feel that in its current state, the premise is not fit to house a restaurant or a tapas bar. We ask that at the very least improvement works to the premise are carried out to increase noise insulation, and also that the kitchen ventilation and exhaust system has to be re-done up to standard, before a licence is issued, in accordance to 8.5.1 in section 8 of the Licensing Policy statement.

We are open to any question regarding the above, and we'd be glad to provide any additional information you might request.

Thank you for your attention.

Kind regards,


Flat window
Exhaust pipe

GUIDANCE ON COMPLETION OF NOISE/SMOKE DISTURBANCE DIARIES

If legal action is to be taken to stop noise/smoke amounting to a nuisance it is possible that the matter will have to be heard in Court. Whether it is the Council or an individual who take the action, the Court will want to know which residents have been affected by noise/smoke and will ask for details of specific incidents.

It is therefore essential that an accurate, detailed record is kept of the noise/smoke. If there are any inaccuracies in the record, the Court will challenge the validity of the whole diary.

Below are notes on each column of the diary.

DATE OF OCCURRENCE

Put here the date when the noise/smoke happened.

TIME NOISE/SMOKE STARTED / FINISHED

Remember to put the time either as am / pm or as the 24 hour clock time.

DESCRIPTION OF NOISE/SMOKE / SOURCE(S) / LEVEL

A description of the noise/smoke should include an indication of its level, nature and where it can be heard/smelt on your premises. The source(s) should be identified as accurately as possible, such as stereo, diesel, cement mixer, circular plane or other sound generating equipment.

EFFECT OF NOISE/SMOKE UPON YOU

The Court will want to know how the noise/smoke is materially affecting the use and / or enjoyment of your premises. Factors of particular importance include whether the noise/smoke is affecting your work, leisure or sleep; the degree of annoyance and possible effects on mental or physical health.

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DIARY OF NOISE/SMOKE DISTURBANCES

This is the Diary of (Name):	Address:
Age (if over 21 enter "Over 21"): Over 21	Telephone number:
Premises where noise/smoke is originating: Corretto	Person(s) responsible for noise/smoke:

Date of Occurrence	Time Noise/Smoke Started	Time Noise/Smoke Finished	Description of Noise/Smoke/Source(s)/Level	Effect of Noise/Smoke upon you
22-07-2016	7pm	1am	Music is probably played by a DJ or recorded, it's loud, and can be heard over the TV in the living room.	Causes distress, sleep is possible only wearing earplugs.
23-07-2016	8pm	1am	Music is played LIVE with drums and live basses, and it's extremely noisy. The floor vibrates in the living room, which is basically inhabitable as bass pounding can be heard over loud TV. Complaining with the manager (Natalie) causes no effect. Police is called too. Sleep is difficult even wearing earplugs, because of bass and drums vibrations.	It is very distressing and annoying, causes headache and affects mood. I'm very irritable because of this situation where I feel powerless.
24-07-2016	7pm	11.30pm	Live music is being played again. Basses and drums are very audible and make the floor vibrate. Again the noise is very upsetting, and it's impossible to even watch TV.	It is very distressing and annoying. Mood is affected.

25-07-2016	8.30pm	11pm	Music volume is much lower. Music starts at around 8.30 and it lasts until 23pm, but it can still be heard from the bedroom, which is above the backroom of Corretto, until around midnight. I suspect they play music after the closing time in there as well. Even if the music is still audible, it's much less distressing and can be ignored if TV is on.	Slightly annoying, but ignorable.
26-07-2016	7.30pm	11pm	Music volume is again low. Still audible but not that annoying. It starts at 7.30 and lasts until 23pm, but again music is still audible from the backroom of the bar until midnight.	Slightly annoying, but ignorable.
27-07-2016	7pm	11pm	Music volume is low, audible but doesn't cause annoyance.	Slightly annoying, but ignorable.
28-07-2016	7pm	12am	Music is audible since 7pm, but it starts being a nuisance at around 8pm. The music played is live, has lots of bass pounding which makes the floor shake, and is played at extremely high volume. Video recorded.	The pounding is very irritating, is heard above TV and is cause of a lot of distress. Causes headache and affects mood.
29-07-2016	8pm	1.30am	We're not home until midnight, we notice the music starting at around 8pm and then we leave for the evening. When we're back, the music is very much audible from our living room, basses pounding as usual until after 1am. Also the fan in Corretto's kitchen, below our bedroom has been left on, and along with the music makes going asleep difficult.	The pounding is as usual very distressing. We both begin to notice physical effects we believe are caused by this stressing situation. Sweating, headache, and general irritability.
30-07-2016	8pm	1am	Music level is slightly better after directors came to speak to us, but it's still way over what's acceptable. The pounding of basses is still loud and annoying, being audible over TV and conversation in the living room. Environmental officers visit our flat to witness the noise.	The noise is constant, and as music can't be heard but only the pounding of basses, this makes it even more distressing. Sleep is very difficult as is even watch TV.

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Diary of Noise/Smoke Disturbance Continuation Sheet

Page No: .....

Date of Occurrence	Time Noise/Smoke Started	Time Noise/Smoke Finished	Description of Noise/Smoke/Source(s)/Level	Effect of Noise/Smoke upon you
31-07-2016	8pm	11pm	Live music is played, basses are very audible and annoying, as the floor in the living room vibrates.	The pounding noise is a nuisance as usual, it can be heard over normal conversation and over TV. Sleep is possible only wearing earplugs.
01-08-2016	8pm	10.30pm	Music volume is higher than the usual Monday. The basses are very much audible from the living room, and floor vibrates as a result.	The pounding, even if lower than the week end, is still very much annoying. Basses are audible over TV and conversation.
02-08-2016	8pm	10.30pm	Basses can still be heard, but the volume is lower. Having the TV on makes the noise almost unnoticeable.	Slightly annoying, but ignorable.
03-08-2016	8pm	10.30pm	The pounding of basses can be heard, but the volume is low. Having the TV on makes the noise almost unnoticeable.	Slightly annoying, but ignorable.
04-08-2016	8pm	11pm	The volume level is back to week-end levels, which is high. There's live music, the basses are as usual pounding through the living room and can be heard over the TV.	The pounding is very annoying, after a tiring day at work it's causing me a strong headache and to be very irritable.

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Diary of Noise/Smoke Disturbance Continuation Sheet

Page No: .....

