Burger King
Park Road South
Havant
PO9 1ER

Noise Assessment of Proposed Extension to Operating Hours

On behalf of

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1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned to undertake a noise assessment relating to a proposed extension of operating hours for the existing Burger King Drive-Thru site in Havant.

1.2. This report presents the results of an environmental noise survey, the applicable polices and guidance, and a noise impact assessment to support a planning application.

1.3. To assist with the understanding of this report a brief glossary of acoustic terms can be found in **Appendix A**. A more in-depth glossary of acoustic terms can be assessed at the following web address http://www.acoustic-glossary.co.uk/.

2.0 Details of development proposals

2.1. The existing Burger King site is located on the west side of Park Road South, just to the north of the junction with Solent Road.

2.2. Vehicles enter and depart the car park and drive-thru from an access road to the north of the Burger King building. The car park is located to the north and the restaurant plant area located on the roof of the building.

2.3. The drive-thru intercom is located towards the east of the restaurant building, with the serving window along the west elevation.

2.4. **Appendix B** contains an aerial photograph showing the site and surrounding area.

2.5. It is understood that Burger King has been granted a 24-hour licence to operate, however, existing Planning Condition 15 restricts operating hours as follows:

> *The premises hereby permitted shall not open to the public before 0600 hours or remain so open after 2400 hours.*

2.6. It is proposed to extend restaurant operating hours to 05.00 – 24.00 hours daily, with 24-hour use of the drive thru. A noise assessment is required to support the planning application to vary Condition 15.

3.0 Nearest noise sensitive receptors

3.1. The area surrounding the site is mixed residential and commercial in use. The most affected noise sensitive properties, identified as Receptor R1, are the flats in South Park Court, at the junction of Bulbeck Road and Park Road South:

3.2. **Appendix B** indicates the locations of the nearest receptors.

4.0 Noise policy

Noise Policy Statement for England

4.1. The Noise Policy Statement for England (NPSE[1]), 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."*

4.2. 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.

4.3. 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."*

4.4. Importantly, the NPSE goes on to state that: "This does not mean that such adverse effects cannot occur."

4.5. 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."*

4.6. 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.

[1] Noise Policy Statement for England, Defra, March 2010

National Planning Policy Framework

4.7. A new edition of NPPF was published in December 2024 and came into effect immediately. The original National Planning Policy Framework (NPPF[2]) 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 2023 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2024 edition.

4.8. 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 or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability."*

4.9. 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 …

4.10. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE[3]).

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

4.12. 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".*

[2] National Planning Policy Framework, DCLG, March 2012

[3] Noise Policy Statement for England, DEFRA, March 2010

4.13. 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"*.

Planning Practice Guidance – Noise

4.14. An updated Planning Practice Guidance (PPG[4]) 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.

4.15. 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').

4.16. 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.

4.17. The LOAEL is described in PPG[5] 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"*.

4.18. 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."*

[4] Planning Practice Guidance – Noise, https://www.gov.uk/guidance/noise--2, 22 July 2019
[5] Paragraph: 005 Reference ID: 30-005-20190722

4.19. 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 PPG[6] 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."*

4.20. The relevant guidance in the PPG in relation to the adverse effect levels is summarized below:

Table 1 PPG Noise effects table

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
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

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

Response	Examples of Outcomes	Increasing Effect Level	Action
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

4.21. The Planning Practice Guidance[7] 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."*

4.22. In addition, the Guide notes that it may also be relevant to consider[8]:

> *"... 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".*

[7] Paragraph: 010 Reference ID: 30-010-20190722
[8] Paragraph: 006 Reference ID: 30-006-20190722

Local Policy

4.23. The NPPF is very clear in that local authorities must update their local plans (one year from publication of the NPPF) and that if the local plan contains policies which do not closely align with the aims of the NPPF, then a decision must be made based on an assessment which shows compliance with the NPPF. Therefore, it is of paramount importance that local authorities have updated local plans which closely align with the aims in the NPPF.

5.0 Acoustic Standards and Guidance

Havant Borough Council

5.1. A review of planning approvals granted for similar plant installations indicates that Havant Borough Council typically grant approval with a Condition requiring noise from fixed plant not to exceed the daytime and night-time background noise levels when assessed at any residential premises in accordance with BS 4142:2014+A1:2019.

BS 4142:2014 + A1:2019 Methods for Rating and Measuring Industrial and Commercial Sound

5.2. BS 4142:2014+A1:2019 describes a method 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 premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

5.3. Therefore, for the first time in the UK, noise associated with store deliveries (i.e. sound from loading and unloading of goods) has a recognised and approved assessment methodology as this type of noise was not included in the scope of previous versions of BS 4142.

