

Simon Kirby

From: Simon Kirby
Sent: 28 September 2022 12:34
To: rebecca.hitchman
Subject: RE: Premises Licence Application - Bakehouse, Borough road, Darwen

Hi Rebecca,

I'm just emailing to make a two minor amendments (in red) to the email that I sent yesterday.

Regards,

Simon Kirby
 Senior Environmental Health Officer,
 Public Protection Service, Blackburn with Darwen Borough Council,
 Davyfield Road Depot, Roman Road Industrial Estate, Blackburn, BB1 2LX
 Tel: 01254 585165
 Or: 01254 267699 and ask for Simon Kirby

From: Simon Kirby
Sent: 27 September 2022 14:23
To: Janet White
Cc: rebecca.hitchman; John Wood; hello@bakehouse.events
Subject: Premises Licence Application - Bakehouse, Borough Road, Darwen

Hello Janet,

I'm emailing in response to the Bakehouse premises licence consultation.

The applicant submitted additional information on the 26/9/22 in support of their premises application (see attached). However, the submitted reports don't provide a robust assessment of the potential impact of noise on residents living nearby. As a consequence, I wish to object to the premises licence application on the grounds of public nuisance.

However, if the applicant submits additional information we'd be happy to review our position to see if we can reach a mutually agreeable way forward. I have listed a number of comments below which may be of use.

I've spoken with the applicant and copied them into this email.

The applicant has submitted two noise reports:

1. The Old Bakery Sound Report.pdf – this relates to a proposed basement venue which isn't the subject of this application, although some of the information that it contains is relevant.
2. The Bakehouse Noise Report – this relates to noise from the proposed first floor venue.

Individual points regarding the report on the proposed first floor venue (report 2):

- a) The report states that the venue structure will reduce sound levels by "some 15dB", which is realistically low given the number of windows and doors. It is unusual to receive an application for this type of noisy licensable activity in a venue with such poor acoustic performance, particularly when it is close to residential premises. Some soundproofing of windows and doors has been recommended, but the effectiveness of these measures hasn't been evaluated.
- b) There are 6 large windows facing on to Borough Road, and large loading bay doors which "pose a large sound leak risk" according to the report, so there will be multiple noise breakout points. In these circumstances it would be appropriate to model the expected noise levels.
- c) The report assumes an indoor music volume of 84 dB(A) in the main bar area, which is low for a lively pub/dance venue, and it doesn't evaluate the potential impact of noise in the lower frequencies*.
- d) The assessment methodology isn't clear. It appears that a noise source was used and the resulting levels were measured? If so, it would be appropriate to include a frequency spectrum for the noise source. Where was the noise source located?

- e) Background noise levels haven't been identified in the report. An important aspect of a noise report is a comparison between the predicted noise from the venue and the background noise level (i.e. when there is no noise from the venue), and to take into account any distinctive noise character (e.g. impulsive or tonal noise). **It would be appropriate to include evening and night time background noise levels in the report, as these will be periods of specific interest.**
- f) The residual "no music" noise level of 62 dB is high and it doesn't appear to be representative**. Noise from the venue is most likely to give rise to disturbance in the late evening and at night, so these will be periods of specific interest. It would be appropriate to include evening and night time residual noise levels in the report.
- g) There is no quantitative evaluation of predicted noise levels on residents living nearby (see comment above about modelling).
- h) Will internal doors be fitted which limit the propagation of noise through areas of the building **from** within the red outline on the submitted plan?
- i) Will there be a smoking area, and what are the noise implications (e.g. customer noise if they are smoking outside at the front of the building)?

*See https://www.researchgate.net/publication/44708828_Noise_from_pubs_and_clubs_-_Final_report which states that, "Many bars playing music had noise levels of 90 – 95 dB LAeq during busy periods, with levels of up to 115 dB Leq in the 63 Hz octave band and 110 dB Leq in the 125 Hz octave band recorded on the dance floors of night clubs."

**The Old Bakery Sound Report indicates a daytime residual/background of 59/43 dB(A) and a night time residual/background of 51/31 dB(A)LAeq.

Regards,

Simon Kirby
 Senior Environmental Health Officer,
 Public Protection Service, Blackburn with Darwen Borough Council,
 Davyfield Road Depot, Roman Road Industrial Estate, Blackburn, BB1 2LX
 Tel: 01254 585165
 Or: 01254 267699 and ask for Simon Kirby

From: Daniel France <hello@bakehouse.events>
Sent: 26 September 2022 17:24
To: Simon Kirby <simon.kirby@blackburn.gov.uk>
Cc: rebecca.hitchman@blackburn.gov.uk; janet.white@blackburn.gov.uk; John Wood
Subject: Re: Bakehouse, Borough Road, Darwen

Hi Simon,

Thanks for the reminder.

I did try and call to chat about the best way to submit our information this afternoon but I couldn't get through to you so if you do need us to submit this in an adapted form then I can do that for you instead.

Please find attached a document outlining our suggestions for alterations as well as the noise reports detailed in the document.

Many thanks

Becca



On Mon, 26 Sept 2022 at 15:08, Simon Kirby <s.kirby@bbk.gov.uk> wrote:

Hello Rebecca,

The consultation deadline for the Bakehouse premises licence application is approaching (29th September), so if you intend to send us some additional information in support of your application I suggest that you submit it at the earliest opportunity.

As I explained in my email below, in its current form we are objecting to the premises licence application on the grounds of public nuisance. But we'd be happy to review this if you'd like to put forward some modifications to your proposal.

Thanks for your time.

Regards,

Simon Kirby

Senior Environmental Health Officer,

Public Protection Service, Blackburn with Darwen Borough Council,

Davyfield Road Depot, Roman Road Industrial Estate, Blackburn, BB1 2LX

Tel: 01254 585165

Or: 01254 267699 and ask for Simon Kirby

From: Simon Kirby

Sent: 13 September 2022 16:29

To: Daniel France <hello@bakehouse.events>

Cc: John Wood <j.wood@bbk.gov.uk>; Janet White <j.white@bbk.gov.uk>

Subject: RE: Bakehouse, Borough Road, Darwen

Hello Rebecca,

Regarding your intentions for the premises and submitting information in support of your premises licence application - Janet has confirmed that you won't have to resubmit the whole application, but you could send in additional plans indicating your intention for each area of the building, and in particular where the licensable activity is going to take place.

To avoid any potential confusion, I have to say that we'd object to the premises licence application in its current form because we're concerned about the potential for public nuisance. The size of the venue, the potential for noise break-out, and the proximity of residential premises are all factors. But we'd be happy to discuss potential compromises.

Sorry to repeat what I said in my email below, but would you be willing to propose some prudent measures that will limit the potential for excessive noise, such as limiting licensable activity to specific parts of the building, or imposing other noise control measures? We'd also be keen to see a significant reduction in the hours of opening at this stage.

You'd still have the option of applying for a temporary event notice which could give you more flexibility, and you could apply to vary a premises licence at a future date.

Janet has also made the following additional points:

- As you have only applied for on sales we need a commitment that the alcohol/regulated entertainment will be kept to the main room where the bar is situated only. Customers could therefore not carry alcohol outside of the bar area.
- Please include your smoking area on your plan(s) and explain how this activity will be managed to stop people congregating outside on Borough Road.

This email relates to your application for a premises licence, not the temporary event notices or your planning application. See my comments below relating to Planning and the temporary event notices.

Finally, I'd be grateful if you'd copy Janet White and John Wood in to any emails that you send, and please note that I will not be at work next week.

Regards,

Simon Kirby

Senior Environmental Health Officer,

Public Protection Service, Blackburn with Darwen Borough Council,

Davyfield Road Depot, Roman Road Industrial Estate, Blackburn, BB1 2LX

Tel: 01254 585165

Or: 01254 267699 and ask for Simon Kirby

From: Daniel France <hello@bakehouse.events>

Sent: 07 September 2022 14:07

To: Simon Kirby <

Subject: Re: Bakehouse, Borough Road, Darwen

Hi Simon,

We are happy to agree to background music only on Sunday and Monday evenings, from 10pm for the TENS applications.

We will provide further information about our plans for the building longer term over the next few days and would be happy to discuss this with you and to make some changes to our application. Although we know what our intentions are I can see how if you only look at the worst case scenario, that could be far scarier than what we actually have in mind. Would we have to submit a new premises license form or would this be done through a process of consultation?

I have heard from the planning permission and need to send a few more things to support the application so that's why that's not showing on the system yet but it is in hand.

Thank you very much for your support and advice.

Becca



On Wed, 7 Sept 2022 at 13:47, Simon Kirby <simon.kirby@...> wrote:

wrote:

Hello Rebecca,

Thank you for your time yesterday. The information you provided was very helpful.

As I explained, John and I are consultees in the licensing process, and we try to ensure that there are adequate controls in place to prevent noise disturbance where there is potential for public nuisance. The prevention of public nuisance is one of the licencing objectives.

I'd like to make the following comments:

Fear Factory TEN applications

You provided a fairly detailed account of how you envisage these events will take place. In much of the building there will be amplified effects which form part of the experience, but this won't be the focus of the activity. As such it can be readily controlled and could take place without excessive disturbance. The playing of Music and the consumption of alcohol will only take place in the upstairs room at the east end of the building. Music will need to be played at a volume which doesn't give rise to excessive noise breakout from the building. There are plenty of windows, and there is a large roof area which may have relatively poor acoustic properties, so careful control of music levels will be required. I acknowledge that you discussed removable sound insulation on the windows, but more detailed information wasn't available at the time of our visit.

Would you be willing to agree to background music only from 10pm onwards on Sunday nights (2nd, 9th, 16th, 23rd, 30th) and Mondays (Halloween 31st). I'd be grateful for a prompt response would be appreciated as the TEN consultation period is almost over.

As I explained during our visit, we are an internal consultee and get involved where noise could be a problem. However, subject to the issue about a 10pm finish on certain days, in light of the information that you provided we will not be objecting to the TEN applications.

Premises Licence Application

You explained that you've included the whole ground and upper floor areas in the application and asked for hours that extend into the really hours of the morning in order to give you some operational flexibility. You indicated that the majority of the licensable activity will not use the full extent of the application. However, from a Council point of view this doesn't provide sufficient degree of reassurance. Experience elsewhere has shown that circumstances may change, and there is the potential for more noisy activity that could be unacceptable.

