NOISE IMPACT ASSESSMENT

Site:	Stour Business Park, Essex
References:	51-987-R1
Date:	05 May 2026
Client:	Kalex

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QUALITY ASSURANCE

Report references	51-987-R1

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01	First issue	12th February 2026
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EXECUTIVE SUMMARY

Site Address	Stour Business Park, Little Wratting, CB9 7TD
Grid Reference	E 569780, N 247516
Proposed Development	Full planning application for a proposed Materials Recycling Facility (MRF) managing construction and demolition waste arising from commercial sources.
Surveys Completed	E3P has undertaken a full weekday and weekend background sound survey in a position considered representative of the closest noise sensitive receptors to the site, noted to be to the south on Haverhill Road. Additionally, attended measurements of the plant items on site have been conducted.
Assessments Completed	A 3D noise model has been constructed to assess to commercial noise impact at existing receptors. Commercial noise is assessed in accordance with BS 4142:2014+A1:2019.
Mitigation Recommended	The assessment of the proposed operations found that the impact had the potential for adverse effect at receptors to the north west and south west. As such, a barrier on the southern edge of the concrete plant is proposed along with operational management to ensure roller shutters are kept closed at all times, except for access.
Conclusions and Discussions	The operation of the site has the potential for adverse impact at receptors assuming a worst-case assessment. As such, mitigation measures are proposed to ensure no adverse impact at the receptors.

CONTENTS

1. INTRODUCTION

1.1. BACKGROUND

E3P was commissioned by Kalex to undertake a Noise Impact Assessment to support a Planning Application and Environmental Permit (EP) application for a proposed Materials Recycling Facility (MRF) managing construction and demolition waste arising from commercial sources at Stour Business Park in Essex, to be referred to as 'the Site'.

The report has been produced by Lee Faulkner, Associate Director at E3P, and full member of the Institute of Acoustics (MIOA).

The purpose of this document is to accompany the planning application and an Environmental Permit (EP) application.

1.2. DESCRIPTION OF WORKS AND SOURCES OF NOISE

The EP is required for the proposed recycling operations involving the storage (keeping) prior to removal, and treatment (all types of handling/processing) of waste. The proposed development will comprise the following elements:

- Weighbridge and weighbridge office.
- Workshop.
- Crushing and screening for processing construction and demolition waste.
- Dedicated storage for aggregates arising from processing and recycling.
- Dedicated storage for residual waste following processing and recycling.
- Dedicated storage for topsoil.
- Wash down and jetwash facilities for plant and haulage.
- Site offices and welfare facilities.
- Operational storage (PPE, administrative supplies, etc.).
- Car parking.

The waste site will typically be open during the following hours for all waste operations, i.e. depositing, sorting, moving, storing and removing waste:

- Monday to Friday - 08:00 – 18:00.
- Saturday - 08:00 – 13:00.
- Sundays, Bank/Public holidays - Closed.

1.3. REPORT OBJECTIVES

The objectives of this report are as follows:

- Establish the existing sound levels at the nearest noise sensitive receptors.
- Consider the existing and potential sources of sound and to measure source sound levels of all applicable sources.

- Assess the impact of commercial sound in accordance with BS 4142 with consideration to the existing and proposed scenario.
- Provide advice on mitigation measures, where required.

2. ASSESSMENT METHODOLOGY

2.1. ENVIRONMENT AGENCY (2022) NOISE AND VIBRATION MANAGEMENT: ENVIRONMENTAL PERMITS

Environmental permits have conditions that require operators to control pollution – this includes controlling noise and vibration. E3P note that the following are required competencies and standards required in relation to Noise Assessments submitted as part of an Environmental Permit Application:

Noise impact assessments should be carried out to an appropriate standard and by competent personnel, for example, holders of either an Institute of Acoustics:

Diploma in Acoustics and Noise Control

Certificate of Competence in Environmental Noise Measurement, with relevant experience

Monitoring noise in the environment is a specialist field. Monitoring should be carried out by a qualified acoustician who can demonstrate competency in environmental work rather than, for example, occupational health and safety work.

You must use 'BS 4142: Methods for rating and assessing industrial and commercial sound' to quantify the level of environmental noise impact from industrial processes.

In rare circumstances, other methods may also be appropriate, for example, NANR45 for assessing existing low frequency sound inside a residential property.

If you want to assess impact using another method, you should discuss and agree this with your regulator before you start the assessment.

Where vibration is an issue, you should contact your regulator for specific advice.

E3P note from the above and the guidance that the EA require a BS 4142 assessment to be conducted.

2.2. BRITISH STANDARD BS 4142:2014+A1: 2019 – METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

This standard describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- Sound from industrial and manufacturing processes.
- Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

The procedure detailed in the standard compares the measured or predicted specific noise level from any of the above with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is typical.