5.4. The industrial or commercial sound is assessed outside a dwelling or premises used for residential purposes, upon which sound is incident.

5.5. The procedure contained in BS 4142:2014 + A1:2019 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.

5.6. 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.

5.7. 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."

5.8. 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."

5.9. The background sound level should be established in terms of the L_{A90} noise index. The standard states that the background sound level should be measured over a period of sufficient length to obtain a representative value. This should not normally be less than 15-minute intervals. The standard states that: "A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

5.10. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) 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.

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."

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."

5.11. 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."

5.12. BS 4142:2014 + A1:2019 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.

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

5.13. 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 (1999[9]).

5.14. The guideline noise levels for dwellings are shown in Table 2 below:

Table 2 BS 8233:2014 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 $L_{Aeq,8h}$

6.0 Existing noise climate

6.1. An environmental noise survey was undertaken to establish the typical environmental sound levels at the nearest noise sensitive receptors.

6.2. The results of the environmental sound survey are summarised in Table 3 below. The full set of measurement results and details of the survey methodology are presented in **Appendix C**.

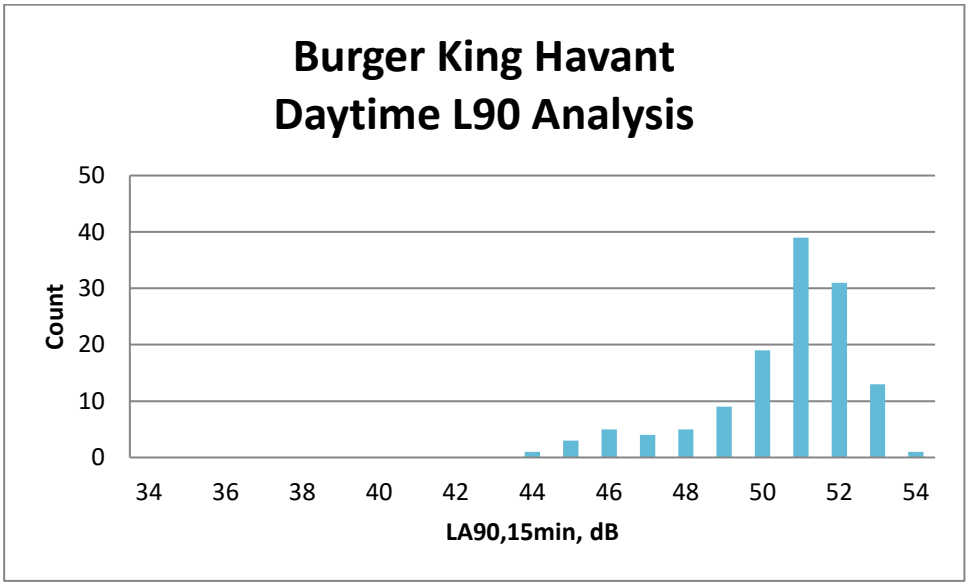
[9] World Health Organisation Guidelines for Community Noise, 1999

Table 3 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 hours)	53-68	69-93	57-72	44-54
Night-time (23.00 – 07.00 hours)	42-61	62-88	42-63	35-52

Background sound levels

Figure 1 Histogram of daytime L_{A90} background sound pressure levels



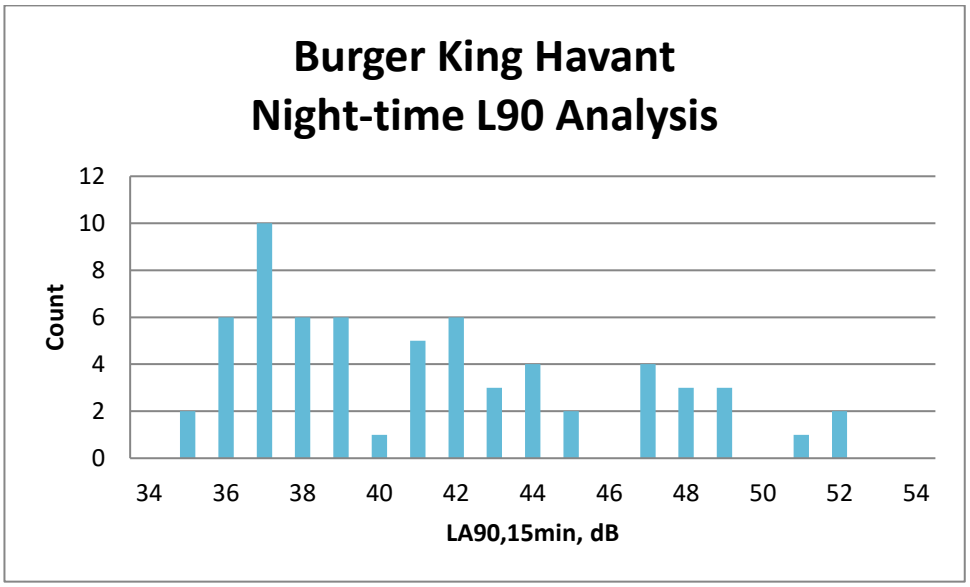
6.3. Additional statistical analysis has been undertaken. As shown in Table 4, the mean, median, and modal values have been calculated:

Table 4 Statistical analysis of $L_{A90,15min}$ levels during the daytime period

dB, L_{A90} daytime period	
Mean	50
Mode	51
Median	51

6.4. From reviewing the above histogram, 48dB has been selected to be robustly representative of the background sound level in the area.

