

66-76 GOOCH STREET NORTH, BIRMINGHAM

PROPOSED RESTAURANT AND HOT FOOD TAKEAWAY

NOISE IMPACT ASSESSMENT



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1. INTRODUCTION

Hoare Lea Acoustics has been instructed to carry out a noise impact assessment for a proposed change of use of former industrial premises to a restaurant and hot food takeaway.

This report determines the existing noise climate in the vicinity of the site and establishes limit levels for operational noise in accordance with local planning requirements. Recommendations for noise control measures are provided where appropriate in order to comply with planning requirements.

2. SITE DESCRIPTION

The development site is located at 66-76 Gooch Street North on the southern side of the City centre. The site comprises former industrial premises on two storeys with a rear courtyard area.

Gooch Street North provides a local access road for the surrounding commercial district and links with Kent Street to the north and Wrentham Street to the south. Beyond Gooch Street North to the west is an area of car parking and open derelict land with two public houses, The Fountain Inn and British Oak beyond this. The A38 Bristol Street dual carriageway lies approximately 200m to the west and is partially visible from the site.

Properties either side of the site are in commercial or industrial use and land use immediately to the rear is also in commercial and industrial use such that the site is bounded on all sides.

It is noted that the site adjoins the Chinese Quarter of the City and in addition to the surrounding commercial and industrial premises, there are also a significant number of public houses, late bars and night clubs in the vicinity.

The nearest residential properties are located above the British Oak public house approximately 25m to the south west of the site boundary across Gooch Street North. Further residential properties are located beyond the pub on Wrentham Street but are closer to the A38.

An aerial view of the site and surrounding area is shown in Figure 1 of this report.

3. DEVELOPMENT PROPOSALS

It is proposed that the existing industrial building undergo a change in use to use as a restaurant and hot food takeaway.

The development is to comprise refurbishment and conversion of the existing building to create kitchen facilities and construction of a single storey building on the rear yard area to provide restaurant seating and a lounge area. It is intended that the rear seating area will have openable glazed partitioning to external walls to provide access to the remaining yard area.

The proposed opening hours are to be midday to 02.00hrs on each day of the week. It is understood that the restaurant will also be used for occasional themed evenings with musical entertainment.

It is intended that ductwork from the kitchen extract plant be located on the rear (courtyard) façade of the existing building and terminate at roof level.

Details of the proposed building layout are given at Figure 2 of this report.

4. BASIS OF ASSESSMENT

4.1 National Planning Policy Framework

The National Planning Policy Framework 2012 (NPPF) sets out the Government's planning policies for England and how these are expected to be applied.

Section 11, '*Conserving and enhancing the natural environment*', paragraph 123 of NPPF states:

'Planning policies and decisions should aim to:

- Avoid noise from new developments giving rise to significant adverse impacts on health and quality of life as a result of new development*
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new developments, including through the use of conditions*
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established*
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'*

Reference is made to the DEFRA Noise Policy Statement for England (NPSfE) 2010 within the NPPF. This latter document is intended to apply to all forms of noise other than that which occurs in the workplace. It includes environmental noise and neighbourhood noise in all forms.

NPSfE advises that the impact of noise should be assessed on the basis of adverse and significant adverse effect but does not provide any specific guidance on assessment methods or limit sound levels. Moreover, the document advises that it is not possible to have '*a single objective noise-based measure...that is applicable to all sources of noise in all situations*'. It further advises that the sound level at which an adverse effect occurs is '*likely to be different for different noise sources, for different receptors and at different times*'.

In the absence of specific guidance for assessment of environmental noise within NPPF and NPSfE, it is considered appropriate to base this assessment on current British Standards and appropriate local or national guidance.

4.2 BS4142: 1997

BS4142: 1997 '*Rating industrial noise affecting mixed residential and industrial areas*' is the current British Standard providing guidance for assessment of noise impact from industrial and commercial sites. The Standard details a procedure for assessing if noise is likely to give rise to complaints from residents within the vicinity. In general, the likelihood of complaint in response to a particular noise is dependent upon factors including the margin by which it exceeds the background noise level, the

character of the noise and its occurrence. The Standard recommends the determination of the Rating Level of the specific source by a correction of +5 dB if it contains any of the following features:

- The noise contains a discreet distinguishable continuous note i.e. whine, hiss screech etc;
- The noise contains distinct impulses - i.e. bangs, clatters or thumps; and
- The noise is irregular enough to attract attention.

