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NOISE IMPACT ASSESSMENT
27 Market Place, Huddersfield, HD1 2AD

Client: Noble Corp Ltd.

Report by
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Acute Acoustics Ltd.

Report Date: 26th July 2024
Ref: 2894 Huddersfield – 27 Market Place NIA [Rev A]
Site Visited by: P M Dyson
Site Visits: 28/29 June 2024

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1.0 INTRODUCTION

Brown & Co Property & Business Consultants Ltd. (BPBCL) instructed Acute Acoustics Ltd (AAL) on behalf of their client, Noble Corp Ltd (NCL), to carry out a noise impact assessment to support a planning application (Kirklees Council Ref: 2023/93615) with the aim of '*Change of use to an Adult Gaming Centre (Sui Generis) (Listed Building within a Conservation Area)'* at 27 Market Place, Huddersfield, HD1 2AD.

This report was commissioned to evaluate the pre-existing background noise levels at the site and assess the impact of noise from the ground floor to be occupied by an adult gaming centre.

The report considers measurements taken onsite, the requirements of relevant legislation and makes recommendations as necessary. Acoustic terminology is explained at Appendix 1; my qualifications at Appendix 2, References at Appendix 3, Location and Layout Plans at Appendix 4, Detailed Results at Appendix 5 and Calculations at Appendix 6.

2.0 ASSESSMENT CRITERIA

Although BS4142 below is not intended for the determination of noise nuisance of sound from music and people (as specified in the Scope at

Section 1.3), the methodology of comparing the 'problem noise' to the background is considered to be a useful one and so it has been included.

2.1 BS4142:2014+A1:2019

BS.4142 "Methods for Rating and Assessing Industrial and Commercial Sound" [Ref 1] describes a method for assessing the impact of sound produced on industrial and commercial premises.

The Standard requires that the ambient noise (total noise including the "problem" noise) is measured in terms of the equivalent continuous sound level LAeq [see Appendix 1 for acoustic terms], which is then corrected for the residual noise (total noise excluding the "problem" noise) also measured as an LAeq, to give the specific noise (from the "problem" noise alone).

A correction for character is made if the noise contains a distinguishable discrete, continuous note [whine, hiss, screech, hum etc.]. If appropriate an addition of up to 6 dB can be made to the specific noise.

Similarly, if there are distinct impulses in the noise [bangs, clicks, clatters, or thumps], a further correction of 3, 6 or 9dB can be made as appropriate.

If the noise is neither tonal nor impulsive but is otherwise readily distinctive in comparison with the residual acoustic environment a correction of 3dB can be made.

Finally, if the noise is irregular enough to attract attention another correction of 3dB can be made. The final figure, including any character corrections is known as the Rating level.

This Rating Level is then compared with the measured background [LA90] level.

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.2 Approved Part E – Building Regulations

For airborne sound insulation, Part E of The Building Regulations (ADE) relies on a single number value for assessment of sound insulation; this term is known as DnT,w+Ctr; DnT,w was the previous single figure term and Ctr is a spectrum adaptation term designed to give more weight to the performance of separating structures at low frequencies. For dwellings and rooms for residential purposes formed by a material change of use, the airborne sound insulation of both separating walls and floors should achieve a value of 43 dB DnT,w+Ctr or higher.

ADE states 'a higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations, the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space'.

In addition, local authorities often require a higher level of airborne sound insulation for partitions separating residential and commercial use space.

2.3 Local Authority

Kirklees Council Environmental Health Dept. have included the following planning condition with regard to noise:

'The site is adjoining residential accommodation, and we have concerns about the transmission of gaming noise to the occupiers of these properties, particularly in the nighttime period (the proposal is for a 24hr/7 days a week use). A Noise Impact Assessment will need to be submitted prior to determination with particular emphasis on the sound insulation between both uses. The applicant is advised a higher level of sound insulation is required where commercial and residential use share a party wall/floor/ceiling and we look to achieve a minimum standard of 55dB DnTw + Ctr for airborne sound insulation.'

3.0 SITE DESCRIPTION

The building at 27 Market Place is Grade II listed (Entry No: 1313531) and located on the south side of the Market Place. It was formerly occupied by a bank and is located in an area of predominantly retail and commercial units nearby including:

'Reeds Rains Estate Agents' at 23 Market Place with opening times of:

Monday-Friday	09:00–17:30
Saturday	09:00–16:00
Sunday	09:00–16:00

'Rico's' clothing shop at 1 New Street with opening times of:

Monday-Saturday	09:30–17:30

Sunday Closed

'Packhorse Shopping Centre' with various retail units with opening times of:

Monday-Saturday 09:00–18:00

Sunday 10:00-16:00

'J Dodd & Co Ltd' Supplements & Vitamins at 7 Market Walk with opening times of:

Monday-Saturday 09:15–17:00

Sunday Closed

'Walkers Jewellers' at 2 Market Walk with opening times of:

Monday-Saturday 09:00–16:00

Sunday Closed

The gaming machines will be situated in the open area of the ground floor and the offices at the rear of the building retained as office and welfare space.

Location and site plans are shown at Appendix 4.

It is understood that NCL have applied for 24hr/7 days a week use for the facility.

There is a live application on the upper floors of the building (covered

by a separate planning application Ref: 2023/62/93553/W) for the change of use to form 8 flats which is yet to be determined. The use is currently vacant storage.

3.3 Nearby Noise Sensitive Receptors

The nearest noise sensitive premises are:

- Upper floor flats in the Packhorse Centre at a distance of 10m.
- Potential Upper floor flats in the building which, if approved, would be at a distance of some 3.5m from ground floor windows to first floor windows.

4.0 BACKGROUND NOISE MEASUREMENTS

The site was visited on Friday 28th June 2024 and noise monitoring equipment was installed at a position 1m from the front façade at first floor height to measure pre-existing background noise levels. The meter was left gathering data until the following day for some 25 hours. The meter was set to record audio as well as data.

