Date: 26th May 2022

Ref: 22123/001/js/a

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ST. MARY'S PLACE GARAGES

RICHMOND, TW9

ASSESSMENT OF NOISE

FROM NEARBY PUBLIC HOUSE GARDEN ACTIVITY

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1.0 Introduction

1.1 There is a proposal to demolish a row of lockup garages to the rear of 20 to 34 St. Mary's Grove, Richmond, TW9 and build in their place a terraced row of five one-bedroom properties. No 20 St Mary's Grove is a public house (The Mitre) which has a garden used by patrons.

1.2 It is understood that there are concerns with respect of possible noise disturbance from the use of the pub garden to future occupants of the new properties. As a consequence it was determined that a noise assessment should be undertaken to highlight if there are likely to be issues. This assessment has considered the levels of noise likely to arise from the use of the pub garden and related these noise levels to nationally accepted criteria.

1.2 This report sets out basis of the noise assessment, the source noise level data and a comparison of the calculated noise levels at the proposed new properties to the suggested noise criteria. Where necessary, mitigation measures are discussed, and a conclusion reached as to the likelihood that the proposed use would be acceptable.

2.0 Site Description

2.1 The development site lies to the west of St. Mary's Grove, enclosed by the rear gardens of St. Mary's Grove to the east, Townshend Terrace to the north, Townshend Road to the west and the Church Estate Almshouses to the south. The site is accessed from St. Mary's Grove through a gap between 20 St. Mary's Grove (The Mitre) and 18 St. Mary's Grove.

2.2 A site location plan is attached as Figure 1, with the site layout show as Figure 2.

3.0 Noise Criterion

3.1 The National Planning Policy Framework (NPPF) document published in 2012 revoked the previously used planning and noise guidance set out in the planning policy document PPG 24. However, NPPF sets out that "*the policies in the Local Plan (and the London Plan) should not be considered out-of-date simply because they were adopted prior to the publication of this Framework*". Existing Local Plan policies were based on consideration of PPG24 and therefore, on the basis of the comment above, it is clear that such guidance is still extant.

3.2 The DEFRA Noise Policy Statement for England (NPSE) is referred to in the NPPF and this sets out that government policy is to "*avoid significant adverse impacts on health and quality of life*" due to noise. Reference is made in the NPSE to SOAEL or "Significant Observed Adverse Effect Level", this being "*the level above which significant adverse effects on health and quality of life occur*".

3.3 The NPSE also comments that "*It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times*".

3.4 It is clear that consideration of acceptable levels of noise cannot include "in-audibility" as the standard set out in NPSE is one which would avoid "*significant adverse impact*" i.e. some level of impact on residents due to noise is acceptable.

3.5 In the London "*Mayor's Ambient Noise Strategy*" reference is made in a footnote to the section on "*An indicative noise management hierarchy*" that "*In particular" reference should be made to "Community Noise Guidelines, World Health Organisation 2000; BS 8233; and such "limit values" as the Government may report in response to Directive 2002/49/EC*". The noise criteria given in WHO and BS8233 are based on noise levels below which there is negligible effects due to noise and consequently comply the requirements of SOAEL.

3.6 As the internal noise criteria in the WHO document and BS8233 are broadly similar, the suggested internal noise criteria in this assessment are based upon the guidance of BS8233. However, it should be noted that the noise criteria in BS8233 relate only to anonymous noise such as transport noise, with noise from non-anonymous sources being specifically excluded in the standard.

3.7 In consideration of noise from sources which are not anonymous, it is suggested that an appropriate night-time noise criterion for these sources would be an L_{Amax} noise level at least 10 dB below the BS8233 internal night-time L_{Amax} noise limit.

3.8 Setting a noise control criterion 10 dB below the BS8233 internal noise criterion should result in noise from entertainment sources being controlled, subjectively, to a level only around half as loud as the level to which transport sources are normally controlled.

