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NURSERY FIELDS, CHALCRAFT LANE, WEST BERSTED

PLANNING APPLICATION 2

NOISE IMPACT ASSESSMENT

Technical Report: R8512-2 Rev 2

Date: 4th November 2020

For: Landform Bersted Ltd
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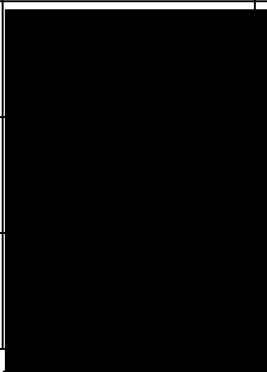
24 Acoustics Document Control Sheet

Project Title: Nursery Fields, Chalcraft Lane, West Bersted

Noise Impact Assessment

Report Ref: R8512-2 Rev 2

Date: 4th November 2020

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Document Status and Approval Schedule

Revision	Description	Prepared By	Reviewed By	Approved By
0	Approved for issue	Kiel Edwards	Reuben Peckham	Reuben Peckham
1	Update	Kiel Edwards	Reuben Peckham	Reuben Peckham
2	Update	Kiel Edwards	Reuben Peckham	Reuben Peckham

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1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been appointed by Landform Bersted Ltd to provide an outline noise impact assessment in support of a proposed residential development at Nursery Fields, Chalcraft Lane in West Bersted, West Sussex.
- 1.2 The application is associated with a neighbouring development on a site known as Chalcraft Nursery. An outline noise impact assessment has been also undertaken for the neighbouring site. This is detailed in 24 Acoustics' technical report ref: R8512-1 Rev 1 Berstead – Application 1.
- 1.3 The site is affected primarily by noise from road traffic using Chalcraft Lane and potentially also from the proposed access road that is to be created. Accordingly, this noise impact assessment has included:
- Environmental noise monitoring;
 - Acoustic modelling of the noise from the proposed access road;
 - Consideration of the ambient noise affecting the site;
 - Assessment of internal noise levels within the proposed dwellings;
 - Consideration of noise levels in external amenity areas.
- 1.4 This report presents the results of the assessment, following site visits and environmental noise surveys undertaken on the site between 5th and 12th May 2020.
- 1.5 All sound pressure levels quoted in this report are in dB relative to 20 µPa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The existing site comprises arable farmland located to the north and west of Chalcraft Nursery. There is an existing vehicular access to Chalcraft Nursery from Chalcraft Lane.
- 2.2 The land to the north and west is in agricultural use, with the site boundaries defined by field parcels. To the south sits the Chalcraft Lane Cemetery. The land to the east and north is largely residential in nature.
- 2.3 Outline planning consent is being sought for up to 225 dwellings at the site, comprising a mix of houses and flats.

- 2.4 The existing site layout is shown in Figure 1. An example of an indicative site masterplan is shown in Figure 2.

3.0 STANDARDS AND GUIDANCE

National Planning Policy Framework and Noise Policy Statement for England

- 3.1 Paragraph 180 of the National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions 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.

- 3.2 The NPPF also refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life.

- 3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

- 3.4 The Planning Practice Guidance (PPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG states that noise can over-ride other planning concerns but should be considered in the context of the wider characteristics of the development proposal, its likely users and its surroundings.
- 3.5 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.
- 3.6 The NPPF, NPSE and PPG documents do not refer to specific noise criteria. For residential developments 24 Acoustics considers that the spirit of the requirements of the NPPF and NPSE will be complied with if criteria from British Standard 8233: 2014 and guidance from the World Health Organisation are adopted for internal noise levels within dwellings.

Professional Practice Guidance on Planning & Noise (ProPG)

- 3.7 The Professional Practice Guidance on Planning and Noise (ProPG) [Reference 4] was published jointly by the Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health in May 2017. The guidance relates to the consideration of existing sources of transportation noise upon proposed new residential development and strives to:
- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
 - Encourage the process of good acoustic design in and around new residential developments;
 - Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
 - Improve understanding of how to determine the extent of potential noise impact and effect; and
 - Assist the delivery of sustainable development.