The specific noise level also acknowledges the reference time intervals depending upon whether the noise source operates during daytime (1-hour) or night-time (15-minute) periods.

There are several 'penalties' which can be attributed to the specific sound level depending upon the 'acoustic features' of the sound level under investigation as follows:

TONALITY

- +2 dB: where the tonality is just perceptible.
- +4 dB: where the tonality is clearly perceptible; and
- +6 dB: where the tonality is highly perceptible.

IMPULSIVITY

- +3 dB: where the impulsivity is just perceptible.
- +6 dB: where the impulsivity is clearly perceptible; and
- +9 dB: where the impulsivity is highly perceptible.

INTERMITTENCY

- +3dB: where the intermittency is readily distinctive against the acoustic environment.

In addition to the above, there is a penalty for 'other sound characteristics' of +3 dB where a sound exhibits characteristics that are neither tonal nor impulsive, though are readily distinctive against the acoustic environment. BS 4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background sound level can yield the following commentary:

- Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact.
- A difference 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
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

3. SURVEY RESULTS

E3P have undertaken a full weekday and weekend background and ambient sound survey in a position considered representative of the closest residential receptors to the site to the west. For receptors to the south, attended measurements have been undertaken.

The Noise Measurement Position is shown in Figure 1.

Figure 1 Noise Measurement Position

3.1. BACKGROUND AND AMBIENT SOUND SURVEY – WESTERN RECEPTORS

A 5 day survey was conducting at the site in a position considered representative of the surrounding receptors. The survey was conducted during the following periods:

- 14:00 Wednesday 21st January to 12:00 Monday 26th January 2026.

The following Noise Measurement Position was used for the survey:

- Noise Measurement Position 1 (NMP1): Located within the site but equidistant from the A143 as receptors to the west and equidistant from the B1061 as receptors to the south. The microphone

of the sound level meter was attached to a tripod at a height of 1.5 m above ground level in free-field conditions. Sound sources consisted of road traffic sound, on-site activity and birdsong.

As the results include on-site operations and intermittent construction works, only the data before/after these works have taken place is used. As such, the data from 07:00-08:00 and 17:00-19:00 during the weekdays and 07:00-08:00 and 13:00-15:00 on Saturdays is used in the assessment. Sundays are not considered. The results of the unattended long-term monitoring are summarised in Table 3.1 for the daytime with hourly values shown in Appendix III.

Table 3.1 Daytime Background Monitoring Results

DATE	MEASUREMENT PERIOD	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,T}$ (dB)
Wednesday 21st January	17:00-19:00	45.0
Thursday 22nd January	07:00-08:00	50.0
	17:00-19:00	46.1
Friday 23rd January	07:00-08:00	49.1
	17:00-19:00	44.6
Saturday 24th January	07:00-08:00	44.4
	13:00-15:00	45.0
Monday 26th January	07:00-08:00	47.5

In order to inform the assessment, the median background sound level from all the above periods is used, which is 46 dB. This is applicable for weekday periods at receptors to the north and west. For Saturdays, a level of 44 dB is used.

For receptors to the south, a position closer to these was not possible. As such, and given the increased distance from the road, the above background sound levels are corrected by 3 dB to allow for potentially, lower background sound levels.

Weather conditions were monitored throughout the survey via forecasts and observations on site before and after the survey. Conditions were conducive to the measurement of environmental noise for the duration.

3.2. SOURCE NOISE SURVEY

E3P have conducted a source noise survey at the site whilst the operator used various equipment that is to be used at the development site. Source noise measurements were conducted at various distances allowing for the size of equipment and the operations taking place.

1/3 octave band data was captured at the time and will be used in the noise model.

The microphone of the sound level meter was at a height of 1.5 m and in free-field conditions. Table 3.2 details the measured values:

Table 3.2 Source Noise Survey

SOURCE	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,T}$ (dB)	MEASUREMENT DISTANCE (m)	MEASUREMENT PERIOD	ASSUMED ON TIME IN HOUR	CALCULATED SOUND POWER LEVEL, L_{WA} (dB)
Jackhammer attached to 360	85.3	5	10 minutes	15 minutes	101.3
Excavator moving material with skip lorry being emptied	71.6	6	13 minutes	15 minutes	89.1
Crusher with excavator feeding material	83.1	11	12 minutes	30 minutes	108.9
Box screener loaded by front loader	83.5	4	12 minutes	45 minutes	102.3
Concrete machine	75.0	13	14 minutes	45 minutes	104.0
Front loader pass-by	77.3	12	3 minutes	10 movements	106.9

The equipment outlined in Table 3.2 was used for the noise survey.

