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**PROPOSED INDUSTRIAL DEVELOPMENT ON LAND
AT KNOWLE LANE, FAIR OAK
NOISE IMPACT ASSESSMENT**

Technical Report: R9791-1 Rev 2

Date: 9th May 2023

For: Parsons Construction Ltd
Wangfield Nurseries,
Wangfield Lane,
Curdridge,
Southampton,
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24 Acoustics Document Control Sheet

Project Title: Proposed Industrial Development on Land at Knowle Lane, Fair Oak
Noise Impact Assessment

Report Ref: R9791-1 Rev 2

Date: 9th May 2023

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SUMMARY

24 Acoustics Ltd has been retained by Parsons Construction Ltd (Parsons) to assess the impact of noise from a proposed industrial development on land east of Knowle Lane, Fair Oak upon existing residential dwellings. Parsons have planning consent for 5 blocks of office accommodation on the site. One block is built and occupied, however, due to a change in market conditions, they are now seeking planning consent for industrial development on the remainder of the site.

The site is neighboured by a former landfill site to the south, which includes a gas engine compound with associated flare and coolers, and an industrial facility operated by BSKYB to the west. Residential properties lie to the north-west of the site in Kingsmill Drive and to the south-west of the site on Knowle Lane.

A BS 4142 assessment has been undertaken to determine the potential impact of the development and the assessment indicates a low impact at all residential receptors.

Noise limits have been specified for external plant to ensure acceptable noise levels are achieved.

An assessment of noise levels anticipated at the nearby office building indicate the proposed development will result in no significant noise impact.

A Noise Management Plan for the site has been prepared and will ensure ongoing management actions to ensure noise from the site is minimised.

On the above basis, it is considered that the proposed development will not cause a significant adverse impact at nearby noise sensitive receptors and is therefore acceptable in planning terms.

CONTENTS	PAGE
1.0 INTRODUCTION	5
2.0 SITE DESCRIPTION	5
3.0 ASSESSMENT CRITERIA	6
4.0 ENVIRONMENTAL NOISE SURVEY	8
5.0 NOISE IMPACT ASSESSMENT	9
6.0 CONCLUSIONS	13
REFERENCES.....	14
APPENDIX A: ACOUSTIC TERMINOLOGY	17
APPENDIX B: BACKGROUND NOISE SURVEY RESULTS	19
APPENDIX C: NOISE MANAGEMENT PLAN	20

1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been retained by Parsons Construction Ltd (Parsons) to assess the impact of noise from a proposed industrial development site at Knowle Lane in Fair Oak on nearby existing noise sensitive receptors. Parsons have planning consent for 5 blocks of office accommodation on the site. One block is built and occupied, however, due to a change in market conditions, they are now seeking planning consent for industrial development on the remainder of the site.
- 1.2 This report presents the results of the appraisal, following site visits, subjective observations and noise surveys undertaken in November 2022.
- 1.3 All noise levels in this report are presented in dB relative to 20 μ Pa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The site is located to the east of Knowle Lane in Fair Oak. It is neighboured by a former landfill site to the south, which includes a gas engine compound with associated flare and coolers, and an industrial facility operated by BSKYB to the west. There is agricultural land to the north and east. Knowle Lane is located to the west of the site and road traffic noise is dominant across the site.
- 2.2 The proposed development is to construct four buildings to provide B2 general industrial use with associated car parking and delivery bays.
- 2.3 Access to the units will be via the existing access road from Knowle Lane. Roller shutter doors and service yards will be located to the front of all units to allow for delivery access. The proposed site will operate during the hours 07:00 to 18:00 hours Monday to Friday and 08:00 to 13:00 hours on Saturdays with no operation on Sundays and bank holidays.
- 2.4 An office block lies to the north-west of the development site with residential properties in Kingsmill Drive beyond. A further residential property lies to the south-west of the site on Knowle Lane.
- 2.5 The site and receptor locations are shown in Figure 1. A site layout plan of the proposed development is shown in Figure 2.

