

Land at Prince Albert

Copthorne Bank,
Crawley,
RH10 3QX

Planning Noise Assessment Report: Convenience Store

On behalf of



Project Reference: 92722 | Revision: 2 | Date: 15th November 2024
Revised 13th March 2026

Document Information

Project Name : Prince Albert, Copthorne Bank, Crawley
Project Reference : 92722
Report Title : Planning Noise Assessment – Convenience Store
Doc Reference : 92722/PNA-C
Date : 15th November 2024

	Name	Qualifications	Initials	Date
Prepared by:	Dafydd Davies	BSc(Hons)	DD	15 th November 2024
Reviewed and approved by:	Jon Stump	BSc(Hons), MIOA	JS	19 th November 2024
For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved
01	11 Mar 2026	Updated proposals	NAC	DMB
02	13 Mar 2026	Typographical errors corrected	NAC	JS

Noise Solutions Ltd (NSL) disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and NSL (Noise Solutions Ltd) accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Noise Solutions Ltd (NSL) 2026

Reg no. 3483481 Head office: Unit 5 Oriel Court, Omega Park, Alton, Hampshire, GU34 2YT
Manchester office: The Old Shippon, Moseley Hall Farm, Chelford Road, Knutsford, WA16 8RB

Contents

1.0	Introduction.....	1
2.0	Details of development proposals	1
	Proposed deliveries.....	1
	Proposed Car park.....	2
3.0	Nearest noise sensitive receptors.....	2
4.0	Noise policy	2
5.0	Acoustic Standards and Guidance	7
6.0	Assessment Methodology	10
	Environmental Noise Survey.....	10
7.0	Retail store delivery noise assessment	11
	Sound pressure levels of activities associated with store deliveries.....	11
	Predicted impact.....	12
	BS 4142:2014 delivery noise assessment	13
	BS 8233:2014 and WHO delivery noise assessment	14
	L _{Aeq} assessment.....	14
8.0	Noise impact of car park.....	14
	Opening hours	14
	Predicted impact of opening hours	15
9.0	Discussion of results.....	16
	Deliveries.....	16
	Noise from customers using car park	17
10.0	Summary	17

Appendices

Appendix A	Acoustic terminology
Appendix B	Photograph and images of site showing areas of interest
Appendix C	Environmental sound survey
Appendix D	Delivery noise impact calculations
Appendix E	Car park activity noise assessment

Executive summary

Noise Solutions Ltd (NSL) has been commissioned to undertake an assessment of the likely noise impact of the use of the proposed car parks, and deliveries to a proposed convenience store at land adjacent to the Prince Albert public house, on the corner of Copthorne Bank and Brookhill Road in Crawley.

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

The assessment of noise from deliveries shows there may be short-term, adverse impacts, although it must be noted that deliveries are unlikely to be made early in the morning or late into the evening, and no more than two main warehouse deliveries will be made in any day.

The assessment of noise from use of the customer car park shows that the internal noise levels within the proposed adjacent dwellings will be below the level at which lowest adverse effects may be observed.

Based on the findings of this assessment, noise should not be grounds for refusal of planning permission for the proposed development.

1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned to undertake assessments of the potential for noise impacts from the use of the proposed convenience store and altered car parking at a site on the corner of Copthorne Bank and Brookhill Road in Crawley.
- 1.2. This report presents the results of an environmental noise survey, the applicable policies 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. It is proposed to redevelop part of the land at the existing Prince Albert public house on the corner of Copthorne Bank and Brookhill Road.
- 2.2. The development proposals considered within this report are the construction of a new convenience store and alterations to the existing car park. The assessment includes the potential for noise impacts on occupants of existing and future houses due to deliveries to the store and the use of the car park.
- 2.3. Plans of the development are shown in **Appendix B**.

Proposed deliveries

- 2.4. For stores of this type, main warehouse deliveries are typically made by vehicles no bigger than 10.35m rigid lorries. Each delivery will take no longer than one hour to complete, the deliveries would not be within the same hour, and no overlap would occur. Typically, deliveries are assumed to be made three times a week, between 07.00 and 23.00 hours, with fresh and frozen deliveries made six times a week (usually between 07.00 and 13.00 hours). It must be noted, however, that deliveries between 07.30 – 09.30 hours and 15.30 – 18.00 hours are generally avoided.
- 2.5. Smaller deliveries will be made via third party suppliers (bread, sandwiches, newspapers, etc.); however, the vehicles and loads associated with these deliveries are not anticipated to result in any significant noise impact, since they are smaller vehicles and metal roll cages are not used.
- 2.6. Deliveries to the store will be made to the delivery bay at the front of the store, near the northwest corner of the store building, with vehicles arriving in forward gear into the delivery bay near the access door to the internal storage area. The delivery vehicles will leave the delivery

bay in reverse gear towards the disabled bay on the east side of the site, and then leave the site in forward gear via the exit to the north onto Copthorne Bank.

