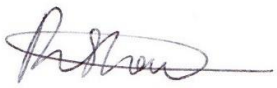
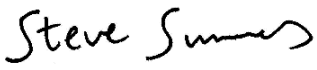
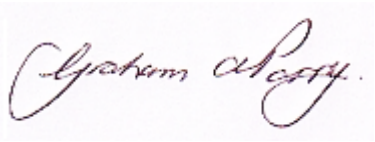
Report for:

XLB Property LLP

Bartley Wood, Hook

Noise Impact Assessment

Status: Final **Date: 25.06.2021**

Author	 Rebecca Shaw BSc (Hons) AMIOA Junior Acoustic Consultant
Author	 Steve Summers BSc MSc MIOA AMICE CEng Associate Director
Reviewed & Approved By	 Graham Parry FIOA Managing Director
Report For	XLB Property LLP'
Date	25.06.2021
Version Number	A4169/N/003
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.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

CONTENTS

LIST OF TABLES

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

LIST OF FIGURES

LIST OF APPENDICES

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

1. INTRODUCTION

1.1. Background

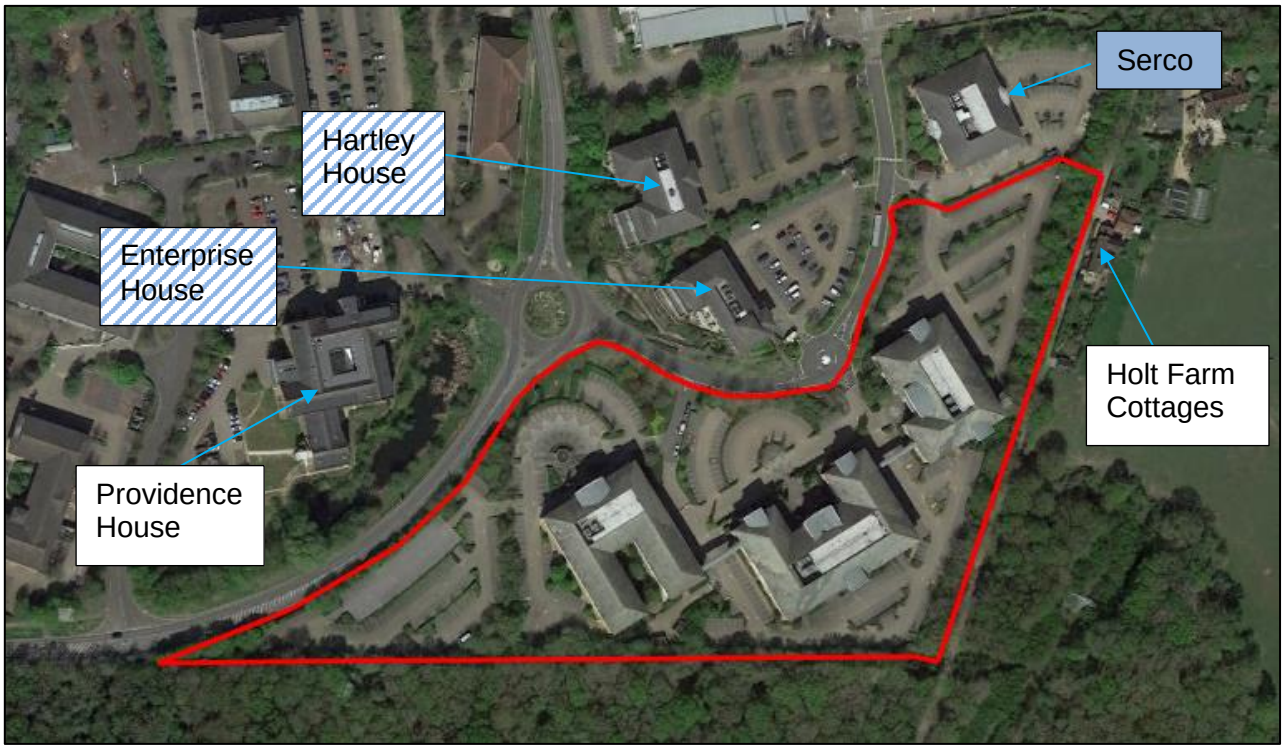
ACCON UK Limited (ACCON) has been commissioned by PRC Architecture & Planning on behalf of XLB Property LLP to undertake a noise impact assessment for the proposed development at Bartley Wood, Hook.

1.2. Existing Site

The site boundary is located approximately 160 m to the south of the South Western Main Line railway and immediately to the west of Holt Road, on the other side of which lie dwellings and a bed and breakfast accommodation. It is also located immediately to the east of Griffin Way South, beyond which lie commercial premises. The site is located approximately 425 m to the north of the M3 motorway with Hook Common & Bartley Heath Nature Reserve (a Site of Special Scientific Interest, SSSI) located between the motorway and the site.

The nearest noise sensitive receptors (NSRs) to the site are illustrated in **Figure 1.1.**

Figure 1.1: Nearest Noise Sensitive Receptors



Key:

Residential NSR	Commercial NSR	Commercial / Residential NSR

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Holt Farm Cottages is a long established residential property and is the closest such property to the north-east of the development site. Providence House is also an established residential development that was converted from a commercial property some time ago. Two other buildings considered as NSRs have Prior Approval to convert to residential use and therefore there is potential for residential use in the future. One of these buildings, Hartley House, has been assumed to be residential for the purposes of the noise assessment. Enterprise House, the other nearby building with Prior Approval to convert to flats, has been considered to be a commercial NSR in the noise assessment as it is understood that there are a number of complications that would make its conversion to residential use unlikely under its current planning approval.

1.3. Proposed Development

The proposed development comprises demolition of existing buildings and redevelopment of the site to provide nine industrial units (Flexible Use Class B2/B8/E(g)(i)-(iii)) and one food store (Use Class E(a)), together with associated parking, a new vehicular access off Griffin Way South, landscaping and other associated works. Each unit will have a delivery yard that will be accessed only via Griffin Way South. It is understood that the food store is likely to be occupied by ALDI and is therefore referred to as such in this report. The proposed site plan is provided as **Figure F.1**.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

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 10 dB(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 perceptible[1]. **Table 2.1** provides typical noise levels of common sources.

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

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

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

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

3. NOISE ASSESSMENT CRITERIA

This section of the report identifies relevant National and Local Authority policy and guidance. Additionally, appropriate British Standards and guidance documents are also referenced.

3.1. National Planning Policy Framework

The revised National Planning Policy Framework (NPPF, February 2019 as amended in June 2019) supersedes the 2012 and 2018 versions of the NPPF. The purpose of the planning system is to contribute to the achievement of sustainable development. There are three dimensions to sustainable development: economic, social and environmental. The environmental role is to contribute to protecting and enhancing our natural, built and historic environment; and as part of this, make effective use of land, help to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate to adapt to climate change including moving to a low carbon economy.

One of the core planning principles is to contribute to conserving and enhancing the natural environment and reducing pollution. Allocations of land for development should prefer land of lesser value, where consistent with other policies in the Framework. The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Paragraph 180 of the NPPF states:

"*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 (see Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food and Rural Affairs, 2010));

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."

Additionally, Paragraph 182 states:

"*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.*"

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

3.2. Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) aims to "*through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life*".

Based on concepts from toxicology, it introduces three 'Effect Levels' relevant to the assessment of noise. These are:

- NOEL: No Observed Effect Level: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL: Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected; and
- SOAEL: Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.

3.3. Planning Practice Guidance

The Planning Practice Guidance for Noise (PPG-N) was published in March 2014 and most recently updated in July 2019. The PPG-N suggests that the most appropriate and cost-effective solutions to potential noise issues are best identified when good acoustic design is considered early in the planning process.

The PPG-N provides the following advice on how to determine the noise impact on development:

"*Plan-making and decision making need to take account of the acoustic environment and in doing so consider:*

- *Whether or not a significant adverse effect is occurring or likely to occur;*
- *Whether or not an adverse effect is occurring or likely to occur; and*
- *Whether or not a good standard of amenity can be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy." (Paragraph 003 Reference ID 30-003-20190722)

The document goes on to acknowledge the levels of noise exposure at which an effect may occur as provided in the NPSE and introduces a fourth effect level:

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

- UAE: Unacceptable Adverse Effect: Extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise lead to psychological stress or physical effects.

Where residential development is proposed in the vicinity of existing businesses, community facilities or other activities that produce noise, the PPG-N advises that the applicant (or 'agent of change') will need to clearly identify the effects of the existing businesses that may cause a nuisance (including noise) and clearly define the mitigation measures being proposed to address any potential significant adverse effects that are identified. The agent of change needs to not only consider the current activities of the business, but the permitted activities too, even if they are not occurring at the time of the application being made. The PPG-N acknowledges that "*It can be helpful for developers to provide information to prospective purchasers or occupants about mitigation measures that have been put in place, to raise awareness and reduce the risk of post-purchase/occupancy complaints.*" (Paragraph 009 Reference ID 30-009-20190722).