3.0 ASSESSMENT CRITERIA

National Planning Policy Framework and Noise Policy Statement for England

3.1 The National Planning Policy Framework (NPPF) [Reference 1], revised in July 2021, states (paragraph 185) in relation to noise that planning policies and decisions should aim to:

- 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;

3.2 The NPPF 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) was updated in 2019 [Reference 3]. This 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 not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.
- 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 In general terms it is considered that a noise impact with an effects level which is lower than SOAEL is acceptable (providing the effect is mitigated to a minimum). There is currently, however, a major discontinuity between the above guidance and objective technical criteria for use in planning noise impact assessments.
- 3.7 For this site it is considered that the appropriate (technical and objective) standards for use in assessing the noise impact is British Standard 4142: 2014+A1:2019. Consideration is also given to BS 8233:2014 in respect of the nearby office building.

BS 4142:2014+A1:2019

- 3.8 The relevant standard for assessing noise from industrial / commercial development in relation to residential dwellings is BS 4142:2014 + A1:2019. The standard provides a method for rating and assessing industrial and commercial sound in relation to residential properties. The standard advocates a comparison between the typical measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered.
- 3.9 For rating purposes if the noise source is tonal, impulsive or otherwise distinctive in character, a rating correction may be applied depending on the severity of the character. The standard states that a difference between the rating level and the background level of around +10 dB or more is likely to be an indication of a significant adverse impact depending on the context, a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context, and where the rating level does not exceed the background level it is an indication of a low impact, depending on the context.

British Standard 8233:2014

- 3.10 BS 8233:2014 provides guidance on sound insulation and noise reduction for buildings and recommends acceptable noise levels of 45 – 50 dB L_{Aeq} in open plan offices.

Summary

- 3.11 Based upon the review of standards described above, noise at residential properties has been assessed in accordance with the following approach:

- BS 4142 for operation of plant and vehicles on-site;
- BS 8233 for consideration of office noise levels.

4.0 ENVIRONMENTAL NOISE SURVEY

Noise Survey Methodology

- 4.1 Environmental noise surveys were undertaken on site between 18th and 23rd November 2022 in order to establish existing ambient noise levels representative of the nearest noise sensitive receptors to the site. The noise measurement location, which is shown in Figure 1, was selected to be representative of the nearest residential properties in Kingsmill Drive, whilst minimising any contribution from plant associated with the office building.

- 4.2 Ambient noise levels were measured using the following equipment:

Rion Class 1 Sound Level Meter	Type NL31;
Bruel & Kjaer calibrator	Type 4231.

- 4.3 The measurement instrumentation was configured to measure and store overall A-weighted statistical parameters such as L_{Aeq} , L_{Amax} , and L_{A90} (all measured on fast response) in 5 minute intervals.

- 4.4 The instrumentation was equipped with an environmental microphone and windshield. The microphone was located at a height of approximately 1.5 m above ground level. The calibration of instrumentation was checked before and after the tests and no signal variation occurred. Calibration of 24 Acoustics' equipment is traceable to National Standards.

- 4.5 There were some periods of inclement weather during the survey period, and these have been removed prior to analysis of the results.

Results

- 4.6 The measurement results are shown graphically in Appendix B and are summarised in Table 1 for the proposed operational hours of the development.

Date (2022)	Ambient Noise Level dB LAeq, 1 hour	Background Noise Level, dB LA90, 1 hour
Fri 18th Nov 07:00 – 18:00	52	40
Sat 19th Nov 08:00 – 13:00	43	38
Mon 21st Nov 07:00 – 18:00	Unused due to poor weather	
Tue 22nd Nov 07:00 – 18:00	48	40
Wed 23rd Nov 07:00 – 18:00	50	44
Average Weekday	50	41
Sat AM	43	38

Table 1: Measured Noise Levels, Land East of Knowle Lane

- 4.7 Typical background noise levels for the wider period were in the order of 40 dB LA90, 1 hour (07:00 to 23:00 hours) and 36 dB LA90, 15 min (23:00 to 07:00 hours) Monday to Sunday.

5.0 NOISE IMPACT ASSESSMENT

Receptors

- 5.1 Calculations have been undertaken to predict noise levels at selected receiver locations from the proposed development and these are defined as follows:

- Nearest property in Kingsmill Drive;
- Residential property /cattery to SW on Knowle Lane, Sandelwood;
- Office Building.

