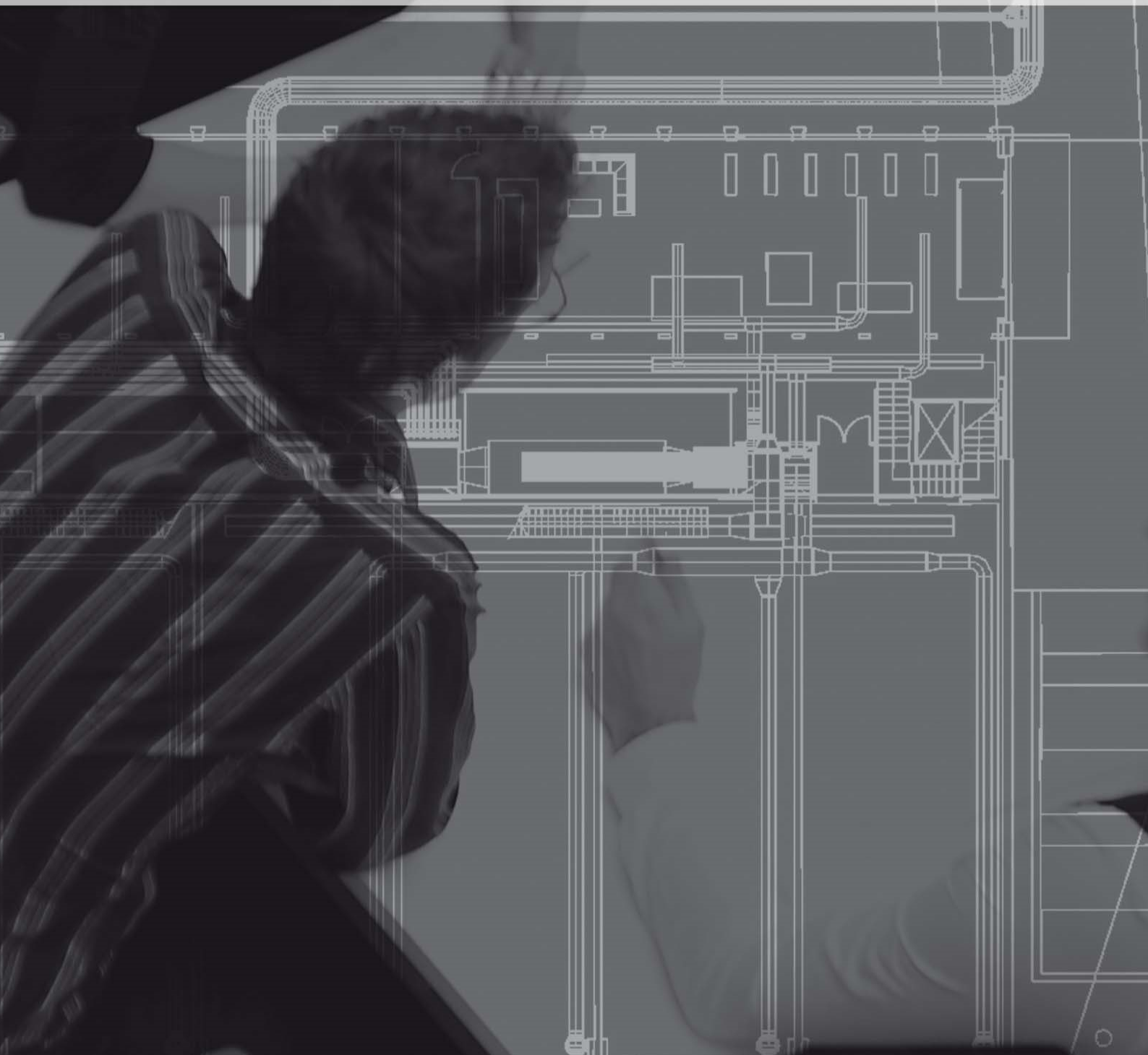


Premier Inn, Kidlington
Proposed New Hotel Development
Report on Existing Noise Climate



