



**Armstrong House
3 Bassett Avenue
Southampton
SO16 7DP**

**T: 02381 555 000
E: info@24acoustics.co.uk**

**LAND AT ELMFIELD HOUSE, PETERSFINGER ROAD, SALISBURY
NOISE ASSESSMENT**

Technical Report: R10248-1 Rev 1

Date: 16th October 2023

For: Dr & Mrs Rodger
c/o Atlas Planning Group
Bodenham House Barn
Bodenham
Salisbury, Wiltshire
SP5 4EN

24 Acoustics Document Control Sheet

Project Title: Land at Elmfield House, Petersfinger Road, Salisbury –Noise Assessment

Report Ref: R10248-1 Rev 1

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	Name	Position	Signature	Date
Prepared by	Aileen Reed BEng MIOA	Principal Consultant		16/10/23
Reviewed by	Reuben Peckham BEng MPhil CEng MIOA	Director		16/10/23
Approved by	Reuben Peckham BEng MPhil CEng MIOA	Director		16/10/23
For and on behalf of 24 Acoustics Ltd				

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5.0 INTRODUCTION

1.1 24 Acoustics Ltd has been instructed by Atlas Planning Group on behalf of Dr & Mrs Rodger to undertake a noise assessment for a proposed residential development on land at Elmfield House, Petersfinger Road, Salisbury. The assessment has included:

- Ambient noise monitoring on the proposed site;
- Assessment of the noise arising from the A36 to the south of the site;
- Production of noise contour maps;
- Proposed noise mitigation measures.

1.2 All sound pressure levels quoted in this report are in dB relative to 20 μ Pa.

2.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 The site is located north of the A36 Southampton Road and to the south of Petersfinger Road. The Romsey to Salisbury railway line lies approximately 60 m to the north of the site and is significantly elevated relative to the site.

2.2 The existing property, Elmfield House, will be retained with the western part of the building undergoing conversion to four flats. The eastern part of the building will remain unchanged as a residential dwelling. The outbuildings to the west of the house will be converted to two dwellings. Twelve new dwellings will be constructed to the south of Elmfield House comprising a mixture of detached, terraced and chalet bungalow accommodation. Part of the site benefits from existing planning consent for residential development (19/00967/OUT and PL/2021/07611).

2.3 The site location can be seen in Figure 1 with the layout for the proposed residential development shown in Figure 2. An existing brick wall along the south-eastern boundary of the site at the junction of Petersfinger Road and Southampton Road is to be re-built to a height of 3 m and the extent of this can be seen in Figure 2.

3.0 CRITERIA

National Planning Policy Framework and Noise Policy Statement for England

- 3.1 Paragraph 185 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;
 - Determine 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 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

- 3.9 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).
- 3.10 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."*
- 3.11 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'.
- 3.12 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.

Building Regulations Approved Document O - Overheating

- 3.13 Approved Document O requires all new dwellings to provide mitigation to control overheating. The overheating mitigation strategy must be usable, and Section 3 of the approved document provides thresholds for night-time noise levels within bedrooms. The document states:

"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)."

Consultation

- 3.14 The Public Protection Department for Wiltshire Council has provided the following guidance:

"To achieve BS8233:2014 we would expect good design with bedrooms facing away from the road.

We would also expect assessments to assume partially ventilated windows, we would not accept mechanical ventilation."

Summary

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

- 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 NOISE MEASUREMENTS

4.1 Environmental noise measurements were obtained at the site between 14th and 19th September 2023.

4.2 The following equipment was utilised:

- Two x Rion (Class 1) precision sound level meter Type NL-52;
- Rion (Class 1) precision sound level meter Type NL-32;
- Brüel & Kjær acoustic calibrator Type 4231.

4.3 The noise monitoring equipment was located as follows (see also Figure 1):

- Location 1 – to the south of the site, facing the A36 Southampton Road at a height of 1.8 m above ground level;
- Location 2 – to the west of the site, adjacent to Petesfinger Park and Ride Car Park at a height of 1.5 m above ground level;
- Location 3 – to the north of the site facing Petersfinger Road at a height of 1.5 m above ground level.

