



Armstrong House
3 Bassett Avenue
Southampton
SO16 7DP

T: 023 8155 5000

LAND OFF ARUNDEL ROAD, ANGMERING

NOISE IMPACT ASSESSMENT

Technical Report: R8896-1 Rev 3

Date: 25th November 2021

For: Redrow Homes Limited
Unit 1 Faraday Office Park
Rankine Road, Basingstoke
RG24 8QB

24 Acoustics Document Control Sheet

Project Title: Land off Arundel Road, Angmering: Noise Impact Assessment

Report Ref: R8896-1 Rev 3

Date: 25th November 2021

	Name	Position	Signature	Date
Prepared by	Aileen Reed BEng MIOA	Principal Consultant	<i>Aileen Reed</i>	25/11/2021
Reviewed by	Stephen Gosling BEng MIOA	Principal Consultant	<i>S. Gosling</i>	25/11/2021
Approved by	Stephen Gosling BEng MIOA	Principal Consultant	<i>S. Gosling</i>	25/11/2021
For and on behalf of 24 Acoustics Ltd				

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1.0 INTRODUCTION

1.1 Redrow Homes Limited has commissioned 24 Acoustics Ltd to carry out a noise impact assessment at land off Arundel Road, Angmering, which is proposed for residential development. The assessment has included:

- Ambient noise monitoring on the proposed site;
- Assessment of the noise arising from Arundel Road and the A27;
- Consideration of noise from a sports pavilion and existing sports pitches to the south of the site;
- Production of noise contour maps;
- Proposed noise mitigation measures.

1.2 An explanation of acoustical terms used in this report is provided in Appendix A. All sound pressure levels in this report are given in dB re: 20 μ Pa.

2.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 The site is located west of Arundel Road to the north of Angmering with the A27 approximately 200 m to the north at its closest point to the site. The site, which can be seen in Figure 1, is currently part open agricultural land and part commercial / industrial premises.

2.2 Sports pitches and a sports pavilion lie to the south of the site. New residential properties are under construction between part of the eastern site boundary and Arundel Road. Agricultural land bounds the site to the north and west.

2.3 Existing commercial / industrial premises located on the site will be removed and all buildings demolished. Redrow Homes Limited intends to submit a planning application for 160 dwellings along with public open space. An area for future employment use is provided in the south-east of the site. The site plan for the proposed residential development is shown in Figure 2.

3.0 ASSESSMENT 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 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.

British Standard 4142:2014+A1:2019

- 3.14 The site is potentially affected by noise associated with future employment uses in the south-eastern corner of the site. BS 4142:2014+A1:2019 [Reference 7] provides a method for rating the effects of industrial and commercial sound on residential areas. The standard advocates a comparison between the typical measured L_{A90} background noise (sound) level and L_{Aeq} (sound) noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction of up to 15 dBA maybe applied. The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact, depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact again depending on the context. Where the rating level does not exceed the background noise (sound) level, this is an indication of the specific sound source having a low impact (depending upon the context). For this situation a rating level no greater than the background noise level is considered acceptable.

Local Planning Guidance and Consultation

- 3.15 Planning Noise Advice Document: Sussex (March 2021) has been reviewed and it is considered that the assessment contained herein meets the requirements of Section 6 "New Noise Sensitive Developments" set out in that document.
- 3.16 24 Acoustics consulted with the Environmental Health Department of Arun District Council and their response is presented in full in Appendix B. In summary it requests consideration of the following:
- Orientation of dwellings to minimise noise and noise mitigation to be provided at source;
 - Consideration of sports pitches and sports pavilion, plant and access roads associated with commercial / industrial uses including the proposed pumping station and any sustainable energy plant;
 - A noise limit of 50 dB L_{Aeq} for external amenity areas and an assessment of night-time L_{Amax} levels based on one-minute noise measurement samples;
 - A proposed noise limit for sports pitches as follows: "...the noise level at the boundaries of any noise sensitive receptor shall not exceed that of the measured background (dB(A)) during hours of permitted operation."

Summary

3.17 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;
- Highly aspirational target limit of 50 dB $L_{Aeq,16hr}$ in external amenity areas.

3.18 Noise limits are set for future Class E employment uses based on the guidance of BS 4142: 2014+A1:2019. Consideration is given to noise from an existing sports pavilion along with potential future expansion.

4.0 NOISE MEASUREMENT PROCEDURE AND RESULTS

Instrumentation

4.1 Noise levels were measured using the following equipment:

- Rion (Class 1) precision sound level meter x 3 Type NL52;
- Brüel and Kjær acoustic calibrator Type 4231.

Noise Measurement Procedure

4.2 The noise measurement locations used (shown in Figure 1 and described below) were chosen to establish how noise from Arundel Road and the A27 affects the proposed site.

- Location 1: Near the north-eastern site boundary approximately 10 m from Arundel Road;
- Location 2: On the northern site boundary;
- Location 3: On the southern site boundary.

4.3 In order to assess typical ambient noise levels, the sound level meters were configured to continuously monitor in one minute sample periods. The meters were set up to measure and store overall A-weighted statistical parameters including the L_{Amax} and L_{Aeq} parameters (measured on fast response). Noise 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 8].