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



6.5. Additional statistical analysis has been undertaken. As shown in Table 5, the mean, median, and modal values have been calculated:

Table 5 Statistical analysis of $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} night-time period	
Mean	41
Mode	37
Median	41

6.6. From reviewing the above histogram, 37dB has been selected to be robustly representative of the night-time background sound level in this area.

6.7. Therefore, the following values are considered as representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 48dB L_{A90} during the daytime period;
- 37dB L_{A90} during the night-time period.

7.0 Plant noise impact

Existing plant details

7.1. Existing plant comprises a kitchen extract fan along with a combined air handling and air conditioning unit, located at roof level.

7.2. There is a condenser plant area located along the south elevation of the building. This comprises two refrigeration units.

7.3. Currently the plant operates between 08.00 and 00.00 hours. Only the two refrigeration units currently operate outside of these hours.

7.4. As part of the proposals to extend operating hours, all proposed plant may potentially operate 24 hours a day.

Proposed noise criteria

7.5. To meet the criteria outlined in Paragraph 5.1, noise from fixed plant should not exceed the following limits:

Table 6 Proposed plant noise emissions level limits at noise sensitive residential receptors

Period	Cumulative plant rating level, dB $L_{Ar,Tr}$
Daytime (07.00 – 23.00 hours)	48
Night-time (23.00 – 07.00 hours)	37

Plant noise survey

7.6. Noise Solutions Ltd attended site between 22.00 and 23.00 hours on Thursday 3rd April 2025 to measure noise emissions from the existing plant.

7.7. It was noted that plant noise levels were comparatively low when compared to prevailing environmental noise. Plant tended towards inaudibility at the residential boundaries. Therefore, it was necessary to measure noise levels closer to the plant and then extrapolate for distance to determine levels at the nearest receptors.

7.8. Measurements were taken of the following scenarios:

- All plant off.
- Roof plant in isolation
- 2No. refrigeration units in isolation.

7.9. 'On' measurements were taken with the equipment operating at maximum design duty.

7.10. Readings were undertaken over short durations (30 seconds) to minimise the influence of extraneous sources (e.g., car pass-bys, passing aircraft, etc.).

7.11. Both broadband and one-third octave band frequency data was measured. The measured L_{A90} noise measurements have been used in this assessment since noise from the plant was constant during operation and, again, this minimises influence from extraneous sources.

7.12. Details of the noise monitoring equipment used during the survey are detailed in the following table.

Table 7 Details of noise monitoring equipment

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977D / 99071	11/05/2023	Factory conformation certificate
Condenser microphone	Microtech MK255 / 25430		
Preamplifier	Svantek SV12L / 129686		
Calibrator	Svantek SV 33B / 83850	01/11/2024	1510142-1

7.13. Weather conditions were still with a temperature of 12°C. Road surfaces in the surrounding area were dry and no rain fell in the surveyed period. Weather conditions were unlikely to have affected the results of the plant noise survey.

7.14. The results of the plant noise measurements, inclusive of extrapolations for distance to determine noise levels at the nearest Receptor R1, are detailed in **Appendix D**.

Plant assessment – current operating hours

7.15. Table 8 assesses the existing plant over the current operating window. The daytime assessment assumes all plant operates simultaneously. The night-time assessment assumes only the refrigeration equipment operates.

7.16. None of the existing plant was observed to exhibit any tonal or impulsive characteristics. All plant is inverter driven and, therefore, gently ramps up and down depending on the demands on the various systems. However, a penalty of 3dB as described in BS 4142:2014 has been applied for the possible presence of "*...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...*". This penalty has not been applied to the kitchen extract system as noise emissions from this plant item were noted to be inaudible at all locations within the site boundary.

Table 8 Assessment of existing plant over current operating hours

Period	Cumulative plant noise level, dBA	Representative background noise level, LA90 (dB)	Difference (dBA)
Daytime (07.00 - 23.00 hours)	32	48	-16
Night-time (23.00 - 07.00 hours)	24	37	-13

7.17. The above assessment demonstrates that noise from the existing plant under current operating conditions does not exceed the representative background noise level and therefore meets the Council's typical criteria outside the nearest receptor.