4.4 Measurements were undertaken in 1 minute samples in terms of the overall free-field A-weighted L_{eq} , L_{10} , 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].

- 4.5 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.
- 4.6 Each instrument was fitted with an environmental weather shield during the survey. Weather conditions during the surveys were typically fine and dry with wind speeds typically lower than 5 m/s. For periods when weather was unsuitable for noise measurement, data has been removed prior to analysis.
- 4.7 The results of the ambient noise survey are shown graphically in Appendix B and are summarised below in Table 1-3.

Day and Date	Sound Pressure Level		
	Daytime Level (07:00 - 23:00) dB L _{Aeq} , 16 hour	Night-time Level (23:00 - 07:00) dB L _{Aeq} , 8 hour	Night-time Typical L _{Amax} , f
Thursday 14/9/2023	69	64	83
Friday 15/9/2023	71	62	82
Saturday 16/9/2023	70	61	81
Sunday 17/9/2023	70	69	84
Monday 18/9/2023	71	65	83
Tuesday 19/9/2023	71	-	-
Representative	71	65	84 max

Table 1: Summary of Ambient Noise Levels – Location 1. (* = incomplete period)

Day and Date	Sound Pressure Level		
	Daytime Level (07:00 - 23:00) dB L _{Aeq} , 16 hour	Night-time Level (23:00 - 07:00) dB L _{Aeq} , 8 hour	Night-time Typical L _{Amax} , f
Thursday 14/9/2023	50	44	62
Friday 15/9/2023	51	44	62
Saturday 16/9/2023	50	42	61
Sunday 17/9/2023	51	49	61
Monday 18/9/2023	53	47	61
Tuesday 19/9/2023	54	-	-
Representative	52	46	62 max

Table 2: Summary of Ambient Noise Levels – Location 2 (* = incomplete period)

Day and Date	Sound Pressure Level		
	Daytime Level (07:00 - 23:00) dB L _{Aeq} , 16 hour	Night-time Level (23:00 - 07:00) dB L _{Aeq} , 8 hour	Night-time Typical L _{Amax} , f
Thursday 14/9/2023	56	50	68
Friday 15/9/2023	57	48	65
Saturday 16/9/2023	56	48	64
Sunday 17/9/2023	57	54	67
Monday 18/9/2023	57	52	68
Tuesday 19/9/2023	59	-	-
Representative	57	50	68 max

Table 3: Summary of Ambient Noise Levels – Location 3 (* = incomplete period)

- 4.8 Observations were made during visits to site which confirmed that road traffic from the A36 was the dominant source of noise across the site. At Location 2, measured noise levels were dominated by noise from the A36 with a small contribution due to noise from activity within the park and ride car park.

5.0 NOISE IMPACT ASSESSMENT

Site Layout

- 5.1 The proposed residential properties closest to the A36 are oriented so that bedroom windows do not face towards the road.
- 5.2 To the south of the site a 3 m high acoustic fence (minimum surface density 12 kg/m²) has been incorporated into the design to ensure that road traffic noise from the A36 is minimised. An existing brick wall at the boundary of Petersfinger Road and Southampton Road will be rebuilt to match the height of the fence. The extent of this can be seen at Figure 2.

Calculated Noise Levels – Road Traffic Noise

- 5.3 An acoustic model of the site has been developed to determine the noise levels across the site from the A36 Southampton Road with the acoustic fence in place. The model has been produced using IMMI 2030 noise mapping software and has used the propagation methodology of CRTN [Reference 8] which takes into account the effects of which takes into account the effects of distance, geometric divergence and acoustic screening. The software incorporates the latest revisions to CRTN issued in LA 111.

- 5.4 Figures 3 and 4 show the predicted L_{Aeq} noise contours across the proposed development site for the day and night-time periods respectively. The model of daytime noise levels assumes a receiver height of 1.5 m whereas the night-time model assumes a receiver height of 4 m to represent first floor height in bedrooms.