Tel: +44 (0) 121 450 4800

Hoare Lea Acoustics
6th Floor West
54 Hagley Road
Edgbaston
Birmingham
B16 8PE

Audit sheet

REVISION	DESCRIPTION	DATE	ISSUED BY	REVIEWED BY
0-DFC	Survey Report	31/07/2017	AMcC	
1	Issued	07/08/2017	AMcC	HCSE
2	Update following client comments	29/08/2017	AM	HCSE

This report is provided for the stated purposes and for the sole use of the named Client. It will be confidential to the Client and the client's professional advisers. Hoare Lea accepts responsibility to the Client alone that the report has been prepared with the skill, care and diligence of a competent engineer, but accepts no responsibility whatsoever to any parties other than the Client. Any such parties rely upon the report at their own risk. Neither the whole nor any part of the report nor reference to it may be included in any published document, circular or statement nor published in any way without Hoare Lea's written approval of the form and content in which it may appear.

Contents

1.	INTRODUCTION	1
2.	SITE DESCRIPTION	2
3.	DEVELOPMENT PROPOSALS	4
4.	BASIS OF ASSESSMENT	5
4.1	National Planning Policy Framework	5
4.2	Premier Inn Specification	6
4.3	BS8233: 2014	6
5.	MEASUREMENTS	8
6.	RESULTS	9
7.	DISCUSSION	11
7.1	Existing noise climate	11
7.2	Premier Inn Specification Assessment	11
7.3	Mechanical Services	12
8.	RECOMMENDATIONS	13
9.	CONCLUSIONS	14
	APPENDIX 1 – PROPOSED SITE LAYOUT	15
	APPENDIX 2 – LIST OF MEASUREMENT EQUIPMENT	16
	APPENDIX 3 – ENVIRONMENTAL NOISE SURVEY RESULTS	17
	APPENDIX 4 – GLOSSARY OF TERMS	20

1. Introduction

Assessment has been made of the existing ambient noise climate on land at the Oxford Technology Park, Kidlington. The site lies adjacent to Langford Lane, located approximately one mile north west of Kidlington village centre. It is proposed that the site be developed to provide a new Premier Inn hotel.

This report details the results of all site measurements and reviews this data with respect to the performance requirements of the Oxford Tech Park Premier Inn specification, dated October 2016 (Rev A), British Standards BS 8233:2014 and BS 4142:2014, and also the requirements of the local planning authority where appropriate

2. Site Description

The development site is located on the southern side of Langford Lane, approximately one mile north west of Kidlington village centre. The rectangular shaped site, is currently a large area of levelled open land.

The site is on-grade with Langford Lane which forms the northern boundary and carries traffic between the A44 Woodstock Road in the west to the A4260 Banbury Road in the east. Langford Lane also provides access to the Oxford Technology Park located to the east of the development, and to the London Oxford Airport located immediately to the north of site on the far side of Langford Lane. Traffic on this stretch of road is fast and intermittent with speeds limited to the national speed limit.

North of the site beyond Langford Lane are a series of buildings associated with the London Oxford Airport with the main runway beyond at a closest distance of 600 metres from the north western site boundary. The main runway is orientated on an angle of 10 and 190 degrees with the shorter runway oriented on an angle of 110 and 290 degrees. As a result, aircraft taking off and landing at the airport do not pass directly over the development site.

Immediately to the west of site is Evenlode Crescent which provides local access to both Kidlington Ambulance Station, located on the far side of the road, and to a secure area of land operated by the National Tactical Response Group.

General activity at the Kidlington Ambulance Station was observed to be generally low with occasional vehicle movement on site. Infrequently, vehicles were observed leaving the station with sirens in operation.

The National Tactical Response Group site is located approximately 160 metres south west of the development site. General activity from the site was observed to be generally low with the exception of occasional gunfire, audible whilst on the initial visit to site.

Located west of the Ambulance Station and north of the National Tactical Response Group are existing dwellings located on Evenlode Crescent.

East of the development are a series of car showrooms.

South the development is a large area of open land.

The A44 Woodstock Road lies approximately 650 metres to the west of the development. The A4260 Banbury Road lies approximately 600 metres to the east. These A-roads and local traffic on Langford Lane are the principal sources of traffic noise for the site.

Premier Inn Kidlington
Proposed New Hotel Development
Report on Existing Noise Climate

An aerial view of the site is shown below.



