

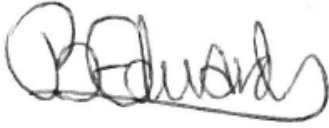
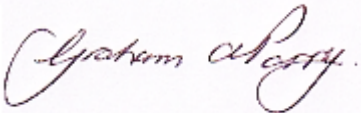
Report for:

Sanjay Kumar

940 Oxford Road, Reading
Noise Assessment

Status: Final

Date: 28.02.2020

Author	 Anargyros Serras Junior Acoustic Consultant
Reviewed By	 Rebecca Edwards Senior Acoustic Consultant
Approved By	 Graham Parry Managing Director
Report For	Sanjay Kumar 940 Oxford Road Reading RG30 6TJ Berkshire
Date	28.02.2020
Version Number	A3891/N/001
Status	Final

This report has been prepared by ACCON UK Limited with all reasonable care and diligence within the terms of the contract with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. We accept no responsibility to third parties to whom this report, or any part, thereof is made available. Any such party relies upon the report at their own risk.

CONTENTS

1. INTRODUCTION	4
2. THE NATURE, MEASUREMENT AND EFFECT OF NOISE.....	6
3. TARGET NOISE LEVELS	7
4. NOISE MEASUREMENT SURVEY	8
5. NOISE IMPACT ASSESSMENT	11
5.1. Internal Noise Levels	11
5.2. Recommendations	13
6. CONCLUSION.....	14

LIST OF TABLES

Table 2.1: Typical Noise Levels.....	6
Table 3.1: Indoor Ambient Noise Levels for Dwellings	7
Table 4.1: Summary of the Façade Noise Levels from Semi-Permanent Noise Monitoring	9
Table 4.2: Summary of the Free-Field Noise Levels from Semi-Permanent Noise Monitoring	10
Table 5.1: Predicted Internal Noise Levels with Open Windows for Ventilation.....	12

LIST OF FIGURES

Figure 1.1: Site Location Plan	5
Figure F.1: Noise Measurement Locations.....	16

LIST OF APPENDICES

Appendix 1 Glossary of Acoustic Terminology	18
Appendix 2 Noise Measurement Results	20

1. INTRODUCTION

ACCON UK Limited (ACCON) has been appointed by Sanjay Kumar to undertake a noise assessment for the proposed change of use development at 940 Oxford Road, Reading. The proposed change of use development will comprise the change of use from commercial (Class A5 Use) to residential (Class C3 Use). Two planning applications have been submitted to Reading Borough Council (RBC) under the Town and Country Planning (General Permitted Development) Order 2015 (as amended) with references 192004 (proposed ground floor unit) and 192005 (proposed basement unit).

The purpose of this noise assessment has been to discharge the proposed pre-commencement planning condition outlined by the RBC Environmental Health Department. The proposed planning condition states:

“No development shall commence on site until a detailed scheme, informed by an assessment of the current noise environment, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014 and the [sic] and that the individual noise events do not exceed 45 dB LA,max,F more than 10 times a night. Where opening windows will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation. Noise from the system should not result in BS8233 internal levels being exceeded.