Proposed car park

- 2.7. There will be a total of 23 car parking spaces on site, including four allocated to Blue Badge holders. Access is from a reconfigured entrance on Copthorne Bank.

3.0 Nearest noise sensitive receptors

- 3.1. The houses most-affected by noise from deliveries will be the proposed new houses (Receptor R1) to the west of the convenience store.
- 3.2. The dwelling most-affected by noise from car parking and associated activities will be the flat above the shops at 4/6 Copthorne Bank (Receptor R2).
- 3.3. **Appendix B** contains an aerial photograph showing the site and surrounding area.

4.0 Noise policy

Noise Policy Statement for England

- 4.1. The Noise Policy Statement for England (NPSE¹), 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.

¹ Noise Policy Statement for England, Defra, March 2010

- 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.

National Planning Policy Framework

- 4.7. A new edition of NPPF was published in December 2024 and came into effect immediately, with corrections issued in February 2025. The original National Planning Policy Framework (NPPF²) 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/February 2025 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the February 2025 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, air, 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 ...*

² National Planning Policy Framework, DCLG, March 2012

- 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 (NPSE³).
- 4.11. 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."*
- 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".*
- 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 (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.
- 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').

³ Noise Policy Statement for England, DEFRA, March 2010

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

- 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 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"*.
- 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."*
- 4.19. 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 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."*
- 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	Observed Adverse Effect	Mitigate and reduce to a minimum

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

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

Response	Examples of Outcomes	Increasing Effect Level	Action
	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.		
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 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

4.22. 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”.

5.0 Acoustic Standards and Guidance

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

5.1. 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). These guideline noise levels 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 $L_{Aeq,8h}$

5.2. 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.”* While the current edition of the standard gives no specific guidance on internal night-time L_{Amax} sound levels, the previous edition¹⁰ recommended that:

For a reasonable standard in bedrooms at night, individual noise events (measured with F time-weighting) should not normally exceed 45 dB L_{Amax} .

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

⁹ World Health Organisation Guidelines for Community Noise, 1999

¹⁰ BS 8233:1999 Sound insulation and noise reduction for buildings – Code of practice

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

- 5.3. BS 4142:2014+A1:2019¹¹ 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.
- 5.4. 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.
- 5.5. The industrial or commercial sound is assessed outside a dwelling or premises used for residential purposes, upon which sound is incident.
- 5.6. The procedure contained in BS 4142 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.
- 5.7. 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.
- 5.8. 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.”

¹¹ For the purposes of brevity, references in this report to “BS 4142:2014” or “BS 4142” should be read as BS 4142:2014 + A1:2019

- 5.9. 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."
- 5.10. 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."
- 5.11. 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."*
- 5.12. 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."*

- 5.13. BS 4142 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 Assessment Methodology

