SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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Unit 2 & 4 Piperell Way

Noise Impact Assessment

London, Manchester, Edinburgh, Birmingham, Belfast, Leeds

post@sandybrown.com
www.sandybrown.com

Sandy Brown Ltd
Registered in England & Wales No. 13227735

Registered Office: 55 Charterhouse Street, London EC1M 6HA

Version	Date	Comments	Author	Reviewer
A	25 Aug 23	-	Anthony Harper	Alex Fryer

Summary

Sandy Brown has been appointed by DT Architects to provide acoustic advice in relation to the proposed development at Units 2 4, Piperell Way, Haverhill.

Planning permission was granted for a previous iteration of the scheme, however, following engineering and market reviews, changes to the approved scheme are required. A new planning permission is therefore being submitted for the revised proposals.

An unattended environmental noise survey was carried out as part of the original application to determine the existing sound levels in the area. The noise survey was performed between 16:20 on 16 July 2020 and 10:35 on 21 July 2020.

An attended daytime noise survey was undertaken between approximately 13:00 and 15:00 on 16 July 2020. Background noise levels during the attended survey varied between $L_{A90,15min}$ 41-45 dB.

The plant noise limits at the worst affected existing noise sensitive premises have been set at $L_{Aeq,1hour}$ 44 dB during the daytime. At night, a more stringent plant noise criterion of $L_{Aeq,15min}$ 25 dB has been adopted at the nearest noise sensitive receptor to ensure that the impact on the existing residents is negligible.

These limits are cumulative and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied.

In the absence of specific plant data for each unit, limits have been apportioned to each unit to ensure that the cumulative plant limits will be achieved.

An assessment of the potential noise impact from the development as a result of the anticipated activities has also been assessed to the nearest noise sensitive premises.

Contents

1 Introduction

Sandy Brown has been appointed by DT Architects to provide acoustic advice in relation to the proposed development at Units 2 and 4, Piperell Way, Haverhill.

Planning permission was granted for a previous iteration of the scheme, however, following engineering and market reviews, changes to the approved scheme are required. A new planning permission is therefore being submitted for the revised proposals.

As part of this, a revised noise impact assessment is required to determine the impact of the currently proposed development on the nearest noise sensitive receptors.

This report presents the noise survey method, the results of the survey, a discussion of acceptable limits for noise emission from the development and assesses potential noise impact as a result of anticipated activity associated with the units.

2 Site description

2.1 The site and its surrounding

The site lies within the Haverhill Industrial Estate, which is located to the south of Haverhill. The northern boundary of the site is formed by Piperell Way, the western boundary is formed by Moon Hall Lane and the southern boundary is formed by Helions Bumpstead Road. The eastern boundary is formed by existing commercial units.

The neatest busy road in the area, the A1017, runs east to west approximately 260 metres to the south of the site

The site location in relation to its surroundings is shown in Figure 1.

Figure 1 Aerial view of site (courtesy of Google Earth Pro)

2.2 Adjacent premises

The application site is surrounded by existing industrial and commercial units. The closest residential properties are the houses located to the south of the site, beyond the A1017, located at a distance of approximately 450 metres from the development site. They are highlighted in blue in Figure 1.The next nearest residential properties are located further to the west on Oxford Road, at a distance of approximately 470 metres from the development site.

No residential dwellings have a direct line of sight to the proposed development, with both areas of residential development being located significantly closer to other existing commercial premises of a similar nature to the units being developed under this planning application.

3 Development proposals

The scheme involves the demolition of two existing small office buildings in the western part of the site and the construction of 7 new commercial units. The proposed site layout is shown in Figure 2.