Table 3.3 Noise Measurement Equipment

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER AND TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
NMP1 and source	Sound Level Meter	01dB Fusion	14616	10th July 2026
	Pre-amplifier	01dB Pre22	20951	
	Microphone	GRAS 40CD	494264	
	Calibrator	Cirrus CR515	99206	5th August 2026

The sound level meter was field calibrated before and after each survey with no significant drift witnessed.

4. BS 4142 NOISE ASSESSMENT

This section considers the likely rating levels from the operations in accordance with BS 4142 and advice given in the Noise and Vibration Management guidance from the EA.

For the purposes of the assessments, E3P has used noise modelling software, CadnaA 2025 MR2, to determine the impact of noise from the sound sources associated with the development.

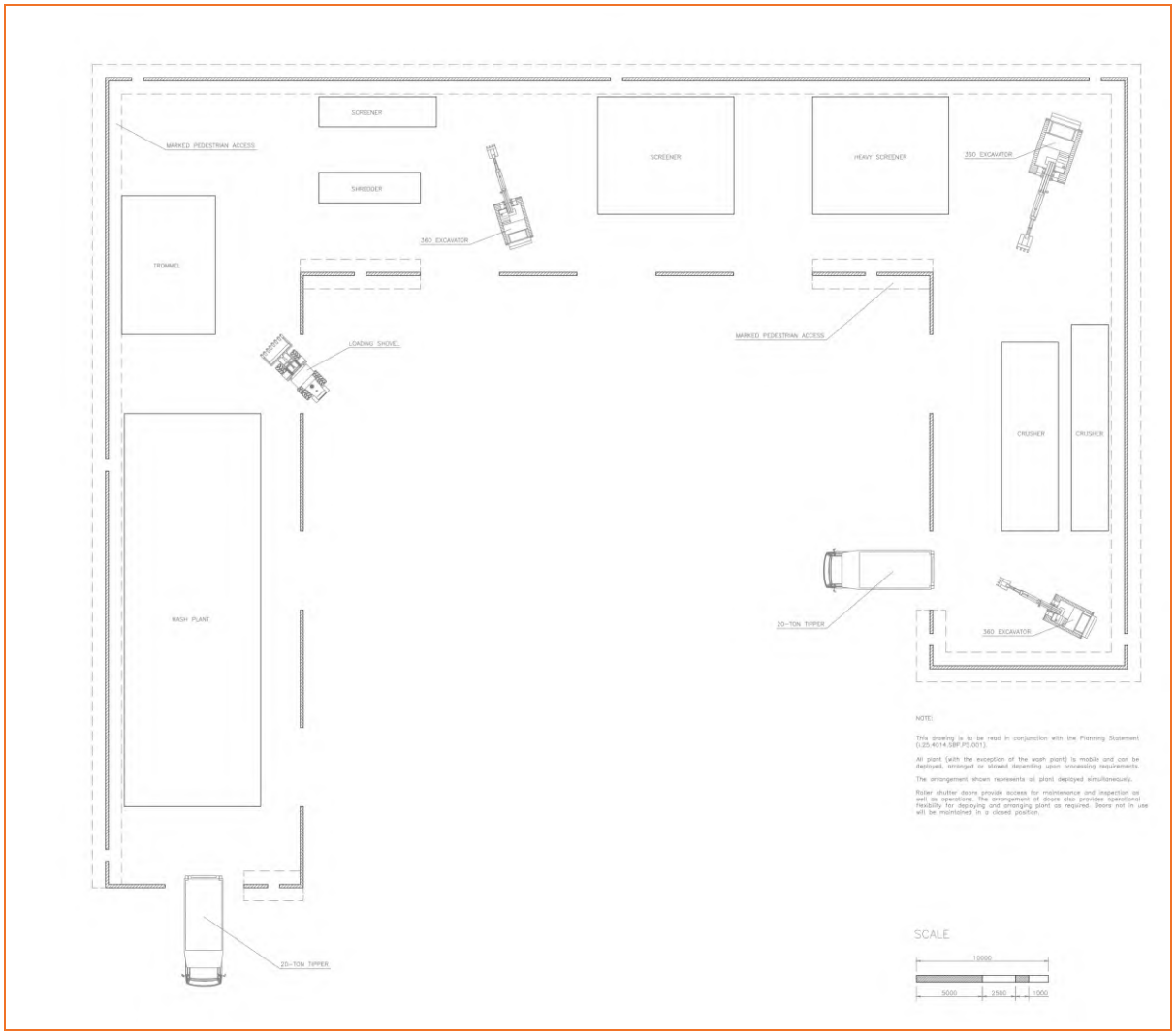
For the BS 4142:2014+A1:2019 assessment, penalties are applied to the specific sound level to provide the rating level. These penalties relate to the acoustic features of the sound source. It is considered that the intermittent nature of the noise associated with the sorting, HGV movements, tipping and general operation of the site will be just perceptible at the nearest residential dwellings given the nature of the existing noise climate and therefore a 3 dB penalty may be applied at these times.

