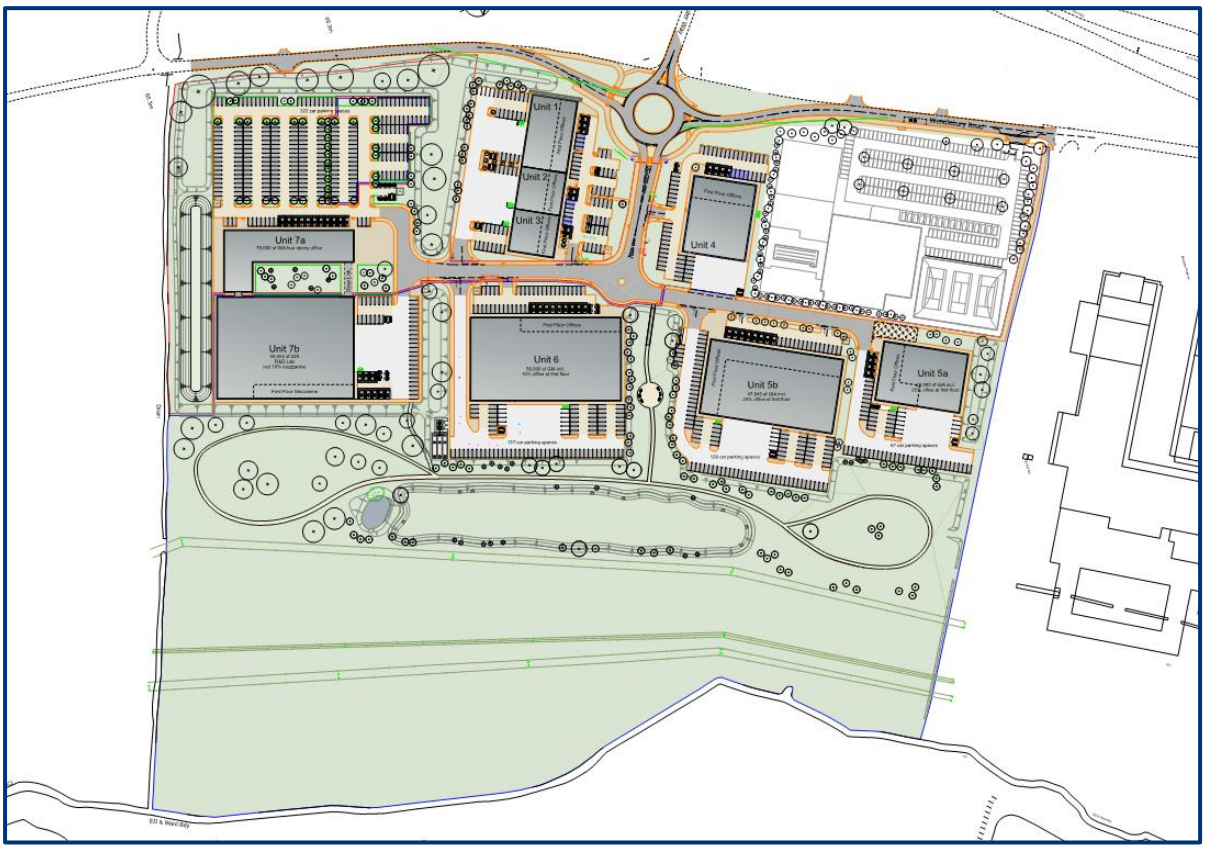
Unit 7A, Catalyst Bicester

Noise Assessment

784-B034431



Noise Assessment for Proposed Office Development

March 2022

Prepared on Behalf of Albion Land Limited

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1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This report presents the findings of a noise assessment for a full planning application for Unit 7A which forms part of the proposed development known as Catalyst Bicester. The site benefits from planning consent associated with the outline planning application (reference: 19/01746/OUT). This noise assessment has been produced in support of a full planning application on part of the site. The proposal comprises a 4-storey office (Use Class E(g)(i)) building and associated access, parking, landscaping and infrastructure.

This report considers noise intrusion within the proposed office spaces and the potential noise impact upon existing sensitive receptors of the following sources:

- Building services plant

Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise. The noise levels from all proposed noise sources associated with site have been predicted at local representative receptors using CADNA noise modelling software which incorporates ISO 9613 and CRTN methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A. Location plans and noise contour plots are presented in Appendix B.

1.2 LEGISLATIVE CONTEXT

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in the revised National Planning Policy Framework (NPPF), published on 20th July 2021. Section 15, Conserving and enhancing the natural environment of the National Planning Policy Framework (NPPF 2021) provides the following guidance in relation to noise impacts.

"*174 Planning policies and decisions should contribute to and enhance the natural and local environment by:*

> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…"*

"185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason…"

"187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

188. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England (NPSE), is to *'identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.'*

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

Table 1.1 NPPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No Specific Measures Required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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 change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The NPPF, NPSE and NPPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents including 'BS 4142: 2014 + A1:2019 '*Methods for Rating and Assessing Industrial and Commercial Sound'* and BS8233:2013 '*Guidance on sound insulation and noise reduction for buildings*.' Section 2.0 presents the noise level criteria used as a basis of this assessment.

The NPPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

1.3 ACOUSTIC CONSULTANTS' QUALIFICATIONS, PROFESSIONAL MEMBERSHIPS

The lead acoustic consultant for this assessment is Emma Aspinall. The report has been verified by Nigel Mann. Relevant qualifications, membership and experience are summarised below.