The weather conditions during the monitoring period were generally fine and dry; temperatures of 11-15 degrees Celsius. Wind speeds were low, generally 0-2 Beaufort Scale and were checked when onsite with a Kestrel 2000 handheld anemometer (s/n 2080552) to check that wind speed did not exceed 5m/s at the microphone position.

Weather information was from observations made at the time of the site visits and also sourced from the www.wunderground.com website using the data for Leeds Bradford Airport monitoring station.

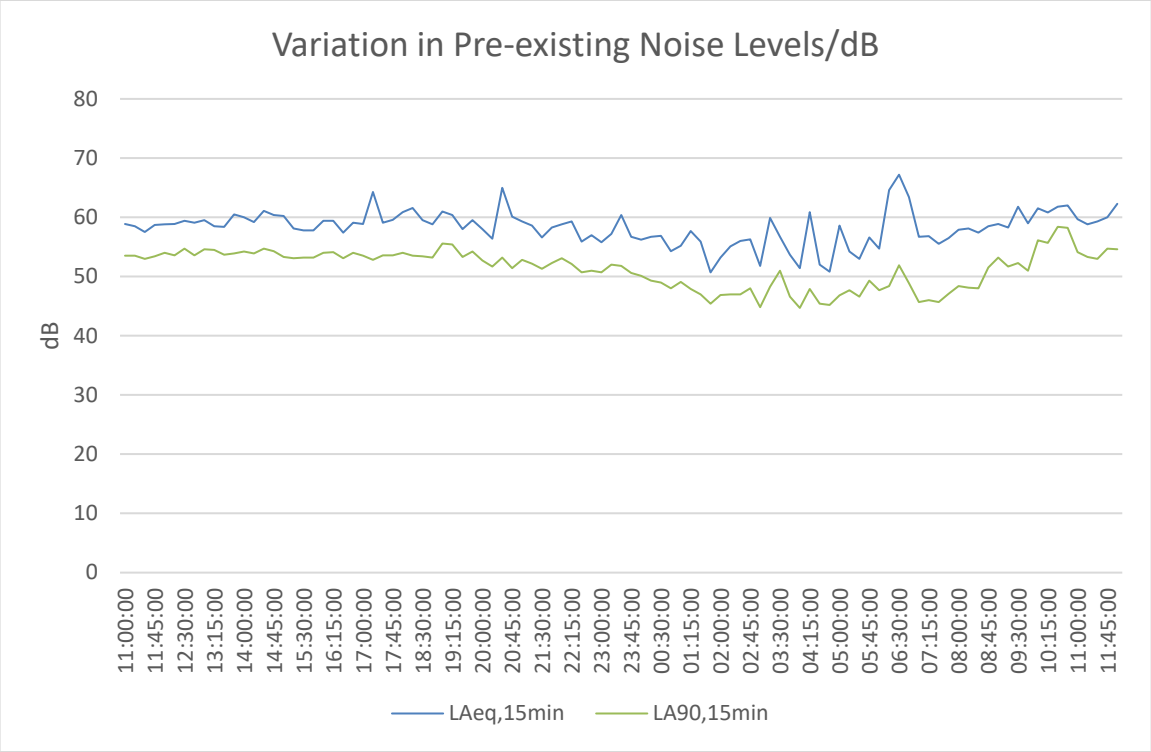
The sound level meter was a Svan Type 957 (s/n 12308); mounted on a pole 1m from the front façade at first floor height and fitted with a RION WSO3SO1 "all-weather" wind muff. The meter calibrated correctly before and after the measurements using a Rion calibrator type NC-74 (s/n 34362117).

Both meter and calibrator had been laboratory calibrated within the preceding 24 months.

5.0 BACKGROUND NOISE RESULTS

5.1 Background Noise Measurement Results

The detailed main results are shown at Appendix 5. Graph 1 below shows the variations in ambient noise levels.



Graph 1: Variations in Pre-existing Ambient Noise Levels/dB

5.2 Subjective Assessment

Noise sources noted included road traffic and pedestrian movement and voices in the Market Place. Listening to the recordings confirms that to be the case throughout the monitoring period. Noise levels during late evening and nighttime were somewhat lower but the Market Place is still well used by pedestrians moving from venue to venue and by some road traffic. A church clock bell sounding the hours and quarters was audible.

High 15 minute LAeq levels were dominated by emergency vehicle sirens nearby (17:15), loud motorbikes passing by (20:30), car horn

(23:30), loud chatter from patrons leaving pubs and other venues (03:15), refuse lorry movement and activity (04:15) and a street sweeper maneuvering (06:30).

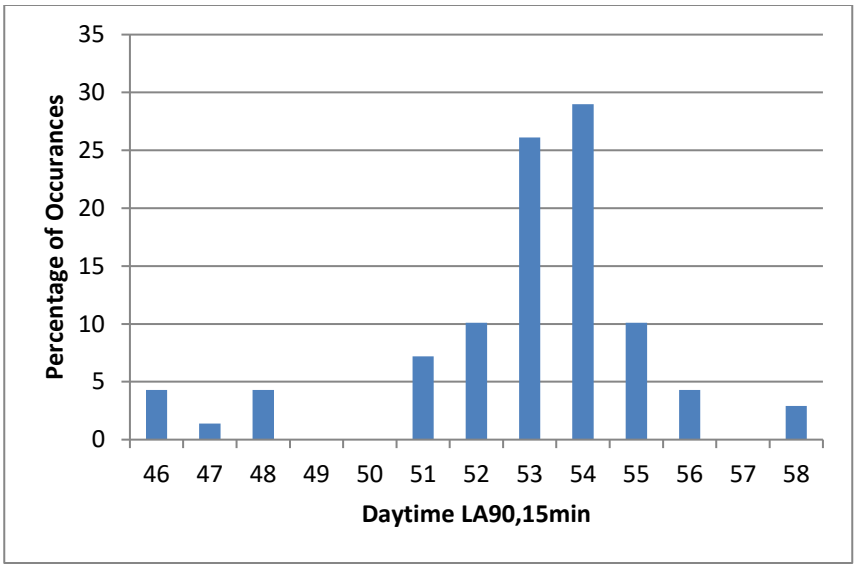
6.0 ASSESSMENT OF BACKGROUND NOISE RESULTS

Considering Graph 1 above and the detailed results at Appendix 5, it can be seen that LA90 noise levels varied between 45-58dB to the nearest whole numbers.

