CLEAR
ACOUSTIC DESIGN

Report

MAP Studio Café

Environmental Noise
Assessment

Document History

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Revision 1			
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Revision 1	
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Revision 3	

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1.0 Introduction

1.1 Brief

Clear Acoustic Design has been appointed to conduct a noise assessment for MAP Studio Café at 46 Grafton Road, London, NW5 3DU.

MAP Studio Café is a long-standing café and live music venue. A retrospective planning application is to be submitted for the formal use of the café in the evening as a live music venue.

A noise impact assessment has been requested in support of the planning application in order to safeguard the amenity of the surrounding noise sensitive receptors from the live music noise source.

The noise impact assessment has been undertaken in line with - and contextualised through - various applicable guidelines as outlined in section 2 of this report. These criteria are seen to be appropriate in assessing and mitigating noise impact from the venue.

1.2 Report Aims

The aim of this noise impact assessment is to:

1. Understand the noise levels on site from the live music noise source.
2. Understand the impact of music noise from the venue at the nearest noise sensitive receptor(s).
3. Provide mitigation, where required, in terms of the control of noise break-out from the venue, to ensure that the nearest noise sensitive receptors are not adversely impacted by noise from the venue during live music events.

1.3 Credentials

This report has been approved and issued by Stefan Hannan of Clear Acoustic Design. Stefan is a Company Director with 18 years of acoustic consulting experience. Stefan is also a full corporate member of the Institute of Acoustics (MIOA).

1.4 Glossary

The report is technical in nature. A supporting glossary of acoustic terms can be found in Appendix C.

2.0 Legislative and Policy Framework

2.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The NPPF provides a framework within which local people and their council can produce their own distinctive local and neighbourhood plans. With explicit reference to noise, the NPPF states that "Planning policies and decisions should contribute to and enhance the natural and local environment by … preventing new and existing development from contributing to, being put at unacceptable risk from … noise pollution".

2.2 Noise Policy Statement for England (NPSE)

The NPPF refers to the Noise Policy Statement for England (NPSE), which applies to most forms of noise including environmental noise. The NPSE sets out the long-term vision of Government policy which is to "Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.". It aims that "Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life."

The use of the terms "significant adverse" and "adverse" are key phrases within the NPSE. The guidance establishes the concept of how the level of adverse effect on health and quality of life can be referenced including:

- 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.

Under the first aim of the NPSE ("avoid significant adverse impacts on health and quality of life"), an impact in line with SOAEL should be avoided. Under the second aim ("mitigate and minimise adverse impacts on health and quality of life"), where the impact lies somewhere between LOAEL and SOAEL, requiring that all reasonable steps are taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development, but does not mean that such adverse effects cannot occur.

2.3 Planning Practice Guidance on Noise (PPG-N)

The Planning Practice Guidance on Noise (PPG-N) is part of a suite of web-based guidance which is intended to support the implementation of the policies in the NPPF and the NPSE. It aids in expanding on the definitions form the NPSE of NOEL, LOAEL and SOAEL, by linking these terms to 'examples of outcomes', i.e. changes in behaviour and/or attitude to noise. The table below summarises the guidance from PPG-N in this regard.

Perception	Examples of outcomes	Increasing effect level	Action
NOEL - No Observed Effect Level [1]			
Not noticeable	No Effect	No Observed Adverse Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.		
LOAEL - Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up the volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
SOAEL - Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to a change in the acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent
[1] This line is an assumption of the adverse effect level and is not explicitly referenced by PPG-N, though this appears to be a safe assumption.			

Table 2.1: Noise exposure hierarchy based on the likely average response – adapted from PPG-N

2.4 BS 8233: 2014

BS 8233: 2014 *Guidance on sound insulation and noise reduction for buildings* provides a range of internal noise level targets for many building types, typically for new residential buildings.

While typically used by planning authorities to place acoustic design targets on new residential developments near major sources of noise, it provides a context as to acceptable internal noise level limits in residential dwellings.

Design targets are based on the World Health Organisation (WHO) published guidelines.

The maximum nighttime noise level is based on WHO guidance but is not strictly part of the requirement of BS 8233: 2014.

The guideline for internal noise levels in residential buildings, taken from BS 8233: 2014, are shown in the table 2.2 below.

Activity	Location	Daytime (07:00-23:00)	Nighttime (23:00-07:00)
Resting	Living Room	35 dB $L_{Aeq,T}$	-
Dining	Dining Area	40 dB $L_{Aeq,T}$	-
Sleeping/Daytime Resting	Bedroom	35 dB $L_{Aeq,T}$	30 dB $L_{Aeq,T}$ / 45 dB L_{AFmax}
Daytime Resting	External Amenity	50-55 dB $L_{Aeq,T}$	-

Table 2.2: Desired internal noise levels in residential buildings, from BS 8233: 2014

2.5 Noise Rating (NR) and Entertainment Noise Legislation

Noise from entertainment venues, e.g. noise from recorded music, live bands or karaoke, can be particularly annoying for residents and business if it is not adequately contained within the venue. When considering the potential impact of a proposal for an entertainment premises or residential building near to entertainment premises, the overall noise level (L_{Aeq}) and the low frequency noise level (63Hz and 125Hz octave bands) should be considered [1].

Music noise in the 63Hz and 125Hz octave bands, which is described as 'bass noise' is and the impulsive and non-steady character of low frequency music noise, can be disturbing for residents exposed to it.

There is a lack of consensus on an assessment method for noise levels within habitable rooms regarding entertainment noise in the UK, and so there is no specific published guidance as to what is considered an acceptable noise level from venues. The aim for new venues or new residential dwellings should be to design internal noise levels so that the music noise is at an "inaudible" level. Noise is considered to be inaudible when it is at a sufficiently low level such that it is not recognisable as emanating from the source in question and it does not alter the perception of the ambient noise environment that would prevail in the absence of the source in question.

The DEFRA report *Noise from Pubs and Clubs – Phase 1*, reproduces the Institute of Acoustics (IOA) working group guidance to achieve music noise levels which are "virtually inaudible" inside a residential property and do so following the below guidance [2].

When dealing with noise control, especially at the lower frequencies it is typical to analyse the octave band data as a Z-weighting (linear) and not solely the A-weighting [3].
In the '*Procedure for the assessment of low frequency noise complaints – Revision 1*',

Moorhouse et al (2011) uses limits for low frequency noise levels in 1/3 octave bands between 10Hz and 160Hz. For the assessment of low frequency music noise, it is more practical to consider the 63Hz and 125 Hz octave bands, however. The Noise Council's Code of

Practice on 'Environmental Noise Control at Concerts' suggests limits on both these octave bands. The DEFRA report *'Noise from Pubs and Clubs – Phase 1'* suggests limits on 1/3 octave bands.

However, the problem with this suggestion, and one of the reasons it is not widely used, is due to the difficulty in obtaining 1/3 octave band sound insulation performance data from manufacturers for construction materials for the façade elements, including walls, glazing, and trickle ventilation.

With regards to assessing music noise at the 63 Hz and 125 Hz octave band levels, a good correlation is shown between the NR15 curve and Moorhouse curve at low frequencies.

This correlation is shown in figure 2.3 below.

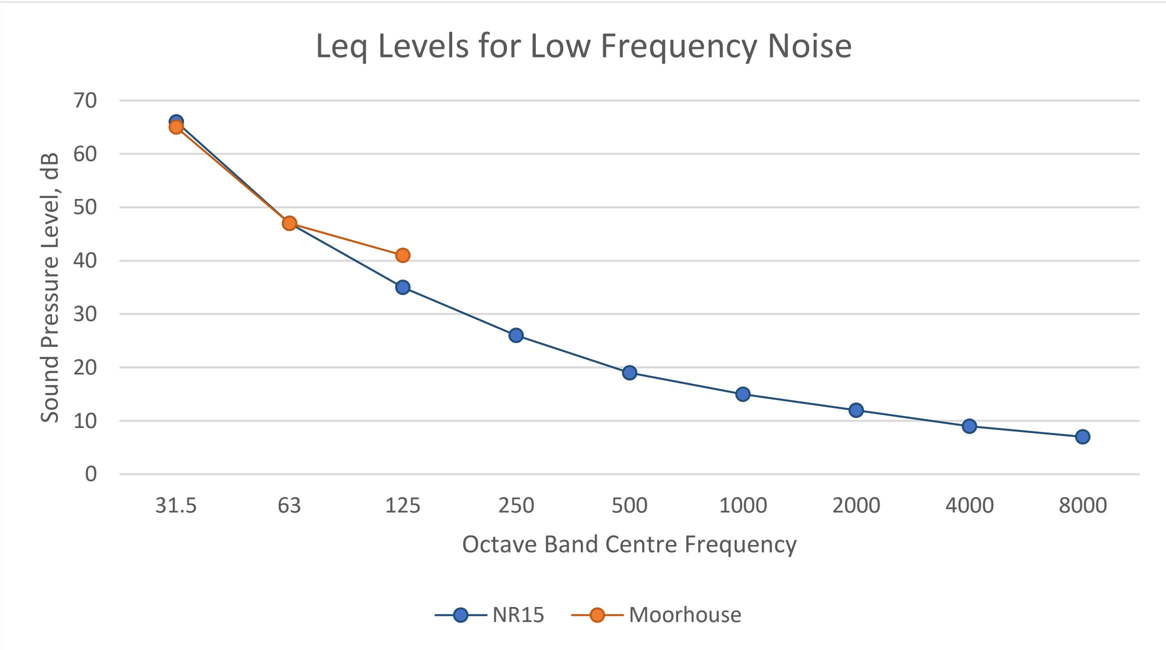


Figure 2.3: NR15 curve vs Moorhouse curve

However, The NR curve may be too stringent at mid and higher frequencies and may be lower than background noise levels in typical habitable spaces.