It is important to understand that as the PPG-N does not specifically provide any advice with respect to noise levels/limits for different sources of noise, it is appropriate to consider other sources of advice and guidance documents when considering whether new developments would be sensitive to the prevailing acoustic environment and the PPG-N signposts a number of appropriate guidance documents.

3.4. Local Authority Policy and Guidance

3.4.1. Hart District Council

There are no specific Hart District Council (HDC) planning policy or guidance documents which deal with noise.

3.5. Noise Guidance

3.5.1. British Standard BS 8233:2014

BS 8233 *Guidance on sound insulation and noise reduction for buildings* has a number of design criteria for intrusive external noise without a specific character. The guidelines, in relation to this development, are designed to achieve good listening conditions in rooms.

With respect to intrusive external noise, BS 8233 identifies the British Council for Offices (BCO) Guide to Specification for general acoustic guidance on offices. BS 8233 highlights that complaints from officer workers typically arise from the intrusion of external noise, high internal noise levels from services, low background noise, excessive reflections from room surfaces, and inadequate sound insulation between offices. Advice is provided within the BS 8233 guidance in respect of the internal design of offices, including open-plan offices for speech privacy and the control of noise.

The relevant criteria for offices are reproduced in **Table 3.1**.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Table 3.1: Indoor Ambient Noise Levels: Offices

Activity	Location	Design Range	
		$L_{Aeq, T}$, (dB)	L_{AFmax} (dB)
Study and work requiring concentration	Executive office	35 – 40	50
Work requiring acoustic privacy	Open plan office	45 – 50	55
Speech or telephone Communications	Corridor, circulation space	45 – 55	50

Furthermore, BS 8233 advises that: "*In order to achieve unintelligible speech from another office, the minimum sound insulation between two offices needs to be approximately D_W = 38 dB. Where privacy is important the minimum sound insulation should be D_W = 48 dB.*"

For industrial buildings, BS 8233 advises that: "*Even where speech communication is not important, it is important that audible warnings and information announcements can be heard clearly*." The maximum noise levels for reliable speech communication are reproduced in **Table 3.2**.

Table 3.2: Indoor Ambient Noise Levels: Industrial Buildings

Distances Between Talker and Listener (m)	Noise level ($L_{Aeq, T}$, dB)	
	Normal Voice	Raised Voice
1	57	62
2	51	56
4	45	50
8	39	44

The levels provided in **Table 3.2** apply to empty workshops. A noise level of 56 $L_{Aeq, T}$ dB is considered by ACCON as a reasonable worst case internal ambient noise level within industrial spaces.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

3.5.2. British Council for Offices Guide to Specification (2014)

The BCO *Guide to Specification* recommends the following noise ratings (NR) for external noise intrusion levels within offices:

- Open plan offices: NR40 ($L_{eq,T}$)
- Speculative offices: NR38 ($L_{eq,T}$)
- Cellular offices/meeting rooms: NR35 ($L_{eq,T}$)

NR levels are described in Annex B of BS 8233. BS 8233 provides the following approximate relationship between A-weighted decibels and NR levels:

NR ≈ dBA – 6

The BCO guidance also states that:

"*$L_{Amax(fast)}$ noise intrusion levels should not normally be more than 55 dB in open plan/speculative offices or 50 dB in cellular offices.*"

3.5.3. British Standard BS 4142:2014+A1:2019

BS 4142 *Methods for rating and assessing industrial and commercial sound* provides a method for the measurement and rating of industrial type noise sources and background noise levels outside dwellings. The rating level (defined in the BS) is used to rate the noise level of the source (this is defined as the 'specific sound level') outside residential dwellings.

The rating level is determined by assessing the character of the noise and applying an acoustic feature correction, if appropriate, to the specific sound level. Corrections are applied for the tonality, impulsivity and intermittency of the noise source which can all increase the impact of noise.

The initial assessment described in BS 4142 to determine whether an adverse impact is likely is based on establishing the difference between the rating level and the background noise level outside the residential property of interest. The British Standard states that the following points should be considered:

- "*Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*"

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Where it is considered that the initial assessment of the impact needs to be modified due to the context in which the noise is occurring, BS 4142 suggests that all pertinent factors are taken into consideration, including:

1) *The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

   Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

   Where residual sound[2] levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

3) *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*

   i. facade insulation treatment;

   ii. ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

   iii. acoustic screening.

There is also a requirement within BS 4142:2014 to consider the uncertainty in the measurement and assessment procedure.

3.5.4. Design Manual for Roads and Bridges LA111 Noise and Vibration

None of the local roads are predicted to experience a decrease in the number of road traffic movements due to the scheme. The increase of noise levels due to the change in the number of road traffic movements can be assessed by considering the long-term increase (an

[2] The residual sound is defined as the ambient sound level at the assessment location in the absence of the specific sound source

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

adverse effect) in traffic flows on public roads following the principles of the Design Manual for Roads and Bridges (DMRB).

The magnitude of the change in road traffic noise levels is considered using the criteria outlined in **Table 3.3**. The relative levels are reproduced from the semantic scale for long-term changes in road traffic noise levels found in the DMRB guidance document.

Table 3.3: Magnitude of Change: Long Term

Magnitude of impact	Long term noise change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 3.0
Low	3.0 to 4.9
Medium	5.0 to 9.9
High	Greater than or equal to 10.0

3.6. Building Research Establishment Environmental Assessment Method (BREEAM) - New Construction 2018 Assessment Criteria

Two acoustics credits are being sought for the development using the Building Research Establishment Environmental Assessment Method (BREEAM) New Construction 2018 (Shell & Core or Shell Only) criteria.

The noise assessments for BREEAM must be carried out by a suitably qualified acoustic consultant. The principal author of this Noise Impact Assessment, Steve Summers, meets the requirements of a Suitably Qualified Acoustician (SQA) by virtue of:

1. Having a minimum of three years relevant experience (within the last five years), including acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures; and
2. Holding a recognised acoustic qualification (the author has a BSc in Electro-acoustics and an MSc in Environmental Acoustics) is a Chartered Engineer and membership of an appropriate professional body (the author is a corporate member of the Institute of Acoustics, MIOA).

This Noise Impact Assessment is considered suitable for use as a 'Professional specialist report' as outlined in Table 2.9: 'General evidence types' of BREEAM New Construction 2018.

3.6.1. Hea 05: Acoustic Performance

For Shell & Core or Shell Only buildings one credit is available for BREEAM Hea 05 if

"*The building meets the appropriate acoustic performance standards and testing requirements defined in the relevant table below. These tables define criteria for the acoustic principles of:… 11.b. Indoor ambient noise level*".

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

For industrial and office buildings ambient noise levels must comply with the design criteria in Section 7 of BS 8233:2014. The relevant criteria for offices are reproduced in **Table 3.1**. 56 dB $L_{Aeq,\ T}$ is considered a reasonable worst case internal ambient noise level within industrial spaces.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

4. NOISE MEASUREMENT SURVEY

4.1. Methodology

Noise measurements were carried out between 1130 hrs on Thursday 4th March 2021 and 1200 hrs on Friday 5th March 2021 to determine the extent to which the site and its environs are currently affected by noise from road traffic.

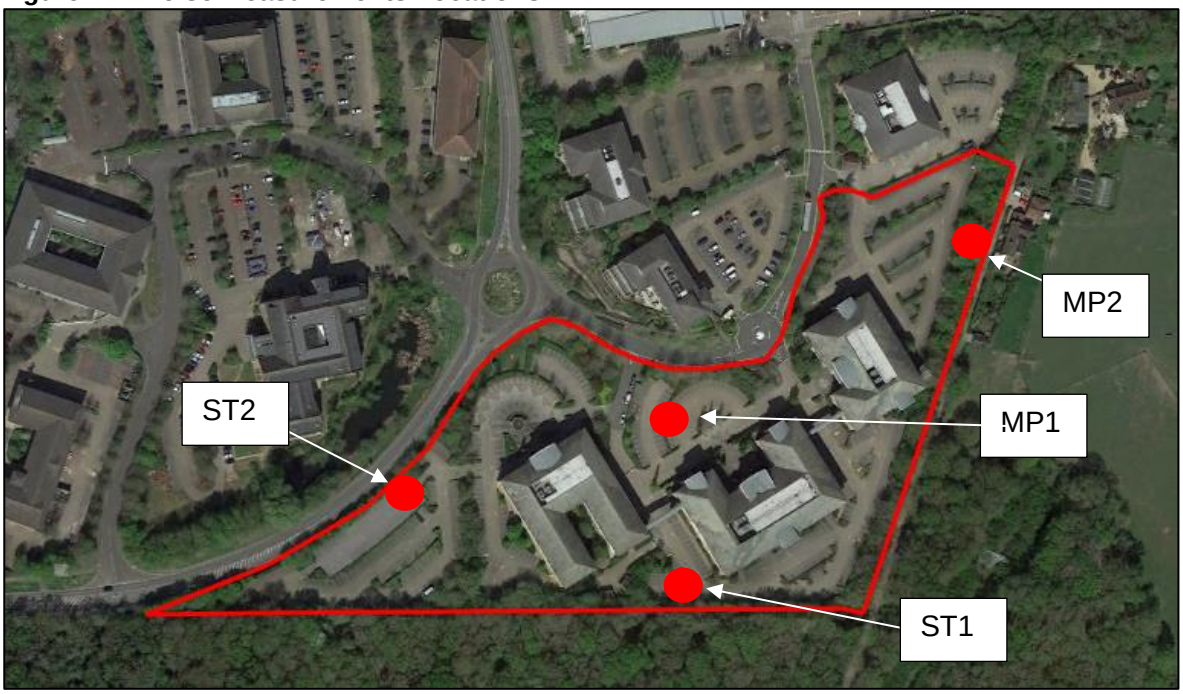
Table 4.1 provides the locations of the noise survey measurements which are identified in **Figure 4.1**.