The likelihood of complaints is assessed by comparing the measured background level with the Rating Level. Where the rating level exceeds the background the chances of complaint increases as shown below:

+10 dB or greater above measured background	Complaints Likely
+ 5 dB	Marginal Significance
- 10 dB or more below measured background	Complaints unlikely

4.3 Birmingham City Council PGN 1

Birmingham City Council has adopted standard planning criteria for new developments and these are detailed in Planning Guidance Note 1. Section 5 of this document, 'Proposed Developments Containing Noise Generating Uses' states the following:

'Where applications contain noise sources which may have an impact upon existing noise-sensitive uses, the applicant will be required to provide supporting information to allow this impact to be evaluated, in line with the provisions of this section'.

In addition it states that:

'For most general noise sources an assessment should be carried out at the façade of the most noise sensitive premises to demonstrate that the following three criteria would be met:

- *The rating level (calculated in accordance with BS4142) is at least 10dB below the existing ambient noise level (L_{Aeq})*
- *The rating level (calculated in accordance with BS4142) is at least 5dB below the existing background noise level (L_{A90})*
- *Between the hours of 19:00 and 07:00 the maximum noise level (L_{AFmax}) from the development shall not exceed the L_{A90} by more than 10dB, however, where the existing background noise level is 45dB L_{A90} or less, the maximum noise levels shall not exceed 55dB L_{AFmax} .*

With regard to noise from Entertainment premises, PGN 1 section 5.5 states:

'As a general principle, music and noise from customer activity emanating from any entertainment premises...should not be audible within any noise sensitive premises'.

5. MEASUREMENTS

Measurements have been made at the site to establish the existing ambient noise climate. Diurnal measurements were made at the western façade through a first floor window overlooking Gooch Street North. The measurement levels at this location are considered to be representative of levels that are likely to occur at residential windows above the British Oak pub.

Levels were recorded continuously in 5 minute samples from Friday 2nd to Tuesday 13th May 2014 to determine the equivalent continuous sound level, L_{Aeq} , the short duration level L_{Amax} and also the percentiles L_{A10} and L_{A90} .

Weather conditions throughout the survey were generally dry and clear. It is considered that the measurement data obtained is representative of the overall noise climate at the site.

All measurements were made with calibrated, precision grade sound level meters in accordance with BS EN 60651 and BS 7445:1993. Details of the equipment used are provided in Appendix 3 – List of Measurement Equipment. All equipment was calibration-checked before and after the survey with no significant drift observed.

6. RESULTS

The results of all diurnal site measurements are tabulated in Appendix 1. Levels are shown as hourly values derived from the measured 5 minute sample results.

The restaurant will be open between midday and 02.00hrs. The following table shows the measured levels between midnight and 02.00hrs for each day of the survey. This period is considered to be the most sensitive for the adjacent residential properties.

Period	Mean $L_{Aeq,T}$	Mean $L_{A90,T}$	Lowest $L_{A90(5min)}$
Friday to Saturday	59.3	49.1	47.8
Saturday to Sunday	60.8	51.7	51.0
Sunday to Monday	60.5	48.1	45.4
Monday to Tuesday	56.0	45.4	45.8

The lowest measured background level sample during the proposed opening hours was $L_{A90(5min)}$ 43.4dB at 01:00 hours on Monday 12th May 2014.

7. DISCUSSION

7.1 Existing noise climate

The existing noise climate in the vicinity of the site is determined by traffic flows on the A38 Bristol Street and by intermittent traffic flows on roads adjacent to the site. Additional noise will be attributable to general activity associated with licensed premises, night clubs and restaurants in the vicinity of the site.

7.2 Potential impact of new restaurant and take-away

General noise emissions from the new restaurant and take-away are expected to be attributable to kitchen plant and primarily the extract system which will discharge at roof level. The specification of this plant is not yet known and, consequently, it will be necessary to derive limit criteria derived from BCC planning requirements. The specification and installation works would then need to incorporate all control measures that are necessary to comply with the limit criterion.

Occasional themed events at the restaurant will use amplified music which will breakout from the new seating area within the courtyard. It must be assumed that the external glazed partitions to this area will be open during warmer months.

It is unlikely that music noise levels in the restaurant would be comparable to those that occur at a dedicated music venue and it is more probable that typical levels would not exceed $L_{Aeq(15min)}$ 85dB. BS 8233 Table 7 advises that the maximum continuous sound level to enable raised voice speech communication at a distance of 1m is 62dB(A). On this basis, a level of 85dB(A) would be considered quite loud and would require shouted communication. It is considered that sound levels above this value would not enable normal restaurant use.

There is unlikely to be any significant noise impact from the proposed development associated with patron vehicles since there is only limited on street parking available adjacent to the site and this can be expected to already be in significant use by patrons of other nearby premises.