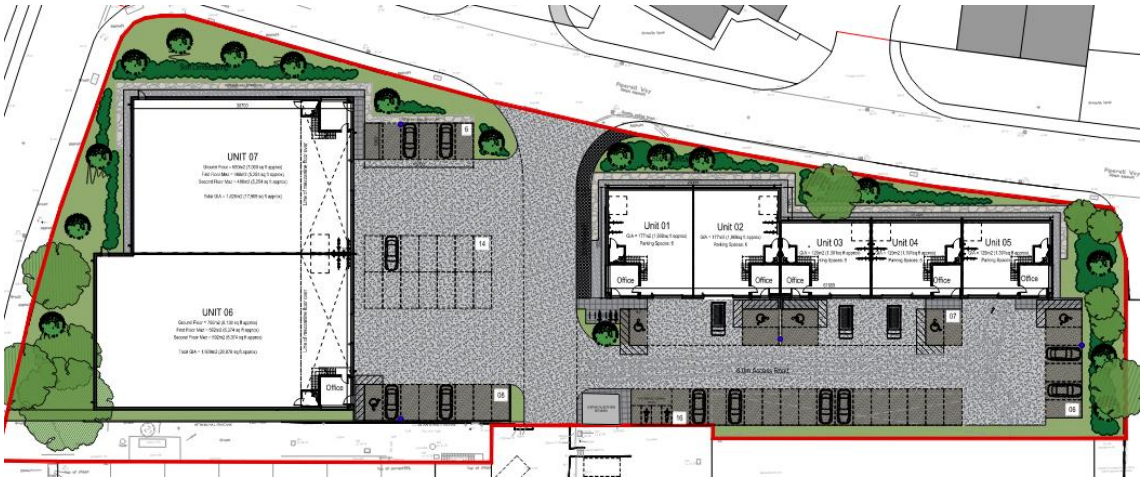


Figure 2 Proposed site layout

The commercial uses proposed as part of the development are likely to be a combination of class use B2 and B8 and are likely to feature new building services plant.

It is understood that the units will operate over the following hours:

- 07:00 to 19:00 Monday - Friday
- 07:00 to 13:00 Saturday

Access to the units will be via the entrance to the north of the site on Piperell Way.

4 Assessment criteria

4.1 NPPF and NPSE

The National Planning Policy Framework, February 2019 (NPPF) sets out the UK government's planning policies for England. It supersedes previous guidance notes such as PPG24. No specific noise criteria are set out in the NPPF, or in the Noise Policy Statement for England (NPSE) to which it refers.

The NPPF states:

> *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> - *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.*
> - *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'*

and

> *'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.'*

The NPSE states that its aims are as follows:

> *'Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*
>
> - *Avoid significant adverse impacts on health and quality of life*
> - *Mitigate and minimise adverse impacts on health and quality of life and*
> - *Where possible, contribute to the improvement of health and quality of life.'*

As such, neither document sets out specific acoustic criteria for new developments, but they require consideration of the effect of noise from the development on the surroundings.

4.2 External noise levels – Noise egress

4.2.1 Standard guidance – BS 4142:2014+A1:2019

BS 4142:2014:+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at nearby noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

4.2.2 Standard guidance – BS 8233:2014

Guidance on acceptable internal noise levels in residential dwellings is given in BS 8233:2014 *Sound insulation and noise reduction for buildings*. The guidance limits are shown in Table 1.

These internal levels are based on annual average data and do not have to be achieved in all circumstances. It is normal to exclude occasional events, such as fireworks night or New Year's Eve.

Table 1 Internal noise criteria for sleeping/resting

Internal space	Indoor ambient noise level, L_{Aeq} (dB)	
	Daytime (07:00 – 23:00)	Night (23:00 – 07:00)
Living rooms	35	-
Dining room	40	-
Bedrooms	35	30[1]

[1] BS 8233 notes that individual noise events can cause sleep disturbance, and that a guideline value may be set depending on the character and number of events per night, although no specific limit is provided. For regular events, such as scheduled aircraft or passing trains, a guideline value may be set in terms of SEL or $L_{Amax,F}$. Sporadic noise events could require separate values.

The standard states that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

5 Noise survey method

A noise survey was undertaken as part of the original noise impact assessment. The survey was undertaken in July 2020. Whilst the results of this survey may have been affected by the Covid 19 pandemic and associated restrictions on movement, this would only have resulted in reduced road traffic noise levels, thereby resulting in a lower background noise level.

Assessing to these limits is therefore considered to represent a robust assessment methodology.

The survey included unattended and attended noise measurements.

5.1 Unattended measurements

Unattended noise monitoring was undertaken at the site over 6 days.

Details of the equipment used and the noise indices measured are provided in Appendix A.

The unattended measurements were taken over 15-minute periods between 16:20 on 16 July 2020 and 10:35 on 21 July 2020. The equipment was installed and collected by Zac Fox.

The measurement position used during the survey is indicated in Figure 1, denoted by the letter 'L'. A photograph showing the measurement location is provided in Figure 3.

Figure 3 Photograph showing unattended measurement position

The meter was installed on the roof of the existing warehouse on the site, it was positioned to the west of the Level 1 office to ensure that it was screened from any existing activity within the yard as much as practicable.