- 4.4 The instrumentation was powered by an external battery and stored in a weatherproof case. Throughout the course of the survey, an outdoor microphone windshield was used. The microphone height was 1.5m above local grade. The weather was generally dry with wind speeds less than 5 m/s, however, where weather conditions were unsuitable for noise measurement, data has been removed prior to analysis.
- 4.5 Calibration was checked before and on completion of the measurements and no drift was found. The calibration of 24 Acoustics' instrumentation is traceable to National Standards.
- 4.6 The measured noise levels at Locations 1 - 3 (expressed as L_{Aeq} , L_{A90} and L_{Amax}) are shown graphically in Appendix B. The measured average (L_{eq}) data values have been combined to generate the overall 16 hour daytime and 8 hour night-time free field levels; these are shown in Tables 1 - 3 below. 24 Acoustics take the typical L_{Amax} value to be the 10th highest value.

Date and Time	Daytime	Night-time	
	dB L_{Aeq} , 16 hour	dB L_{Aeq} , 8 hour	dB $L_{Amax,f}$
Tuesday 2/03/2021	59*	57	79
Wednesday 3/03/2021	61*	57*	78
Thursday 4/03/2021	62	55*	79
Friday 5/03/2021	61	51	77
Saturday 6/03/2021	60	50	76
Sunday 7/03/2021	60	56	79
Monday 8/03/2021	61	55	79
Tuesday 9/03/2021	63*	-	-
Average	61	55	79 max

Table 1: Noise Survey Results, Location 1

* partial measurement

Date and Time	Daytime	Night-time	
	dB LAeq, 16 hour	dB LAeq, 8 hour	dB LAmax,f
Tuesday 2/03/2021	50*	49	64
Wednesday 3/03/2021	50*	50*	64
Thursday 4/03/2021	53	47*	62
Friday 5/03/2021	54	45	64
Saturday 6/03/2021	51	43	65
Sunday 7/03/2021	48	47	61
Monday 8/03/2021	48	47	64
Tuesday 9/03/2021	51*	-	-
Average	51	47	65 max

Table 2: Noise Survey Results, Location 2

* partial measurement

Date and Time	Daytime	Night-time	
	dB LAeq, 16 hour	dB LAeq, 8 hour	dB LAmax,f
Tuesday 2/03/2021	50*	49	62
Wednesday 3/03/2021	48*	*50	60
Thursday 4/03/2021	55	*47	60
Friday 5/03/2021	53	45	59
Saturday 6/03/2021	50	43	57
Sunday 7/03/2021	49	50	62
Monday 8/03/2021	50	45	59
Average	51	48	62 max

Table 3: Noise Survey Results, Location 3

* partial measurement

- 4.7 Subjectively it was noted that road traffic noise from Arundel Road and the A27 dominated ambient noise levels across the site. Measured noise levels varied with wind direction with higher noise levels measured during winds with a northerly component when the site is downwind of the A27.

5.0 NOISE IMPACT ASSESSMENT

Site Layout

- 5.1 24 Acoustics were consulted in the early stages of the project and noise has been taken into consideration during development of the site layout presented in Figure 2.
- 5.2 Proposed properties fronting onto Arundel Road have been oriented so that rear gardens are screened from road traffic noise by the dwellings themselves.

Calculated Noise Levels – Road Traffic Noise

- 5.3 Noise measurement results have been corrected to account for potentially lower volumes of traffic due to the national lockdown in place due to Covid-19 during the noise survey period. Department for Transport data states there were approximately 30% fewer vehicles on the road during the noise survey period compared to the previous year prior to the first lockdown. Similarly, 24 Acoustics normally utilises the 10th highest night-time L_{Amax} value, however, in this instance the 5th highest value has been utilised.
- 5.4 An acoustic model of the site has been developed to determine the noise levels across the site from the existing roads. The model has been produced using IMMI 2017 noise mapping software and has used the propagation methodology of CRTN [Reference 9] which takes into account the effects of which takes into account the effects of distance, geometric divergence and acoustic screening.
- 5.5 Figures 3 and 4 show the predicted L_{Aeq} noise contours across the proposed development site for the day and night-time periods. 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 bedroom height.

Internal Noise Levels

- 5.6 The analysis given below has been based on 24 Acoustics' understanding of the envelope construction to be used for this scheme (based on a cavity masonry construction). Calculations have been undertaken utilising drawings showing internal layouts and elevations of the various house types provided by Redrow Homes Limited.

- 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 Calculations have identified minimum required acoustic window and background ventilator specifications for proposed residential properties. The specifications for habitable rooms are described below in Table 4 and relevant Zone locations identified in Figure 2.

Zone	Room	Glazing Type	Ventilator Type
1	Lounge	A	V1
	Bedroom	B	V2
2	Lounge	A	V1
	Bedroom	C	V3
3	Lounge	A	V1
	Bedroom	A	V4
All Other Areas	Lounges & Bedrooms	A	V1

Table 4: Acoustic Glazing and Background Ventilator Requirements

- 5.9 Windows when installed should be capable of achieving the performance stated below in Table 5.