3.8 The guidance describes a recommended approach for new residential development, which includes four key elements of the assessment process, identified below:

- i. Good acoustic design process;
- ii. Internal noise level guidelines;
- iii. External amenity area noise assessment;
- iv. Assessment of other relevant issues.

3.9 It is important to note that the guidance in ProPG does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.

BS 8233:2014 and WHO Guidelines

3.10 BS 8233:2014 [Reference 5] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB $L_{Aeq,16hr}$ in living rooms and bedrooms during the day, 40 dB $L_{Aeq,16hr}$ in dining rooms during the day and 30 dB $L_{Aeq,8hr}$ in bedrooms at night. A relaxation of 5 dBA in the above figures is given in the standard for rooms which are naturally ventilated (by opening windows).

3.11 BS 8233:2014 also notes that *“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night.”*

3.12 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 6] suggest internal night-time noise levels not exceeding 30 dB $L_{Aeq,8hr}$ or regularly (10 – 15 times per night) exceeding 45 dB $L_{Amax,f}$ for ‘a good night’s sleep’.

3.13 BS 8233:2014 suggests an upper guideline value of 55 dB $L_{Aeq,16hr}$ for noise levels in external amenity spaces such as gardens. This is considered an aspirational limit and BS 8233 recognises that the desirable noise levels for external amenity areas are not always achievable in certain locations. BS 8233 also states that development should not be prohibited on the basis of noise levels within external amenity areas.

Summary

3.14 The impact of noise upon the proposed development has been assessed using the following recommended maximum internal noise levels, due to road traffic:

- 35 dB $L_{Aeq,16hr}$ daytime noise level for living rooms;
- 30 dB $L_{Aeq,8hr}$ night-time noise level for bedrooms;
- 45 dB $L_{Amax,f}$ night-time noise levels in bedrooms for regular events;
- Aspirational target limit of 55 dB $L_{Aeq,16hr}$ in external amenity areas.

4.0 ENVIRONMENTAL NOISE SURVEYS

4.1 Environmental noise measurements were undertaken between 5th and 12th May 2020 to determine the existing noise levels at the site. Ambient noise levels were measured using the following equipment:

- | | |
|------------------------------------|-------------|
| • Rion precision sound level meter | Type NL-52; |
| • Norsonic acoustic calibrator | Type 1251. |

4.2 The survey location is shown in Figure 1 and described below.

- Location 1 to the south of the site, between the retail area and the new housing area.

4.3 Noise measurements were undertaken in samples of 5 minutes in terms of the overall A-weighted and octave band L_{eq} , L_{90} and $L_{max,f}$ noise levels. Measurements were made in accordance with BS 7445:1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 7].

4.4 The instrumentation calibration was checked before and after the survey in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards.

4.5 All instruments were fitted with environmental weather shields during the surveys. Weather conditions during the survey were typically fine and dry with wind speeds typically lower than 5 m/s throughout.

4.6 The results of the noise survey are summarised in Table 1 below and shown graphically in Appendix B.

Day and Date	Time of Day, Noise Metric and Sound Pressure Level, dB				
	Day		Night		
	L _{Aeq} , 16 hour Average	L _{A90} , 5 min Typical	L _{Aeq} , 8 hour Average	L _{Amax} , f Typical	L _{A90} , 5 min Typical
Tuesday 5/5/2020			47	66	32
Wednesday 6/5/2020	46	36	46	70	32
Thursday 7/5/2020	46	33	44	67	26
Friday 8/5/2020	42	33	43	65	27
Monday 11/5/2020	48	38	43	64	29
Saturday 9/5/2020	45	35	43	67	24
Sunday 10/5/2020	48	39	47	64	39

Table 1: Ambient Noise Levels, 5-12th May 2020, Chalcraft Nurseries

- 4.7 Please note that 24 Acoustics determines the typical night-time maximum noise level to be the tenth highest in this period.