The meter was installed approximately 1 metre from the facade of the Level 1 office, and as such the measurements are considered to be facade noise levels.

5.2 Attended measurements

Attended sample measurements were also taken by Zac Fox at a location to the south of the site, close to the nearest noise sensitive premises. This is indicated in Figure 1 as position '1'. The attended measurements were carried out on 16 July 2020, over 15-minute periods.

A photograph showing the attended measurement position is given in Figure 4.

The microphone was mounted on a tripod approximately 1.2 m above the ground level and at least 3.5 m from any other reflective surface. Measurements in this location are considered to be free-field measurements. Details of the equipment used and the noise indices measured are provided in Appendix A.

Dominant noise sources occurring during the measurements were noted.

Figure 4 Photograph showing attended measurement position 1

5.3 Weather conditions

Weather conditions during the survey are described in Appendix A.

6 Noise survey results

6.1 Observations

At the unattended logging position, the dominant noise sources observed whilst installing the monitoring equipment was road traffic on Piperell Way and A1017 and industrial activity from both the site and adjacent premises.

At the attended monitoring position, the dominant noise sources were noted to be road traffic on the A1017, with occasional vehicles, including buses on Copy Hill, adjacent to the monitoring position.

6.2 Noise measurement results

6.2.1 Unattended measurement results

A graph showing the results of the unattended measurements is provided in Appendix B.

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 2.

These measurements were conducted approximately 1 m from the closest reflective surface, and as such are considered to be facade noise levels.

Table 2 Ambient noise levels measured during the unattended survey

Date	Daytime (07:00 – 19:00) $L_{Aeq,12h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Thursday 16 July 2020	-	49
Friday 17 July 2020	50	49
Saturday 18 July 2020	49	49
Sunday 19 July 2020	50	50
Monday 20 July 2020	51	50
Average	50	49

Minimum background noise levels measured during the daytime and night-time period are presented in Table 3.

Table 3 Minimum background sound levels measured during the unattended survey

Date	Daytime (07:00 – 19:00) $L_{A90,15min}$ (dB)	Night (23:00 – 07:00) $L_{A90,15min}$ (dB)
Thursday 16 July 2020	48[1]	47
Friday 17 July 2020	45	46
Saturday 18 July 2020	44	46
Sunday 19 July 2020	46	45
Monday 20 July 2020	48	48
Tuesday 21 July 2020	48[1]	-

[1] Measurement not made over full period due to monitoring start and end time.

The lowest background sound levels measured during the survey were $L_{A90,15min}$ 44 dB during the daytime and $L_{A90,15min}$ 45 dB at night.

From review of the noise measurement data, it is noted that there is very little variation between measured ambient and background noise levels during both the daytime and at night.

It is believed that existing building services noise associated with the site and surrounding uses has resulted in influenced the minimum noise levels during the day and night time period at the monitoring position.

6.2.2 Attended measurement results

Noise levels and key sources recorded during the attended measurements are summarised in Table 4. These are free field noise levels.

Table 4 Noise levels and key noise sources from attended measurements

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
1	13:02	61	83	45	Road traffic on A1017 and local road traffic on Copy Hill
	13:17	58	81	43	
	13:32	57	79	43	
	13:47	60	80	44	
	14:02	61	81	41	
	14:17	59	80	43	
	14:32	58	79	43	
	14:47	58	78	42	

7 Noise egress – building services plant noise limits

7.1 Development noise limits

As the presence of building services noise has been noted on the long-term monitoring results, the daytime limiting plant noise levels has been set based achieving a 'low impact' when assessed against BS 4142. The assessment has also been based on the lowest measured background noise level during the attended noise survey, rather than a representative background, ensuring a robust assessment methodology.

Night-time noise monitoring has not been undertaken at the nearest receptor, therefore a fixed limit has been proposed to ensure that there is no significant impact on the existing residents. To derive the plant noise limit, a representative background noise level of L_{A90} 25 dB has been assumed, which is considered to be robust given the semi-rural nature of the area, the proximity of the A1017, and the presence of a significant number of existing commercial units to the north.

The cumulative noise level resulting from the operation of all new building services plant at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the limits set out in Table 5. The limit applies at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels. A +3 dB correction has therefore been applied to the limits to account for the presence of the facade.