Glazing	Minimum SRI (dB) per Octave Band Centre Frequency (Hz)					
	125	250	500	1k	2k	4k
Type A	21	17	25	35	37	39
Type B	22	21	28	38	40	47
Type C	21	20	26	38	37	39

Table 5: Required Window Performance

- 5.10 In making a comparison with the values in Table 5, 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.

5.11 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 R_w ;
- Glazing Type B: 8 mm glass: 6-16 mm cavity (minimum): 4 mm glass, Minimum 33 dB R_w ;
- Glazing Type C: 6 mm glass: 6-16 mm cavity (minimum): 4 mm glass, Minimum 32 dB R_w .

5.12 The acoustic performance criteria for background ventilators whilst in the open position are shown in Table 6 below.

Ventilator	Minimum Vent Weighted Normalised element weighted level difference, $D_{n,e,w}$, dB	Example of Type of Vent
V1	32	Standard trickle vent
V2	41	Ryttons 150 mm Acoustic Aircore with Hit & Miss Ventilator AAC635HM
V3	38	Simon Acoustic EHAS
V4	36	Sound attenuated trickle vent

Table 6: Acoustically Rated Vent Specification

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 values assume one ventilator per habitable room. All ventilators must comply with the requirements of Part F of the Building Regulations [Reference 10].

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.

External Noise Levels

- 5.15 Noise levels in external amenity areas during the day are predicted to be no greater than 50 dB $L_{Aeq, 16hr}$. This is within the aspirational limit of 55 dB $L_{Aeq, 16hr}$ specified in BS 8233 and also complies with the more stringent requirements of Arun DC. This assumes provision of 1.8 m high close board garden fences in the areas identified in Figure 2.

Air Source Heat Pumps

- 5.16 It has not been finalised if this proposed development will incorporate air source heat pumps on any dwellings, however, it is understood these are considered permitted development subject to certain criteria. If this is to form part of the development, then lower noise pumps should be sourced and a noise assessment undertaken to ensure no noise impact to the occupants of the dwelling or neighbouring dwellings.

Sports Pavilion

- 5.17 No activity occurred at Angmering Sports and Social Club during the survey period. The pavilion building and its access road are close to a large number of existing residential dwellings on Decoy Drive and Palmer Road with the closest house less than 20 m away from the pavilion building. The closest dwellings proposed as part of this development are more than 120 m away.
- 5.18 It is understood that the facility is used for small local events only. Given the proximity of the existing dwellings, any impact at the proposed site would be considerably lower and is unlikely to be significant.

Provision of Public Open Space

- 5.19 The planning application includes a large area of public open space which has the potential to be used as sports pitches. The area set aside for this is to the south of the site. As this application does not include the sports pitches there is no information available regarding the nature, size or location of such pitches and as such it is not possible to assess noise from potential future pitches at this time.

Pumping Station

- 5.20 A pumping station will be installed to the west of the proposed development site. Pumps will be located underground and, based on 24 Acoustics experience, a noise level less than 20 dB L_{Aeq} would be anticipated at the nearest residential properties which will result in no noise impact. Once further details are known, a BS 4142 assessment will be undertaken utilising a target rating noise level of 5 dB below the representative background noise level.

Commercial Units

- 5.21 It is understood that Class B2 use will not form part of the future commercial units proposed for future development in the south-east part of the site. It is recommended that a good quality close board fence (with a minimum height of 2 m and minimum surface density 12 kg/m²) is installed around the boundary of the commercial area next to any existing or proposed dwellings.
- 5.22 Class E businesses are likely to occupy this area and it is considered appropriate to set a noise limit for the commercial units.
- 5.23 Under BS 4142, a rating noise level equivalent to the representative background noise level at the nearest receptor would be an indication of the specific sound source having a low impact. Noise limits for all commercial noise sources are given in Table 7 below.

Noise Source / Period	Proposed Noise Limit
Employment Use Plant	
Day (07:00 – 23:00)	42 dB $L_{Ar, 1hr}$
Night-time (23:00 – 07:00)	31 dB $L_{Ar, 15 min}$