A more detailed account of your vision for the premises would be helpful. In its current form it is likely that we will object to the application on the grounds of public nuisance. Would you be willing to propose some prudent measures that will limit the potential for excessive noise, such as limiting potentially noisy activity to parts of the building, and noise control measures? We would also wish to see a reduction in the hours of opening at this stage. You'd still have the option of applying for a temporary event notice which could give you more flexibility. I'd be happy to discuss this in more detail.

Planning Application

Please be aware that the application for planning permission is a separate process. However, it is likely that noise will be a significant consideration.

I can find the reference to the planning application for the basement Live Music Venue, the ref is 10/22/0758. However, I can not find an application for the rest of the building that is the subject of your current licence application. You can view the planning portal on the following link. If you do a general search for borough road you will find 10/22/0758 but there are no other applications that are pending on Borough Road.

<https://planning.blackburn.gov.uk/Northgate/PlanningExplorer/GeneralSearch.aspx>

I suggest you raise this one with planning.

<https://www.blackburn.gov.uk/planning/planning-permission-applications>

When an application is received we would be asking for more information in respect of noise. We have already asked for this information in respect of the basement Live Music Venue ref 10/22/0758. We have to have confidence that the building is or could be made suitable for purpose from an acoustics standpoint.

Regards,

Simon Kirby

Senior Environmental Health Officer,

Public Protection Service, Blackburn with Darwen Borough Council,

Davyfield Road Depot, Roman Road Industrial Estate, Blackburn, BB1 2LX

Tel: 01254 585165

Or: 01254 267699 and ask for Simon Kirby

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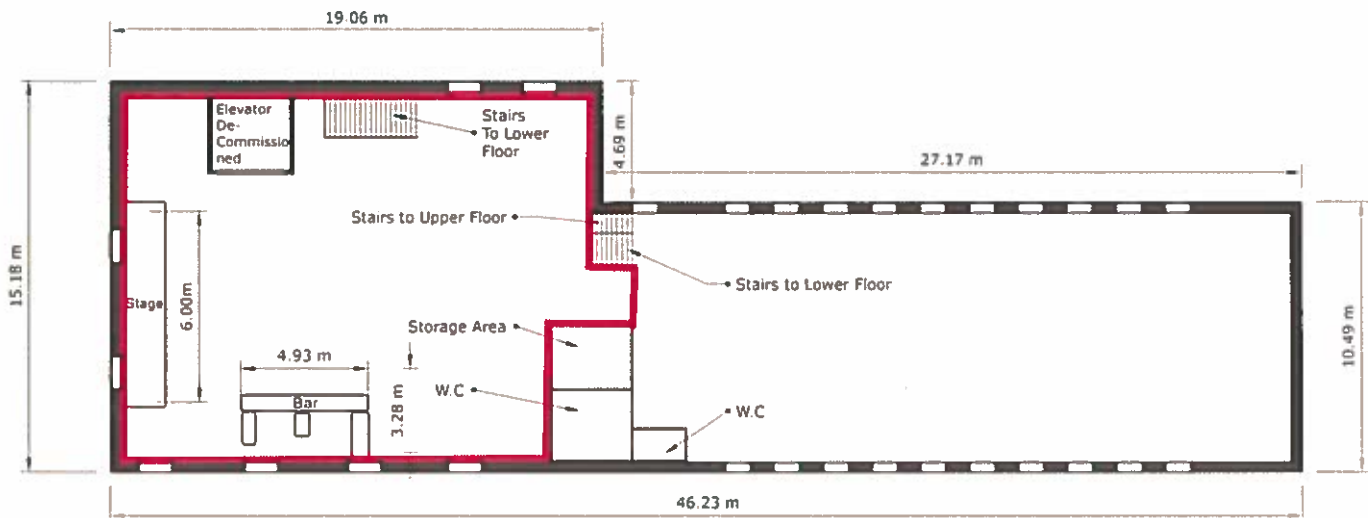
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Proposed Changes to the Premises License Application for The Bakehouse

In order to reduce the risk of public nuisance we are proposing that the following changes be made to our application for premises license for The Bakehouse, Borough Road, Darwen, BB3 1PL.

- o Removal of indoor sporting events and wrestling/boxing from the application.
- o Change of area we are requesting license for, to:

(UPPER FLOOR)



Meaning all licensable activities will be restricted to the furthest end of the building; closest to the town centre and away from residential houses. We still intend to use the other areas of the building but for non-licensable activities.

- o Changes to hours for activities:

For live music, dance, plays, films:

- Sunday - Thursday 08:00 - 23:00
- Friday & Saturday - 08:00 - 00:00

For recorded music:

- Sunday - Thursday 08:00 - 23:00 - nothing beyond BGM after 22:00
- Friday & Saturday - 08:00 - 00:00

For sale of alcohol:

- Sunday - Thursday 08:00 - 22:00
- Friday & Saturday - 08:00 - 23:00

Allowing an hour at the end of the evening for customers to finish their beverages and clear the building.

Please also find attached both the sound report for the entire building (commissioned by the landlord) and the activity specific noise assessment done for The Bakehouse space; both done before any sound reduction measures had been put in place. From the recommendations the following are being implemented with immediate effective (with full consideration given to additional measures if necessary.)

**The stage, tech stand and sound equipment have all been fitted to the specification recommended in the report.*

**Removable soundproofing is being constructed for the windows which are street facing.*

**A processor has been installed at the tech stand to give full control over sound levels from any entertainment as suggested.*

PEAK acoustics



Noise Impact Assessment

Client:	Grant Mizon
Site:	Darwin Windows Ltd, Borough Rd, Darwen, BB3 1PL
Reference No.	JP0908223NR
Revision:	0.0
Date of Issue:	14/09/2022

Project Consultant

J. Parrott BEng (Hons) AMIOA
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Peak Acoustics Ltd, Silk Point, Queen's Avenue, Macclesfield, SK10 2BB

Executive Summary

A Noise Impact Assessment has been undertaken at Darwin Windows Ltd, Borough Rd, Darwen, BB3 1PL, to assess the noise breakout from the proposed change of use from a vacant mill to a Live Music Venue (Sui Generis). The proposed licensed operating hours are from 18:30 – 23:30 Sunday – Friday and 18:30 – 04:00 on Saturdays.

Measurements of the prevailing background noise climate were undertaken from 2nd – 5th September 2022 at a location representative of the identified Noise Sensitive Receptors (NSRs).

The nearest or most-affected Noise Sensitive Receptors (NSRs) were identified as the residential properties southwest of the site on Borough Rd as well as the façade of 'Darwin Health Centre' facing the site. The closest habitable room windows of these properties will be considered as specific reception points in calculations.

Using the measured background noise survey data, a representative night-time background sound level of **31 dB L_{A90}** was derived for the assessment.

Guidance taken from the Institute of Acoustics 'Good Practice Guide on the Control of Noise from Pubs and Clubs' March 2003, the University of Salford's 'Report for the department of Environment, Food and Rural Affairs' March 2005 as well as elements of BS4142:2014 has been utilised to create three assessment methodologies.

- Assessment Methodology 1: 85dB noise breakout vs background noise level (L_{A90}) 1m outside habitable rooms.
- Assessment Methodology 2: 85dB noise breakout vs NR25 curve within habitable rooms
- Assessment Methodology 3: Internal sound test of existing Ceiling/Separating floor.

Methodology 1 found the noise level to be up to **7 dB** below the measured background sound level at the NSR locations indicating a *Low Impact* in accordance with BS4142:2014.

Methodology 2 found that when comparing the noise breakout to the NR25 curve, levels at all frequencies are below the accepted criteria corresponding to the achievement of 'NOEL – No Observed Effect Level' in the NPSE.

Methodology 3 found that significant mitigation to the existing Ceiling/Separating floor is needed for the proposal to operate without '*Significant Adverse Effect*' on the commercial properties above.

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1. Introduction

- 1.1 A Noise Impact Assessment has been undertaken at Darwin Windows Ltd, Borough Rd, Darwen, BB3 1PL, hereby referred to as 'the site', to assess the noise breakout from the proposed change of use from vacant mill to Live Music Venue (Sui Generis).
- 1.2 The hours of operation of the proposal are as follows:
 - **Sunday – Friday: 18:30 – 23:30**
 - **Saturday: 18:30 – 04:00**
- 1.3 Data sourced from 'ANSI - Calculation of Speech Transmission Index in rooms' February 2014 and background music measurements taken by Peak Acoustics at other representative sites and utilised within the assessment to model the potential noise breakout using industry-standard acoustic modelling software 'SoundPLAN'.
- 1.4 An assessment of the noise breakout is to be undertaken to determine whether residents are likely to suffer a loss of amenity as a result of noise from the general use of the building. Mitigation will be given should any potential loss of amenity be indicated.

2. Planning Policy & Guidance

- 2.1 Guidance for the assessment of noise affecting new residential development is given in the National Policy Framework (NPPF). Section 15 of the NPPF states:

"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

E) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of...noise pollution."

Section 185 further states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

1. *Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
2. *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

Section 187 states:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

- 2.2 To avoid and mitigate adverse noise effects on health arising from and impacting new development, the NPPF makes reference to NPSE. The Noise Policy Statement for England (NPSE) was published in March 2010 and covers all forms of noise other than occupational noise. For the purposes of this report, “Neighbourhood Noise” is most relevant as NPSE defined in paragraph 2.5.

“neighbourhood noise which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.”

- 2.3 The Noise Policy Statement for England (NPSE) states the following aims in paragraph 2.2.

NOEL – No Observed Effect Level.

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level.

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level.

This is the level above which significant adverse effects on health and quality of life occur.

3. Assessment Criteria

- 3.1 Guidance taken from the Institute of Acoustics ‘Good Practice Guide on the Control of Noise from Pubs and Clubs’ March 2003 and the University of Salford’s ‘Report for the department of Environment, Food and Rural Affairs’ March 2005 consider two main measurements and assessment methodologies;

- 3.2 Absolute Criteria;

“using A-weighted target values for music intrusion within residential properties, generally based on World Health Organisation values. However, it is generally considered inappropriate to use only A-weighted target levels for music noise intrusion, because the impact of the bass elements of the noise.”