Table 1.2 Acoustic Consultants' Qualifications & Experience

Name	Education	Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Emma Aspinall	MGeol (2017)	Jul (2017)	Jan (2021)	-
Graham Davis	BA (2008)	Sept (2011)	Jan (2014)	-
Nigel Mann	BSc (1997) Msc (1999)	Nov (1998)	Nov (2001)	Jul (2005)

2.0 ASSESSMENT CRITERIA

2.1 NOISE ASSESSMENT CRITERIA

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 present the equivalent noise levels and associated actions with the target noise level criteria identified for building services plant. The noise level criteria detailed below have been derived from the following standards and design guidance:

- BS 4142:2014 + A1:2019 *'Methods for rating and assessing industrial and commercial sound'*

Table 2.1 Noise Level Criteria and Actions

Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level (NOAEL)	BS4142 Score of zero or lower	No Action Required Score of zero or lower is an indication of the sound source having a low impact
Lowest Observed Adverse Effect Level (LOAEL)	*BS4142 Score of +5 or lower*	No Action Required Difference of +5 dB likely to be an indication of an adverse effect BS4142 Score of plus 5 or lower
Significant Observed Adverse Effect Level (SOAEL)	BS4142 Score between +5 and +10	Difference of up to +10dB likely to be an indication of a significant adverse effect Mitigate to achieve: BS4142 Score of + 5 or lower
Unacceptable Observed Adverse Effect Level (UOAEL)	BS4142 Score of + 10 or higher	Avoid Mitigate to achieve: BS4142 Score of 5 dB or lower

Table 2.2 below presents the design range criteria for internal office spaces of the development site derived from BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings – Code of practice'.

Table 2.2 Internal Noise Level Criteria

Criterion	Typical Situations	Design Range $L_{Aeq,T}$ (dB)
Typical noise levels for acoustic privacy in shared spaces	Open Plan Office	45-50
Study and work requiring concentration	Staff/Meeting Room, Training Room, Executive Office	35-45
Speech of telephone communications	Cafeteria, canteen, kitchen	45-55
-	Toilets	50-55

3.0 ASSESSMENT METHODOLOGY

3.1 NOISE MODELLING METHODOLOGY

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data and model settings as given in the table below have been used.

Table 3.1 Modelling Parameters Sources and Input Data

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Traffic data – main surrounding roads	DTA Transport Planning Consultants	Provided by DTA Transport Planning Consultants
Traffic data – local roads	DTA Transport Planning Consultants	Provided by DTA Transport Planning Consultants
Building heights – around site	Tetra Tech Observations	8 m height for two storey residential properties, and 4 m for Bungalows. 3 m per storey for multi-storey buildings.
Barrier heights	Tetra Tech Observations	All existing garden fences at 1.8 m with the exception of hedges and trees which are considered to offer no noise protection.
Receptor positions	Tetra Tech	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties. 1.5 m height for model grid and monitoring locations for validation.
Proposed Plans	Cornish Architects	Drawing Title: Full Application Red Line Plan Drawing No.: 21023 – SK – 027 Rev B Dated: 08/02/2022

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst-case.

3.2 MODEL INPUT DATA – OPERATIONAL PHASE

3.2.1 Road Traffic; Noise Data

In order to assess noise intrusion upon proposed office spaces, road traffic data provided by DTA Transport Planning Consultants has been utilised for noise associated with the surrounding road

network. Road traffic levels associated with the future year 2031 scenario with development-generated traffic has been used. The AAWT traffic flows used are presented below in Table 3.2 below.

Table 3.2 Traffic Data (2031 Baseline + Proposed Development)

Road	18hr AAWT
A41 (North)	28891
Unlabelled Rd (East)	5940
A41 (South)	29698
P&R (West)	1072
Vendee Dr (North)	12208
Wendlebury Road	2770

3.2.2 Building Service Plant; Noise Data

Point sources have been used in the model to represent the proposed plant associated with the scheme. The maximum sound pressure levels of the point sources at 1 and 3 metres were estimated in the model as a conditional maximum level that the noise levels at nearby existing and proposed office receptors were predicted to meet the BS 4142 assessment criteria. Noise emission limits have been specified to ensure that plant noise rating levels are at least 10 dB below existing daytime and night-time background noise levels.

3.2.3 Car Park; Noise Data

Worst case noise levels from car parking have been based upon observations and measurements taken at a similar sized car park during a shift change. The noise data has been included in the model as an area source at 1.5m height. The noise levels used are presented in Table 3.3 below.

3.2.4 Summary of Noise Levels

In order to represent a worst-case scenario, noise levels associated with deliveries from the surrounding units have been included within the assessment upon proposed office spaces at Unit 7A. A summary of the operational phase noise levels, used within the model for daytime L_{Aeq} are presented in Table 3.3 below. Further explanation on how each noise level was calculated, for each noise source, can be found in Appendix B.