Environmental Noise Survey

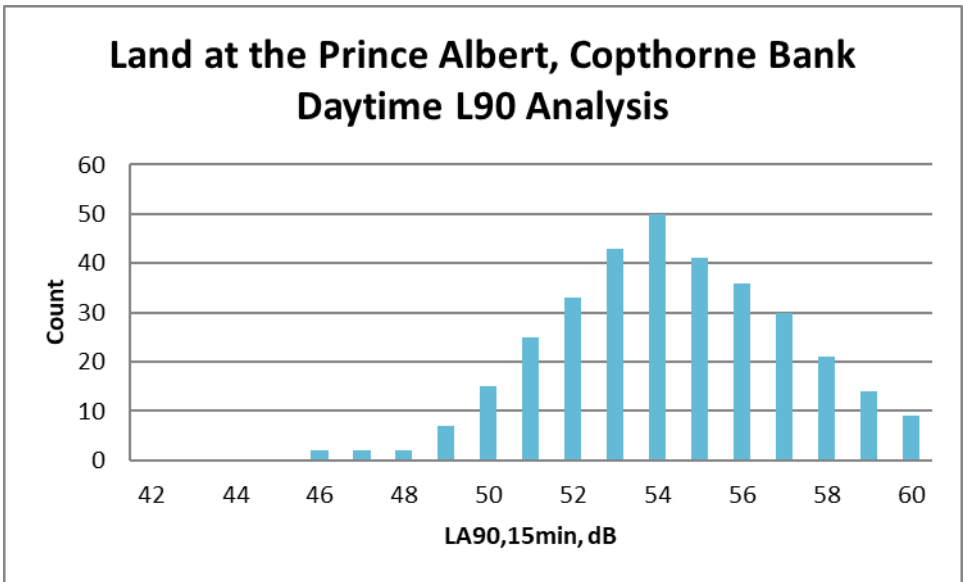
- 6.1. An unattended environmental sound pressure level survey was undertaken between Wednesday 23rd October and Monday 28th October 2024.
- 6.2. The survey was undertaken in order to establish the typical incident environmental noise levels at the proposed residential development.
- 6.3. Full details of the survey are provided in [Appendix C](#) alongside time history graphs of the measurement results.
- 6.4. The relevant results of the survey have been summarised in Table 3.

Table 3 Summary of survey results

Survey Location	Measurement period	Range of recorded sound pressure levels (dB)			
		L _{Aeq} (15mins)	L _{Amax} (15mins)	L _{A10} (15mins)	L _{A90} (15mins)
West (roadside)	Daytime (07.00 – 23.00 hours)	55-71	73-99	58-71	46-62
	Night-time (23.00 – 07.00 hours)	48-65	59-89	47-69	43-56

- 6.5. Noise levels at the west of the site were observed to be due to traffic on Brookhill Road

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

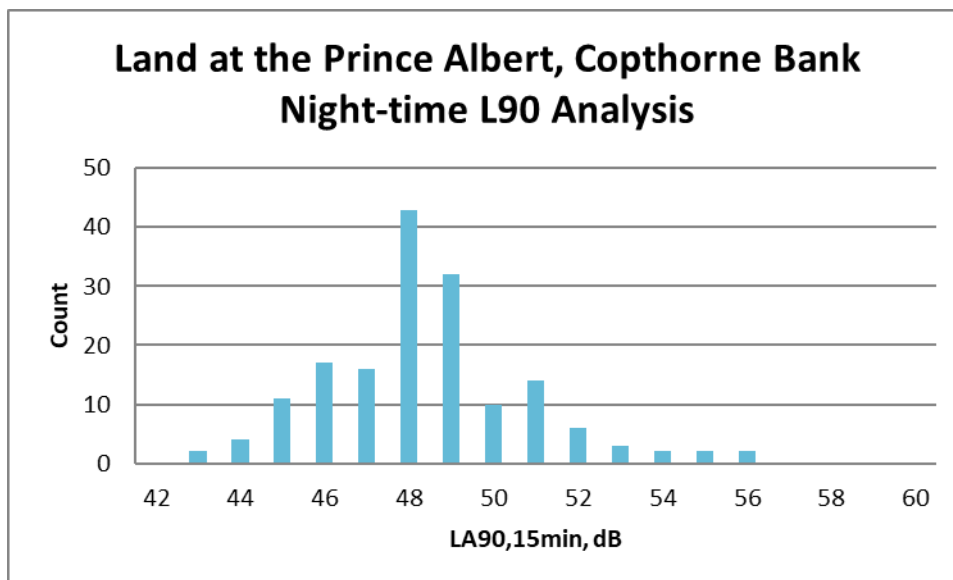


- 6.6. Further statistical analysis has been undertaken on the data, and the mean, mode and median values are shown in Table 4 below.

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

dB, L_{A90} daytime period	
mean	54
modal	54
median	54

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



- 6.7. Further statistical analysis has been undertaken on the data and the mean, mode and median values are shown in Table 5 below.

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

dB, L_{A90} night-time period	
mean	48
modal	48
median	48

- 6.8. The following values are considered robustly representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 48dB L_{A90} during the daytime period.
- 43dB L_{A90} during the night-time period.

7.0 Retail store delivery noise assessment

Sound pressure levels of activities associated with store deliveries

- 7.1. The sound pressure levels associated with refrigerated lorry deliveries were established by measurement of a delivery at a similar convenience store in operation. The measurements

included all aspects of the delivery including, but not limited to, the arrival, unloading, movement of cages and the departure of the lorry. The sound pressure levels were normalised to a distance of 10m from the delivery area and have been converted to Sound Exposure Levels (SEL) for ease of comparison/calculation. Typical L_{Amax} levels were also established.