3.9 On the basis of the above, the suggested internal noise criteria are as set out below:

Table 1: Internal noise level criteria (non-anonymous noise);

Assessment Period	Internal Noise Criterion
Daytime (07:00 – 23:00 hrs)	25 dB $L_{Aeq,\ 16\ hr}$
Night Time (23:00 - 07:00 hrs)	20 dB $L_{Aeq,\ 8\ hr}$ 35 dB L_{pASmax}

3.10 Given the commonly accepted15 dBA external to internal noise reduction for a window open sufficiently for ventilation, the internal noise levels given above would give rise to external noise criteria as set out below:

Table 2: External noise level criteria (non-anonymous noise);

Assessment Period	External Noise Criterion
Daytime (07:00 – 23:00 hrs)	40 dB $L_{Aeq,\ 16\ hr}$
Night Time (23:00 - 07:00 hrs)	35 dB $L_{Aeq,\ 8\ hr}$ 50 dB L_{pASmax}

3.11 **As a daytime only use (the pub garden only being used up to 23:00), the appropriate noise control criterion at the front of the proposed new properties is the external daytime criterion of 40 dB $L_{Aeq,\ 16\ hr}$.**

3.12 The roof skylights are in the bathroom of the proposed properties and consequently external noise would have to pass through the skylight and the bathroom before reaching the associated bedroom. In addition to the 15 dBA loss through the open skylight there would be a further internal noise reduction, with the bathroom door closed, estimated to be around 8 dBA.

3.13 **On this basis, as a daytime only use (the pub garden only being used up to 23:00), the appropriate noise control criterion at the roof skylight above the bathrooms of the proposed new properties is the external daytime criterion of 48 dB $L_{Aeq,\ 16\ hr}$.**

3.14 A glossary of acoustic terms is attached as an Appendix.

4.0 Source Noise Levels

4.1 The noise source from the activity on the proposed terrace is human speech and the source sound power levels for speech are as given below; (Data from Beranek)

Table 3: Assumed source noise levels, dB L_{pA}

	octave band centre frequency (Hz								
	63	125	250	500	1k	2k	4k	8k	dB A
	sound power level, dB re $2x10^{-12}$ W								
Speech (male)	58	62	67	75	80	75	64	58	82

5.0 Calculated Noise Levels and Noise Assessment

5.1 The closest and most affected property would be Plot 1 of the proposed development at about 11m from the centre of the pub garden to the closest skylight of the proposed property. To the front of the proposed property the distance would be about 16m. The direct sound transmission paths from source to both receiver locations are screened by the roof of an outbuilding within the pub garden and, in the case of the front of the proposed new properties, the new building itself.

5.2 The occluded sound transmission path is demonstrated by the perspective drawing attached as Figure 3.

5.3 The pub garden is about 60m² and, based upon the guidance given in the Building Regulations Approved Document B (ADB) Fire Safety Table D1 on page 155, the assumed occupancy density for a public house (more than 2m from the bar) is one person for every square metre. On that basis the capacity of the pub garden is 60 people and, on the basis of one person speaking for every six people listening (a mix of one-to-one conversations and one speaker in a larger group of people and allowing for natural pauses in conversation), **it has been taken that the source speech would be the equivalent of 10 people speaking continuously for the entire period of the occupancy of the garden. This would give a source noise correction of +10 dB.**

5.4 Not all of the speakers will be facing directly towards the receiver location and there will be acoustic screening of speakers provided by the crowd of people. **With the directivity of the human voice and screening provided by the crowd it has been estimated that a noise correction of -10 dB should apply to the basic speech noise levels**.

5.5 The noise criterion is a sixteen-hour equivalent noise pressure level and therefore consideration must be given to the likely period of time over the sixteen-hour period (07:00 to 23:00) that the garden would be used by as large a crowd as 60 people. The longest advertised hours of opening of The Mitre are Saturday 12:00 to 23:00.

5.6 On the basis that on a Saturday the garden could be used for most of the day this is considered as being the worst case with respect of occupancy of the pub garden.

5.7 On the basis of 60 people on the garden for the period 13:00 to 22:00 would give a use of nine hours. This time period allows for a build-up of occupancy in the first hour and for a decline in numbers over the last hour before closing. **A correction for noise from a 16 hour use to a nine hour use is -2 dB.**

5.8 It is calculated that the level of acoustic screening provided by the pub outbuilding roof to the skylight of plot 1 is about 9 dBA and this, combined with the reduction over the 11m shortest source to receiver distance, gives rise to the receiver noise levels given below:

Table 4: Calculated noise reductions to the roof skylight.