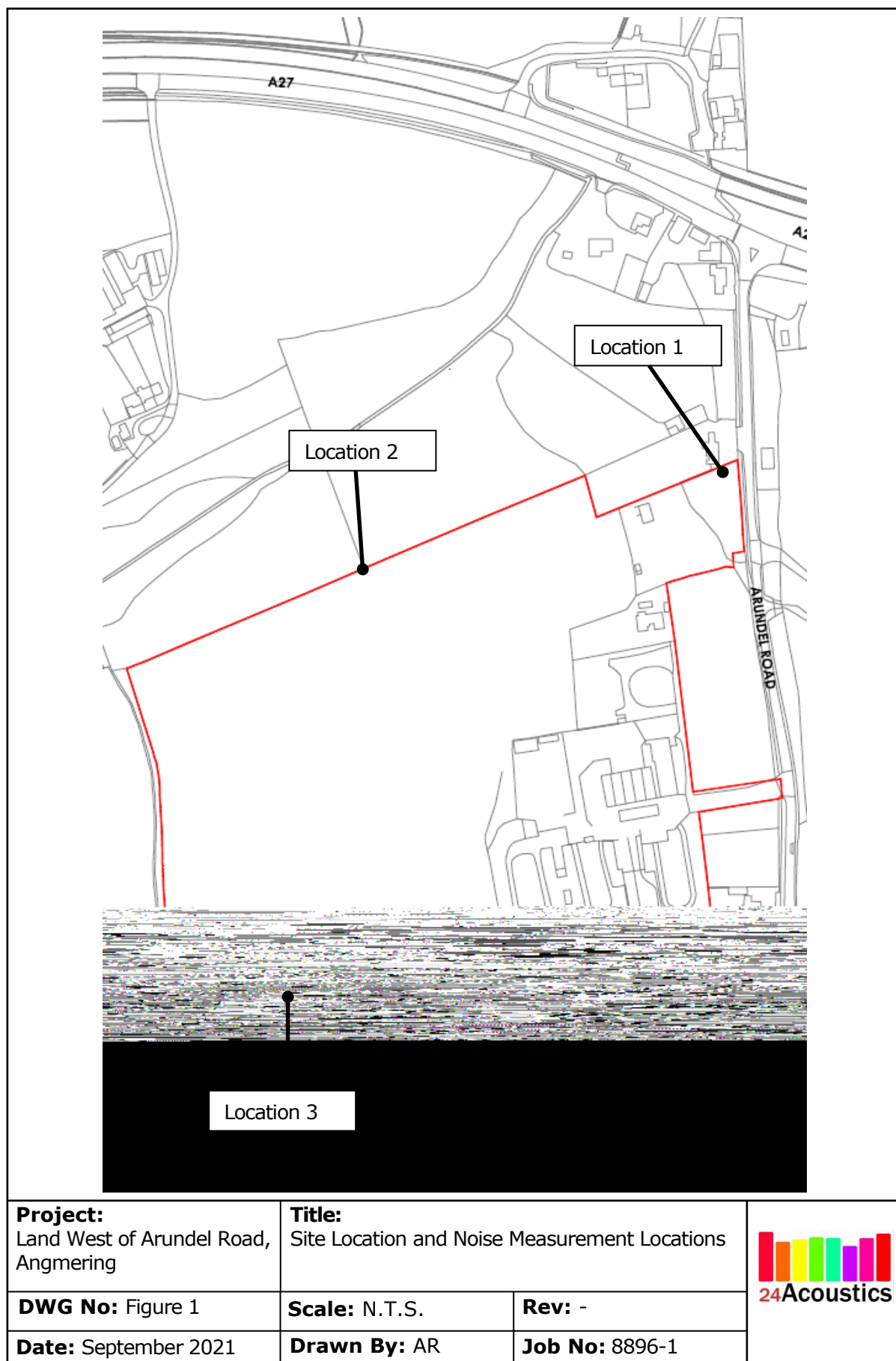
Table 7: Proposed Cumulative Commercial Use Noise Limit

6.0 CONCLUSIONS

- 6.1 Redrow Homes Limited intends to submit a planning application to develop land west of Arundel Road, Angmering for residential use. A commercial area is proposed in outline (hybrid application) to the south-east of the current application site. The site is subject to noise from road traffic on Arundel Road and the A27 which lies to the north of the site.
- 6.2 24 Acoustics Ltd has been retained by Redrow Homes Limited to provide an assessment of the impact of the existing sources of noise on the proposed new dwellings.
- 6.3 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.
- 6.4 Noise levels in external amenity areas during the day are predicted to be less than 50 dB $L_{Aeq, 16hr}$ which is considered acceptable in planning terms.
- 6.5 On the above basis, it is considered that an appropriate acoustic environment can be provided to the proposed residential properties, both externally and internally.

REFERENCES

1. Department for Communities and Local Government. National Planning Policy Framework, updated July 2021.
2. DEFRA, Noise Policy Statement for England, March 2010.
3. National Planning Practice Guidance, Department of Communities and Local Government (revised July 2019).
4. Association of Noise Consultants, Institute of Acoustics, Chartered Institute of Environmental Health. Professional Practice Guidance on Planning and Noise, May 2017.
5. British Standards Institution. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings, 2014.
6. World Health Organisation. Guidelines for Community Noise, 2000.
7. British Standards Institution. British Standard 4142: Methods for rating and assessing industrial and commercial sound, 2014.
8. British Standards Institution. British Standard 7445:1991 Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use, 1991.
9. Calculation of Road Traffic Noise (CRTN), Department of Transport, 1988.
10. Building Regulations. Approved Document F - Ventilation, 2010.