5.0 NOISE FROM PROPOSED ACCESS ROAD

- 5.1 The proposed access road will serve as the main route through the site. Dead end branch roads will provide access to all properties not directly accessible from the road.
- 5.2 It is possible that the new housing (to which this planning application relates) and existing housing on Chalcraft Lane could be affected by noise from road traffic using the access road. For this reason, an acoustic model of the proposed road has been developed. This has used the calculation method of the Department of Transport publication Calculation of Road Traffic Noise [Reference 8] and ISO 9613 parts 1 and 2 [Reference 9] to determine the likely noise level across the site. Immi v 2017 noise mapping software has been used. The model has been based upon the traffic forecasts produced by iTransport in October 2020 for 225 dwellings within the site (shown in Appendix C). Night-time noise levels were derived using the provided traffic forecasts and the guidance of the TRL project report PR/SE/451/02 "Converting the UK traffic noise index L_{A10,18h} to EU noise indices for noise mapping" [Reference 10].
- 5.3 In addition, the noise survey data reported in Section 4 above has also been entered into the model to show the total variation in noise level across the site.

- 5.4 The associated noise contours are shown in Figures 3 and 4.

6.0 NOISE IMPACT ASSESSMENT

Noise Impact of Proposed Relocated Access Road on Existing House

- 6.1 The acoustic model indicates that noise from road traffic using Chalcraft Lane will be significantly more dominant than noise from traffic using the proposed access road. As a result there will be no material change in noise impact on existing properties in Chalcraft Lane as a result of the traffic on the relocated access road.

Noise Levels in External Amenity Areas (Proposed New Housing)

- 6.2 Acoustic calculations show that external noise levels in private gardens are likely to be lower than 55 dB $L_{Aeq,16hr}$ during the day. Given the context of the site, this is considered acceptable in planning terms.

Internal Noise Levels

- 6.3 Calculations have been undertaken to determine the level of noise break-in to the proposed development, to ensure that the average noise levels do not exceed 35 dB $L_{Aeq,16hr}$ during the day and 30 dB $L_{Aeq,8hr}$ at night (and also not regularly exceed 45 dB $L_{Amax,f}$ at night). BS 8233:2014 does, however, provide a 5 dBA dispensation for rooms which are ventilated by open windows and this is considered relevant in this case.
- 6.4 Where it is necessary for windows to be closed in order to achieve acceptable internal noise levels a ventilation strategy must also achieve other relevant requirements as per Building Regulations Approved Document F [Reference 11], which is to be confirmed by others. Where reliance is made on closed windows in order to achieve a satisfactory internal noise level Landform Bersted Ltd should also give consideration to design measures to prevent excess thermal build up in each property.
- 6.5 The analysis given below has been based on 24 Acoustics' understanding that external walls will comprise a cavity masonry construction, which would typically achieve a minimum sound insulation performance of 52 dB R_w .
- 6.6 Accurate room volumes and glazed areas are not currently known, therefore, typical room dimensions and glazed areas have been assumed in the calculations. This assessment must be updated once the dwellings' layout details are determined.