Table 4.1 Noise Survey Locations

Location Reference	Location Description	Measurement Duration	Observed Noise Sources
MP1	In the north of the site, approximately 30 m to the south of Bartley Way	24 hours	Local road traffic along Bartley Way and the B3349 is the dominant noise source. Train movements along the South Western Main Line to the north of the site are audible.
MP2	In the north east of the site, approximately 7 m to the west of Holt Lane	24 hours	Holt Lane is the dominant road traffic noise source. Road traffic noise from Bartley Way is also audible.
ST1	In the south of the site, approximately 450 m to the north of the M3	2 x 1-hour periods	Distant road traffic noise from the M3 is audible.
ST2	In the west of the site. Approximately 16 m to the east of Griffin Way South (B3349)	2 x 1-hour periods	Griffin Way South (B3349) is the dominant road traffic noise source.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Figure 4.1: Noise Measurements Locations



At the start of the noise measurement period the weather was dry with 100% cloud cover, a daytime temperature of 7^0C and northerly winds with gusts up to 3 m/s. At the end of the measurement period the weather was dry with 100% cloud cover, a daytime temperature of 7^0C and wind speeds of less than 1 m/s. These weather conditions are representative of the weather during the whole of the noise measurement period and are considered suitable for noise monitoring.

4.2. Results

The measured unattended noise levels are summarised in **Table 4.2**.

Table 4.2 Unattended Noise Measurement Summary

Position	Period	$L_{Aeq, T}$ (dB)	L_{AFmax} (dB)	$L_{A10, T}$ (dB)	Mean $L_{A90, T}$ (dB)	Modal $L_{A90, T}$ (dB)	Typical $L_{A90, T}$ (dB)
MP1	0700 hrs to 2300 hrs	51	69	52	45	46	46
	2300 hrs to 0700 hrs	45	59	43	36	33	32
MP2	0700 hrs to 2300 hrs	50	73	50	43	45	43
	2300 hrs to 0700 hrs	47	68	44	37	33	33

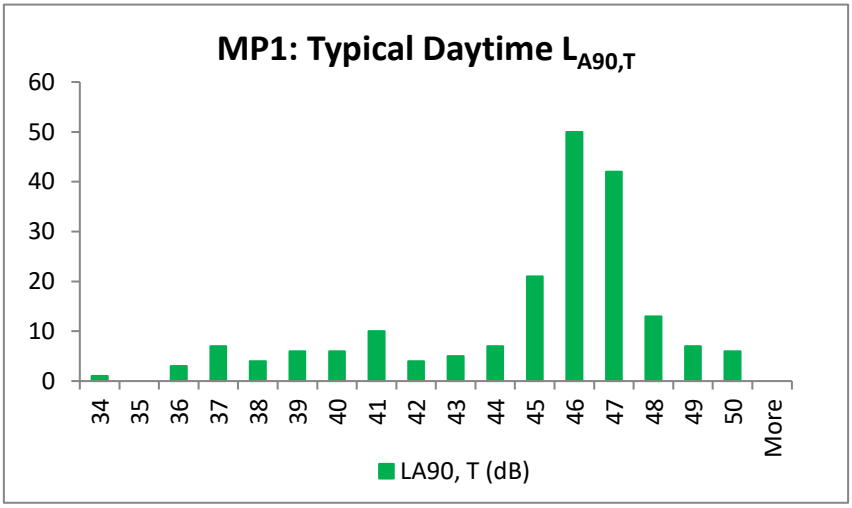
Note: The levels stated are logarithmic averages for $L_{Aeq, T}$ and arithmetic averages for $L_{A10, T}$ and mean $L_{A90, T}$. The L_{AFmax} is the average of the highest hourly maximum sound levels measured during the measurement

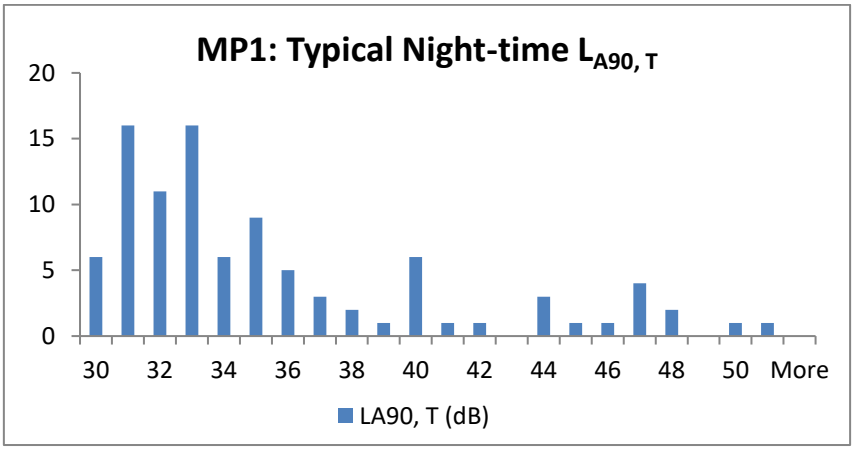
Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

period, measured with a fast time-weighting. The L_{AFmax} levels in brackets are the tenth highest L_{AFmax} noise levels measured during the measurement period. The typical background sound level is a value representative of the lowest $L_{A90, T}$ values that typically occur (as illustrated in Figure 4.1 and Figure 4.2).

Figure 4.2 and **Figure 4.3** identify the $L_{A90, T}$ histograms for the daytime and night-time periods at MP1 and MP2 respectively.

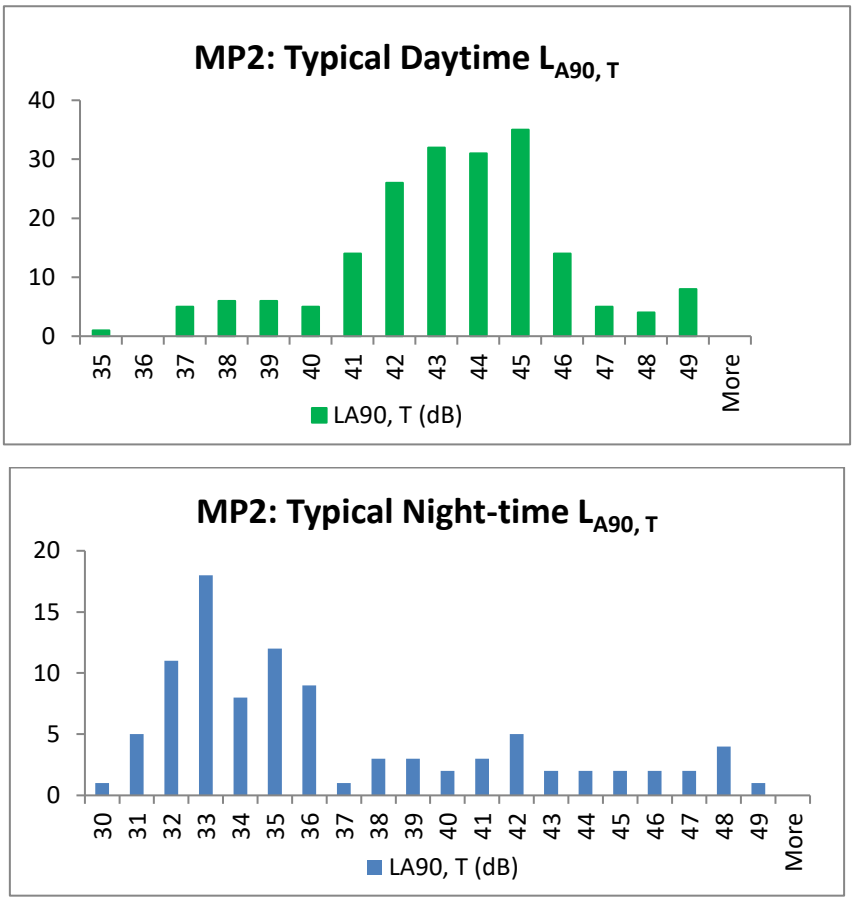
Figure 4.2: $L_{A90, T}$ Histogram for Daytime and Night-time Period: MP1





Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Figure 4.3: $L_{A90, T}$ Histogram for Daytime and Night-time Period: MP2



The summary of the noise levels measured during the attended short-term noise measurement survey is shown below in **Table 4.3**.