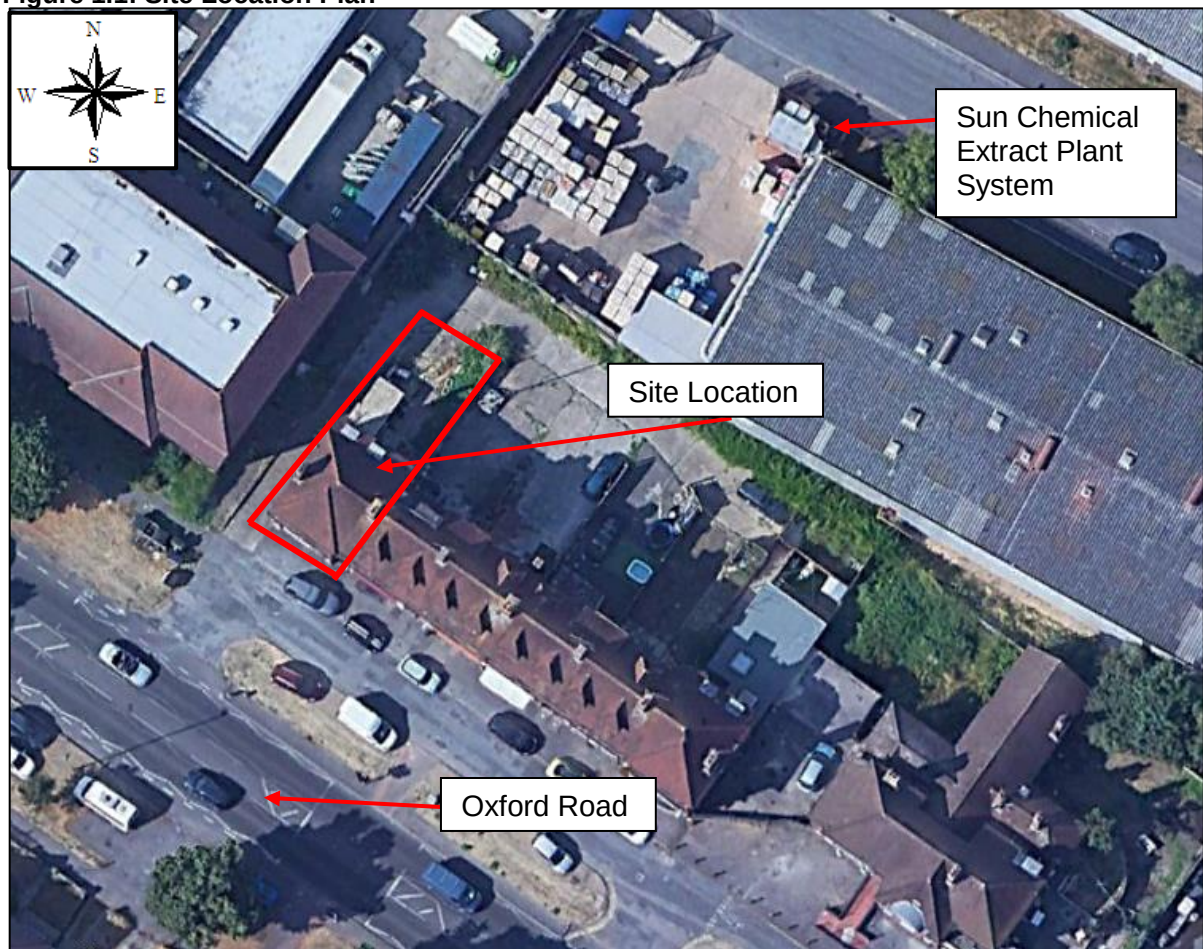
Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing.

REASON: *These details are required due to insufficient information being contained within this submission and in order to safeguard the amenity of occupants in accordance with Policy CC8 of the Reading Borough Local Plan 2019.”*

A Glossary of Acoustic Terminology is provided in **Appendix 1**.

Figure 1.1 presents the location of the proposed development site.

Figure 1.1: Site Location Plan



The site is located immediately to the north of Oxford Road. The site is located to the east of a Waitrose supermarket and to the south of the Sun Chemical Ltd service yard which is accessed from Deacon Way. A large extract plant system is located on the north-western façade of the Sun Chemical premises. Further north of the Sun Chemical premises, the Great Western Main Line railway is visible from the rear of site. The site is located at the western end of a terrace of commercial units with residential units above. Other commercial uses in the terrace include a fireworks shop, tattoo parlour, barbers and hairdressers, and a take away. There is an extraction system located on the rear of the takeaway premises to the rear of the proposed change of use development, however we have confirmed from the audio recordings that it was not audible over and above the general noise climate.

2. THE NATURE, MEASUREMENT AND EFFECT OF NOISE

Noise is often defined as sound that is undesired by the recipient. Whilst it is impossible to measure nuisance caused by noise directly, it is possible to characterise the loudness of that noise. 'Loudness' is related to both sound pressure and frequency, both of which can be measured. The human ear is sensitive to a wide range of sound levels. The sound pressure level of the threshold of pain is over a million times that of the quietest audible sound. In order to reduce the relative magnitudes of the numbers involved, a logarithmic scale of decibels (dB) is normally used, based on a reference level of the lowest audible sound.

The response of the human ear is not constant over all frequencies. It is therefore usual to weight the measured frequencies to approximate the human response. The resulting 'A' weighted decibel, dB (A), has been shown to correlate closely to the subjective human response.