Internal Noise Levels

- 5.5 The analysis given below has been based on 24 Acoustics' understanding of the envelope construction to be used for this scheme (based on a conventional cavity masonry construction). This is expected to achieve a minimum sound insulation performance of 52 dB R_w and this should be confirmed during detailed design. Similarly, the roof construction is assumed to achieve a minimum sound insulation performance of 45 dB R_w and this should be confirmed during detailed design, particularly where bedrooms are in the eaves of the houses.
- 5.6 Calculations have been undertaken utilising drawings showing internal layouts and elevations of the various house types provided by Atlas Planning.
- 5.7 Results of acoustic modelling have been used to determine the glazing and ventilation requirements for the proposed residential scheme which will ensure that the noise levels inside the properties do not exceed 35 dB $L_{Aeq, 16 \text{ hour}}$ during the day and 30 dB $L_{Aeq, 8 \text{ hour}}$ at night and also do not regularly exceed 45 dB $L_{Amax,f}$ at night.
- 5.8 Windows when installed should be capable of achieving the performance stated below in Table 4.

Glazing	Minimum SRI (dB) per Octave Band Centre Frequency (Hz)					
	125	250	500	1k	2k	4k
All Areas	21	17	25	35	37	39

Table 4: Required Window Performance

- 5.9 In making a comparison with the values in Table 4, it is important that the glazing figures used are the result of tests in accordance with ISO 10140, Part 2: 2010 and that the quoted minimum sound reduction specifications are met by the entire glazing system as a whole, including frames, seals, any insulated panels and not just the glass. The requirements also apply to any external glazed doors to habitable rooms.
- 5.10 In order to assist with the selection process, the following suggested glazing configurations, if installed properly, would be capable of achieving the required sound reduction performance. These configurations should not be used for design purposes:

- Glazing Type A: 4 mm glass: 6-16 mm cavity (minimum): 4 mm glass,
Minimum 29 dB Rw.

5.11 Calculations have identified minimum required background ventilator specifications for proposed residential properties. The vent requirements for habitable rooms are described below in Table 5 and relevant Zone locations identified in Figure 5.

Zone	Room	Vent Type
V1	Lounge	A
	Bedroom	A
V2	Lounge	B
	Bedroom	A
All Other Areas	Lounges & Bedrooms	B

Table 5: Background Vent Requirements

5.12 The acoustic performance criteria for background ventilators whilst in the open position are shown in Table 6 below and can be seen in Figure 5.

Vent	Minimum Vent Weighted Normalised element weighted level difference, $D_{ne,w}$ dB	Example of Type of Vent
Type A	36	Sound attenuated trickle vent
Type B	32	Standard trickle vent

Table 6: Required Vent Acoustic Performance

5.13 In making a comparison with the specifications in Table 6, it is important that the figures used are the result of laboratory tests with the vent in the open position. Note that the stated minimum performance value assumes two ventilators per living /bedroom and 3 ventilators in open plan living / kitchen / dining rooms. The specific ventilation requirements (e.g. equivalent free area etc.) to meet the requirement of Part F of the Building Regulations [Reference 9] should be confirmed by others.

5.14 It is considered that with the proposed mitigation measures as detailed above, suitable internal noise levels can be achieved for the proposed dwellings. If the site layout / housing types change then these calculations should be revised accordingly.

Overheating

- 5.15 Houses at the site should be designed and constructed to comply with Approved Document O, which came into effect in June 2022 and requires all new dwellings to provide mitigation to control overheating.
- 5.16 It is recommended that an overheating assessment is undertaken to ensure adequate mitigation measures are incorporated into the site design.

External Noise Levels

- 5.17 For the vast majority of the site, noise levels in external amenity areas during the day are predicted to be no greater than 55 dB $L_{Aeq, 16hr}$ and as such will meet the (aspirational) target level specified in BS 8233.