Zone 1 Zone 2 Zone 3 1.8 m high garden fence 

Project:
Land West of Arundel Road,
Angmering

Title:
Site Masterplan showing Noise Mitigation Zones

DWG No: Figure 2

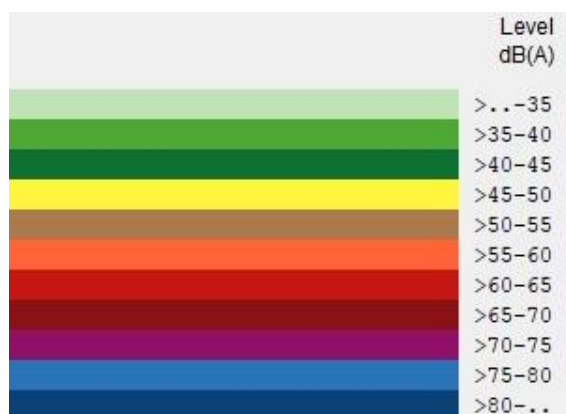
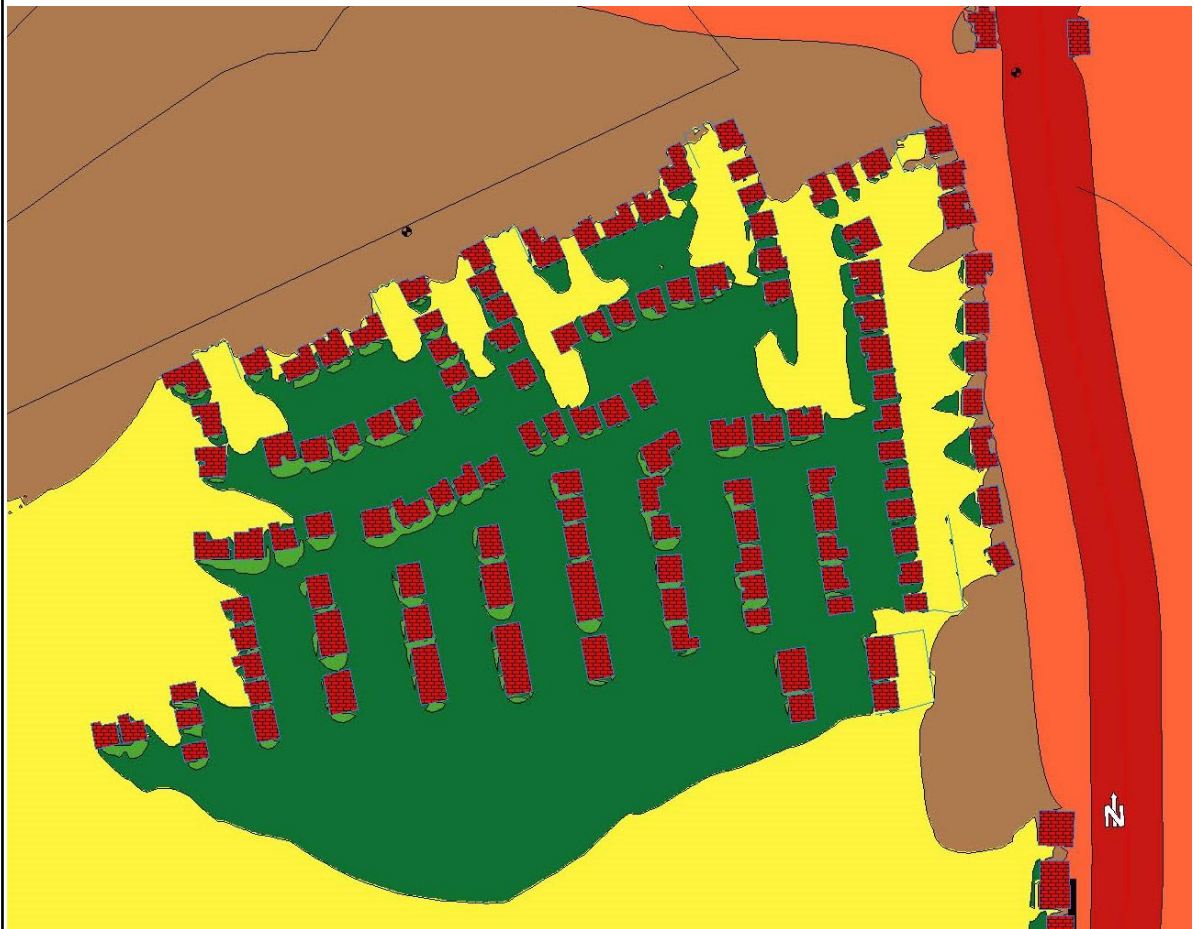
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Rev: C