7.3 Birmingham City Council PGN1 April 2011 Assessment

The determination of noise limits for mechanical plant in accordance with the criteria set by Birmingham City Council document PGN1 is shown below. The assessment is based upon the lowest 5minute sample between midnight and 02.00hrs over the survey period.

Time	Measured	Measured	Condition 1: Rating Level	Condition 2: Rating Level	Condition 3: L_{Amax} <10dB above L_{A90}
Period	L_{Aeq}	L_{A90}	>10dB below L_{Aeq}	>5dB below L_{A90}	
00:00 – 02:00	50.6	43.2	40.6	38.2	53.2

Based upon Conditions 1 and 2, it is determined that the Rating Level of any mechanical plant associated with the takeaway should be no greater than L_{Aeq} 38.2dB at the nearest residential property. Assuming a character correction of +5dB in accordance with BS4142, the derived plant noise limit level at the nearest residential receptor is L_{Aeq} 33dB.

In the case of the kitchen extract, the discharge outlet will be approximately 30m from the nearest residential window at the British Oak pub and it is extrapolated that the limit noise level at the duct outlet would be L_{Aeq} 63dB at 1m after allowance for distance attenuation.

Based upon Condition 3, it is determined that the noise level of any mechanical plant associated with the takeaway should be no greater than L_{Amax} 53.2dB at the nearest noise sensitive window.

The above figures indicate the combined noise level of all items of newly installed plant running at 100% load. Without detailed acoustic information, it is not possible to predict the individual contribution of each of the items of plant.

For music noise, an internal restaurant sound level of L_{Aeq} 85dB would be expected to result in a break-out sound level of L_{Aeq} 75dB within the courtyard area when windows/doors are open. The courtyard is approximately 50m from the nearest residential receptor. It is noted that the opening sides of the restaurant are on the northern and eastern elevations facing away from the residential property. In addition, the single storey restaurant is fully screened from the residential property by intervening two storey buildings such that there is no line of sight from the residential property. From this, it would be expected that there would be a screening effect of the order of 15dB. When allowance is made for screening and distance attenuation, the expected sound level at the nearest residential windows of the British Oak is L_{Aeq} 26dB.

The calculated music noise level at the nearest residential receptor is approximately 17dB below the lowest background noise level sample and approximately 24dB below the lowest ambient noise level sample. On this basis, a music noise level of L_{Aeq} 85dB within the restaurant would not give rise to perceptible noise at the nearest residential property. It is probable that higher music noise levels could be accommodated without any noticeable impact upon the residential property and it may be preferable to establish an upper limit operational sound level once the development has been fitted out and the P.A system installed.

8. RECOMMENDATIONS

Limit levels for mechanical plant at the proposed development have been determined in accordance with the procedure set out in the Birmingham City Council PGN1.

The recommended limit levels are:

- L_{Aeq} 33dB at the nearest noise sensitive window.
- L_{Amax} 53dB at the nearest noise sensitive window.

It will be necessary for the plant installations to be reviewed during or after installation to confirm compliance with the limit levels.

It is recommended that music noise levels within the restaurant area are limited to L_{Aeq} 85dB. Higher music noise levels will be acceptable where it can be demonstrated that these do not have any significant impact upon the nearest noise sensitive receptor.

9. CONCLUSIONS

Measurements have been made of existing ambient noise levels at 66-76 Gooch Street North, Birmingham over a period of five days including a weekend period. The noise climate, primarily, is determined by traffic noise from the A38 Bristol Street but with additional noise from local traffic and nearby licensed and entertainment premises.

Noise limit levels have been derived in accordance with BCC PGN 1 for all mechanical services plant associated with the proposed development.

Assessment of anticipated music noise levels for the restaurant area indicates that levels at the nearest noise sensitive receptor are expected to be significantly below existing background levels during the quietest period between midnight and 02.00hrs. On this basis, music noise is not expected to have any audible impact upon noise sensitive premises.