When related to changes in noise, a change of ten decibels, for example, from 60 dB (A) to 70 dB (A), would represent a doubling in 'loudness'. Similarly, a decrease in noise, for example, from 70 dB (A) to 60 dB (A), would represent a halving in 'loudness'. A change of 3 dB (A) is generally considered to be just perceptible¹. **Table 2.1** details typical noise levels.

Table 2.1: Typical Noise Levels

Approximate Noise Level (dB(A))	Example
0	Limit of hearing
30	Rural area at night
40	Library
50	Quiet office
60	Normal conversation at 1 m
70	In car noise without radio
80	Household vacuum cleaner at 1 m
100	Pneumatic drill at 1 m
120	Threshold of pain

¹ Institute of Environmental Management and Assessment (2014). Guidelines for environmental noise impact assessment.

3. TARGET NOISE LEVELS

The planning condition identifies the use of the target noise levels from Table 4 of BS 4142:2014 for the assessment of noise impacts on the proposed change of use development. Table 4 of BS 4142:2014 is reproduced in **Table 3.1**.

Table 3.1: Indoor Ambient Noise Levels for Dwellings

Activity	Location	Daytime 0700 hrs to 2300 hrs	Night-time 2300 hrs to 0700 hrs
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

In accordance with the planning condition, maximum noise levels should not exceed 45 dB L_{AFmax} more than ten times a night.

4. NOISE MEASUREMENT SURVEY

A noise measurement survey has been carried out at the site in order to determine the extent to which it is currently affected by noise. Noise measurements were carried out in order to characterise the existing noise climate over a 24-hour period. The noise measurements were carried out between 0930 on Wednesday 26th February 2020 and 1000 hrs on Thursday 27th February 2020 at two semi-permanent noise monitoring positions. The locations of the noise monitoring positions are identified in **Figure F.1**.

The weather conditions recorded during the daytime on the 26th February 2020 were dry with approximately 5% cloud cover. However, after 1400 hrs there were intermittent light rain showers for approximately two hours which did not noticeably affect the noise measurement results. There was a south-westerly wind with average speeds of approximately 3 m/s, occasional gusts exceeding 5 m/s and a temperature of 5°C.

During the night-time, there was rain between 0400 hrs and 1000 hrs, however, as identified from the audio recordings obtained at both of the noise measurement positions, the rain has not significantly affected the noise measurement results. There was a northerly wind with speeds of approximately 4 m/s and a temperature of 2°C².

The weather conditions recorded on the 27th February 2020 were wet, with 100% cloud cover. There was a south-westerly wind with average speeds of 2.3 m/s, and a temperature of 3°C was recorded.

The semi-permanent noise measurements utilised two Svantek 971 Sound Level Meters. Both of these meters are Class 1 rated and hold current certificates of calibration, which are available upon request. The equipment was field calibrated before and after the measurement period to ensure that it had remained within reasonable calibration limits (± 0.5 dB).

Measurement Position 1 (MP1) was located at a height of 5 m above local ground level at the front of the property. The microphone was mounted approximately 1 metre from the building façade, outside of a first floor window. MP1 was located approximately 15 m to the north of Oxford Road. The dominant noise source at MP1 was road traffic noise from the adjacent Oxford Road.

Measurement Position 2 (MP2) was located at a height of 5 m above local ground level at the rear of the development. The microphone was mounted approximately 1 metre from the building façade, outside of a ground floor window. MP2 was located approximately 20 m to the south of the boundary of Sun Chemicals Ltd. The dominant noise source at MP2 was the extract plant system at Sun Chemicals Ltd. The extract plant, as identified from the noise measurement data and audio recordings from MP2, is operational between 0600 hrs and 2000 hrs. Intermittent train movements were audible during the periods that the plant noise

² Retrieved from <http://www.timeanddate.com/weather/uk/reading/history> on 27th February 2020

was not operational (i.e. during the evening and night-time periods), as well as some neighbourhood noises such as dogs barking, people shouting etc.

The daytime and night-time façade noise levels measured at MP1 and MP2 are summarised in **Table 4.1**. The detailed façade noise measurement results are presented in **Appendix 2**.