Date of Occurrence	Time Noise/Smoke Started	Time Noise/Smoke Finished	Description of Noise/Smoke/Source(s)/Level	Effect of Noise/Smoke upon you
05-08-2016	8pm	12pm	DJ music is played, with loads of basses that are making the floor vibrate as usual. Basses are heard over the TV in the living room. Loud music stops at 11pm, but can still be heard until 1am.	The pounding is very annoying as usual, and causes distress throughout the evening. After 11pm volume goes down noticeably, I can still hear the music but it causes less distress.
06-08-2016	8pm	1am	Live music is played at extraordinary high levels. Basses pound heavily everywhere in the flat, causing vibrations in the furniture too. Unlike most of the other times, I can hear the voice of the singer at the mic too. The noise goes well over the TV, and even having headphones on I can hear the beatings. The volume decreases after 11pm, but music can still be heard until 1am.	The level of noise is utterly unacceptable. I can't watch TV, I can't of course do anything requiring any level of concentration. The noise and the frustration caused by it is having physical effects as well: headache, increased sweating, high irritability, anxiety.
07-08-2016	8pm	12am	Live music is played again at extreme levels. Basses pound heavily everywhere, causing vibrations in the furniture too. The noise goes well over the TV, and even having headphones on I'm unable to watch TV. The volume decreases after 10.30pm, but music can still be heard until 12am.	Pounding and vibrations are extreme. Furniture and appliances too are pounding with the basses. I'm unable to do any activity whatsoever as the noise is causing extreme frustration and stress. I'm very nervous, I'm sweating and I'm shaking because of the tension the situation is causing me.

22-08-2016	7.00pm	11pm	Music is audible as usual, especially basses. At Corretto seem to have changed the amp position or something like that, as now the noise is more concentrated in the bedroom area while usually the living room was where the music was louder. The volume is not too loud but it's still annoying.	The basses are a nuisance, even if the volume is lower than the week end. As the sound is less audible in the living room we can have dinner and watch TV fairly calmly, but once in the bedroom the pounding is very much audible and stressful. Sleep is possible only wearing earplugs.
23-08-2016	7.00pm	11pm	The pounding of basses can be heard in the living room and in the bedroom, but the volume is back to normal levels.	The background noise can be heard while watching TV or having conversation. Sleeping is difficult unless wearing earplugs.
24-08-2016	8.30pm	11pm	The basses can be heard in the living room and in the bedroom, but the volume is back to normal levels.	The background noise can be heard while watching TV or having conversation. Sleeping is difficult unless wearing earplugs.
25-08-2016	8.30pm	11pm	The pounding of basses can be heard, but the noise is not continuous and the volume is not too high.	Still annoying, but ignorable.
26-08-2016	8.30pm	00.30am	The pounding of basses can be heard, but the noise is not continuous and the volume is not too high. Complaining with Bruce for music being played after 11pm is effective, but music stops after midnight.	Still annoying, but ignorable.
27-08-2016	8.30pm	11pm	The pounding of basses can be heard, but the noise is not continuous and the volume is not too high.	Still annoying, but ignorable.
28-08-2016	7.30pm	11pm	Live band is playing, basses are very loud and intrusive in the whole flat. Complaining with the managers results in the live music stopping at around 10pm, but only after an hour of messaging back and forth.	Live music is obviously not suitable. The basses are very loud as usual and prevent a peaceful enjoyment of any activity.
29-08-2016	7.30pm	11pm	Music can be heard in the background but is tolerable.	A bit annoying, but ignorable.

08-08-2016	8.30pm	11pm	The pounding of basses can be heard, but the volume is back to normal levels.	Still annoying, but ignorable.
08-08-2016	8.30pm	11pm	The pounding of basses can be heard, but the volume is back to normal levels.	Still annoying, but ignorable.
17-08-2016	8.30pm	11pm	The pounding of basses can be heard, but the volume is back to normal levels.	Still annoying, but ignorable.
18-08-2016	8.00pm	11pm	There's live music on, the volume itself is not that high but the basses vibrate clearly through the floor in the living room.	The pounding of basses is a nuisance even when watching TV. It can be heard over conversations and causes headache and distress.
19-08-2016	8.00pm	11pm	Basses can be heard over the TV and are noisy but only on certain times. For long times the volume can be noticed but it's acceptable.	The pounding of basses is a nuisance when watching TV. It can be heard over conversations but it's not continuous.
20-08-2016	10.00am	After 12.30pm	Basses and music can be heard since morning in the living room and bedroom as well. In the evening, since 8pm the music is heavy on basses, which resound through the floor in the living room.	The background noise through the whole day prevents any form of concentration. The basses in the evening can be heard over TV and the pounding is very anxiety-inducing.
21-08-2016	7.00pm	10.30pm	Live music is on, and can be heard loudly in the living room and bedroom. Basses are very noisy, and make the floor vibrate.	The pounding noise is very annoying, induces anxiety and headache. While watching TV the noise can be heard clearly and causes irritability.

30-08-2016	7.30pm	11pm	Music can be heard in the background but is tolerable.	A bit annoying, but ignorable.
31-08-2016	7.30pm	11.30pm	Music is high and bass can be heard pounding through the floor. It is not continuous as some songs are worse than others. Complained with Bruce, music is lowered but not enough. I text him again and finally the volume is lowered at acceptable levels.	The background noise can be heard while watching TV or having conversation. The pounding causes distress and anxiety.
01-09-2016	7.30pm	11pm	Music can be heard in the background but is tolerable.	A bit annoying, but ignorable.
02-09-2016	7.30pm	00.30am	Music volume is high and bass heavy. It is not continuous. Complained with Bruce, music is lowered but not enough. I have to text him several times before the volume is set to suitable levels. Music can still be heard way after 11pm, even if it's not too loud.	The background noise can be heard while watching TV or having conversation over dinner. The pounding causes distress and anxiety.
03-09-2016	8.30pm	11pm	Music can be heard in the background but is tolerable. Sometimes bass is still audible and annoying but is not continuous.	A bit annoying especially when it gets bass-heavy, but acceptable.
04-09-2016	8.30pm	10.30pm	Music can be heard in the background but is tolerable.	A bit annoying, but ignorable.
05-09-2016	7.30pm	11pm	Music volume is very low, almost inaudible.	No disturbance.
06-09-2016	8.30pm	11pm	We've been informed by directors audio setting has been modified to reduce noise. Nevertheless, music is a bit too loud so I message one of the directors. After 20 mins he replies and music is lowered to acceptable levels.	Bass can be heard while watching TV and having conversation. It's unnerving and causes distress.