BS4142:2014 [Ref 3] provides guidance on analysing the measured levels when a range of results is available and daytime (07:00-23:00) and nighttime (23:00-07:00) periods have been considered separately.

6.1 Assessment of Results – Daytime (07:00-23:00)

Considering the daytime period from 07:00-23:00, the arithmetic average of the results was 53dB LA90; the spread of the results is shown on Graph 2 below:

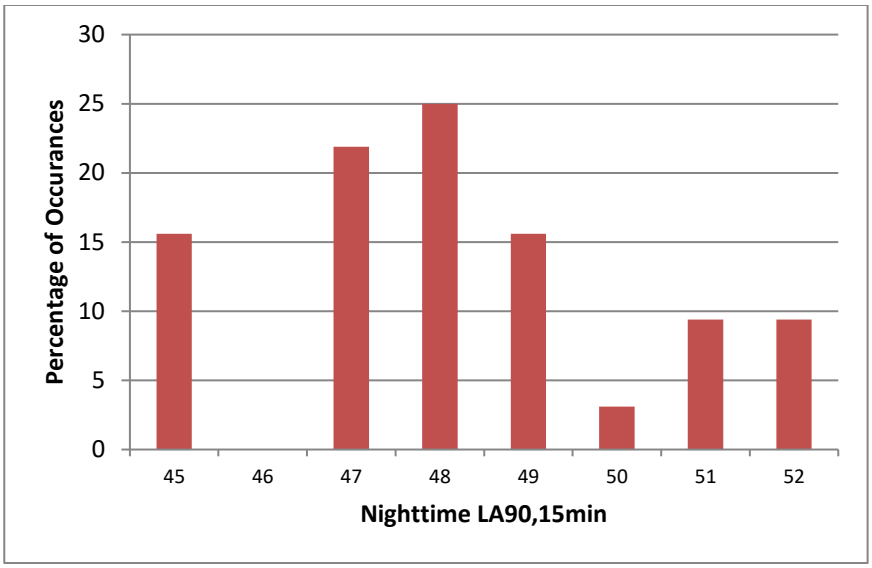


Graph 2: Statistical Analysis of Pre-existing LA90 Noise Levels/dB – 07:00-23:00

From Graph 2, whilst 54dB LA90 is the modal level, **53dB LA90** has been taken as being representative of **background noise levels** during the daytime. Background noise levels were 53dB or greater for 74% of the 07:00-23:00 daytime period.

6.2 Assessment of Results – Nighttime (23:00-07:00)

Considering the nighttime period from 23:00-07:00, the arithmetic average of the results was 48dB LA90; the spread of the nighttime results is shown on Graph 3 below:



Graph 3: Statistical Analysis of Pre-existing LA90 Noise Levels/dB – 23:00-07:00

From Graph 3, whilst 48dB LA90 is also the modal level, **47dB LA90** has been taken as being representative of **background noise levels** during the nighttime. Background noise levels were 47dB or greater for 84% of the 07:00-23:00 nighttime period (*and 95% of the daytime period)*.

The measured noise levels were for a position 1m from the façade and therefore include a façade reflection effect increasing noise levels. Façade Levels should be assumed to be 3dBA higher than levels measured away from any buildings.

Therefore, the 'free field' Daytime **LA90 = 50dB** (53 – 3).
The 'free field' Nighttime **LA90 = 44dB** (47 – 3).

It is understood that the facility has applied for 24hr/7 days a week operation, so the nighttime level has been used for consideration of impact.

7.0 SOURCE NOISE LEVELS

7.1 Source Noise Measurements

An existing adult gaming centre at 44 Northgate, Darlington, DL1 1TT, operated by the client and considered to be similar to the Huddersfield site, was visited on Friday 28th June 2024. Noise measurements were carried out to establish levels within the gaming centre when the gaming machines were operating, and music played over a small PA system.

The manager of the Darlington facility and John Noble of NCL were present and able to advise on typical noise levels and to set the PA accordingly. It is understood that music 'Level 2' is set when the facility is quieter with fewer patrons and 'Level 3' when busier. The music is not played at high levels at all as the purpose is to mask conversation and add atmosphere. The machines play various sound effects and music stings when being played and also on occasion when idling between patrons. It is also understood that whilst the gaming centres do usually have 24 hour licenses, very few customers use the facilities late at night or during the early hours of the morning.

It was noted that the outer doors are left open but there are inner glazed doors that open and close automatically limiting exterior street noise from breaking in and music and machine noise from breaking out. It is understood that this arrangement is to be installed at the Huddersfield site.

The sound level meter was a Svan type 977 (s/n 97425), handheld at arm's length and fitted with a wind muff. Measurements were made whilst moving around the playing area of the facility.

The meter calibrated correctly before and after the measurements using the calibrator detailed above and both meter and calibrator had been laboratory calibrated within the preceding 24 months.

7.2 Source Noise Results

The detailed main results are shown below in Figure 1/dB. The third octave band results are shown at Appendix 5/dBLin in both tabular form and at Graph 4/dBLin. Octave Band levels are shown below in Figure 2/dBLin.

Descrition	Duration,T	LAeq,T	LAmax,F
Music Level 2, all machines running, 5 players	00:03:38	63.8	78.3
Music Level 3, all machines running, 8 players	00:03:36	67.0	78.1

Figure 1: Source Noise Results/dB

Frequency/Hz	63	125	250	500	1000	2000	4000	8000
Music Level 2, all machines running, 5 players	56.1	58.9	63.1	60.4	59.5	56.6	50.6	42.5
Music Level 3, all machines running, 8 players	55.4	60.7	64.7	63.3	61.9	61.1	54.3	44.9

Figure 2: Source Noise Octave Band Results/dBLin

7.2 Subjective Observations

It was noted at the time of the site visit that noise levels within the Darlington facility were not particularly high; conversation was still possible with someone close by but could not be overheard by others playing machines. The sound effects and music stings from the gaming machines were louder than the PA level so that the player could react accordingly to the sound effect/music sting. The PA was not particularly bass heavy as would be the case in a bar or nightclub setting. It's important for staff and customers to be able to converse easily without being distracted or drowned out by the music on the PA system.