3. Development Proposals

The hotel building will occupy the northern half of the site and will be aligned along the Langford Lane boundary with provision for 101 bedrooms over four floors as per the following:

- Ground Floor: 17 Rooms
- 1st Floor: 22 Rooms
- 2nd Floor: 31 Rooms
- 3rd Floor: 31 Rooms

The building will be set back approximately 10m from Langford Lane with car parking with space for 139 vehicles to be provided to the west and south of the building. The ground floor of the hotel will be occupied by common facilities and bedrooms whilst the upper floors will be given over entirely to guest bedrooms.

The current proposed site layout is shown in Appendix 1 of this report.

4. Basis of Assessment

4.1 National Planning Policy Framework

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

Section 11, Conserving and enhancing the natural environment, para 123 of NPPF states:

'Planning policies and decisions should aim to:

- Avoid noise from 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 development, 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 2010 (NPSfE). This latter document is intended to apply to all forms of noise other than that which occurs in the workplace and 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 assessment on current British Standards and appropriate local or national guidance.

It is noted that NPSfE also advises that the general principle that increases in ambient noise should be 'minimised', needs to be considered in context for each site and, in this regard, states:

'Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as is reasonably practical... the application of the NPSfE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular

policy, development or other activity may not have been given adequate weight when assessing the noise implications’.

4.2 Premier Inn Specification

Premier Inn has adopted standard design criteria for external noise break-in to bedrooms which is replicated in the Oxford Tech Park Premier Inn Specification document dated 1st October 2016. Table 2.13.4 of the specification gives the requirements as follows:

Period	Noise Level
Daytime (0700 -2300 hrs)	$L_{Aeq,1hour}$ 35 dB
Night-time (2300 - 0700 hrs)	$L_{Aeq,1hour}$ 30 dB $L_{Amax,F}$ 42 dB*
<p><i>(*)The maximum criterion applies to all vehicle and railway train pass-bys and all aircraft flyovers. It also applies to the noise from all street activities including those associated with patrons attending and leaving adjacent, neighbouring or connected entertainment venues; noise associated with commercial and industrial neighbouring premises including delivery activities and process equipment; seagulls and church bells. Genuinely infrequent and unpredictable sources such as car alarms occurring no more than twice a night are excluded.</i></p>	

It is noted that these requirements correlate to the internal noise level criteria of British Standard BS 8233:2014 for hotel rooms. It is noted that the above values are to be achieved with closed windows and open vents (where provided).

In the case of mechanical services plant serving adjacent or neighbouring properties, section 2.13.5 of the specification requires that break-in sound levels attributable to this plant do not exceed $L_{Aeq(5min)}$ NR 20 whilst vibration levels should not be perceptible when assessed in accordance with BS 6472:2008.

4.3 BS8233: 2014

BS 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’ is the current British Standard providing guidance on the acoustic design of buildings. The Standard advises appropriate criteria and limits for different building types including dwellings.

BS 8233 provides guidance regarding acceptable internal and external noise level criteria for dwellings but does not form any statutory requirement to achieve the guidance values provided therein.

The BS 8233 target internal design criteria for dwellings are as follows:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room / Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS 8233 Section 7.2.2 states that '*...the internal target levels may be relaxed by up to 5dB and reasonable conditions still achieved*'.

Section G1 of BS 8233 advises that sound reduction across an open window is limited to 15dB but acknowledges that there will be additional sound reduction for the room and furnishings. Available test data indicates that, for mid frequencies typical of traffic and rail noise, the overall sound reduction is of the order of 20dB.

Section G1 of BS 8233 advises that, where windows are open for ventilation, then sound reduction is limited to 15dB.

For gardens and terraces, the Standard states that it is desirable that the steady noise level does not exceed $L_{Aeq,T}$ 50dB whilst a level of $L_{Aeq,T}$ 55dB would be acceptable in noisier environments. However, BS 8233 states that, 'it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable...In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited'.

5. Measurements

Hoare Lea Acoustics has carried out a measurement survey to establish the prevailing noise conditions at the development site. The survey comprised automated logged noise level measurements for a 5-day period between Thursday 27th and Monday 31st July 2017.