Effect	Calculated reduction
Barrier due to outbuilding (path difference 0.14m)	-9 dBA
Distance correction (10*Lg(2/(4*π*distance²)	-29 dBA
Total loss	-38 dBA
Source noise level (82-10+10-3) dB (see 5.3, 5.4 and 5.7)	80 dBA
Receiver level	42 dBA

Table 5: Calculated worst case receiver noise levels at the roof skylight.

Activity	External Noise at Skylight	Noise Criterion
Speech	42 dB $L_{Aeq,\ 16\ hr}$	48 dB $L_{Aeq,\ 16\ hr}$

5.9 It is calculated that the level of acoustic screening provided by the pub outbuilding roof to the front of plot 1 is about 28 dBA and this, combined with the reduction over the 16m shortest source to receiver distance, gives rise to the receiver noise levels given below:

Table 6: Calculated noise reductions to the front of the properties.

Effect	Calculated reduction
Barrier due to outbuilding & development (path difference 0.49m)	-28 dBA
Distance correction (10*Lg(2/(4*π*distance²)	-32 dBA
Total loss	-60 dBA
Source noise level (82-10+10-3) dB (see 5.3, 5.4 and 5.7)	80 dBA
Receiver level	20 dBA

Table 7: Calculated worst case receiver noise levels at the front of the properties.

Activity	External Noise Level at Front of Properties	Noise Criterion
Speech	20 dB $L_{Aeq, 16\ hr}$	40 dB $L_{Aeq, 16\ hr}$

5.10 The assessment locations used in this report as indicated on Figure 2: Site layout.

5.11 **As can be seen the calculated noise level for both worst case receiver locations are within the suggested noise criteria.**

6.0 Conclusion

6.1 It is concluded that the impact of noise from the use of The Mitre pub garden should be such that noise should not be a reason for refusing consent of planning permission for the proposed residential development.