Graph 4 at Appendix 5 shows that the music was not particularly tonal or bass heavy which agrees with the subjective assessment.

8.0 CALCULATION OF RECEPTOR NOISE LEVELS

8.1 Noise Breakout Levels

Considering the higher noise level measured in the existing facility and erring on the side of safety, an internal noise level of **70dBA** has been assumed.

Appendix 7 shows calculations of noise break out from the facility at the receptors identified (in Section 3.3) at Figures 3 & 4.

Assumptions Used in Calculations:

- The predictions of noise transmission through the front wall of the building have been performed using the "Radiation of sound from plane areas" method in "Acoustics and Noise Control" 2nd Edition [Ref 5]. This method assumes that the receptor lies on a line perpendicular from the centre of the panel so can overestimate the noise impact if receptors are 'off to the side'.
- Where receptors have no direct view of the source, 5dB attenuation has been assumed.
- The frequency analysis measured has been used for the calculations.
- 9" brick wall (possibly thicker) assumed to have acoustic performance of cavity masonry wall.

With an internal noise level of **70dBA** in the facility, the building breakout noise level is calculated to be **19dBA** at the nearest Upper Floor flats in the Packhorse Centre and **24dBA** at the nearest potential first floor flat above the facility.

9.0 BREAK OUT NOISE ASSESSMENT

It is considered likely that the music and noise from the facility will contain some impulsive content and be different from the residual sound, so it is considered appropriate that 3dB penalty for each is added which is a total character correction of **+6dB**.

As stated above, the methodology that has been used is similar to BS4142 in that a rated noise level of the problem noise has been compared to the nighttime background noise level.

9.1 Assessment – Packhorse Flats

Specific Sound Level = 19dBA

Total Character Correction = 6dB

Rating Level = 25dB

Background Noise Level = 44dBA

Rating Level, 25dB – Background Level, 44dB = **-19dB**

A 'BS4142' assessment is an indication of **a low impact** depending on context.

9.2 Assessment – Potential First Floor Flats Above

Specific Sound Level = 24dBA

Total Character Correction = 6dB

Rating Level = 30dB

Background Noise Level = 44dBA

Rating Level, 30dB – Background Level, 44dB = **-14dB**

A 'BS4142' assessment is an indication of **a low impact**.

9.3 Discussion

It can be seen that the breakout noise level at the nearest receptors is significantly below the pre-existing background noise level, even when a 3dB higher than measured source noise level is used.

10.0 UNCERTAINTIES

10.1 In order to reduce uncertainties:

- A 3dB higher than highest measured internal noise level has been assumed for building break out.
- Representative background noise levels lower than the modal

value have been used.

- Noise monitoring was carried out following procedures within BS7445-1 when meteorological conditions were favourable.

11.0 SEPARATING FLOOR – GROUND FLOOR/FIRST FLOOR

An airborne sound insulation test was carried out between the ground floor commercial space and a first floor office by RP Acoustics Ltd (Ref: NA/1207/23/252 V1.0 dated 11/12/2023) as part of their noise assessment for the planning application for the upper floor flats (and available on the Kirklees Council planning portal). The result was a Dntw of 61dB and a Dntw + Ctr of 54dB which fails by 1dB to meet the Kirklees Council planning condition.

However, the Kirklees Council consultation response to the noise assessment submitted to support the application for the flats above states:

"*Section 6* (of the report) *considers the sound insulation between the commercial use on the ground floor and the residential use to the first floor. Testing shows that it achieves a performance of 54dB DnTw + Ctr which is slightly below our requirement of 55dB DnTw + Ctr but is accepted based upon the tolerances within the testing regime and the*

listed building status and the limitations within this. The findings of the report are accepted".

Given the noise levels encountered and measured in the existing facility are not particularly high, it is considered that the separating floor should give ample protection to occupants of flats above if planning is agreed.

12.0 CONCLUSIONS

12.1 The noise impact from an adult gaming centre is shown above.

12.2 An assessment of predicted noise impact from the facility is of a low impact.

12.3 The current use of the upper floors is storage, and this application is suitable. If the above application is granted (2023/62/93559/W) then whilst further mitigation measures would be required on the first floor to meet the Kirklees Council condition (outside of this application), Environmental Health have confirmed a Dntw + Ctr of 54dB to be acceptable.

12.4 Should the site layout change, or workloads increase significantly from those described above, it may be necessary to re-evaluate the impact.

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A).**

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus, most people cannot distinguish between, say 30 and 31 dB(A).

If a noise varies over time, then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.
The following table gives an indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	30	Very Quiet
Quiet office	40	
Rural background noise	45	
Normal conversational level	60	
Busy restaurant	65	
Typewriter @ 1m	73	
Inside suburban electric train	76	
Alarm clock ringing @ .5m	80	
Hand clap @ 1m	80	
HGV accelerating @ 6m	92	Very Loud

APPENDIX 2

The measurements were carried out and the report prepared by Peter Dyson of Acute Acoustics Ltd., a consultancy company which specialises in Environmental and Workplace Noise.

He holds the Institute of Acoustics Diploma in Acoustics and Noise Control, a Bachelor's degree in Mechanical Engineering, The Institute of Acoustics Certificates of Competence in Environmental Noise Assessment and in Workplace Noise Measurement. He is a Member of the Institute of Acoustics.

He is also an ANC accredited Sound Insulation tester for Martec Environmental Consultants Ltd., a consultancy company which also specialises in Environmental and Workplace Noise.

Acute Acoustics Ltd is a member of the Association of Noise Consultants.