Measurements were made in 15-minute sample periods to determine the L_{Aeq} , L_{Amax} and L_{A90} indices.

The measurement location is marked on the site plan at Appendix 1 and described below.

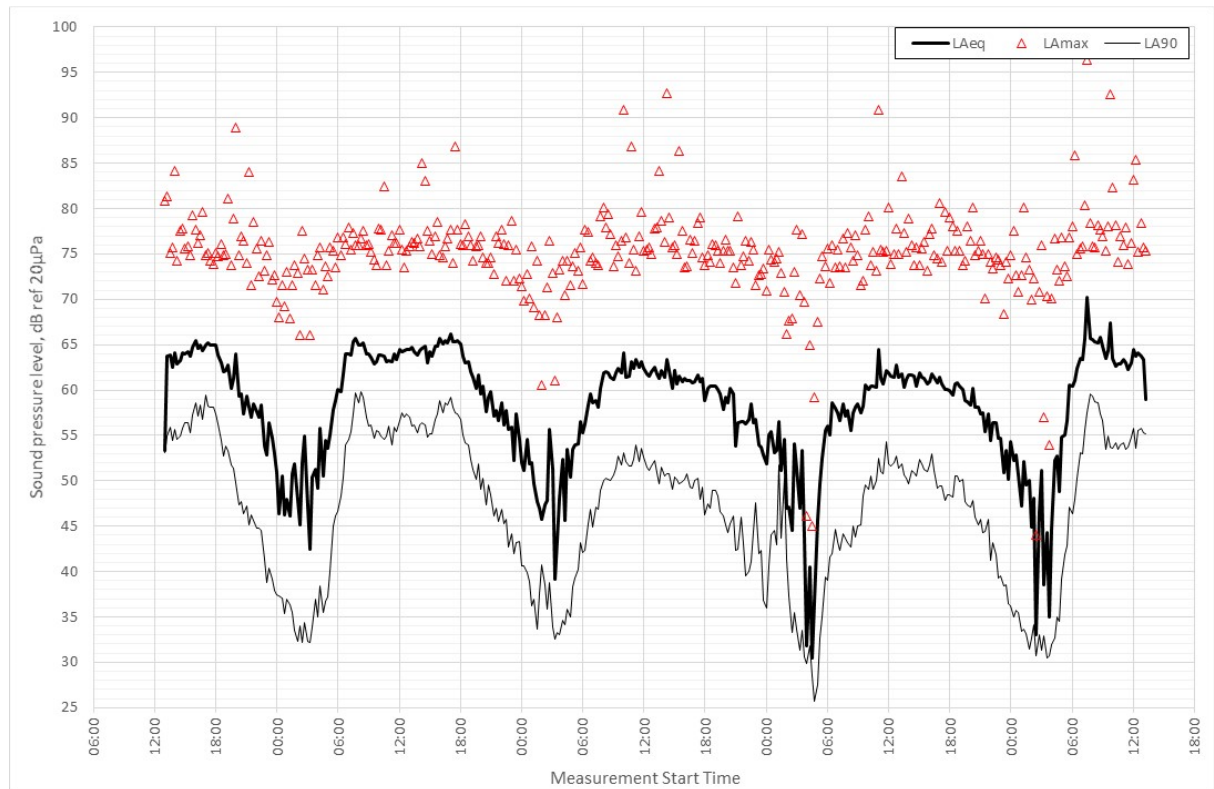
Location ref:	Description
1	Towards the north western site boundary, approximately 10 metres from the nearest kerb of Langford Lane and 5 metres from the nearest kerb of Evenlode Crescent.

Weather conditions over the survey period were predominantly dry with little or no wind and temperatures ranged between 8° and 24° Celsius with the exception of occasional rain on the Saturday and Sunday. It is considered that the measurement data obtained is representative of the overall noise climate at site.

All measurements were made with a calibrated precision grade sound level meter in accordance with BS EN 60651 and BS 7445:1993. All equipment was calibration-checked before and after the survey – no significant drift was observed. A list of the equipment used can be found in Appendix 2.

6. Results

The results of all diurnal site measurements are tabulated in Appendix 3. Levels are shown as hourly values derived from the measured 15 minute sample results. The measured levels are also shown graphically below.