Access Road, Proposed Service Yard and Delivery Noise Levels

- 5.2 Details of vehicle movements have been obtained from the Transport Statement, prepared by Nick Culhane for the development in January 2023. The transport assessment results have indicated that the proposed use would generate in the region of 364 vehicle movements (combined arrivals and departures) over a 11-hour daily period (07:00 – 18:00) with approximately 10% being HGV movements. The maximum number of vehicle movements predicted during the peak morning period (08:00 to 09:00 hours) is 34. The maximum number of vehicle movements predicted during the peak rush hour period (17:00 to 18:00 hours) is 24. From 24 Acoustics library of noise data, a sound power level of 95 dBA has been assumed for a HGV on the access road with a sound power level of 75 dB assumed for a car.
- 5.3 24 Acoustics library noise data for deliveries within a service yard has also been utilised, comprising HGV and cage trolley movements, with a sound power level of 93 dBA assumed and corrected for % on-time (15-minutes simultaneous HGV activity in five of the loading bays over an hourly period).
- 5.4 It is recommended that a Noise Management Plan be submitted to the local authority for approval prior to the facility coming into first use. It is assumed that vehicles will not utilise tonal reversing alarms and that broadband alarms will be used as part of the Noise Management Plan for the site.

Proposed Commercial Noise Levels

- 5.5 As the future occupiers are unknown, a worst-case reverberant workshop noise level of 85 dBA has been assumed and it is recommended that the building construction achieves the sound reduction performances stated in Table 2.

Element	Sound Reduction Index (dB) per Single Octave Band						
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Shutter Door	15	13	16	17	18	22	14
Façade/Roof	13	14	29	38	40	45	55
Rooflights	10	13	18	22	27	32	36

Table 2: Recommended Minimum Sound Insulation performance

- 5.6 Calculations assume that all shutter doors will be normally closed.

BS 4142 Assessment

- 5.7 The predicted resultant noise levels for all aspects of the proposed development are given in Table 3.

Receiver Location	Resultant Noise Level dB L _{Aeq} , 1 hr
Receiver 1 – Kingsmill Drive	29
Receiver 2 – Sandelwood, Knowle Lane	32
Receiver 3 - Office Building	39

Table 3: Predicted Noise Levels from Proposed B2 Use

- 5.8 Table 4 shows the BS 4142 assessment for each of the selected residential receiver locations considered. A character correction of +3 dB has been applied to reflect the potentially intermittent nature of the noise.

Receiver Location	Specific Source Noise Level, dB L _{Aeq} , 1 hour	Rating Level, dB L _{Ar}	Representative Background Sound Level, dB L _{A90} , 1 hour	BS 4142 Assessment Level
Mon to Fri: 07:00 – 18:00 Hours				
Receiver 1 - Kingsmill Drive	29	32	41	-9
Receiver 2 - Sandelwood	32	35	41	-6
Sat: 08:00 – 13:00 Hours				
Receiver 1 - Kingsmill Drive	29	32	38	-6
Receiver 2 - Sandelwood	32	35	38	-3

Table 4: BS 4142 Assessment, Proposed B2 Use

- 5.9 Under BS 4142, a rating noise level which does not exceed the background level is an indication of a low impact, depending on the context and it is therefore considered that noise from the proposed development at all residential receptor locations will result in a low impact.
- 5.10 BS 4142 requires uncertainty to be considered as part of the assessment. At this site an extended background noise survey has been undertaken (over a 5-day period) and the data analysed to ensure that background noise data influenced by meteorological conditions has

been removed from the assessment. The sound level meters were calibrated before and after the survey and no significant drift in calibration was recorded. Standard acoustic theory has been used in the calculations. It is therefore considered that the uncertainty associated with the assessment has been reduced to a minimum.

Proposed External Plant Noise Limits

- 5.11 As no detailed information is available regarding any plant which may be included in the proposed development, it is appropriate to propose noise limits for those uses. When determining the rating level, it will be necessary to take into account any acoustic features such as tonality or impulsivity which may increase the significance of any impact.
- 5.12 Under BS 4142, a rating noise level equivalent to the representative background noise level would be an indication of the specific sound source having a low impact and noise limits for plant noise sources associated with operation of the new development are given in Table 5.