Table 3.3 Summary of Noise Source Noise levels during Daytime

Noise Source	Noise Level (dB)
	Daytime L_{Aeq}
HGV Unloading	73.8 @ 3m
Car Parking	53.0 @ 3m

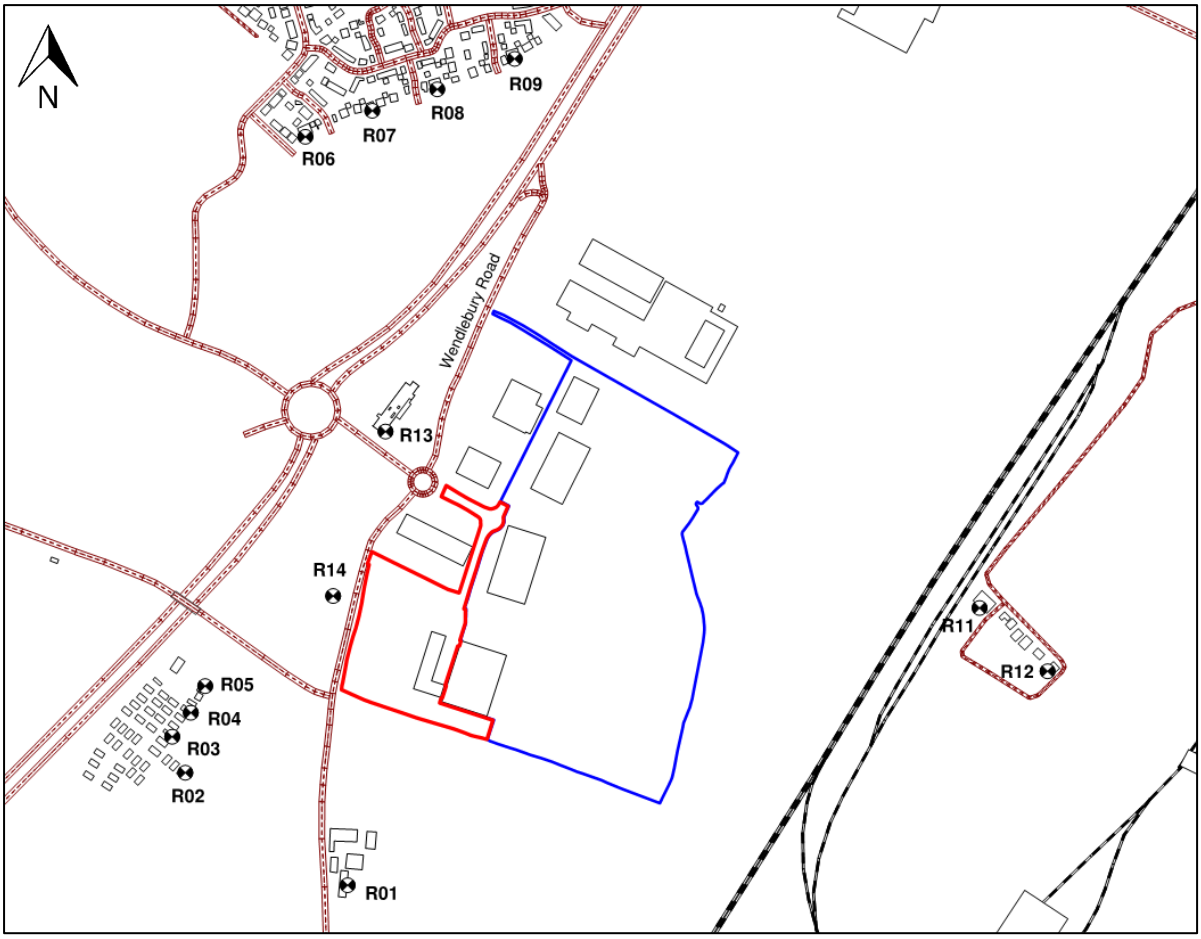
3.3 SENSITIVE RECEPTORS

The table below summarise receptor locations that have been selected to represent worst-case residential receptors with respect to direct noise proposed building services plant associated with Unit 7A. Ground and first floor facades (adjacent and facing the proposed development) of nearest properties have been represented. The locations of the receptors are shown on Figure 3.1 below.

Table 3.4 Receptor Locations

Ref.	Description	Height (m) Daytime/Night-time
R01	Promised Land Farm, Wendlebury Road	1.5 / 4.0
R02	13 Bicester Park Home	1.5
R03	4a Bicester Park Home	1.5
R04	2a Bicester Park Home	1.5
R05	28a Bicester Park Home	1.5
R06	10 Hereford Close	1.5 / 4.0
R07	15 Hereford Close	1.5 / 4.0
R08	32 Haydock Road	1.5 / 4.0
R09	98 Haydock Road	1.5 / 4.0
R10	77 Flanders Close	1.5 / 4.0
R11	1 Graven Hill	1.5 / 4.0
R12	10 Graven Hill	1.5 / 4.0
R13	Holiday Inn Express, Wendlebury Road	4.0
R14	Consented Residential Units, Wendlebury Road (20/00293/OUT)	4.0