Period	Average Measured dB L _{Aeq}	Average measured dB L _{A10}	Average Measured dB L _{A90}
Thursday (13:00 – 23:00)	62.8	62.3	52.8
Thursday night	55.5	44.5	38.3
Friday	63.6	63.7	54.4
Friday night	53.6	44.7	38.8
Saturday	61.0	59.3	48.8
Saturday night	53.3	44.2	38.0
Sunday	60.1	57.9	48.3
Sunday night	55.4	43.7	37.1
Monday (07:00 – 13:00)	64.9	66.0	55.4

The mean weekday daytime ambient noise level was L_{Aeq,16hr} 62.4dB.

The mean night time ambient noise level was L_{Aeq,8hr} 54.6dB.

The survey data indicates that typical maximum night time levels were in the range L_{Amax} 49-78dB with 1 louder event per night attributable to sirens.

The lowest typical background noise level measured during the monitoring survey was L_{Aeq(1-hr)} 43.9dB during the day and L_{Aeq(15-min)} 32.0dB during the night.

7. Discussion

7.1 Existing noise climate

The noise climate across the site is primarily determined by traffic flows on Langford Lane to the north of the site. The majority of noise from the road is attributable to tyre 'roar' which has a characteristic mid-frequency tonal peak. Additional background traffic noise results from the A44 to the west and from the A4260 to the east.

This general noise climate is punctuated by occasional aircraft activity from the airport to the north with occasional sirens from ambulances from the station to the west. There are also occasional gunshots to be heard from the National Tactical Response Group site to the south west.

7.2 Premier Inn Specification Assessment

The proposed hotel building will be set back approximately 10m from the edge of Langford Lane and from the measurement data at Position 1, it can be determined that temporal sound levels on the northern elevation of the building will be L_{Aeq} 62dB daytime and L_{Aeq} 55dB night time. From these corrected levels, it may be extrapolated that, in order to achieve the temporal requirements of the Premier Inn specification, the building fabric would need to provide a minimum composite sound reduction of 27dB during the daytime and 25dB during the night.

In the case of maximum levels, the Premier Inn specification stipulates a night time internal noise event limit level of L_{Amax} 42dB. The measured survey data for Position 1 indicates that night time maximum levels mostly were in the range 49-78dB(A), with 4no events (1 event per night) above this range to a maximum of 86dB(A). For maximum levels, the derived requirement is 36dB.

In practice, the structural components of the building envelope can be expected to provide a sound reduction in excess of 45 dB and will not provide a significant pathway for noise break-in. Greatest sound break-in can be expected to occur via windows.

Data provided in BRE IP 12/89 and BS 8233 indicates that, for road traffic noise, standard thermal double glazing provides a typical sound reduction of approximately 33dB(A). This order of reduction would not be sufficient to achieve the Premier Inn internal design requirement for all bedrooms due to exposure of noise associated with the airport, ambulance station and tactical response group and it will be necessary to protect against this by use of higher performance windows. It is considered that windows with a minimum rating of R_w 36 would enable sufficient sound reduction to achieve acceptable levels within bedrooms on all elevations.

The sound reductions discussed above apply to closed windows and BS8233 advises that sound reduction across a partially open window will be limited to 15dB. Under these conditions the Premier Inn internal criteria will be exceeded and it will be necessary for bedrooms to be provided with alternative

means of ventilation. Background ventilation in accordance with Building Regulations requirements can be achieved with proprietary acoustic rated window or wall mounted trickle vents.

7.3 Mechanical Services

Details of plant installations on the development are not currently available and, consequently, it is not possible to carry out a formal BS 4142 assessment. BS 4142 can, however, be used to derive limit noise levels at the nearby dwellings that would achieve an assessment of 'low impact'.

The typical lowest background levels from the survey were L_{A90} 44dB during the daytime and L_{A90} 32dB during the night. The following table derives the limit sound levels to be achieved at the nearest dwellings in order to achieve a BS 4142 condition of 'low impact'.

Parameter	Daytime (07:00 – 23:00)	Night time (23:00 – 07:00)
Background level – L_{A90}	44	32
Character correction	-5	-5
Limit level - L_{Aeq}	39	27

The derived limit levels for fixed plant are cumulative values to be achieved at the nearest residential property with all plant operating normally.