07-09-2016	8.30pm	11pm	Music can be heard in the background but is tolerable.	A bit annoying, but ignorable.
08-09-2016	8.00pm	11pm	Live music is on, and can be heard loudly in the living room. We and Louis complain with directors, who come in and witness the noise themselves. Live music is then turned off at around 9pm, and normal music after that can be heard in the background but is tolerable.	Live music levels are intolerable and prevent any activity, even watching TV.
09-09-2016	8.00pm	11pm	Music can be heard in the background but is tolerable.	A bit annoying, but ignorable.
10-09-2016	8.00pm	After 12pm	Bass is loud and the pounding can be heard in the living room. I complained with the directors, and music is lowered after 15mins. Music is still audible at around midnight.	Bass can be heard while watching TV and having conversation. It's unnerving and causes distress.
17-09-2016	8.30pm	23pm	Bass is loud and the pounding can be heard in the living room. I complained with the directors, and music is lowered almost immediately. Music is low but still audible at around midnight.	Bass can be heard while watching TV and having conversation. It's unnerving and causes distress.
22-09-2016	8.30pm	23pm	Bass is audible pounding through the floor. After complaining with the director volume is lowered after around 20 mins and become still audible but ignorable.	Bass can be heard while watching TV and having conversation. It's unnerving and causes distress.
23-09-2016	8.30pm	9.30pm	Bass is audible pounding through the floor. After complaining with the director volume is lowered but is still audible, although ignorable.	Bass can be heard while watching TV and having conversation. It's unnerving and causes distress.
24-09-2016	8.30pm	midnight	Bass is audible pounding through the floor. After complaining with the director volume is lowered and become still audible but ignorable.	Bass can be heard while watching TV and having conversation. It's unnerving and causes distress.
27-09-2016	10pm	23pm	Music starts unusually late, with bass very audible in the living room as usual. After immediate complain (by Flat 1 tenant) music is lowered but not much as it's still audible until 23.	Bass pounding is a nuisance while watching TV or having conversation. It's distressing and causes anxiety.

29-09-2016	9pm	23pm	Live music is being played once again from 9pm, with the usual results: very loud noise and bass pounding through the whole living room. I make an immediate complaint to Bruce, he says he wasn't aware live music was planned for the evening (!). It makes it stop after half an hour, after that music is back to usual levels, still audible but more ignorable.	Bass pounding is a nuisance while watching TV or having conversation. It's distressing and causes anxiety.
30-09-2016	8.30pm	23pm	Music with heavy pounding bass can be heard through the floor in the living room. Complaints are made to Bruce, which after claiming to have lowered the music (half an hour after our first message) effectively refuses to acknowledge the disturbance claiming "the cause of the noise is your floor" (!). As a result the noise goes on until 23pm.	The pounding of the bass is very annoying and can be heard while watching TV or having conversation. It's very distressing and causes me an headache.
21-10-2016	8.30pm	23.30pm	Bass is audible pounding through the floor. It remains audible until after 11.30pm	Bass pounding is a nuisance while watching TV or having conversation. It's distressing and causes anxiety.
28-10-2016	8.30pm	9pm	Music is loud and can be heard through the floor. After around 20 minutes, I go downstairs to complaint directly with the bar staff, and they agree to lower the volume.	Bass pounding is a nuisance while watching TV and having conversation at dinner. It's distressing and causes anxiety.

Sat 5/11	Started at 8.30 - stopped at 00.30pm	Music lowered after Louise's complaint
Wed 9/11	Went loud at 10.30pm - Stopped at 11pm	Music lowered after my complaint
Thu 10/11	Started and stopped at 8pm after immediate complaint	Music lowered after my complaint
Fri 11/11	Started at 8.30 - Stopped at 11.30pm	Music lowered after my complain

08-02-17	Wednesday	5.30pm (back from work)	10pm	Not audible from bar, but music is coming from their kitchen from 5.30 (when I'm back from work) and lasts until around 10pm	Paolo
09-02-17	Thursday	5.30pm (back from work)	10.30pm	No music audible from the bar, but bass noise is coming from their kitchen from 5.30 (when I'm back from work) and lasts until around 10.30pm	Paolo
10-02-17	Friday	5.30pm (back from work) from kitchen; 9.30 from bar	12am	Music from the bar is audible until 11.30. Music from Corretto kitchen is audible from 5.30 (when I'm back from work) to around midnight	Paolo
11-02-17	Saturday	1pm from kitchen; 9.30pm from bar	12am	Music from the bar is audible until 11.30. Music from Corretto kitchen is audible from 5.30 (when I'm back from work) and lasts until around midnight	Paolo
14-02-17	Tuesday	5.30pm (back from work)	11pm	Music is audible from the bar since around 9pm, and from the kitchen too from 5.30pm. Both last until around 11pm	Paolo
15-02-17	Wednesday	5.30pm (back from work)	10.30pm	Not audible from bar, but music is coming from their kitchen from 5.30 (when I'm back from work) to around 10pm	Paolo
16-02-17	Thursday	5.30pm (back from work)	10.30pm	Not audible from bar, but music is coming from their kitchen from 5.30 (when I'm back from work) to around 10pm	Paolo
17-02-17	Friday	5.30pm (back from work)	11.30pm	Music from the bar is ignorable, but music is coming from the kitchen below our bedroom from 5.30 (when I'm back from work) to around 11.30pm, when I go down to complain with kitchen staff	Paolo
18-02-17	Saturday	1pm from kitchen; 9.30pm from bar	12am	Music from the bar is audible until 11.30, when we move to the other room, where music from Corretto kitchen is audible from 5.30 (when I'm back from work) to around midnight	Paolo
21-02-17	Tuesday	5.30pm (back from work)	around 10pm	Not audible from bar, but music is coming from their kitchen from 5.30 (when I'm back from work) to around 10pm	Paolo
22-02-17	Wednesday	5.30pm (back from work)	around 10pm	Not audible from bar, but music is coming from their kitchen from 5.30 (when I'm back from work) to around 10pm	Paolo
23-02-17	Thursday	12pm from kitchen	10.30pm	Not audible from bar, but music is coming from their kitchen from 12 in the morning and lasts all day until around 10pm	Giovanna
24-02-17	Friday	12pm from kitchen	11.30pm	Not audible from bar, but music is coming from their kitchen from 12 in the morning and lasts all day until around 10pm	Giovanna