Table 5 Cumulative plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound rating level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)
Daytime (07:00-23:00)	44
Night-time (23:00-07:00)	25

For the night-time limit, assuming 10-15 dB of attenuation for a partially open windows, noise associated with building services plant would be reduced to approximately 10-15 dB within the dwellings at night. This is 15-20 dB below the recommended internal noise levels within bedrooms outlined in BS 8233, which suggests a negligible impact.

Furthermore, this will be significantly below the noise floor within these dwellings and as such should be approaching inaudibility.

7.2 Noise limits for each new commercial unit

The plant items to be installed for each respective commercial unit as part of the development are not known, therefore limiting plant noise levels for each have been determined. Compliance with these limits will ensure compliance with the overall cumulative limits described in Section 7.1. Any items of fixed plant, such as toilet extract fans, cooling plant etc, serving the units will need to be selected to meet these criteria.

There are a total of 7 commercial units proposed as part of the development, the limits for each commercial unit are set out in Table 6.

Table 6 Individual commercial unit plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound rating level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)
Daytime (07:00-23:00)	35
Night-time (23:00-07:00)	16

If a commercial unit features multiple items of plant then the cumulative noise level from all of the plant serving the unit must achieve the noise limits in Table 6.

The limiting plant noise levels presented above should not result on unreasonable restriction on the selection of plant, as a result of the significant distance between the units and the nearest noise sensitive receptor.

8 Noise egress – operational noise

8.1 Basis of assessment

The proposed activities within the site are currently unknown, however the main source of noise generated by the development is anticipated to be unloading activities in the service yard.

Typical activity within the units is unlikely to generate noise levels in excess of those generated by the service yard, as a result of screening via unit massing and attenuation from the building shell. Noise from within the units has therefore not been formally assessed.

As specific details regarding the potential operation of the units are unknown, octave band and broadband library noise data for the anticipated activities associated with the development have been used to assess the impact on the nearby noise sensitive premises. This data is provided in Table 7 and Table 8. General vehicle activity includes the shutting of car doors and boots, the starting of engines, car movement etc.

Whilst the operating hours are limited to daytime hours only, an assessment of potential maximum (L_{Fmax}) noise levels has been undertaken, should any activity occur before 07:00.

Table 7 Noise associated with car parking

	Sound level at octave band centre frequency (Hz)								
Source	63	125	250	500	1k	2k	4k	8k	dBA
Car door slam									
Maximum noise levels at 10 m - L_{Fmax}	73	68	63	69	70	63	57	48	72
Car boot slam									
Maximum noise levels at 10 m - L_{Fmax}	78	69	68	68	61	62	56	53	69

Table 8 Noise levels associated with HGV's

Source	Sound level (dB)
HGV unloading	
Average noise level at 10 m - L_{Aeq}	66
Maximum noise level at 10 m - L_{AFmax}	75-79

8.2 Receptor location

The worst affected noise sensitive receptors have been identified to be the residential premises to the south of the site, highlighted in blue in Figure 1.

The nearest receptor is approximately 450 m from the nearest service yard and benefits from screening from the massing of other buildings on site and further to the south. As a result, 10 dB of screening attenuation has been adopted for the purpose of the assessment for all units.

8.3 Assessment of activity noise impact

Calculations have been undertaken to predict the rating daytime noise levels at the worst affected noise sensitive receptor resulting from service yard activity associated with HGV unloading.

Distance attenuation has been based on the geometric spreading of sound.

Given the existing industrial/commercial uses in the area, it is not considered necessary to apply and character penalties to the source, as discussed in BS 4142.

Given the layout of the site, it has been assumed that 2 HGV unloading operations could be undertaken simultaneously, ie, one serving each of units 6 and 7. The assessment also robustly assumes that this could potentially be carried out continuously over an hour, ensuring a robust assessment.

The proposed layouts indicate light goods vehicle access only to units 1 to 5, noise from these deliveries is typically significantly lower than that of HGV deliveries and given the distance to

the nearest receptor, and there being no direct line of sight, is unlikely to have a significant impact on the dwellings..

Daytime activity noise levels at the nearest residential receptor are summarised in Table 9. Noise levels are presented as facade noise levels.

Table 9 Expected HGV unloading noise levels at 1 m from the facade of the nearest residential receiver - daytime

Source	Noise level outside the nearest residential receptor – $L_{Aeq,1h}$ (dB)
Two HGVs unloading	29

The noise level predicted above is considered to be very low. Assuming 10-15 dB of attenuation for a partially open window at night, this would result in an internal noise level of $L_{Aeq,1h}$ 14-19 dB within dwellings.

