

NOISE IMPACT ASSESSMENT

Site:	F. Ball & Co., Cheddleton
References:	51-704-R1
Date:	29 January 2026
Client:	Sammons Architectural Limited





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QUALITY ASSURANCE

Report references

51-704-R1

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EXECUTIVE SUMMARY

Site Address	F. Ball & Co., Station Road, Cheddleton, Leek, ST13 7RS
Grid Reference	E 398033, 352478
Proposed Development	Proposed extension of production area at F. Ball & Co. to facilitate new tanks for goods to be pumped from inbound deliveries via tanks carried by HGVs.
Background	E3P was commissioned to undertake a Noise Impact Assessment to accompany the planning application, considering the potential noise impact of the development on existing receptors.
Surveys Completed	E3P conducted an unattended background sound survey to quantify noise levels at a position considered representative of non-associated residential receptors. Attended source measurements of activities expected to take place in the proposed extension area were also captured.
Assessments Completed	E3P carried out calculations of the proposed sound sources using the source measurement data and worst-case assumptions. The predicted rating levels were compared to the measured background sound levels.
Mitigation Recommended	An acoustic barrier with minimum height of 2 m is recommended to be installed between the proposed extension façade and the façade of a pre-existing building on site to reduce the calculated rating level below the typical weekday daytime background level by removing line of sight from the proposed activities to the nearest receptors garden.
Conclusions and Discussions	Predicted rating levels at the nearest receptors are +7 dB relative to typical daytime background sound levels, indicating adverse impact in accordance with BS 4142. With the installation of an acoustic barrier, this would fall, equal to typical daytime background sound levels and, as such, no adverse impact is predicted.



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1. INTRODUCTION

1.1. BACKGROUND

E3P has been commissioned by Sammons Architectural Limited to undertake a Noise Impact Assessment for the proposed extension to the production area at F. Ball & Co., Cheddleton, hereafter referred to as 'the site'.

1.2. REPORT OBJECTIVES

The objectives of this report are as follows:

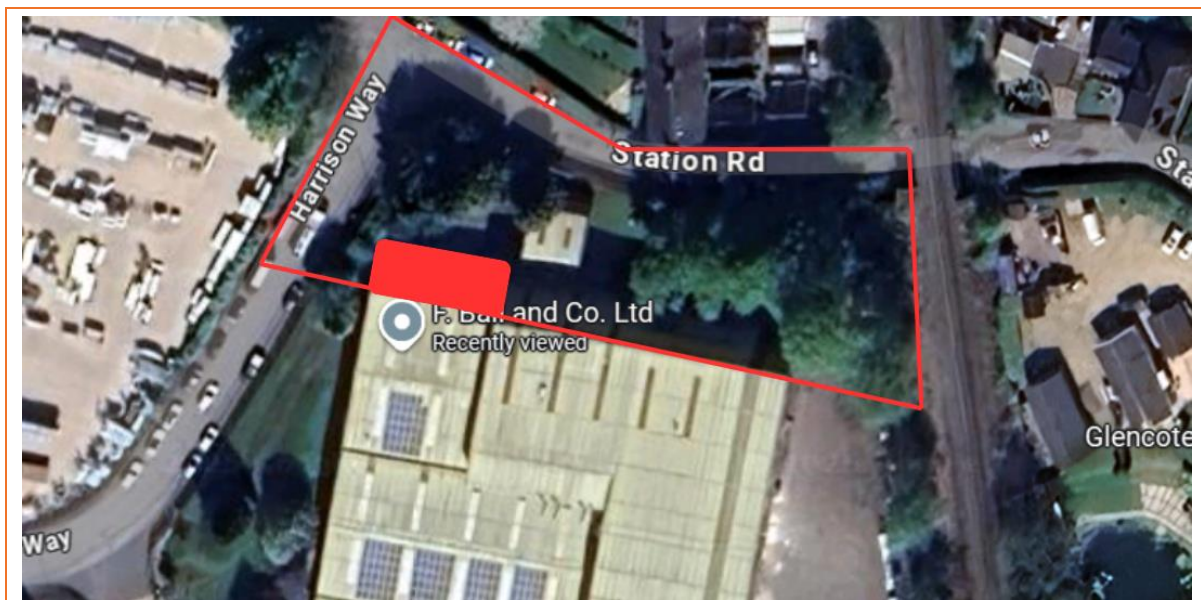
- ✦ Establish the existing sound levels during relevant operational periods.
- ✦ Identify and quantify potential sources of sound that may impact receptors surrounding the site.
- ✦ Compare predicted rating levels with the measured background sound levels in accordance with BS 4142.
- ✦ Provide advice on mitigation measures, where required.

