



CSV DEVELOPMENTS LIMITED

FORMER GROUSE HOTEL CAR PARK, BIRCH VALE

NOISE ASSESSMENT FOR PLANNING PURPOSES

13 December 2024

AEC REPORT: P5418/R01/PJK

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1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by CSV Developments Ltd to undertake a noise assessment for planning purposes in relation to the proposed new residential development consisting of 6 plots on the site of the former Grouse Hotel Car Park, Birch Vale.
- 1.2 This report details the baseline noise levels measured at the development site, presents the assessment criteria and discusses the implications on the building design, to achieve acceptable internal noise levels as required by the Local Authority.
- 1.3 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND AND SITE DESCRIPTION

Site Location

- 2.1 The site is bound by residential properties off Hayfield Road to the north, Morland Road to the east and agricultural land to the south and west, as identified on Figure 2.1, below.



- 2.2 Hayfield Road links Hayfield to the east and New Mills to the west. Morland Road is a single carriageway road providing access to properties on Morland Road and a farm.

Proposed Scheme

- 2.3 The proposed scheme, which has been designed by Randfield Associates Ltd, includes for six residential properties as presented in Figure 2.1, above.
- 2.4 It is understood that triple glazing will be installed in all habitable rooms and trickle vents will also be provided in all windows.

3.0 BASIS OF ASSESSMENT

Determining External Noise Levels

- 3.1 British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' (BS8233) describes how noise levels can be determined and assessed from different sources in chapters 6.2 to 6.7.
- 3.2 In relation to road traffic noise, BS8233 states that the noise from road traffic can be determined using the Department of Transport Welsh Office document '*Calculation of Road Traffic Noise*' issued in 1988 (CRTN). CRTN presents the shortened measurement procedure which can be used to convert the arithmetic mean of the measured $L_{A10,T}$ levels (measured over 3 consecutive hours during the period 1000h to 1700h) into an 18-hour L_{A10} level by subtracting 1dB.
- 3.3 BS8233 suggests that the conversion of the $L_{A10,18h}$ to $L_{Aeq,16h}$ can be achieved by the (approximate) relationship of $L_{Aeq,16h} = L_{A10,18h} - 2dB$. Therefore, the daytime ambient noise level can be determined by subtracting 3dB from the arithmetic mean of the $L_{A10,T}$ levels measured on-site over 3 consecutive hours (between 1000 and 1700h).

National Planning Policy Framework

- 3.4 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government, dated March 2012, and revised most recently in December 2024.
- 3.5 The planning policies which relate specifically to noise, were updated in July 2021, and are presented in paragraphs 187, 198 and 200 which are reproduced below:

"187. 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;*

198. *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.*
200. *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.*
- 3.6 Further to the above, the Governments 'Planning Practice Guidance' (PPG) published on 6 March 2014 and most recently updated in September 2023 states:
- 'Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.'*
- 3.7 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users, and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.
- 3.8 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users, and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.

Internal Noise Level Limits

- 3.9 The daytime and night-time noise limit levels to be achieved in habitable rooms due to sources without a specific character (e.g. roads and rail) are presented in Table 3.1, below. These are based on guidance in BS8233, WHO Guidelines for community noise and The Association of Noise Consultants (ANC) document Professional Practice Guidance on Planning and Noise 'New Residential Development' (2017) (ProPG).

Table 3.1 – Internal Noise Level Limits within Habitable Rooms

Activity	Location	Noise Level Limit, dB		
		Daytime 0700 – 2300h $L_{Aeq,16h}$	Night-Time 2300 – 0700h	
			$L_{Aeq,8h}$	$L_{Amax,F}$
Resting	Living Room	35	-	-
Dining	Dining Room/Area	40	-	-
Sleeping (daytime resting)	Bedroom	35	30	45

- 3.10 In relation to maximum noise levels in bedrooms during the night-time period, Note 4 of ProPG states that *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed $45dB_{LAmax,F}$ more than 10 times a night."*