Furthermore, the NR curve is most commonly used to set limits for mechanical services noise in buildings i.e. steady, continuous noise sources. Music noise has distinctive characteristics and as such can be described as unsteady and non-continuous in comparison.

Even though the Moorhouse curve does not specifically relate to entertainment noise (as per the caveat in the revised edition) these levels provide a good practical basis to assess low frequency music noise.

As such it is concluded that they also provide a workable prediction for a measurement method and assessment for low frequency noise in habitable spaces.

Therefore, a criterion that would achieve a condition of "inaudible" or "virtually inaudible" which is applicable for residential developments that are structurally connected or in close proximity (structurally separate) to entertainment venues (or vice versa) would be:

> "Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB (L_{eq}), respectively".

This criteria is summarised in table 2.4 below.

	Octave Band Frequency Noise Level Limit	
Noise Rating	63 Hz	125 Hz
NR15	47 dB	41 dB

Table 2.4 Noise Rating curve NR15

Note, however, this guidance typically refers to newly proposed venues or newly proposed residential receptors close to existing venues. It may be more reasonable to mitigate music noise, if required, in line with the existing noise levels at the nearest noise sensitive receptor façade when there is no music noise present, i.e.

> "Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed these octave centre frequency noise levels (L_{eq}) respectively during a representative time when music noise is not present at the façade,"

This would be generally considered an avoidance of a significant adverse noise impact on health and quality of life.

References in this section:

1. Institute of Acoustics (2002) – Good practice guide on the control of noise from pubs and clubs – Draft Annex McCullough et al (2004)

2. Proposed criteria for the assessment of low frequency noise disturbance, Defra (updated in 2008 and 2011)

3. A practical evaluation of objective noise criteria used for the assessment of disturbance due to entertainment music Moorhouse et al (2005)

2.6 Local Authority Requirements

The following local authority guidance is recognised and adhered to throughout the assessment:

Paragraph 6.87 of the Camden Local Plan recognises that due to the large proportion of entertainment venues, these will inevitably be close to residential properties.

Policy D14 (Noise) of the London Plan aspires to reduce, manage and mitigate noise to improve health and quality of life. This requires that development:

- Avoids significant adverse noise impacts on health and quality of life
- Mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses

3.0 Site Description

3.1 Introduction

MAP Studio Café is a long-standing café and live music venue, typically hosting jazz, world music, and weekly jam/open mic sessions. While it is understood that the site has operated as a music venue for approximately 13 years, a retrospective planning application is now to be submitted for the formal use of the café in the evening as a live music venue.

3.2 Site Context

The site states opening hours of between 13:00 and 23:00. The music venue typically only operates between the hours of 19:00 and 23:00 on the days when live music is scheduled, and so nighttime noise disturbance (that is, noise between the hours of 23:00 and 07:00) is not seen to be a concern for the application.

The street has a mix of commercial and residential premises. While some stretches along the street are fairly residential in nature, there is some existing commercial premises on the same street including Kentish Town Sports Centre and The Grafton public house, both approximately 100m south from the site. Motor traffic volume is seen to be average for this type of street.

The Grafton is a typical public house serving alcohol and food, and hosts occasional entertainment (live music) nights. Additionally, it has outdoor seating for patrons.

Prince of Wales Road – considered a main arterial road – and Kentish Town West overground station are both with 150m of the site.

3.3 Site Description

The site occupies a three-storey building on the corner of Inkerman Road and Grafton Road. The ground floor is dedicated to the main café area and open kitchen, with a recording studio to the rear of the building. On the upper floors are three office/studio spaces.

The live music venue is located on the first floor in what is considered the 'extended' area of the original building three-story building (which is situated across the ground and first floor). The venue space features stage area for a live band, small bar, and outdoor terrace area for approximately 6 patrons.

Given the size of the venue, it does not amplify live music, that is, use microphone and PA system to amplify the live sound from musical instruments. The stage area has a "house band" set up, with drum kit, bass guitar with amp, piano, and guitar with amplifiers. There are speakers which can be used to play recorded music, but live music is deemed the louder source (see section 4 for these noise levels).

Full plans of the site can be seen in Appendix B. The floor plan layouts are provided in figure 3.1 for immediate context.

Figure 3.1 Site plans

3.4 Nearest Noise Sensitive Receptor

The nearest noise sensitive receptor to the site is 44 Grafton Road, which is adjoined to MAP Studio Café to the south. This receptor neighbours the site and has a direct view of the first floor terrace of the venue. It is understood that this receptor is worst affected by live music from the site, given its proximity.

31 Willes Road is located directly to the east of the site, and 48b Inkerman Road is located across the street to the north.

It is seen that there are no separating elements (that is, walls or floors) that are directly shared with the venue space and the identified receptors.

An aerial view of the site (taken from Google Maps) is shown in figure 3.2 below.

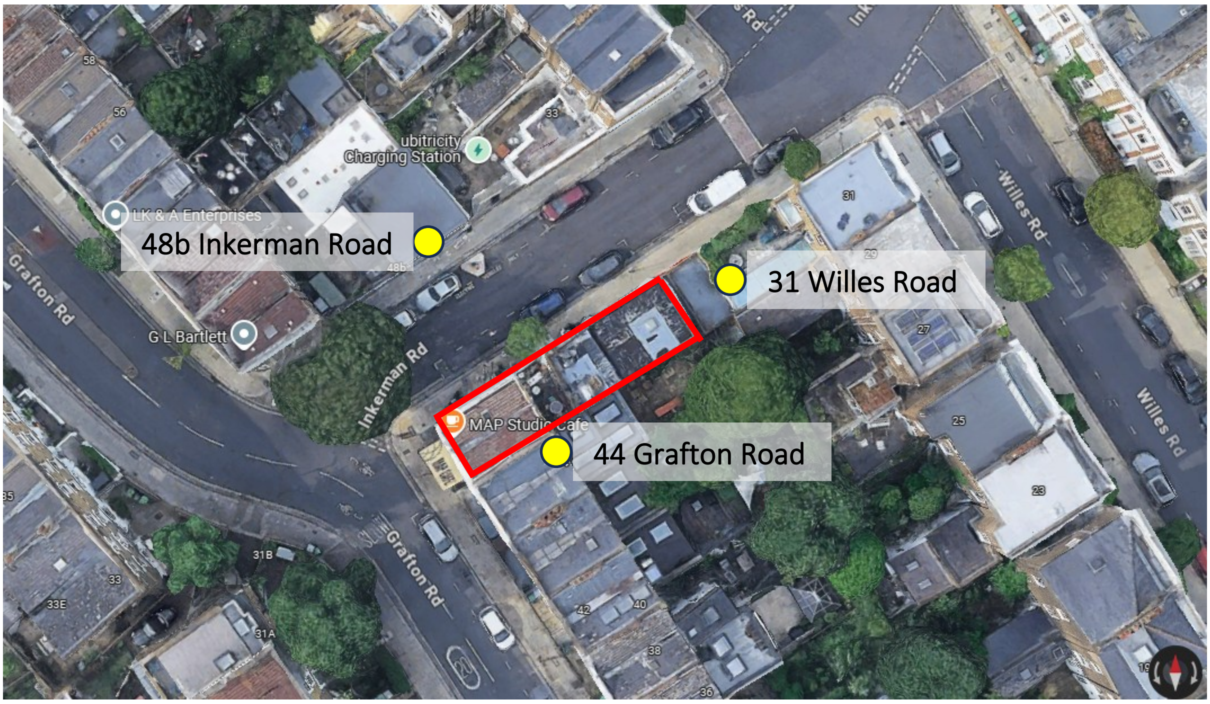


Figure 3.2 Aerial view of site

4.0 Environmental Noise Survey

4.1 External Noise Monitoring

In order to understand the noise level affecting the nearest noise sensitive receptor, 44 Grafton Road, Clear Acoustic Design have undertaken an environmental noise survey in a position representative of the worst affected noise sensitive receptor façade to the site.

Noise levels were measured over a 24 hour period between 20/03/25 and 21/03/25 using a single fixed noise monitor (referred to as F1). The sound level meter was positioned on an extended pole from the second floor façade of MAP Studio Café. This is seen to be representative of the noise levels at the façade of neighbouring 44 Grafton Road.

During this time, there was a live music event at the site on 20/03/25 between 19:00 and 23:00. Further noise measurements were also taken over at various points around the site to understand noise levels in neighbouring areas and receptors.

By measuring the noise from the venue at a façade representative of the nearest noise sensitive receptor over a 24 hour period, it is possible to understand the noise levels from the venue during a live music event at the nearest receptor façade. Whereby noise levels are compliant at this receptor location, it ensures compliance at all other receptor locations.

The long term measurement position, F1, is marked on figure 4.1 below.

The measured noise level at this position is often a combination of live music noise and people noise from use of the external terrace area.

Every care has been taken by Clear Acoustic Design to capture the noise level at the façade of the nearest noise sensitive receptor from the venue, which includes a period during a time when a known live music event was on. It is understood that the noise levels of the live music event are considered fairly typical for the venue.

The mitigation within section 4 of the report is based on the captured noise levels during this time, which is understood to be a typical operational noise level from this source during music/entertainment events.

Figure 4.1 Aerial view of site with long term survey location (F1)

4.2 Internal Noise Monitoring

Internal noise monitoring has also been undertaken to understand the noise levels of live and recorded music from inside the venue during typical operation.

The noise levels of both the "house band" set up as described above, and recorded music through the speaker system were both measured at the centre of the first floor room. These noise levels have been compared against existing noise levels from Clear Acoustic Design's in house library of similar noise sources for verification and are deemed typical of this source.