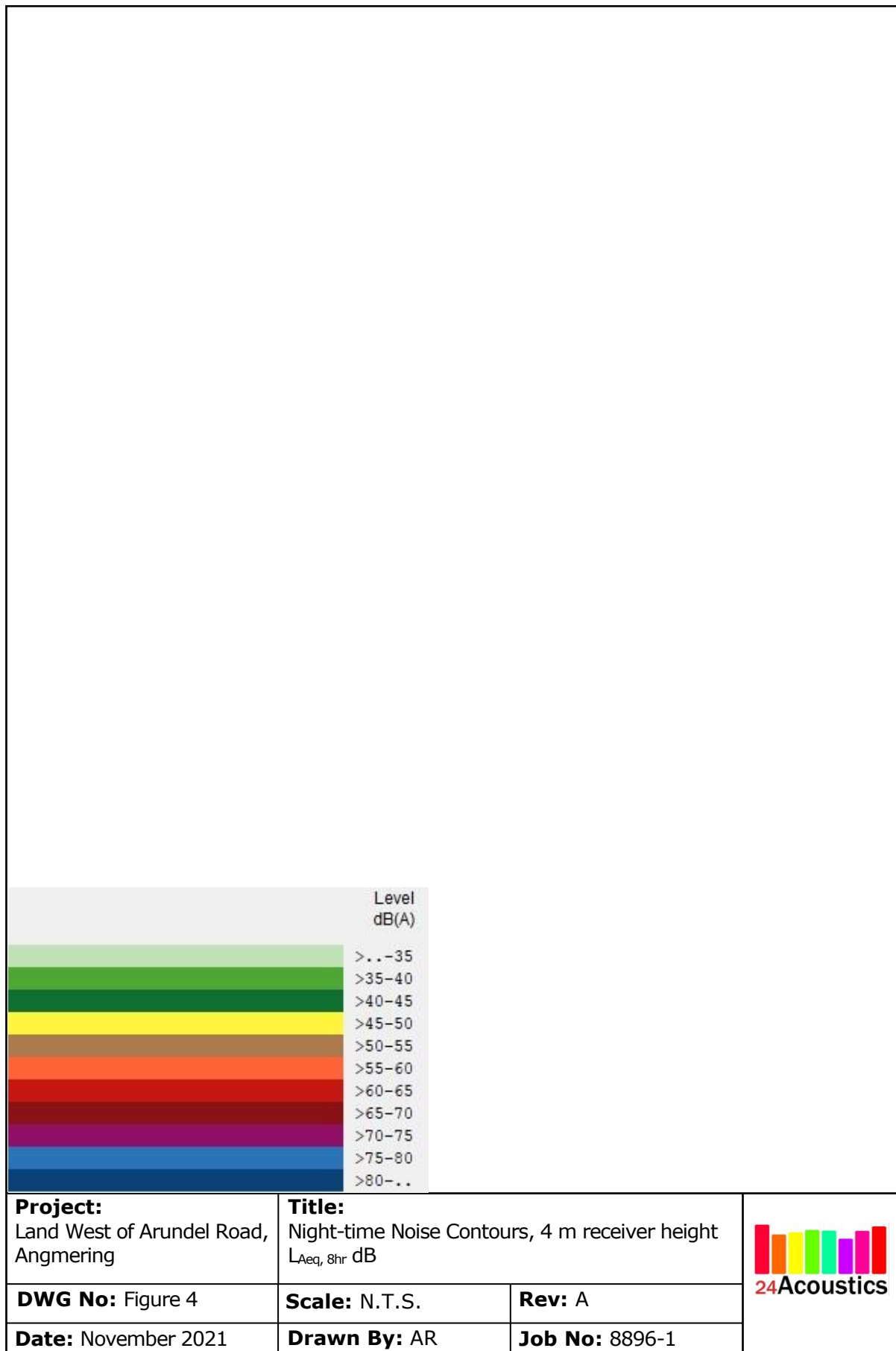
Date: November 2021

Drawn By: AR

Job No: 8896-1



Project: Land West of Arundel Road, Angmering	Title: Daytime Noise Contours, 1.5 m receiver height $L_{Aeq, 16hr}$ dB		 24Acoustics
DWG No: Figure 3	Scale: N.T.S.	Rev: A	
Date: November 2021	Drawn By: AR	Job No: 8896-1	



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 dB(A) weighting. This is an internationally accepted standard for noise measurements.

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

APPENDIX B: ARUN DC CONSULTATION**From:** Carol Reynolds**Sent:** 17 February 2021 15:08**To:** [REDACTED]**Cc:** Michael Eastham <[REDACTED]>**Subject:** FW: A/122/19/OUT: Land West of Arundel Road, Angmering - Proposed Noise Report

Dear Aileen,

Thank you for your consultation on this matter. Your proposed methodology would appear to be suitable, however I would ask for your consideration of matters previously raised by this Department.

*All built elements to this development will require optimal orientation in order to minimise adverse impact from noise. (Planning: ProPG 2017).

*Noise mitigation should be provided at source.

*As well as consideration of major roads (Arundel Road and the A27) please take account of the possible adverse impact of access roads into the new mixed B1 and B2 commercial facilities, as well as the road into the proposed Sports Hub/Social Club and vehicle parking/deliveries at both of these sites. Noise in external amenity spaces should be less than 50 dbLAeq.

*Please provide detail of the number of times when night-time impact noise in bedrooms will be above 45 L_{Amax,f} (measured over one minute monitoring intervals) as a result of vehicle movement on roads, as above.

*Sports Pitches: This Department has already stated (17 May 2018, A/36/18/OUT) that the noise level at the boundaries of any noise sensitive receptor shall not exceed that of the measured background (dB(A)) during hours of permitted operation.

*It will be necessary to assess noise from any club or exercise room, air handling equipment, extract ventilation and chiller units as appropriate to all commercial installations as well as likely noise generation from proposed B2 uses, in order to protect the amenity of sensitive receptors.

*A foul water pumping station was intended on this site (initially to the north western boundary). Please include this as part of your BS4142 assessment.