Ventilation Provision

Whole Dwelling Ventilation

- 3.11 The above internal noise level limits need to be achieved with whole dwelling ventilation, as defined in Approved Document F 'Ventilation' (2021) of the Building Regulations.
- 3.12 Whole dwelling ventilation is typically achieved either via background ventilators (e.g., an open window or trickle ventilators) or mechanical means.
- 3.13 ProPG, states that the attenuation of external to internal noise levels provided by a window partially open for ventilation is no more than -15dB.
- 3.14 Therefore, for whole dwelling ventilation to be provided via a partially open window, the external noise levels presented in Table 3.2, below should not be exceeded.
- 3.15 In relation to purge ventilation, PNTG states that ADF states *"The indoor noise level criteria for bedrooms and living rooms do not need to be achieved when windows are opened to achieve Part F purge ventilation requirements."*
- 3.16 In addition, ProPG suggests that in relation to the requirement for purge ventilation, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food), the internal desired noise levels are not generally applicable. Therefore, internal noise levels due to windows being opened for purge ventilation has not been discussed further.
- 3.17 ADF states that information about overheating is given in Approved Document O (ADO) 'Requirement 01: Overheating Mitigation Regulations: 40B' (2021 edition).

Overheating Strategy

- 3.18 ADO states that in locations where external noise may be an issue (e.g. buildings close to busy roads) the overheating mitigation strategy should take account of the likelihood that windows will be closed during normal sleeping hours (2300 to 0700h).

3.19 The document then states that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:

- “a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
b. 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).”*

3.20 Paragraph 1.11 and Table 1.4 of ADO states that the opening in the external façade of a bedroom should have a minimum free area of 4% of the floor area of the room for medium-risk areas such as this site.

3.21 In relation to proposing appropriate internal noise level limits for the control of overheating in residential properties during the daytime, AEC has considered the guidance presented in the Association of Noise Consultants ‘Acoustics, Ventilation and Overheating: Residential Design Guide (2020) (AVO)’. It is important to note that AVO is a design guide only and not a statutory document and the Local Authority may have their own requirements.

3.22 Whilst AVO does not specify specific limits in relation to allowable internal noise levels, it does suggest a Level 1 risk assessment should be undertaken considering the magnitude of external noise levels. Table 3.2 of AVO provides an indicative risk category assessment for different free-field external noise levels and states that above a free-field external noise level of approximately 63dB $L_{Aeq,16h}$, there is ‘increasing risk of adverse impact’. Therefore, this has been chosen as the external daytime noise level limit for which open windows cannot be relied upon for the control of overheating.

3.23 To consider the likely internal noise levels based on the above external noise levels, AVO indicates that a reduction in noise levels of around 13dB can be expected across a window that is partially open for ventilation purposes (approximately 2% of the floor area for a room).

Summary – External Noise Levels for Different Types of Ventilation

3.24 Based on the above guidance from ProPG, ADF, ADO and AVO, the free-field external noise level limits for which openable windows cannot be relied upon for different forms of ventilation are presented in Table 3.2, below.

Table 3.2 – Noise Level Limits Above Which Openable Windows Should Not be Used for the Each Type of Ventilation/Overheating