The following inputs have been included in the model:

- Ground elevations around the site have been taken as existing by way of a 1 m grid Digital Terrain Model (DTM) which contains public sector information licensed under the Open Government License v3.0.
- Existing buildings have been included in the model and assumed to have a structured façade for dwellings and flat hard walls for other buildings.
- A reflection order of two has been used in all calculations.
- Ground absorption is set at 0.95 with roads and concrete areas input as hard ground.
- Noise levels generated using ISO 9613-2:2024 “Acoustics – Attenuation of sound during propagation outdoors” as incorporated into CadnaA software.

The data in Table 3.2 is used to inform the noise model. For the plant items, the following internal layout has been provided:

Figure 2 Internal Layout of MRF Building



A wash plant is shown above but it is understood that this no longer forms part of the application.

The building is included in the noise model with the facades and openings modelled as vertical area sources and the roof input as an area source. An SRI of 25 dB is assumed for the solid facades and roof construction assuming single skin steel construction. No attenuation is applied to the roller shutter openings except where the source is distant from the opening, i.e. only the western section of the building.

The sound power levels for the facades are calculated using internal to external break-out calculations using the octave band data for available plant items.

For plant not present on site, E3P have used library source data for similar sites for each proposed plant item/process which are outlined below:

- 360 Excavator at a height of 2 m with a sound power level of 103.1 dB.

Other operations/plant similar to those already measured are allocated their respective sound power level. The measured octave band data for each plant item is given below

Table 3.4 Noise Levels for Noise Model – Sound Power Levels

SOURCE	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1K Hz	2K Hz	4K Hz	8K Hz
Jackhammer attached to 360	88.6	95.3	98.9	92.3	89.5	93.2	96.7	96.6	91.8
Excavator moving material with skip lorry being emptied	92.6	89.4	87.2	87.0	86.0	84.2	81.7	77.3	70.3
Crusher with excavator feeding material	98.2	105.7	107.0	104.6	105.9	103.8	101.1	97.2	90.1
Box screener loaded by front loader	96.3	100.6	96.2	95.0	98.6	97.6	94.6	87.7	79.6
Concrete machine	110.2	102.8	102.6	99.9	99.6	98.0	96.4	93.9	97.6
Front loader pass-by	100.0	100.6	97.1	99.0	96.5	93.5	94.1	88.4	84.7

The concrete machine is input as a point source as the noise source was the discharge into the waiting cement mixer at the pump.

4.1. WEEKDAY OPERATIONS

Figure 3 details the resultant Grid Noise Map with levels calculated at 1.5 m height and façade levels showing maximum façade value. Considering the distance and intervening industrial uses, no feature corrections are applied to receptors on School Road.

Table 4.1 details the results of the BS 4142 for a selection of receptors and based on worst-case levels per group of receptors. Receptors are shown on Figure 3.

Table 4.1 Daytime Weekday BS 4142 Assessment

RECEPTOR	PREDICTED SPECIFIC SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	ACOUSTIC FEATURE CORRECTION (dB)	PREDICTED RATING LEVEL, L_{Ar} (dB)	BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	DIFFERENCE, +/- (dB)
Old Haverhill Road	51	+3	54	46	**+8**
Haverhill Road	59	+3	62	43	**+19**

RECEPTOR	PREDICTED SPECIFIC SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	ACOUSTIC FEATURE CORRECTION (dB)	PREDICTED RATING LEVEL, L_{Ar} (dB)	BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	DIFFERENCE, +/- (dB)
A143 North east	39	+3	42	46	-4
School Road	40	0	40	46	-6

The assessment has determined an exceedance of up to 19 dB exceedance at the closest residential receptors to the south west and 8 dB for receptors to the north west. This is considered a potential significant adverse impact after consideration of context and uncertainty.

Context is considered below.

4.2. SATURDAY OPERATIONS – 08:00-13:00

Figure 3 details the resultant Grid Noise Map with levels calculated at 1.5 m height and façade levels showing maximum façade value. Considering the distance and intervening industrial uses, no feature corrections are applied to receptors on School Road.

Table 4.2 details the results of the BS 4142 for a selection of receptors and based on worst-case levels per group of receptors. Receptors are shown on Figure 3.

Table 4.2 Daytime Saturday BS 4142 Assessment

RECEPTOR	PREDICTED SPECIFIC SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	ACOUSTIC FEATURE CORRECTION (dB)	PREDICTED RATING LEVEL, L_{Ar} (dB)	BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	DIFFERENCE, +/- (dB)
Old Haverhill Road	51	+3	54	44	**+10**
Haverhill Road	59	+3	62	41	**+21**
A143 North east	39	+3	42	44	-2
School Road	40	0	40	44	-4

The assessment has determined an exceedance of up to 21 dB exceedance at the closest residential receptors to the south west and 10 dB for the north west. This is considered a potential significant adverse impact after consideration of context and uncertainty.