1.3. PROPOSED DEVELOPMENT

Sammons Architectural Limited intends to submit a full planning application for the extension of the production area at F. Ball & Co. The proposed extension will primarily facilitate the delivery of goods, which will be pumped into on-site tanks through wall openings via connecting hoses. Deliveries will be undertaken by HGVs approximately two to three times per week.

A snapshot of the proposed development location is presented in Figure 1.

Figure 1 Snapshot of the Proposed Development





2. ASSESSMENT METHODOLOGY

2.1. NATIONAL PLANNING POLICY FRAMEWORK (2024)

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 impact 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.

2.2. NATIONAL PLANNING PRACTICE GUIDANCE

Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Local planning authorities' plan-making and decision-making should take account of the acoustic environment and in doing so consider:

- ✦ Whether or not a significant adverse effect is occurring or is likely to occur.
- ✦ Whether or not an adverse effect is occurring or is likely to occur.
- ✦ Whether or not a good standard of amenity can be achieved.

In line with the explanatory note of the NPSE, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase, where applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

The “observed effect levels” are as follows:

- ✦ Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
- ✦ Lowest observed adverse effect level: This is the level of noise exposure above which adverse effects on health and quality of life can be detected.
- ✦ No observed effect level: This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Table 2.1 summarises the noise exposure hierarchy, based on the likely average response.



Table 2.1 Noise Exposure Hierarchy

PERCEPTION	EXAMPLES OF OUTCOMES	INCREASING EFFECT LEVEL	ACTION
Not Applicable	No effect	No observed effect	No specific measures required.
Noticeable and Not Intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No observed adverse effect	No specific measures required
Lowest Observed Adverse Effect			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television, speaking more loudly, or having to close windows for some of the time because of the noise where there is no alternative ventilation. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion, having to keep windows closed most of the time because of the noise where there is no alternative ventilation. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed effect	Avoid
Noticeable and Very Disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening, loss of appetite, significant/medically definable harm (auditory and non-auditory).	Unacceptable adverse effect	Prevent

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any situation. These factors include the following:



- ✦ The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day. The adverse effect can also be greater simply because there is less background noise at night.
- ✦ For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise can be important.
- ✦ The spectral content of the noise and the general character of the noise. The local topology and topography should also be considered along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- ✦ Where applicable, the cumulative impacts of more than one source should be considered along with the extent to which the source of noise is intermittent and of limited duration.
- ✦ Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases, a suitable alternative means of ventilation is likely to be necessary.
- ✦ If external amenity spaces are an intrinsic part of the overall design, then the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

2.3. 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

Figure 2 details the measurement locations for both surveys conducted.

Figure 2 Noise Measurement Position



3.1. BACKGROUND SOUND SURVEY

E3P has undertaken a full weekday and weekend background sound survey to quantify the existing levels of background sound at a position considered representative of the closest non-associated residential receptors to the development. The survey was carried out over the following period:

📅 16:00 Thursday 13th – 11:00 Monday 17th November 2025

The following noise measurement position was chosen for the unattended background sound survey:

📍 Noise Measurement Position 1 (NMP1): Located 1.5 m above ground level on the northern boundary of site under free-field conditions. This location is considered representative of the surrounding noise sensitive receptors.

Table 3.1 presents the measured background sound levels for daytime periods. This data is used to inform the assessment in accordance with BS 4142:2014+A1:2019.

Deliveries will occur only on weekdays during daytime hours; therefore, weekend background levels have not been considered. Site activities typically conclude between 11:30 and 12:30 on Fridays; consequently, the measured background level includes some activity from F. Ball & Co. but is predominantly influenced by noise from the surrounding industrial estate.