Period	Proposed Noise Limit
Daytime (07:00 – 23:00)	38 dB L _{Ar} , 1 hour
Night-time (23:00 – 07:00)	36 dB L _{Ar} , 15 min

Table 5: Proposed Noise Limits – Plant

Office Building

- 5.13 For the nearby office building, total noise levels due to the proposed development are predicted to be 39 dB L_{Aeq}, 1 hr. Assuming a 15 dB reduction across an open window, this would result in an internal noise level of 24 dB L_{Aeq}, 1 hr. It is understood that this building is equipped with a cooling system, and this minimises the likelihood of windows being opened for cooling purposes.
- 5.14 The predicted noise level from the proposed development is considerably lower than the existing weekday ambient noise level of 50 dB L_{Aeq}. Furthermore, the anticipated internal noise level is considerably lower than the BS 8233 acceptable noise level criteria for open plan offices (45 – 50 dB L_{Aeq}). On that basis it is considered that the development would result in no significant impact at the office building.

Noise Management Plan

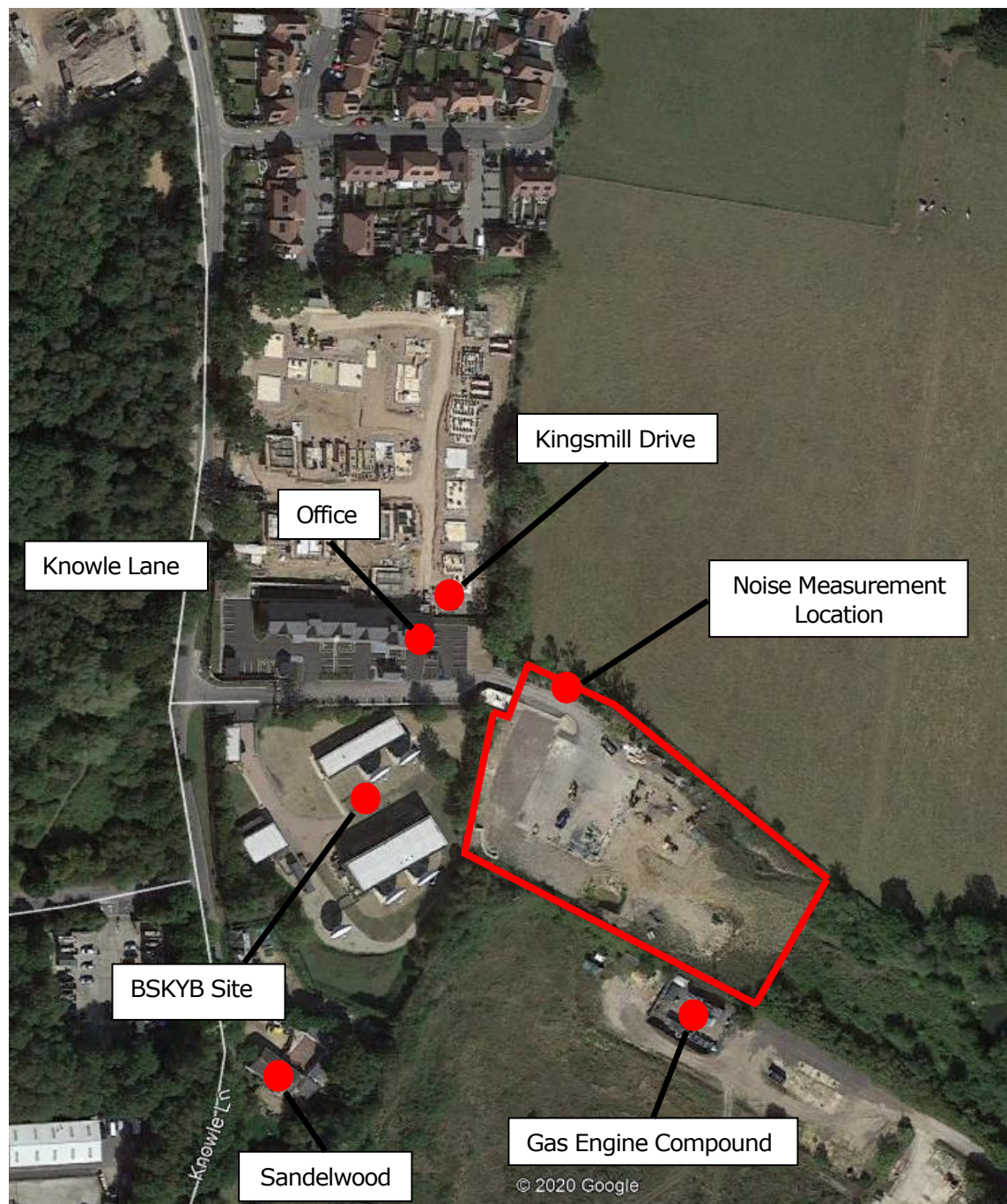
- 5.15 A Noise Management Plan for the site has been prepared and is included as Appendix C. This will ensure ongoing management actions to ensure noise from the site is minimised.