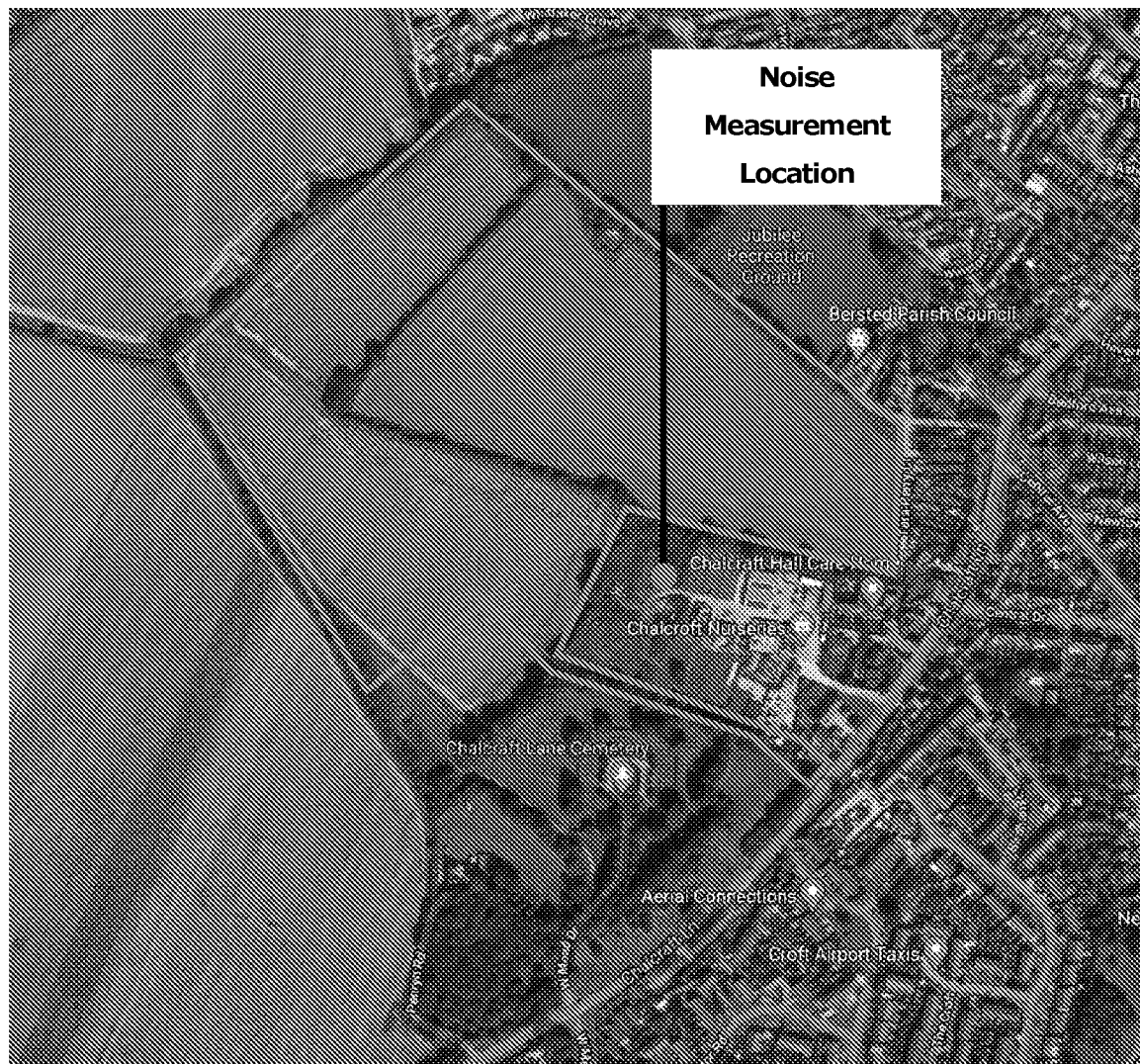
- 6.7 The analysis indicates that all dwellings on the main part of the proposed housing area will be capable of achieving acceptable internal noise levels (taking into account the 5 dBA dispensation offered in BS 8233) in habitable rooms when windows are open for ventilation purposes. This means that there will be no special glazing or ventilation requirements.
- 6.8 The houses overlooking the main access road and the houses closest to Chalcraft Lane (north east of the site) will likely be contingent on closed windows to bedrooms and lounges in order to achieve an acceptable internal noise environment. Alternative means of ventilation will therefore be required. This should be fully specified once the glazing areas and room volumes are determined, however, indicative calculations show that, as a minimum, an acoustically rated through wall/trickle vent (or alternatively a MVHR system) will be required. Measures will also need to be considered to prevent overheating in these properties.
- 6.9 It is considered that with the proposed outline mitigation measures as detailed above, suitable internal noise levels can be achieved for the proposed dwellings.