6.0 CONCLUSIONS

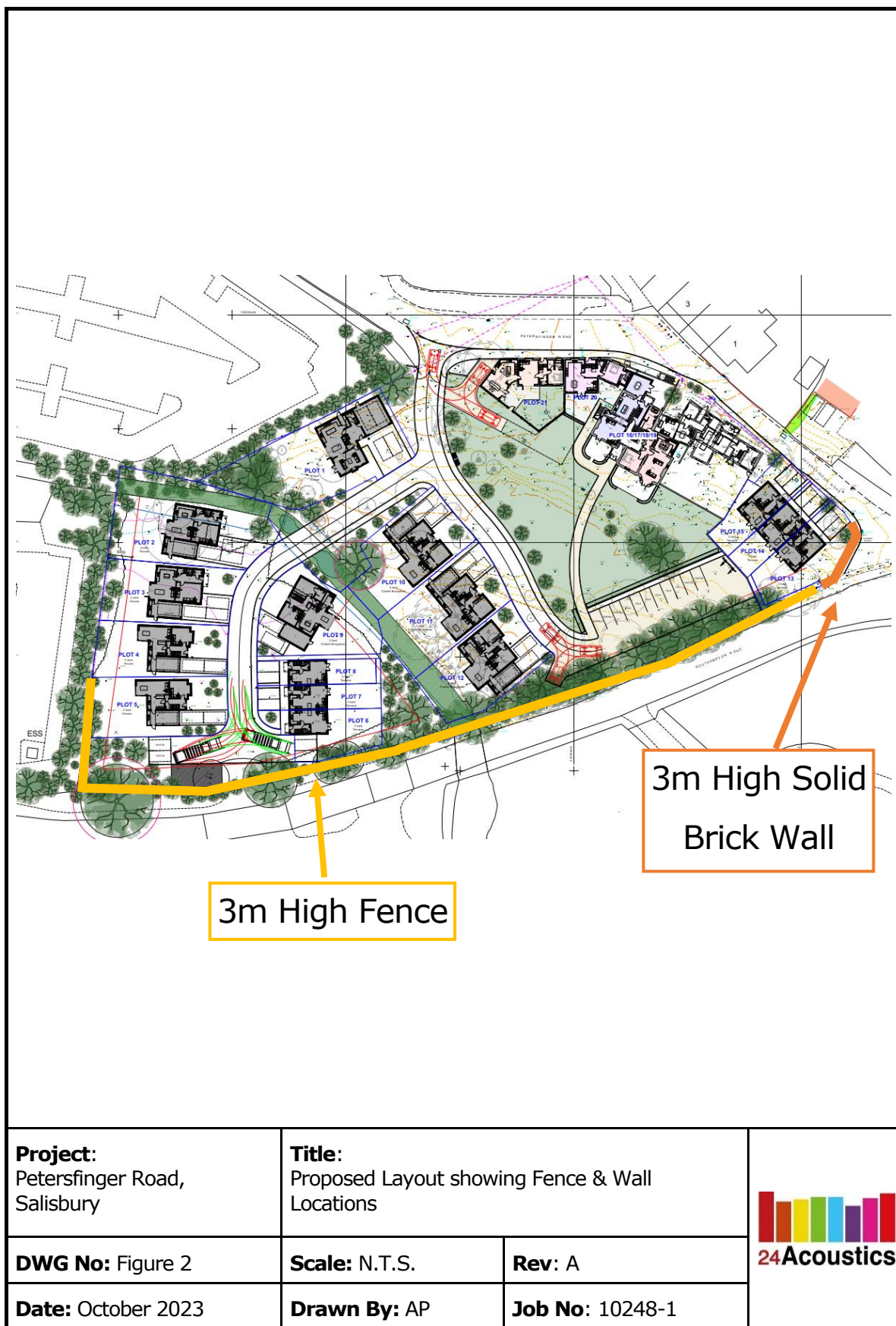
- 6.1 Atlas Planning, on behalf on Dr & Mrs Rodgers, intends to submit a planning application to develop land at Elmfield House, Petersfinger Road, Salisbury for residential use. The site is subject to noise from road traffic on the A36 Southampton Road and Petersfinger Park and Ride car park.
- 6.2 24 Acoustics Ltd has been retained to provide an assessment of the impact of the existing sources of noise on the proposed new dwellings.
- 6.3 A 3 m high acoustic fence and brick wall have been incorporated into the design between the proposed development site and the A36 Southampton Road.
- 6.4 For internal noise, recommendations in terms of glazing and alternative means of ventilation have been provided to ensure that noise within habitable rooms, due to road traffic, would comply with maximum internal levels of 35 dB L_{Aeq} during the daytime and 30 dB L_{Aeq} and 45 dB $L_{Amax, f}$ at night.
- 6.5 Noise levels in external amenity areas during the day are predicted to be less than 55 dB $L_{Aeq, 16hr}$ across the vast majority of the site and this is considered acceptable in planning terms.
- 6.6 On the above basis, it is considered that an appropriate acoustic environment can be provided to the proposed residential properties, both externally and internally.