Figure 3.1 Sensitive Receptor Locations



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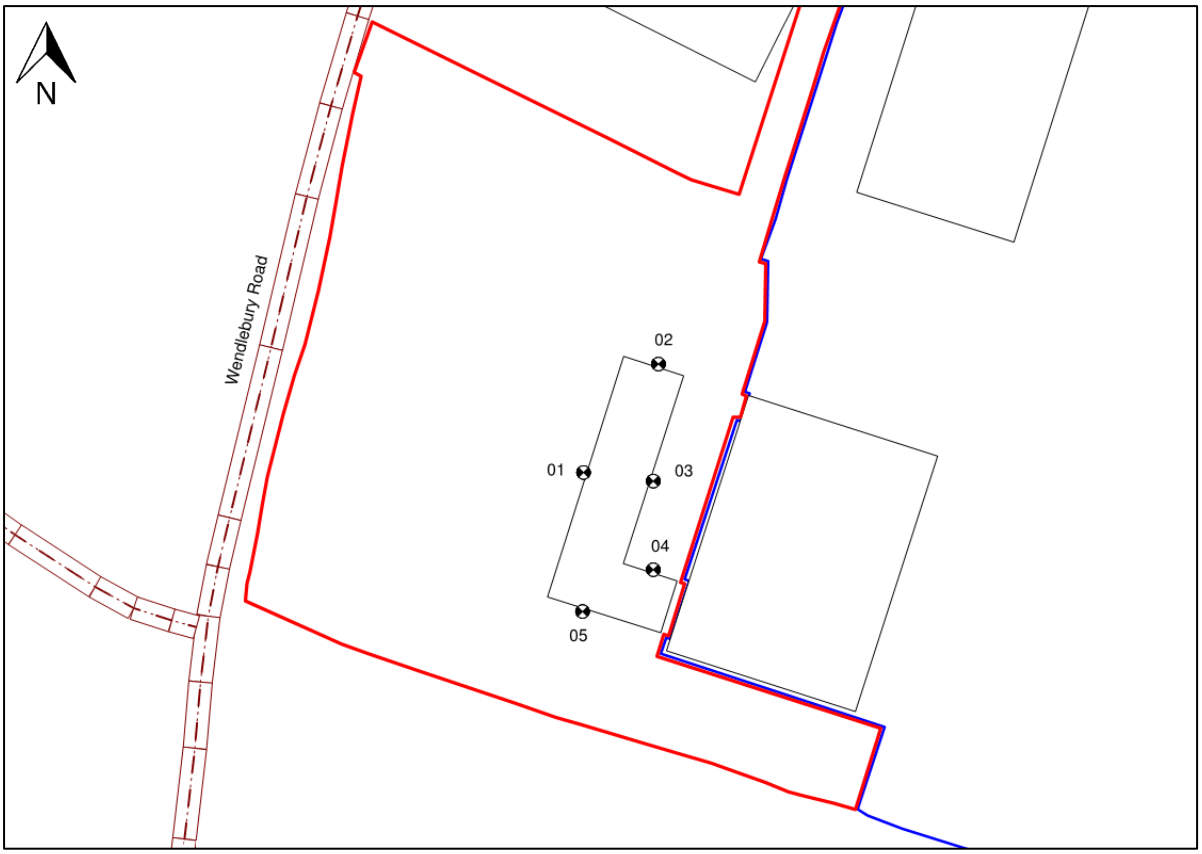
An assessment upon proposed office facades has been undertaken inclusive of existing and proposed noise levels across the site and have been assessed at ground floor up to third floor heights. The locations of the proposed receptors are shown on Figure 3.2 below.

Figure 3.2 Proposed Office Receptor Locations



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4.0 NOISE SURVEY

4.1 NOISE SURVEY METHODOLOGY

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Rion NL-52	Environmental Noise Analyser	s/n	1276552
Rion NL-32	Environmental Noise Analyser	s/n	213442
Rion NL-52	Environmental Noise Analyser	s/n	342867
Rion NC-75	Sound Calibrator	s/n	35270131

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice, and no drift was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

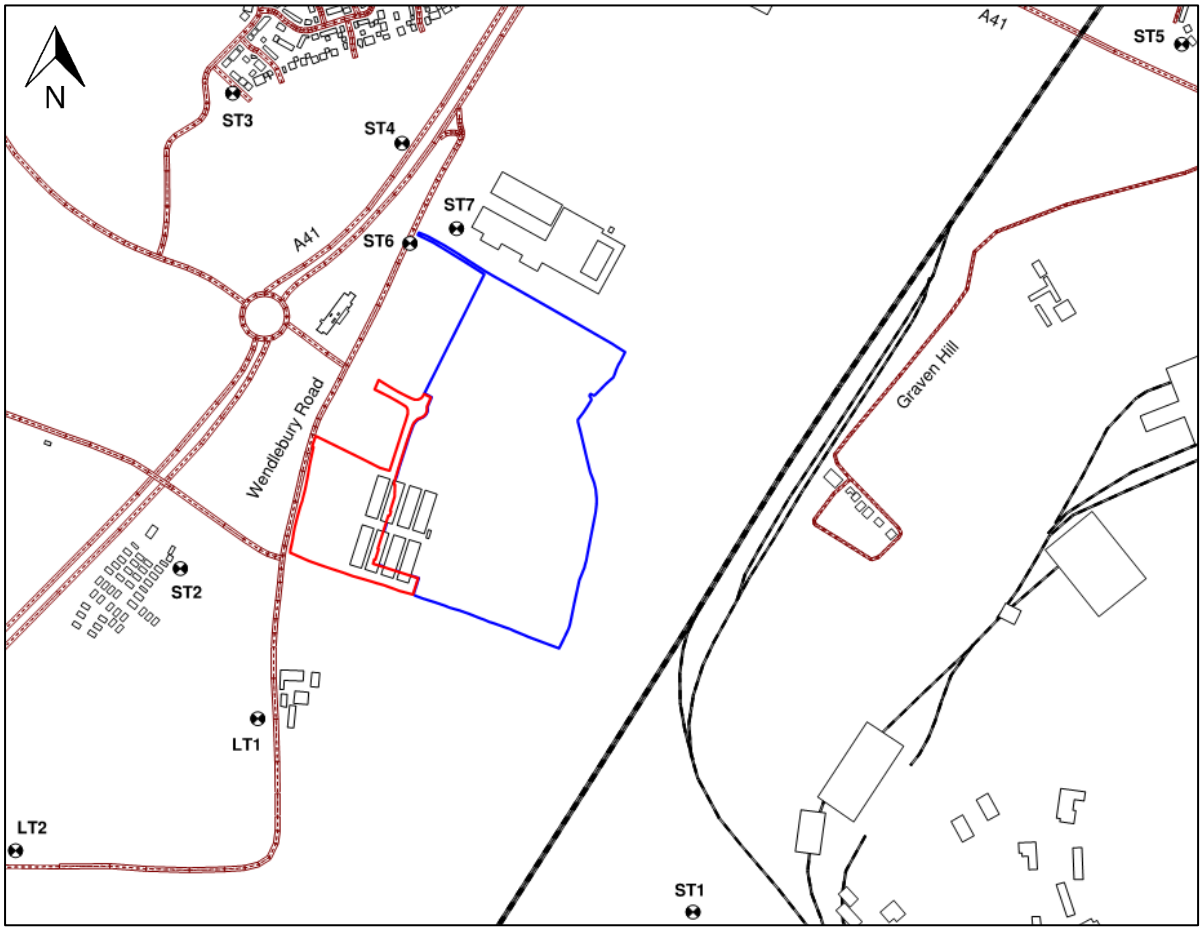
A baseline monitoring survey was undertaken at six locations (as specified in the following table and shown in Figure 4.1) from Friday 16th November 2018 to Thursday 22nd November 2018. Attended short term measurements were undertaken at seven locations during day, evening and night-time periods with two additional locations being measured unattended over a 141-hour period. The raw data collected from the long-term monitoring are available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms^{-1} at all times during the survey, with a predominant easterly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	South-west of the site, adjacent Wendlebury Road
LT2	South-west of the site, between Wendlebury Road and A41
ST1	1 Hexham Road
ST2	North of the site, adjacent to A41
ST3	73a Flanders Close
ST4	North of the site, adjacent to Wendlebury Road
ST5	Bicester Avenue Garden Centre car park
ST6	South-west of the site, adjacent Wendlebury Road
ST7	South-west of the site, between Wendlebury Road and A41