7.0 CONCLUSIONS

- 7.1 24 Acoustics Ltd has been appointed by Landform Bersted Ltd to provide a noise impact assessment in support of a proposed development at Nursery Fields, Chalcraft Lane in West Bersted, West Sussex.
- 7.2 An environmental noise survey has been carried out at the site to determine existing noise levels during daytime and night-time periods and calculations undertaken to determine the likely noise from the use of the proposed site access road.
- 7.3 Outline recommendations have been provided in relation to the glazing and ventilation strategy to ensure that average noise levels from road traffic within habitable rooms would comply with the requirements of British Standard 8233:2014.
- 7.4 Noise levels in external amenity areas are considered acceptable in planning terms given the context of the site.
- 7.5 It is concluded that, with the recommended outline measures given, noise levels will be acceptable for future occupiers of the scheme and there will be no material change to the occupiers of the existing dwellings on Chalcraft Lane.

REFERENCES

1. Department for Communities and Local Government. National Planning Policy Framework, 2018.
2. DEFRA. Noise Policy Statement for England, 2010.
3. Department of Communities and Local Government. Planning Practice Guidance, July 2019.
4. Association of Noise Consultants, Institute of Acoustics, Chartered Institute of Environmental Health. Professional Practice Guidance on Planning and Noise, May 2017.
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9. ISO 9613 Parts 1 and 2 – Acoustics, 1993/1996.
10. TRL project report PR/SE/451/02. Converting the UK traffic noise index $LA_{10,18h}$ to EU noise indices for noise mapping, 2002.
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Project: Nursery Fields, West Berstead	Title: Aerial view and noise measurement location.		 24Acoustics
DWG No: Figure 1	Scale: N.T.S.	Rev: 0	
Date: October 2020	Drawn By: KE	Job No: 8512-2	



Project: Nursery Fields, West Berstead	Title: Indicative Site Masterplan		 24Acoustics
DWG No: Figure 2	Scale: N.T.S.	Rev: 0	
Date: October 2020	Drawn By: KE	Job No: 8512-2	



Project: Nursery Fields, West Berstead	Title: Noise Contour Map- Daytime $L_{Aeq, 16 \text{ hour}}$, dB at 1.5m		 24Acoustics
DWG No: Figure 3	Scale: N.T.S.	Rev: 0	
Date: October 2020	Drawn By: KE	Job No: 8512-2	



Project: Nursery Fields, West Berstead	Title: Noise Contour Map- Night time L_{Aeq} , 8 hour, dB at 4m		
DWG No: Figure 4	Scale: N.T.S.	Rev: 0	
Date: October 2020	Drawn By: KE	Job No: 8512-2	

APPENDIX A – ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dB is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