“A relatively common application of absolute criteria is to use Noise Rating Curves to provide a target level in design work.”

3.3 Relative Criteria;

“Developers should show that noise from the place of entertainment shall not be audible inside habitable rooms of the new development. Inaudibility shall be defined as: Zero increase in the LAeq,1 min (music playing) over the background LA90 (music off) and Zero increase in the L10,T vs L90,T exceedance in each 1/3 octave”

3.4 A common standard for the assessment of industrial and commercial sound is ‘**BS4142 – Methods for rating and assessing industrial and commercial sound**’. The industrial noise assessment method in BS4142 is based on the difference between the measured ‘background sound level’ (LA90), and the ‘Rating Level’ of the industrial source, at a noise-sensitive location (NSR).

An estimation of the impact of the specific sound can be obtained by the difference between the rating sound level and the background sound level whilst considering the following:

“A Sound Rating Level at or below the background noise level is indicative of Low Impact;

A Sound Rating Level that exceeds the background noise level by around +5dB is likely an indication of Adverse Impact, depending on the context;

A Sound Rating Level that exceeds the background noise level by around +10dB is likely an indication of Significant Adverse Impact, depending on the context;”

BS4142 further states:

“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 negligible impact, depending on the context.”

Achievement of a *Low Impact* in accordance with BS4142 can be deemed to correspond to ‘*NOEL – No Observed Effect Level*’ in the NPSE, as detailed above in Paragraph 2.3.

3.5 Although Section 1.3 of BS4142:2014 states that the assessment of people and recreational activities is beyond the scope of the British Standard, the methods are still deemed a useful tool for the assessment.

3.6 A combination of these methods will be utilised for the assessment to ensure any potential loss of amenity to local residents will be indicated.

- Assessment Methodology 1: 85dB noise breakout vs background noise level (LA90) 1m outside habitable rooms;

Using industry-standard acoustic modelling software ‘SoundPLAN’ to model the proposal and calculate the noise breakout towards the nearest NSR at an internal level of 85 dB. This will then be compared against the measured background sound level.

An internal sound level of 85 dB has been assumed after onsite observations as the proposal is a relatively small development with no windows and a low ceiling.

- Assessment Methodology 2: 85dB noise breakout vs NR25 curve within habitable rooms.

The same internal sound source as used in Methodology 1 will then be compared to the NR25 curve within the nearest habitable room of the NSR. This assessment will account for the frequency response breakout from the proposal.

- Assessment Methodology 3: Internal sound test from proposed lower ground floor to commercial units above.

We will conduct a test of the floor/ceiling partition between the proposal and the commercial development on the floor above. The guidance in Approved Document E (ADE) regarding commercial uses is simply that a higher standard of sound insulation may be required between spaces separating domestic and non-domestic purposes, and that the appropriate level of sound insulation required will depend on the noise generated in the non-domestic space

For guidance, an improvement of 10dB compared with the normal residential sound insulation requirements might typically be suitable for general commercial use. A review of the proposals for the constructions separating the various spaces within the development may be required at a later stage. Such an assessment can be undertaken once the proposed plans have been confirmed and detailed construction proposals are available for review.

- 3.7 An environmental noise survey to measure background sound levels representative of the nearest noise-sensitive receptors (NSRs) will be taken. Measurements will be carried out in accordance with the provisions of BS7445 '*Description and Measurement of Environmental Noise*'. The measurements made will include both dBA and octave band noise levels including L_{eq} , L_{max} , and L_{90} parameters.

4. Site Location

4.1 The site is located on the west side of Darwin in an area of mixed-use approximately 120 metres south of the A666 which is the main road through Darwin connecting to the M65 to the north and Bolton to the south. Many commercial properties line this road including restaurants, takeaways, bars, clothing shops and a leisure centre. On the southeast boundary of the site lies 'Holy Trinity CE Primary school' with associated parking and playground with a further playground at the south of the site. Opposite the site over Borough Rd on Police Street is 'Darwin Health Centre' with many associated car parks and a bus stop directly outside. Further southwest of the site is residential developments namely those on James St West and Punstock Road. Either side and above the site are existing commercial buildings which are currently unoccupied.

4.2 The site, proposed noise source and receptor locations are shown in Figure 1 below:

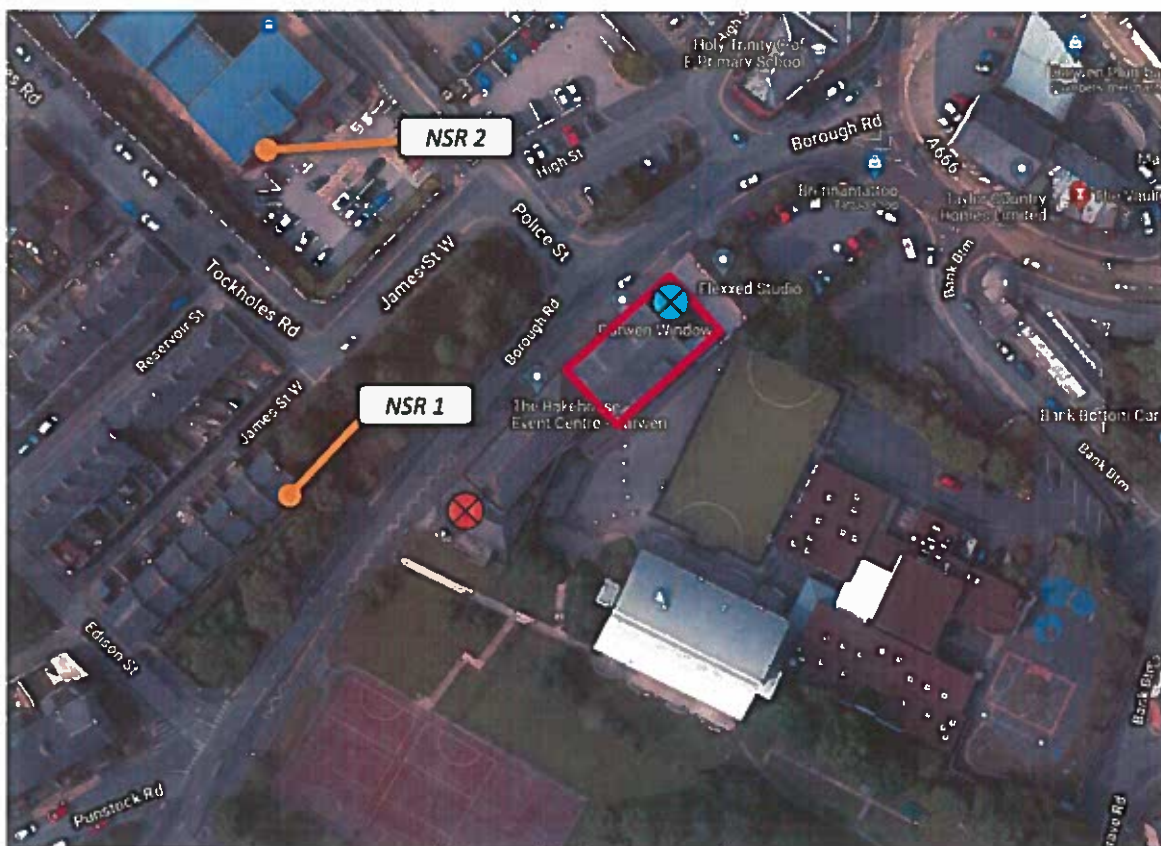


Figure 1: Site, Source & NSR Locations - <https://google.co.uk/maps>

- | | |
|--|---|
|  Site Boundary (Approx.) |  Background Monitoring Location M1 (Approx.) |
|  Noise Sensitive Receptors (NSRs) |  Background Monitoring Location M2 (Approx.) |

5. Noise Sensitive Receptors

- 5.1 The nearest or most-affected Noise Sensitive Receptors (NSRs) have been identified as the residential buildings to the southwest of the site on James St West (NSR 1). Additionally, the façade of 'Darwin Health Centre' facing the site (NSR 2) is to be assessed although it is unclear if the centre has overnight patients.
- 5.2 The closest habitable room windows of these properties will be considered as specific reception points in calculations.
- 5.3 The NSR locations and reception points are shown in an aerial image (**Figure 1**) on Page 8.

6. Background Noise Survey

- 6.1 An unattended background noise survey was conducted at positions M1 and M2 over a period of approximately 3 days from 11:30 on the 2nd September to 12:30 on the 5th of September 2022. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 5-minute intervals in accordance with BS7445 - 'Description and Measurement of Environmental Noise'.
- 6.2 At position M1 shown in **Figure 1**, the microphone was placed approximately 1.2m from local ground level and away from nearby reflective surfaces. Position M1 is located at the northern boundary of the site in the existing courtyard.
- 6.3 Position M2 shown in **Figure 1** was placed approximately 1.5m from local ground level and away from nearby reflective surfaces. Position M2 is located on the south boundary of the existing commercial buildings nearest the Primary School Playground and opposite the properties on James St West.
- 6.4 The noise climate at the monitoring positions was dominated by road noise from the adjacent Borough Road as well as activity associated with 'Darwin Health Centre' including car movements and pedestrians entering and leaving the Centre. Secondary sources were noted as construction work around the site, noise emanating from a nearby gas bottle supplier and conversing pedestrians.
- 6.5 Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.
- 6.6 Equipment was calibrated before and after use and no significant drift occurred during measurements. Up-to-date calibration certification can be provided upon request. Full calibration details are provided in **Appendix D**.
- 6.7 Daytime temperatures during the survey were noted as between 19 – 21°C with wind speeds being recorded typically between 4 – 4.5 m/s; Detailed meteorological information can be found in **Appendix C**.