- 7.2. It should be noted that the example delivery represented a standard operation; the refrigeration unit was switched off as standard.
- 7.3. Table 6 below details typical source noise levels, used within the assessment, with the data presented in terms of SEL and maximum individual noise event levels (L_{Amax}).

Table 6 Reference noise data for delivery activities (at 10m)

Noise Source	SEL, dB(A)	L_{Amax} , dB(A)
Lorry arrives and manoeuvres	68	62
Lorry manoeuvring-first movement (no reversing alarms)	75	66
Unloading cages on to lift	71	74
Unloading pallets on to lift	75	73
Lift up	73	65
Lift down	71	71
Unloading cages into BoH	69	75
Lorry departure	75	68

Predicted impact

- 7.4. The information contained in Table 6 was used to model 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.

- 7.5. The delivery noise level at each of the nearest residential windows has been predicted. Full calculations are shown in [Appendix E](#) and are summarised in Table 7.

Table 7 Predicted delivery noise levels

Receptor	Predicted noise levels at window of most affected residential dwelling	
	$L_{Aeq,T}$, dB	Range of L_{Amax} (dB)
R1	50	59 - 69

BS 4142:2014 delivery noise assessment

- 7.6. Table 8 below presents the initial assessment of the likely impact at the nearest residences during the likely delivery periods, in accordance with the BS 4142:2014 methodology:

Table 8 Assessment of predicted external delivery noise levels at Receptor R1 using BS 4142:2014 during the daytime period

Results	Mon-Sun 07.00 – 23.00	Relevant Clauses of BS 4142:2014	Commentary
Background Sound level	$L_{A90} = 48\text{dB}$	8.1, 8.2	Representative typical background sound level during permitted delivery period, determined from a range of measurements
Assessment made during the daytime, so the reference interval is one hour		7.2	
Specific Sound Level	$L_{Aeq,T} = 50\text{dB}$	7.3.6	Calculations presented in Appendix D
Acoustic Feature Correction	5dB	9.2	See calculation
Rating Level	$(50+5)\text{ dB} = 55\text{dB}$		
Excess of Rating Level over background sound level	$(55-48)\text{ dB} = +7\text{dB}$		
Context	Site is on a road with local traffic, producing short periods of high noise levels.		
Assessment of impact:	Possible adverse impact		

- 7.7. The assessment indicates that, for deliveries made within the typical delivery periods as noted, the rating level is 7dB above the representative background sound level and there is therefore the possibility of an adverse noise impact.
- 7.8. However, deliveries are not likely to occur in the early morning or late evening, and there are likely to be no more than nine main depot deliveries in a week. The majority of the deliveries would be likely to be made between 07.00 and 13.00 hours.
- 7.9. The following must, therefore, also be taken into consideration when determining the potential daytime impact that may be experienced:
- The assessment is undertaken at a single residential window. The impact on all other residential windows will be lower due to distance/screening losses.

- The assessment has assumed the worst-case scenario in terms of the levels of noise produced. Providing that the trollies are well maintained, it is likely that the noise from the deliveries will be quieter than the levels predicted above.
- A robust +5dB penalty has been added to the rating level.
- The distance over which trolleys and cages will be moved is minimised by the proximity of the lorry delivery area to the back of house door. The duration of each movement will therefore be reduced to the shortest practical period.
- The number of expected deliveries by large lorries is low (i.e. typically one in the morning, one in the afternoon each day).
- It is to be appreciated that the BS 4142 assessment relates to external noise levels only. To assess internal noise levels, it would be necessary to take into account the sound attenuation provided by windows and ventilation provisions at nearby dwellings and to assess internal noise levels according to guidelines in BS 8233 and WHO.

BS 8233:2014 and WHO delivery noise assessment

- 7.10. A BS 4142:2014 assessment considers only external noise levels at the location of sensitive receptors and does not consider the attenuation offered by the building envelope and the resulting internal noise level.

L_{Aeq} assessment

- 7.11. The sound attenuation offered by a building will be governed by its weakest element, acoustically speaking. This is invariably the glazing and any natural ventilation provision. With windows open for ventilation, and assuming a 15dB attenuation (as referenced in WHO) with two deliveries per day, internal noise levels of around 23dB L_{Aeq,16 hours} would be expected within the nearest residential room to the delivery area.