25-02-17	Saturday	1pm from kitchen; 9.30pm from bar	11.30pm	We're out for the evening until 11pm. Once back, music from the bar and kitchen is audible until 11.30, I go down to complain with kitchen staff at around 11.30pm	Paolo
28-02-17	Tuesday	5.30pm (back from work)	around 10pm	Not audible from bar, but music is coming from the kitchen from 5.30 (when I'm back from work) to around 10pm	Paolo
01-03-17	Wednesday	1pm from kitchen	around 10pm	Not audible from bar, but music is coming from the kitchen from 1pm and lasts until around 10pm	Giovanna
02-03-17	Thursday	5.30pm (back from work)	around 10pm	Not audible from bar, but music is coming from the kitchen from 5.30 (when I'm back from work) and lasts until around 10pm	Paolo
03-03-17	Friday	5.30pm (back from work)	10.30pm	Music from the bar is ignorable, but not so much from the kitchen-therefore in our bedroom. I go down to complain with kitchen staff at 10.30pm	Paolo
04-03-17	Saturday	1pm from kitchen; 9.30pm from bar	11.45pm	Not home until 11pm. Music from the bar is audible until 11.30 when we move to the other room, where music from Corretto kitchen is audible until around midnight	Paolo
17-03-17	Friday	10.30pm (we weren't home before that)	around 12am	We're not home until 10.30pm. Music is audible in the living room well after 11pm.	Paolo
18-03-17	Saturday	11pm (we weren't home before that)	around 1am	We're not home until 11pm. Music is audible in the living room until 1am.	Paolo
24-03-17	Friday	10.30pm	Past 12am	Music from the bar is turned up after 10, and remains audible well after midnight.	Paolo
25-03-17	Saturday	11pm (we weren't home before that)	around 1am	We're not home until 11pm. Music is audible in the living room until 1am.	Paolo

Report VA1574.160913.SIT2

Corretto, 10 Queen Street, Godalming

Sound Insulation Tests
Corretto to Apartment 2.2

13 September 2016

Corretto ESP Limited
10 Queen Street
Godalming
GU7 1BD

Vent a Acoustics

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0203 8650332
mail@ventaacoustics.com

registered company no. 10139494

Contents

Attachments

1. Introduction

Corretto, 10 Queen Street, Godalming is a small restaurant in Godalming that has experienced noise complaints from the apartments above due to amplified music, specifically with regard to low frequency noise.

Venta Acoustics have been previously commissioned by Corretto ESP Ltd to undertake an evaluation of the sound insulation between their restaurant and different areas of apartment 2.1, the results of which are summarised in report ref. VA1574.160831.SIT.

Following this, Venta Acoustics has returned to undertake new tests to apartment 2.2, which was recently occupied. The results of the tests will be evaluated against the current Building Regulation requirements as summarised in Approved Document E *Resistance to the passage of sound* (2003 Edition) for comparative purposes.

2. Test Procedures and Equipment

Tests were undertaken by Jamie Duncan, in full general accordance with BS EN ISO *140 Acoustics – Measurement of sound insulation in buildings and of building elements Part 4: Field measurements of airborne sound insulation between rooms.*

High volume 'pink' noise was generated from two loudspeakers in the source room, positioned so as to obtain a diffuse sound field within the space. A spatial average of the resulting one-third octave band noise levels was obtained within both the source and the receive room.

In order to correct for room reverberant characteristics, the reverberation time (RT) was measured in the receive room using an interrupted broadband noise source and the RT function of the NTi XL2 sound level meter. Six microphone positions and two loudspeaker positions were used to obtain an average result.

Background noise levels were measured in the receive room in order to correct the received noise measurements for the influence of the prevailing noise climate as in accordance with BS EN 140 part 4.

The prevailing background noise in the apartment was traffic noise from the surrounding streets.

The following equipment was used for the sound insulation tests.

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-11586-E0	42530-A2A-11586-E0	9/6/16
Larson Davis Calibrator	CAL200	13069	42530-13069	9/6/16
Electro Voice Speaker	ZLX-12P-EX	095208361761760076	-	-
Electro Voice Speaker	ZLX-12P-EX	095208361761760087	-	-
Unbranded WAV player	-	-	-	-
Unbranded WAV player	-	-	-	-

Table 2.1 – Equipment used for the tests

3. Test Results

The airborne sound insulation tests of Weighted Standardised Level Difference, $D_{nT,w}+C_{tr}$. Attached figures VA1574/AB4 – AB5 shows the one-third octave band spectrum results of the test for airborne sound insulation, as summarised here:

Test Element	Source	Receive	Test Result ($D_{nT,w}+C_{tr}$)
Floor	Restaurant	Living Room	40 dB
	Restaurant	Bedroom	47 dB*

Table 3.1 – Measured airborne sound insulation
* Stagger in room layout hence higher sound insulation performance.

4. Results Analysis

By way of a comparison, current Building Regulations for dwellings formed by conversion require the airborne sound insulation between dwellings to be at least $D_{nT,w} + C_{tr}$ 43dB while purpose built new dwellings should achieve at least $D_{nT,w} + C_{tr}$ 45dB. The Robust Details scheme typically achieves sound insulation performance of around $D_{nT,w} + C_{tr}$ 50dB while modern "super prime" residential apartments are usually designed to achieve around $D_{nT,w} + C_{tr}$ 53dB - 55dB.

The sound insulation performance between the restaurant and the living room do not currently meet the Building Regulation requirements for sound insulation between dwellings.

The performance between the restaurant and the bedroom achieves a performance of $D_{nT,w} + C_{tr}$ 47dB, but it is likely that this is due to the layout of the rooms, with a fair percentage of the floor area of the bedroom being above the corridor, not the restaurant.

5. Discussion

The Building Regulations deal with sound insulation through the use of Approved Document E *Resistance to the passage of sound* (2003 Edition). As highlighted previously, this document specifically addresses sound insulation between dwellings. In this situation, only one element of the construction is a residential dwelling. However, requirement E1 states:

> *Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings.*

The regulations go on to state:

> *A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes.*

From previous experience, many councils require an improvement in sound insulation of 5dB or more in such situations. Therefore, in this situation, with a commercial premises below a residential apartment, the floor should reasonably be designed to achieve at least $D_{nT,w}$ + C_{tr} 48 – 50dB. The measured sound insulation performance is well below this standard.

It may be argued then that the floor construction has not been designed or constructed in a way that provides reasonable resistance to sound, or even meets the requirements of the Building Regulations.

In its current form, the floor build-up is not considered acoustically fit for purpose for between dwellings, let alone to reasonably allow a restaurant or commercial premises to operate below a residential dwelling.

6. Conclusions

Sound insulation test have been undertaken between Corretto restaurant and apartment 2.2 above at 10 Queen Street, Godalming.

The sound insulation test results fail to meet the requirements of the Building Regulations for converted dwellings in one room, with the other room achieving the requirement.