The sound level meter was positioned on a tripod at 1.5 metres above floor level and was approximately 3.5 metres from the stage area and speakers.

Recorded music was played thourgh the speaker system via a tablet. The tablet has an EQ function which could be employed to reduce noise levels in certain frequency bands. For the measurement, an EQing of typical/normal operation was used. The two venue speakers are situated on the walls to the left and right of the stage area, at an elevated (1.5m) position, slightly angled towards the centre of the room.

The noise levels of the instruments of the house band set up were deemed to be typical of a normal live event. As noted previously, these instruments are not amplified through a PA system, and noise for electric/electronic instruments comes direct from their amplifiers at the back of the room/stage area.

The noise levels from these measurment periods are shown in section 4.5 below.

4.3 Measurement Equipment and Environmental Conditions

The weather was dry and overcast for the duration of the surveys with a high of 21°C during the daytime period and a low of 9°C during the nighttime period.

Wind speeds were below $5m/s^{-1}$ for the duration of the survey and typically from an easterly direction.

The conditions were seen to be good for conducting noise measurements.

The following noise measurement equipment as seen in table 4.2 was used for the survey.

Equipment	Serial Number	Calibration Date
Svantek SV 971A Type 1 Sound Level Meter	113218	15/09/23
Svantek SV 18A Preamplifier	113711	15/09/23
ACO 7152 Microphone	80617	15/09/23
B&K 2250 G4A Sound Level Meter	2449831	26/11/23
B&K 4189 Microphone	1837044	26/11/23
B&K VZ 0032 Preamplifier	17002	26/11/23

Table 4.2 Measuring Equipment Used for Survey

4.4 Fixed Noise Monitoring Graph – F1

Figure 4.3 below provides a graph of the long-term measured noise levels at survey position F1.

The ambient (L_{Aeq}) and background (L_{A90}) noise levels are shown.

Noise levels are shown over 1 minute integration periods.

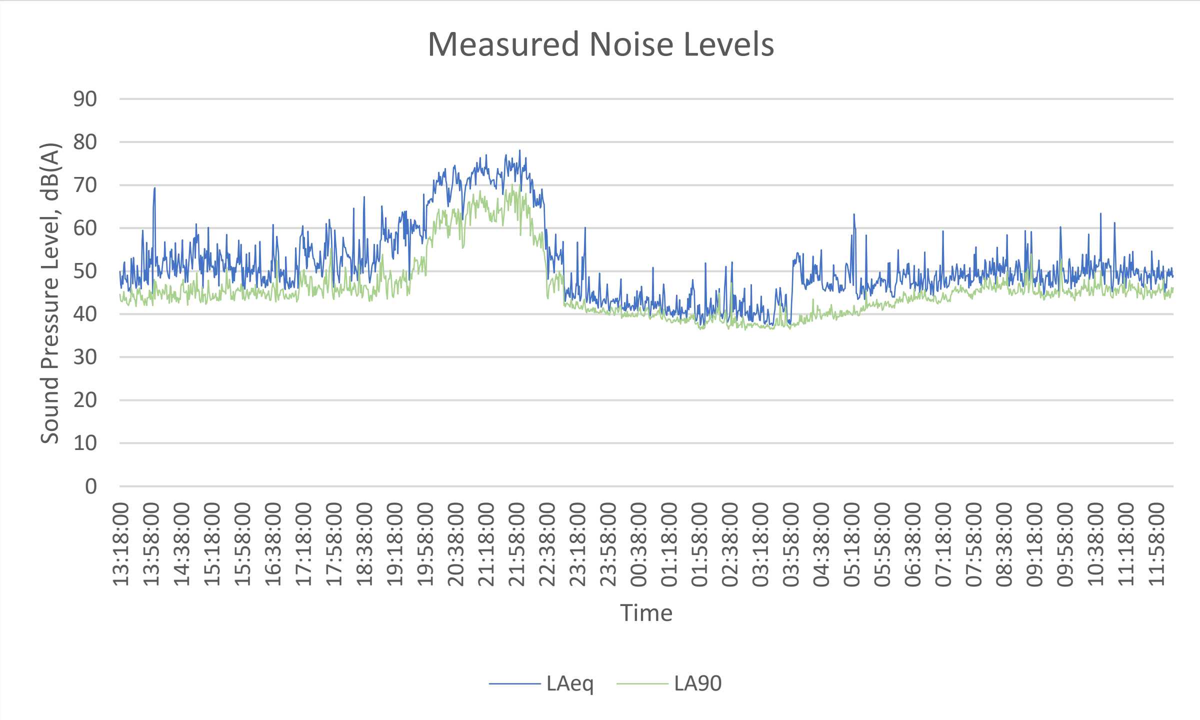


Figure 4.3 Long Term Measurement Graph – F1

4.5 Measured Noise Levels from Noise Monitoring Survey

The continuous equivalent noise levels (L_{Aeq}) levels from the survey data are shown below.

The unweighted (linear, Z) frequency in each octave band is provided. The A-weighted noise level of these spectrums (dB(A)) is also shown.

The continuous equivalent noise level at the nearest façade 44 Grafton Road is taken in the daytime period prior to the live music event, to understand the typical noise level at this façade without the live music source present.

L_{Aeq} noise levels at the façade of the receptor are at their highest when the outdoor terrace is in use. Noise levels from the live event when the terrace was and was not in use have been included below, based on the worst case 15 minute averaged continuous equivalent noise levels periods for both.

4.5.1 External Noise Levels at Nearest Receptor Façade (F1)

	Octave Band Frequency (dB)							
Measurement	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Receptor, daytime (13:30-17:30) (no live music event)	58.7	50.7	49.0	50.1	51.3	46.4	38.4	54.2
Live music, terrace use, noisiest 15 min (19:00-23:00)	69.0	64.6	67.5	73.9	71.4	66.8	59.1	75.2
Live music event, no terrace use, nosiest 15 min (19:00-23:00)	67.7	57.9	58.1	60.6	56.4	51.1	45.7	61.1

Table 4.4 Survey Noise Levels

4.5.2 Internal Noise Levels

The internal noise levels from the measurement period are shown below. The worst case 1 minute continuous equivalent noise level is provided.

	Octave Band Frequency (dB)							
Measurement	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Internal live music, 1 min	89.3	91.7	91.9	90	91.6	85.2	83.6	94.5
Internal recorded music, 1 min	74.8	74.0	63.2	64.8	60.6	66.5	62.2	70.3

Table 4.5 internal Survey Noise Levels

4.6 Discussion of Noise Levels & Mitigation Methods

The nature of the site means that it's not possible to understand and determine every single noise path from the source. Given that the room of the music venue does not directly share any separating elements with neighbouring properties, and that the nearest adjoining property (44 Grafton Road) is believed to be of separate building construction, it is thought that flanking- and structural- borne noise is unlikely to be a key issue in terms of noise impact.

As such, noise breaking out through the existing façade elements of the venue room – through the walls, windows, doors, and roof – and then the resulting noise level at the neighbouring façades, entering the receptor rooms through these façades, is likely to be the main issue regarding noise impact. It is seen that some of the neighbouring residential properties have single glazed sash windows, and the sound reduction performance of these window types is generally quite poor, meaning that the noise impact could be greater compared to receptor rooms with more modern window frames and double glazing types.

As can be seen in table 4.4, the noise survey shows that the ambient noise level (L_{Aeq}) rises by approximately 7 dB(A) from 54.2 dB(A) to 61.1 dB $L_{Aeq,15min}$ at the nearest receptor façade during a typical live music event when the terrace is not in use. Noise levels in the 63Hz and 125Hz octave bands rise by approximately 9 dB and 8 dB respectively.

The ambient noise level rises further when people congregate on the terrace, up to 75.2 dB $L_{Aeq,15min}$. There is a door to the rear of the venue at first floor level directly onto the terrace which is used during the live music events. Not only does this increase the noise level from the live music source at the receptor façade (due to the continual opening of the door leading to further noise breakout from the venue), but the terrace itself is only 2 metres from the receptor façade, meaning that noise levels from patrons talking is highly perceivable, and often louder (in term of L_{Aeq}) than the live music source.

Note the A-weighted noise level at lower frequencies (for example, -26.2 dB at 63Hz) and so may not present a fully accurate picture of the noise impact, however.

Instead, it is more appropriate to analyse the linear octave band frequencies and assess possible mitigation methods by ensuring that these octave band frequencies do not exceed that of the typical daytime period when the live music source is not present at the receptor façade. This typical noise level is shown in the first row in table 4.4.

Mitigation in the form of improved sound insulation in order to control noise breakout from the venue can therefore be explored and is done so in section 5.

5.0 Noise Mitigation

5.1 Existing Constructions

In order to recommend upgrades to the venue's sound insulation, it is first necessary to determine the likely noise breakout through each separating element (walls, windows, doors, and roof) of the venue. By understanding the 'weak' points within the venue's envelope, it will be possible to determine the areas which require sound insulation upgrades.

The exact constructions of the wall and roof elements are unknown and so are based on their most likely construction, given the age and type of the building, and those that could be observed on site. It is recommended that the client investigates the building construction further as to ascertain the exact construction of the wall and roof materials. This will enable accurate recommendations for the necessary build ups of sound insulation improvements.

The wall is likely to be of 215mm plastered brick construction, based on what was observable on site, and the likely building age. The flat roof is likely of timber-joist construction, with asphalt on boarding above, and plasterboard ceiling finish. It is possible that there is a layer of mineral wool insulation within the cavity as is typical of this construction type. Again, however, the exact construction should be ascertained by the client.