APPENDIX 3

REFERENCES

1 National Planning Policy Framework - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

2 National Planning Policy Guidance – Noise – http://planningguidance.planningportal.gov.uk/blog/guidance/noise/noise-guidance/

3 BS4142:2114 "Methods for Rating and Assessing Industrial and Commercial Sound".

4 World Health Organisation – Guidelines for Community Noise - http://www.who.int/docstore/peh/noise/Comnoise-1.pdf

5 Acoustics & Noise Control, 2nd Edition. Smith, Peters & Owen – Pearson Longman.

6 Kingspan Acoustic Performance Guide - http://www.kingspanpanels.com/Resource_Centre/Literature/Download/Various-Issues/Acoustic-Performance-Guide.aspx

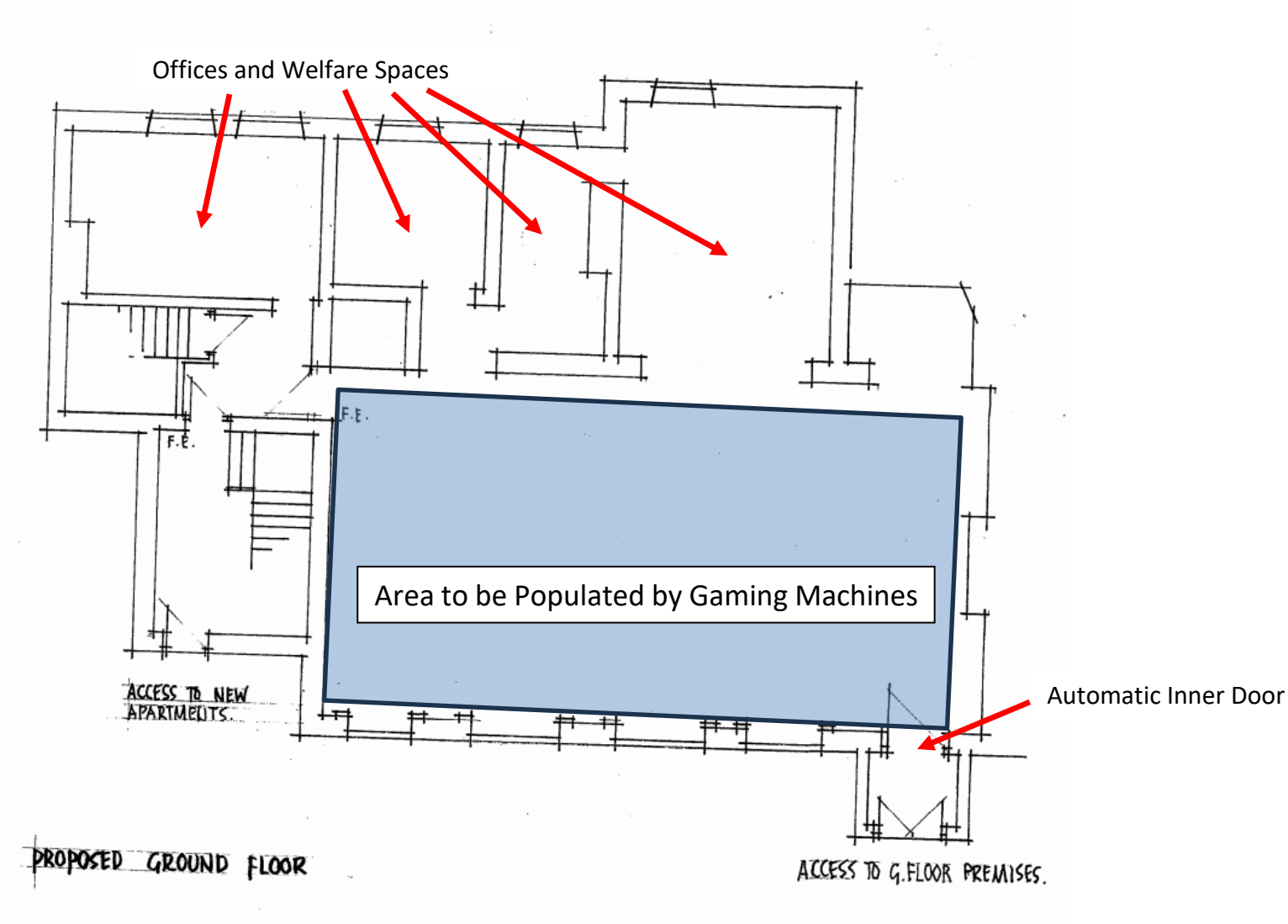
7 BS5228-1:2009 "Code of Practice for Noise and Vibration Control on Construction and Open Sites" – Part 1: Noise