Table 4.3 Attended Noise Measurement Survey

Position	Period	$L_{Aeq, T}$ (dB)	L_{AFmax} (dB)	$L_{A10, T}$ (dB)	Mean $L_{A90, T}$ (dB)
ST1	1155 hrs to 1255 hrs	48	61	49	45
	0935 hrs to 1035 hrs	51	58	53	49
ST2	1300 hrs to 1400 hrs	68	79	72	51
	1040 hrs to 1140 hrs	67	78	71	53

Note: The levels stated are logarithmic averages for $L_{Aeq, T}$ and arithmetic averages for $L_{A10, T}$ and mean $L_{A90, T}$. The L_{AFmax} is the average of the highest hourly maximum sound levels measured during the measurement period, measured with a fast time-weighting.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

5. NOISE MODELLING

5.1. Methodology

The CadnaA noise modelling software has been utilised to calculate the external noise levels from road traffic movements and the proposed development. CadnaA is a three-dimensional noise model developed by DataKustik and has been extensively used by ACCON and others to develop noise models for a wide variety of situations and noise sources. CadnaA utilises the methodology in the Department of Transport's Technical Memorandum Calculation of Road Traffic Noise (CRTN) to predict noise from road traffic and ISO 9613 to predict noise from point, line and area sources.

The results of the noise measurement survey detailed in **Section 4** have been utilised to calibrate the noise model predictions of the existing site and its environs.

5.2. Model Details

The following information has been used within the noise model:

- Layout of the proposed development: PRC drawing number 102 'Proposed Site Plan' dated April 2021;
- Topography: Defra Survey Data[3];
- Road traffic data: Motion dated 26th May 2021;
- Plant sound power levels provided by Shepherd Brombley Partnership Ltd, the project Building Services Engineering Consultants.

5.3. Calibration

The baseline noise model has been calibrated using the on-site noise measurements. **Table 5.1** provides the results of the noise model calibration. At the time of the survey, Government restrictions in response to the Covid pandemic is estimated to have reduced traffic flows to 72% based on Department for Transport observations. This reduction in traffic equates to approximately a 1 dB reduction in noise level and has been included as part of the noise model calibration.

Table 5.1 Noise Model Calibration

Measurement Location	Daytime $L_{Aeq,16h}$ (dB)			Night-Time $L_{Aeq,8h}$ (dB)		
	Measured	Model	Difference	Measured	Model	Difference
MP1	51	50	-1	45	44	-1
MP2	50	52	+2	47	46	-1

[3] https://environment.data.gov.uk/DefraDataDownload/?Mode=survey Accessed: 21st May 2021

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Table 5.1 demonstrates that the noise levels predicted by the noise model are within ± 2 dB at each of the semi-permanent measurement locations. Therefore, the noise model provides a reliable prediction of the existing road traffic noise conditions across the site and in the immediate environs.

5.4. Selection of Plant

Source noise levels for HGV movements and unloading activities associated with the use of the development have been obtained from BS 5228:2009+A1:2014 Part 1 and the CadnaA Library of sound sources. Average noise source percentage on-times have been derived from previous observations by ACCON.

Table 5.2 Delivery Plant List

Phase	Plant	Reference	Sound pressure level at 10 m	Estimated Quantity	On-time
HGV Deliveries	HGV movement (L_{AFmax})	BS 5228 Table C.11.11	88	20 per hour	N/A[1]
	HGV movement ($L_{Aeq, T}$)	CadnaA Library	63	20 per hour	100%
	HGV unloading	BS 5228 Table D.7 122	102	20 per hour	100%
Note 1: L_{AFmax} is an instantaneous value, therefore no on-time is required.					

The BS 4142 daytime assessment period for commercial noise is 1 hour and the night-time assessment period is 15 minutes. It has been assumed that each HGV arrival will take 15 minutes and that the ALDI store and all nine proposed commercial units may have one arrival each hour. Therefore, a maximum of 20 HGV movements have been assumed to occur per hour (two HGVs for ALDI and two for each of the nine units). It is not known how many HGV movements will occur during the night-time. As a worst case.it is has been assumed that there may be four HGV movements in any 15-minute period at night for the commercial units and one serving the ALDI store. Delivery HGV speeds have been modelled as 20 km/h on the part of the access road nearest to Griffin Way South and 15 km/h on other parts of the proposed development.

External fixed plant details have been provided by Shepherd Brombley Partnership Ltd, the project Mechanical and Engineering consultants. Commercial units one to nine will have Daikin RZASG140 condensing units located on the unit wall. The octave band sound power levels for the condensing units are provided in **Table 5.3**.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Table 5.3 Fixed Plant Sound Power Levels

Unit	Octave Band Sound Power Level (dB, Hz)						
	125	250	500	1000	2000	4000	8000
Daikin RZASG140	74	73	74	64	63	55	50

External fixed plant details have been provided for the proposed ALDI store by K2 Cooling. One of each plant item will be located in an enclosure located along the eastern façade of the proposed store. The broadband sound power levels for the ALDI plant are provided in **Table 5.4**.

Table 5.4 Fixed Plant Sound Power Levels for ALDI

Plant Item	Sound Pressure Level (dB(A) at 10 m)
Refrigeration Pack	33
Refrigeration Gas Cooler	43
Refrigeration HT CU	37.6
Refrigeration LT CU	38.6

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

6. NOISE IMPACT ASSESSMENT

6.1. External Noise to Residential Receptors

The data from the noise measurement survey has been used to determine the impact that will be produced by any potential plant when assessed using the methodology in BS 4142. BS 4142 is only suitable for assessment of noise to residents and not to commercial premises. An assessment of the potential noise level at existing commercial units has been undertaken in **Section 6.2** by comparing the predicted $L_{Aeq, T}$ and measured existing $L_{Aeq, T}$.

6.1.1. Noise from Fixed Plant

The nearest residential noise sensitive receptors (NSRs) to the site are dwellings located on Holt Lane, approximately 24 m to the north west of the site . **Table 6.1** provides a summary of the predicted specific noise levels from fixed plant associated with the development at the nearest NSRs.

Table 6.1 Fixed Plant Noise Levels Predicted at Residential NSRs

NSR	Specific Plant Noise Level ($L_{Aeq, T}$, dB)		
	From Proposed Units	From Proposed ALDI	Combined
Holt Farm Cottages (South) Ground Floor	27	< 10	27
Holt Farm Cottages (South) First Floor	29	< 10	29
Holt Farm Cottages (West) Ground Floor	23	< 10	23
Holt Farm Cottages (West) First Floor	25	< 10	25
Hartley House (South) Ground Floor	20	< 10	20
Hartley House (South) First Floor	22	< 10	22
Hartley House (South) Second Floor	22	< 10	22
Harley House (West) Ground Floor	11	< 10	11
Hartley House (West) First Floor	13	< 10	13

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Specific Plant Noise Level ($L_{Aeq, T}$, dB)		
	From Proposed Units	From Proposed ALDI	Combined
Hartley House (West) Second Floor	13	< 10	13
Providence House (East) Ground Floor	10	< 10	11
Providence House (East) First Floor	12	< 10	12
Providence House (East) Second Floor	13	< 10	13
Providence House (South) Ground Floor	9	< 10	9
Providence House (South) First Floor	10	< 10	11
Providence House (South) Second Floor	11	< 10	11

6.1.2. Noise in Service Yards

External operational activities will include the movement of vehicles, loading and unloading of vehicles, mobile sources (such as fork-lift trucks) and public address (PA) systems. However, it has been assumed for the noise assessment that loading and unloading of HGVs will take place within internal loading bays. Therefore, only very occasional use of fork-lifts in the service yard external to the proposed unit would be expected to occur. The volume control and mounting of any ancillary PA systems will need to be fully considered during the design and installation of any such system to ensure that noise is adequately controlled. prior to the installation of any such system. TTherefore, PA noise has not been assessed in detail.