Figure 1: Site location

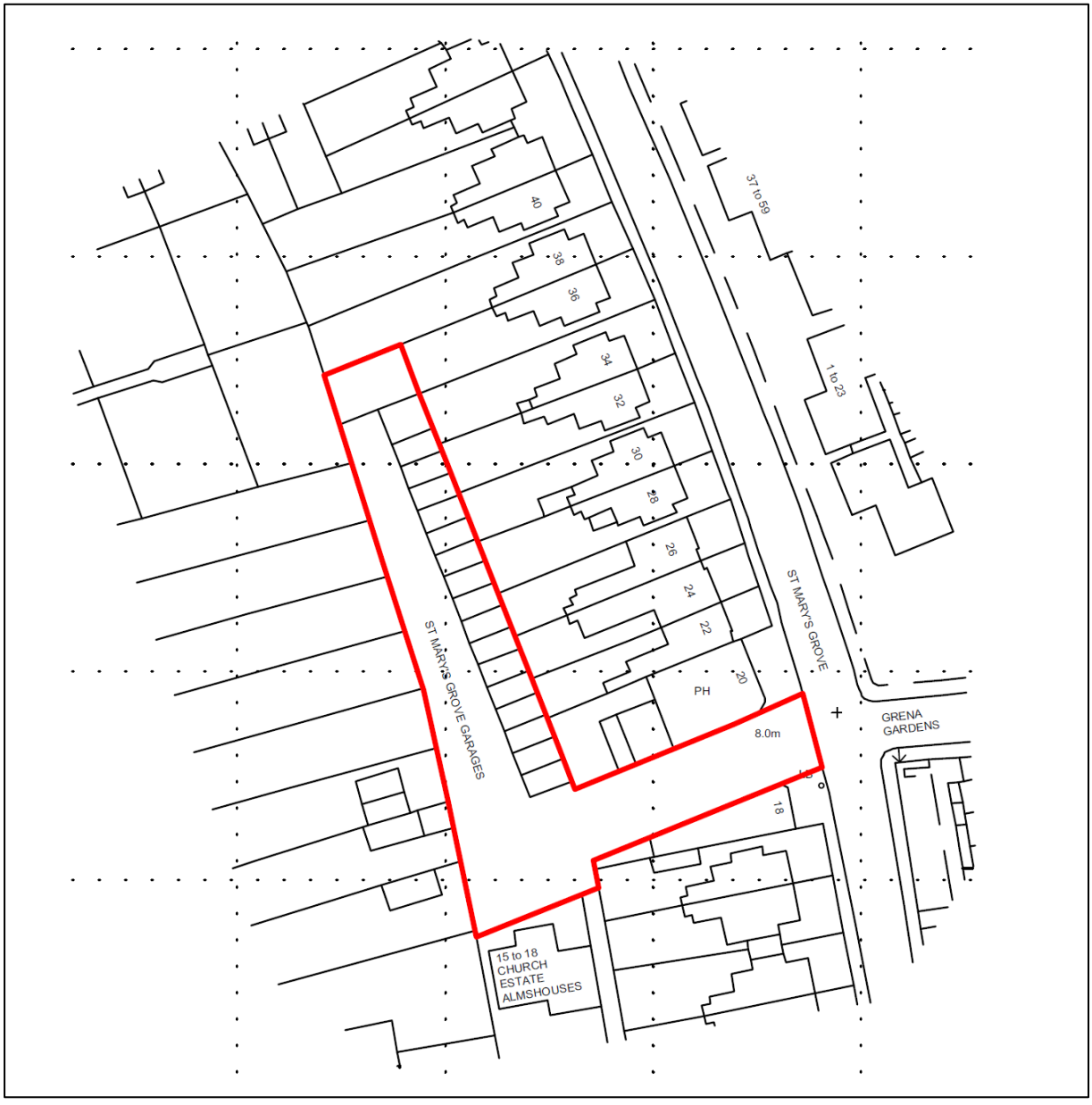

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Figure 2: Site Layout

Figure 2: Perspective Drawing Showing Pub Garden Outbuilding

Appendix: Glossary of Terms

Term	Description	Explanation
	Noise	Unwanted sound. In the explanation given below the words 'sound' and 'noise' can often be used interchangeably, depending on context.
dB	The decibel scale	The decibel (or dB) scale is the scale on which sound pressure levels are commonly measured. It is a logarithmic scale and is used for convenience to compress the audible range of sound pressures into a manageable range, from 0 dB to 140 dB. The zero of the scale, 0 dB, corresponds to the threshold of hearing, 0.00002 Pa, and the upper limit, 140 dB, corresponds to 20 Pa, the threshold of pain.
	Sound pressure	Sound is a disturbance or fluctuation in air pressure, and sound pressure, measured in pascals (Pa), is used as a measure of the magnitude of the sound. The human ear can detect sound pressures in the range from 0.00002 Pa to 20 Pa. This is an enormously wide range and so for convenience sound pressures are commonly measured on a decibel (dB) scale.
Lp	Sound pressure level	Instantaneous value of Sound Pressure Level (Lp).
A	A-weighting	One of the three frequency weightings (A, C and Z) used in sound level meters, and defined in BS EN ISO 61672-1; a very widely used method of producing a single figure measure of a broad band noise which takes into account, in an approximate way at least, the frequency response of the human hearing system. The idea is that sound levels measured in this way should give an indication of the loudness of the sound.
f	Time weighting, fast	An averaging time used in sound level meters, and defined in BS EN ISO 61672-1.
L_A (dBA)	A- weighted sound pressure level	The value of the sound pressure level, in decibels, measured using an A-weighting electronic circuit built into the sound level meter. The vast majority of noise measurements are carried out in this way.
$L_{Aeq,T}$	Equivalent continuous sound level	It represents a measure of the 'average' sound level over the measurement period. It corresponds to the steady level of sound which, over the same period of time, T, would contain the same amount of (A-weighted) sound energy as the time varying noise. Also known as the Average sound level. This is the most common method of measuring time varying noise, and within certain limits gives the best correlation with human response to noise, for example with annoyance.
$L_{Amax,T}$	Maximum sound pressure level	The instantaneous maximum sound pressure level, usually A-weighted, which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the LAeq,T value. The time weighting, F or S, must always be specified.