APPENDIX 4

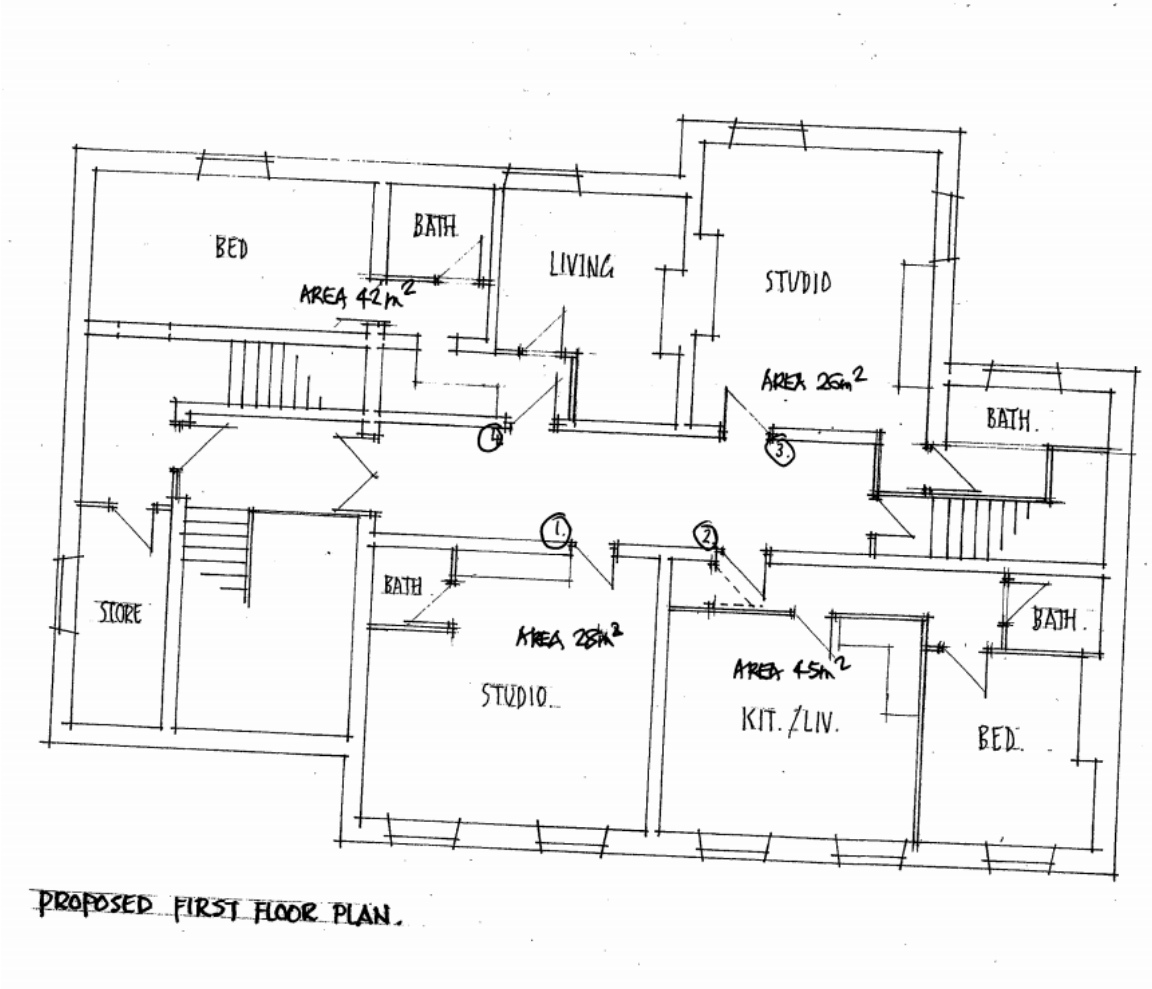
Site Location Plan

Background Noise Measurement Position

Indicative Proposed Ground Floor Plan



Proposed First Floor Plan (Separate Planning Application)



APPENDIX 5

Detailed Noise Level Results/dB

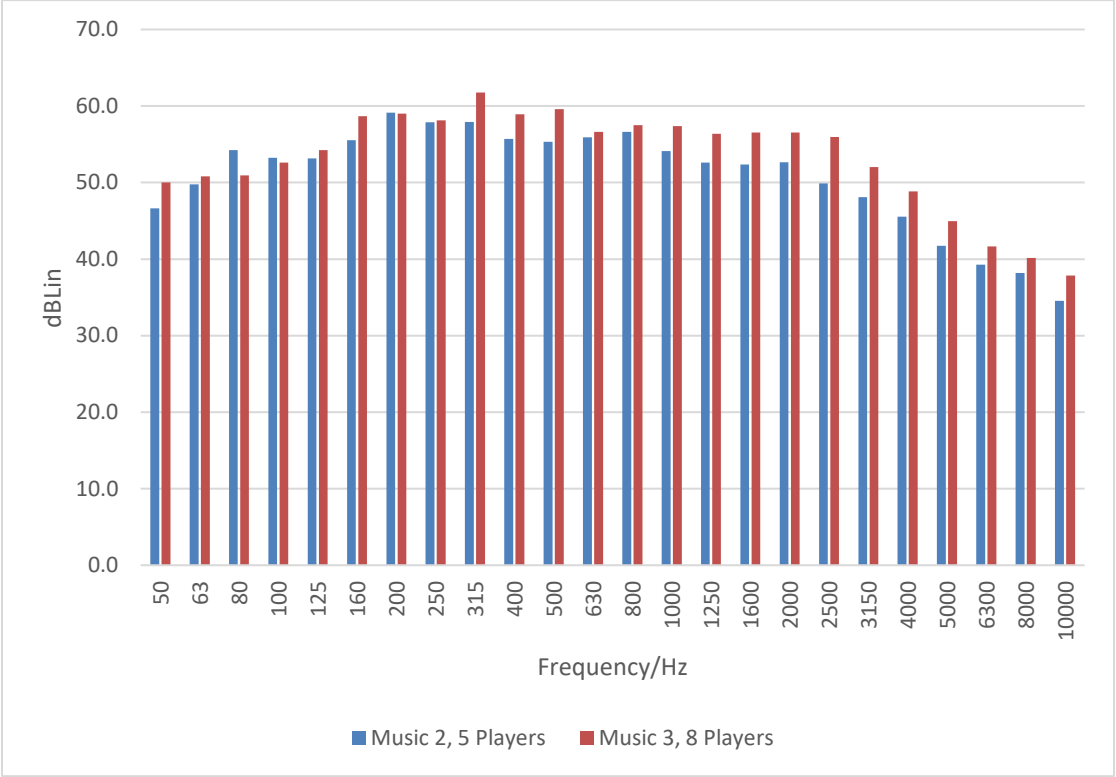
Day/Date	Start Time	Duration,T	LAeq,T	LA10	LA90	LAmax,F
Fri 28	11:00:00	00:15:00	58.9	61.4	53.5	81.2
Fri 28	11:15:00	00:15:00	58.5	61.6	53.5	75.6
Fri 28	11:30:00	00:15:00	57.5	60	53	78
Fri 28	11:45:00	00:15:00	58.7	61.6	53.4	77.3
Fri 28	12:00:00	00:15:00	58.8	61.7	54	75
Fri 28	12:15:00	00:15:00	58.9	61.8	53.6	73
Fri 28	12:30:00	00:15:00	59.4	62.1	54.7	74
Fri 28	12:45:00	00:15:00	59.1	62	53.6	76.1
Fri 28	13:00:00	00:15:00	59.5	62.6	54.6	71.8
Fri 28	13:15:00	00:15:00	58.5	60.9	54.5	70.9
Fri 28	13:30:00	00:15:00	58.4	60.7	53.7	72.9
Fri 28	13:45:00	00:15:00	60.5	62.7	53.9	81.4
Fri 28	14:00:00	00:15:00	60	62.5	54.2	87.7
Fri 28	14:15:00	00:15:00	59.2	61.7	53.9	77.6
Fri 28	14:30:00	00:15:00	61.1	62.7	54.7	81.5
Fri 28	14:45:00	00:15:00	60.4	61.9	54.3	78.6
Fri 28	15:00:00	00:15:00	60.2	60.8	53.3	84.4
Fri 28	15:15:00	00:15:00	58.1	60.9	53.1	71.8
Fri 28	15:30:00	00:15:00	57.8	60	53.2	75.8
Fri 28	15:45:00	00:15:00	57.8	60.4	53.2	75
Fri 28	16:00:00	00:15:00	59.4	62.1	54	73.3
Fri 28	16:15:00	00:15:00	59.4	62.2	54.1	76.5
Fri 28	16:30:00	00:15:00	57.4	60	53.1	70.2
Fri 28	16:45:00	00:15:00	59.1	61.4	54	82.3
Fri 28	17:00:00	00:15:00	58.9	61.4	53.5	78.3
Fri 28	17:15:00	00:15:00	64.3	61.9	52.8	87.1
Fri 28	17:30:00	00:15:00	59.1	61.7	53.6	78.3
Fri 28	17:45:00	00:15:00	59.6	62.4	53.6	77
Fri 28	18:00:00	00:15:00	60.9	63.4	54	86.7
Fri 28	18:15:00	00:15:00	61.6	62.6	53.5	84.6
Fri 28	18:30:00	00:15:00	59.5	62.3	53.4	74
Fri 28	18:45:00	00:15:00	58.8	61.2	53.2	78.1
Fri 28	19:00:00	00:15:00	61	63.2	55.6	76.7
Fri 28	19:15:00	00:15:00	60.4	63.2	55.4	74.8
Fri 28	19:30:00	00:15:00	58	60.6	53.3	72.1
Fri 28	19:45:00	00:15:00	59.5	62	54.2	79.5