7. Background Sound Levels

7.1 The day and night-time background sound levels from measurements M1 and M2 are summarised below.

Measurement	Date(s)	Period	L _{Aeq,T}	L _{A90,T}
M1	2 nd – 3 rd & 5 th September 2022	Daytime (07:00 – 23:00) (aggregated period)	60	43
		Night-time (23:00 – 07:00)	50	33
	3 rd – 4 th September 2022	Daytime (07:00 – 23:00)	59	44
		Night-time (23:00 – 07:00)	51	35
	4 th – 5 th September 2022	Daytime (07:00 – 23:00)	63	43
		Night-time (23:00 – 07:00)	52	33
M2	2 nd – 3 rd & 5 th September 2022	Daytime (07:00 – 23:00) (aggregated period)	59	45
		Night-time (23:00 – 07:00)	49	32
	3 rd – 4 th September 2022	Daytime (07:00 – 23:00)	56	43
		Night-time (23:00 – 07:00)	51	40
	4 th – 5 th September 2022	Daytime (07:00 – 23:00)	57	43
		Night-time (23:00 – 07:00)	51	31

Table 1: Background Noise Survey Results

7.2 Using the measured background noise survey data, the lowest night-time background sound level of 31dB L_{A90}, measured at M2 on the 5th of September 2022 will be used for the assessment.

7.3 A full-time history of the survey data is shown in **Appendix E**.

8. Source Noise Levels

8.1 'SoundPLAN' was used to model the internal source noise for Assessment Methodology 1: 85dB noise breakout, and Methodology 2: 85dB noise breakout vs NR25 curve within habitable rooms. The assumed internal sound pressure level is given below.

Source	63	125	250	500	1k	2k	4k	8k	dBA
Raised Vocal & Background Music	99	97	90	81	71	66	56	45	85.5

Table 2: Modelled Source Noise Levels

8.2 Grid noise maps of Assessment 1 can be found in **Appendix F**.

9. Specific Sound Levels

9.1 The Specific Sound Level is denoted L_{A_s} and is the A-weighted, equivalent noise level at the NSR locations. Specific Sound Levels have been calculated for both assessments using industry-standard acoustic modelling software 'SoundPLAN'. This software uses ISO-9613-2 - *Attenuation of sound during propagation outdoors* and the model takes into account the following key factors:

- *Aerial Imagery & Terrain Data sourced from Google Maps/Elevations*
- *Geometric divergence of sound*
- *Atmospheric absorption of sound*
- *Ground absorption*
- *A light downwind correction toward the NSRs*
- *Surrounding structures and objects which may reflect or block sound toward the NSRs*
- *The height of the NSRs (e.g., First, second or third-floor reception point)*

9.2 The facades and ceiling of the proposal have been modelled to provide a minimum sound reduction of 48 dB R_w .

9.3 The Specific Sound Levels (L_{A_s}) have been calculated to the receptor locations shown in Figure 1 and described in Section 5. The Specific Sound Levels are tabulated below.

Location	Specific Sound Level, dB L_{A_s}
NSR 1 (F2)	19
NSR 2 (F1)	18

Table 3: Specific Sound Levels

9.4 The noise model input parameters were as follows:

Parameter	Input
Reflection Order	3
Ground Absorption Factor	G = 0.2
Air pressure	1013.3 mbar
Relative Humidity	70.0 %
Temperature	10.0°C

Table 4: Calculation Input Parameters

9.5 A Noise map showing external sound propagation is shown in **Appendix F**.

10. Rating Levels

10.1 In accordance with BS4142, the Specific Sound Levels may be corrected for characteristics that make the sound more noticeable at the NSR location such as tonality, impulsivity and intermittency. Section 9.2 of BS4142 gives commentary on these characteristics and appropriate penalties:

“Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

10.2 Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.”

- 10.3 The penalty’s outlined in BS4142:2014 relating to tonality, impulsiveness and intermittency are based on the assessment of mechanical or industrial noise sources. This assessment models human voice and background sound music, which is neither mechanical nor industrial. However, the source will be readily distinguishable over the background environment and have tonal aspects. A rating penalty of 5 dB has therefore been added to account for these features.

11. Assessment 1, Rating Level Vs Background

- 11.1 The Specific Sound Levels are to be compared to the representative background sound level to determine the noise impact in accordance with BS4142.

A Sound Rating Level at or below the background noise level is indicative of Low Impact;

A Sound Rating Level that exceeds the background noise level by around +5dB is likely an indication of Adverse Impact, depending on the context;

A Sound Rating Level that exceeds the background noise level by around +10dB is likely an indication of Significant Adverse Impact, depending on the context;

11.2 The indicated noise impact at the identified Noise Sensitive Receptors is summarised below:

Location	Rating Level, dB L _r	Background Sound Level, dB L _{A90}	Difference, dB	Noise Impact
NSR 1 (F2)	24	31	- 7	Low Impact
NSR 2 (F1)	23		- 8	Low Impact

Table 5: Noise Impact

11.3 The noise impact at the receptor positions is indicative of a *Low Impact* in accordance with BS4142:2014 at an internal level of 85 dB.

12. Assessment 2, Specific Sound Levels Vs NR25 Curve

12.1 Noise levels 1 metre from the worst affected NSR have been calculated using 'SoundPLAN' and are denoted above as the Specific Sound Levels. The calculated noise levels have been compared to the limits of the NR25 curve in Table 6 below. This scenario represents the breakout of the proposal at 85 dB.

Internal Space/Criteria	63	125	250	500	1k	2k	4k	8k
All Windows / Doors Open								
Noise Source (LpA)	73	81	81	78	71	67	57	44
NSR 1 (Receiver)	14.7	16.2	11.5	2.8	-11	-21.6	-43.4	-59.3
NR25	55.2	43.7	35.2	29.2	25.0	21.9	19.5	17.7
Difference, dB	-40.5	-27.5	-23.7	-26.4	-36.0	-43.5	-62.9	-77

Table 6: Building Breakout Vs NR25 Curve

12.2 As can be seen in the table above, the noise levels at the worst affected NSR are under the NR25 curve. It should also be noted that sound reduction due to a closed window at the NSR has not been included.

12.3 Graphs of the NR Curves can be found in Appendix E.

13. Assessment 3, Sound Test of Separating Floor

13.1 To further validate the sound insulation performance of the Ceiling/Separating floor between the proposal and the commercial properties above, an airborne and impact sound insulation test was conducted on the 2nd of September 2022.

13.2 The test was conducted in accordance with ISO 140-4. Test equipment is of class 1 instrumentation and holds valid UKAS certification. Full equipment details are given in Appendix B.

13.3 As discussed in Section 3.6 an improvement of 10dB compared with the normal residential sound insulation requirements might typically be suitable for general commercial use. This improvement is to be applied to the results of the sound test which are given below.

Test	Test Type	Source Room	Receiving Room	Measured $D_{nT,w} + C_{tr}(dB)^{[2]}$	Required $D_{nT,w} + C_{tr}(dB)$	Pass/Fail	Improvement on Building Regs
1	ABF ^[1]	Ground Floor Location 1	Lower Ground Floor Location 1	28	53	Fail	-25
3	ABF ^[1]	Ground Floor Location 2	Lower Ground Floor Location 2	27	53	Fail	-26

Table 7: Airbourne Floor Test Results

[1] - Airbourne Floor.

[2] - Measured $D_{nT,w} + C_{tr}(dB)$ – Higher is better.

Test	Test Type	Source Room	Receiving Room	Measured $L'_{nT,w} (dB)^{[4]}$	Required $L'_{nT,w} (dB)$	Pass/Fail	Improvement on Building Regs
2	IMP ^[3]	Ground Floor Location 1	Lower Ground Floor Location 1	81	54	Fail	-27
4	IMP ^[3]	Ground Floor Location 2	Lower Ground Floor Location 2	72	54	Fail	-18

Table 8: Impact Test Results

[3] - Impact.

[4] - Measured $L'_{nT,w}(dB)$ – Lower is better.

13.4 As can be seen in the results above, a significant improvement on the current Ceiling/Separating floor is needed. A review of the proposals for separating the various spaces within the proposal may be required at a later stage. Such an assessment can be undertaken once the proposed plans have been confirmed and detailed construction proposals are available for review.

13.5 A full Sound Test report can be found in **Appendix H**.

14. Conclusion

14.1 A Noise Impact Assessment has been undertaken at Darwin Windows Ltd, Borough Rd, Darwen, BB3 1PL, to assess the noise breakout from the proposed change of use from a vacant mill to a Live Music Venue (Sui Generis).

14.2 Measurements of the prevailing background noise climate were undertaken from 2nd – 5th September 2022 at a location representative of the identified Noise Sensitive Receptors (NSRs).

14.3 The nearest or most-affected Noise Sensitive Receptors (NSRs) were identified as the residential properties southwest of the site on Borough Rd as well as the façade of 'Darwin Health Centre' facing the site. The closest habitable room windows of this property will be considered as specific reception points in calculations.

- 14.4 Using the measured background noise survey data, a representative night-time background sound level of **31 dB L_{A90}** was derived for the assessment. Assessment methodologies 1 and 2 found the noise level to achieve acceptable outcomes in conjunction with the adopted assessment criteria, whilst acknowledging relevant context corresponding to the achievement of 'NOEL – *No Observed Effect Level*' in the NPSE.
- 14.5 Assessment methodology 3 found that significant mitigation to the existing Ceiling/Separating floor is needed for the proposal to operate without '*Significant Adverse Effect*' on the commercial properties above.

15. Uncertainty

- 15.1 The background monitoring equipment is subject to a 1dB error margin, however, calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurements.
- 15.2 Uncertainty can arise in the prediction of noise propagation from and around flat reflective surfaces, such as the surrounding structures present on site. This has been reduced to a minimum by utilising an acoustic modelling software that uses the validated method, ISO-9613-2, as described in BS4142.