Jamie Duncan MIOA

Airborne Sound Insulation Test

Figure : VA1574/AB4

Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

(NB Higher $D_{nT,w}+C_{tr}$ figures denote better sound insulation performance)

Construction Tested:
Unknown

Frequency Hz	D_{nT} dB	
100	23.3	
125	26.6	
160	28.9	
200	37.8	
250	49.9	
315	51.6	
400	51.3	
500	54.6	
630	61.7	
800	63.6	
1k	64.6	
1.25k	66.6	
1.6k	68.2	Limit of measurement, $D_{nT} \geq$ 68.2
2k	67.0	Limit of measurement, $D_{nT} \geq$ 67.0
2.5k	68.6	Limit of measurement, $D_{nT} \geq$ 68.6
3.15k	71.5	Limit of measurement, $D_{nT} \geq$ 71.5

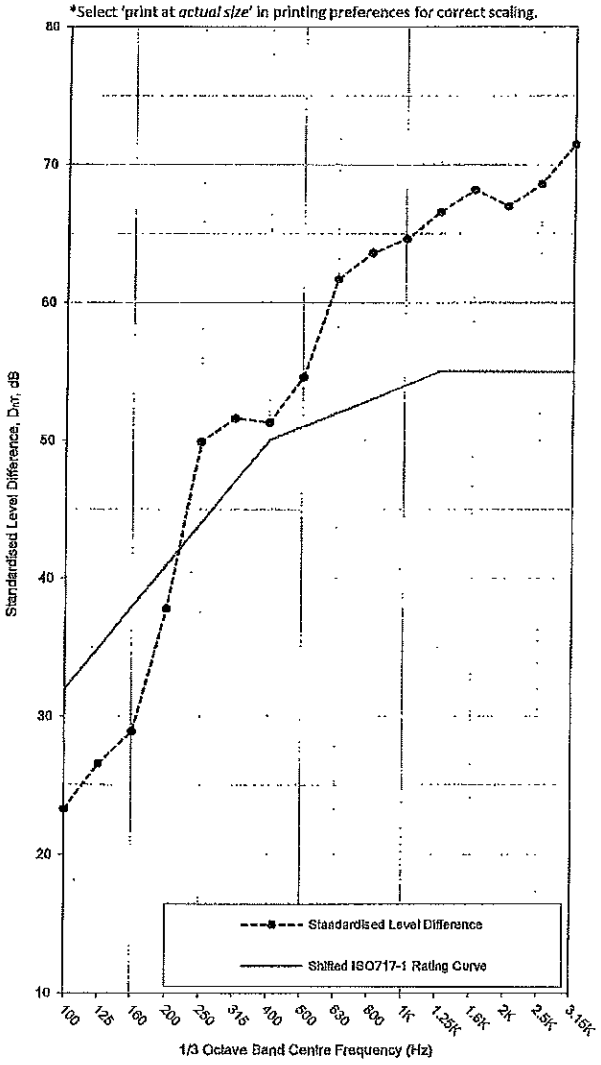
Shift Curve By:	-1 dB
Sum of Adverse Deviations =	29.4 dB
C_{tr} =	-11 dB
$D_{nT,w}$ =	51 dB

$$D_{nT,w} + C_{tr} = 40 \text{ dB}$$

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.

Test Standard: *BS EN ISO 140-4*
Rating Standard: *BS EN ISO 717-1*
Test Date: *13/09/2016*

*Select 'print at *actual size*' in printing preferences for correct scaling.



Project Number: *VA1574*

Client: *Corretto ESP Ltd*
Site: *Corretto, 10 Queen Street*

Venta Acoustics

Airborne Sound Insulation Test

Figure : **VA1574/AB5**

Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

(NB Higher $D_{nT,w}+C_{tr}$ figures denote better sound insulation performance)

Construction Tested:
Unknown

Frequency Hz	D_{nT} dB
100	29.1
125	33.4
160	37.4
200	44.4
250	52.7
315	55.5
400	55.3
500	57.1
630	62.6
800	65.6
1k	66.9
1.25k	65.8
1.6k	67.7
2k	64.6
2.5k	65.0
3.15k	68.1

Limit of measurement, $D_{nT} \geq$ 66.9
Limit of measurement, $D_{nT} \geq$ 65.8
Limit of measurement, $D_{nT} \geq$ 67.7

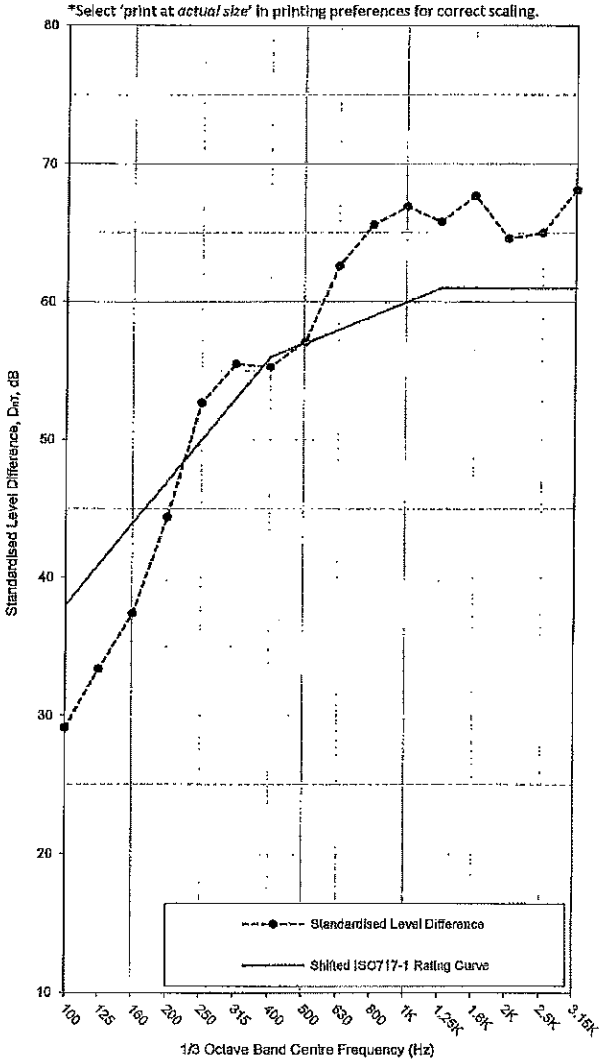
Shift Curve By:	5 dB
Sum of Adverse Deviations =	26.4 dB
C_{tr} =	-10 dB
$D_{nT,w}$ =	57 dB

$$D_{nT,w}+C_{tr} = 47 \text{ dB}$$

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.

Test Standard: *BS EN ISO 140-4*
Rating Standard: *BS EN ISO 717-1*
Test Date: *13/09/2016*

*Select 'print at *actual size*' in printing preferences for correct scaling.