Premier Inn design requirements for external mechanical services plant stipulate an internal sound level no greater than NR 20 within any bedroom and a level no greater than 5dB below background when measured at the nearest noise sensitive property.

8. Recommendations

Based upon the results of the site measurements, it is recommended that windows with a minimum manufacturer's rating of R_w 36 be installed to guest bedrooms on each floor on all elevations.

It is recommended that bedrooms throughout the building be provided with background ventilation in accordance with Building Regulations requirements. Where vents are provided to the building façade, these should have an acoustic rating when open that is comparable to the rating of the room window system.

All items of plant that are to be installed to the new building should meet with the criteria derived in Section 7.3 of this report.

It will be necessary to assess plant noise levels and determine any appropriate control measures at the design and construction stage.

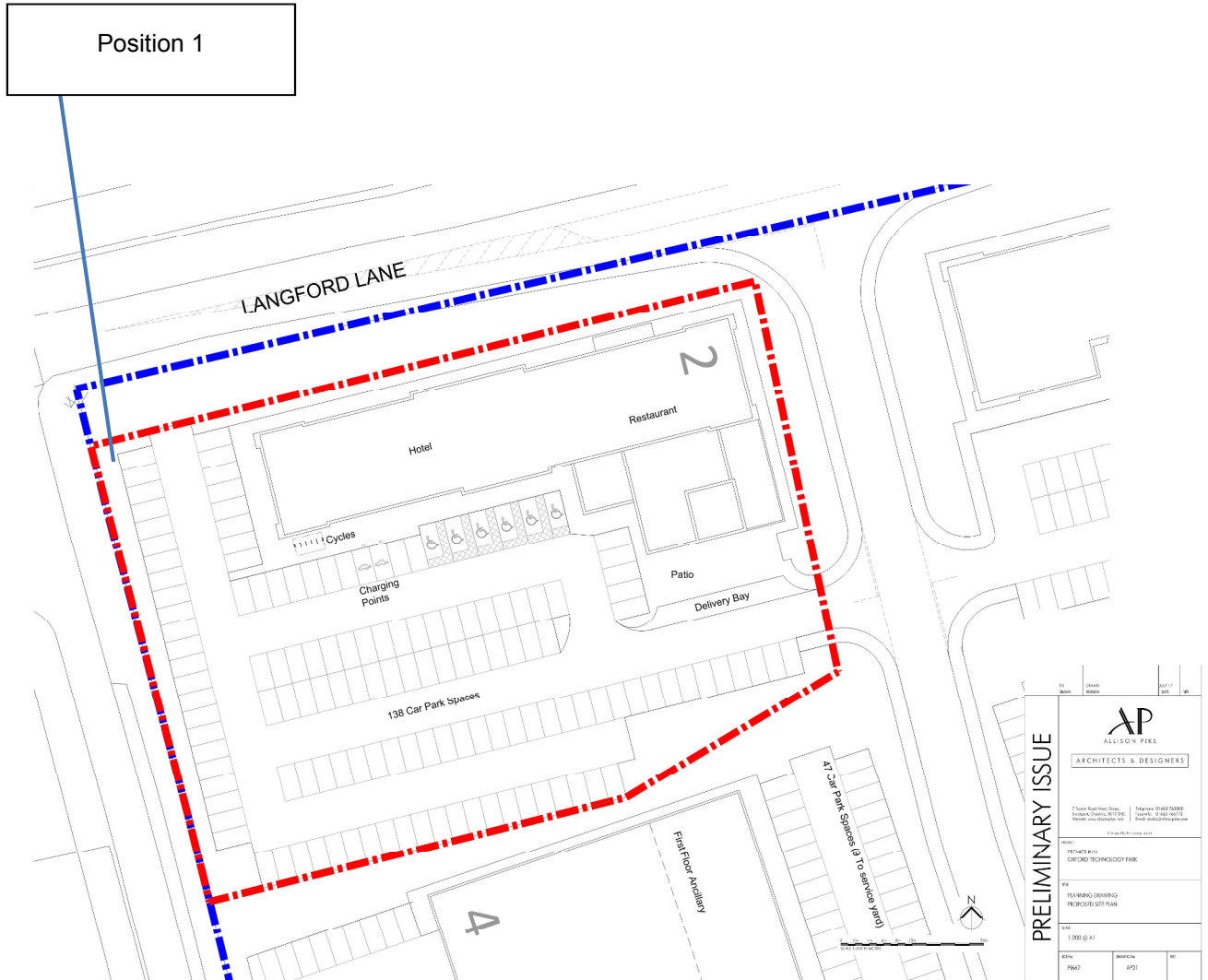
9. Conclusions

Survey work carried out at this site indicates that, for the majority of time, the noise climate is determined by general traffic noise from Langford Lane and other roads in the local vicinity. Additional intermittent noise occurs during the daytime from activities at the London Oxford Airport to the north, the Kidlington Ambulance Station to the west and the National Tactical Response Group to the south west. Short duration noise levels from aircraft, sirens and gunfire tend to be higher than general traffic noise.

Internal noise criteria given in the Premier Inn specification will require the use of appropriate acoustic rated glazing for all bedrooms throughout the development. In addition, all guest bedrooms should be provided with means of background ventilation other than by use of open windows.