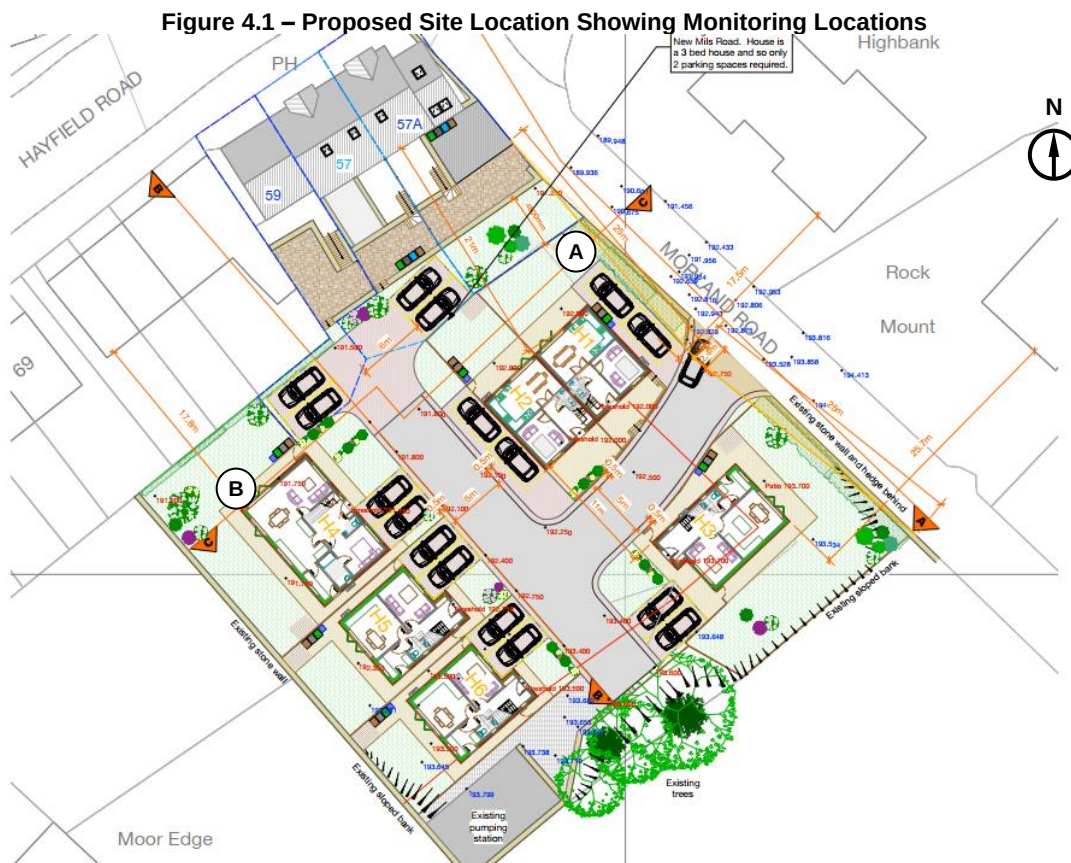
Period	Rooms	Noise Level Limit, dB					
		Whole Dwelling (ADF) Requirement		Overheating (ADO) Requirement		Overheating (AVO) Guidance Only	
		External Free-field	Internal	External Free-field	Internal	External Free-field	Internal
Daytime	Living Room/Bedroom	50 $L_{Aeq,16h}$	35 $L_{Aeq,16h}$	-	-	63 $L_{Aeq,16h}$	50 $L_{Aeq,16h}$
Night-time	Bedroom	45 $L_{Aeq,8h}$	30 $L_{Aeq,8h}$	50 $L_{Aeq,8h}$	40 $L_{Aeq,8h}$	-	-
		60 $L_{Amax,F}$	45 $L_{Amax,F}$	65 $L_{Amax,F}$	55 $L_{Amax,F}$	-	-

External Noise Level Limits

3.25 For traditional external areas that are used as an amenity space, such as gardens and patios, BS8223 states that it is desirable that ambient noise levels should not exceed 50dB $L_{Aeq,16h}$ during the daytime (0700 to 2300h), with an upper limit of 55dB $L_{Aeq,16h}$.

4.0 NOISE CLIMATE

- 4.1 An attended daytime noise level survey was undertaken by AEC between approximately 1330 to 1530h on Wednesday 11th December 2024.
- 4.2 Measurements were undertaken in two locations, identified as A and B on the Figure 4.1, below.
- 4.3 All measurements were undertaken under free-field conditions and in general accordance with BS7445-1: 2003 'Description and measurement of environmental noise. Guide to quantities and procedures'. A full measurement procedure for the survey is presented in Table B.1 of Appendix B and the measured data is presented in Table B.2 and B.3.



- 4.4 In summary, the daytime ambient noise levels were consistently around 55dBL_{Aeq,T} at Location A and 49dBL_{Aeq,T} at Location B. At night, ambient noise levels were consistently below 45dBL_{Aeq,T} and the highest maximum noise level was 62dBL_{Amax,F}. The noise climate during both periods was dominated by road traffic on Hayfield Road. The maximum noise level was due to a bus pass-by.