The windows and doors are all wooden framed with single glazing. It is noted that most of the window frames have gaps around them and so do not form a perfect seal with the outer frame. This could lead to further leakage of sound from the venue, which will be accounted for in the calculations with an approximately additional 3 dB correction. The skylight within the roof is assumed to have similar acoustic performance given its type and thickness.

The sound reduction index of each element is provided below, based on known SRI data for these assumed construction types.

	Octave Band Frequency						
Element Type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
215mm plastered brick	39	41	44	48	55	55	55
Timber-joist roof, asphalt on board, 12mm p/b, 100m/w insulation	20	22	37	43	49	57	57
6mm single glazing, window and door	13	20	24	31	35	27	36

Table 5.1: Acoustic Performance of Façade Elements,

5.2 Calculation of Noise Breakout with Existing Constructions

The calculation of noise breakout from the venue is provided below. In order to determine potential sound insulation upgrades, each façade is firstly calculated separately. The noise level from the live music source penetrating through the relevant façade element and the resulting noise level at the façade is shown. Finally, the total noise level at the receptor façade through each venue façade, is shown at the bottom of table 5.2. Where appropriate, screening, directivity and leakage is accounted for. Full calculations are provided in Appendix A.

	Octave Band Frequency (dB)							
Noise type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Internal live music noise level	89.3	91.7	91.9	90	91.6	85.2	83.6	94.5
Façade of venue	Noise level through façade							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Roof façade, including skylight	58.0	59.2	46.6	39.5	35.6	32.4	23.1	45.8
West façade, including door to terrace	69.3	65.7	62.9	55.1	52.6	54.2	43.7	60.4
North façade, masonry and windows	47.4	42.0	38.3	30.9	26.0	24.2	12.2	34.5
East façade, masonry only	25.5	23.9	20.1	14.2	6.8	-2.6	-6.2	16.0
South façade, masonry only	35.6	36.0	33.2	27.3	21.9	15.5	13.9	29.4
Total noise level at receptor façade	69.6	66.6	63.1	55.2	52.7	54.2	43.7	60.5

Table 5.2 Noise breakout calculation (existing constructions)

The resulting calculation of the noise level at the receptor façade is similar to that of the measured noise levels from the noise monitoring survey in section 3.

Typically, the sound reduction of the masonry portion of the facade is much higher than that of the glazing and/or roof provision, therefore noise penetration through the masonry is typically disregarded as insignificant compared to noise penetration through the glazing and roof provision.

Through these indicative calculations based on the assumption of current constructions, it can be seen in table 5.2 that the majority of the noise from the venue breaks out from the roof façade (45.8 dB L_{Aeq}, 58 dB L_{eq} at 63 Hz, and 59.2 dB L_{eq} at 125 Hz) and the western façade of the venue – i.e. where the door that opens out onto the terrace is located (60.4 dB L_{Aeq}, 69.3 dB L_{eq} at 63 Hz, and 65.7 dB L_{eq} at 125 Hz). It is also apparent that noise breakout through the existing windows at all façades is a likely issue.

Upgrades to these elements, as well as further mitigation to the door and terrace areas, will improve the noise level at the receptor façade in line with that typical of noise levels during a time when there is no live music event on, and are detailed in the sections below.

5.3 Mitigation Methods

It is proposed that the following mitigation methods be employed to reduce noise breakout from the venue to acceptable levels. This will involve:

1. Creating a lobbied area between the main venue and the terrace area. This will minimise noise breakout from when the terrace door is opened by patrons using the outside terrace area.
2. Upgrade the existing door to the terrace area which is easily closed and well-sealed when done so.
3. Upgrade existing windows to a higher acoustically performing provision. This could be done by installing secondary glazing over the existing glazing (where possible), or installing new double or triple glazing windows that meet the specified acoustic performance (detailed below). If using secondary glazing, it should be ensured that any existing gaps in the original frames are made good so that there is a tight seal between the window and outer frame.
4. Upgrade the roof to ensure that it performs to the acoustic specification below (see section 5.3.4 below).
5. Create a covered area over the terrace so that the nearest receptor does not have a direct line of sight this terrace area. This will reduce the noise levels arising from patrons talking when on the terrace.

5.3.1 Lobbied Area

A lobbied area could be built around the existing door as shown in red in the diagram below (figure 5.3, two options shown). This would reduce noise breakout to the external area when patrons exit to the terrace.

Figure 5.3 Potential lobbied areas, shown in red

The door to the lobbied area should have a surface mass of at least 25kg/m^2, be well-sealed around the edges where it meets the frame, and have a self-closing mechanism attached. The typical SRI of this door type is provided below in table 5.6 which should be met when selecting a suitable door. Any timber stud wall partitions around the lobbied area should also achieve the following SRI in table 5.4. Most typical insulated timber stud walls should achieve this e.g. one layer of Gyproc SoundBloc 15mm each side of 75 x 38mm timber stud (CLS) at 600mm centres; 75mm Isover Acoustic Partition Roll (APR 1200) in the cavity.

	Octave Band Frequency						
Element Type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
25kg/m^2 well-sealed door	16	20	25	27	28	32	32
Timber stud wall partition	20	24	34	40	45	49	49

Table 5.4: Acoustic Performance of lobbied area partitions

5.3.2 Upgrade Existing Door to External

The upgraded door to the terrace area should meet the same requirements as detailed above and in table 5.4 – the door should have a surface mass of at least 25kg/m^2, be well-sealed around the edges, where it meets the frame, and have a self-closing mechanism attached.

5.3.3 Upgrade Window Specification

Windows should achieve the below acoustic specification to meet the predicted noise level reduction. The specification is based on a secondary glazing system with 6mm original sash window/glazing, 100mm cavity, and an additional 6mm acoustically treated glazing panel.

Where a secondary glazing system is not possible to install, similar performing replacement windows may be used.

Where there are gaps between the original window frames and outer frames, these should be repaired so that the original windows are well sealed in their original frames when closed.

The skylight within the roof should also achieve the same specification as below which may also be done by using a secondary glazing system if desired.

	Octave Band Frequency						
Element Type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Secondary glazing system (6mm/100mm/6mm)	25	28	30	38	45	45	45

Table 5.5: Acoustic Performance of new window provisions

5.3.4 Upgrade Roof Specification

The acoustic specification of the roof should meet following SRI in table 5.6 to achieve suitable noise level reduction.

As mentioned, the current construction of the roof should be ascertained so that suitable upgrade types can be specified, and prior to the conducting of any work. The below specification is seen to be achievable based on the assumed construction. This may be achieved by installing a suspended ceiling to the original construction, lining with suitable sound absorbent material, and finishing with two layers of 12.5mm Gyproc Soundbloc and plaster or similar.

	Octave Band Frequency						
Element Type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Upgraded roof	35	39	40	49	53	57	57

Table 5.6: Acoustic Performance of upgraded roof

5.3.5 Covered Terrace Area

Use of the terrace area is determined to cause noise levels of around 75 dB(A) at the receptor façade when it is at full capacity. This is due to the noise from patrons congregating and talking, combined with music noise that breaks out through the terrace door opening.

It is recommended that mitigation be employed so that the noise level from this source is reduced.

This can be achieved by creating a covered terrace area which would cut off the direct line of sight between the receptor façade and terrace area, as demonstrated in the figures below.

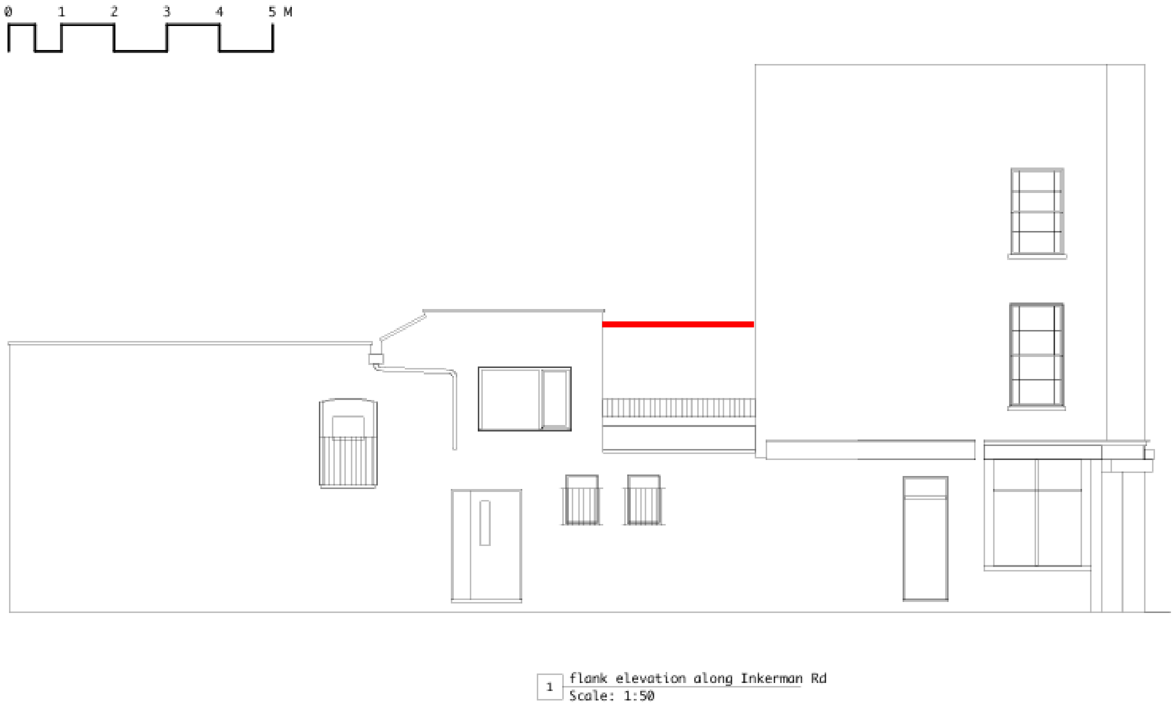


Figure 5.7: Covering of terrace area (red)