APPENDIX A – Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A5	02/09/2022	11:57	05/09/2022	12:37
M2	A4	02/09/2022	11:36	05/09/2022	12:31
Sound Test	SKT 5	02/09/2022	10:00	02/09/2022	11:15

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A4	Sound Meter	Svantek	971	1	60688
A4	Pre-Amp	Svantek	SV18	1	62781
A4	Microphone	ACO	7052E	1	66703
A5	Sound Meter	RION	NL-52	1	00219828
A5	Pre-Amp	RION	NH-25	1	00344
A5	Microphone	RION	UC-59	1	18806
1	Calibrator	Svantek	SV33A	1	83715
A5	Calibrator	RION	NL-75	1	34212936
STK 3	Sound Meter	Svantek	977	1	36815
STK 3	Microphone	ACO	7052E	1	79006
STK 3	Calibrator	Svantek	SV33A	1	32507

APPENDIX C - Meteorology Details

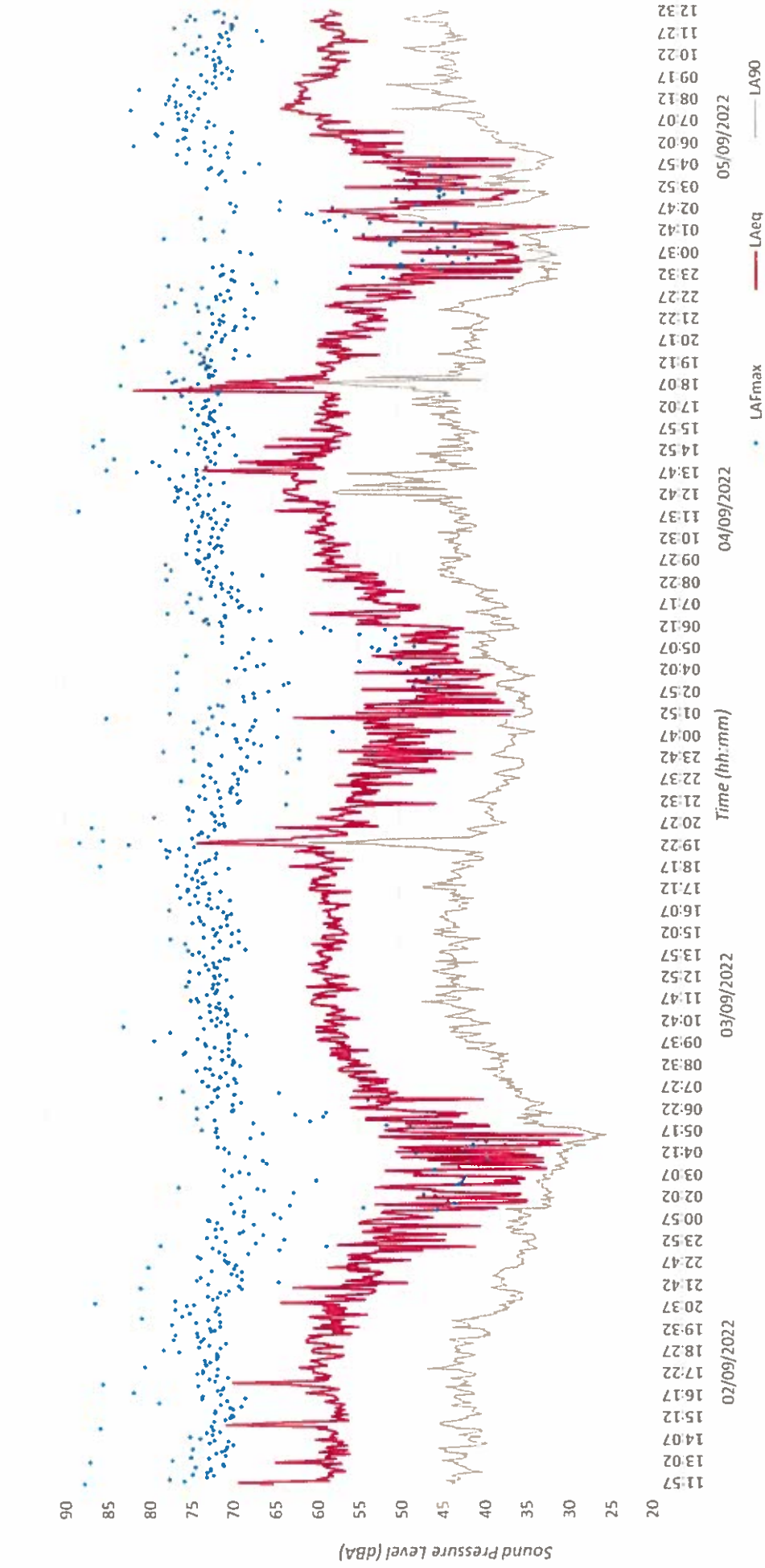
Date	Temp C°	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
02/09/2022	21	4	ESE	64	0.0	1/8
05/09/2022	19	4.5	SSE	66	0.0	1/8

APPENDIX D - Calibration Details

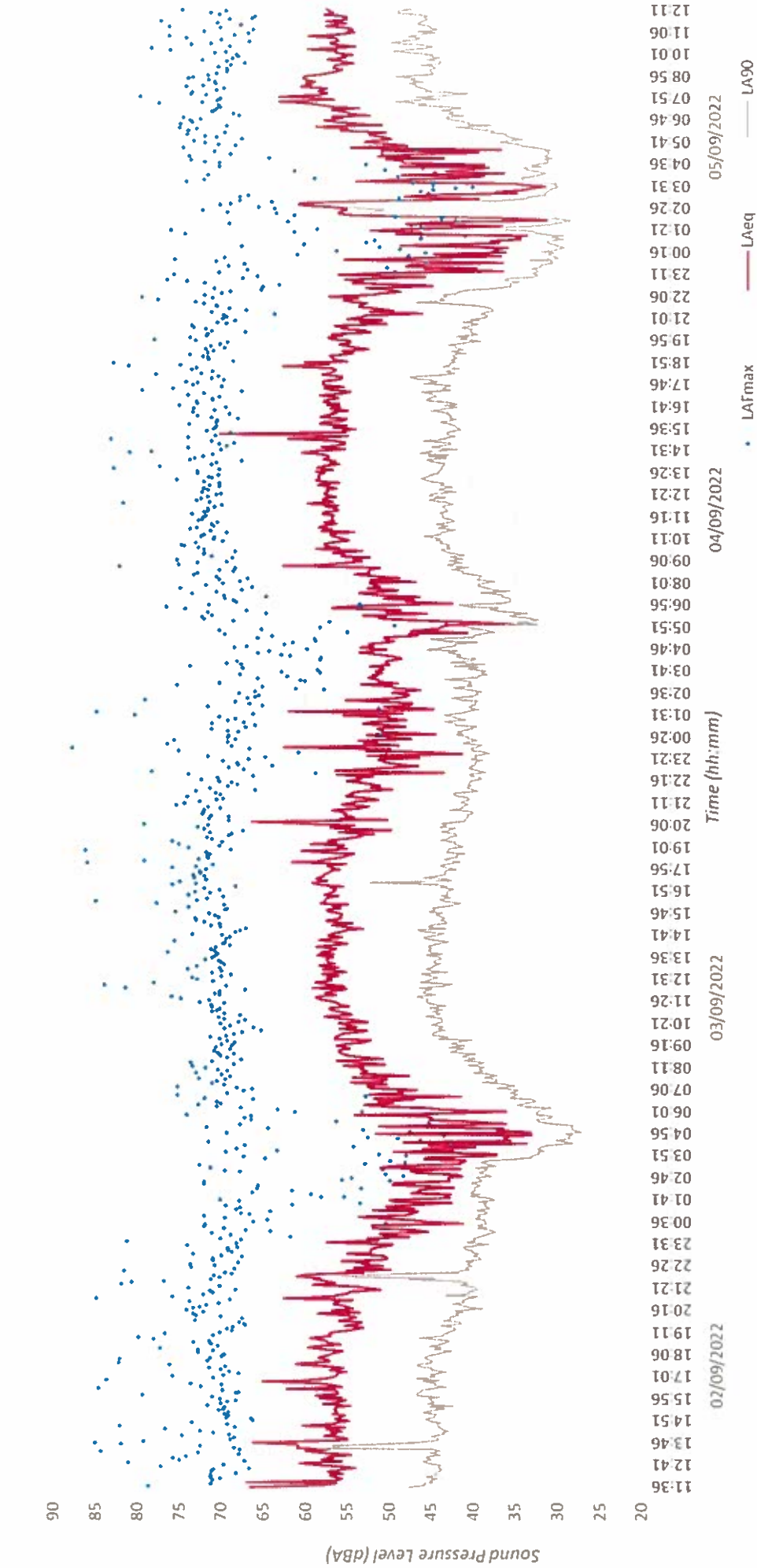
Measurement	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
M1	94.0	0.0	0.0
M2	113.8	-1.33	-1.36
Sound Test	114.1	-0.21	-0.20

APPENDIX E – Noise Survey Results

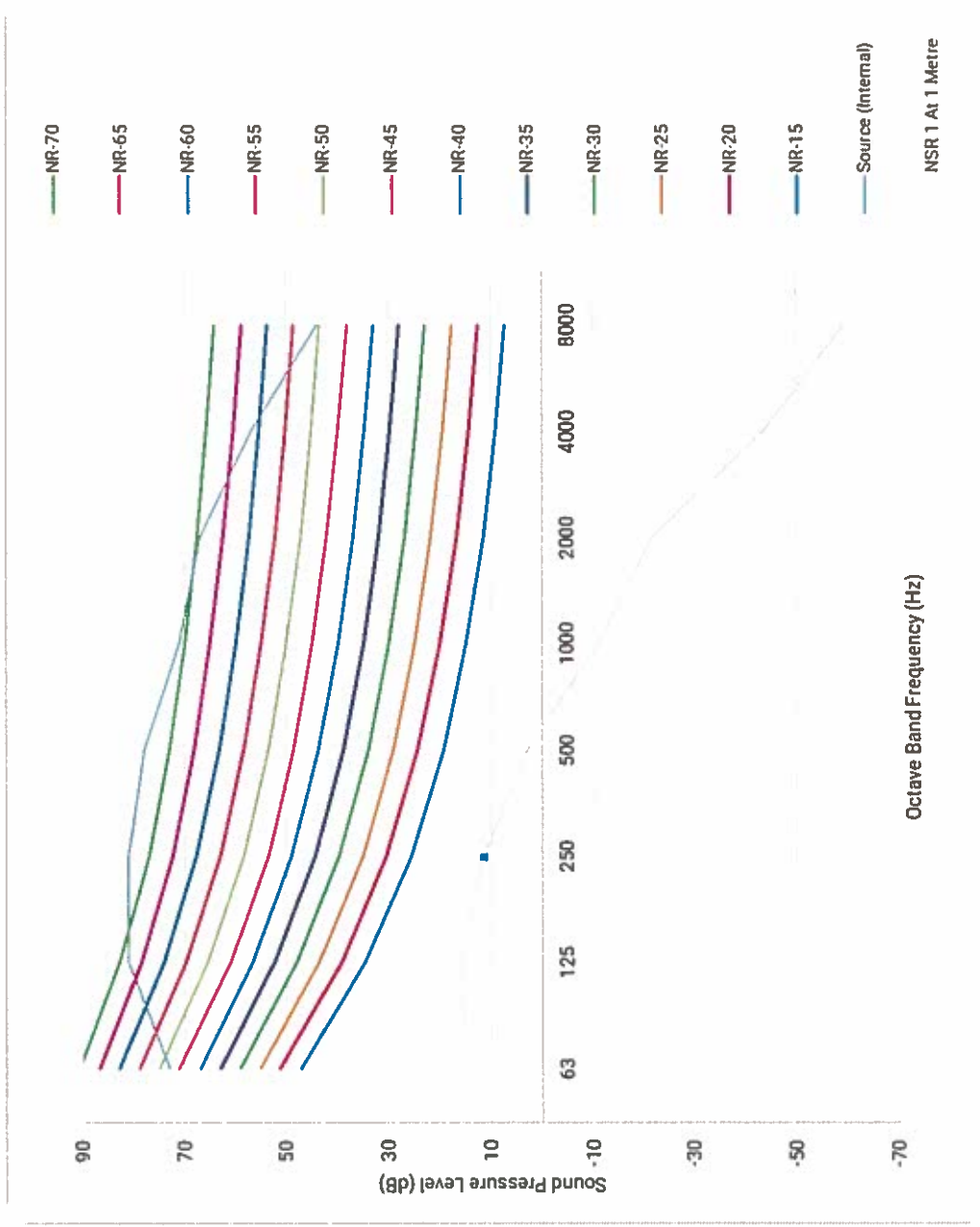
Measured Background Sound Levels Time History (M1): 02/09/2022 – 05/09/2022



Measured Background Sound Levels Time History (M2): 02/09/2022 – 05/09/2022

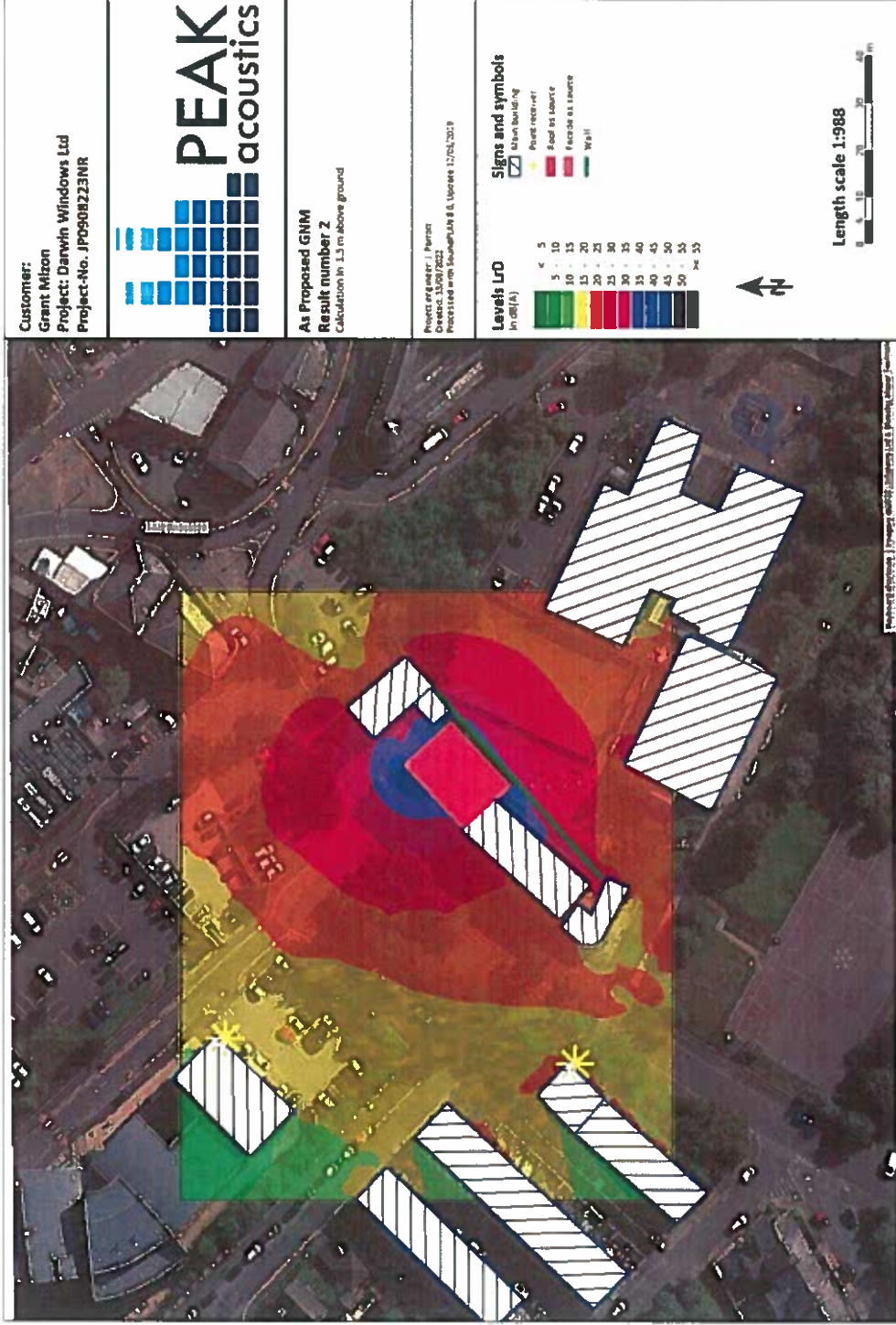


Assessment Source Levels Vs NR Curves

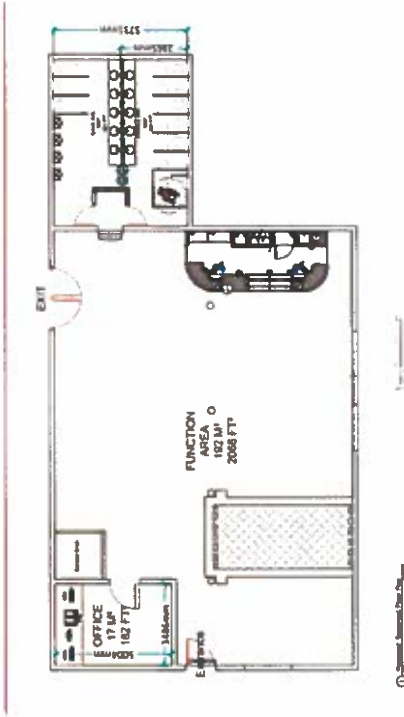


APPENDIX F –Grid Noise Map

85 dB Noise Breakout as proposed



APPENDIX G – Site Plan



APPENDIX H – Sound Test Certificate



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Sound Insulation Test Report

Measurements to British Standard BS EN ISO 140-4 & 7 (1998) and BS EN ISO 717-1 & 2 (1997), following the test procedures in Annex B of Approved Document E of The Building Regulations at:

Darwen Windows Ltd, Borough Road,
Darwen,
Lancashire.
BB3 1PL.

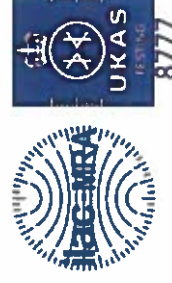
Chris Clarke

Approved Test Technician - Peak Acoustics Ltd

NOTES:

- The rooms referenced in this report were tested in the condition presented by the client and the results relate only to the items tested.
- This report should not be reproduced except in full, without written approval of the laboratory.
- Text highlighted in blue lettering is information supplied by the client

Ref: 0908223ST



Peak Acoustics Ltd Head Office - Silk Point, Queens Avenue, Marsdenfield, Ormskirk, Lancashire SK10 2BS Registered (England) 8351088

Page 1 of 8

J. Parrott BEng (Hons) AMIOA

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Property Type: Change of use -

Test	Source Room	Receiving Room	Measured $D_{n,w}$ + C_p (dB)	Required Level $D_{n,w}$ + C_p (dB)	Measured $L_{1,w}$ (dB)	Required Level $L_{1,w}$ (dB)	Pass/Fail	Improvement on Building Regulations (dB)	Test Type
1	Ground Floor Location 1	Basement Location 1	28	43			Fail	-15	ABF
2	Ground Floor Location 1	Basement Location 1			81	64	Fail	-17	IMP
3	Ground Floor Location 2	Basement Location 2	27	43			Fail	-16	ABF
4	Ground Floor Location 2	Basement Location 2			72	64	Fail	-8	IMP

ABW - Airborne Wall
ABF - Airborne Floor
IMP - Impact

0908223ST





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Testing commissioned by:

Grant Milton,
Borough Road,
Dawson, Lancashire,
BB3 1PL.

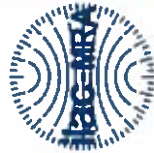
Test Date:

02/09/2022

Equipment: Kit 3

Svantek 977 Class 1 SLM Serial No. 36815
Aco Pacific type 7052E microphone Serial No. 79006
Svantek SV 33 Acoustic Calibrator Serial No. 32507
Ossurac Qam Amplifier - SN 3126
Ossurac Qohm Dodec Source - 8105
Norsonic Type 277 Tapping Machine, Serial No. 2776064

Ref: 09082235T



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Standardised level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

Client: Grant Mizon,
Certificate: Airborne 1

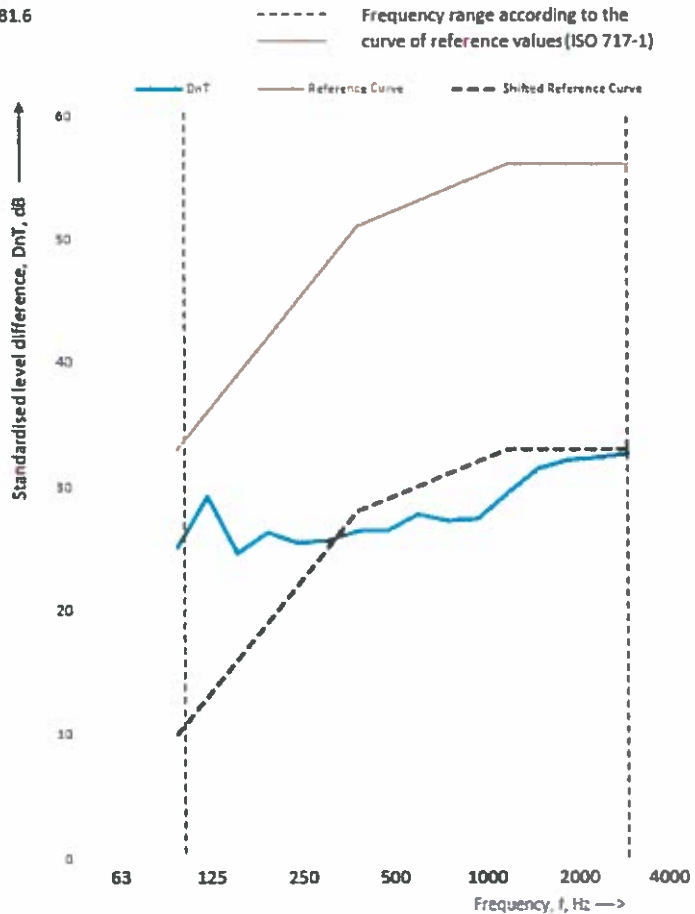
Date of test: 02/09/2022

Project: 0908223ST

Source: Ground Floor Location 1
Receiver: Basement Location 1

Source room volume (m³): 1069.5
Receiver room volume (m³): 681.6

Frequency (Hz)	DnT 1/3 octave (dB)
50	
63	
80	
100	25.1
125	29.2
160	24.6
200	26.3
250	25.4
315	25.6
400	26.4
500	26.4
630	27.7
800	27.2
1000	27.4
1250	29.5
1600	31.4
2000	32.1
2500	32.3
3150	32.6
4000	
5000	



<p>Rating according to ISO 717-1</p> <p style="text-align: center;">DnT,w (C; Ctr) = 29 (0; -1) dB</p> <p>Evaluation based on field measurement results obtained by an engineering method</p>	<p>Signed: Chris Clarke</p> <p>b: background corrected, B: maximum correction No background noise influence on measured result</p>
--	--

<p>Certificate Ref: 0908223ST - 1</p> <p>Date: 02/09/2022</p>	<p>Test Institute: Peak Acoustics Ltd</p>
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Standardised impact sound pressure levels according to ISO 140-7
Field measurements of impact sound insulation of floors

Client: Grant Mizon,
Certificate: Impact 2

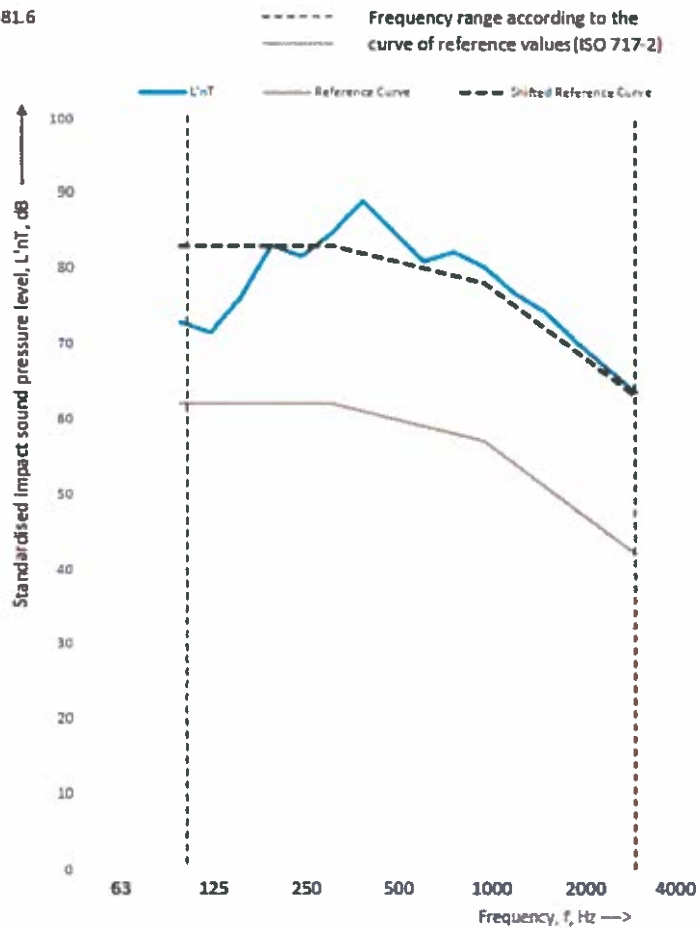
Date of test: 02/09/2022

Project: 0908223ST

Source: Ground Floor Location 1
Receiver: Basement Location 1

Source room volume (m³): 1069.5
Receiver room volume (m³): 681.6

Frequency (Hz)	L'nT 1/3 octave (dB)
50	
63	
80	
100	72.8
125	71.4
160	76.2
200	83.1
250	81.7
315	84.8
400	89.0
500	85.1
630	81.0
800	82.2
1000	80.2
1250	76.7
1600	74.3
2000	70.4
2500	66.9
3150	63.6
4000	
5000	



Rating according to ISO 717-2	Signed: Chris Clarke
L'nT,w = 81 dB	
Evaluation based on field measurement results obtained by an engineering method	b: background corrected, B: maximum correction Result corrected for background noise

Certificate Ref: 0908223ST - 2	Test Institute: Peak Acoustics Ltd
Date: 02/09/2022	

Standardised level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

Client: Grant Mizon,
Certificate: Airborne 3

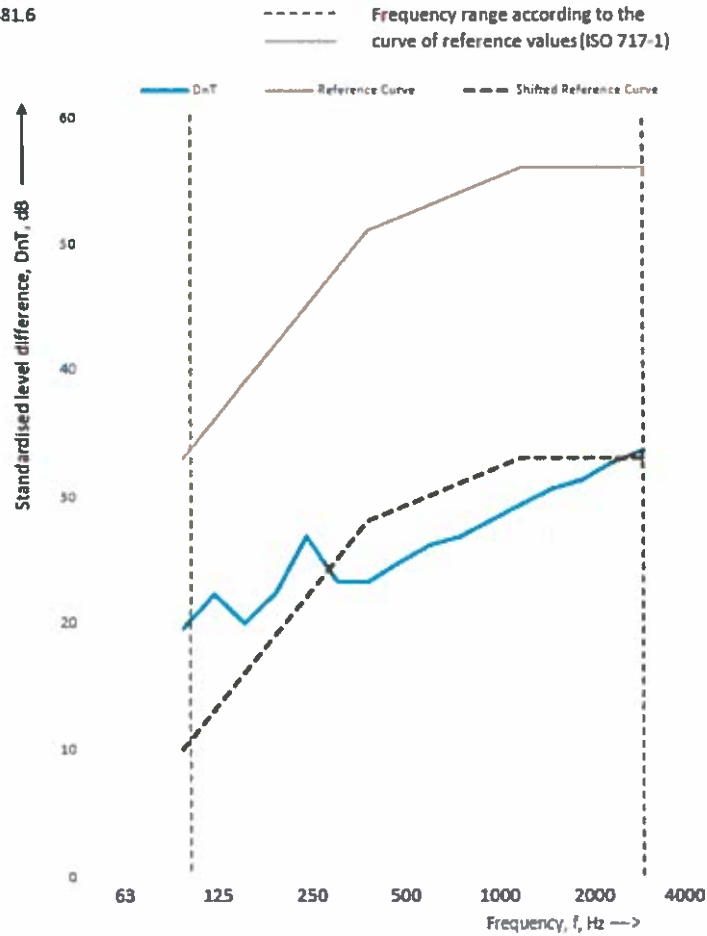
Date of test: 02/09/2022


Project: 0908223ST

Source: Ground Floor Location 2
Receiver: Basement Location 2

Source room volume (m³): 1069.5
Receiver room volume (m³): 681.6

Frequency (Hz)	DnT 1/3 octave (dB)
50	
63	
80	
100	19.6
125	22.2
160	19.9
200	22.3
250	26.8
315	23.3
400	23.2
500	24.7
630	26.1
800	26.8
1000	28.1
1250	29.3
1600	30.6
2000	31.3
2500	32.7
3150	33.6
4000	
5000	



Rating according to ISO 717-1 DnT,w (C; Ctr) = 29 (-1; -2) dB Evaluation based on field measurement results obtained by an engineering method	Signed: Chris Clarke  b. background corrected, B: maximum correction No background noise influence on measured result
--	--

Certificate Ref: 0908223ST -3	Test Institute: Peak Acoustics Ltd	
Date: 02/09/2022		

Standardised impact sound pressure levels according to ISO 140-7
 Field measurements of impact sound insulation of floors

 Client: Grant Mizon,
 Certificate: Impact 4

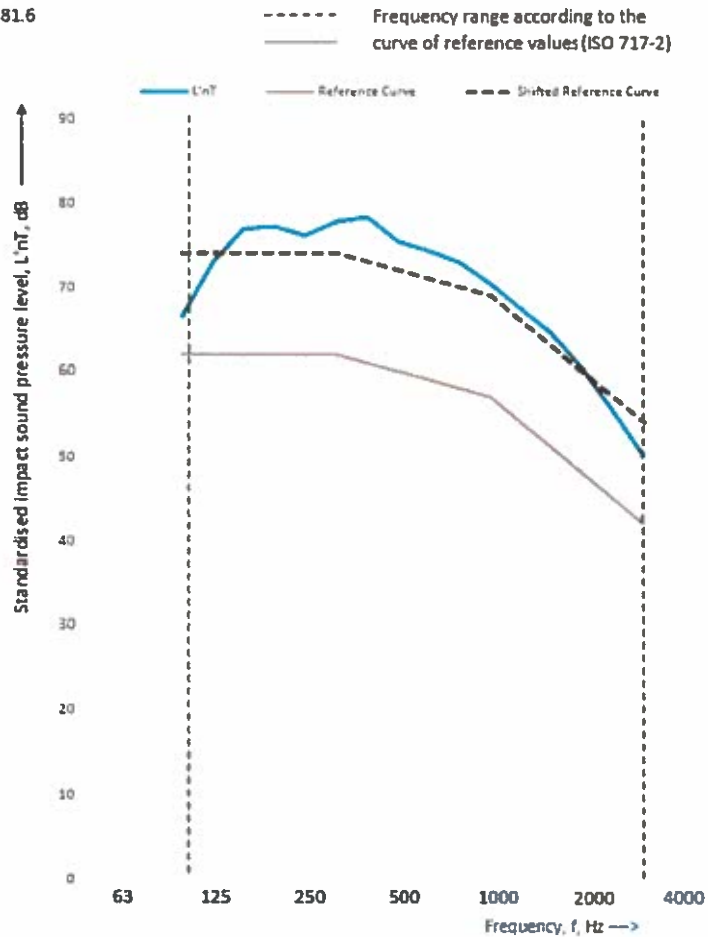
Date of test: 02/09/2022

Project: 0908223ST

 Source: Ground Floor Location 2
 Receiver: Basement Location 2

 Source room volume (m³): 1069.5
 Receiver room volume (m³): 681.6

Frequency (Hz)	L'nT 1/3 octave (dB)
50	
63	
80	
100	66.5
125	72.9
160	76.9
200	77.2
250	76.1
315	77.7
400	78.3
500	75.4
630	74.3
800	72.9
1000	70.4
1250	67.5
1600	64.5
2000	60.5
2500	55.4
3150	50.1
4000	
5000	