Fri 28	20:00:00	00:15:00	58	60.6	52.7	71.4
Fri 28	20:15:00	00:15:00	56.4	58.7	51.7	76.2
Fri 28	20:30:00	00:15:00	65	64	53.2	88.2
Fri 28	20:45:00	00:15:00	60.1	61.3	51.4	87.2
Fri 28	21:00:00	00:15:00	59.3	62.1	52.8	76.7
Fri 28	21:15:00	00:15:00	58.6	60.6	52.2	79.3
Fri 28	21:30:00	00:15:00	56.6	59.4	51.3	73.6
Fri 28	21:45:00	00:15:00	58.3	61.3	52.3	79.3
Fri 28	22:00:00	00:15:00	58.8	61.1	53.1	79
Fri 28	22:15:00	00:15:00	59.3	61.9	52.1	80.2
Fri 28	22:30:00	00:15:00	55.9	58.8	50.7	68.1
Fri 28	22:45:00	00:15:00	57	60.1	51	73.1
Fri 28	23:00:00	00:15:00	55.8	58.3	50.7	74.7
Fri 28	23:15:00	00:15:00	57.2	59.2	52	81.6
Fri 28	23:30:00	00:15:00	60.4	60.3	51.8	86.6
Fri 28	23:45:00	00:15:00	56.7	58.1	50.6	83
Sat 29	00:00:00	00:15:00	56.2	58.2	50.1	80.9
Sat 29	00:15:00	00:15:00	56.7	58	49.3	75
Sat 29	00:30:00	00:15:00	56.9	58.9	49	79.6
Sat 29	00:45:00	00:15:00	54.3	56.5	48	71.4
Sat 29	01:00:00	00:15:00	55.2	56.6	49.1	74.2
Sat 29	01:15:00	00:15:00	57.7	56.5	47.9	82.6
Sat 29	01:30:00	00:15:00	55.9	55.7	47	80.8
Sat 29	01:45:00	00:15:00	50.7	53.3	45.4	71.2
Sat 29	02:00:00	00:15:00	53.2	55.9	46.9	71.2
Sat 29	02:15:00	00:15:00	55.1	57.4	47	76.6
Sat 29	02:30:00	00:15:00	56	58.4	47	78.7
Sat 29	02:45:00	00:15:00	56.3	59	48	80.8
Sat 29	03:00:00	00:15:00	51.8	54.1	44.8	73.4
Sat 29	03:15:00	00:15:00	59.9	62.9	48.3	81.7
Sat 29	03:30:00	00:15:00	56.7	58.9	51	72.2
Sat 29	03:45:00	00:15:00	53.7	56.2	46.6	74.5
Sat 29	04:00:00	00:15:00	51.4	54.2	44.7	67.3
Sat 29	04:15:00	00:15:00	60.9	65.6	47.9	73.5
Sat 29	04:30:00	00:15:00	52	55.6	45.4	64.1
Sat 29	04:45:00	00:15:00	50.8	53.5	45.2	64.9
Sat 29	05:00:00	00:15:00	58.6	60.1	46.8	75.1
Sat 29	05:15:00	00:15:00	54.2	57.1	47.7	66.8
Sat 29	05:30:00	00:15:00	53	56	46.6	65.2
Sat 29	05:45:00	00:15:00	56.6	59.6	49.3	73.4
Sat 29	06:00:00	00:15:00	54.7	57.8	47.7	70.6