Project Number: *VA1574*

Client: *Corretto ESP Ltd*
Site: *Corretto, 10 Queen Street*

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APPENDIX A

Venta Acoustics

Acoustic Terminology & Human Response to Broadband Sound

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A.
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
R	*Sound Reduction Index.* Effectively the *Level Difference* of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.
D	The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. *D* is the arithmetic *Level Difference* in decibels between the source and receive sound levels when filtered into frequency bands.
D_{nT}	*Weighted Standardised Level Difference.* As defined in BS EN ISO 717-1, representing the *Weighted Level Difference*, when standardised for reference receiving room reverberant characteristics.
R_w D_w $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$	Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value.
C, C_{tr}	Spectral adaptation terms to be added to a single number quantity such as $D_{nT,w}$, to take account of the sound insulation within frequency ranges of particular interest.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

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Acoustic Terminology & Human Response to Broadband Sound

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Report VA1574.160831.SIT

Corretto, 10 Queen Street, Godalming

Sound Insulation Investigation

01 September 2016

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Contents

Attachments

1. Introduction

Corretto, 10 Queen Street, Godalming is a small restaurant in Godlaming that has experienced noise complaints from the apartment above due to amplified music, specifically with regard to low frequency noise.

Venta Acoustics have been commissioned by Corretto ESP Ltd to undertake an evaluation of the sound insulation between their restaurant and different areas of the apartment. The results of the tests will be evaluated against the current Building Regulation requirements as summarised in Approved Document E *Resistance to the passage of sound* (2003 Edition) for comparative purposes.

2. Test Procedures and Equipment

Tests were undertaken by Jamie Duncan, in full general accordance with BS EN ISO *140 Acoustics – Measurement of sound insulation in buildings and of building elements Part 4: Field measurements of airborne sound insulation between rooms.*

High volume 'pink' noise was generated from two loudspeakers in the source room, positioned so as to obtain a diffuse sound field within the space. A spatial average of the resulting one-third octave band noise levels was obtained within both the source and the receive room.

In order to correct for room reverberant characteristics, the reverberation time (RT) was measured in the receive room using an interrupted broadband noise source and the RT function of the NTi XL2 sound level meter. Six microphone positions and two loudspeaker positions were used to obtain an average result.

Background noise levels were measured in the receive room in order to correct the received noise measurements for the influence of the prevailing noise climate as in accordance with BS EN 140 part 4.

The prevailing background noise in the apartment was plant noise from the kitchen extract system servicing Prezzo, which is located at 1st floor roof level, outside the apartment's windows.

The following equipment was used for the sound insulation tests.

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-11586-E0	42530-A2A-11586-E0	9/6/16
Larson Davis Calibrator	CAL200	13069	42530-13069	9/6/16
Electro Voice Speaker	ZLX-12P-EX	095208361761760076	-	-
Electro Voice Speaker	ZLX-12P-EX	095208361761760087	-	-
Unbranded WAV player	-	-	-	-
Unbranded WAV player	-	-	-	-

Table 2.1 – Equipment used for the tests

3. Test Results

The airborne sound insulation tests of Weighted Standardised Level Difference, $D_{nT,w} + C_{tr}$. Attached figures VA1574/AB1 – AB3 shows the one-third octave band spectrum results of the test for airborne sound insulation, as summarised here:

Test Element	Source	Receive	Test Result ($D_{nT,w} + C_{tr}$)
Floor	Restaurant	Living Room	47 dB
	Restaurant	Bedroom	55 dB*
	Kitchen	Bedroom	43 dB

Table 3.1 – Measured airborne sound insulation
* Diagonal test: undertaken purely for informative purposes

4. Results Analysis and Site Observations

By way of a comparison, current Building Regulations for dwellings formed by conversion require the airborne sound insulation between dwellings to be at least $D_{nT,w} + C_{tr}$ 43dB while purpose built new dwellings should achieve at least $D_{nT,w} + C_{tr}$ 45dB. The Robust Details scheme typically achieves sound insulation performance of around $D_{nT,w} + C_{tr}$ 50dB while modern "super prime" residential apartments are usually designed to achieve around $D_{nT,w} + C_{tr}$ 53dB - 55dB.

However, this guidance is intended for between dwellings, rather than between a commercial premises and a residential dwelling. From previous experience, many councils require an improvement in sound insulation of 5dB or more in such situations.

4.1 Noise Climate in Local Area

Background noise levels in the apartment are not notably quiet, mainly due to the extract fan associated with Prezzo outside the rear of the apartments. It is likely that noise levels drop to much lower levels later at night once the adjacent restaurant kitchen closes for the night.

Traffic noise could be heard from vehicles on Flambard Way and it is expected that this becomes the dominant noise source later at night.

4.2 Restaurant to Living Room

The measured sound insulation of the floor between the restaurant and the apartment provides a reasonably good level of acoustic separation at mid to high frequencies, but the low frequency performance is relatively poor. This would correlate with the observations of the residents of the apartment who have stated they cannot hear voices or similar noise from the restaurant, but the bass from the music is the noticeable element.

The speakers in the restaurant are currently hung from the ceiling in mounts located at the opposite end of the room from the apartment, below a currently vacant apartment. Although they are rigidly

attached to the ceiling, the fact that the floor provided poor low frequency performance with the test speakers located at floor levels would indicate that the issue is not a structure borne noise issue.

4.3 Kitchen to Bedroom

Between the kitchen and the bedroom, the sound insulation performance is not especially good, and only just meets the requirements for party floors of dwellings in converted buildings. It also shows the same pattern of poor low frequency sound insulation performance. It was noted that during a second, informative test between the kitchen and the bedroom with the kitchen extract fan operating at full duty, there was a low level hum audible in the room at around 100Hz, with a low level of vibration perceptible from the floor directly above the unit.

The diagonal test between the restaurant and bedroom was for informative purposes and demonstrates there is much lower degree of sound transfer between these areas.

5. Discussion

The Building Regulations deal with sound insulation through the use of Approved Document E *Resistance to the passage of sound* (2003 Edition). As highlighted previously, this document specifically addresses sound insulation between dwellings. In this situation, only one element of the construction is a residential dwelling. However, requirement E1 states:

> *Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings.*

It could be considered that in this situation, with a commercial premises below an apartment, the floor construction has not been designed or constructed in a way that provides reasonable resistance to sound. It should be noted that timber floor systems are characterised by poor low frequency performance and it is unlikely that a high level of protection against low frequency music noise can be reasonably achieved.