It will be necessary to ensure that all plant installations associated with the development achieve acceptable sound levels at hotel bedroom windows and at nearby residential property. This can be achieved with careful selection and siting of fixed plant along with specific control measures as appropriate. All plant will need to achieve acceptable sound levels in accordance with BS 4142 at the nearest dwellings.

Appendix 1 – proposed site layout



Appendix 2 – list of measurement equipment

Measurements

Rion Type NL-52 Sound Level Meter	S/N 00710261
Rion Type NA-31 Sound Level Meter	S/N 2497394

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.

Appendix 3 – Environmental Noise Survey Results

Position 1 – North Western Boundary

	From:	To:	L _{eq,1hr}	L _{max,1hr}	L _{10,1hr}	L _{90,1hr}	
Thursday	13:00	13:59	62.3	81.4	65.7	54.6	
	14:00	14:59	63.6	84.2	65.1	55.2	
	15:00	15:59	64.2	79.3	66.4	56.3	
	16:00	16:59	64.8	79.6	67.2	57.7	
	17:00	17:59	65.0	75.1	67.2	58.5	
	18:00	18:59	63.6	76.1	65.2	55.2	
	19:00	19:59	61.7	81.1	62.0	52.6	
	20:00	20:59	60.8	88.9	57.4	47.8	
	21:00	21:59	58.3	84.0	55.0	46.0	
	22:00	22:59	57.0	76.4	52.3	43.9	
	23:00	23:59	54.5	76.3	46.1	39.1	
Friday	00:00	00:59	49.1	71.5	41.4	36.8	
	01:00	01:59	49.7	73.7	40.1	35.6	
	02:00	02:59	51.5	77.5	38.1	33.2	
	03:00	03:59	48.9	73.3	37.6	33.8	
	04:00	04:59	53.3	75.7	41.8	36.4	
	05:00	05:59	56.9	75.7	50.9	42.1	
	06:00	06:59	61.7	76.8	60.2	49.8	
		07:00	07:59	64.8	77.9	66.4	56.8
		08:00	08:59	64.8	77.6	66.8	58.7
		09:00	09:59	63.4	76.1	65.1	55.6
		10:00	10:59	63.6	82.4	65.2	55.0
		11:00	11:59	63.4	77.1	65.1	55.3
		12:00	12:59	64.4	77.7	66.5	57.1
		13:00	13:59	64.4	76.7	66.5	56.1
		14:00	14:59	64.3	85.0	65.8	55.9
		15:00	15:59	64.4	78.5	66.3	56.1
		16:00	16:59	65.4	76.7	67.6	58.3
		17:00	17:59	65.6	86.8	67.3	58.0
		18:00	18:59	63.8	78.3	65.2	55.0
		19:00	19:59	61.4	76.0	61.2	51.4
		20:00	20:59	59.3	76.9	57.1	49.0
		21:00	21:59	58.0	77.0	54.0	46.8
	22:00	22:59	57.2	77.7	52.3	45.2	
	23:00	23:59	55.4	78.6	49.4	43.1	
Saturday	00:00	00:59	52.6	72.8	45.5	40.0	
	01:00	01:59	49.5	75.8	40.7	36.1	
	02:00	02:59	51.1	76.5	42.9	38.5	
	03:00	03:59	47.5	73.3	37.4	33.2	