Figure 4.1 Noise Monitoring Locations



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4.2 NOISE SURVEY RESULTS

The ambient noise climate found in the area includes road traffic noise from the A41 located towards the western boundary of the proposed development site. Noise was also audible from surrounding localised roads such as Wendlebury Road and Anniversary Avenue with occasional contributions from passing rail traffic.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period). For the long-term (LT) locations, the presented $L_{Aeq,T}$ and $L_{A10,T}$ are average noise levels whilst the L_{A90} is the modal noise level of each 5-minute measurement over the stated survey period.

Table 4.2 Meteorological Conditions during the Survey

Survey Location	Date & Time	Temperature (ºC)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Daytime ST1	21/11/2018 12:30	7.0	3 - 4	E	0	Distant road traffic noise
Daytime ST2	21/11/2018 13:03	7.0	4 - 5	E	0	Localised road traffic noise Wendlebury Road and distant road traffic noise from the A41
Daytime ST3	21/11/2018 14:45	6.0	3 - 4	E	4	Road traffic noise A41
Daytime ST4	21/11/2018 15:07	5.0	3 - 4	E	4	Road traffic noise A41
Daytime ST5	21/11/2018 11:57	7.0	1 - 2	E	0	Road traffic noise A41
Daytime ST6	21/11/2018 14:18	7.0	3 - 4	E	2	Road traffic noise A41
Daytime ST7	21/11/2018 13:56	7.0	2 - 3	E	0	Road traffic noise on garden centre exit road
Evening ST1	21/11/2018 21:18	1.0	0 - 1	E	0	Distant road traffic noise
Evening ST2	21/11/2018 19:09	2.0	0 - 1	E	0	Road traffic noise A41
Evening ST3	21/11/2018 14:45	2.0	0 - 1	E	0	Road traffic noise A41
Evening ST4	21/11/2018 15:07	2.0	0 - 1	E	0	Road traffic noise A41
Evening ST5	21/11/2018 11:57	2.0	0 - 1	E	0	Road traffic noise A41
Evening ST6	21/11/2018 14:18	2.0	0 - 1	E	0	Road traffic noise A41
Night-time ST1	22/11/2018 01:10	0.0	0 - 1	E	0	Distant road traffic noise
Night-time ST2	22/11/2018 00:31	0.0	0 - 1	E	0	Road traffic noise A41
Night-time ST3	21/11/2018 23:46	0.0	0 - 1	E	0	Road traffic noise A41
Night-time ST4	22/11/2018 00:04	0.0	0 - 1	E	0	Road traffic noise A41
Night-time ST5	21/11/2018 23:00	1.0	0 - 1	E	0	Road traffic noise A41
Night-time ST6	21/11/2018 23:22	0.0	0 - 1	E	0	Road traffic noise A41

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2 x 10^{-5} Pa).