Sat 29	06:15:00	00:15:00	64.6	66.4	48.4	81.1
Sat 29	06:30:00	00:15:00	67.2	70.2	51.9	80.1
Sat 29	06:45:00	00:15:00	63.4	65.3	48.9	81
Sat 29	07:00:00	00:15:00	56.7	61.8	45.7	68
Sat 29	07:15:00	00:15:00	56.8	60.9	46	70.3
Sat 29	07:30:00	00:15:00	55.5	58.6	45.7	70.4
Sat 29	07:45:00	00:15:00	56.5	60.5	47.1	69.3
Sat 29	08:00:00	00:15:00	57.9	62.1	48.4	73.1
Sat 29	08:15:00	00:15:00	58.1	62.7	48.1	74.2
Sat 29	08:30:00	00:15:00	57.4	61.1	48	78.1
Sat 29	08:45:00	00:15:00	58.5	61.7	51.5	71.3
Sat 29	09:00:00	00:15:00	58.9	62.4	53.2	75.5
Sat 29	09:15:00	00:15:00	58.3	61.9	51.7	70.7
Sat 29	09:30:00	00:15:00	61.8	62.2	52.3	86.2
Sat 29	09:45:00	00:15:00	59	62	51	72
Sat 29	10:00:00	00:15:00	61.5	62.5	56.1	86.3
Sat 29	10:15:00	00:15:00	60.8	62.5	55.7	85.2
Sat 29	10:30:00	00:15:00	61.8	64.2	58.4	73.9
Sat 29	10:45:00	00:15:00	62	64.2	58.2	82
Sat 29	11:00:00	00:15:00	59.7	62	54.1	72.7
Sat 29	11:15:00	00:15:00	58.8	61.9	53.3	72.6
Sat 29	11:30:00	00:15:00	59.3	62.4	53	74.3
Sat 29	11:45:00	00:15:00	60	62.8	54.7	73.1
Sat 29	12:00:00	00:15:00	62.3	64.5	54.6	84.5

Frequency Analysis of Source Noise Measurements/dBLin

]	Frequency/Hz																						
Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
Music Level 2, all machines running, 5 players	46.6	49.8	54.3	53.2	53.1	55.6	59.1	57.9	57.9	55.7	55.3	55.9	56.6	54.1	52.6	52.3	52.7	49.9	48.1	45.6	41.7	39.3	38.2	34.5
Music Level 3, all machines running, 8 players	50.0	50.8	50.9	52.6	54.2	58.7	59.0	58.1	61.8	58.9	59.6	56.6	57.5	57.4	56.4	56.5	56.5	56.0	52.0	48.9	45.0	41.6	40.2	37.8



Graph 5: Frequency Analysis of Gaming Centre Noise Levels/dBLin

APPENDIX 6

Calculation of Noise Break out Levels at Receptors/dB

Buliding Breakout Calcs						Octave Band Centre Frequency [Hz]					dBA
Version 3						125	250	500	1k	2k	
©2017 Martec Environmental Consultants Ltd	Internal Reverberant Spectrum (dBLin)					60.7	64.7	63.3	61.9	61.1	66.7
"Noise & Noise Control 2nd Ed" Sn 8.22 Method	Adjustment to a Given Level if required				70.0						
	Adjusted Internal Spectrum					64.0	67.9	66.6	65.2	64.4	70.0
Element	Addntnl Attntn	Dimension Lrgr	Dimension Smlr	Area If Diff	Dist	Element Sound Reduction Index [SRI]					dBA Contrib
Front Wall: BS8233 Brick & Block External Wall	0.0	14.0	3.0	18.0	10.0	40	44	45	51	56	-1.8
Near Wall: None						0	0	0	0	0	0.0
Front Windows: 4mm_single_glazing	0.0	8.8	2.5	22.0	10.0	20	22	28	32	33	18.7
Glass Inner Door: 10mm_single_glazing		2.0	1.0		10.0	26	27	34	35	36	3.8
Doorway: None						0	0	0	0	0	0.0
Roof: None						0	0	0	0	0	0.0
Vents: None						0	0	0	0	0	0.0
						Attenuation					
	Barrier Attenuation [-ve values]					0	0	0	0	0	
	Dist over Soft Grnd [BS5228 Correction]					0.0	0.0	0.0	0.0	0.0	
	Façade Reflection					0	0	0	0	0	
											Tot dBA
	External SPL/dBLin					21.6	23.6	16.2	10.9	9.1	19

Figure 3: Calculation of Noise Break Out – Upper Floor Flats in Packhorse Centre/dB

Buliding Breakout Calcs						Octave Band Centre Frequency [Hz]					dBA
Version 3						125	250	500	1k	2k	
©2017 Martec Environmental Consultants Ltd					Internal Reverberant Spectrum (dBLin)	60.7	64.7	63.3	61.9	61.1	66.7
"Noise & Noise Control 2nd Ed" Sn 8.22 Method					Adjustment to a Given Level if required 70.0						
					Adjusted Internal Spectrum	64.0	67.9	66.6	65.2	64.4	70.0
Element	Addntnl Attntn	Dimension Lrgr	Dimension Smlr	Area If Diff	Dist	Element Sound Reduction Index [SRI]					dBA Contrib
Front Wall											
BS8233 Brick & Block External Wall	5.0	14.0	3.0	18.0	3.0	40	44	45	51	56	2.0
Near Wall											
None						0	0	0	0	0	0.0
Front Windows											
4mm_single_glazing	5.0	8.8	2.5	22.0	3.0	20	22	28	32	33	24.2
Glass Inner Door											
10mm_single_glazing	5.0	2.0	1.0		3.0	26	27	34	35	36	9.2
Doorway											
None						0	0	0	0	0	0.0
Roof											
None						0	0	0	0	0	0.0
Vents											
None						0	0	0	0	0	0.0
						Attenuation					
					Barrier Attenuation [-ve values]	0	0	0	0	0	
					Dist over Soft Grnd [BS5228 Correction]	0.0	0.0	0.0	0.0	0.0	
					Façade Reflection	0	0	0	0	0	
											Tot dBA
					External SPL/dBLin	27.1	29.0	21.7	16.3	14.5	24

Figure 4: Calculation of Noise Break Out – Potential Upper Floor Flats (First Floor)/dB