For the purposes of predicting delivery noise, the site access road has been modelled as a line source and not a road due to the low traffic flow. The predicted daytime period noise levels ($L_{Aeq, T}$) produced by the activities are detailed in **Table 6.2**, having regard to the plant list in **Table 5.2.** The total combined predicted night-time specific noise level is 4 – 5 dB lower than the corresponding daytime noise levels and these are presented in **Table A2.3** in **Appendix 2**.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Table 6.2 Delivery Noise Levels Predicted at Residential NSRs: $L_{Aeq, T}$

NSR	Specific Delivery Noise Level ($L_{Aeq, T}$, dB)		
	From Proposed Units	From Proposed ALDI	Combined
Holt Farm Cottages (South) Ground Floor	7	0	8
Holt Farm Cottages (South) First Floor	9	0	9
Holt Farm Cottages (West) Ground Floor	6	0	7
Holt Farm Cottages (West) First Floor	8	0	9
Hartley House (South) Ground Floor	23	13	24
Hartley House (South) First Floor	26	16	26
Hartley House (South) Second Floor	26	16	26
Harley House (West) Ground Floor	24	15	25
Hartley House (West) First Floor	27	17	27
Hartley House (West) Second Floor	27	17	27
Providence House (East) Ground Floor	29	19	29
Providence House (East) First Floor	31	22	32
Providence House (East) Second Floor	31	21	32
Providence House (South) Ground Floor	29	19	29

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Specific Delivery Noise Level ($L_{Aeq, T}$, dB)		
	From Proposed Units	From Proposed ALDI	Combined
Providence House (South) First Floor	31	21	32
Providence House (South) Second Floor	31	21	32

6.1.3. Breakout Noise

Operational activities associated with the proposed commercial units are likely to be undertaken predominantly within the buildings and may involve the use of mechanical and electrical plant, amplified music or public address (PA) systems and mobile sources (such as fork-lift trucks). The level of activity will be likely to vary considerably from day to day depending on the specific uses of the premises.

The exact uses of the proposed development have yet to be determined, however, it is known that they will be industrial in nature. ACCON has previously measured noise levels of approximately 80 dB $L_{Aeq, T}$ in similar units. Also, as the Control of Noise at Work Regulations 2005 sets the first action level at 80 dB, new industrial units would not be expected to operate with noise levels exceeding this value. Therefore, an internal noise level of 80 dB $L_{Aeq, T}$ has been assumed to provide a worst case assessment for breakout noise from the units.

Table 6.3 provides a summary of the assumed sound insulation properties of the proposed units.

Table 6.3 Sound Insulation Properties of Typical Constructions

Element	Description of Example Construction	Assumed Weighted Sound Reduction R_w (dB)
Wall and Roof Panels	Insulated metal panels (i.e. corrugated outer metal sheet, insulation, corrugated inner metal sheet)	40(1)
Roller Doors	Insulated metal roller doors	25
Personnel Doors	Insulated metal personnel doors	35
Roof lights	Multi-wall polycarbonate	22
Windows	Standard double-glazed windows	30
Note (1): Depending on the thickness and density of the insulation.		

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

The overall average façade sound reduction for each façade has been calculated based on the area of different materials from the drawings received from PRC Architecture and Planning on 11th May 2021

Breakout noise from the proposed ALDI store is not considered to be a significant source of noise to nearby NSRs and therefore has not been included in this noise assessment.

Table 6.4 provides a summary of the breakout noise levels at the nearest existing NSRs.

Table 6.4 Breakout Noise Levels Predicted at Residential Receptors: Daytime

NSR	Specific Breakout Noise Level ($L_{Aeq, T}$, dB)
Holt Farm Cottages (South) Ground Floor	28
Holt Farm Cottages (South) First Floor	30
Holt Farm Cottages (West) Ground Floor	29
Holt Farm Cottages (West) First Floor	31
Hartley House (South) Ground Floor	24
Hartley House (South) First Floor	26
Hartley House (South) Second Floor	26
Harley House (West) Ground Floor	24
Hartley House (West) First Floor	26
Hartley House (West) Second Floor	26
Providence House (East) Ground Floor	29
Providence House (East) First Floor	31
Providence House (East) Second Floor	31
Providence House (South) Ground Floor	28
Providence House (South) First Floor	30
Providence House (South) Second Floor	31

This assessment assumes that doors will be closed during internal activities. This should be encouraged for any future occupant, particularly those who might carry out noisy activities.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Doors could be opened when noisy machinery is not in use. Other means of ventilation should be considered where necessary.

The predicted breakout noise levels consider potential worst-case uses of the new units and utilises historic noise measurement data obtained by ACCON at commercial units of varying size and number of employees. This prediction does not necessarily represent the final uses of potential businesses that will occupy the new spaces. However, the assessment aims to demonstrate the likely noise impact on nearby receptors of a potential worst-case scenario.

6.1.4. Summary of Initial BS 4142 Assessment

For daytime, the BS 4142 assessment period is one hour and therefore it is reasonable to consider the combined noise level over this period from deliveries, fixed plant and breakout from the commercial buildings.

For noise from deliveries an intermittency correction of +3 dB has been applied and a correction of +3 dB for just perceptible impulsivity. The fixed plant will be designed so that tonal noise will be avoided and having regard to the building envelope sound insulation, breakout noise at the receptors will not have any audible features warranting a character correction. Therefore a total correction of +6 dB has been applied to calculate the BS 4142 rating level.

Table A2.1 of **Appendix 2** provides the BS 4142 assessments for operational noise from the proposed units at the residential NSRs during the daytime. It can be seen that the combined rating noise level of plant noise, breakout noise and delivery noise does not exceed the background sound level with the highest rating level being 4 dB below the existing background noise levels. According to BS 4142:2014, a difference of "around +5 dB" is "*likely to be an indication of an adverse impact, depending on the context"*, and where the "rating level does not exceed the background level" it is "*a low impact, depending on the context"*. The initial BS 4142 assessment for daytime therefore indicates a low impact.

For night-time, the BS 4142 assessment period is 15 minutes and it is appropriate to consider the relatively continuous noise from fixed plant and breakout noise from the commercial buildings separately from the noise from deliveries which are likely to occur intermittently. No character corrections are appropriate for the noise from fixed plant and breakout noise. For noise from deliveries an intermittency correction of +3 dB has been applied and a correction of +3 dB for just perceptible impulsivity, as for daytime.

Table A2.2 of **Appendix 2** provide the BS 4142 assessments for operational noise from fixed plant and breakout noise from the proposed units for night-time respectively. It can be seen that the rating noise level does not exceed the background sound level with the highest rating level being 1 dB below the existing background noise levels. The initial BS 4142 assessment for night-time from fixed plant and breakout noise therefore indicates a low impact.

Table A2.3 of **Appendix 2** provide the BS 4142 assessments for operational noise from deliveries for night-time. It can be seen that the rating noise level exceeds the background sound level at Providence House with the highest rating level being 1 dB above the existing background sound levels. The rating levels are below the background sound levels at all other residential receptors. The initial BS 4142 assessment for night-time delivery noise

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

therefore indicates an adverse impact depending on the context for Providence House, and a low impact at all other locations.

6.1.5. Discussion of Context and Conclusions of BS 4142 Assessment

The proposed development is situated in an area of existing commercial units and therefore the proposed development is not, in general, introducing sound with a new character to the surrounding area. The western part of the site and surrounding properties in the area are also affected by relatively high levels of road traffic noise.

In relation to the night-time initial BS 4142 assessments, it is appropriate to consider further details of the context. Night-time plant and breakout noise has been shown by the initial BS 4142 assessment to be a low impact. This assessment is further reinforced as it is predicted to be generally 15 dB below the measured night-time residual (ambient) noise levels of 45 – 47 dB L_{Aeq}. The initial assessment of delivery noise at night indicates a potential adverse impact at Enterprise House. However, it should be noted that the typical night-time background noise levels are low (32 dB L_{A90}) and the rating levels for delivery noise do not exceed the background noise levels by more than 1 dB. Therefore, the rating levels are low absolute noise levels, not exceeding 33 dB and BS 4142 suggests initial findings of the assessment may need to be considered further where absolute sound levels are low. During night-time, residents will be within their dwellings and therefore it is appropriate to consider the sound insulation provided by the building envelope of the dwellings. Allowing for a 15 dB reduction for windows partially open for ventilation, the rating levels inside the dwellings would not exceed 18 dB. Furthermore, excluding the BS 4142 character corrections, the predicted sound levels from deliveries inside bedrooms at Enterprise House would not exceed 12 dB $L_{Aeq,\ 15\ min}$ and would therefore be inaudible.

These considerations indicate, that when context is taken into account, the noise from deliveries at night would not be considered to result in an adverse noise impact at the worst affected existing dwellings. It can therefore be concluded that the noise impact on dwellings would be low from all activities associated with the proposed development.

6.2. External Noise to Non-Residential Receptors

It has been assumed that the night-time noise to existing commercial NSRs will not be critical. This is because there are unlikely to be any office workers within those buildings during the night-time.

6.2.1. Noise from Fixed Plant

Table 6.5 provides a summary of the plant noise levels which would arise at the existing commercial NSRs.