Table 4.3 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Daytime 07:00 - 23:00	61 Hours	16/11/2018 – 22/11/2018 11:44 – 08:44	LT1	64.5	93.8	28.4	47.9	48.0
Weekday Night-time 23:00 – 07:00	32 Hours	16/11/2018 – 22/11/2018 23:00 - 07:00		53.3	90.7	25.6	41.2	37.0
Weekend Daytime 07:00 - 23:00	32 Hours	17/11/2018 – 18/11/2018 07:00 - 23:00		62.4	93.7	36.0	47.2	46.0
Weekend Night-time 23:00 – 07:00	16 hours	17/11/2018 – 18/11/2018 23:00 - 07:00		51.4	85.7	22.4	37.4	36.0
Weekday Daytime 07:00 - 23:00	61 Hours	16/11/2018 – 22/11/2018 12:17 – 08:32	LT2	60.1	82.0	32.7	61.8	56.0
Weekday Night-time 23:00 – 07:00	32 Hours	16/11/2018 – 22/11/2018 23:00 - 07:00		55.0	75.0	28.3	56.2	38.0
Weekend Daytime 07:00 - 23:00	32 Hours	17/11/2018 – 18/11/2018 07:00 - 23:00		59.3	80.8	36.9	61.0	57.0
Weekend Night-time 23:00 – 07:00	16 hours	17/11/2018 – 18/11/2018 23:00 - 07:00		51.0	81.2	25.4	54.0	36.0
Daytime 07:00 - 19:00	15 Mins	21/11/2018 12:30	ST1	52.2	69.1	42.5	55.0	46.3
	15 Mins	21/11/2018 13:03	ST2	52.0	73.5	45.3	54.0	48.6
	15 Mins	21/11/2018 14:45	ST3	57.1	76.5	51.6	58.0	53.5
	15 Mins	21/11/2018 15:07	ST4	72.9	86.3	53.0	76.6	60.1
	15 Mins	21/11/2018 11:57	ST5	62.3	75.8	54.1	64.5	58.8
	15 Mins	21/11/2018 14:18	ST6	66.3	82.4	48.1	70.9	52.5
	15 Mins	21/11/2018 13:56	ST7	57.7	79.3	47.4	58.0	50.0
Evening 19:00 - 23:00	15 Mins	21/11/2018 21:18	ST1	54.5	91.9	41.2	45.8	43.0
	15 Mins	21/11/2018 19:09	ST2	52.1	66.6	45.2	54.3	48.6
	15 Mins	21/11/2018 14:45	ST3	51.2	60.9	46.4	53.2	48.7
	15 Mins	21/11/2018 15:07	ST4	71.5	90.0	49.3	76.0	55.6
	15 Mins	21/11/2018 11:57	ST5	57.9	65.9	42.3	61.3	49.1
	15 Mins	21/11/2018 14:18	ST6	59.7	78.0	48.3	60.8	52.3
Night-time 23:00 - 07:00	15 Mins	22/11/2018 01:10	ST1	39.5	53.7	35.7	41.1	37.5
	15 Mins	22/11/2018 00:31	ST2	44.4	54.4	36.2	47.5	40.0
	15 Mins	21/11/2018 23:46	ST3	46.0	60.4	39.0	48.3	42.2
	15 Mins	22/11/2018 00:04	ST4	66.6	85.8	40.8	69.8	43.7
	15 Mins	21/11/2018 23:00	ST5	54.9	66.0	40.7	59.1	44.6
	15 Mins	21/11/2018 23:22	ST6	57.5	82.6	41.0	55.1	45.5

All values are sound pressure levels in dB re: 2x 10^{-5} Pa

5.0 ASSESSMENT OF KEY EFFECTS

5.1 BUILDING SERVICES PLANT NOISE ASSESSMENT

This assessment has been undertaken in order to establish the maximum external noise levels from the proposed building services plant located at a worst-case position on Unit 7A. This includes five indicative sources of roof mounted plant. The assessment compares the predicted worst-case breakout noise levels from the plant with the existing measured average daytime and night-time background noise L_{A90} at the closest existing residential receptors.

A series of predictions were made by defining different sound power levels at a point source. When the sound pressure levels are set as shown in Tables 5.1 (which are considered to be achievable), the noise levels at all the existing and worst-case proposed office receptors are predicted to be at least 10 dB below existing background levels during the daytime and night-time as shown in Tables 5.2. All predicted rating noise levels fall within the No Observed Adverse Effect Level.

In accordance with section 9.2 of BS4142:2014+A1:2019 an overall +3 dB character correction has been applied to account for any intermittent characteristics of noise from the plant units which may be perceptible at the closest sensitive receptors. The assessment presented below has been undertaken with plant for each unit operating at full capacity, simultaneously.

Table 5.1 Proposed Emission Limits for BSP as Modelled

BSP Location	Noise Emission Limit - Sound Pressure Level	
	Daytime 07:00-23:00	Night-time 23:00-07:00
5 no. roof-mounted Indicative Building Services Plant	79.5 dB(A) at 1 m OR 69.9 dB(A) at 3 m	66.5 dB(A) at 1 m OR 56.9 dB(A) at 3 m

Table 5.2 BS 4142 Assessment – Building Services Plant

Location	Existing Measured Background L_{A90}		Noise rating level from plant (with +3 dB Correction)		BS 4142 Score	
	Daytime 07:00-23:00	Night-time 23:00-07:00	Daytime 07:00-23:00	Night-time 23:00-07:00	Daytime 07:00-23:00	Night-time 23:00-07:00
R01	46	36	27	15	-19	-21
R02	49	36	33	20	-17	-17
R03	49	36	32	19	-17	-17
R04	49	36	33	20	-16	-16
R05	49	36	34	21	-15	-15
R06	49	42	27	14	-22	-28
R07	49	42	25	12	-24	-30
R08	49	42	23	10	-26	-32
R09	49	42	22	9	-27	-33
R10	49	45	16	3	-33	-42

Location	Existing Measured Background L_{A90}		Noise rating level from plant (with +3 dB Correction)		BS 4142 Score	
	Daytime 07:00-23:00	Night-time 23:00-07:00	Daytime 07:00-23:00	Night-time 23:00-07:00	Daytime 07:00-23:00	Night-time 23:00-07:00
R11	43	38	25	12	-18	-26
R12	43	38	24	11	-20	-27
R13	50	46	32	19	-18	-27
R14	46	36	39	26	-10	-10

All values are sound pressure levels in dBA re: 2x 10^{-5} Pa.