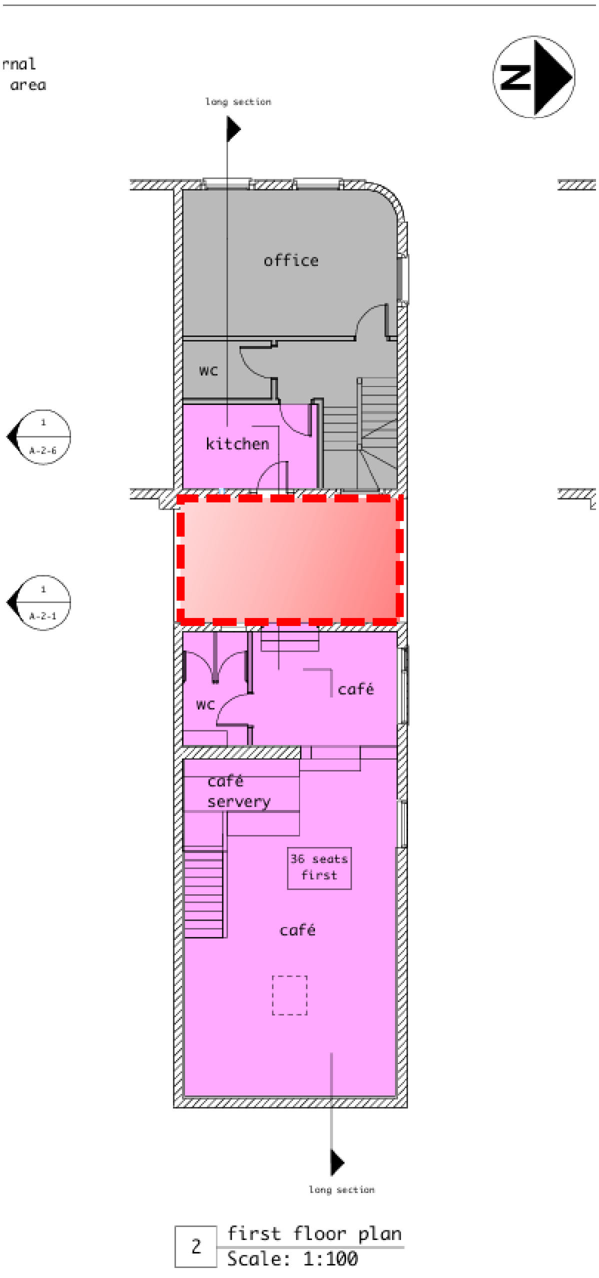


Figure 5.7: Covering of terrace area (red)

The structure should have a surface mass of at least 15 kg/m^2, where all joins between panels are well sealed, including at the base threshold. A suitable construction would comprise a close boarded timber structure, for example solid acoustic fencing or similar, which should extend to the ground along the south boundary of the terrace and cover the entirety of the terrace area.

The inner face of the structure should be lined with an acoustically absorbent material with a minimum thickness of 25mm.

This will likely reduce noise level by at least 10 dB at the nearest receptor façade from patron noise, due to the removal of direct line of sight between the noise source and receptor.

5.4 Calculation of Noise Breakout with Mitigation

The calculation of noise breakout of live music from the venue with the suggested mitigation in section 5.3 is provided below. The noise level from the live music source penetrating through the each venue façade element and the resulting noise level at the nearest receptor façade is shown. The combined total noise level at the nearest receptor façade from each venue façade, is shown at the bottom of table 5.7. Where appropriate, screening and directivity is accounted for. Full calculations can be seen in Appendix A.

	Octave Band Frequency (dB)							
Noise type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Internal live music noise level	89.3	91.7	91.9	90	91.6	85.2	83.6	94.5
Façade of venue	Noise level through façade							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Roof façade, including skylight	43.4	42.9	43.0	33.2	30.4	20.7	19.1	37.5
East façade, including door to terrace	41.9	39.4	33.0	30.6	31.1	35.0	35.0	39.5
North façade, masonry and windows	37.0	35.7	33.6	26.5	19.1	9.7	6.1	28.6
West façade, masonry only	25.5	23.9	20.1	14.2	6.8	-2.6	-6.2	16.0
South façade, masonry only	35.6	36.0	33.2	27.3	21.9	15.5	13.9	29.4
Total noise level at receptor façade	46.7	45.6	44.2	36.3	34.2	35.2	35.1	42.1

Table 5.7 Noise breakout calculation (with mitigation)

5.5 Noise Impact with Mitigation and Further Context

The total noise level from the noise breakout of the venue at the nearest and worst affected receptor, 44 Grafton Road, is provided at the bottom of table 5.7.

The music noise level from the venue is predicted to be 42.1 dB $L_{Aeq,15min}$ during typical operation of a live music event. In each octave band, the noise level is predicted to be less than the typical daytime noise level at the receptor façade. For context, this is shown in table 5.8 below.

This is an indication that the noise impact of live music at the receptor façade will be low when the mitigation is accounted for.

	Octave Band Frequency (dB)							
Measurement	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Receptor, daytime (13:30-17:30) (no live music event)	58.7	50.7	49.0	50.1	51.3	46.4	38.4	54.2
Total noise level at receptor façade from venue w/ mitigation	46.7	45.6	44.2	36.3	34.2	35.2	35.1	42.1

Table 5.8 Noise levels with mitigation at receptor façade

For further context, an indicative noise break in calculation to inside the nearest residential receptor has been undertaken to understand noise intrusion levels at the lowest frequency range (63Hz and 125Hz).

The calculation is based solely on the predicted live music noise level at the façade, and this noise level entering a typical residential bedroom (with assumed room volume of 12m^2, a reverberation time of 0,5 seconds, and typical façade constructions for this area (215mm plastered brick, typical tile/slate roof, and 6mm single glazing sash window)).

The predicted internal noise level at the nearest receptor room is provided in table 5.9 below.

	Octave Band Frequency (dB)							
Measurement	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dB(A)
Noise level at façade from live music	58.7	50.7	49.0	50.1	51.3	46.4	38.4	54.2
Internal noise level inside dwelling from live music	35.8	28.4	23.0	10.1	5.9	5.8	8.7	18.9

Table 5.9 Indicative internal noise level at nearest receptor room

Indicative calculations show that the noise level from live music is likely to be considered "inaudible" inside the nearest receptor room over a typical averaged 15 minute period, as it is seen to comply with the noise rating curve of NR15 (see section 2.3 of this report for further information). Note that this is only an indicative calculation based on the presumed parameters of the receptor room as described above. This, however, is a positive indication that the live music noise presents a low risk to internal noise levels of the nearest noise sensitive receptor once mitigation is accounted for.

	Octave Band Frequency (dB)						
Noise Rating	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
NR15	47	35	26	19	15	12	9

Table 5.10 NR15 noise curve

6.0 Noise Management Plan

In addition to the suggested mitigation measures in section 5, a Noise Management Plan could be developed so that unnecessary noise impact is avoided during live music events. Suggestions that could form part of this plan are provided below. It is noted that the venue already practises many of these strategies. However, it is recommended that they could form a formal part of the application, where applicable or appropriate in order to help manage noise levels during live music events.

6.1 Premises Management Responsibility

Nominate a Designated Premises Supervisor (DPS), who will have the responsibility for ensuring that noise nuisances and hazards arising from the premises are minimised.

6.2 Management Control Measures

The following range of management control methods will be implemented at the premises, including but not limited to:

1. Site staff will be made aware that they are working in the vicinity of noise-sensitive receptors and avoid all unnecessary noise due to elevated music levels, opening of doors/windows or excessive noise from patrons. The DPS will be required to implement strict staff rules to ensure that the staff immediately respond to unnecessary elevated noise levels beyond what is typically expected for a live music event.
2. Staff training will involve reviewing the Noise Management Plan.
3. All operational staff will be responsible for reporting any noise problems immediately to the DPS.
4. Shouting will be discouraged at all times in the external patron area. Any patrons found to be violating this will be moved inside the venue.

6.3 Issue Management and Complaints Log

An Issue Management System (IMS) will be implemented and completed by the DPS. This will include records of subjective noise monitoring and complaints. Further to this, a complaints procedure will be implemented which will allow for all complaints, feedback and requests made by third parties regarding the premises operational activities to be dealt with effectively.

An email address for the premises will be made available online to allow any member of the public to lodge a complaint without entering the premises. The DPS will be specifically assigned to deal with complaints.

All complaints received from third parties including statutory authorities, statutory consultees, members of the general public and representatives of the company will be forward to the DPS to action as below within 1-hour (where feasible). The complaint will be noted in the complaints log within 24-hours.

The operations manager will ensure that:

1. The complaint is investigated to identify the cause, if necessary, this may involve direct communication with the complainant.
2. In the event of elevated noise being detected, action will be taken immediately to prevent a recurrence of the same problem. These actions must be documented.
3. The complainant will be contacted and given information on the investigations conducted and actions taken as appropriate.
4. Details of other complaints are sent to other company personnel as appropriate.

6.4 External Noise Sources

The following external activities will be strictly prohibited:

1. Outside performances: any form of musical performance activities that take place outside or on the terrace area.

2. Fireworks: the use of fireworks or any other pyrotechnic devices

6.5 Deliveries to Site

Noise from deliveries can present a significant risk of noise impact. In order to reduce the potential for impact, deliveries should take place during typical working hours, e.g. 09:00 to 17:00.