8.0 Noise impact of car park

Opening hours

- 8.1. Noise from vehicles in car parks, and noise from customers, falls outside the scope of BS 4142:2014 + A1:2019. 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 2 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 50dB¹² L_{Aeq}.

- 8.2. The noise from the car park will comprise the noise produced from vehicles entering and departing the car park, engines starting, car doors closing etc. The patrons of the store and public house may also converse with each other or on the phone whilst they walk back and forth from their vehicles. Other patrons who may not drive may also be present. It is unlikely that all the car park spaces will be used in the later hours. Therefore, for the purposes of the assessment, a set of reasonably worst-case assumptions will have to be made in relation to the number of vehicles which may use the car park in any, one-hour period (particularly outside the peak opening hours).
- 8.3. Table 9 below details typical source noise level used in this assessment with the data presented in terms of SEL.

Table 9 Reference noise data for assessment

Activity	Measurement Data			
	L _{Aeq,T}	Dist (m)	Time (s)	SEL (dB)
Car movement	58	3	15	70
A person talking	60	1	15	72

Predicted impact of opening hours

- 8.4. The information in Table 9 was used to calculate a source noise level based on the number of activity events over the assessment period.
- 8.5. A total of 23 car park spaces are proposed, including four dedicated for use by Blue Badge holders. An estimate of the typical number of movements to each space in a peak hour has been made and used to calculate the resultant external noise level at the receptors. As a robust assessment, it has been assumed that every parking space will be used by three vehicles in a nominal peak hour for the proposed retail store and used by one vehicle in a nominal peak hour for the existing public house.
- 8.6. The car park was divided into different zones as to better predict the noise from each zone to the receptor. The different zones are shown in **Appendix B**.
- 8.7. The calculations are included in **Appendix E** and summarised in Table 10. As described in BS 8233:2014, the typical noise reduction provided by an open window is around 15 dBA, and this has been used to predict the resulting highest internal noise levels at the receptor.

¹² 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.

Table 10 Predicted car park sound levels at receptor R2

Source	Zones	Receptor	L _{Aeq,1hr}	
			External Noise Level, dB	Internal Noise Level, dB
Retail car park*	A, B, C and D	R2	44	29
Public house car park*	E and F	R2	33	18
Combined			44	29

*Nominal allocation

- 8.8. Using the method described above, the predicted car park noise level, during the noisiest hour, is below the *Lowest Observed Adverse Effect Level* inside the proposed residential receptors, even with windows open.
- 8.9. During less-busy periods, the noise level will be lower than the levels predicted in Table 10.

9.0 Discussion of results

- 9.1. Where possible uncertainty in the above assessments has been minimised by taking the following steps:
- The measurement of the background sound levels was taken over many days including a weekend.
 - The meter and calibrator used have a traceable laboratory calibration and 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.
 - Care was taken to ensure that the measurement positions were representative of the noise climate outside the nearby residential dwellings and not in positions where higher noise levels were present.

Deliveries

- 9.2. The BS 4142 assessment indicates that noise from deliveries is of potential adverse impact, though it should be noted that main warehouse deliveries are assumed to occur no more than twice in any day and not in the early morning or late evening.
- 9.3. The BS 8233:2014 assessment for the internal noise level demonstrates that during the assumed proposed delivery window internal noise is below the LOAEL and is therefore acceptable in planning terms.

Noise from customers using car park

- 9.4. A noise impact assessment of car park noise shows that, even during the busiest periods, the resulting noise level inside the nearest noise-sensitive receptors is below the LOAEL and is therefore acceptable in planning terms.

10.0 Summary

- 10.1. Noise Solutions Ltd (NSL) has been commissioned to undertake assessments of noise from deliveries and car park activities at the proposed convenience store on land south east of the corner of Copthorne Bank and Brookhill Road.
- 10.2. This report presents the results of an environmental noise survey, the applicable policies and guidance, and a noise impact assessment to support a planning application.
- 10.3. Noise from deliveries to the proposed convenience store was assessed to determine the impact of noise on existing and proposed future residential properties. Reference delivery activity noise from a similar operating convenience store to the one proposed at this site were used in the assessment. The rating level was assessed to be 7dB above the representative background, and there is therefore the possibility of an adverse noise impact, though the number of deliveries is low and deliveries will not occur outside normal store trading hours.
- 10.4. An assessment of the noise impact of customer visits shows that noise from the car park is below the *Lowest Observed Adverse Effect* level inside the nearest noise-sensitive receptors, even during the busiest one-hour periods and with the receptor windows open.
- 10.5. Based on the findings of this assessment, noise should not be grounds for refusal of planning permission for the proposed development.