Table 3.1 Daytime Background Sound Pressure Levels

Date	Time period	Range of measured background sound levels, $L_{A90,1hr}$ (dB)	Median measured background sound level, $L_{A90,1hr}$ (dB)
Thursday 13 th November	16:00 – 23:00	32.1-47.2	34
Friday 14 th November	07:00 – 23:00	50.5-58.4	54
Monday 17 th November	07:00 – 11:00	49.5-50.6	50

From Table 3.1, a background sound level of 54 dB is considered representative of the daytime period. Data from Thursday 13th and Monday 17th have been excluded because the measurement periods do not cover a full working day. Accordingly, Friday 14th November has been selected as it captures background sound levels over a complete working day.

The chosen background level is considered representative of typical weekday daytime conditions at the receptor location when industrial estate activity is present.

Weather conditions were monitored throughout the survey to ensure that no adverse conditions affected the measurements, as the site was not suitable for the installation of an unattended weather station. During the survey, conditions remained dry, and wind speeds rarely exceeded 10 mph.

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

Table 3.2 Noise Measurement Equipment and Calibration Dates

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER AND TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
NMP1	Sound Level Meter	Svantek SV958A	97701	8 th January 2027
	Microphone	Svantek 7152	93784	
	Calibrator	Cirrus CR:515	109471	4 th August 2026

3.2. ATTENDED SOURCE MEASUREMENT

Source measurements were carried out following the completion of the background sound survey of a delivery of goods being pumped into the existing tanks on site. The survey was carried out over the following period:

📅 12:15 – 13:10 Monday 4th December 2025

The following noise measurement position was chosen for the source measurements:

📍 Noise Measurement Position 2 (NMP2): Located 2.0 m above ground level and approximately 9.0 m from the delivery under free-field conditions.



Table 3.3 presents the measured noise levels associated with a delivery of goods and the subsequent extraction of liquid from the delivery tank via pumping hoses for storage in the on-site tank room. This delivery process represents the primary activity anticipated from the proposed extension.

Table 3.3 Measured Sound Pressure Levels of Delivery

Measurement Period	Source	Measured sound pressure level $L_{Aeq,5min}$ (dB)	Maximum measured sound pressure level L_{AFmax} (dB)
04/12/2025 12:15	Pumping liquid	71.9	95.5
04/12/2025 12:20	Pumping liquid	54.8	62.0
04/12/2025 12:25	Pumping liquid	56.7	67.2
04/12/2025 12:30	Pumping liquid	55.3	62.4
04/12/2025 12:35	General noise (movements of staff, pump room breakout)	54.3	65.5
04/12/2025 12:40	General noise (movements of staff, pump room breakout)	56.5	83.1
04/12/2025 12:45	Air pressure increases in tank	79.5	89.3
04/12/2025 12:50	General noise (movements of staff, pump room breakout)	56.4	76.8
04/12/2025 12:55	HGV preparing to leave	67.0	91.0
04/12/2025 13:00	HGV preparing to leave	64.5	81.6
04/12/2025 13:05	HGV left	53.1	62.7

The measured delivery is considered representative of future deliveries in terms of vehicle type, unloading method, and duration.

The equipment outlined in Table 3.4 was used for the noise survey.

Table 3.4 Noise Measurement Equipment and Calibration Dates

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER AND TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
NMP2	Sound Level Meter	Svantek SV307A	154450	1 st August 2027
	Calibrator	Cirrus CR:515	109332	4 th August 2026



4. NOISE IMPACT ASSESSMENT

For the purposes of this assessment, E3P has undertaken a BS 4142:2014+A1:2019 assessment of the delivery activity to determine the potential noise impact at the new location associated with the proposed extension. Figure 3 illustrates both the location of the measured delivery and the expected location of future deliveries following the extension.