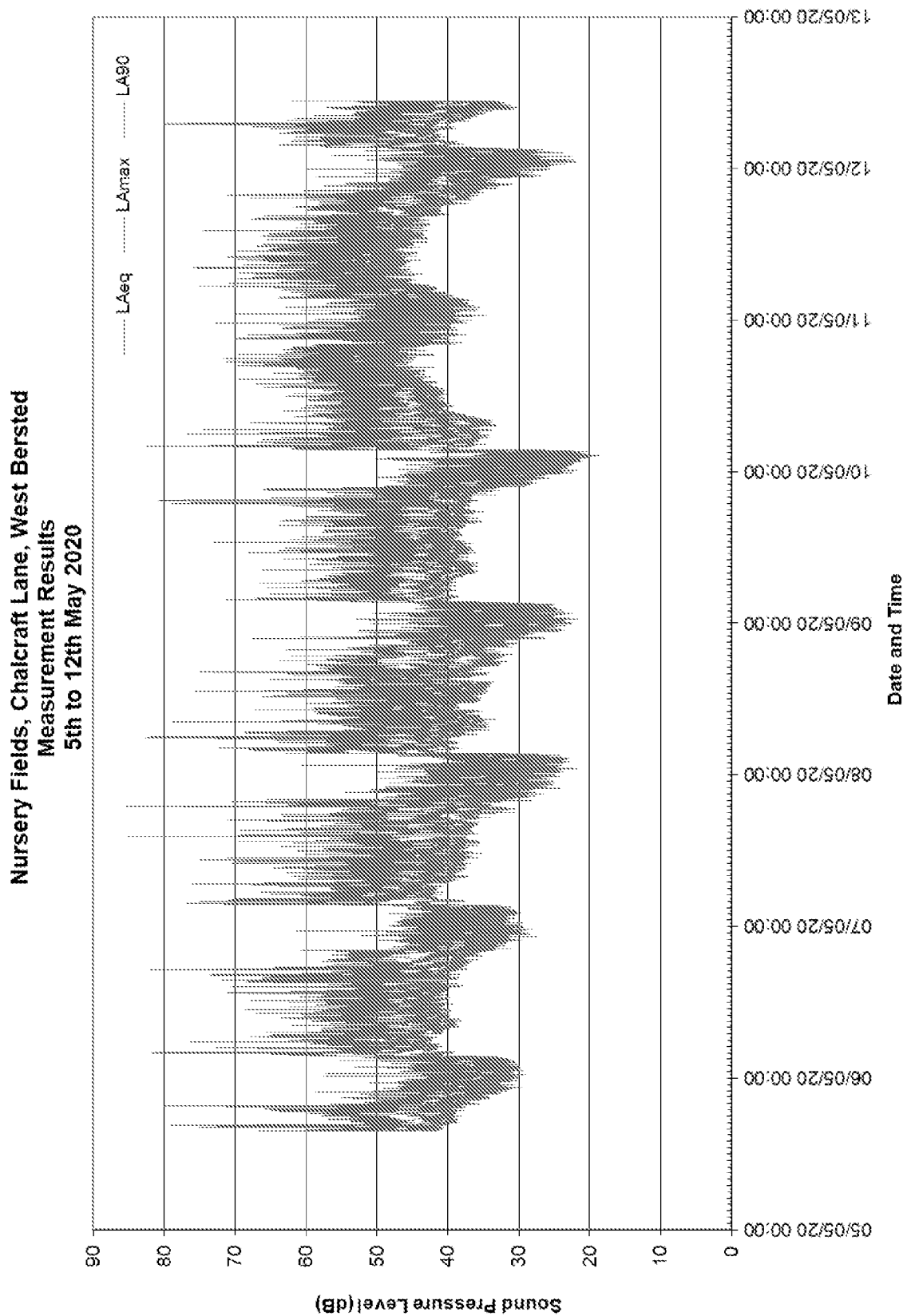
It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – ENVIRONMENTAL NOISE SURVEY RESULTS

APPENDIX C – TRAFFIC FORECASTS PRODUCED BY ITRANSPORT

			Development Flows									Noise 5 day 8hr (23-7)			Noise 5 day 16hr (7-23)			Noise 5 day 18hr (6-24)		
Link	Location	Direction	AM Peak Hour			PM Peak Hour			Combined Peak Hour			Total Veh flow	HGV flow	HGV %	Total Veh flow	HGV flow	HGV %	Total Veh flow	HGV flow	HGV %
			Total Veh flow	HGV flow (No. of vehidet)	HGV %	Total Veh flow	HGV flow (No. of vehidet)	HGV %	Total Veh flow	HGV flow (No. of vehidet)	HGV %									
1	Site Access	Eastbound	71	0	0%	25	0	0%	96	0	0%	33	0	0%	500	0	0%	526	0	0%
		Westbound	26	0	0%	67	0	0%	93	0	0%	32	0	0%	484	0	0%	510	0	0%
		Two-Way	97	0	0%	92	22	0%	189	0	0%	64	0	0%	984	0	0%	1036	0	0%