Table 6.5 Noise Levels from Fixed Plant Predicted at Non-Residential NSRs

NSR	Specific Plant Noise Level ($L_{Aeq,\ T}$, dB)
Serco (South) Ground Floor	25
Serco (South) First Floor	26

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Specific Plant Noise Level ($L_{Aeq, T}$, dB)
Serco (South) Second Floor	26
Serco (West) Ground Floor	26
Serco (West) First Floor	27
Serco (West) Second Floor	27
Enterprise House (South East) Ground Floor	23
Enterprise House (South East) First Floor	25
Enterprise House (South East) Second Floor	25
Enterprise House (South West) Ground Floor	17
Enterprise House (South West) First Floor	19
Enterprise House (South West) Second Floor	19

6.2.2. Noise from Service Yards

Using the same assumptions as those outlined in **Section 6.1.2**, **Table 6.6** provides a summary of the delivery noise levels which would arise at the existing commercial NSRs.

Table 6.6 Delivery Noise Levels Predicted at Non-Residential NSRs

NSR	Specific Delivery Noise Level ($L_{Aeq, T}$, dB)
Serco (South) Ground Floor	23
Serco (South) First Floor	25
Serco (South) Second Floor	25
Serco (West) Ground Floor	22
Serco (West) First Floor	24
Serco (West) Second Floor	24

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Specific Delivery Noise Level ($L_{Aeq, T}$, dB)
Enterprise House (South East) Ground Floor	29
Enterprise House (South East) First Floor	31
Enterprise House (South East) Second Floor	31
Enterprise House (South West) Ground Floor	27
Enterprise House (South West) First Floor	29
Enterprise House (South West) Second Floor	29

6.2.3. Breakout Noise

Using the same assumptions as those outlined in **Section 6.1.3**, **Table 6.7** provides a summary of the breakout noise levels which would arise at the existing commercial NSRs.

Table 6.7 Breakout Noise Levels Predicted at Non-Residential Receptors

NSR	Specific Breakout Noise Level ($L_{Aeq, T}$, dB)
Serco (South) Ground Floor	28
Serco (South) First Floor	31
Serco (South) Second Floor	31
Serco (West) Ground Floor	31
Serco (West) First Floor	33
Serco (West) Second Floor	33
Enterprise House (South East) Ground Floor	29
Enterprise House (South East) First Floor	31
Enterprise House (South East) Second Floor	31

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Specific Breakout Noise Level ($L_{Aeq, T}$, dB)
Enterprise House (South West) Ground Floor	25
Enterprise House (South West) First Floor	27
Enterprise House (South West) Second Floor	27

6.2.4. External Noise Assessment

Table A2.4 and **Table A2.5** of **Appendix 2** provides the noise assessment for operational noise from the proposed units to non-residential NSRs. It can be identified that the existing ambient noise levels at the NSRs would not increase as a result of the proposed development.

6.3. Increase in Road Traffic Noise

The calculation of the increase in road traffic due to traffic generation from the proposed development has not been performed for the site access road as this is a new road and noise from this source has been calculated as part of the delivery noise calculation. The remaining relevant road links have been compared for the 2023 Without Development and 2023 With Development scenarios. **Figure F.2** illustrates the predicted change in road traffic noise to nearby NSRs. It can be seen that road traffic noise levels are generally increased by less than 3 dB. In the long-term, this is a negligible increase in road traffic noise due to the proposed development (refer to **Table 3.3**).

6.4. Noise to Proposed Commercial Uses

6.4.1. BREEAM Hea 05 Assessment for Offices

The layouts of the proposed offices do not show any cellular offices. However, it is possible that future occupants will install partition walls to create cellular offices and therefore cellular and open plan offices have been considered. **Table 6.8** and **Table 6.9** summarise the predicted internal ambient and maximum noise levels resulting from external sources of noise within offices using the assumptions listed in **Table 6.3**.

Table 6.8 Predicted Internal Ambient Noise Level within Offices

Unit	Predicted Internal Noise Level within Offices ($L_{Aeq, T}$, dB)	
	Day	Night
Unit 1 Offices	22	16
Unit 2 Offices	22	16

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Unit	Predicted Internal Noise Level within Offices ($L_{Aeq, T}$, dB)	
	Day	Night
Unit 3 Offices	22	16
Unit 4 Offices	22	15
Unit 5 Offices	21	15
Unit 6 Offices	28	22
Unit 7 Offices	27	21
Unit 8 Offices	24	18
Unit 9 Offices	25	19

Table 6.9 Predicted Internal L_{AFmax} Noise Level within Offices

Unit	Predicted Internal Maximum Noise Level within Offices (L_{AFmax}, dB)	
	Day	Night
Unit 1 Offices	42	37
Unit 2 Offices	43	38
Unit 3 Offices	42	37
Unit 4 Offices	42	37
Unit 5 Offices	28	18
Unit 6 Offices	28	18
Unit 7 Offices	28	18
Unit 8 Offices	27	17
Unit 9 Offices	55	45

Table 6.8 and **Table 6.9** demonstrate that the predicted internal ambient noise levels are below the criteria for all office types (as summarised in **Table 3.1**). If internal partitions are installed by the occupiers, they should have a sound insulation performance of D_w = 38 dB for unintelligible speech or D_w = 48 dB where privacy is important.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

6.4.2. BREEAM Hea 05 Assessment for Industrial Spaces

Table 6.10 summarises the predicted internal ambient noise levels within industrial spaces using the assumptions listed in **Table 6.3**.

Table 6.10 Predicted Internal Ambient Noise Level within Industrial Spaces

Unit	Predicted Internal Ambient Noise Level within Industrial Spaces ($L_{Aeq, T}$, dB)	
	Day	Night
Unit 1 Industrial Space	29	23
Unit 2 Industrial Space	29	23
Unit 3 Industrial Space	29	23
Unit 4 Industrial Space	31	25
Unit 5 Industrial Space	28	22
Unit 6 Industrial Space	32	26
Unit 7 Industrial Space	27	21
Unit 8 Industrial Space	28	23
Unit 9 Industrial Space	29	23

Table 6.10 demonstrates that the predicted internal ambient noise levels are below the criteria of 56 dB $L_{Aeq, T}$ for all industrial spaces (see **section 3.6.1**).

6.5. Discussion of Uncertainty

6.5.1. Noise Survey

The noise survey was undertaken during national lockdown restrictions, as imposed by the UK Government on 4th January 2021. It is therefore possible that the measured ambient noise levels are lower than they would be with typical access to the commercial uses in the vicinity of the site. A correction of + 1 dB has been applied to the measured noise levels to correct for the reduction in road traffic observed by the Department for Transport during the measurement period.

6.5.2. Assessment

The assumptions used in the assessment are based on worst-case activities for potential noisy occupants of the units. However, the assessment has been restricted to single-value quantities for sound insulation, breakout noise and distance correction. Overall, it is considered that this noise assessment represents a reasonable worst case with a low to medium level of uncertainty in the calculation procedure.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

7. MITIGATION

The noise assessment has indicated that no additional noise mitigation is required other than that incorporated into the general layout and design.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

8. SUMMARY AND CONCUSIONS

A noise assessment has been carried out to consider the noise impact of the proposed commercial development at Bartley Wood, Hook on the nearest existing noise sensitive receptors to the site. The impact from existing road traffic sources to potential employees of the development has also been assessed.

An assessment of the noise impact of the proposed development on residential NSRs has been completed in line with the methodology provided in BS 4142+A1:2019. The daytime assessment indicates that the combined rating noise level of plant noise, breakout noise and delivery noise does not exceed the background sound level and therefore is assessed as a low impact. The night-time BS 4142 assessment of the combined rating noise level of plant noise and breakout noise also results in a finding of low impact. The initial night-time BS 4142 assessment of delivery noise indicates a potential adverse noise impact. However, taking context into account, as advocated by BS 4142, results in a conclusion of no significant adverse effect from deliveries at night.

An assessment of the noise impact of the proposed development on non-residential NSRs has been completed by comparing the anticipated future ambient noise levels with the existing measured ambient noise levels. The assessment indicated that the existing ambient noise levels are not exceeded at the non-residential NSRs.

An assessment of the increase in road traffic noise due to the development indicated that there is a negligible increase in road traffic noise as a result of the proposed development.

Predicted noise levels within the proposed offices are expected to be suitable for the proposed uses without mitigation.

The assessment has demonstrated that the aims of paragraph 180 of the NPPF will be met as noise from the proposed development will not result in any significant adverse impact on health of quality of life to nearby NSRs.