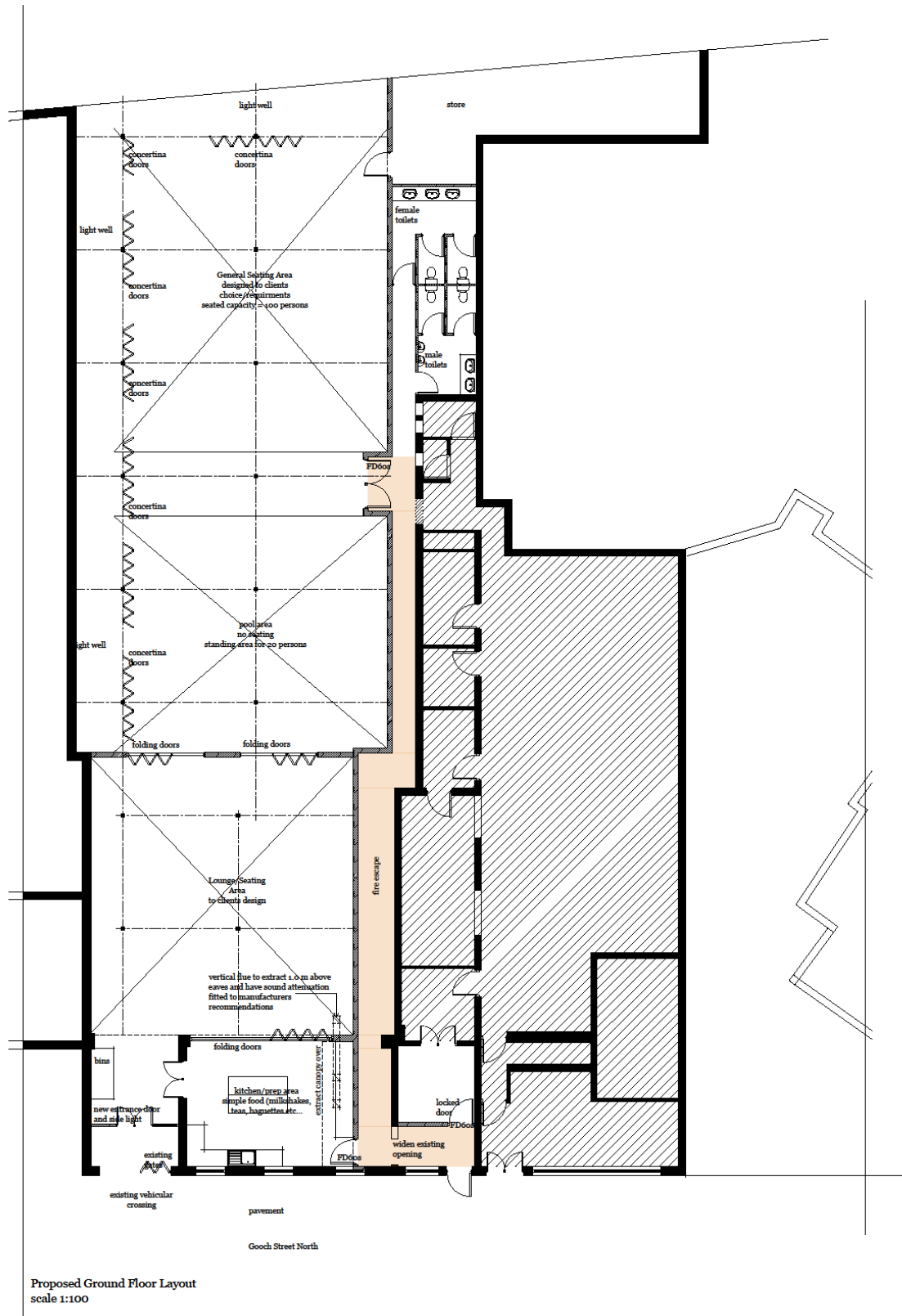
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FIGURE 1 – SITE LOCATION



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FIGURE 2 - DEVELOPMENT PROPOSALS



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APPENDIX 1 – MEASURED SOUND PRESSURE LEVELS

		L _{Aeq,5min}	L _{Amax,5min}	L _{A90,5min}
Day 1	00:05	59.2	72.6	51.2
	00:10		78.7	49.4
	00:15	60.7	76.6	48.8
	00:20	58.8	74.1	48.7
	00:25	58.7	80.0	48.7
	00:30	59.6	77.6	48.9
	00:35	57.7	74.0	49.6
	00:40	59.4	74.5	49.4
	00:45	52.8	64.7	47.8
	00:50	58.3	73.1	48.9
	00:55	55.5	72.2	48.7
	01:00	61.3	75.6	51.0
	01:05	61.5	79.0	49.1
	01:10	56.5	71.0	48.9
	01:15	55.0	65.2	47.9
	01:20	59.7	74.9	48.4
	01:25	56.5	71.2	47.3
	01:30	60.6	76.5	49.6
	01:35	57.5	72.5	47.9
	01:40	57.8	70.4	49.1
	01:45	57.5	73.3	50.2
	01:50	61.3	77.2	48.7
	01:55	59.4	79.8	50.0
	02:00	58.4	74.2	48.0
		L _{Aeq,5min}	L _{Amax,5min}	L _{A90,5min}
Day 2	00:05	61.3	75.1	52.2
	00:10	61.7	75.1	51.0
	00:15	61.8	78.7	53.8
	00:20	60.8	75.5	52.9
	00:25	58.8	72.4	51.9
	00:30	60.4	75.0	52.0
	00:35	60.9	74.8	51.2
	00:40	58.3	69.5	51.9
	00:45	61.1	73.4	52.4
	00:50	61.1	74.3	51.5
	00:55	59.3	75.4	53.2
	01:00	61.7	78.3	51.1
	01:05	58.7	75.0	51.1
	01:10	60.7	74.8	51.8
	01:15	60.7	73.7	50.8