Figure 3 Delivery Locations

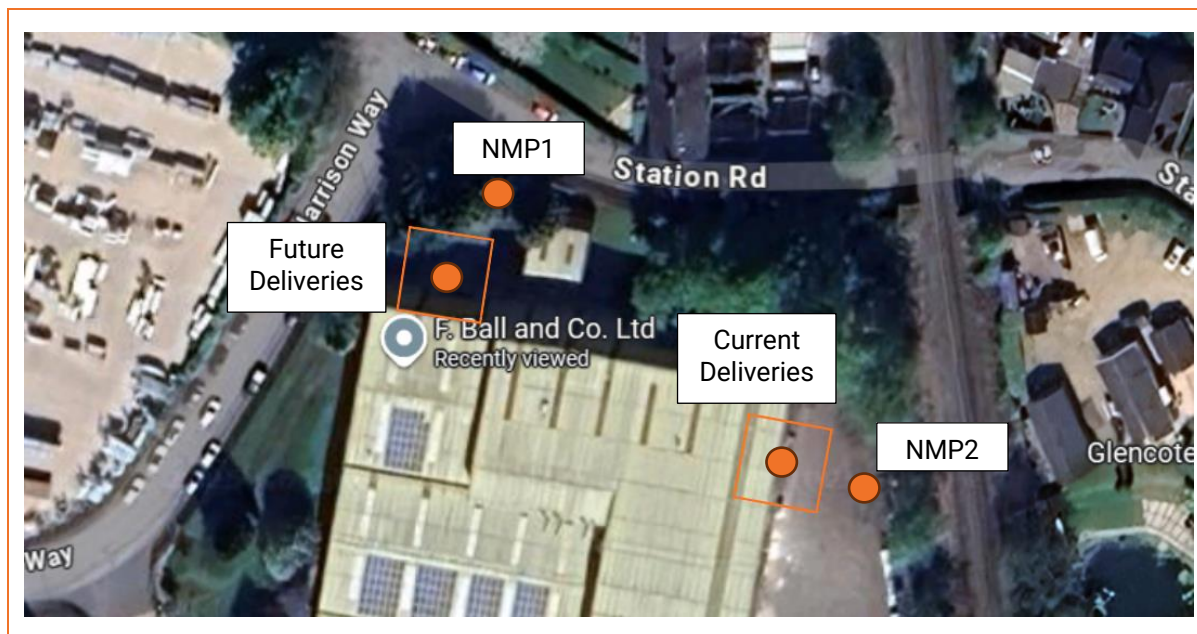


Table 4.1 presents the calculated specific noise levels at the nearest garden for the measured delivery.

The measured $L_{Aeq,55min}$ has been time-corrected to an equivalent $L_{Aeq,1hr}$ to align with the background reference period required by BS 4142.

Table 4.1 Calculation of External Specific Noise Level at Nearest Receptors (Windows in the North)

Source	Measured sound pressure level at 9 m, $L_{Aeq,55min}$ (dB)	Time corrected sound pressure level at 9 m, $L_{Aeq,1HR}$ (dB)	Distance to Window (m)	Calculated Specific sound pressure level at window, $L_{Aeq,1hr}$ (dB)
Delivery	70.1	69.8	35.0	58.0

For the BS 4142:2014 assessments, penalties are applied to the specific sound level to provide the rating level. These penalties relate to the acoustic features of the sound source. Accordingly, the following objective and subjective features have been accounted for in the assessment, in accordance with the subjective method detailed in BS 4142:2014, for the site as a whole operation.



Table 4.2 Acoustic features

Acoustic feature	Applicable?	Attributable penalty	Comment
Tonality	No	-	No tonal components were identified during the attended survey, and the delivery activity is not expected to generate tonal noise.
Intermittency	Yes	+3	The delivery activity occurs as discrete events with clearly perceptible start and stop characteristics, and is therefore considered intermittent in accordance with BS 4142. Whilst pumping can be continuous, the overall activity comprises discrete, time-limited delivery events and contains operational phases that are readily perceptible.
Impulsivity	No	-	No impulsive sounds are attributable to the source/s.
Other	No	-	Source is unlikely to be readily distinctive against the existing sound climate.

4.1. DAYTIME ASSESSMENT – 07:00 – 23:00

To provide a realistic assessment for a typical workday, the measured background sound level of 54 dB has been used. The results of the assessment are summarised in Table 4.3.

Table 4.3 Calculation of Rating Level and Comparison with Background Sound Level – Daytime

Receptor	Calculated specific noise level, $L_{Aeq,T}$ (dB)	Calculated rating level, $L_{A,r}$ (dB)	Typical Background sound level, $L_{A90,1hr}$ (dB)	Difference +/- (dB)
Garden Closest to Northern Boundary of Site	58	61	54	+7

Table 4.3 presents the façade noise levels at the nearest receptor. The results indicate that rating levels are expected to be 7 dB above the background sound level at receptors located to the north of the site. BS 4142 states that a difference of approximately +6 dB is indicative of adverse impact, which may be of high significance depending on context. To determine the overall impact, contextual factors have been considered and are summarised below.

The equipment measured at NMP2 is older, and the client has confirmed that newer models will be used for the development, which may result in lower noise emissions. It is also relevant that the existing sound climate is characteristic of an active industrial estate during daytime working hours, where delivery noise is not expected to be readily distinguishable. Soft-ground attenuation from grassed areas and trees has also been omitted to maintain the worst-case approach.

Finally, consideration to the existing ambient sound levels, L_{Aeq} , at NMP1 have been considered. Here it is noted that noise levels range between 47.0 dB and 64.6 dB during the week between 07:00 and 23:00. As such, the value of 54 dB falls comfortably within this range with noise from deliveries likely to be



masked for most periods. Indeed, the 16-hour average noise level on Friday is noted to be 61.4 dB due to existing noise sources.

There is still cause for concern even with the consideration of the context presented above. Accordingly, adverse impact is predicted at the receptors as a result of the delivery activity associated with the proposed extension. As such, mitigation is required to reduce noise levels within garden areas north of site.

Deliveries are restricted to weekday daytime hours; therefore, a night-time assessment is not required.



5. MITIGATION

As discussed, noise emission from the proposed activities associated with the production area extension are predicted to have adverse impacts on garden areas north of the site during daytime periods. Currently the calculated rating level is predicted to be 7 dB above the background sound level in the daytime.

5.1. ACOUSTIC BARRIER

As garden areas to the north would experience an exceedance of the background sound levels, an acoustic barrier is recommended to reduce noise levels to below or equal to the background sound level. Calculations have been conducted to determine that an acoustic barrier with height of 2.0 m can provide 7 dB reduction thus reducing the calculated specific noise level to 49 dB, using calculation methods given in ISO 9613-2:2024.

Table 5.1 presents the calculated rating level and comparison against the background sound level for weekday daytime periods with the inclusion of a 2 m acoustic barrier.

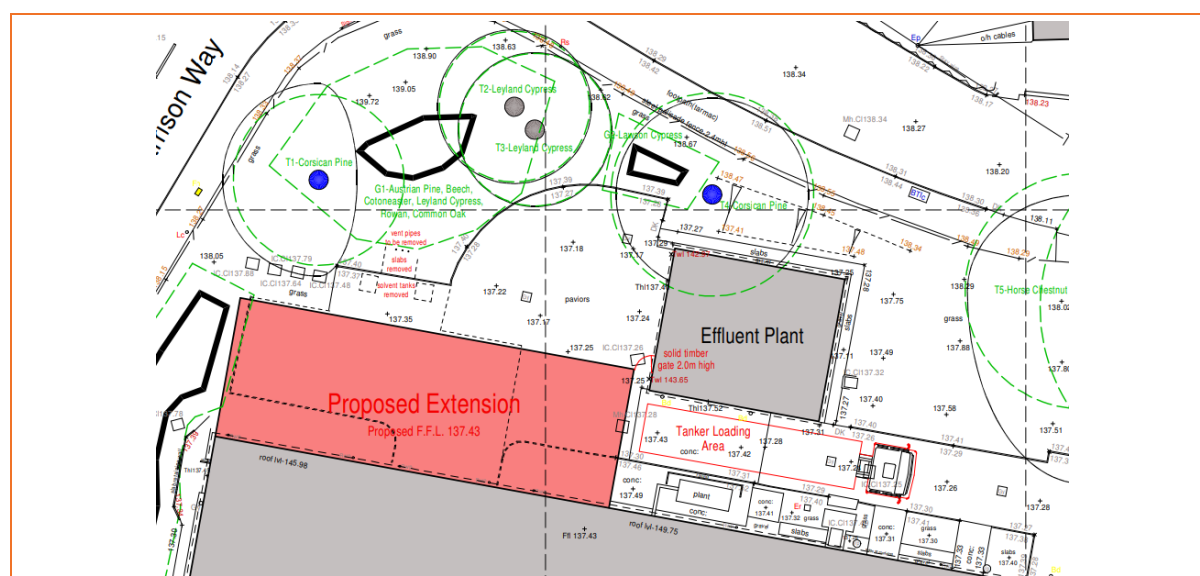
Table 5.1 Calculation of Rating Level and Comparison with Background Sound Level – Daytime, With Barrier