Table 4.1: Summary of the Façade Noise Levels from Semi-Permanent Noise Monitoring

Measurement Position	Period (hours)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	Average $L_{A10,5min}$ (dB)	Average $L_{A90,5min}$ (dB)
MP1	Daytime (0700 hrs to 2300 hrs)	71	89	73	64
	Night-time (2300 hrs to 0700 hrs)	66	79 (80)	64	42
MP2	Daytime (0700 hrs to 2300 hrs)	65	82	63	58
	Night-time (2300 hrs to 0700 hrs)	57	71 (72)	52	44

Note: The noise measurements were carried out over consecutive five-minute periods. The $L_{Aeq,T}$ was subsequently logarithmically averaged over the time periods indicated in **Table 4.1**. The L_{AFmax} is the maximum L_{AFmax} in each period, with the tenth highest night-time L_{AFmax} noise levels (obtained from the measured five-minute periods) presented in parenthesis. The average $L_{A10,5min}$ and $L_{A90,5min}$ are arithmetical averages of the five-minute L_{A10} and L_{A90} noise levels.

Table 4.2 identifies the free-field noise levels which have been derived from the measured façade noise levels by subtracting a 3 dB façade correction for sound reflections.

Table 4.2: Summary of the Free-Field Noise Levels from Semi-Permanent Noise Monitoring

Measurement Position	Period (hours)	L _{Aeq,T} (dB)	L _{AFmax} (dB)	Average L _{A10,5min} (dB)	Average L _{A90,5min} (dB)
MP1	Daytime (0700 hrs to 2300 hrs)	68	86	70	61
	Night-time (2300 hrs to 0700 hrs)	63	76 (77)	61	39
MP2	Daytime (0700 hrs to 2300 hrs)	62	79	60	55
	Night-time (2300 hrs to 0700 hrs)	54	68 (69)	49	41

Note: The noise measurements were carried out over consecutive five-minute periods. The L_{Aeq,T} was subsequently logarithmically averaged over the time periods indicated in **Table 4.2**. The L_{AFmax} is the maximum L_{AFmax} in each period, with the tenth highest night-time L_{AFmax} noise levels (obtained from the measured five-minute periods) presented in parenthesis. The average L_{A10,5min} and L_{A90,5min} are arithmetical averages of the five-minute L_{A10} and L_{A90} noise levels.

5. NOISE IMPACT ASSESSMENT

The free-field noise results of the noise measurement survey detailed in **Section 4** have been utilised to identify the extent to which the site is currently affected by noise.

5.1. Internal Noise Levels

BS 8233 states that “*if partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15 dB*”. The WHO guidelines also state that a slightly open window would result in “*a [sound] reduction from outside to inside of 15 dB*”.

Table 5.1 identifies the predicted internal noise levels with open windows for ventilation and the minimum combined façade sound reduction required to achieve the noise criteria of BS 8233.

Table 5.1: Predicted Internal Noise Levels with Open Windows for Ventilation

Receptor	Predicted External Noise Levels (dB) ⁽¹⁾			Predicted Internal Noise Levels (dB) With opens windows			Target Internal Noise Levels Achieved?	Minimum Combined Façade Sound Reduction Required ⁽²⁾ dB(A)
	Daytime L _{Aeq,16hr}	Night-time L _{Aeq,8hr}	Night-time L _{AFmax}	Daytime L _{Aeq,16hr}	Night-time L _{Aeq,8hr}	Night-time L _{AFmax}		
Front Façade (MP1)	68	63	77	53	48	62	X	33
Rear Façade (MP2)	62	54	69	47	33	54	X	27

Note: The L_{AFmax} is the tenth highest night-time L_{AFmax} noise level

Table 5.1 identifies that the target internal noise levels would not be achieved with open windows for ventilation at the proposed change of use development. In accordance with the planning condition, mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation, such as the Titon Sonair or similar, should be provided to the proposed residential units to minimise the need to open windows.