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	01:20	64.1	92.6	51.2
	01:25	59.8	71.7	52.7
	01:30	62.6	76.5	51.9
	01:35	60.8	74.5	52.0
	01:40	58.6	74.0	50.9
	01:45	58.1	72.2	49.4
	01:50	62.1	76.3	51.2
	01:55	57.7	71.3	51.0
	02:00	61.3	76.5	50.0
		L _{Aeq,5min}	L _{Amax,5min}	L _{A90,5min}
Day 3	00:05	59.8	74.3	50.7
	00:10	59.0	74.1	49.7
	00:15	58.4	73.4	49.4
	00:20	58.9	73.5	47.9
	00:25	60.0	75.6	50.0
	00:30	58.8	74.0	48.2
	00:35	65.9	88.0	48.6
	00:40	61.5	76.9	49.0
	00:45	58.7	73.3	47.1
	00:50	57.9	75.8	47.8
	00:55	61.5	75.4	48.6
	01:00	56.7	74.8	45.4
	01:05	59.3	78.4	45.7
	01:10	60.2	77.2	46.1
	01:15	61.1	77.2	47.6
	01:20	56.7	72.0	47.9
	01:25	54.7	71.2	46.0
	01:30	64.3	82.8	47.3
	01:35	58.0	73.9	47.0
	01:40	59.8	74.7	48.5
	01:45	60.2	76.5	48.5
	01:50	61.5	76.5	48.2
	01:55	59.8	76.3	47.4
	02:00	59.0	71.6	46.2
		L _{Aeq,5min}	L _{Amax,5min}	L _{A90,5min}
Day 4	00:05	56.8	72.7	46.6
	00:10	55.2	74.9	46.2
	00:15	56.9	73.2	46.4
	00:20	56.6	73.4	46.8
	00:25	57.2	74.5	46.8
	00:30	56.7	74.4	46.6
	00:35	61.3	81.1	48.1

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	00:40	53.1	68.4	45.8
	00:45	56.9	76.4	46.0
	00:50	55.9	72.8	47.1
	00:55	54.4	68.4	47.5
	01:00	56.3	73.8	46.8
	01:05	55.7	71.9	45.3
	01:10	57.8	77.7	45.0
	01:15	57.3	76.7	44.8
	01:20	50.6	65.4	43.6
	01:25	52.0	66.0	43.2
	01:30	52.7	69.0	43.9
	01:35	56.2	72.4	43.5
	01:40	55.1	73.9	43.7
	01:45	53.9	72.8	41.3
	01:50	50.6	68.1	44.1
	01:55	55.2	70.0	43.4
	02:00	49.3	65.3	41.3

APPENDIX 2 – GLOSSARY OF TERMS

Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithm is taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to approximate to the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies. An 'A' weighted sound level is written as dB(A).

$L_{Aeq,T}$

The A-weighted equivalent continuous sound level – the level of a notionally steady sound having the same energy as the true fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter. It is the preferred descriptor for environmental noise in accordance with BS 7445:1993.

$L_{A90,T}$

The A-weighted noise level exceeded for 90% of the specified measurement period (T). This is generally taken to indicate the prevailing background noise level.

$L_{A10,T}$

The A-weighted sound level exceeded for 10% of the specified measurement period (T). This parameter is indicative of the average maximum sound level

L_{Amax}

The highest short duration A-weighted sound level recorded during a noise event.

APPENDIX 3 – LIST OF MEASUREMENT EQUIPMENT

Measurements

Rion type NL-32 Sound Level Meter	S/N 01161940
Rion type NH-21 pre-amplifier	S/N 21975
Rion type UC-53A Microphone	S/N 311042

Additional Equipment

Rion Type NC-74 Calibrator	S/N 34172706
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The above equipment fulfils IEC 61672 Class 1 and is traceable to calibration under BS7580: Part 1:1997.

The equipment was calibration-checked before and after measurement – no adverse deviation was observed.