Receptor	Calculated specific noise level with barrier, $L_{Aeq,T}$ (dB)	Calculated rating level, $L_{A,r}$ (dB)	Typical Background sound level, $L_{A90,1hr}$ (dB)	Difference +/- (dB)
Garden Closest to Northern Boundary of Site	51	54	54	0

As can be seen, the installation of an acoustic barrier with height of 2.0 m could reduce the calculated rating sufficiently to ensure rating levels are equal to the background sound level.

The above calculations assume an acoustic barrier would be installed between the proposed extension and an existing building to remove line of site from the proposed activities to the nearest receptors garden, as shown in Figure 4:

Figure 4 Recommended Location of Acoustic Barrier





Partial line of sight removal is already achieved by the pre-existing building on the site, however full line of sight removal at a height of 2.0 m is required to reduce the predicted activity noise levels to 54 dB in the receptors garden.

Accordingly, no adverse impact is predicted at the receptors due to the activities predicted to be associated with the proposed extension of the production area with the inclusion of a 2.0 m tall acoustic barrier between the proposed extension and pre-existing building.

The barrier can be a wooden fence or a brick wall construction but must be free from holes, be sealed at the base and have a minimum mass of 10 kg/m². E3P cannot provide detailed advice on barrier construction and design, it is recommended that the client finds an appropriate vender to implement the advice given to reduce noise levels at the closest non-associated residential receptors north of the site.



6. CONCLUSIONS AND DISCUSSION

E3P has been commissioned by Sammons Architectural Limited to undertake a Noise Impact Assessment for a proposed development at F. Ball & Co., Cheddleton. The assessment identified the key noise sources associated with the development and evaluated their potential impacts on existing noise-sensitive receptors in the vicinity.

Unattended background sound measurements were undertaken during relevant operational periods at a location considered representative of the closest residential receptors to the site, supported by attended source measurements of activities expected to take place in association with the proposed extension.

E3P carried out detailed calculations of the proposed activities to predict noise levels at the nearest receptors in accordance with BS 4142:2014+A1:2019. The assessment demonstrates that the predicted rating levels are high; accordingly, adverse impact is predicted as a result of the proposed development.

To mitigate noise levels in amenity areas north of the site, E3P completed detailed hand calculations to determine an acoustic barrier with 2.0 m height is necessary between the proposed extension and a pre-existing building on site to reduce the calculated rating noise level equal to the typical background noise level for weekday daytime periods. As such, with the implementation of the advice provided, no adverse impact is predicted on non-associated residential receptors north of the site.

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.
LAmx	LAmx is the maximum A-weighted sound pressure level recorded over the period stated. LAmx 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.

1. warrant work/data undertaken/provided by others.