Context is considered below.

4.3. CONTEXT AND UNCERTAINTY

In order to determine the final outcome of the assessment, the context must be considered, in accordance with BS 4142:2014+A1:2019, Section 11. The factors to be considered are discussed below:

4.3.1. BASELINE CONDITIONS

Uncertainty in the assessment was controlled via the following precautions/procedures:

- Both the sound level meter and calibrator are UKAS calibrated and the meter was field-calibrated both before and after the measurements.
- The measurement locations are considered representative of the existing noise climate outside the nearest residential dwellings to the proposed development.
- Background monitoring was undertaken during favourable weather conditions (e.g. dry and under 5m/s wind speed).

4.3.2. THE ABSOLUTE LEVEL OF THE SOUND

The worst-case absolute noise level at the façade of the most affected receptor is 59 dB $L_{Aeq,1hr}$. Assuming 10 dB for attenuation provided by an open window, this would result in the internal noise level of 49 dB, 14 dB above the internal noise criterion for daytime resting.

As such, this suggests an adverse impact at the receptors. Furthermore, rear garden noise levels are 59 dB, which is 9 dB above the 50 dB criterion for garden areas to the south.

4.3.3. THE CHARACTER AND LEVEL OF THE SOUND

The existing sound climate, whilst the site is not operational is road traffic and birdsong, along with local sources. As such, the operational sound sources would be noticeable over the existing sound climate.

Accordingly, the assessment and AFC applied are considered robust and accurate.

4.3.4. THE SENSITIVITY OF THE RECEPTOR AND EXISTING DESIGN MEASURES

The receptors are residential, permanent and are therefore considered to be highly sensitive. Given that details of the existing receptors are not known, it is assumed that no design measures are incorporated, i.e. open windows relied upon. Based on the absolute noise levels at the façade, the internal noise levels would fall comfortably below the BS 8233:2014 criteria during the day and be considered low impact.

Given the contextual factors discussed above in accordance with BS 4142:2014+A1:2019, it is concluded that the sound sources have the potential for adverse impact at the receptors to the north west and south west only with a low impact considered at those to the north east.

As such, mitigation measures are recommended to reduce noise levels for the dwelling to the north west and south west.

Upon review of the noise model, it is noted that the dominant sources of noise are the break-out from open roller shutters especially in the eastern area of the building with levels of between 47 and 53 dB for south western receptors. The concrete plant results in a noise level of 46 dB.

It is clear from the above that the operation of the crushers in the eastern area of the building, with doors open, and concrete plant are the primary noise sources at the receptors.

5. MITIGATION

Due to the potential for industrial sound to result in up to +8 dB exceedance of the background sound level at existing receptors to the north west and south west, mitigation measures are recommended.

As the main noise source is the internal plant through the proposed openings of the building, barriers not considered effective. As such, it is recommended that roller shutter doors be implemented and kept closed except for access. A reduction of 20 dB is applied for a typical steel roller shutter with rubber seals. Single skin roller shutters typically attenuate 15-25 dB but with rubber seals a mid reduction is assumed.

Additionally, the key source at Haverhill Road to the south is the Concrete Plant. Accordingly, a 4 m high barrier is recommended along the southern edge of this plant. This barrier is recommended to have an absorbative northern elevation to ensure no significant noise reflection to the north. As such, a bund/fence combination would be ideal.

Figure 4 details the resultant grid noise map with roller shutters closed and the barrier in place. Table 5.1 details the BS 4142 assessment with the barrier in place:

Table 5.1 Daytime BS 4142 Assessment with Mitigation

RECEPTOR	PREDICTED SPECIFIC SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	ACOUSTIC FEATURE CORRECTION (dB)	PREDICTED RATING LEVEL, L_{Ar} (dB)	BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	DIFFERENCE, +/- (dB)
Old Haverhill Road	47	+3	50	46	**+4**
Haverhill Road	46	+3	49	43	**+6**
A143 North east	39	+3	46	46	0
School Road	40	0	40	46	-6

With the barrier in place, there is a +4 dB exceedance of the background sound level at the north western receptor. However, considering the specific sound levels and context, this level of exceedance is not considered adverse. Indeed, Extrium Noise Mapping predict road traffic noise levels of between 55 and 60 dB at this location. As such, road traffic sound is likely to mask much of the sound from the site.

For Haverhill Road, a +9 dB exceedance is predicted. However, absolute levels of noise, 46 dB, are considered low with internal noise levels of approximately 33 dB with open windows. Noise levels in garden areas are 45 dB which results in a rating level 5 dB in exceedance which would be considered a low impact.

As such, no adverse impact is predicted with mitigation measures in place.