6. Conclusions

Sound insulation test have been undertaken between Corretto restaurant and the apartment above at 10 Queen Street, Godalming.

The sound insulation test results meet the requirements of the Building Regulations for converted dwellings, although one of the areas is a commercial premises. However, the low frequency performance between the restaurant and the apartment was noted to be relatively poor.

Jamie Duncan MIOA

Airborne Sound Insulation Test

Figure : VA1574/AB1

Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

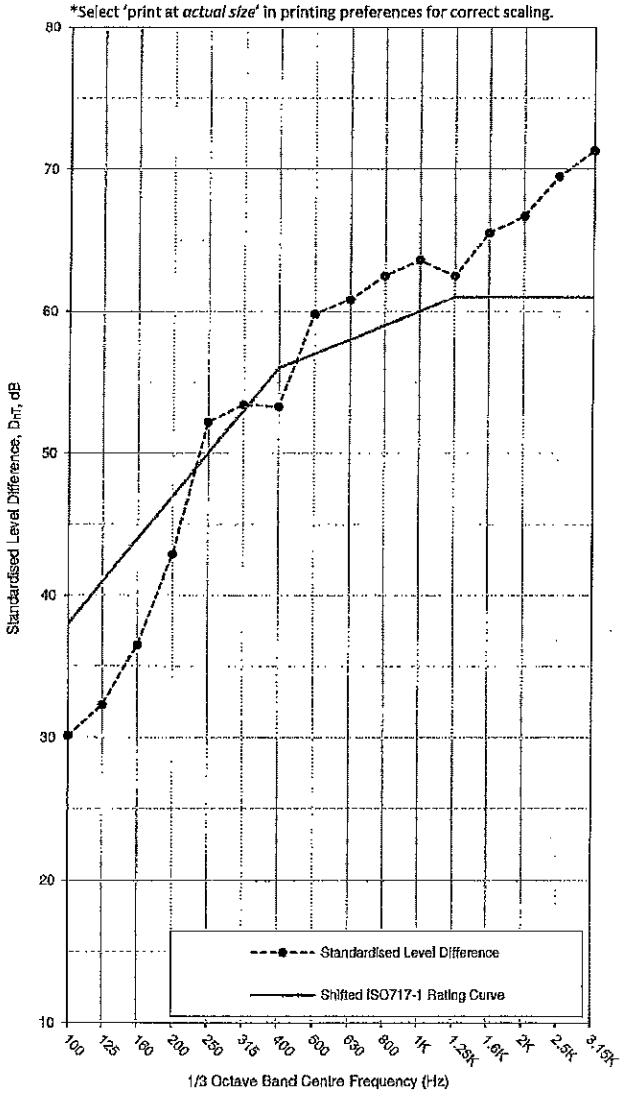
(NB Higher $D_{nT,w}+C_{tr}$ figures denote better sound insulation performance)

Construction Tested:
Construction unknown

Rooms Tested From : ***Restaurant***
To : ***Living Room***

Frequency Hz	D_{nT} dB	
100	30.1	
125	32.3	
160	36.5	
200	42.9	
250	52.2	
315	53.4	
400	53.3	
500	59.8	Limit of measurement, $D_{nT} \geq 59.8$
630	60.8	
800	62.5	Limit of measurement, $D_{nT} \geq 62.5$
1k	63.6	Limit of measurement, $D_{nT} \geq 63.6$
1.25k	62.5	Limit of measurement, $D_{nT} \geq 62.5$
1.6k	65.5	Limit of measurement, $D_{nT} \geq 65.5$
2k	66.7	Limit of measurement, $D_{nT} \geq 66.7$
2.5k	69.5	Limit of measurement, $D_{nT} \geq 69.5$
3.15k	71.3	Limit of measurement, $D_{nT} \geq 71.3$

*Select 'print at *actual size*' in printing preferences for correct scaling.



Shift Curve By:	5 dB
Sum of Adverse Deviations =	30.9 dB
C_{tr} =	-10 dB
$D_{nT,w}$ =	57 dB

$D_{nT,w}+C_{tr}$ = 47 dB

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.

Test Standard: *BS EN ISO 140-4*
Rating Standard: *BS EN ISO 717-1*
Test Date: *25/08/2016*

Project Number: *VA1574*

Client: *Corretto ESP Ltd*
Site: *Corretto, 10 Queen Street, Godalming*

Venta Acoustics

Airborne Sound Insulation Test

Figure : VA1574/AB2

Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

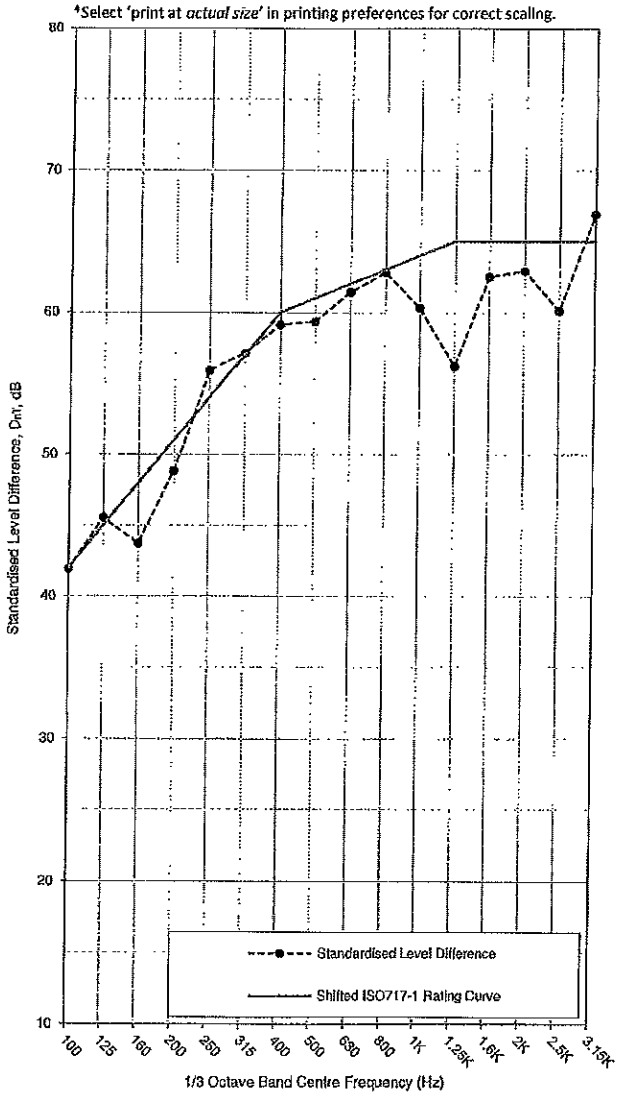
(NB Higher $D_{nT,w}+C_{tr}$ figures denote better sound insulation performance)