*I understand that a source/s of sustainable energy is/are advocated on this site. It will be necessary to address this/these possible sources of noise.

I look forward to receiving your report together with your recommendations for noise mitigation measures.

Please note that the Planning Noise Advice Document: Sussex 2015 is under revision and will shortly be updated.

Yours sincerely
Carol Reynolds

From: Aileen Reed <[REDACTED]>**Sent:** 03 February 2021 14:47**To:** Environmental Health <Environmental.Health@arun.gov.uk>**Subject:** FAO Carol Reynolds / Environmental Health

Dear Ms Reynolds

24 Acoustics has been instructed to carry out a noise impact assessment for residential development on land west of Arundel Road, Angmering. The site has outline consent (A/122/19/OUT) and I believe you provided input in relation to noise during that process.

We are planning to undertake a noise survey at the site to establish the existing noise levels there. Whilst we consider it likely that noise from the A27 and Arundel Road will be most significant, we will also consider noise from sports pitches and the social club which lies to the south of the site along with any employment uses. The assessment will take into consideration all relevant guidance ie NPPF, NPSE, PPG, ProPG, BS8233:2014 and BS4142 as appropriate along with the Sussex Planning Noise Advice Document.

We would like to proceed with the noise survey, however we are conscious that the current lockdown conditions may mean lower than average noise levels. We propose to correct measured road traffic noise levels with published road traffic data to obtain levels representative of normal conditions. The survey will be carried out over approximately 5 days to include a weekend.

I'd be grateful if you could let me know if you have any comments or queries regarding our proposed methodology and if you are happy for us to proceed with the noise survey on the above basis. If you are no longer dealing with this site, I'd be grateful if you could forward this message to the appropriate person.

Many thanks for your assistance.
Regards
Aileen Reed

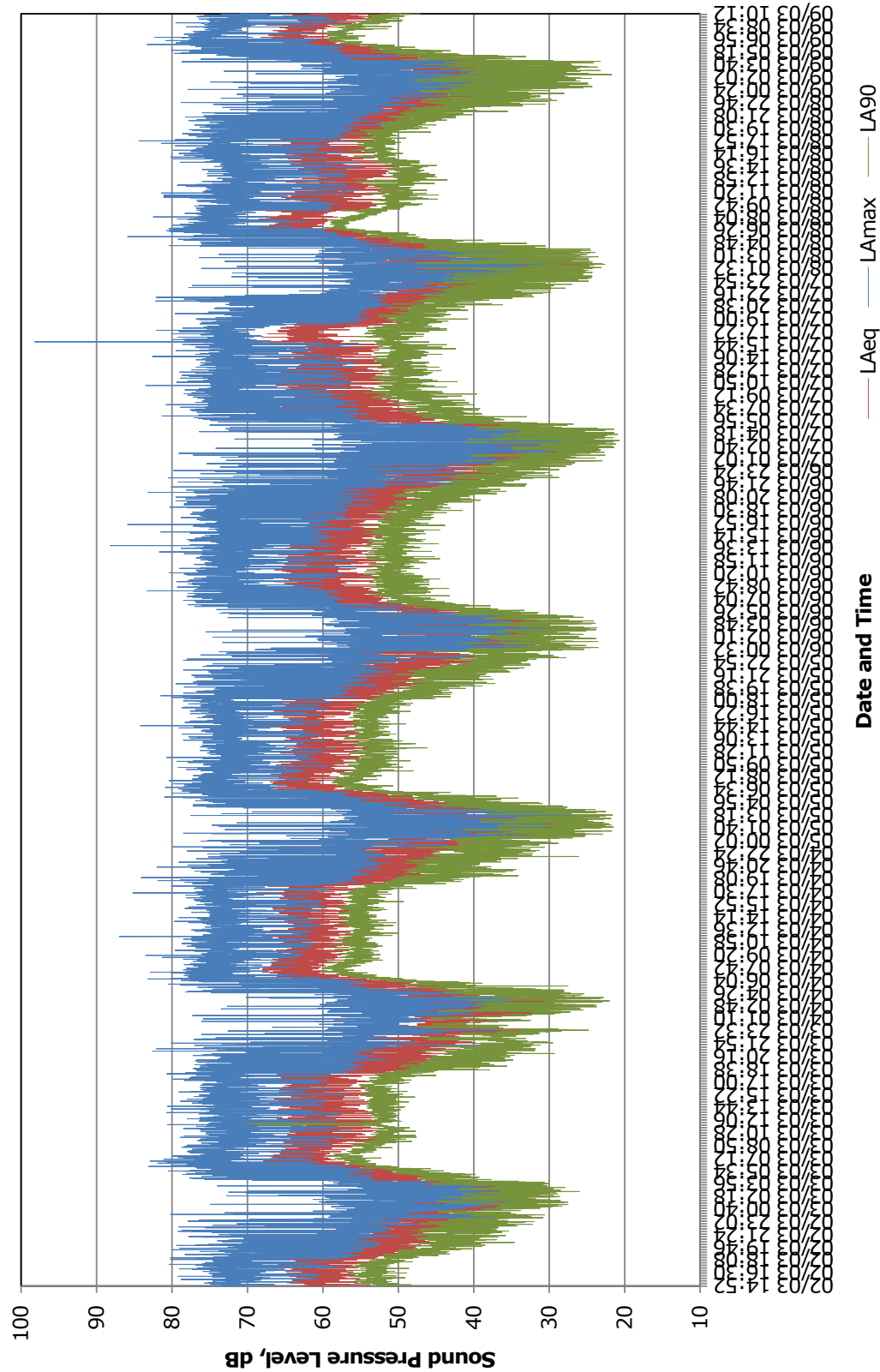
Regards
Aileen Reed
Principal Consultant