For the barrier, this must be of solid construction, be sealed at the base and be free from holes. An example would be legio blocks. Roller shutters are recommended to be steel construction with rubber seals to prevent noise leakage through gaps. These must remain closed except for access.

END OF REPORT

Appendix I: Limitations

GENERAL

1. This report and any associated works (together comprising the "Services") were compiled and carried out by E3P for the client (as present in Section 1) under the E3P “Terms of Business” or with those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.

2. Unless explicitly agreed otherwise, in writing, this report has been prepared under E3P Standard Terms and Business as included within our proposal to the Client.

3. Project-specific appointment documents may be agreed upon at our discretion and a charge may be levied for both the time to review and finalise appointment documents and also for associated changes to the appointment terms. E3P reserves the right to amend the fee should any changes to the appointment terms create an increased risk to E3P.

4. The report needs to be considered in light of the proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

NOISE AND VIBRATION IMPACT ASSESSMENTS

5. Where a noise or vibration survey is required to inform an assessment, E3P will endeavour to ensure that all noise and vibration measurements taken are robust, representative and reliable in order to inform an accurate assessment.

6. Where mitigation measures are specified in this report, it should be noted that these measures are relative to a specific sound or vibration source, both in terms of the measured sound pressure and vibration level and the character of the sound source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, E3P cannot be held responsible for any subsequent variations in the proposed mitigation performance.

7. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walkover inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. E3P cannot be held responsible for any disclosures that are provided post-production of our report and will not automatically update our report.

8. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, E3P reserves the right to review such information and, if warranted, to modify the opinions accordingly.

9. E3P does not warrant work/data undertaken/provided by others.

Appendix II: Glossary

NOISE

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source. The most widely used weighting mechanism that best corresponds to the response of the human ear is the “A”-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or LAeq, LA90 etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective but, as a general guide, a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A Typical Sound Pressure Levels

SOUND PRESSURE LEVEL	LOCATIONS/EXAMPLE
0	Threshold of hearing
20-30	Quiet bedroom at night
30-40	Living room during the day
40-50	Typical office
50-60	Inside a car
60-70	Typical high street
70-90	Inside a factory
100-110	Burglar alarm at 1 m away
110-130	Jet aircraft on take off
140	Threshold of pain

ACOUSTIC TERMINOLOGY

Table B Terminology

DESCRIPTOR	EXPLANATION
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2E-05 Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. "A" weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
LAeq, T	LAeq is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
LAmax	LAmax is the maximum A-weighted sound pressure level recorded over the period stated. LAmax is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the "fast" sound level meter response.
L10 and L90	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L10 is the level exceeded for 10% of the time and as such can be regarded as the "average maximum level". Similarly, L90 is the "average minimum level" and is often used to describe the background noise. It is common practice to use the L10 index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Fast	A time weighting used in the root-mean-square section of a sound level meter with a 125-millisecond time constant.
Slow	A time weighting used in the root-mean-square section of a sound level meter with a 1000-millisecond time constant.
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2E-05 Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. "A" weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

Appendix III: Measured Sound Pressure Levels

Table A.1 Hourly Measured Ambient and Background Sound Levels

MEASUREMENT START TIME	MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
21/01/2026 14:00	59.9	49.6
21/01/2026 15:00	60.2	54.6
21/01/2026 16:00	63.1	55.0
21/01/2026 17:00	51.2	47.5
21/01/2026 18:00	49.5	45.1
21/01/2026 19:00	47.7	42.4
21/01/2026 20:00	45.4	37.1
21/01/2026 21:00	45.2	37.3
21/01/2026 22:00	42.9	35.4
21/01/2026 23:00	41.9	34.5
22/01/2026 00:00	41.6	37.1
22/01/2026 01:00	41.8	35.1
22/01/2026 02:00	37.1	29.2
22/01/2026 03:00	37.4	28.1
22/01/2026 04:00	38.2	27.7
22/01/2026 05:00	45.4	33.3
22/01/2026 06:00	52.8	44.8
22/01/2026 07:00	53.6	50.0
22/01/2026 08:00	53.7	50.1
22/01/2026 09:00	51.5	47.1
22/01/2026 10:00	59.4	51.8
22/01/2026 11:00	53.9	51.9
22/01/2026 12:00	55.3	51.5
22/01/2026 13:00	61.0	46.4
22/01/2026 14:00	53.9	47.0
22/01/2026 15:00	55.3	51.5
22/01/2026 16:00	57.7	49.4
22/01/2026 17:00	51.3	47.6
22/01/2026 18:00	49.9	44.6
22/01/2026 19:00	48.1	42.7
22/01/2026 20:00	46.8	40.0
22/01/2026 21:00	43.7	35.4
22/01/2026 22:00	42.7	34.1
22/01/2026 23:00	40.5	30.4