All calculations used to derive the above table (including averaging of background noise levels and predicted source noise levels) have been undertaken to 1 decimal place to avoid perpetuation of rounding errors. However, in accordance with BS4142 para 8.6 the levels are expressed as integers (with 0.5 dB being rounded up). This may mean that the arithmetic's in the above table may appear to be up to 1 dB incorrect due to this rounding.

5.2 NOISE INTRUSION FOR PROPOSED OFFICES

To represent a worst-case assessment, internal noise levels have been assessed within potential office spaces at Unit 7A from noise associated with future year 2031 traffic flows, proposed building services plant and operational noise from the proposed surrounding employment units. Furthermore, for the purposes of this worst-case assessment, no screening effects associated with the consented development (20/00293/OUT) have been included within the noise model.

The noise levels have been assessed both with windows open, where a reduction from a partially open window of 15 dB has been used, and with windows closed where glazing with a sound reduction of R_w 30 dB has been used unless stated otherwise. Table 5.3 below shows the noise intrusion assessment for potential office spaces within the proposed development to determine whether additional mitigation will be required for specific room-types. Figure 5.1 illustratively shows noise levels across the site during the daytime.

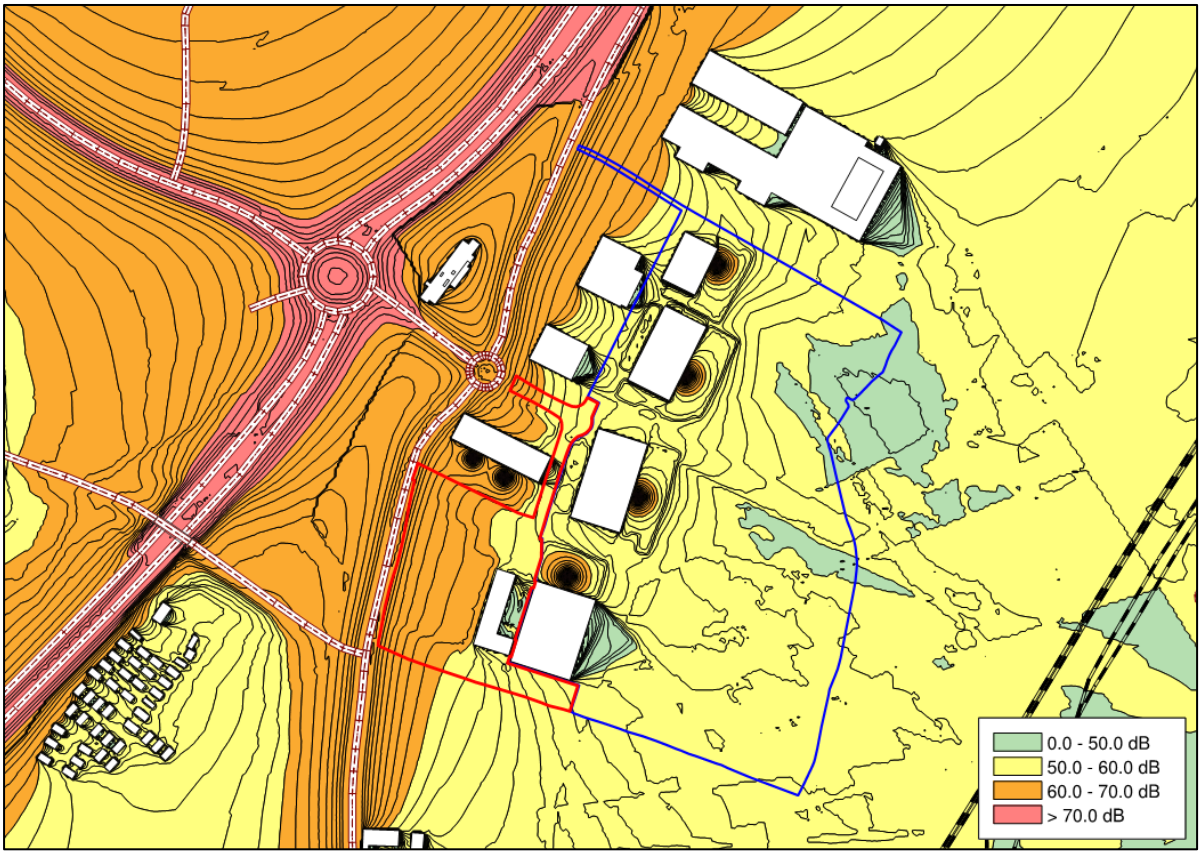
Table 5.3 Daytime Noise Intrusion Levels L_{Aeq} for Proposed Office Spaces

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Minimum Attenuation Required for Open Plan Office R_w/D,n,e,w (dB)	Minimum Attenuation Required for Meeting Rooms etc. R_w/D,n,e,w (dB)	Minimum Attenuation Required for Canteens etc. R_w/D,n,e,w (dB)
Ground Floor						
01	59.7	44.7	29.7	0.0	25.0	0.0
02	57.7	42.7	27.7	0.0	23.0	0.0
03	47.4	32.4	17.4	0.0	0.0	0.0
04	49.0	34.0	19.0	0.0	0.0	0.0
05	55.7	40.7	25.7	0.0	21.0	0.0
First Floor						
01	60.7	45.7	30.7	16.0	26.0	16.0
02	59.4	44.4	29.4	0.0	25.0	0.0
03	48.2	33.2	18.2	0.0	0.0	0.0
04	50.7	35.7	20.7	0.0	16.0	0.0