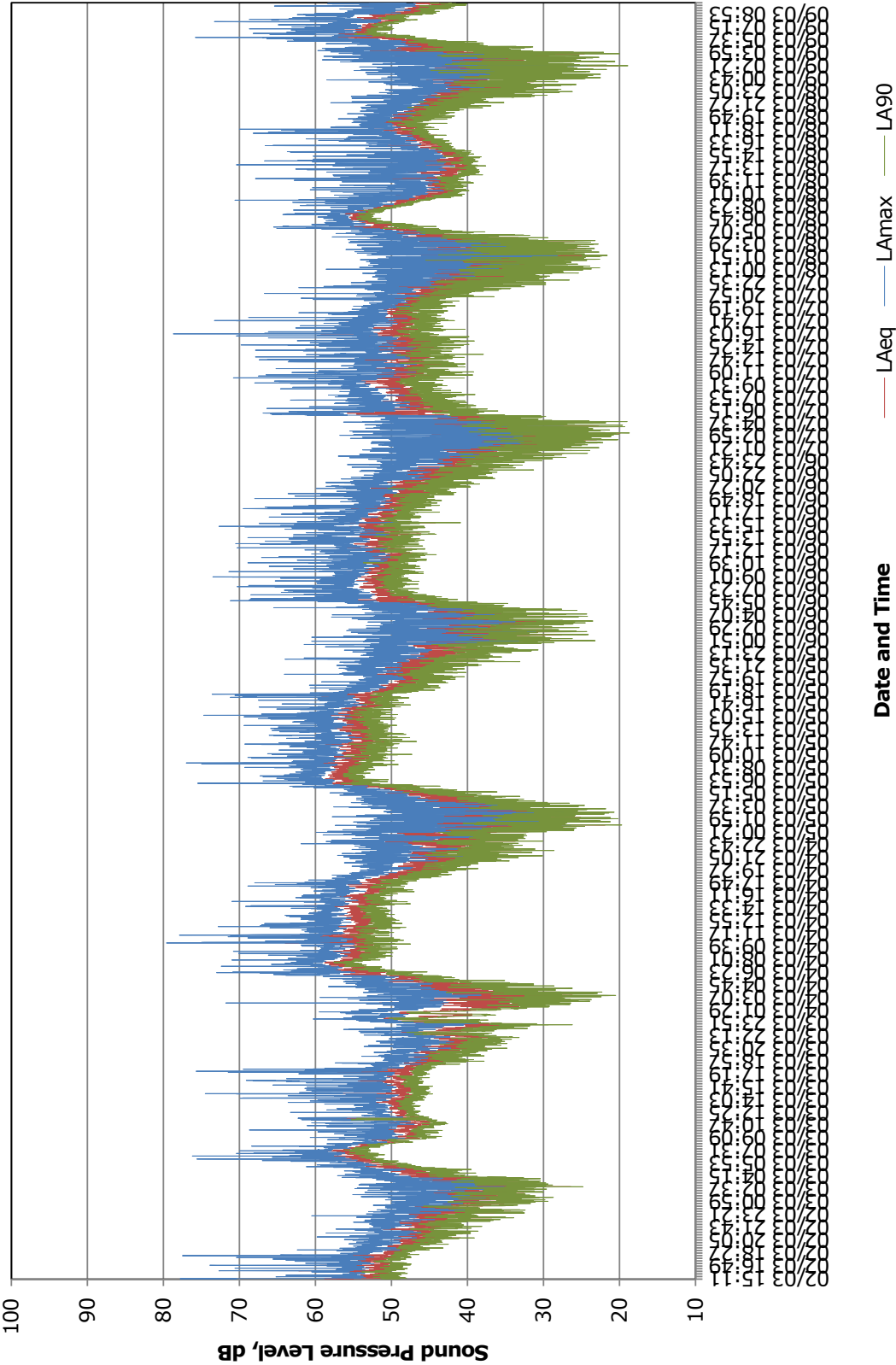
Armstrong House, 3 Bassett Avenue, Southampton, SO16 7DP
T: 02381 555 000
E: [REDACTED]
W: www.24acoustics.co.uk

APPENDIX C: NOISE SURVEY RESULTS

Figure C1: Ambient Noise Levels, Location 1,
Land off Arundel Road, Angmering 2nd - 9th March 2021



**Figure C2: Ambient Noise Levels, Location 2,
Land off Arundel Road, Angmering 2nd - 9th March 2021**



**Figure C3: Ambient Noise Levels, Location 3,
Land off Arundel Road, Angmering 2nd - 9th March 2021**