6.0 CONCLUSIONS

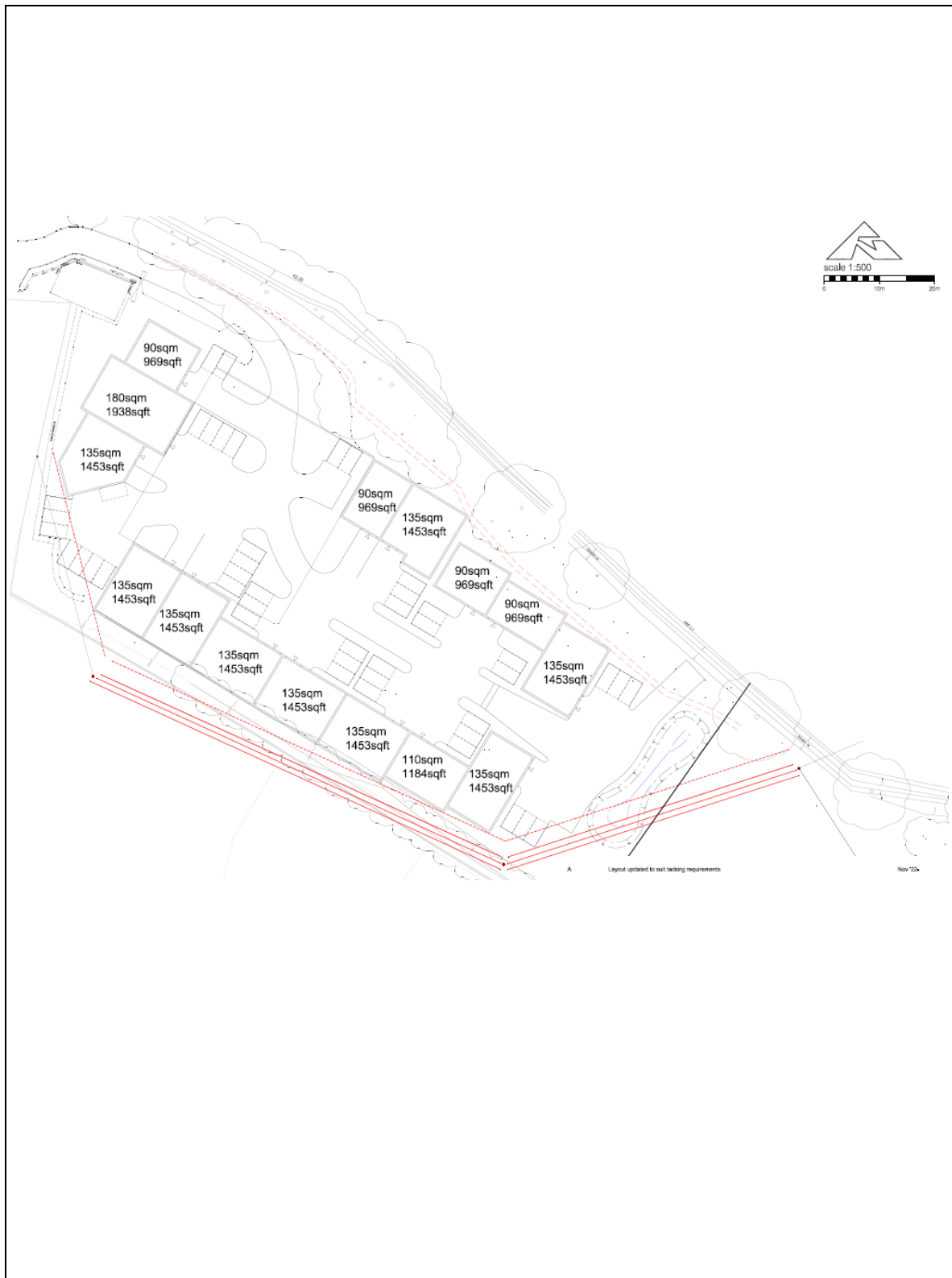
- 6.1 24 Acoustics Ltd has been retained by Parsons Construction Ltd (Parsons) to assess the impact of noise from a proposed industrial development on land east of Knowle Lane, Fair Oak upon existing residential dwellings. Parsons have planning consent for 5 blocks of office accommodation on the site. One block is built and occupied, however, due to a change in market conditions, they are now seeking planning consent for industrial development on the remainder of the site.
- 6.2 The site is neighboured by a former landfill site to the south, which includes a gas engine compound with associated flare and coolers, and an industrial facility operated by BSKYB to the west. Residential properties lie to the north-west of the site in Kingsmill Drive and to the south-west of the site on Knowle Lane.
- 6.3 A BS 4142 assessment has been undertaken to determine the potential impact of the development and the assessment indicates a low impact at all residential receptors.
- 6.4 Noise limits have been specified for external plant to ensure acceptable noise levels are achieved.
- 6.5 An assessment of noise levels anticipated at the nearby office building indicate the proposed development will result in no significant noise impact.
- 6.6 A Noise Management Plan for the site has been prepared and will ensure ongoing management actions to ensure noise from the site is minimised.
- 6.7 On the above basis, it is considered that the proposed development will not cause a significant adverse impact at nearby noise sensitive receptors and is therefore acceptable in planning terms.