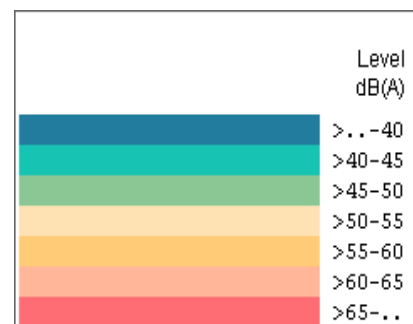
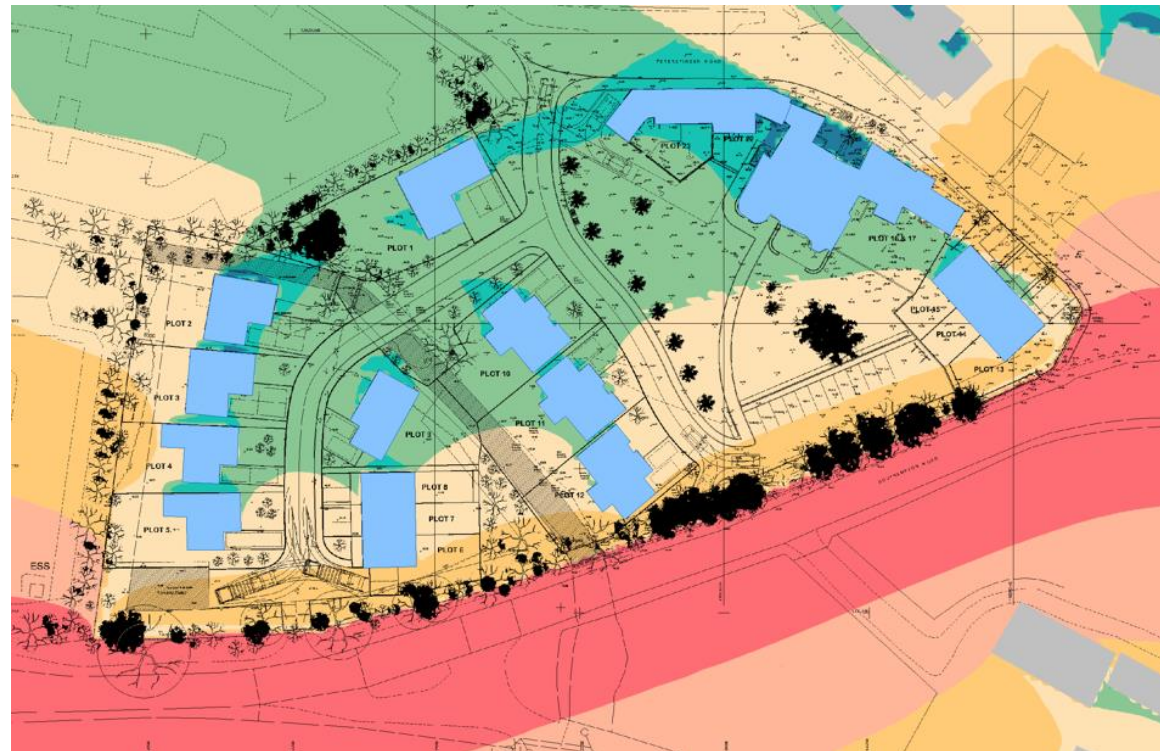
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2. DEFRA, Noise Policy Statement for England, March 2010.
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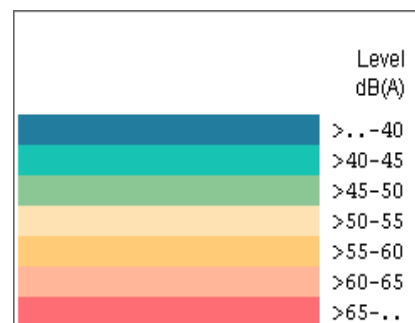
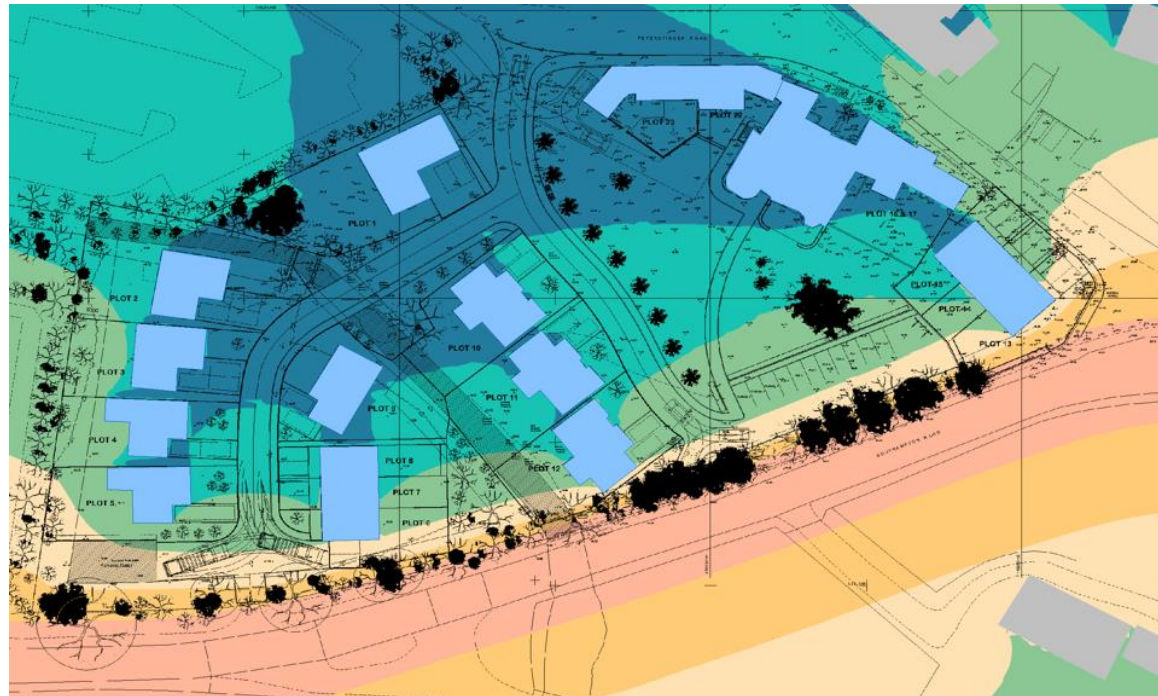