6.6 Dispersal of Patrons

Staff will actively encourage the gradual dispersal of patrons to minimise potential nuisance at closing time. All external patrons shall be asked to relocate inside at 22:45 hours to limit external patron noise emissions in the late evening period prior to closure.

A member of staff will be positioned in an area close to the main exit to oversee the end of night departure period to ensure that:

1. Patrons are encouraged to be considerate upon leaving the premises.
2. Patrons do not leave the premises other than by the doors and exits they are guided towards.

Further to this, prominent, clear, and legible notices will be displayed at the exits requesting the public to respect residents and to leave the premises and the area quietly.

6.7 Subjective Noise Monitoring by Staff

All staff will, as part of their induction, be made aware of the surrounding receptors and the effects of noise on residential amenity. It is the responsibility of all staff to be aware of noise on site and to report any potential noise issues to the premises manager at the earliest opportunity. All staff will have refresher training on noise issues, prevention, and managements at yearly intervals.

The Noise Management Plan will be reviewed annually or as agreed appropriate to ensure it is streamlined and effective. New and innovative approaches to problem-solving or incidents and any lessons learnt will be incorporated accordingly.

7.0 Conclusion

7.1 Summary of Assessment

Clear Acoustic Design has been appointed to conduct a noise assessment for MAP Studio Cafe at 46 Grafton Road, London, NW5 3DU.

A noise impact assessment has been requested in support of the planning application in order to safeguard the amenity of the surrounding noise sensitive receptors from the live music noise source.

The report has responded to the initial aims of the assessment by:

1. Understanding the noise levels on site from the live music noise source and how this may break through the existing façade elements of the venue.
2. Understanding the impact of music noise from the venue at the nearest noise sensitive receptor(s) through the venue façade elements.
3. Provided mitigation to control of noise break-out from the venue, to ensure that the nearest noise sensitive receptors are not adversely impacted by noise from the venue during live music events.

7.2 Summary of Mitigation

The mitigation advised is as follows:

1. Creating a lobbied area between the main venue and the terrace area. This will minimise noise breakout from when the terrace door is opened by patrons using the outside terrace area.
2. Upgrade the existing door to the terrace area which is easily closed and well-sealed when done so.

3. Upgrade existing windows to a higher acoustically performing provision. This could be done by installing secondary glazing over the existing glazing (if possible) or installing new double or triple glazing windows that meet the specified acoustic performance in section 5. If using secondary glazing, it should be ensured that any existing gaps in the original frames are made good so that there is a tight seal between the window and outer frame.
4. Upgrade the roof to ensure that it performs to the required acoustic specification as provided in section 5.3.4.
5. Create a covered area over the terrace so that the nearest receptor does not have a line of sight this outside area. This will reduce the noise levels arising from patrons talking when on the terrace by at least 10 dB at the receptor facade.

7.3 Summary of Noise Impact with Mitigation

Indicative calculations show that the noise level from the live music is likely to be considered "inaudible" inside the nearest receptor room over a typical averaged 15 minute period, as it is seen to comply with the noise rating curve of NR15. This is typically deemed an acceptable outcome.

Note that this is only an indicative calculation based on the presumed parameters of the receptor room as described above. This, however, is a positive indication that the live music noise presents a low risk to internal noise levels of the nearest noise sensitive receptor.

Appendix A – Calculations

Existing likely noise breakout calculations:

Noise Break-Out Calculation From Roof		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	17.5 m2								
Distance to reciever	8 m2								
Screening Losses		0	0	0	0	0	0	0	
FAÇADE Elements									
Façade Area	**56.0 m2**								
Roof	55 m2	20	22	37	43	49	57	57	
Flat timber-joist roof, asphalt on boarding, 12mm p/bd ceiling, 100mm m/w		57.7	58.1	43.3	35.4	31.0	16.6	15.0	43.3
Window	1 m2	13	20	24	31	35	27	36	
Single 6mm to use			-1	-2	-3	-3	-3	-3	
		47.2	42.6	38.8	29.9	27.5	29.1	18.5	35.7
Combined Noise Levels - dBA		**58.0**	**59.2**	**46.6**	**39.5**	**35.6**	**32.4**	**23.1**	**45.9**

Noise Break-Out Calculation From West Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	4								
10*log(S)	10.4 m2								
Distance to reciever	2 m2								
Screening Losses		0	0	0	0	0	0	0	
FAÇADE Elements									
Façade Area	**11.0 m2**								
Wall	6 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level through solid façade		44.1	44.5	41.7	35.8	30.4	24.0	22.4	37.9
Window	5 m2	13	20	24	31	35	27	36	
Single 6mm to use			-1	-2	-3	-3	-3	-3	
Predicted noise level in building from glazing		69.3	64.7	60.9	52.0	49.6	51.2	40.6	57.8
Combined Noise Levels - dBA		**69.3**	**65.7**	**62.9**	**55.1**	**52.6**	**54.2**	**43.7**	**60.4**

Noise Break-Out Calculation From North Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	14.3 m2								
Distance to reciever	9 m2								
Screening Losses		2	4	5	5	7	10	12	
FAÇADE Elements									
Façade Area	**27.0 m2**								
Wall	25 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level through solid façade		32.2	30.6	26.8	20.9	13.5	4.1	0.5	22.6
Window	2 m2	13	20	24	31	35	27	36	
Single 6mm to use			-1	-2	-3	-3	-3	-3	
Predicted noise level in building from glazing		47.2	40.6	35.8	26.9	22.5	21.1	8.5	31.5
Combined Noise Levels - dBA		**47.4**	**42.0**	**38.3**	**30.9**	**26.0**	**24.2**	**12.2**	**34.5**

Noise Break-Out Calculation From East Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	11.1 m2								
Distance to reciever	14 m2								
Screening Losses		2	4	5	5	7	10	12	
FAÇADE Elements									
Façade Area	**13.0 m2**								
Wall	13 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level in building from wall		25.5	23.9	20.1	14.2	6.8	-2.6	-6.2	15.9
Combined Noise Levels - dBA		**25.5**	**23.9**	**20.1**	**14.2**	**6.8**	**-2.6**	**-6.2**	**16.0**

Noise Break-Out Calculation From South Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	14.3 m2								
Distance to reciever	8 m2								
Screening Losses		0	0	0	0	0	0	0	
FAÇADE Elements									
Façade Area	**27.0 m2**								
Wall	27 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level through solid façade		35.6	36.0	33.2	27.3	21.9	15.5	13.9	29.4
Predicted noise level in building from glazing									
Combined Noise Levels - dBA		**35.6**	**36.0**	**33.2**	**27.3**	**21.9**	**15.5**	**13.9**	**29.4**

Existing likely noise breakout with mitigation calculations:

Noise Break-Out Calculation From Roof		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	17.5 m2								
Distance to reciever	8 m2								
Screening Losses		0	0	0	0	0	0	0	
FAÇADE Elements									
Façade Area	**56.0 m2**								
Roof	55 m2	35	39	40	49	53	57	57	
Flat 100m concrete		42.7	41.1	40.3	29.4	27.0	16.6	15.0	34.4
Window	1 m2	25	28	30	38	45	45	45	
Double windows 6/100/6			-1	-2	-3	-3	-3	-3	
		35.2	34.6	32.8	22.9	17.5	11.1	9.5	27.1
Combined Noise Levels - dBA		**43.4**	**42.9**	**43.0**	**33.2**	**30.4**	**20.7**	**19.1**	**37.5**

Noise Break-Out Calculation From West Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. lobbied area		80.0	79.2	72.8	68.3	68.7	58.3	56.7	72.3
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	4								
10*log(S)	10.4 m2								
Distance to reciever	2 m2								
Screening Losses		0	0	0	0	0	0	0	
FAÇADE Elements									
Façade Area	**11.0 m2**								
Wall	6 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level through solid façade		34.8	32.0	22.6	14.1	7.5	-2.9	-4.5	19.2
Window	1 m2	25	28	30	38	45	45	45	
Double windows 6/100/6			-1	-2	-3	-3	-3	-3	
Predicted noise level in building from glazing		41.0	37.2	28.8	16.3	9.7	-0.7	-2.3	24.2
door	4 m2	16	20	25	27	28	32	32	
25kgm2 well sealed door									
Predicted noise level through solid façade		57.8	53.0	41.6	35.1	34.5	20.1	18.5	40.6
Combined Noise Levels - dBA		**41.9**	**39.4**	**33.0**	**30.6**	**31.1**	**35.0**	**35.0**	**40.3**

Noise Break-Out Calculation From North Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	14.3 m2								
Distance to reciever	9 m2								
Screening Losses		2	4	5	5	7	10	12	
FAÇADE Elements									
Façade Area	**27.0 m2**								
Wall	25 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level through solid façade		32.2	30.6	26.8	20.9	13.5	4.1	0.5	22.6
Window	2 m2	25	28	30	38	45	45	45	
Double windows 6/100/6			-1	-2	-3	-3	-3	-3	
Predicted noise level through glazing		35.2	32.6	29.8	19.9	12.5	3.1	-0.5	23.9
Combined Noise Levels - dBA		**37.0**	**35.7**	**33.6**	**26.5**	**19.1**	**9.7**	**6.1**	**28.6**

Noise Break-Out Calculation From East Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	11.1 m2								
Distance to reciever	14 m2								
Screening Losses		2	4	5	5	7	10	12	
FAÇADE Elements									
Façade Area	**13.0 m2**								
Wall	13 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level in building from glazing		25.5	23.9	20.1	14.2	6.8	-2.6	-6.2	15.9
Window	0 m2	13	20	24	31	35	27	36	
Single 6mm to use									
Predicted noise level through solid façade		-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	-99.0	0.0
Combined Noise Levels - dBA		**25.5**	**23.9**	**20.1**	**14.2**	**6.8**	**-2.6**	**-6.2**	**16.0**