Plant assessment – proposed operating hours

7.18. The following table assesses predicted plant noise levels based on all plant operating 24 hours a day.

Table 9 Assessment of existing plant over proposed operating hours (mitigated)

Period	Cumulative plant noise level, dBA	Representative background noise level, LA90 (dB)	Difference (dBA)
Daytime (07.00 - 23.00 hours)	32	48	-16
Night-time (23.00 - 07.00 hours)	32	37	-5

7.19. The assessment demonstrates that noise from the plant will not exceed the representative background noise level. Plant noise levels can be considered to be of 'low impact' in accordance with BS 4142:2014 methodology.

7.20. Noise from fixed plant when operating over the proposed extended operating window should, therefore, be acceptable to the local authority.

Context and uncertainties

7.21. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment is undertaken at the nearest residential windows. The impact on all other receptors benefitting from increased distance and screening losses will be lower.

- The assessment is based on the equipment running at maximum duty. The plant will not run in this manner at all times (for example, when demands for heating/cooling are lower) and, therefore, this is a robust assessment.

7.22. Where possible uncertainty in the above assessments has been minimised by taking the following steps:

- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method.

8.0 Drive-Thru

8.1. The assessment of noise from cars and customers, and associated activities, is outside the scope of BS 4142:2014 + A1:2014. It is therefore proposed to assess noise from the driver-thru lane by comparison of the specific noise with the ambient noise, and determining the resulting increase in sound level, if applicable.

8.2. The sound pressure levels associated with vehicle movements and the use of a drive-thru intercom system have been measured previously at similar premises (note – the intercom system on site was not working during NSL's evening attendance on 3rd April 2025). 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.

8.3. The input data is typical of a standard vehicle and is shown in Table 10 below.

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

Noise Source	SEL, dB(A)	L_{Afmax}, dB(A)
Vehicle Pass-by	55	53
Vehicle engine	59	59
Intercom Speaker	67	60

8.4. The information contained in Table 10 was used to 'build-up' a source noise level based on the number of activity events over the required assessment period using the following equation:

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

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.

8.5. It has been robustly assumed that four customers will use the drive-thru during any one fifteen-minute period at night. The cumulative drive-thru noise levels at the most affected noise sensitive receptor have been predicted based on these predicted flows and taking into consideration distance attenuation and directivity corrections.

8.6. The resultant sound pressure levels are summarised in Table 11. Full calculations are given in **Appendix E**.

Table 11 Predicted drive-thru noise levels during worst-case 15-minute period at night.

Receptor	Predicted sound pressure levels at receptor	
	$L_{Aeq,15mins}$ dB	L_{Amax}
R1	31	34 - 45

8.7. The activities considered fall outside the scope of BS 4142:2014 + A1:2019 and no other Standards are strictly applicable. It is therefore appropriate to assess the likely noise impact using the effects table in PPG Noise, reproduced as Table 1 in this report, and IEMA guidance[10], by considering the increase in existing ambient sound levels resulting from extended drive-thru operations. To ensure a worst-case assessment, the predicted levels are assessed against the lowest $L_{Aeq(15mins)}$ recorded during the environmental noise survey. The results are shown in Table 12.

Table 12 Noise impact assessment – drive-thru activity

	Receptor
	R1
Existing lowest recorded ambient sound level, dB $L_{Aeq,15mins}$	42
Predicted worst case drive-thru sound level, dB $L_{Aeq,15mins}$	31
Cumulative level, dB $L_{Aeq,15mins}$	42
Increase in ambient sound level, dB $L_{Aeq,15mins}$	0
Assessment	
PPG Noise	Below NOAEL
IEMA[11]	Negligible

[10] Institute of Environmental Management and Assessment *Guidelines for Environmental Noise Impact Assessment*, version 1.2 (November 2014)

[11] Likely effects based on Table 7-14, *Impact from the change in sound levels (Source HS2 Phase 1 Environmental Statement*

8.8. It can be seen that noise from the use of the drive-thru lane and associated order and collection points will be significantly below the existing ambient sound level at all times.

8.9. As detailed in BS 8233:2014, a partially open window can be assumed to provide approximately 15dB overall noise reduction from external to internal. Assuming open windows for natural ventilation, internal noise levels resulting from drive-thru activity are predicted to be 16dBA inside Receptor R1. These levels are significantly below the guidance on desirable internal noise levels given in BS 8233:2014 and detailed in Table 2.

Discussion

8.10. Notwithstanding the above analysis which demonstrates that the potential 24hr use of the drive-thru would have negligible impact on nearby noise sensitive properties, it is understood that there is anecdotal evidence to suggest the intercom speaker is audible at distances of around 60m from the site, near to residences.

8.11. It is recommended that, in the first instance, the operation of the intercom speaker be checked to ensure that noise levels produced are not excessively high, particularly late at night. Any volume controls should be set as low as possible while still remaining audible at the order point.

8.12. It is also noted that a noise source does not have to be inaudible at a receptor for the PPG and IEMA guidance used in the above assessment to show a negligible impact.

9.0 Car parking

9.1. The assessment of noise from cars and customers, and associated activities, is outside the scope of BS 4142:2014 + A1:2014. It is therefore proposed to assess noise from the car park by comparison of the specific noise with the ambient noise, and determining the resulting increase in sound level, if applicable.

9.2. The sound pressure levels associated with vehicle movements 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.

9.3. The input data is typical of a standard vehicle and is shown in Table 10 below.

Table 13 Reference noise data for vehicle movement (at 10m)

Noise Source	SEL, dB(A)
Vehicle Pass-by	55
Door slam	57
People talking	52

9.4. The information contained in Table 13 was used to 'build-up' a source noise level based on the equation detailed in Paragraph 8.4.

9.5. It has been assumed that three customers will use the car park during any one fifteen-minute period at night, with one of the four users of the drive-thru leaving site. The cumulative car park noise levels at the most affected noise sensitive receptors have been predicted based on these predicted flows and taking into consideration distance attenuation and directivity corrections.

9.6. The resultant sound pressure levels are summarised in Table 14. Full calculations are given in **Appendix F**.

Table 14 Predicted car park noise levels during worst-case 15-minute period at night.

Receptor	Predicted sound pressure levels at receptor
	$L_{Aeq,15mins}$ dB
R1	27

9.7. The activities considered fall outside the scope of BS 4142:2014 + A1:2019 and no other Standards are strictly applicable. It is therefore appropriate to assess the likely noise impact using the effects table in PPG Noise, reproduced as Table 1 in this report, and IEMA guidance[12], by considering the increase in existing ambient sound levels resulting from extended drive-thru operations. To ensure a worst case assessment, the predicted levels are assessed against the lowest $L_{Aeq(15mins)}$ recorded during the environmental noise survey. The results are shown in Table 15.

Table 15 Noise impact assessment – car park activity

	Receptor
	R1
Existing lowest recorded ambient sound level, dB $L_{Aeq,15mins}$	42
Predicted worst case car park sound level, dB $L_{Aeq,15mins}$	27
Cumulative level, dB $L_{Aeq,15mins}$	42
Increase in ambient sound level, dB $L_{Aeq,15mins}$	0
Assessment	
PPG Noise	Below NOAEL
IEMA[13]	Negligible

9.8. It can be seen that noise from the use of the car park and associated order and collection points

[12] Institute of Environmental Management and Assessment *Guidelines for Environmental Noise Impact Assessment*, version 1.2 (November 2014)

[13] Likely effects based on Table 7-14, *Impact from the change in sound levels (Source HS2 Phase 1 Environmental Statement*

will be significantly below the existing ambient sound level at all times.

9.9. As detailed in BS 8233:2014, a partially open window can be assumed to provide approximately 15dB overall noise reduction from external to internal. Assuming open windows for natural ventilation, internal noise levels resulting from car park activity are predicted to be 12dBA inside Receptor R1. These levels are significantly below the guidance on desirable internal noise levels given in BS 8233:2014 and detailed in Table 2.

10.0 Summary

10.1. Noise Solutions Ltd (NSL) has been commissioned to undertake a noise assessment relating to a proposed extension of operating hours for the existing Burger King Drive-Thru site in Havant.

10.2. It is understood that Burger King has been granted a 24-hour licence to operate, however, existing Planning Condition 15 restricts operating hours as follows:

> *The premises hereby permitted shall not open to the public before 0600 hours or remain so open after 2400 hours.*

10.3. It is proposed to extend restaurant operating hours to 05.00 – 24.00 hours daily, with 24-hour use of the drive thru. A noise assessment is required to support the planning application to vary Condition 15.

10.4. An environmental noise survey has been undertaken at a location representative of the nearest noise sensitive receptors in order to determine existing noise levels affecting the site.

10.5. A plant noise survey has been undertaken to determine existing plant noise emissions. An assessment has been undertaken to determine the impact of the existing equipment operating 24 hours a day. The assessment has determined that noise levels will meet Havant Borough Council's usual emissions criteria and will be of 'low impact' in accordance with BS 4142:2014, with no specific mitigation measures required.