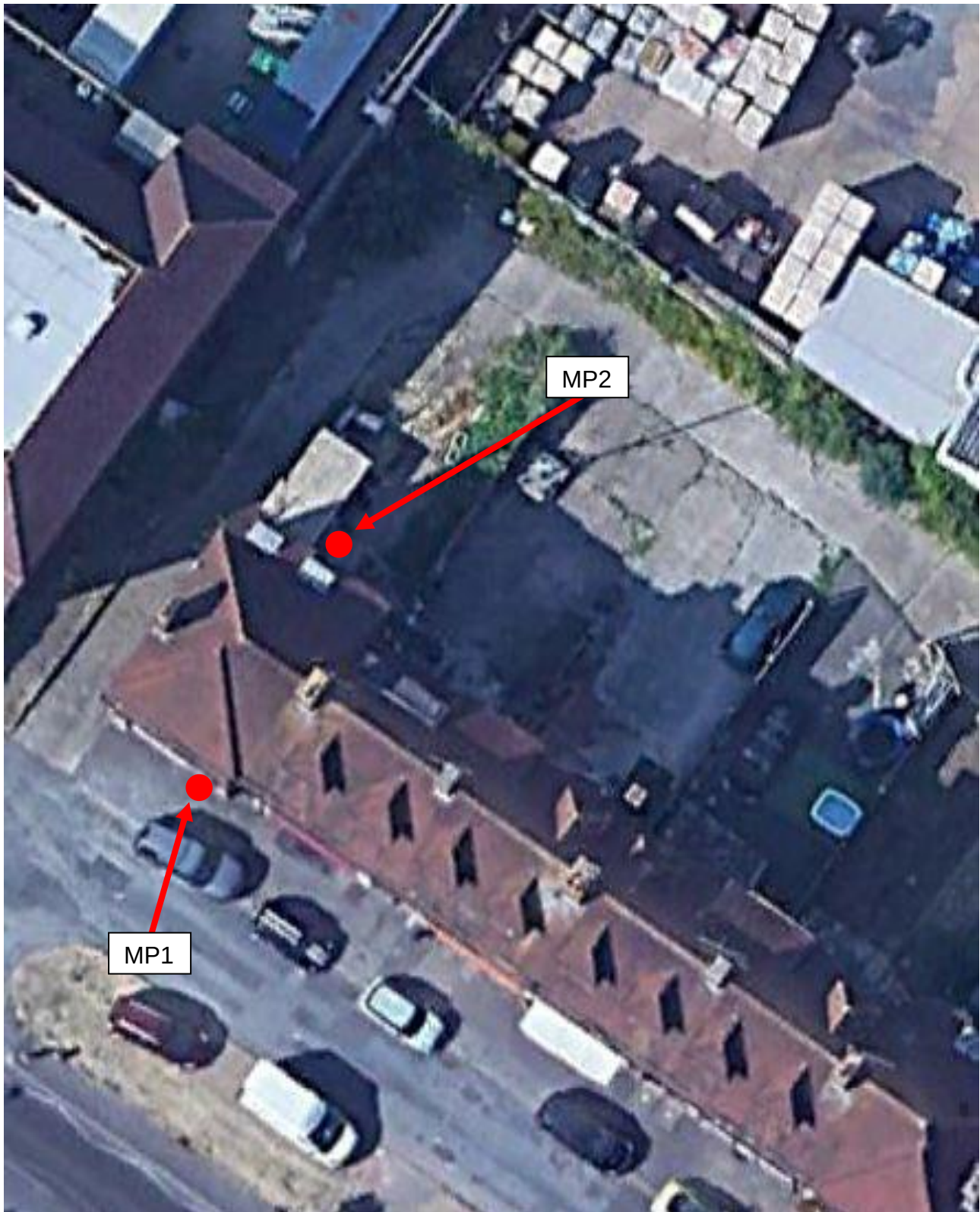
6. CONCLUSION

An environmental noise survey has been carried out at the site to inform the assessment of noise impacts on the proposed development in line with the requirements of the proposed pre-commencement planning condition.

Section 5 identifies that the target internal noise levels would not be achieved with open windows for ventilation. Therefore, a mechanical ventilation system with heat recovery and cool air bypass, or similar (for example Titon Sonair systems) should be provided for the new ground floor and basement residential units.