Premier Inn Kidlington
Proposed New Hotel Development
Report on Existing Noise Climate



	04:00	04:59	51.3	74.3	40.2	34.9
	05:00	05:59	54.7	75.7	48.8	40.3
	06:00	06:59	57.7	77.7	52.5	44.1
	07:00	07:59	59.0	79.2	56.6	46.9
	08:00	08:59	61.8	80.1	61.1	50.1
	09:00	09:59	61.8	76.5	62.4	51.6
	10:00	10:59	62.7	90.9	62.7	52.1
	11:00	11:59	62.9	79.6	64.0	53.0
	12:00	12:59	62.0	75.7	62.8	51.7
	13:00	13:59	62.0	84.1	63.0	51.1
	14:00	14:59	61.9	92.7	61.9	50.3
	15:00	15:59	61.4	86.4	61.2	50.1
	16:00	16:59	61.1	76.6	61.0	49.9
	17:00	17:59	61.2	79.0	60.5	49.4
	18:00	18:59	60.0	76.1	58.2	47.4
	19:00	19:59	59.6	76.0	57.8	47.5
	20:00	20:59	59.4	76.6	55.7	45.2
	21:00	21:59	56.0	79.2	50.7	43.5
	22:00	22:59	57.1	76.5	49.2	41.2
	23:00	23:59	54.6	73.4	48.5	42.2
Sunday	00:00	00:59	54.1	75.5	46.5	41.3
	01:00	01:59	54.3	75.2	50.4	47.2
	02:00	02:59	49.8	73.0	42.1	36.9
	03:00	03:59	50.2	77.7	37.0	32.3
	04:00	04:59	36.6	64.9	32.6	29.0
	05:00	05:59	52.2	74.7	44.2	33.6
	06:00	06:59	57.1	75.9	52.6	41.8
	07:00	07:59	57.5	76.7	52.7	43.4
	08:00	08:59	57.3	77.3	52.5	43.7
	09:00	09:59	58.8	77.7	56.2	47.0
	10:00	10:59	60.3	79.1	59.5	49.7
	11:00	11:59	62.4	90.9	62.1	52.1
	12:00	12:59	61.9	80.1	62.9	52.1
	13:00	13:59	61.2	83.5	61.2	51.0
	14:00	14:59	61.3	78.9	61.5	50.6
	15:00	15:59	61.3	76.3	62.1	51.6
	16:00	16:59	61.2	77.8	61.3	51.3
	17:00	17:59	60.6	80.6	59.7	48.8
	18:00	18:59	60.3	79.0	59.1	49.4
	19:00	19:59	59.6	78.1	57.9	48.8
	20:00	20:59	58.8	80.1	55.3	46.5
	21:00	21:59	57.0	76.5	53.1	45.0
	22:00	22:59	55.6	74.6	48.8	41.4
	23:00	23:59	52.6	74.1	44.5	38.2

Premier Inn Kidlington
 Proposed New Hotel Development
 Report on Existing Noise Climate



Monday	00:00	00:59	52.7	77.5	41.2	35.6
	01:00	01:59	50.1	80.1	37.3	32.9
	02:00	02:59	45.5	72.3	36.4	32.6
	03:00	03:59	46.2	75.9	35.3	31.4
	04:00	04:59	50.6	76.7	40.5	33.5
	05:00	05:59	57.5	76.8	53.2	42.7
	06:00	06:59	62.0	85.9	61.3	49.4
	07:00	07:59	67.0	96.4	67.3	56.4
	08:00	08:59	65.5	78.2	67.6	58.6
	09:00	09:59	65.3	92.6	66.1	54.7
	10:00	10:59	63.0	82.3	64.5	53.8
	11:00	11:59	62.9	77.9	64.7	54.0
	12:00	12:59	64.0	85.4	66.0	55.2

Note that maximum noise levels presented above are the highest level measured in each one-hour period.

Appendix 4 – 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 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.