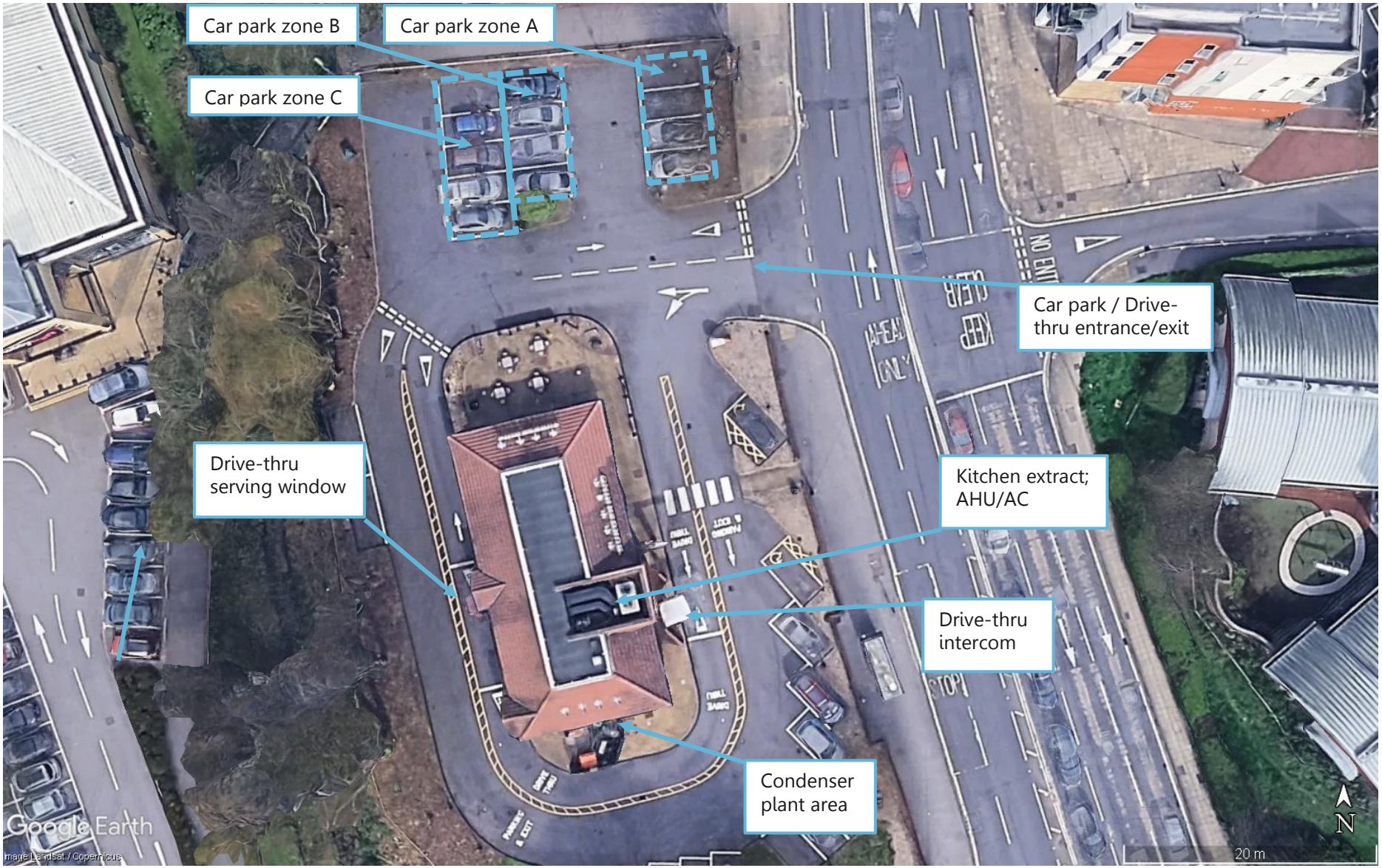
10.6. Noise from drive-thru and car parking activity has been predicted at the nearest receptors during the night-time period. The likely noise impact has been assessed using the effects table in PPG Noise and been determined to be below the NOAEL. The noise impact has also been determined to be 'negligible' based on IEMA guidance.

10.7. Given the results of the assessments, noise should not be grounds to refuse planning permission for the extension of opening hours.

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 s1 and s2 is given by 20 $\log_{10}$ (s1/s2). 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 20µPa. 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 Photograph of site showing areas of interest


Car park zone B
Car park zone A
Car park zone C
Car park / Drive-thru entrance/exit
Drive-thru serving window
Kitchen extract; AHU/AC
Drive-thru intercom
Condenser plant area
Google Earth
20 m
N

Appendix C Environmental sound survey

Details of environmental sound survey

C.1 Measurements of the existing environmental sound levels were undertaken between 13.15 hours on Wednesday 2nd April and 13.45 hours on Friday 4th April 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 lamp post on the south side of Bulbeck Road (location indicated on the site plan in Appendix B). This location is approximately representative of the levels of road traffic noise at the closest elevation of the nearest houses to the site. The microphone was positioned approximately 3m above ground level and removed from any reflecting surfaces.

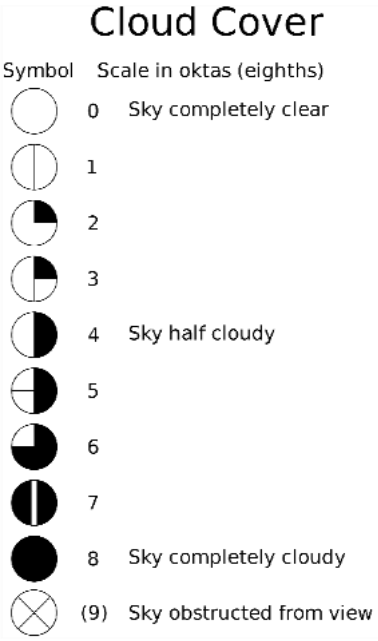
C.4 In accordance with BS 7445-2:21991 *'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were undertaken under free-field conditions.

Equipment

C.5 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 in the calibration level was noted.

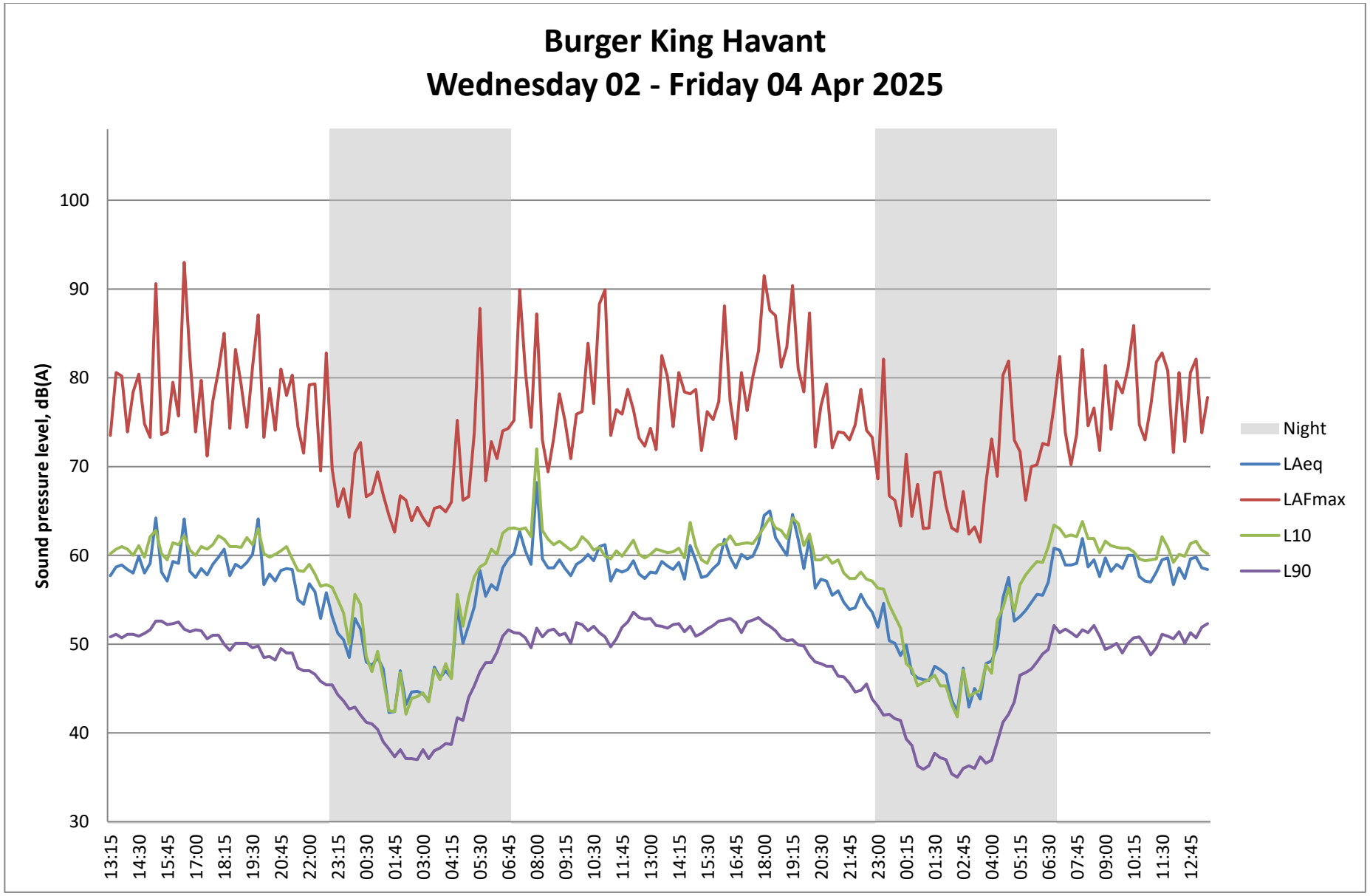
Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977D / 99070	29/01/2025	1510560-1
Condenser microphone	Microtech MK255 / 30579		
Preamplifier	Svantek SV12L / 163321		
Calibrator	Rion NC-74 / 35094453	03/09/2024	1509491-1

C.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the installation and removal of the meter.