Project: Petersfinger Road, Salisbury	Title: Site Boundary and Noise Measurement Locations		 24Acoustics
DWG No: Figure 1	Scale: N.T.S.	Rev: -	
Date: October 2023	Drawn By: AR	Job No: 10248-1	





Project: Petersfinger Road, Salisbury	Title: Daytime (07:00-23:00) Noise Contours, dB L _{Aeq} , 16 hr		 24Acoustics
DWG No: Figure 3	Scale: N.T.S.	Rev: -	
Date: October 2023	Drawn By: AP	Job No: 10248-1	



Project: Petersfinger Road, Salisbury	Title: Night time (23:00–07:00) Noise Contours, dB L _{Aeq} , 8 hr		 24Acoustics
DWG No: Figure 4	Scale: N.T.S.	Rev: -	
Date: October 2023	Drawn By: AP	Job No: 10248-1	


Zone V1

Sound attenuated trickle vents, Minimum $D_{ne,w}$, 36 dB, living rooms and bedrooms

Zone V2

Sound attenuated trickle vents, Minimum $D_{ne,w}$, 36 dB, bedrooms only

Project: Petersfinger Road, Salisbury	Title: Proposed Layout showing Ventilator Requirements for Dwellings		 24Acoustics
DWG No: Figure 5	Scale: N.T.S.	Rev: -	
Date: October 2023	Drawn By: AR	Job No: 10248-1	