Construction Tested:
Construction unknown

Rooms Tested From : ***Restaurant***
To : ***Bedroom***

Frequency Hz	D_{nT} dB	
100	41.9	
125	45.5	
160	43.7	Limit of measurement, $D_{nT} \geq 43.7$
200	48.8	
250	55.9	
315	57.1	
400	59.1	
500	59.3	Limit of measurement, $D_{nT} \geq 59.3$
630	61.4	Limit of measurement, $D_{nT} \geq 61.4$
800	62.8	Limit of measurement, $D_{nT} \geq 62.8$
1k	60.3	Limit of measurement, $D_{nT} \geq 60.3$
1.25k	56.2	Limit of measurement, $D_{nT} \geq 56.2$
1.6k	62.5	Limit of measurement, $D_{nT} \geq 62.5$
2k	62.9	Limit of measurement, $D_{nT} \geq 62.9$
2.5k	60.1	Limit of measurement, $D_{nT} \geq 60.1$
3.15k	66.9	Limit of measurement, $D_{nT} \geq 66.9$

*Select 'print at *actual size*' in printing preferences for correct scaling.



Shift Curve By:	9 dB
Sum of Adverse Deviations =	32.0 dB
C_{tr} =	-6 dB
$D_{nT,w}$ =	61 dB

$D_{nT,w}+C_{tr}$ = 55 dB

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.

Test Standard: *BS EN ISO 140-4*
Rating Standard: *BS EN ISO 717-1*
Test Date: *25/08/2016*

Project Number: *VA1574*

Client: *Corretto ESP Ltd*
Site: *Corretto, 10 Queen Street, Godalming*

Venta Acoustics

Airborne Sound Insulation Test

Figure : **VA1574/AB3**

Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

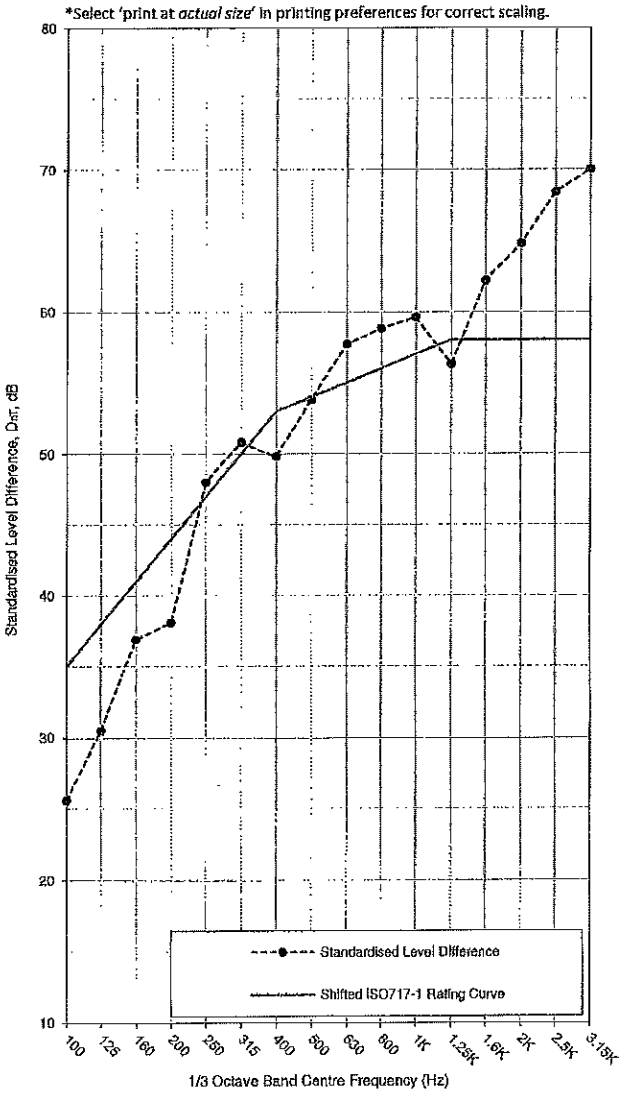
(NB Higher $D_{nT,w}+C_{tr}$ figures denote better sound insulation performance)

Construction Tested:
Construction unknown

Rooms Tested From : ***Kitchen***
To : ***Bedroom***

Frequency Hz	D_{nT} dB	
100	25.6	Limit of measurement, $D_{nT} \geq$ 58.8
125	30.5	Limit of measurement, $D_{nT} \geq$ 59.6
160	36.9	Limit of measurement, $D_{nT} \geq$ 56.8
200	38.1	Limit of measurement, $D_{nT} \geq$ 62.2
250	48.0	Limit of measurement, $D_{nT} \geq$ 64.8
315	50.8	Limit of measurement, $D_{nT} \geq$ 68.4
400	49.8	Limit of measurement, $D_{nT} \geq$ 70.0
500	53.8	
630	57.7	
800	58.8	
1k	59.6	
1.25k	56.3	
1.6k	62.2	
2k	64.8	
2.5k	68.4	
3.15k	70.0	

*Select 'print at *actual size*' in printing preferences for correct scaling.



Shift Curve By:	2 dB
Sum of Adverse Deviations =	32.0 dB
C_{tr} =	-11 dB
$D_{nT,w}$ =	54 dB

$D_{nT,w}+C_{tr}$ = 43 dB

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.

Test Standard: *BS EN ISO 140-4*
Rating Standard: *BS EN ISO 717-1*
Test Date: *25/08/2016*

Project Number: *VA1574*

Client: *Corretto ESP Ltd*
Site: *Corretto, 10 Queen Street, Godalming*

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APPENDIX A

Venta Acoustics

Acoustic Terminology & Human Response to Broadband Sound

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A.
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
R	*Sound Reduction Index.* Effectively the *Level Difference* of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.
D	The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. *D* is the arithmetic *Level Difference* in decibels between the source and receive sound levels when filtered into frequency bands.
D_{nT}	*Weighted Standardised Level Difference.* As defined in BS EN ISO 717-1, representing the *Weighted Level Difference*, when standardised for reference receiving room reverberant characteristics.
R_W D_w $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$	Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value.
C, C_{tr}	Spectral adaptation terms to be added to a single number quantity such as $D_{nT,w}$, to take account of the sound insulation within frequency ranges of particular interest.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

APPENDIX A

Venta Acoustics

Acoustic Terminology & Human Response to Broadband Sound

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial