

Starbucks
Broad Street
Leek
ST13 5NS

Noise Impact Assessment

On behalf of

Thistlewood Properties

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1	2 Apr 2026	Addition of screening to north boundary; operating hours reduced.	JS	NAC
2	3 July 2026	Drive through hours further restricted; additional fencing to east boundary.	JS	NAC

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Executive Summary

Noise Solutions Limited has been appointed to provide noise impact assessment of operations at the proposed Starbucks drive-through on Broad Street in Leek.

Assessments have been made of noise from daytime and night-time operations, including vehicle movements, door slams, order point speaker noise, etc., inclusive of the proposed acoustic screen along the northern boundary which will reduce noise to houses on Eversley Avenue.

The assessments show that noise from the site will be below the prevailing ambient noise climate and there will, therefore, be little or no impact. Noise from the proposed scheme should not be a reason for refusal of planning permission.

1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned to provide a noise impact assessment relating to the proposed Starbucks coffee shop at Broad Street in Leek. Assessment is required of noise from the drive-through facility and from a proposed EV charging hub on site.
- 1.2. Daytime and night-time operational noise levels have been predicted at the nearest noise-sensitive receptors and assessed against recognised standards and other applicable guidance.
- 1.3. To assist with the understanding of this report a glossary of acoustic terms can be found in [Appendix A](#). An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

- 2.1. The proposed Starbucks coffee shop will occupy a dedicated single storey unit on the north western side of Broad Street in Leek, between the junctions with Alsop Street and King Street. The area surrounding the site contains a mixture of residential and commercial properties. A building materials supplier lies to the south west, with offices beyond on the north western side of Broad Street. On the south eastern side of Broad Street, the Leek Masonic Hall is immediately opposite the site, with other retail premises to the north and south. There are residential houses to the north and on streets to the south.
- 2.2. Vehicles using the drive-through lane will enter a loop road to the southwest of the building and circulate clockwise to exit to the same point. The order point will be located alongside the southwest corner of the shop, with the collection/service point on the north elevation.
- 2.3. Following the issue of an earlier version of this assessment report, an acoustic barrier is now proposed to be installed on top of the existing retaining wall to the north of the site. An additional barrier will also be installed alongside the eastern boundary.
- 2.4. The proposed coffee shop opening hours are 06.00 to 22.00 hrs Monday to Saturday and 07.00 to 22.00 hours on Sundays. There will be no noise-producing activity at the premises outside those hours.
- 2.5. The drive-through will not be available for use before 07.00 hours.
- 2.6. The proposed site layout is shown in [Appendix C](#).

3.0 Nearest noise sensitive receptors

- 3.1. The nearest noise-sensitive properties are on Broad Street immediately adjacent to the site to the north-east (Receptor R1) and the rear of houses on Eversley Avenue to the north (Receptor R2), beyond a row of garages. Houses on Eversley Avenue will benefit from significant screening provided by the proposed acoustic barrier to the north, while the garden of Receptor R1 will benefit from significant screening from the barrier to the east.
- 3.2. All other nearby noise sensitive receptors benefit from losses due to increased screening, distance, or both.
- 3.3. A photograph showing the site and surrounding area and the nearest noise sensitive properties is presented in [Appendix B](#).

4.0 Existing noise climate

- 4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.
- 4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in [Appendix C](#).

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	L _{Aeq} (15mins)	L _{Amax} (15mins)	L _{A10} (15mins)	L _{A90} (15mins)
Daytime (07.00 – 23.00 hrs)	51-87	69-105	45-92	34-74
Night-time (23.00 – 07.00 hrs)	34-61	52-96	36-64	29-44
Daytime operating (07.00 – 22.00 hrs)	51-87	71-105	45-92	35-74
Night-time opening (06.00 – 07.00 hrs, Mon to Sat)	51-61	73-85	46-64	33-44

5.0 Noise criteria and guidance

National Planning Policy Framework

- 5.1. A new edition of the NPPF was published in December 2024 and came into effect immediately, with corrections issued in February 2025. The original National Planning Policy Framework

(NPPF¹) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2024 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2024/February 2025 edition.