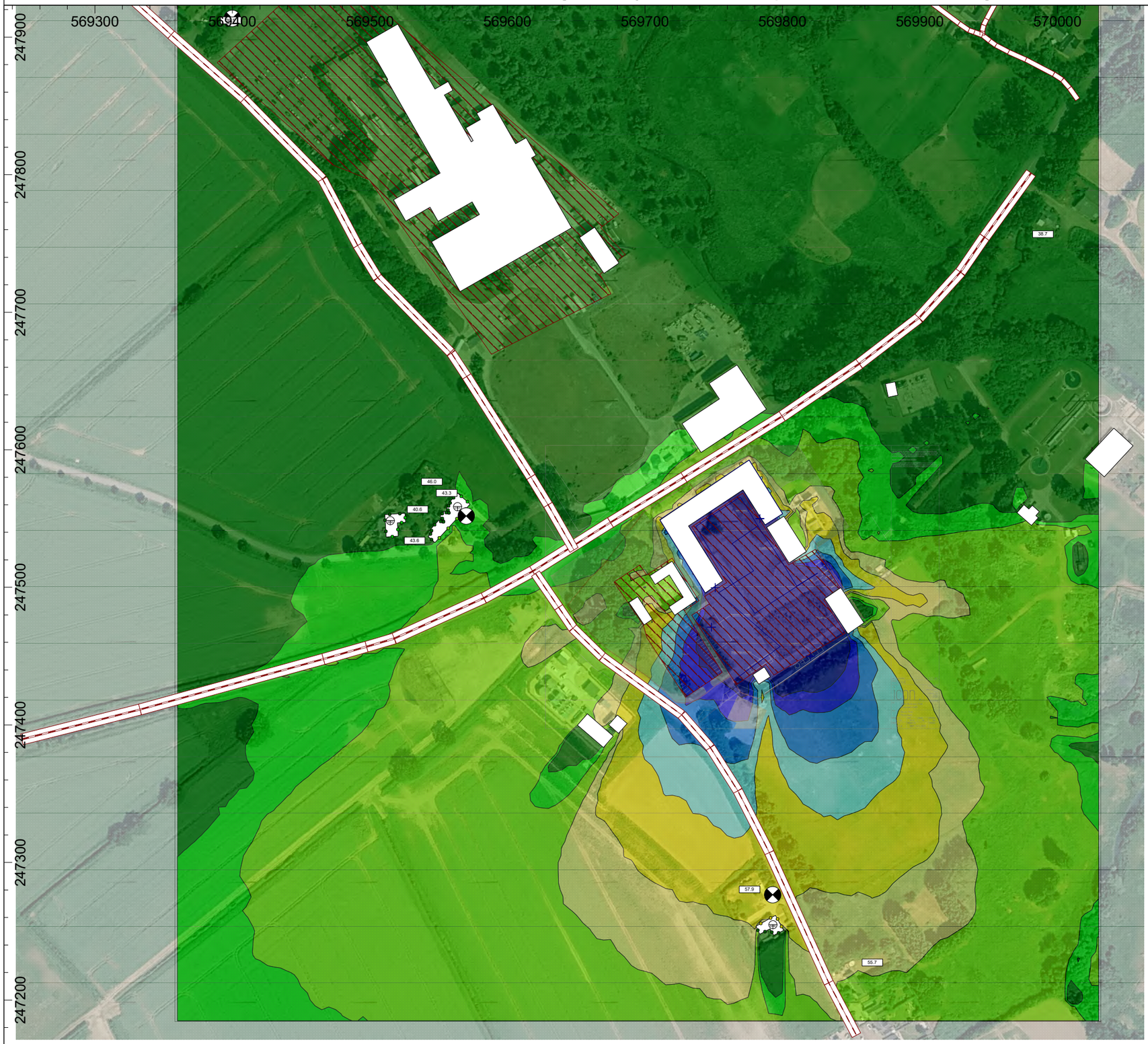
MEASUREMENT START TIME	MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
23/01/2026 00:00	36.8	26.8
23/01/2026 01:00	35.6	26.6
23/01/2026 02:00	36.0	27.5
23/01/2026 03:00	37.5	28.5
23/01/2026 04:00	39.2	28.0
23/01/2026 05:00	44.8	33.3
23/01/2026 06:00	59.8	44.6
23/01/2026 07:00	55.7	49.1
23/01/2026 08:00	63.8	52.9
23/01/2026 09:00	55.7	47.0
23/01/2026 10:00	53.1	47.9
23/01/2026 11:00	59.8	51.5
23/01/2026 12:00	58.8	55.0
23/01/2026 13:00	57.2	48.1
23/01/2026 14:00	57.6	52.2
23/01/2026 15:00	64.1	56.2
23/01/2026 16:00	61.1	49.2
23/01/2026 17:00	55.2	45.7
23/01/2026 18:00	48.6	43.4
23/01/2026 19:00	46.8	40.5
23/01/2026 20:00	45.0	37.0
23/01/2026 21:00	44.1	34.2
23/01/2026 22:00	43.5	35.0
23/01/2026 23:00	41.6	31.4
24/01/2026 00:00	38.9	29.8
24/01/2026 01:00	35.8	28.1
24/01/2026 02:00	35.9	27.5
24/01/2026 03:00	35.6	26.7
24/01/2026 04:00	38.4	28.1
24/01/2026 05:00	40.5	29.4
24/01/2026 06:00	47.8	37.3
24/01/2026 07:00	55.3	44.4
24/01/2026 08:00	50.2	44.9
24/01/2026 09:00	53.3	48.5
24/01/2026 10:00	65.8	52.2