Guidance in BS 8233 recommends noise level $L_{Aeq,16h}$ 35 dB within habitable rooms during the daytime, and $L_{Aeq,8h}$ 30 dB in bedrooms at night. The predicted noise level of $L_{Aeq,1h}$ 14-19 dB is 11-16 dB lower than even the night time internal noise level criteria, and as a result, general activity at the units is expected to have a minimal impact at the noise sensitive receptors.

8.4 Assessment of maximum noise levels

To ensure a robust assessment of the proposals, potential maximum (L_{AFmax}) noise levels associated with activity at the units has been assessed.

Although the previous planning application limited operational hours to daytime only, calculations have been undertaken to predict the noise impact from maximum noise events associated with the development at the nearest noise sensitive premises.

Distance attenuation has been based on the geometric spreading of sound (point source propagation of -6 dB per doubling of distance) and 10 dB of screening has again been taken as a result of the screening to both the loading bays and the proposed car parks.

Maximum noise levels associated with vehicle activities and unloading outside the worst affected noise sensitive receptors are presented in Table 10.

Table 10 Predicted maximum noise levels at 1 m from the facade of the nearest noise sensitive receptor

Source	Expected noise level outside the nearest residential receptor - L_{AFmax} (dB)
Car door slam	32
Car boot slam	29
HGV unloading	39

The predicted maximum noise levels presented in Table 10 are also considered to be very low. Maximum noise levels associated with general road traffic on the A1017 will result in higher maximum noise levels at the dwellings throughout the night.

Assuming 10-15 dB of attenuation for a partially open window at night, this would result in maximum noise levels of up to L_{AFmax} 24-29 dB. For reference World Health Organisation Guidelines on Community Noise recommend that maximum noise levels within dwellings do not exceed L_{AFmax} 45 dB more than 10-15 times per night.

The predicted maximum internal noise levels associated with the operation of the proposed units are 16-21 dB lower than this level. The impact on the residents in terms of maximum noise levels at night is therefore considered to be negligible, even if occasional activity were to take place during night time hours.

9 Conclusion

Plant noise limits at the worst affected existing noise sensitive premises have been set at $L_{Aeq,1hour}$ 44 dB during the daytime and $L_{Aeq,15min}$ 25 dB at night the nearest noise sensitive receptors.

These limits are cumulative and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied. Limiting plant noise levels for each commercial unit have been determined and provided.

An assessment of the potential noise impact from the development as a result of the anticipated HGV unloading has also been assessed to the nearest noise sensitive premises. The impact on the dwellings is predicted to be negligible.

On the basis of the above, provided building services plant is selected to comply with the plant noise limits, the proposed development should not result in any significant impact on the local residents.

Appendix A

Survey details

Equipment

The unattended and attended noise measurements were taken using two different Rion NL-52 sound level meters.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Rion NL-52 (F)				
Sound level meter	NL-52/00242702	Rion	30 Jan 21	TCRT19/1091
Microphone	UC-59/06185	Rion	30 Jan 21	TCRT19/1091
Pre-amp	NH-25/32730	Rion	30 Jan 21	TCRT19/1091
Calibrator	CAL200/4499	Larson Davis	30 Jan 21	TCRT19/1090
Rion NL-52 (J)				
Sound level meter	NL-52/00375679	Rion	9 Jul 21	TCRT19/1541
Microphone	UC-59/11168	Rion	9 Jul 21	TCRT19/1541
Pre-amp	NH-25/65806	Rion	9 Jul 21	TCRT19/1541
Calibrator	SV30A/10576	Svan	9 Jul 21	TCRT19/1539

[1] Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meter(s) used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{ASmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a slow time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

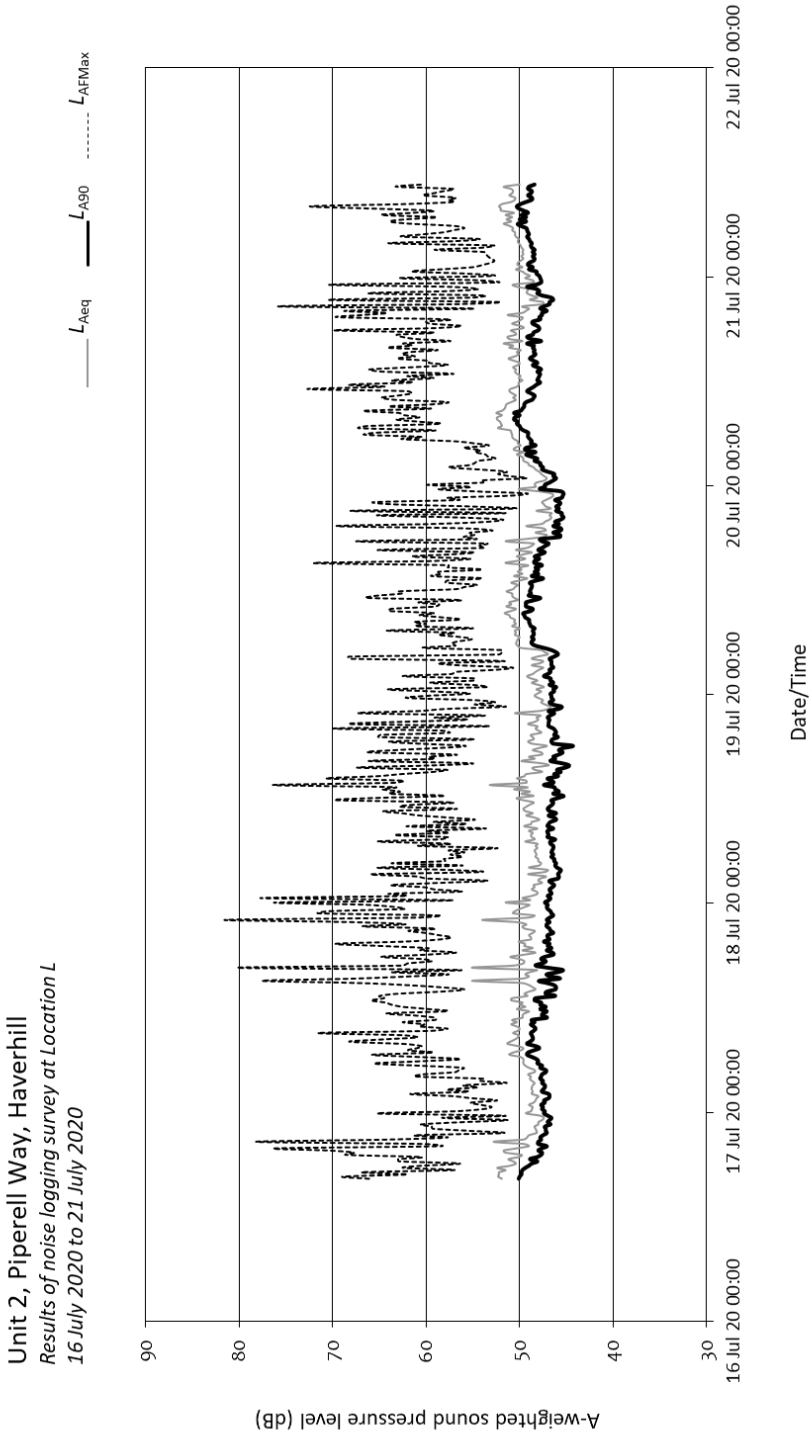
Weather conditions

During the attended noise measurements, the weather was generally clear and dry and no rain occurred.

During the unattended noise measurements, weather reports for the area indicated that temperatures varied between 15°C at night and 22°C during the day.

Appendix B

Results of unattended measurements at Location 'L'


Unit 2, Piperell Way, Haverhill
Results of noise logging survey at Location L
16 July 2020 to 21 July 2020
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
90
80
70
60
50
40
30
16 Jul 20 00:00
17 Jul 20 00:00
18 Jul 20 00:00
19 Jul 20 00:00
20 Jul 20 00:00
21 Jul 20 00:00
22 Jul 20 00:00
Date/Time

Appendix C

BS 4142 corrections for attention catching features

The following applies where plant noise is assessed in accordance with BS 4142:2014+A1:2019.

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), penalty corrections should be applied based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible.

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible.

For noise which is equally both impulsive and tonal, then both features can be accounted for by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment of tonality is not appropriate, an objective assessment can be made by analysis of time-averaged, third-octave band sound pressure levels. A noise source is deemed to be tonal if the level in a third-octave band exceeds the level in adjacent third-octave bands by the level differences given below:

- 15 dB in the low frequency third-octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency third-octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency third-octave bands (500 Hz to 10000 Hz).

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.