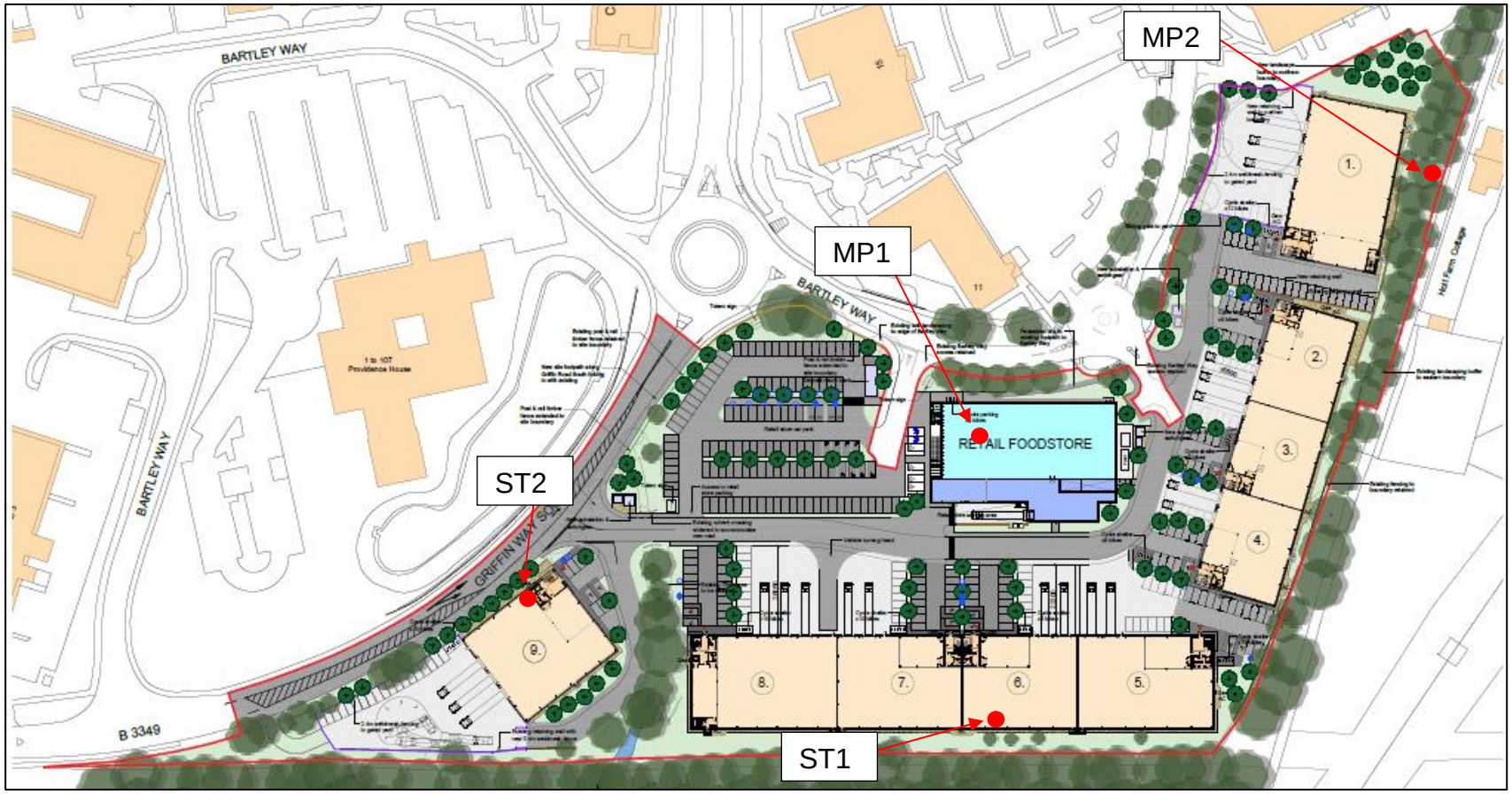
As a Suitably Qualified Acoustician, the author confirms that the developer's work will enable a future tenant, utilising a typical fit-out and specification, to meet the noise levels required to demonstrate compliance with the requirements for one credit under BREEAM Hea 05 for a Shell and Core building.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

ADDITIONAL FIGURES

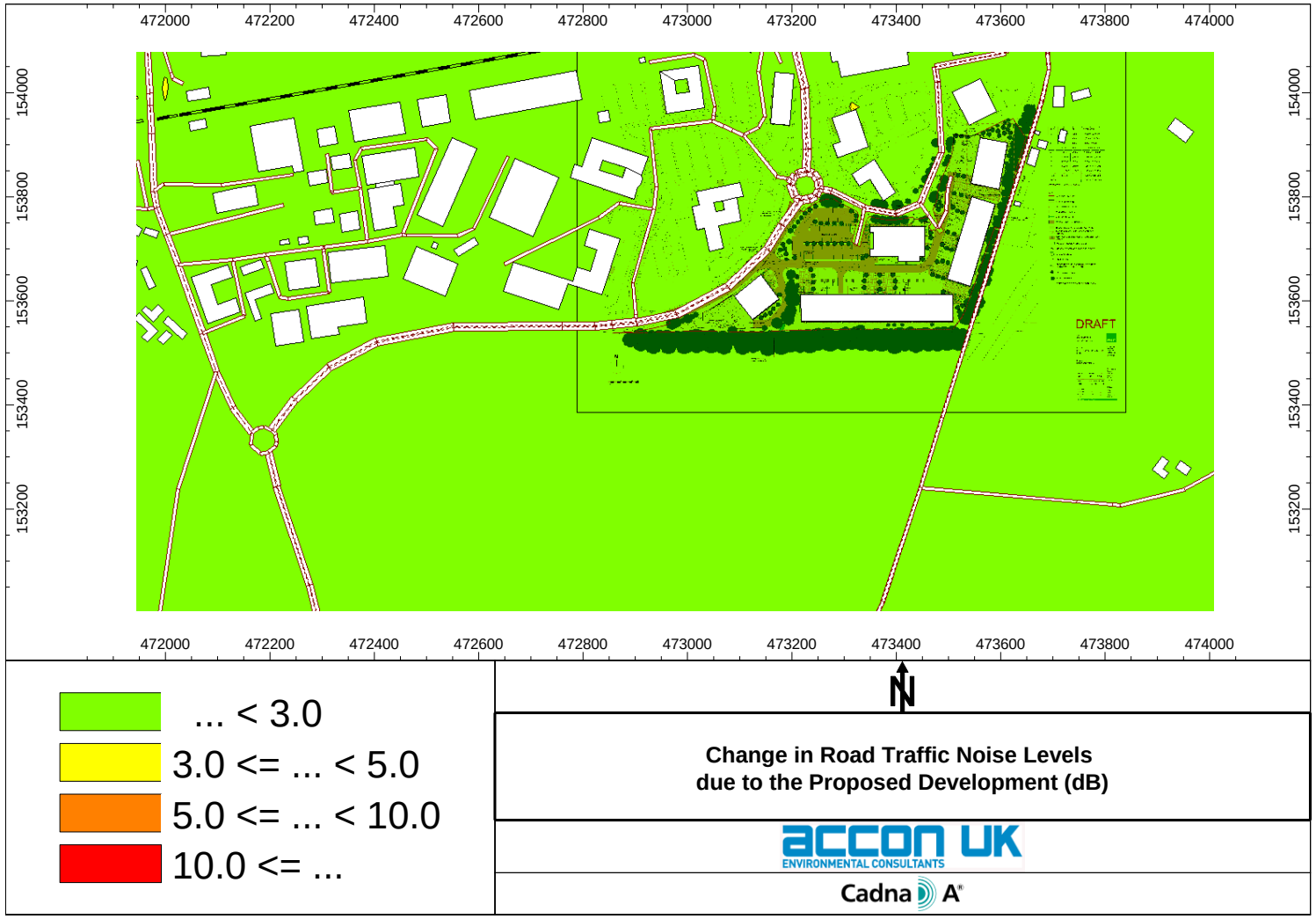
Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Figure F.1: Proposed Site Layout



Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Figure F.2: Change in Road Traffic Noise



Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

APPENDICES

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Appendix 1

Glossary of Acoustic Terminology

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Term	Description
'A'-Weighting	This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.
Decibel (dB)	This is a tenth (deci) of a bel. A 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.
Ambient /Period Sound Level, $L_{Aeq, T}$	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.
Road Traffic Noise Level, $L_{A10, T}$	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.
Background Sound Level, $L_{A90, T}$	The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time (T). The $L_{A90, T}$ is used to describe the background noise levels at a particular location.
L_{AFmax}	The 'A'-weighted maximum sound pressure level measured over a measurement period measured with 'fast' weighting (125 ms).
Rating Level, $L_{Ar, Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Specific Sound Level, $L_{Aeq,Tr}$	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.
R	Sound reduction index. Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band
R_w	Weighted sound reduction index, a single number quantity for the airborne sound insulation in buildings and of building elements such as wall, doors and windows. The quantity is intended for rating the airborne sound insulation and for simplifying the formulation of acoustical requirements in building codes, when measured in the presence of flanking sound transmission, denoted R'_w.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Term	Description
D	Arithmetic difference of the SPL between two spaces, for example room (a) and room (b)
D_w	Single number quantity describing arithmetic difference in SPL between room (a) and room (b) in buildings and of building elements such as walls, doors and windows, when measured in the presence of flanking sound transmission, denoted D'_w.