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

Determining of External Noise Levels

- 5.1 The main source of noise affecting the site during the daytime and night-time periods is road traffic on Hayfield Road.
- 5.2 Based on the noise levels measured on-site, distance attenuation, angle of view to the noise source and screening where applicable the daytime ambient noise level affecting all properties would be no greater than $50\text{dBL}_{\text{Aeq},16\text{h}}$ with the exception of the western elevation of H1 where the external noise level would be around $55\text{dBL}_{\text{Aeq},16\text{h}}$. At night, ambient noise levels across the entire would be $45\text{dBL}_{\text{Aeq},8\text{h}}$ and the maximum noise level would be below $60\text{dBL}_{\text{Amax},\text{F}}$ with the exception of Plot 1 where maximum noise levels could exceed $60\text{dBL}_{\text{Amax},\text{F}}$.

Glazing and Ventilation Requirements

- 5.3 As stated in Section 3.0, for habitable rooms to have whole dwelling ventilation provided via a window partially open, external noise levels should not exceed $50\text{dBL}_{\text{Aeq},\text{T}}$ during the daytime and $45\text{dBL}_{\text{Aeq},\text{T}}$ and $60\text{dBL}_{\text{Amax},\text{F}}$ at night.
- 5.4 A comparison between these levels and the determined noise levels presented above, indicates that windows could be opened at all times with the exception of habitable rooms on the western elevation of Plot 1 during the daytime and night-time periods. Windows to these spaces would need to be closed and alternative means of ventilation provided.
- 5.5 Calculations indicate that appropriate internal noise level limits would be achieved with standard double glazing (4mm glass / thermal cavity / 4mm glass) which achieves a sound insulation performance of 29dBR_w and $25\text{dBR}_w + C_{tr}$ and acoustic trickle ventilators which provide $33\text{dBD}_{n,e,w}$ in the open position.
- 5.6 As stated above, it is understood that triple glazing is to be installed to all habitable rooms, and these would be expected to achieve at least 29dBR_w and $25\text{dBR}_w + C_{tr}$ and therefore would be acceptable.
- 5.7 All background ventilation sound insulation requirements have been based on the use of a single ventilator per room. If more than one unit is required, such as may be required to satisfy Building Control requirements, the performance of each unit might need to be increased.

Purge Ventilation

- 5.8 Windows can be openable for purge ventilation provided that they are effectively acoustically sealed when closed, and it is important that any frames and seals do not downgrade the sound insulation performance of the glazing.

Control of Overheating

- 5.9 Ambient noise levels during the daytime and night-time and night-time maximum noise levels affecting the site are at a level that windows could be open to aid with the control of overheating during all periods.

External Envelope

- 5.10 To maintain the sound insulation performance of the external envelope, the remainder of the façade construction should have a sound insulation performance of at least 10dB higher than the glazing. Therefore, the external walls and roof would need to achieve a sound insulation performance of at least around 40dB_{R'w}. This would be readily achievable with standard construction methods.

External Noise Levels in Gardens

- 5.11 As per Table 5.1, above, daytime ambient noise levels within the gardens of the properties would not exceed 55dB_{LAeq,16h}, and would therefore, be acceptable.

6.0 SUMMARY & CONCLUSIONS

- 6.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by CSV Developments Ltd to undertake a noise assessment for planning purposes in relation to the proposed new residential development consisting of 6 plots on the site of the former Grouse Hotel Car Park, Birch Vale.
- 6.2 An assessment of noise affecting the site has been carried out based on the current National Planning Policy Guidance and guidance presented in the following documents:
- BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'
 - World Health Organisation '*Guidelines for Community Noise: 1999*'
 - Professional Practice Guidance on Planning and Noise '*New Residential Development*' 2017
 - Association of Noise Consultants (ANC) '*Acoustics Ventilation and Overheating – Residential Design Guide*' Ver 1.1 January 2020
 - Approved Document O of the Building Regulations 2010 '*Requirement 01: Overheating Mitigation Regulations 40B*'
- 6.3 An attended daytime and night-time noise survey was undertaken by AEC in December 2024 and the main noise source in the area was road traffic on Hayfield Road. Full details of the noise level survey are presented in Appendix B. A summary of the noise levels measured and the sources of noise affecting the proposed development are discussed in Section 4.0.
- 6.4 An assessment of the noise levels measured and affecting the proposed development is presented in Section 5.0. Based on this assessment, the sound insulation requirements of the building envelope and ventilation have been determined and are presented in paragraph 5.5. In brief, acoustically enhanced glazing is required to the habitable rooms on the northern elevation of Plot 1, and ventilation can be provided by through the frame acoustic trickle vents.
- 6.5 Based on the above, appropriate planning conditions can be applied to the proposed development to ensure internal noise levels compliant with relevant the guidance documents in the proposed accommodation are achieved.