Noise Break-Out Calculation From South Facade		63	125	250	500	1000	2000	4000	dB(A)
Sound Pressure Level within Room, i.e. on internal facade		89.3	91.7	91.9	90.0	91.6	85.2	83.6	94.6
3dB Safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Directivity of facade, **Q**	2								
10*log(S)	14.3 m2								
Distance to reciever	8 m2								
Screening Losses		0	0	0	0	0	0	0	
FAÇADE Elements									
Façade Area	**27.0 m2**								
Wall	27 m2	39	41	44	48	55	55	55	
Brick (215mm) plastered									
Predicted noise level in building from glazing		35.6	36.0	33.2	27.3	21.9	15.5	13.9	29.4
Combined Noise Levels - dBA		**35.6**	**36.0**	**33.2**	**27.3**	**21.9**	**15.5**	**13.9**	**29.4**

The noise level in a room due to sound penetrating a façade element may be calculated according to BS EN 12354-3 and BS 8233 from:

$$L_2 = L_{1,in} - R + 10 \times Log(S / V) + 10 \times Log(T) + 11$$

Where:

- L_2 = noise level in room due to sound through façade portion of area S and mean sound reduction index R, dB
- $L_{1,\,in}$ = external free-field noise level at the position of the façade, dB
- R = sound reduction index of portion, dB
- S = area of façade portion, m^2
- V = room volume, m^3
- T = reverberation time, s

For small façade components, such as ventilators, the noise level in a room may be calculated according to the same standards as above from:

$$L_2 = L_{1,in} - D_{n,e} - 10 \times Log(V) + 10 \times Log(T) + 21$$

Where:

- Dn,e = element-normalised sound level difference of the ventilator.

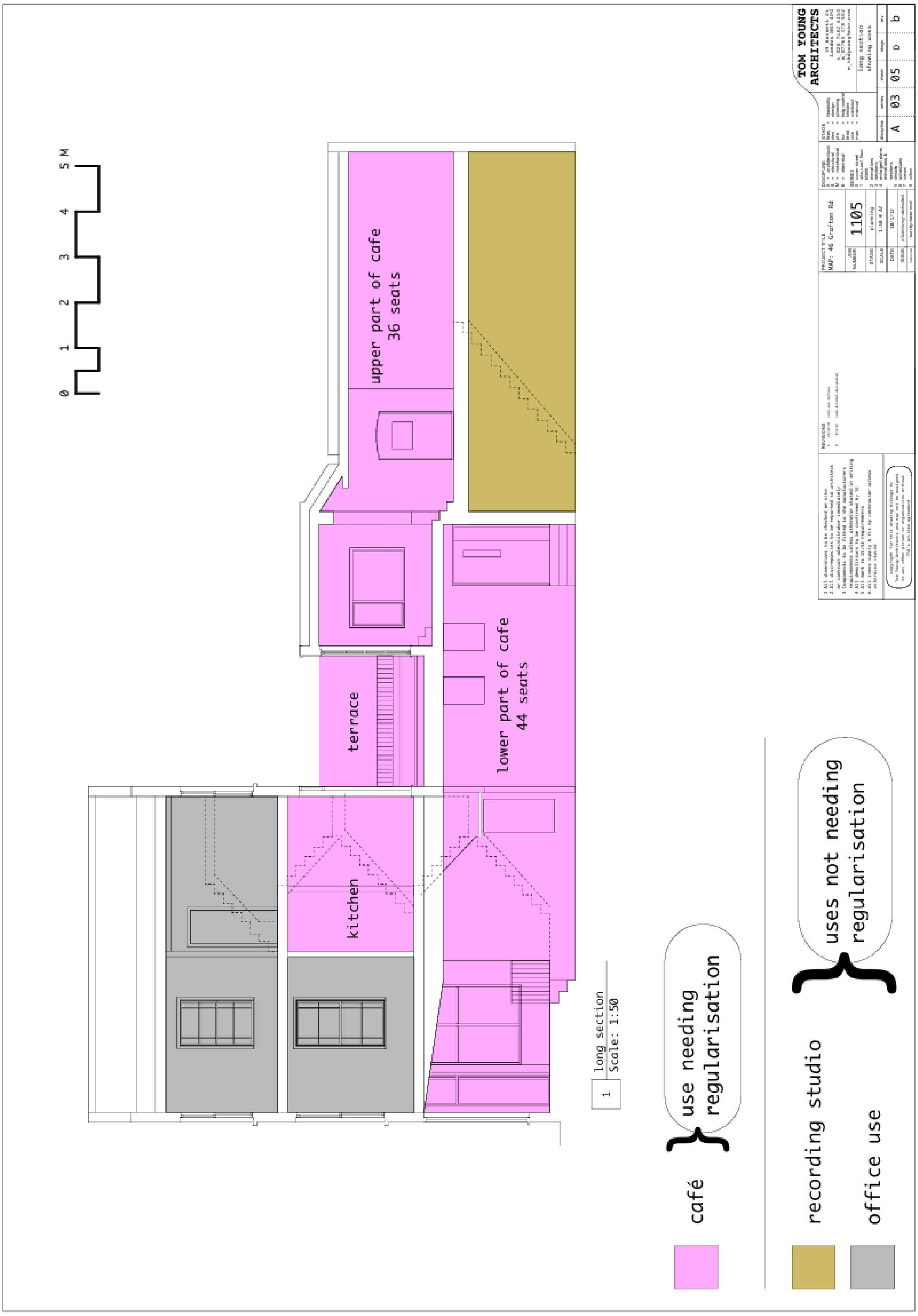
(Other components have the same meaning as above).

The sound reduction of the masonry portion of the facade is much higher than that of the glazing and ventilation provision, therefore noise penetration through the masonry is typically disregarded as insignificant compared to noise penetration through the glazing and ventilation provision. The noise penetration through the vents and the glazing is calculated as above and then combined in each frequency band to give an overall internal level from the external sources by these routes.

Likely noise level in nearest residential receptor room calculations:

BS8233 Noise Break-in Calculation		63	125	250	500	1000	2000	4000	dB(A)
Noise Level at Façade		46.7	45.6	44.2	36.3	34.2	35.2	35.1	43
add safety	3 dB	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Facade Corrections	Lff	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Volume of room	12 m3								
Reverberation Time in room	0.5 s	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
A = Total absorption is Sabines		3.9	3.9	3.9	3.9	3.9	3.9	3.9	
10*log(S/A)		6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Facade Details									
Total Façade Area	**18.0 m2**								
Brick (215mm) plastered	8 m2	39	41	44	48	55	55	55	
External Wall									
Noise ingress through element		**13.9**	**10.8**	**6.4**	**-5.5**	**-14.6**	**-13.6**	**-13.7**	0.9
Single - 4mm	2 m2	13	20	22	28	32	33	28	
Glazing									
Noise ingress through element		**33.8**	**25.7**	**22.3**	**8.4**	**2.3**	**2.3**	**7.2**	17.2
Tiled/slated roof, 25mm p/bd ceiling, 100mm m/w	8 m2	23	27	37	43	48	52	52	
Roof									
Noise ingress through element		**29.9**	**24.8**	**13.4**	**-0.5**	**-7.6**	**-10.6**	**-10.7**	11.3
		63	125	250	500	1000	2000	4000	dB(A)
Total Noise Level in Room		**35.8**	**28.4**	**23.0**	**10.1**	**5.9**	**5.8**	**8.7**	18.9

Appendix B – Plans



café } use needing regularisation

recording studio
office use } uses not needing regularisation

AREAS		
CAFE	OFFICE	STUDIO
149.7 sqm	64.3 sqm	34.5 sqm

1 All dimensions to be checked on site
2 All discrepancies to be reported to architect or contract administrator immediately
3 Components to be fitted to the manufacturers requirements unless otherwise stated in writing
4 All demolitions to be confirmed by SE
5 All work to DS/SE requirements
6 All items supply & fit by contractor unless otherwise stated

REVISIONS
1 22/11/11 cafe terrace
2 9/1/12 seating, kitchen changes sought by planner

PROJECT TITLE
MAP: 46 Grafton Rd

JOB NUMBER	1105
STAGE	planning
SCALE	1:100 @ A3
DATE	18/1/12
ISSUE	planning-amended
CAD FILE	survey-base.mod

DISCIPLINE
A = architectural
S = structural
M = mechanical
E = electrical

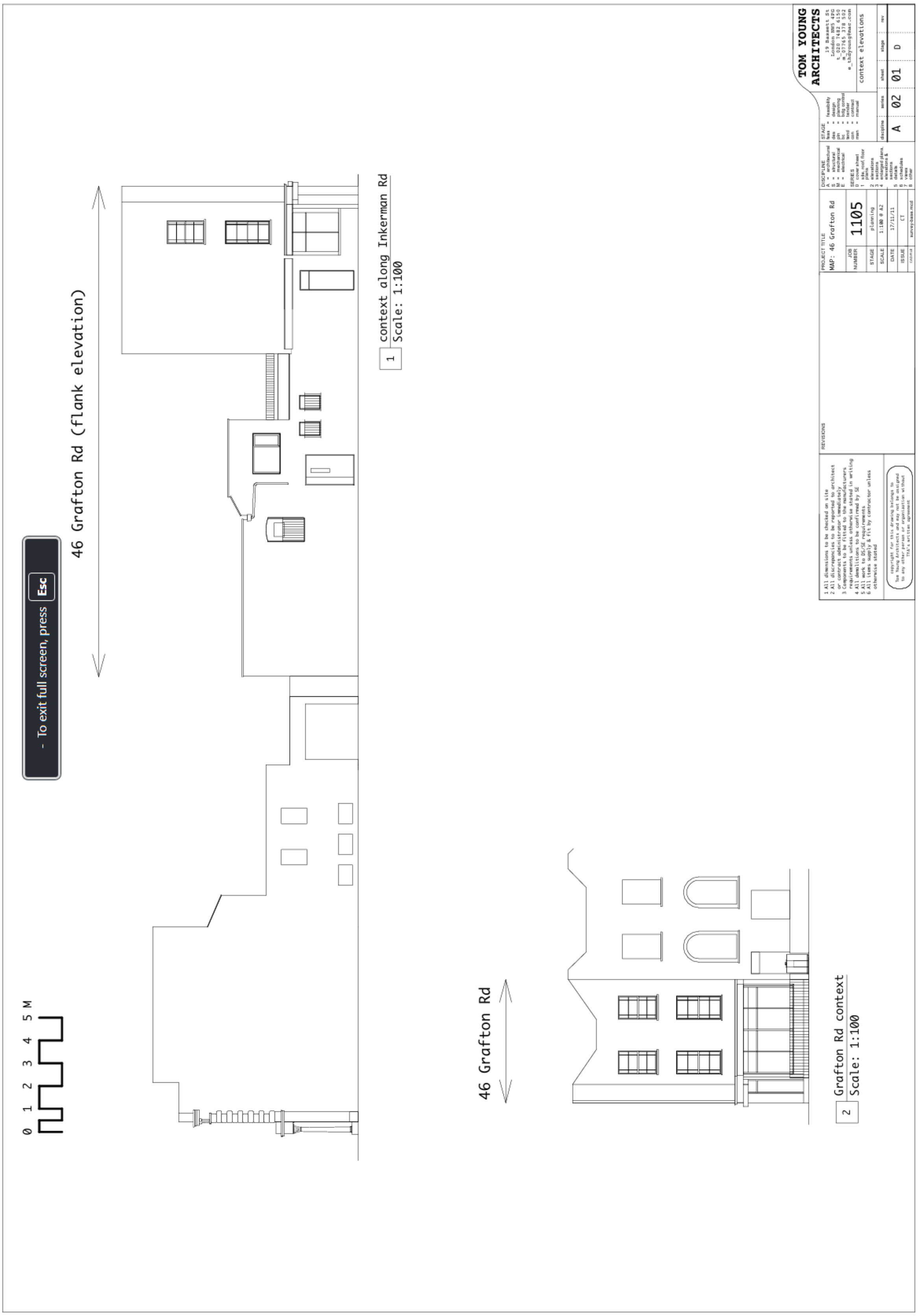
SERIES
0 cover sheet
1 site, roof, floor plans
2 elevations
3 sections
4 enlarged plans, elevations & sections
5 details
6 schedules
7 views
8 other

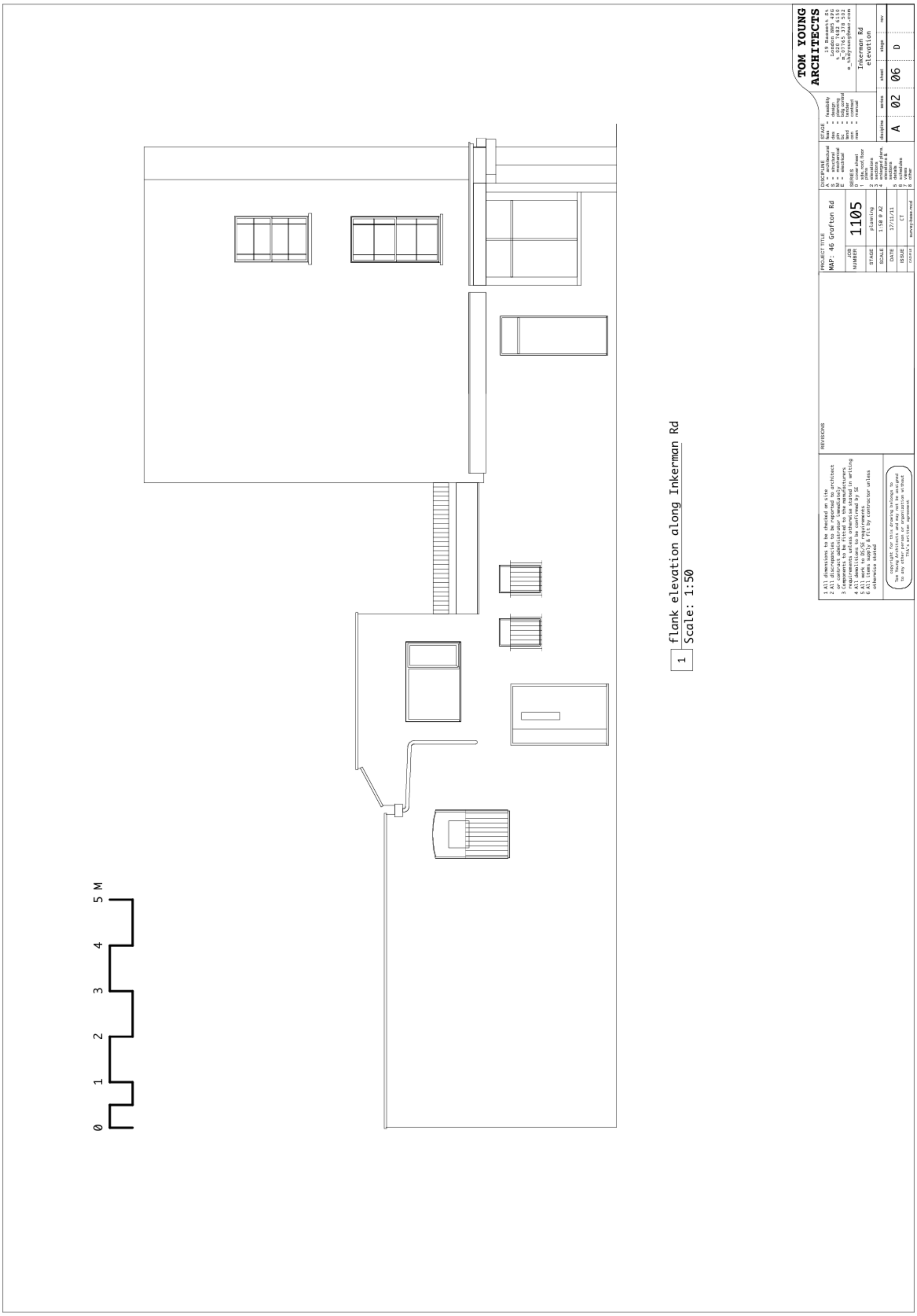
STAGE
feas = feasibility
des = design
pln = planning
bc = bdg control
tend = tender
con = contract
man = manual

TOM YOUNG ARCHITECTS
19 Bassett St
London NW5 4PG
t_020 7482 6150
m_07765 378 502
e_thdyoung@mac.com

existing plans showing uses

discipline	series	sheet	stage	rev
A	01	02	D	b


46 Grafton Rd (flank elevation)
1 context along Inkerman Rd
Scale: 1:100
46 Grafton Rd
2 Grafton Rd context
Scale: 1:100
0 1 2 3 4 5 M
TOM YOUNG ARCHITECTS
MAP: 46 Grafton Rd
1105
context elevations
A 02 01 D
- To exit full screen, press Esc


TOM YOUNG ARCHITECTS
19 Bassett St
London NW5 4PG
t_020 7482 6150
m_07765 378 502
e_thdyoung@mac.com
Inkerman Rd elevation
PROJECT TITLE
MAP: 46 Grafton Rd
JOB NUMBER 1105
STAGE planning
SCALE 1:50 @ A2
DATE 17/11/11
ISSUE CT
discipline A
series 02
sheet 06
stage D
rev
DISCIPLINE
A = architectural
S = structural
M = mechanical
E = electrical
SERIES
0 cover sheet
1 site, roof, floor plans
2 elevations
3 sections
4 enlarged plans, elevations & sections
5 details
6 schedules
7 views
8 other
STAGE
feas = feasibility
des = design
pln = planning
bc = bdg control
tend = tender
con = contract
man = manual
REVISIONS
1 flank elevation along Inkerman Rd
Scale: 1:50
0 1 2 3 4 5 M

Appendix C – Glossary

dB(A)

A frequency filtering system which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed as dB(A), has been shown to correlate with a human's subjective response to noise.

Decibel (dB)

A relative unit for the measurement of sound. The dB is a logarithmic ratio between the measured level and a reference (threshold) level of 0dB.

D level difference

The difference in sound levels in two spaces separated by a partition, measured as part of a sound insulation test according to BS EN ISO 140.

Dne

Standardised level difference values for small elements (e.g. ventilators).

Hertz (Hz)

The frequency (or pitch) of a sound. 1 Hz = 1 cycle per second, 1 kHz = 1000 Hz, 2 kHz = 2000 Hz, etc.

$L_{Aeq, T}$

The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period. $L_{Aeq,16hour}$ (07:00 to 23:00 hours) and $L_{Aeq,8hour}$ (23:00 to 07:00 hours) are used to qualify daytime and night-time noise levels respectively.

L_{AFmax}

The highest, A-weighted instantaneous sound level recorded during the measurement period. The subscript 'F' denotes fast time weighting.

L_{A90}

The A-weighted sound level which is exceed for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1 hour measurement – used as a measure of the background noise level.

R_w

Weighted Sound Reduction Index (R_w) is a single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.

Sound Pressure Level (L_p)

A logarithmic measure of the effective pressure of a sound relative to a reference value, defined in dB (decibel). Sound pressure is the local deviation from the ambient air pressure caused by a sound wave. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = RMS sound pressure in Pa; and p_0 = reference sound pressure (20 μPa).