MEASUREMENT START TIME	MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
24/01/2026 11:00	65.8	53.0
24/01/2026 12:00	64.0	51.3
24/01/2026 13:00	52.5	45.8
24/01/2026 14:00	49.2	44.1
24/01/2026 15:00	48.9	42.4
24/01/2026 16:00	49.1	43.8
24/01/2026 17:00	48.0	42.7
24/01/2026 18:00	47.3	41.0
24/01/2026 19:00	46.5	39.6
24/01/2026 20:00	45.0	37.2
24/01/2026 21:00	45.5	38.6
24/01/2026 22:00	45.1	37.0
24/01/2026 23:00	43.4	34.2
25/01/2026 00:00	39.3	30.3
25/01/2026 01:00	38.6	28.3
25/01/2026 02:00	39.3	31.3
25/01/2026 03:00	36.9	27.9
25/01/2026 04:00	37.0	26.8
25/01/2026 05:00	38.6	27.1
25/01/2026 06:00	40.9	29.1
25/01/2026 07:00	54.7	38.6
25/01/2026 08:00	55.0	48.7
25/01/2026 09:00	59.0	46.4
25/01/2026 10:00	53.4	43.8
25/01/2026 11:00	64.4	51.2
25/01/2026 12:00	71.2	58.7
25/01/2026 13:00	60.4	44.2
25/01/2026 14:00	48.1	42.1
25/01/2026 15:00	48.4	42.6
25/01/2026 16:00	47.0	40.6
25/01/2026 17:00	45.8	37.2
25/01/2026 18:00	45.6	36.9
25/01/2026 19:00	44.4	34.4
25/01/2026 20:00	43.8	32.5
25/01/2026 21:00	41.6	30.6

MEASUREMENT START TIME	MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
25/01/2026 22:00	39.9	30.4
25/01/2026 23:00	37.7	28.4
26/01/2026 00:00	34.8	27.5
26/01/2026 01:00	42.4	28.1
26/01/2026 02:00	35.0	29.1
26/01/2026 03:00	37.7	28.2
26/01/2026 04:00	39.7	28.8
26/01/2026 05:00	43.7	31.2
26/01/2026 06:00	49.1	41.9
26/01/2026 07:00	52.1	47.5
26/01/2026 08:00	53.4	48.9
26/01/2026 09:00	55.2	50.2
26/01/2026 10:00	64.4	46.6
26/01/2026 11:00	69.9	52.8

Appendix IV: Figures

Figure 3 - Daytime Grid Noise Map - Calculation at 1.5 m above ground level



Project:
Stour Business Park

Project-No:
51-987

Client:
Kalex

Predicted Noise Level, LAeq,T (dB)

- ... <= 47
- 47 < ... <= 50
- 50 < ... <= 55
- 55 < ... <= 57
- 57 < ... <= 60
- 60 < ... <= 62
- 62 < ... <= 65
- 65 < ... <= 67
- 67 < ...

Noise Map Objects

- Point Source
- Line Source
- Area Source
- vert. Area Source
- Road
- Parking Lot
- Building
- Barrier
- Receiver
- Building Evaluation
- Calculation Area

Project Engineer: L Faulkner
Date: 13/02/2026

Figure 4 - Daytime with Mitigation Grid Noise Map - Calculation at 1.5 m above ground level

Project:
Stour Business Park

Project-No:
51-987

Client:
Kalex

Predicted Noise Level, LAeq,T (dB)

- ... <= 47
- 47 < ... <= 50
- 50 < ... <= 55
- 55 < ... <= 57
- 57 < ... <= 60
- 60 < ... <= 62
- 62 < ... <= 65
- 65 < ... <= 67
- 67 < ...

Noise Map Objects

- Point Source
- Line Source
- Area Source
- vert. Area Source
- Road
- Parking Lot
- Building
- Barrier
- Receiver
- Building Evaluation
- Calculation Area

e3p

Project Engineer: L Faulkner
Date: 13/02/2026