APPENDIX A – Acoustic Terminology in Brief

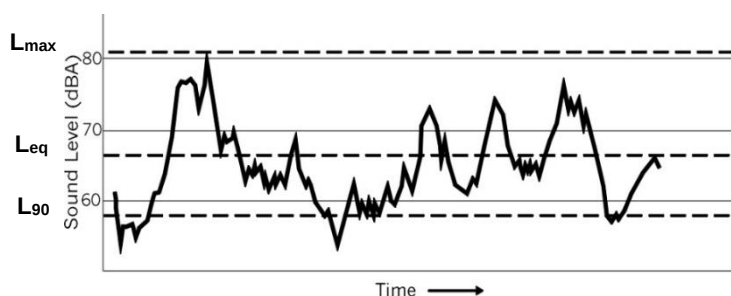
General

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasizes or reduces the importance of certain frequencies within the audible range

Sound / Noise Units

The figure below shows an example of sound level varying with time. Because of this variation over time the same period of noise can be described by several different levels. The most common of these are described below.



Commonly Used Descriptors for Sound / Noise

$L_{Amax,F/S}$	The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' meter response should be cited.
$L_{Aeq,T}$	The equivalent continuous (A-weighted) sound level. It may be thought of as the "average" sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises. It can be considered as the "ambient" noise level.
$L_{A90,T}$	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe the "background" noise.
Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
Façade Level	This refers to the sound level measured outside, at 1m from a hard reflecting surface, typically 3dB greater than the free-field level.
R_w	Single number rating used to describe the <u>laboratory</u> airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
R'_{w}	Apparent sound reduction index - Single number rating used to describe the sound reduction index of an on-site construction over a range of frequencies, typically 100-3150Hz.
C_{tr}	A road traffic spectrum adaptation term which is used to describe the low frequency sound insulation performance of building elements.
$L'_{nT,w}$	Single number rating used to describe the on-site impact sound insulation performance properties of a floor over a range of frequencies, typically 100-3150Hz.

APPENDIX B – Noise Survey Details

Table B.1 – Environmental Noise Procedure

Date & Time of Survey:	Daytime: 1345 to 1530h on Wednesday 11 December 2024. Night-time: 2300 to 2340h on Thursday 12 December 2024.					
Personnel:	Daytime: Liam Harrison (AEC). Night-time: Paul Knowles (AEC)					
Equipment Used:	B&K 2250 Real Time Analyser (AEC Kit 1). B&K 2260 Real Time Analyser (AEC Kit 2).					
Calibration:	The sound level analysers, which conforms to BS EN 61672-1: 2013 ' <i>Electroacoustics – Sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	11.12.24	Day	Dry	8-12°C	Calm	50%
	12.12.24	Night	Dry	8°C	Calm	100%
Measurement Locations:	Measurements were undertaken at two locations around the development site. Identified as A and B on Figure 4.1.					
Measurement Details:	Measurements at Locations A and B were undertaken under free-field conditions. Measurements were undertaken over various periods in terms of L_{eq} and L_{max} and were logged continuously over 1s for post processing and assessment. The measured daytime and night-time periods for the unattended survey is presented in Tables B.1 and B.2.					
Measured Data:	Full octave band centre frequency data was obtained for all measurements.					

Table B.2 – Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	$L_{Amax, F}$	
A	1345-1515	56.0	59.4	41.6	67.1	Main source of noise was road traffic on Hayfield Road, including bus pass-bys.
B	1330-1345	49.4	52.2	43.7	64.1	
	1515-1530	49.3	51.9	43.6	60.7	

Table B.3 – Measured Night-Time Noise Levels

Location	Period, h	Noise Level, dB			Comments
		L_{Aeq}	L_{A90}	$L_{Amax, F}$	
A	2300-2310	42.8	31.6	57.7	Main source of noise was road traffic on Hayfield Road, including bus pass-bys.
	2315-2325	42.2	30.8	58.3	
	2330-2340	42.1	30.2	61.5	