5.2. Paragraph 187 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability."*

5.3. The NPPF goes on to state in Paragraph 198:

"planning policies and decisions should ...

- a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason ...*

5.4. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE²).

5.5. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission be determined in accordance with the development plan unless material considerations indicate otherwise."*

5.6. Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed"*.

5.7. Paragraph 87 of the NPF states:

"Planning policies and decisions should recognise and address the specific locational requirements of different sectors. This includes making provision for:

¹ National Planning Policy Framework, DCLG, March 2012

² Noise Policy Statement for England, DEFRA, March 2010

- a) *clusters or networks of knowledge and data-driven, creative or high technology industries; and for new, expanded or upgraded facilities and infrastructure that are needed to support the growth of these industries (including data centres and grid connections);*
 - b) *storage and distribution operations at a variety of scales and in suitably accessible locations that allow for the efficient and reliable handling of goods, especially where this is needed to support the supply chain, transport innovation and decarbonisation; and*
 - c) *the expansion or modernisation of other industries of local, regional or national importance to support economic growth and resilience”.*
- 5.8. Paragraph 124 states that *“Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or ‘brownfield’ land”.*

Noise Policy Statement for England

- 5.9. The Noise Policy Statement for England (NPSE³), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are: *“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*
- *avoid significant adverse effects on health and quality of life;*
 - *mitigate and minimise adverse effects on health and quality of life; and*
 - *where possible, contribute to the improvement of health and quality of life.”*
- 5.10. The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and quality of life occur.

³ Noise Policy Statement for England, Defra, March 2010

- 5.11. The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the NPSE). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case: *"...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development."*
- 5.12. Importantly, the NPSE goes on to state that: "This does not mean that such adverse effects cannot occur."
- 5.13. The NPSE does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that: *"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*
- 5.14. It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

Planning Practice Guidance – Noise

- 5.15. An updated Planning Practice Guidance (PPG⁴) for noise was published on 22 July 2019 and provides additional guidance and elaboration on the NPPF. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:
- Whether or not a significant adverse effect is occurring or likely to occur;
 - Whether or not an adverse effect is occurring or likely to occur; and
 - Whether or not a good standard of amenity can be achieved.
- 5.16. This guidance introduced the concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). NOAEL differs from NOEL in that it represents a situation where the acoustic character of an area can be slightly affected (but not such that there is a perceived change in the quality of life). UAEL represents a situation where noise is 'very disruptive' and should be 'prevented' (as opposed to SOAEL, which represents a situation where noise is 'disruptive', and should be 'avoided').

⁴ Planning Practice Guidance – Noise, <https://www.gov.uk/guidance/noise--2>, 22 July 2019

- 5.17. As exposure increases above the LOAEL, the noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will then at some point cross the SOAEL boundary.
- 5.18. The LOAEL is described in PPG⁵ as the level above which *"noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard"*.
- 5.19. PPG identifies the SOAEL as the level above which *"noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present."*
- 5.20. In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG⁶ acknowledges that *"...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 particular situation."*
- 5.21. The relevant guidance in the PPG in relation to the adverse effect levels is summarized below:

Table 2 PPG guidance and effect levels

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. 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

⁵ Paragraph: 005 Reference ID: 30-005-20190722

⁶ Paragraph: 006 Reference ID: 30-006-20190722

Response	Examples of Outcomes	Increasing Effect Level	Action
Lowest Observed Adverse Effect Level			
Present and Intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and Disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. 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 Adverse Effect	Avoid
Present and very Disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

5.22. The Planning Practice Guidance⁷ states the following in relation to mitigation measures:

"For noise sensitive developments, mitigation measures can include avoiding noisy locations in the first place; designing the development to reduce the impact of noise from adjoining activities or the local environment; incorporating noise barriers; and optimising the sound insulation provided by the building envelope."

⁷ Paragraph: 010 Reference ID: 30-010-20190722

5.23. In addition, the Guide notes that it may also be relevant to consider⁸:

"... whether any 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 (and the effect this may have on living conditions). In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations".

BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.

5.24. This Standard provides recommended guideline values for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation (WHO) document, Guidelines for Community Noise (1999⁹). These guideline noise levels are shown in Table 3, below:

Table 3 BS 8233 Desirable Internal Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

5.25. BS 8233:2014 advises that: *"regular individual noise events...can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values."*

5.26. The standard also provides advice in relation to design criteria for external noise. It states that:

"for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable."

⁸ Paragraph: 006 Reference ID: 30-006-20190722

⁹ World Health Organisation Guidelines for Community Noise, 1999

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

- 5.1. BS 4142:2014+A1:2019¹⁰ is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes "sound from fixed plant installations which comprise mechanical and electrical plant and equipment".
- 5.2. The procedure contained in BS 4142:2014 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.
- 5.3. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 5.4. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: "Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."
- 5.5. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: "Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."
- 5.6. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
 - *Typically, the greater this difference, the greater the magnitude of the 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;*
 - *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 or a significant 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, depending on the context.*

¹⁰ References in this report to "BS 4142:2014" or "BS 4142" should be read as BS 4142:2014 + A1:2019

- 5.7. The standard does state that “adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.”
- 5.8. The standard goes on to note that: “Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”
- 5.9. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

“An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.”

- 5.10. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

6.0 Operational noise

- 6.1. Noise from vehicles in car parks, and noise from customers, falls outside the scope of BS 4142:2014 + A1:2019. Where the standard notes that it can be used to assess “*sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises*”, the examples given are heavy machinery (fork-lift trucks, trains and ships) and not private cars. Noise from vehicles manoeuvring around the proposed site will be entirely in keeping with the prevailing noise climate.
- 6.2. Guidance in BS 8233:2014 confirms that for sporadic sources it may not be appropriate to set specific noise limits and that bespoke limits may be set instead. Therefore, for the purposes of this assessment and in line with guidance summarised in Table 3 of this report, a level of 35dB $L_{Aeq, 1hr}$ inside the nearest noise-sensitive dwellings is proposed as a *Lowest Observed Adverse Effect Level*, with a *Significant Observed Adverse Effect Level* of 50dB¹¹ L_{Aeq} .
- 6.3. The proposed vehicle movement in and out of the site will consist of customers
- driving in, parking their cars in the main car park and eating inside the coffee shop;

¹¹ HS2 noise impact assessment which has been approved by the secretary of state implies a 15dB difference between the LOAEL and SOAEL for transportation noise.

- using the drive-through and eating off site;
 - walk in customers.
- 6.4. Night-time activities will in fact be confined to the periods 06.00 to 07.00 hours. As noted in Section 2.5, the drive-through lane will be closed until 07.00 hours so its use will be restricted to the daytime period.
- 6.5. The sound pressure levels associated with vehicle movements and the use of a drive-through intercom system have been measured previously at similar premises. The sound pressure levels were normalised to a distance of 10m from the area of movement and have been converted to Sound Exposure Levels (SEL) for ease of comparison/ calculation. Typical L_{Amax} levels were also established. Noise data is shown in Table 4.

Table 4 Reference noise data for vehicle movement and drive-through (at 10m)

Noise Source	SEL, dB(A)	L_{Amax} , dB(A)
Vehicle Pass-through	55	53
Intercom Speaker	64	71
Car door slam	57	57

- 6.6. It is noted that the assessment is limited to typical vehicular activity. Unsociably loud exhausts or radios would and should be dealt with by existing legislation and are not a problem inherent to premises which attract customers arriving by car.

Predicted sound levels at receptors

- 6.7. The information contained in Table 4 was used to establish a source noise level based on the number of activity events over the required assessment period using the following equation:

$$L_{Aeq,T} = SEL + 10 \cdot \log\left(\frac{1}{T}\right) + 10 \cdot \log(n) \quad \text{(Equation 1)}$$

Where:

SEL is the L_{Aeq} over a one second period, and represents the noise energy from an event (e.g. cage movement) compressed into one second;

T is the reference time period in seconds; and

N is the number of movements in the time period, T.

- 6.8. From the transport assessment by WSP¹², peak hours at the unit are predicted to be 12.00 to 13.00 hours on weekdays (with 29 arrivals and 32 departures) and 13.00 to 14.00 hours on Saturdays (with 32 arrivals and 36 departures).

¹² Highways technical note dated 23 July 2025

- 6.9. For the night-time period, the peak hour is predicted to be 06.00 to 07.00 on weekdays, with seven arrivals and six departures.
- 6.10. To provide a robust assessment it assumed that, during the daytime period, all vehicles will both use the drive-through lane and make use of the car parking spaces. In practice it is likely that only a fraction of customers will do both, with the majority either parking within the car park and being served within the coffee shop or collecting drive-through orders and departing the site immediately. In any event, it can be seen from the calculations that the drive-through element dominates the overall noise level at the receptors, with use of the parking spaces having little cumulative effect.
- 6.11. Between 06.00 and 07.00 hours, it is assumed that all vehicles will use the parking spaces. The drive-through lane will be closed.
- 6.12. The cumulative customer vehicle movement and drive-through noise levels at the most affected noise sensitive receptor have been predicted based on these predicted flows and takes into consideration distance attenuation and directivity corrections.
- 6.13. The resultant sound pressure levels are summarised in Table 5.

Table 5 Assessment of predicted vehicle movement and drive-through sound levels at receptors

Receptor	Period	Predicted sound levels at window of most affected residential dwelling	Highest L _{AFmax} sound level at nearest receptor
		L _{Aeq} 1 hr dB	L _{AF,max} dB
R1	06.00-07.00hrs*	33	55
	13.00-14.00hrs Sat.	44	59
R2	06.00-07.00hrs*	15	38
	13.00-14.00hrs Sat.	33	57

**Drive-through lane closed*

Charging hub

- 6.14. The car park includes two spaces dedicated to electric vehicle charging. These spaces are located at the south-west end of the car park and are, therefore, the furthest spaces from both receptors being around 30m from R1 and 57m from R2.

- 6.15. Allowing for a robust situation where the two EV spaces are used by a number of vehicles equivalent to the peak hour drive-through activity, the overall noise level from the site would not be increased over the levels in Table 5. Realistically usage levels of the EV spaces will be lower than this, as vehicles will remain at the spaces for extended periods in order to make use of the chargers.

7.0 Discussion

- 7.1. It can be seen from Table 5 that the worst-case predicted sound level from customer activity is 44dB L_{Aeq} at receptor R1, during the peak hour on Saturdays. As noted in Table 1 the minimum ambient $L_{Aeq,15mins}$ during the daytime survey period was 51dBA. Noise from the site will therefore be below the existing ambient noise level, with cumulative levels only elevated by 0.8dB, an unnoticeable increase. It should be noted that, at the peak hour in terms of customer activity, the existing ambient noise level is between 61 and 76dBA, so the site activity would have even less of an impact.
- 7.2. During the proposed night-time opening hours (06.00 to 07.00 hours), the predicted activity sound level is 33dB $L_{Aeq,1hr}$ at the worst affected receptor. Existing ambient noise levels at this time range between 51 and 61dB $L_{Aeq,15mins}$. Taking a figure toward the lower end of this range, noise from the site will be comfortably below the existing ambient level with cumulative levels less than 0.1dB above existing.
- 7.3. It can also be seen that, even during the busiest period, activity noise from the site is predicted to be comfortably below the guidance of 50dB L_{Aeq} for external amenity in nearby residential gardens. This is further improved by the installation of solid acoustic fencing to the northern and eastern boundaries, reducing noise in nearby gardens as far as practicably possible.
- 7.4. Allowing a nominal 15dB reduction for a window left open for ventilation, internal noise levels within the most affected receptor will be 29dB $L_{Aeq,1hr}$, below the proposed *Lowest Observed Adverse Effect Level*. Maximum levels internally may be up to 44dB L_{Amax} and no louder than the guidance of 45dB; it must also be noted that the predicted L_{Amax} activity noise at the receptor of 59dB is comfortably below the prevailing noise climate in the area for throughout the proposed hours of operation.
- 7.5. During the more sensitive night-time period, internal L_{Amax} levels at the most affected receptor will be 40dB, below typically accepted limits for sleep disturbance.

8.0 Summary

- 8.1. Noise Solutions Ltd has been commissioned to provide an assessment of noise from customer activity at the proposed Starbucks drive-through on Broad Street in Leek.

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- 8.2. The assessment shows that noise from the site, based on usage rates provided, will be below the prevailing ambient noise climate and that there will, therefore, be little or no impact.
- 8.3. Mitigation, in the form of a solid acoustic screen on top of the existing retaining wall to the north, along with an additional screen to the east, has been proposed to reduce noise from the site where possible. Previously proposed opening hours in the later evening have also been reduced to minimise the noise impact, and the use of the drive-through will be limited to daytime hours.
- 8.4. Noise from the proposed scheme should not be a reason for refusal of planning permission.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Aerial photograph site showing areas of interest



Appendix C Environmental sound survey

Details of environmental sound survey

- C.1 Measurements of the existing environmental sound levels were undertaken between 13.30 hours on Friday 31st October and 08.00 hours on Monday 3rd November 2025.
- C.2 The sound level meter was programmed to record the A-weighted L_{eq} , L_{90} , L_{10} and L_{max} noise indices for consecutive fifteen-minute sample periods for the duration of the survey.

Measurement position

- C.3 The representative measurement position was located on a lamppost at the corner of Sneyd Street and Strangman Street. This location is approximately representative of the levels of road traffic noise at the closest receptor, in the absence of local plant noise. The approximate location of the microphone is indicated on the plan in [Appendix B](#).
- C.4 It can be seen from publicly available noise mapping¹³ that the monitoring location is on a much quieter road than Broad Street and is further than R2 from Broad Street, which is likely to be the dominant noise source.
- C.5 In accordance with BS 7445-2:1991 '*Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use*', the measurements were undertaken under free-field conditions.

Equipment

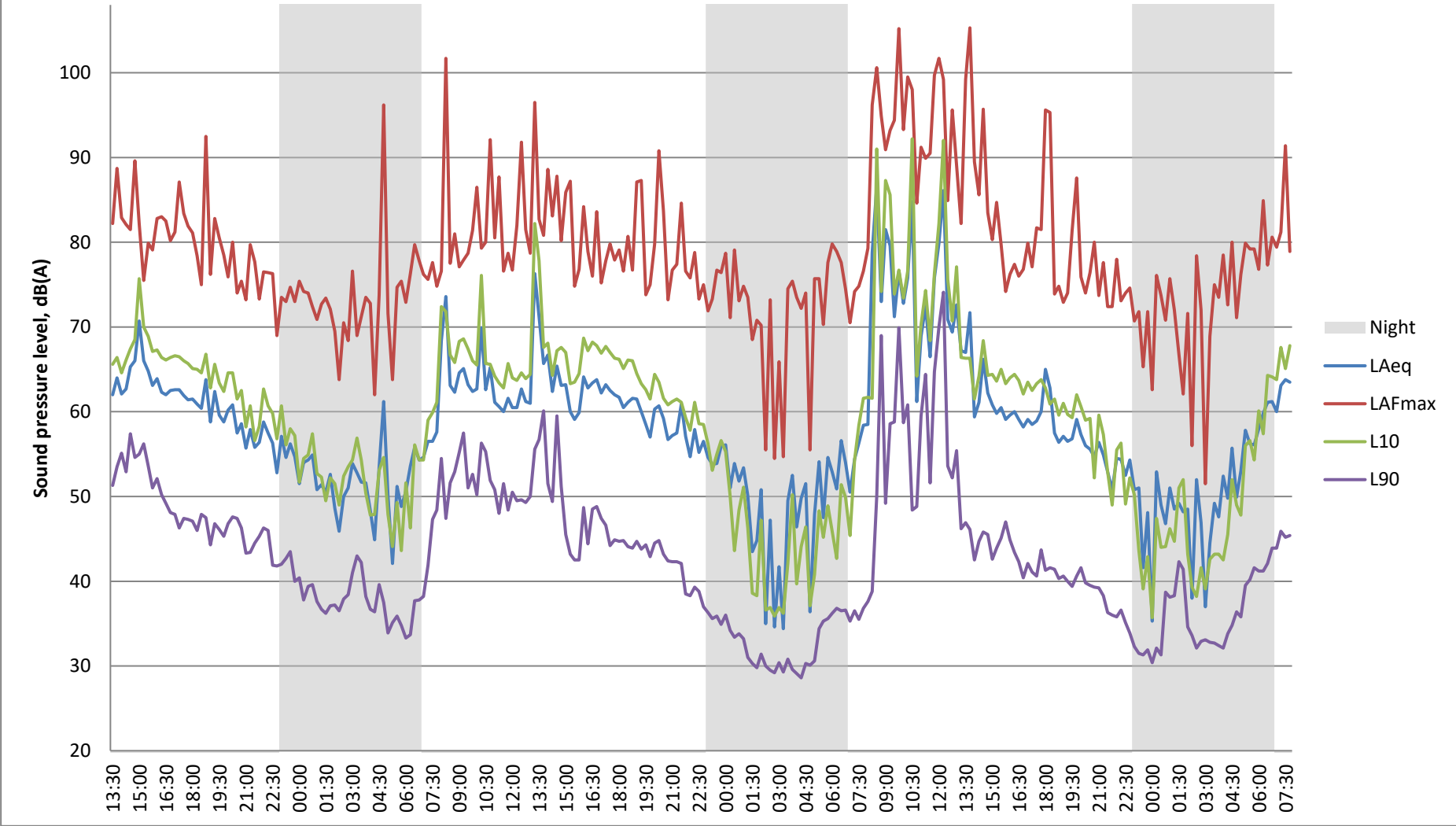
- C.6 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

¹³ extrium.co.uk

Environmental noise survey

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977 / 36190	24/09/2024	1509891-1
Condenser microphone	GRAS 40E / 86699		
Preamplifier	Svantek SV12L / 86561		
Calibrator	Svantek SV33B / 73430	25/09/2025	1513494-1

Broad Street, Leek Friday 31 Oct - Monday 03 Nov 2025



Receptor R2

Collection point

Receptor R1

Drive-through lane

Order intercom

Google Earth

30 m

N

RECEPTOR R1

Activity	Source noise levels	Distance correction		Screening correction (dB)	No. of events	Total SEL at receptor (dB)	Resultant Sound Pressure Level, dB L _{Aeq, 1hr}
	dB L _{AE} (at 10m)	Distance to receiver (m)	Correction (dB)				
Drive-Through							
Closest Vehicle Pass-Through	55	5	6	0	36	77	41
Order Point Speaker	64	35	-11	-5	36	64	28
Collection Point Speaker	64	22	-7	-5	36	68	32
Car park							
Closest Vehicle Pass-Through	55	12	-2	0	36	69	33
Door slam	57	12	-2	0	72	74	38
Combined sound pressure level, dB L _{Aeq, 1hr}							44
Nominal reduction through partially-opened window							-15
Sound pressure level inside receptor, dB L _{Aeq, 1hr}							29

L_{Amax} sound levels

Activity	Source noise levels	Distance correction		Screening correction (dB)	Resultant Sound Pressure Level, dB L _{AFmax}
	dB L _{AF,max} (at 10m)	Distance to receiver (m)	Correction (dB)		
Drive-Through					
Closest Vehicle Pass-Through	53	5	6	0	59
Order Point Speaker	71	35	-11	-5	55
Collection Point Speaker	71	22	-7	-5	59
Car park					
Closest Vehicle Pass-Through	53	12	-2	0	51
Door slam	57	12	-2	0	55
Highest L_{AF,max} at receptor					59
Nominal reduction through partially-opened window					-15
Highest L_{AF,max} within worst-affected bedroom					44

Daytime (13.00 to 14.00 hours Saturday)

Activity	Source noise levels	Distance correction		Screening correction (dB)	No. of events	Total SEL at receptor (dB)	Resultant Sound Pressure Level, dB L _{Aeq, 1hr}
	dB L _{AE} (at 10m)	Distance to receiver (m)	Correction (dB)				
Drive-Through							
Closest Vehicle Pass-Through	55	22	-7	-6	36	58	22
Order Point Speaker	64	36	-11	-6	36	62	27
Collection Point Speaker	64	25	-8	-6	36	66	30
Car park							
Closest Vehicle Pass-by	55	45	-13	-6	36	51	16
Door slam	57	45	-13	-6	72	57	21
Combined sound pressure level, dB L _{Aeq, 1hr}							33
Nominal reduction through partially-opened window							-15
Sound pressure level inside receptor, dB L _{Aeq, 1hr}							18

L_{Amax} sound levels

Activity	Source noise levels	Distance correction		Screening correction (dB)	Resultant Sound Pressure Level, dB L _{AFmax}
	dB L _{AF,max} (at 10m)	Distance to receiver (m)	Correction (dB)		
Drive-Through					
Closest Vehicle Pass-Through	53	22	-7	-6	40
Order Point Speaker	71	36	-11	-6	54
Collection Point Speaker	71	25	-8	-6	57
Car park					
Closest Vehicle Pass-by	53	45	-13	-6	34
Door slam	57	45	-13	-6	38
Highest L_{AF,max} at receptor					57
Nominal reduction through partially-opened window					-15
Highest L_{AF,max} within worst-affected bedroom					42

Night-time (06.00 to 07.00 hours)

Activity	Source noise levels	Distance correction		Screening correction (dB)	No. of events	Total SEL at receptor (dB)	Resultant Sound Pressure Level, dB L _{Aeq, 1hr}
	dB L _{AE} (at 10m)	Distance to receiver (m)	Correction (dB)				
Drive-Through							
Closest Vehicle Pass-Through	55	5	6	0	0	-	-
Order Point Speaker	64	35	-11	-5	0	-	-
Collection Point Speaker	64	22	-7	-5	0	-	-
Car park							
Closest Vehicle Pass-by	55	12	-2	0	7	62	26
Door slam	57	12	-2	0	14	67	31
Combined sound pressure level, dB L _{Aeq, 1hr}							33
Nominal reduction through partially-opened window							-15
Sound pressure level inside receptor, dB L _{Aeq, 1hr}							18

R1 Night-time $L_{\max}$ sound levels

Activity	Source noise levels	Distance correction		Screening correction (dB)	Resultant Sound Pressure Level, dB $L_{AF\max}$
	dB $L_{AF,\max}$ (at 10m)	Distance to receiver (m)	Correction (dB)		
Car park					
Closest Vehicle Pass-by	53	12	-2	0	51
Door slam	57	12	-2	0	55
Highest $L_{AF,\max}$ at receptor					55
Nominal reduction through partially-opened window					-15
Highest $L_{AF,\max}$ within worst-affected bedroom					40

Night-time (06.00 to 07.00 hours)

Activity	Source noise levels	Distance correction		Screening correction (dB)	No. of events	Total SEL at receptor (dB)	Resultant Sound Pressure Level, dB L _{Aeq, 1hr}
	dB L _{AE} (at 10m)	Distance to receiver (m)	Correction (dB)				
Drive-Through							
Closest Vehicle Pass-Through	55	22	-7	-6	0	-	-
Order Point Speaker	64	36	-11	-6	0	-	-
Collection Point Speaker	64	25	-8	-6	0	-	-
Car park							
Closest Vehicle Pass-by	55	45	-13	-6	7	44	9
Door slam	57	45	-13	-6	14	49	14
Combined sound pressure level, dB L _{Aeq, 1hr}							15
Nominal reduction through partially-opened window							-15
Sound pressure level inside receptor, dB L _{Aeq, 1hr}							0

R2 Night-time $L_{\max}$ sound levels

Activity	Source noise levels	Distance correction		Screening correction (dB)	Resultant Sound Pressure Level, dB $L_{AF\max}$
	dB $L_{AF,\max}$ (at 10m)	Distance to receiver (m)	Correction (dB)		
Car park					
Closest Vehicle Pass-by	53	45	-13	-6	34
Door slam	57	45	-13	-6	38
Highest $L_{AF,\max}$ at receptor					38
Nominal reduction through partially-opened window					-15
Highest $L_{AF,\max}$ within worst-affected bedroom					23