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 – NOISE MEASUREMENT RESULTS

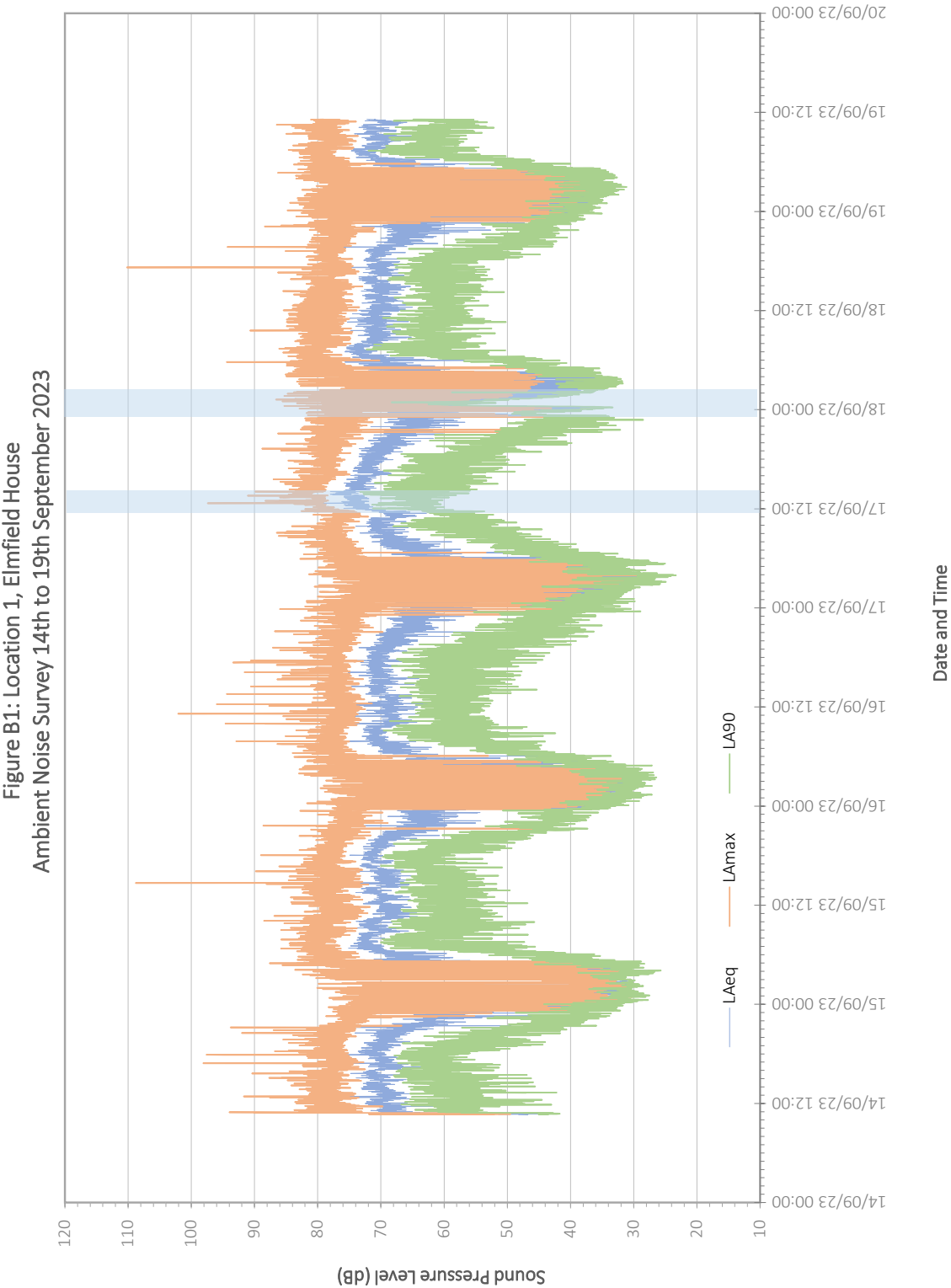


Figure B2: Location 2, Elmfield House, Salisbury
Ambient Noise Survey, 14th to 19th September 2023