REFERENCES

1. Department for Communities and Local Government. The National Planning Policy Framework (NPPF), 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. British Standards Institution. British Standard 4142:2014+A1:2019. Methods for Rating and Assessing Industrial and Commercial Sound, 2014.
5. British Standards Institution. British Standard 8233: Guidance on sound insulation and noise reduction for buildings, 2014.



Project: Knowle Lane, Fair Oak		Title: Site Location, Noise Measurement Location & Receptors		
DWG No: Figure 1		Scale: N.T.S.	Rev: -	
Date: December 2022		Drawn By: AR	Job No: 9791	



Project: Knowle Lane, Fair Oak	Title: Proposed Site Development		 24Acoustics
DWG No: Figure 2	Scale: N.T.S.	Rev: -	
Date: December 2022	Drawn By: AR	Job No: 9791	

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 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA 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.

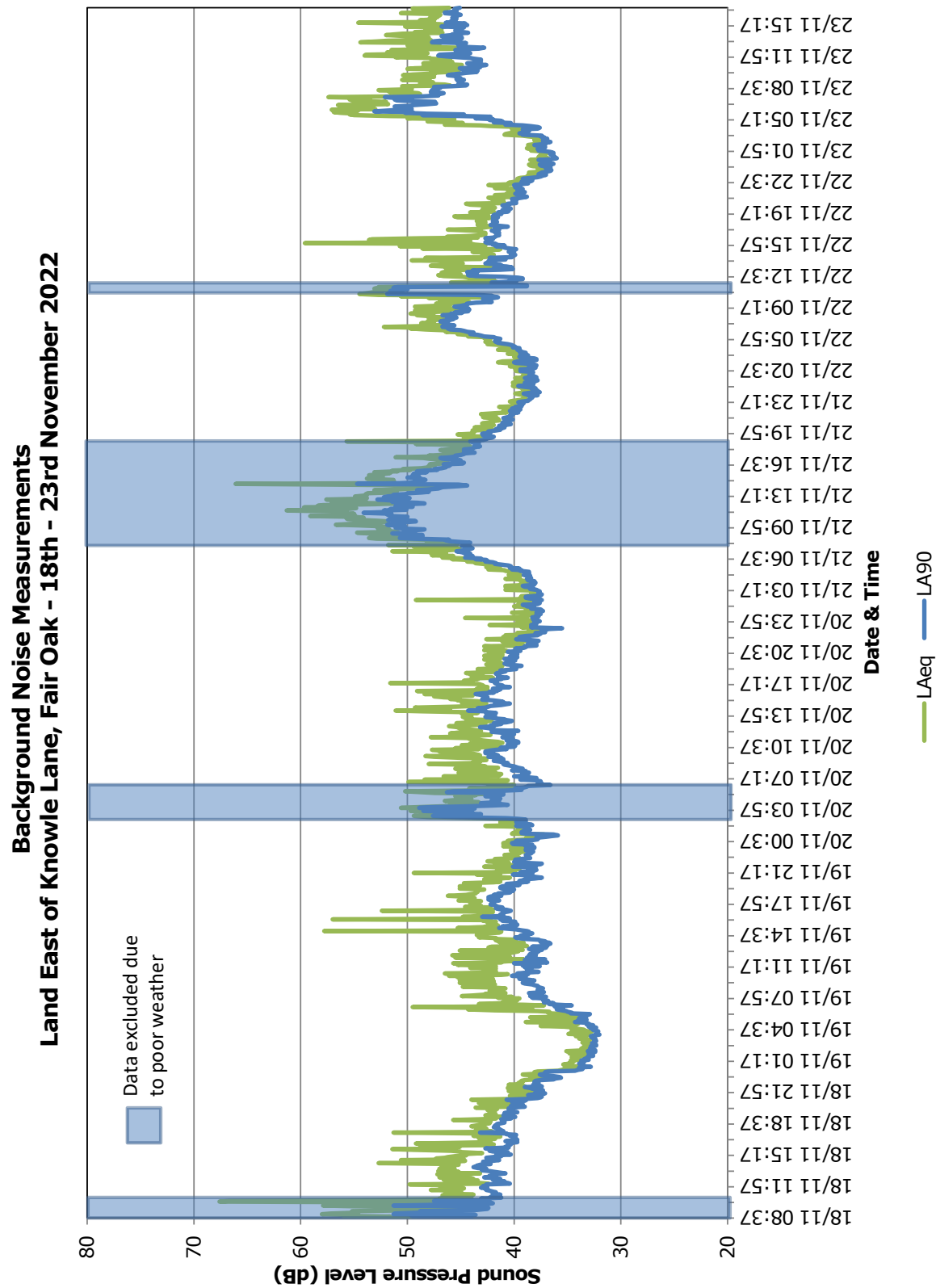
iii) The L_{A10} noise level

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: BACKGROUND NOISE SURVEY RESULTS



APPENDIX C: NOISE MANAGEMENT PLAN

NOISE MANAGEMENT PLAN NMP Rev 0 - December 2022

This document presents a Noise Management Plan for Knowle Lane Industrial Estate, Knowle Lane, Fair Oak.

The objective of this document is to ensure that noise from the site is minimised and that vehicles operate efficiently and effectively when serving the site, thereby minimising any incidence of potential disruption from potential noise disturbance to local residents.

This plan should be reviewed as a minimum every two years or when changes are made to site operations.

Noise Management Scheme

The site will be operational during the hours 07:00 – 18:00 Monday to Friday and 08:00 – 13:00 on Saturdays with no operation on Sundays or Bank Holidays.

The site access road will be subject to a speed limit of 10 mph with appropriate signage posted and maintained.

The surface of the access road and external yard shall be maintained in good order.

No tannoy / public address system will be utilised on the site.

HGVs and other vehicles will not be left to idle unnecessarily, and horns must not be used other than when required in an emergency.

Vehicle doors should be closed without excessive force.

Where possible, the operator will endeavour to use broadband (white noise) reversing alarms on vehicles.

There will be no shouting in the external service yards.

Where safe and practicable, doors to the industrial units will remain closed when noisy operations are underway internally.

Noisy operations will not be permitted in external service yard areas.

All new tenants must be provided with a copy of this document and a lease clause will be included to ensure that tenant's activity does not create nuisance or disturbance to residential neighbours. Reminders to minimise noise emissions will be included in briefings to tenants on a regular basis. These procedures will be logged and made available to the LPA on request.

Complaints Procedure

Contact details for the site manager will be displayed at the site entrance. Any and all complaints relating to noise will be logged and investigated. Results from subjective evaluations and any noise measurements undertaken, where applicable, will be recorded.

A sample sheet to log communications from residents is shown below.

Noise Complaint Log:

Date of Incident		Time of Incident		Weather conditions at time of incident	
Date of Complaint		Time of complaint			
<u>Complainant</u>					
Name		Address		Contact details	
<u>Nature of Complaint</u>					

Signed:.....

Details of Investigation				
Action Taken				
Future Actions				
Reporting	Complainant	Site Staff	Management	EA

Signed:..... (Site manager)