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Appendix 2
Operational Noise Assessments

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Table A2.1: Operational Noise Assessment for Residential Receptors: Daytime

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Delivery Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Holt Farm Cottages S Ground Floor	27	28	8	37	43	-6	Low Impact
Holt Farm Cottages S First Floor	29	30	9	39	43	-4	Low Impact
Holt Farm Cottages W Ground Floor	23	29	7	36	43	-7	Low Impact
Holt Farm Cottages W First Floor	25	31	9	38	43	-5	Low Impact
Hartley House S Ground Floor	20	24	24	34	46	-12	Low Impact
Hartley House S First Floor	22	26	26	36	46	-10	Low Impact
Hartley House S Second Floor	22	26	26	36	46	-10	Low Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Delivery Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] ($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Hartley House W Ground Floor	11	24	25	34	46	-12	Low Impact
Hartley House W First Floor	13	26	27	36	46	-10	Low Impact
Hartley House W Second Floor	13	26	27	36	46	-10	Low Impact
Providence House Ea Ground Floor	11	29	29	38	46	-8	Low Impact
Providence House Ea First Floor	12	31	32	40	46	-6	Low Impact
Providence House Ea Second Floor	13	31	32	40	46	-6	Low Impact
Providence House Eb Ground Floor	9	28	29	38	46	-8	Low Impact
Providence House Eb First Floor	10	30	32	40	46	-6	Low Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Delivery Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] ($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Providence House Eb Second Floor	11	31	32	40	46	-6	Low Impact
Providence House S Ground Floor	9	28	30	38	46	-8	Low Impact
Providence House S First Floor	11	30	32	40	46	-6	Low Impact
Providence House S Second Floor	11	31	32	40	46	-6	Low Impact

Note 1: The rating level includes corrections for intermittency and impulsivity totalling +6 dB

Table A2.2: Operational Noise Assessment for Residential Receptors: Night-Time – Plant and Breakout Noise

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] ($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Holt Farm Cottages S Ground Floor	27	28	31	33	-2	Low Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Holt Farm Cottages S First Floor	29	30	32	33	-1	Low Impact
Holt Farm Cottages W Ground Floor	23	29	30	33	-3	Low Impact
Holt Farm Cottages W First Floor	25	31	32	33	-1	Low Impact
Hartley House S Ground Floor	20	24	25	32	-7	Low Impact
Hartley House S First Floor	22	26	27	32	-5	Low Impact
Hartley House S Second Floor	22	26	28	32	-4	Low Impact
Hartley House W Ground Floor	11	24	25	32	-7	Low Impact
Hartley House W First Floor	13	26	26	32	-6	Low Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Hartley House W Second Floor	13	26	27	32	-5	Low Impact
Providence House Ea Ground Floor	11	29	29	32	-3	Low Impact
Providence House Ea First Floor	12	31	31	32	-1	Low Impact
Providence House Ea Second Floor	13	31	31	32	-1	Low Impact
Providence House Eb Ground Floor	9	28	28	32	-4	Low Impact
Providence House Eb First Floor	10	30	30	32	-2	Low Impact
Providence House Eb Second Floor	11	31	31	32	-1	Low Impact
Providence House S Ground Floor	9	28	28	32	-4	Low Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Plant Specific Noise Level ($L_{ar, Tr}$, dB)	Development Breakout Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Providence House S First Floor	10	30	30	32	-2	Low Impact
Providence House S Second Floor	11	31	31	32	-1	Low Impact

Table A2.3: Operational Noise Assessment for Residential Receptors: Night-Time – Delivery Noise

NSR	Development Delivery Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Holt Farm Cottages S Ground Floor	4	10	33	-23	Low Impact
Holt Farm Cottages S First Floor	6	12	33	-21	Low Impact
Holt Farm Cottages W Ground Floor	4	10	33	-23	Low Impact
Holt Farm Cottages W First Floor	5	11	33	-22	Low Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Development Delivery Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Hartley House S Ground Floor	20	26	32	-6	Low Impact
Hartley House S First Floor	23	29	32	-3	Low Impact
Hartley House S Second Floor	23	29	32	-3	Low Impact
Hartley House W Ground Floor	20	26	32	-6	Low Impact
Hartley House W First Floor	23	29	32	-3	Low Impact
Hartley House W Second Floor	23	29	32	-3	Low Impact
Providence House Ea Ground Floor	25	31	32	-1	Low Impact
Providence House Ea First Floor	27	33	32	1	Adverse Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Development Delivery Specific Noise Level ($L_{ar, Tr}$, dB)	Development Rating Noise Level[1] (($L_{ar, Tr}$, dB)	Measured Background Sound Level ($L_{A90, T}$, dB)	Difference Rating Level and Background Sound Level (dB)	Initial Estimate of Impact
Providence House Ea Second Floor	27	33	32	1	Adverse Impact
Providence House Eb Ground Floor	24	30	32	-2	Low Impact
Providence House Eb First Floor	27	33	32	1	Adverse Impact
Providence House Eb Second Floor	27	33	32	1	Adverse Impact
Providence House S Ground Floor	25	31	32	-1	Low Impact
Providence House S First Floor	27	33	32	1	Adverse Impact
Providence House S Second Floor	27	33	32	1	Adverse Impact

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Note 1: The rating level includes corrections for intermittency and impulsivity totalling +6 dB

Table A2.4: Operational Noise Assessment for Non-Residential Receptors: Daytime

NSR	Ambient ($L_{Aeq, T}$, dB)	Plant noise level ($L_{Aeq, T}$, dB)	Development breakout noise level ($L_{Aeq, T}$, dB)	Development delivery noise level ($L_{Aeq, T}$, dB)	Total Development noise level ($L_{Aeq, T}$, dB)	Ambient plus development ($L_{Aeq, T}$, dB)	Increase in $L_{Aeq, T}$, (dB)	Exceeds Threshold?
Serco S comm Ground Floor	50	25	28	23	31	50	0	No
Serco S comm First Floor	50	26	31	25	33	50	0	No
Serco S comm Second Floor	50	26	31	25	33	50	0	No
Serco W comm Ground Floor	50	26	31	22	33	50	0	No
Serco W comm First Floor	50	27	33	24	34	50	0	No
Serco W comm Second Floor	50	27	33	24	35	50	0	No

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Ambient ($L_{Aeq, T}$, dB)	Plant noise level ($L_{Aeq, T}$, dB)	Development breakout noise level ($L_{Aeq, T}$, dB)	Development delivery noise level ($L_{Aeq, T}$, dB)	Total Development noise level ($L_{Aeq, T}$, dB)	Ambient plus development ($L_{Aeq, T}$, dB)	Increase in $L_{Aeq, T}$, (dB)	Exceeds Threshold?
Enterprise House SE Ground Floor	50	23	29	29	32	50	0	No
Enterprise House SE First Floor	50	25	31	31	34	50	0	No
Enterprise House SE Second Floor	50	25	31	31	35	50	0	No
Enterprise House SW Ground Floor	50	17	25	27	29	50	0	No
Enterprise House SW First Floor	50	19	27	29	31	50	0	No
Enterprise House SW Second Floor	50	19	27	29	32	50	0	No

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

Table A2.4: Operational Noise Assessment for Non-Residential Receptors: Night-Time

NSR	Ambient ($L_{Aeq, T}$, dB)	Plant noise level ($L_{Aeq, T}$, dB)	Development breakout noise level ($L_{Aeq, T}$, dB)	Development delivery noise level ($L_{Aeq, T}$, dB)	Total Development noise level ($L_{Aeq, T}$, dB)	Ambient plus development ($L_{Aeq, T}$, dB)	Increase in $L_{Aeq, T}$, (dB)	Exceeds Threshold?
Serco S comm Ground Floor	47	25	28	23	31	47	0	No
Serco S comm First Floor	47	26	31	25	33	47	0	No
Serco S comm Second Floor	47	26	31	25	33	47	0	No
Serco W comm Ground Floor	47	26	31	23	33	47	0	No
Serco W comm First Floor	47	27	33	26	35	47	0	No
Serco W comm Second Floor	47	27	33	26	35	47	0	No
Enterprise House SE Ground Floor	47	23	29	29	32	47	0	No

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

NSR	Ambient ($L_{Aeq, T}$, dB)	Plant noise level ($L_{Aeq, T}$, dB)	Development breakout noise level ($L_{Aeq, T}$, dB)	Development delivery noise level ($L_{Aeq, T}$, dB)	Total Development noise level ($L_{Aeq, T}$, dB)	Ambient plus development ($L_{Aeq, T}$, dB)	Increase in $L_{Aeq, T}$, (dB)	Exceeds Threshold?
Enterprise House SE First Floor	47	25	31	31	34	47	0	No
Enterprise House SE Second Floor	47	25	31	31	35	47	0	No
Enterprise House SW Ground Floor	47	17	25	27	29	47	0	No
Enterprise House SW First Floor	47	19	27	29	31	47	0	No
Enterprise House SW Second Floor	47	19	27	29	32	47	0	No

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

[This page is intentionally blank]

Email: enquiry@accon-uk.com • www.accon-uk.com
Unit B, Fronds Park, Frouds Lane, Aldermaston, Reading, RG7 4LH
Reading Office: 0118 971 0000
Brighton Office: 01273 573 814

ENVIRONMENTAL CONSULTANTS

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