Weather Conditions				
Measurement Location	**Time/Date**	**Description**	**Beginning of Survey**	**End of Survey**
As indicated on Appendix B	13.15 2/4/25 - 13.45 4/4/25	Temperature (°C)	15	20
		Precipitation:	No	No
		Cloud cover (oktas – see guide)	1	0
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	No
		Wind Speed (m/s)	3	3
		Wind Direction	ENE	E
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

C.7 The results of the survey are considered to be representative of the environmental sound levels in the area. During installation and removal of the meter, the noise climate at the survey location was affected by distant and local road traffic. The results of the survey are presented in a time history graph overleaf.


Burger King Havant
Wednesday 02 - Friday 04 Apr 2025
Sound pressure level, dB(A)
100
90
80
70
60
50
40
30
13:15
14:30
15:45
17:00
18:15
19:30
20:45
22:00
23:15
00:30
01:45
03:00
04:15
05:30
06:45
08:00
09:15
10:30
11:45
13:00
14:15
15:30
16:45
18:00
19:15
20:30
21:45
23:00
00:15
01:30
02:45
04:00
05:15
06:30
07:45
09:00
10:15
11:30
12:45
Night
LAeq
LAFmax
L10
L90

Appendix D Plant noise assessment

Plant item	Measurement distance, m	Ambient, L_{90} dBA	Residual , L_{90} dBA	Specific, L_{90} dBA	Distance correction		Screening (dBA)	Feature correction (dBA)	Resultant (dBA)
					Distance, m	Correction, dBA			
Ventilation plant	10	51	52	<42	50	-14	0	3	31
Refrigeration plant	2	61	49	60	60	-30	-10	3	24
Cumulative, all plant on									**32**
Cumulative, refrigeration plant only (out of hours)									**24**

**Where there was no measurable change in noise level with the plant switched on/off, it is assumed that the specific plant noise level is no louder than 10dBA below the measured residual level. No feature corrections have been applied since the plant was inaudible.*

Appendix E Drive-thru noise assessment

Receptor R1

Activity	Source noise levels		Distance correction		Screening correction (dB)	No. of events	Total SEL at receptor (dB)	Specific noise levels	
	dB L_{AE} (at 10m)	dB L_{AFmax} (at 10m)	Distance to receiver (m)	Correction (dB)				LAeq (15-mins)	LAmax
Vehicle Pass-by (in)	55	53	29	-9	0	4	52	22	44
Vehicle idling (ordering point)	59	59	49	-14	0	4	51	22	45
Drive through speaker (ordering)	67	60	49	-14	0	4	59	30	46
Vehicle idling (collection point)	59	59	58	-15	-10	4	40	10	34
							Cumulative	**31**	**34 - 45**
							Sound reduction for open window	-15	-15
							Resultant internal level	**16**	**19 - 30**

Appendix F Car park noise assessment

								R1 - South Park Court to north east			
Actvity	Measurement Data				No. Events / 15-mins	Normalised at 10m	LAeq,15mins @ 10m	Receptor Distance, m	Distance correction, dB	Screening, dB	Resultant at R1
	LAeq,T	Dist (m)	Time (s)	SEL		SEL, 10m					
ZONE A (4 spaces)	**Spaces:**	**4**									
Car Passby	75	1	1	75	1	55	25	28	-9	0	17
Door slam	77	1	1	77	2	57	30	28	-9	0	22
People talking	60	1	15	72	2	52	25	28	-9	0	17
ZONE B (4 spaces)	**Spaces:**	**4**									
Car Passby	75	1	1	75	1	55	25	25	-8	0	17
Door slam	77	1	1	77	2	57	30	40	-12	0	18
People talking	60	1	15	72	2	52	25	40	-12	0	13
Zone C (5 spaces)	**Spaces:**	**5**									
Car Passby	75	1	1	75	1	55	25	28	-9	0	17
Door slam	77	1	1	77	2	57	30	45	-13	0	17
People talking	60	1	15	72	2	52	25	45	-13	0	12
										$L_{Aeq,15mins}$	**27**