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Minimum Attenuation Required for Open Plan Office R_W/D,n,e,w (dB)	Minimum Attenuation Required for Meeting Rooms etc. R_W/D,n,e,w (dB)	Minimum Attenuation Required for Canteens etc. R_W/D,n,e,w (dB)
05	56.4	41.4	26.4	0.0	22.0	0.0
Second Floor						
01	60.7	45.7	30.7	16.0	26.0	16.0
02	60.1	45.1	30.1	16.0	26.0	16.0
03	49.2	34.2	19.2	0.0	0.0	0.0
04	53.5	38.5	23.5	0.0	19.0	0.0
05	57.0	42.0	27.0	0.0	22.0	0.0
Third Floor						
01	60.8	45.8	30.8	16.0	26.0	16.0
02	62.1	47.1	32.1	18.0	28.0	18.0
03	51.7	36.7	21.7	0.0	17.0	0.0
04	58.6	43.6	28.6	0.0	24.0	0.0
05	58.7	43.7	28.7	0.0	24.0	0.0

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa

Figure 5.1 Daytime Noise Levels L_{Aeq}



Not to scale
OS Licence No. AL553611
Grid Height: 1.5m

The results presented above demonstrate that the design range for open-place office spaces is generally expected to be achieved, assuming a windows-open scenario. However, certain spaces

(such as cellular offices or meeting rooms) may exceed the lower design-range criteria and therefore the provision of glazing and an alternative means of ventilation (from passive through to mechanical systems) maybe required in order to achieve the target internal noise level and ventilation requirements. Glazing and ventilation with a minimum sound reduction which matches or exceeds the performance outlined in Table 5.3 above would be required and are considered to be readily achievable (it should be noted that due to contributions from the indicative building services plant at upper levels, the glazing specification will be reviewed following the finalised plant selection).

6.0 CONCLUSIONS

A noise impact assessment has been undertaken for a full planning application for Unit 7A as part of the proposed development known as Catalyst Bicester.

The NPPF provides test points against which the proposed development has been assessed. Considering these points, the following conclusions can be drawn:

NPPF paragraphs 174 (e) and 185 (a)

Maximum noise levels from the proposed building services plant have been set and are predicted to be at least 10 dB below existing daytime and night-time background noise levels at existing and proposed residential dwellings.

With regard to proposed office receptors, a noise intrusion assessment has been based upon road traffic noise associated with the future year 2031 traffic flows inclusive of development trips as well as operational noise from the proposed surrounding units. It is considered that all 'adverse impacts on health and quality of life' (relating to noise) are mitigated by the use of an appropriate glazing strategy with alternative means of ventilation which is compliant with Building Regulations. The suggested glazing and ventilation specifications are considered to be readily achievable.

NPPF paragraphs 185 (b), 187 and 188

Considering the site already benefits from outline consent for employment use, it is not considered that any existing businesses wanting to develop would be restricted by the proposals.

Planning Practice Guidance: Noise

Noise levels at both existing and proposed receptors are predicted to fall below the Lowest Observed Adverse Effect Level (LOAEL) during the daytime period.

APPENDICES

APPENDIX A – ACOUSTIC TERMINOLOGY AND ABBREVIATIONS

Acoustic Terminology

dB — Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dB(A) — Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.

L_{Aeq} — Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00\ –\ 23:00}$ for example, describes the equivalent continuous noise level over the 16 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower that the $L_{Aeq,\ 07:00\ –\ 23:00}$.

L_{Amin} — The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.

L_{Amax} — The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

L_n — Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say. 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10,\ 1\ hr}$ = x dB.

The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.

R_w — The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Abbreviations

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

PPG – Planning Practice Guidance

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

APPENDIX B – MODEL INPUT DATA CALCULATIONS

HGV Docking Event; Noise Data

Noise of a docking delivery event has been known to vary from site to site by as much as 22 dB L_{Aeq} at 5 m distance even with the same vehicle type. Similarly, individual events using the same vehicle and at the same store have been recorded to vary by as much as 14 dB.

As such, the following worst-case calculations have been based on measurements of HGVs at an existing distribution depot. All measurements were undertaken in free-field conditions. In addition to noise from the unloading process, the levels used in the assessment include noise from the vehicle pulling up to the unloading bay, manoeuvring into position and then pulling away once unloading/loading is complete, together with other sources such as trolleys and reversing bleepers. During the daytime, the assessment is based on 100% of the docking bays having an HGV arrive, unload and depart in any 1-hour period. Events are modelled as a point source.

HGV Unloading Event Noise Data

- *Specific Noise Level*

  2 minutes at L_p 67.5 dB at 3 m distance (vehicle arriving and manoeuvring)
  30 minutes at L_p 76.8 dB at 3 m distance (vehicle unloading)
  1 minute at L_p 67.5 dB at 3 m distance (vehicle leaving)

  27 minutes of quiet with engine off

$$\text{Daytime } L_{Aeq(60\ mins)} = 10\log(1/60)(2\ \text{mins} \times 10^{0.1 \times 67.5dB} + 30\ \text{mins} \times 10^{0.1 \times 76.8dB} + 1\ \text{mins} \times 10^{0.1 \times 67.5dB})$$

$$= 73.8\ \text{dB at 3 m distance}$$

APPENDIX C – REPORT CONDITIONS

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