Appendix III: Measured Sound Pressure Levels at NMP1





Table C Hourly Noise Levels at NMP1

Period	L _{Aeq}	L _{A90}
13/11/2025 16:11	56.6	47.2
13/11/2025 17:11	54.7	39.5
13/11/2025 18:11	53.0	33.1
13/11/2025 19:11	51.2	32.1
13/11/2025 20:11	49.9	33.1
13/11/2025 21:11	49.3	36.2
13/11/2025 22:11	47.0	33.7
13/11/2025 23:11	43.4	31.9
14/11/2025 00:11	42.7	36.3
14/11/2025 01:11	44.4	35.5
14/11/2025 02:11	36.8	32.4
14/11/2025 03:11	39.5	31.0
14/11/2025 04:11	39.5	34.8
14/11/2025 05:11	40.4	34.4
14/11/2025 06:11	50.1	37.7
14/11/2025 07:11	56.7	50.5
14/11/2025 08:11	57.2	50.9



14/11/2025 09:11	58.9	52.4
14/11/2025 10:11	59.9	53.8
14/11/2025 11:11	61.4	55.1
14/11/2025 12:11	60.5	54.1
14/11/2025 13:11	61.2	54.9
14/11/2025 14:11	60.7	53.8
14/11/2025 15:11	61.7	54.2
14/11/2025 16:11	63.8	57.1
14/11/2025 17:11	64.6	58.4
14/11/2025 18:11	63.6	57.8
14/11/2025 19:11	63.5	56.4
14/11/2025 20:11	61.2	54.9
14/11/2025 21:11	60.8	54.3
14/11/2025 22:11	58.6	52.3
14/11/2025 23:11	58.0	52.7
15/11/2025 00:11	58.5	52.1
15/11/2025 01:11	56.8	51.5
15/11/2025 02:11	55.2	49.6
15/11/2025 03:11	53.8	48.2



15/11/2025 04:11	50.3	44.0
15/11/2025 05:11	49.6	44.4
15/11/2025 06:11	51.7	44.5
15/11/2025 07:11	52.5	43.8
15/11/2025 08:11	53.8	42.1
15/11/2025 09:11	53.0	38.9
15/11/2025 10:11	53.7	38.4
15/11/2025 11:11	56.6	40.2
15/11/2025 12:11	55.2	42.2
15/11/2025 13:11	54.0	41.1
15/11/2025 14:11	53.8	36.0
15/11/2025 15:11	54.3	35.2
15/11/2025 16:11	52.9	33.2
15/11/2025 17:11	51.4	31.3
15/11/2025 18:11	53.3	30.7
15/11/2025 19:11	51.6	29.1
15/11/2025 20:11	50.4	29.8
15/11/2025 21:11	49.8	28.3
15/11/2025 22:11	47.0	28.5



15/11/2025 23:11	45.2	28.4
16/11/2025 00:11	46.1	28.8
16/11/2025 01:11	45.3	27.9
16/11/2025 02:11	41.5	24.9
16/11/2025 03:11	33.8	23.5
16/11/2025 04:11	44.7	24.8
16/11/2025 05:11	37.0	27.9
16/11/2025 06:11	41.1	29.2
16/11/2025 07:11	46.9	31.2
16/11/2025 08:11	51.0	34.6
16/11/2025 09:11	49.6	34.2
16/11/2025 10:11	61.7	35.1
16/11/2025 11:11	52.6	34.8
16/11/2025 12:11	52.4	34.6
16/11/2025 13:11	52.4	32.8
16/11/2025 14:11	52.7	29.3
16/11/2025 15:11	51.8	31.2
16/11/2025 16:11	53.3	31.5
16/11/2025 17:11	51.0	29.4



16/11/2025 18:11	49.6	30.4
16/11/2025 19:11	50.3	31.8
16/11/2025 20:11	49.6	30.6
16/11/2025 21:11	48.5	30.4
16/11/2025 22:11	40.7	29.3
16/11/2025 23:11	48.4	29.3
17/11/2025 00:11	36.2	27.0
17/11/2025 01:11	34.3	25.8
17/11/2025 02:11	38.3	25.7
17/11/2025 03:11	30.9	26.5
17/11/2025 04:11	39.6	28.9
17/11/2025 05:11	39.9	31.1
17/11/2025 06:11	49.4	34.6
17/11/2025 07:11	55.6	49.5
17/11/2025 08:11	56.7	50.6
17/11/2025 09:11	56.5	50.4
17/11/2025 10:11	57.0	50.5