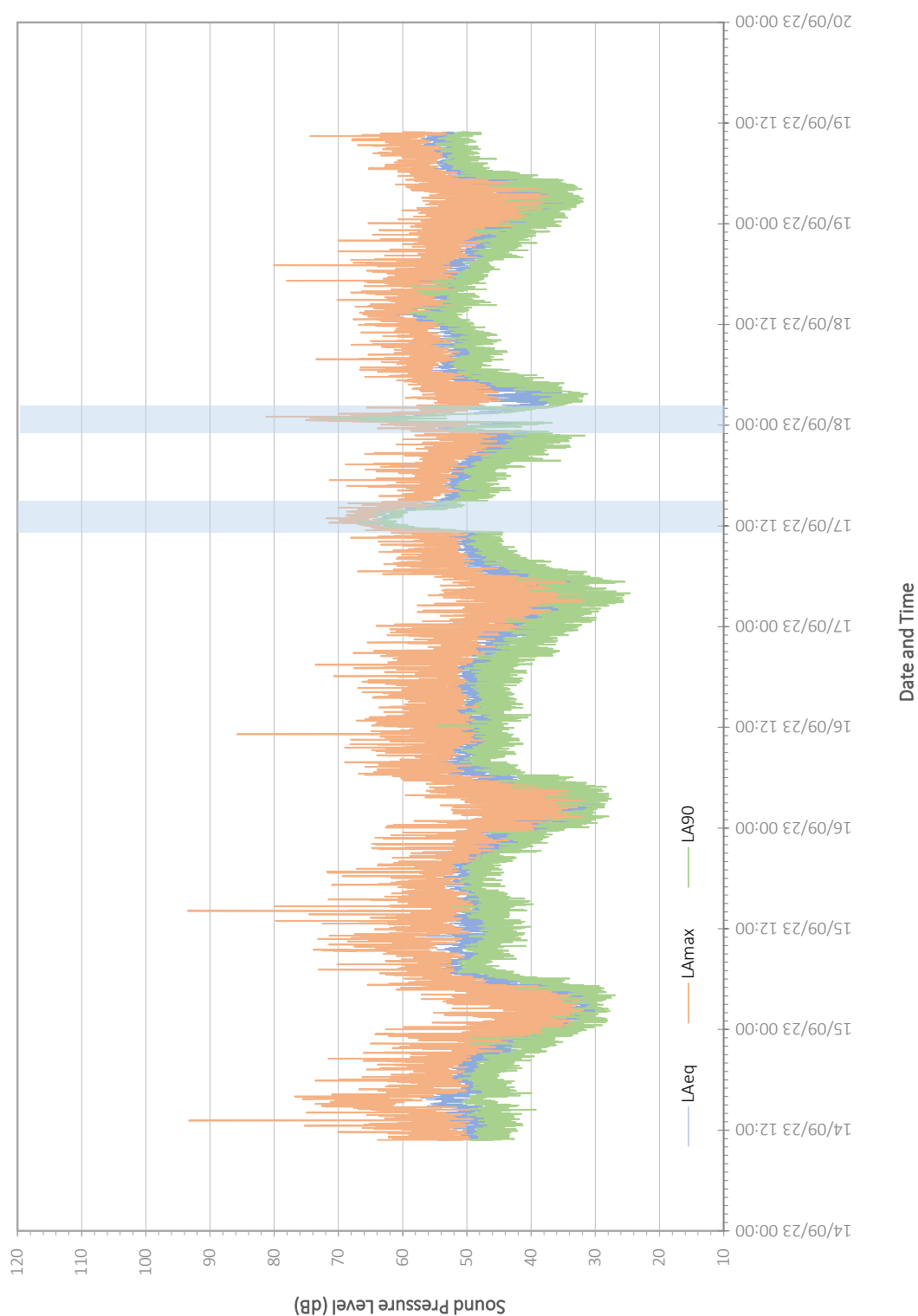


Figure B3: Elmfield House, Salisbury
Ambient Noise Survey, 14th to 19th September 2023