Rating according to ISO 717-2 L'nT,w = 72 dB Evaluation based on field measurement results obtained by an engineering method	Signed: Chris Clarke  b: background corrected, B: maximum correction Result corrected for background noise
---	---

Certificate Ref: 0908223ST - 4 Date: 02/09/2022	Test Institute: Peak Acoustics Ltd
--	------------------------------------



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References

Peak Acoustics were unable to determine the construction materials used in forming the sampled partitions referenced in this report and no information was available from the client in this regard immediately prior to testing commencing.

Test Procedure - Airborne Sound Insulation

Airborne sound insulation measurements are taken to a recommended procedure summarised below:-

- A pink noise source generates a steady and continuous spectrum across the required frequency bands.
- Measurements, following the International Standard (2), of the sound levels are taken at one-third octave intervals from 100Hz to 3150Hz, in the source and receiver room using fixed microphone positions.
- An average sound pressure level, representative of the space in each room is established.
- Reverberation time measurements are made in the receiver room (3).
- The standardised level difference (DnT) in decibels (dB) is calculated in each frequency band using the equation:
 $DnT = L1 - L2 + 10 \lg T/T0$

DnT is the Standardised Level Difference (dB)

L1 is the average sound pressure level in the source room (dB)

L2 is the average sound pressure level in the receiver room (dB)

T is the average reverberation time of the receiver room (seconds)

T0 is the reference reverberation time of 0.5 seconds.

- The Weighted Standardised Level Difference (DnT,w) in decibels and Spectrum Adaptation Terms (C and Ctr), are calculated in accordance with BS EN ISO 717-1:1997(4)

Test Procedure - Impact Sound Transmission

Impact sound insulation measurements are taken to a recommended procedure summarised below:-

- An industry standard *tapping machine* is used as the impact noise source.
- Measurements, following the International Standard (5), of the sound level are taken at one-third octave bands intervals from 100Hz to 3150Hz in the receiver room using fixed microphone positions.
- An average sound pressure level representative of the space in each room is established.
- Reverberation time measurements are made in the receiver room (3)
- The Standardised Impact Sound Pressure Level (L'nT) in decibels (dB) is calculated in each frequency band using the equation: $L'nT = L1 - 10 \lg T/T0$

where L'nT is the Standardised Level Difference (dB)

L1 is the average sound pressure level in the source room (dB)

L2 is the average sound pressure level in the receiver room (dB)

T is the average reverberation time of the receiver room (seconds)

T0 is the reference reverberation time of 0.5 seconds.

- The Weighted Standardised Impact Sound Pressure Level (L'nT,w) in decibels (dB) is calculated in accordance with BS EN ISO 717-2:1997 (6).

Reference Documents

1. The Building Regulations 2015 - Approved Document E: Resistance to the passage of sound.
2. BS EN ISO 140-4:1998 Acoustics - Measurements of sound insulation in buildings and of building elements.
3. BS EN ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room.
4. BS EN ISO 717-1:1997 (Incorporating Amendment 1) Rating of sound insulation in buildings and of building elements.
5. BS EN ISO 140-7:1998 Field Measurements of impact sound insulation of floors.
6. BS EN ISO 717-2:1997 (Incorporating Amendment 1) Acoustics. Rating of sound insulation in buildings and of building elements. Impact sound insulation.



APPENDIX I – Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140dB. Here are some examples of common environments and their typical noise levels.

Noise Level	Environment
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 metre away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level (2×10^{-5} Pa – threshold of hearing).

$L_{Aeq,T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level over which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{A90} – The sound level exceeded 90% of the time. Typically used to describe background noise the L_{90} is regarded as the 'average minimum level' and quantifies the common sound level of a fluctuating sound field i.e. the sound level that occurs 90% of the time. Alternatively, L_{10} describes the sound level exceeded 10% of the time and therefore quantifies the 'average maximum level' of sound which is often used during the calculation of road traffic noise.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.



Professional Audio / Visual Services

CLIENT INFORMATION

The Bakehouse
Event Center
Borough Road
Darwen
BB3 1PL

**NOISE REPORT
THE BAKEHOUSE DARWEN**

Background Music Level - Externally measured - 1.5m from building
Conducted - **12th - 13th September 2022** - Acoustic Meter Calibrated at 9:00am

AMBIENT OUTDOOR LEVEL (No Music)	INDOOR VOLUME LEVEL - LAeq	OUTDOOR VOLUME LEVEL - LAeq	AMBIENT OUTDOOR LEVEL (No Music)	EXTERNAL NOISE FACTORS (Traffic)	OUTDOOR NOISE DIFFERENTIAL - LAeq
Upper Floor - Warehouse (Potential Main Bar Area)	69.0db	63.8db	62.0db	71.8db	1.8db
Lower Floor - Warehouse	68.6db	65.7db	62.0db	71.8db	3.7db
Upper Floor - Bakery	71.2db	64.2db	62.0db	71.8db	2.2db
Lower Floor - Bakery	71.5db	66.2db	62.0db	71.8db	4.2db

Performance Music Level - Externally measured - 1.5m from building
Conducted - **12th - 13th September 2022** - Acoustic Meter Calibrated at 2:00pm

LOCATION	INDOOR VOLUME LEVEL - LAeq	OUTDOOR VOLUME LEVEL - LAeq	AMBIENT OUTDOOR LEVEL (No Music)	EXTERNAL NOISE FACTORS (Traffic)	OUTDOOR NOISE DIFFERENTIAL LAeq
Upper Floor - Warehouse (Potential Main Bar Area)	84.0db	69.6db	62.0db	71.8db	6.4db
Lower Floor - Warehouse	84.1db	71.3db	62.0db	71.8db	9.3db
Upper Floor - Bakery	85db	70.1db	62.0db	71.8db	8.1db
Lower Floor - Bakery	85db	73.0db	62.0db	71.8db	9.0db

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Main Structure

The main walls of the venues structure are nearly half a meter thick and reduce sound levels by some 15db. The main performance and music area is planned to be situated in the warehouse on the upper floor which means it will be furthest away from the nearest residential building. The wooden apex roof structure was tested and the thick oak timber adds to the reduction in sound level. There are however some weaknesses observed and addressed below.

Fire Exit, Entrance Doors & Loading Bays

These areas, when open, all have potential for noise bleed into local residential areas.

Recommended Action:

All fire exit doors and entrance areas could have two sets doors giving each entrance / exit a dedicated "sound lobby". Each exit door could also have a programmable access lock linked to the fire alarm system to stop unwanted opening of these areas. This will maintain the sound lobby at all times removing weak links in the venue. Whilst the loading bay doors pose a large sound leak risk, generally a load in / out is done at the beginning or end of an event. Therefore it is recommended that you do not provide additional live entertainment simultaneously while these are doors are open.

Internal Areas

Multiple Windows and small loading door areas, lend to noise bleed from the building as they are thinner than the structural wall and the glass allows sound to permeate more easily. This area is the main sound leakage from the building when out at street level.

Recommended Action:

We recommend the existing windows and loading doors to have a removable framed filled with Acoustic mineral wool which is then covered with a layer of 15mm acoustic plasterboard, then a layer of Technosound, followed by another layer of 15mm acoustic plasterboard.

External Areas

As above the windows, small loading doors etc present the same weakness.

Recommended Action:

As above for internal areas.

Stage / Sound System / DJ Position

Whilst these areas were not built when we conducted our assessment, the below recommendations should be heeded when considering the build and placement.

Recommended Action:

The stage and DJ booth should be positioned at the furthest point of the warehouse; furthest from the nearest residential building. Speakers should be elevated and angled inwards, and directed away from weak spots such as windows and doors. This action will allow to reduce sound levels exposed to the weaker street side area and thus reducing levels escaping from the venue to residential areas.

If intended to be installed, sub bass units should be fixed onto sound absorbing springs reducing resonance from the units and giving control.

All speakers should be controlled via a DBX drive rack digital processor to enable full control/limiting of the frequency spectrum as well as any crossover, delays etc.

It is also recommended that a processor should be installed in the amplifier rack which should then be locked with password protection.

All entertainment should be routed through an in-house sound system via an audio patch panel, giving full control of all types of requirements. An in-house limiter can additionally be added to ensure excessive sound levels are not reached. This limiter should be setup with the local EHO department then set and locked to the agreed levels.

Final Notes & Overview

Generally the noise limits recorded, both indoor and outdoor, were as expected with no extreme or excessively concerning levels, particularly curb side. Often the volume of the passing cars and traffic (71.8db) superseded any volume level of noise bleed from the building, even when testing at a loud performance music level. Upon request of The Bakehouse, we additionally took measurements of the sound levels and differentials further afield; outside the nearest residential building and the noise was either minimal or lower than what could audibly be heard over the ambient street noises.

The overall noise pollution from the building would normally not warrant additional measures to be taken, however should you wish to reduce the audible levels further we have given our recommendations on the best practises to do so above. These are not guaranteed, however should promote better noise and audio control from the building if needed.

Once in place we can provide further testing and data analysis to gauge any audible changes or reductions.



Liam O'Leary

Company Director

Loop AV Ltd - Professional Audio / Visual Services