ADDITIONAL FIGURES

Figure F.1: Noise Measurement Locations



APPENDICES

Appendix 1

Glossary of Acoustic Terminology

Term	Description
'A'-Weighting	<i>This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.</i>
Decibel (dB)	<i>This is a tenth (deci) of a bel. Decibel can be a measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.</i>
$L_{Aeq,T}$ (Ambient/Period Sound Level)	<i>The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specified location. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.</i>
$L_{A90,T}$ (Background Sound Level)	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time. The $L_{A90,T}$ is used to describe the background noise levels at a particular location.</i>
$L_{A10,T}$ (Road Traffic Noise Level)	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time. The $L_{A10,T}$ is used to describe road traffic noise levels at a particular location.</i>
L_{Amax}	<i>The 'A'-weighted maximum sound pressure level measured over a measurement period. Typically measured with 'fast' weighting (125 ms) or 'slow' weighting (1 s).</i>
Rating Level, $L_{Ar,Tr}$	<i>The specific sound level plus any adjustment for the characteristic features of the sound.</i>
Residual Sound Level, $L_r = L_{Aeq,T}$	<i>Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.</i>
Specific Sound Level, $L_s = L_{Aeq,Tr}$	<i>The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.</i>

Appendix 2

Noise Measurement Results

Table 1: Façade Noise Measurement Results for MP1

Time	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
0700 – 0800	75	98	77	68
0800 – 0900	75	93	77	70
0900 – 1000	73	82	75	67
1000 – 1100	70	83	73	64
1100 – 1200	70	94	72	64
1200 – 1300	70	86	73	64
1300 – 1400	72	102 (sirens)	72	64
1400 – 1500	73	106 (sirens)	73	64
1500 – 1600	71	94	73	65
1600 – 1700	70	91	73	66
1700 – 1800	71	94	73	66
1800 – 1900	70	80	73	65
1900 – 2000	70	83	73	64
2000 – 2100	69	80	72	61
2100 – 2200	67	79	71	54
2200 – 2300	67	77	71	52
2300 – 0000	64	80	68	44
0000 – 0100	62	78	67	40
0100 – 0200	57	75	56	37
0200 – 0300	57	78	53	35
0300 – 0400	60	79	58	35
0400 – 0500	62	81	62	40
0500 – 0600	68	81	72	48
0600 – 0700	72	81	76	58
Day (0700 – 2300)	71	89	73	64
Night (2300 – 0700)	66	79	64	42

The L_{Aeq,T} noise levels measured in each 5-minute period were logarithmically averaged over the periods stated in the table above. The L_{AFmax} levels are the highest maximum noise levels measured in each hourly period with the average of these levels presented in the daytime and night-time summary rows. The L_{A10,T} and L_{A90,T} noise levels are arithmetic averages of the noise levels measured in 5-minute periods for each of the periods stated in the table above.

Table2: Façade Noise Measurement Results for MP2

Time	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
0700 – 0800	65	77	67	64
0800 – 0900	65	73	66	63
0900 – 1000	67	97	67	60
1000 – 1100	64	86	66	61
1100 – 1200	67	92	67	61
1200 – 1300	63	74	65	61
1300 – 1400	67	87	68	61
1400 – 1500	66	92	66	61
1500 – 1600	70	97	68	61
1600 – 1700	64	82	65	61
1700 – 1800	64	72	65	62
1800 – 1900	64	71	65	62
1900 – 2000	63	81	65	60
2000 – 2100	52	74	54	45
2100 – 2200	51	76	52	42
2200 – 2300	55	85	52	42
2300 – 0000	49	73	50	40
0000 – 0100	51	71	52	39
0100 – 0200	47	71	45	37
0200 – 0300	47	69	46	39
0300 – 0400	48	73	49	40
0400 – 0500	51	71	53	45
0500 – 0600	55	70	57	51
0600 – 0700	65	73	65	61
Day (0700 – 2300)	65	82	63	58
Night (2300 – 0700)	57	71	52	44

The L_{Aeq,T} noise levels measured in each 5-minute period were logarithmically averaged over the periods stated in the table above. The L_{AFmax} levels are the highest maximum noise levels measured in each hourly period with the average of these levels presented in the daytime and night-time summary rows. The L_{A10,T} and L_{A90,T} noise levels are arithmetic averages of the noise levels measured in 5-minute periods for each of the periods stated in the table above.



Email: enquiry@accon-uk.com

Reading Office:

Unit B, Fronds Park,
Frouds Lane, Aldermaston,
Reading, RG7 4LH
Tel: 0118 971 0000 Fax: 0118 971 2272

Brighton Office:

Citibase, 95 Ditchling Road,
Brighton, East Sussex, BN1 4ST
Tel: 01273 573 814

www.accon-uk.com