Appendix A Acoustic terminology

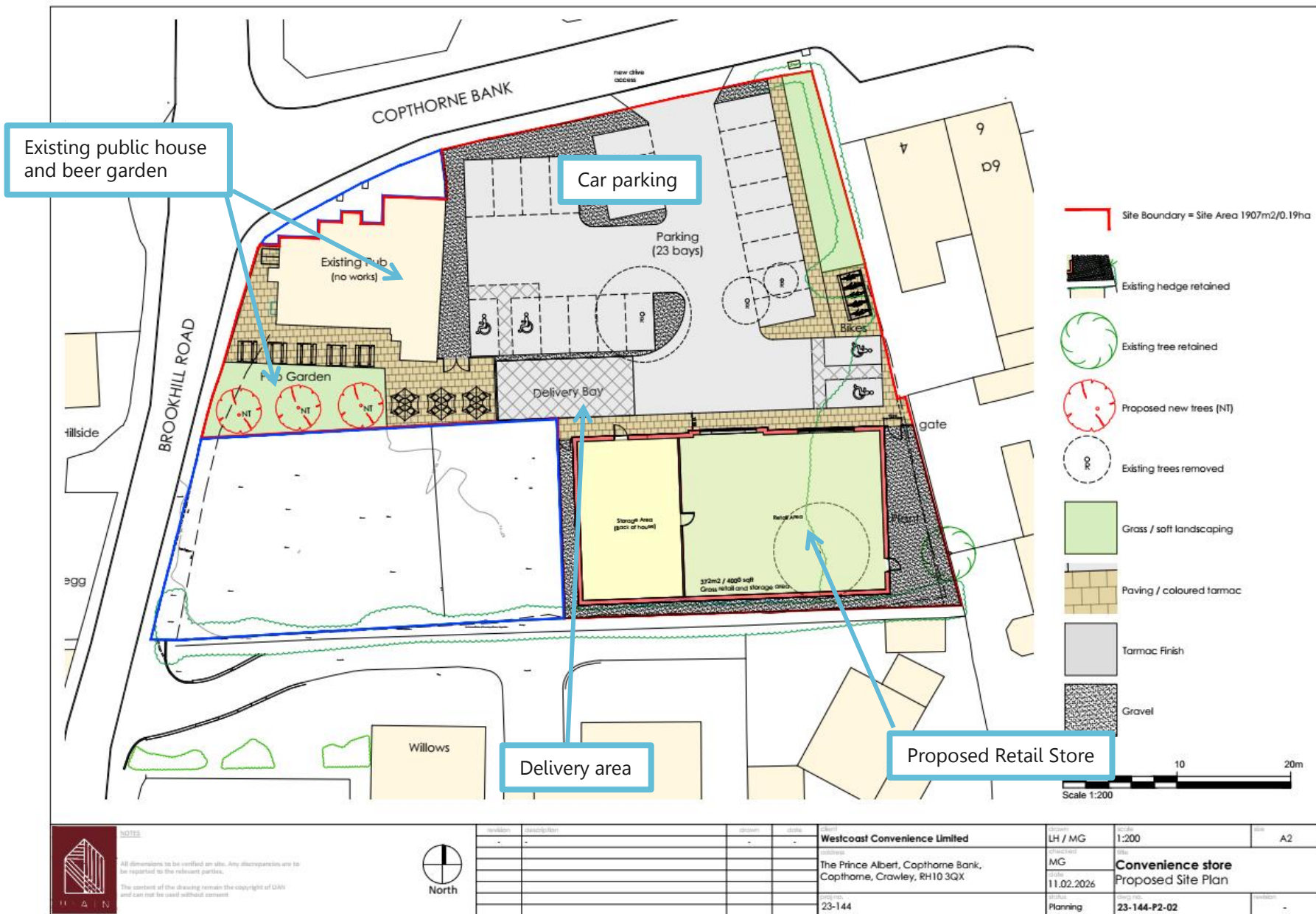
Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. 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 Photograph and images of site showing areas of interest

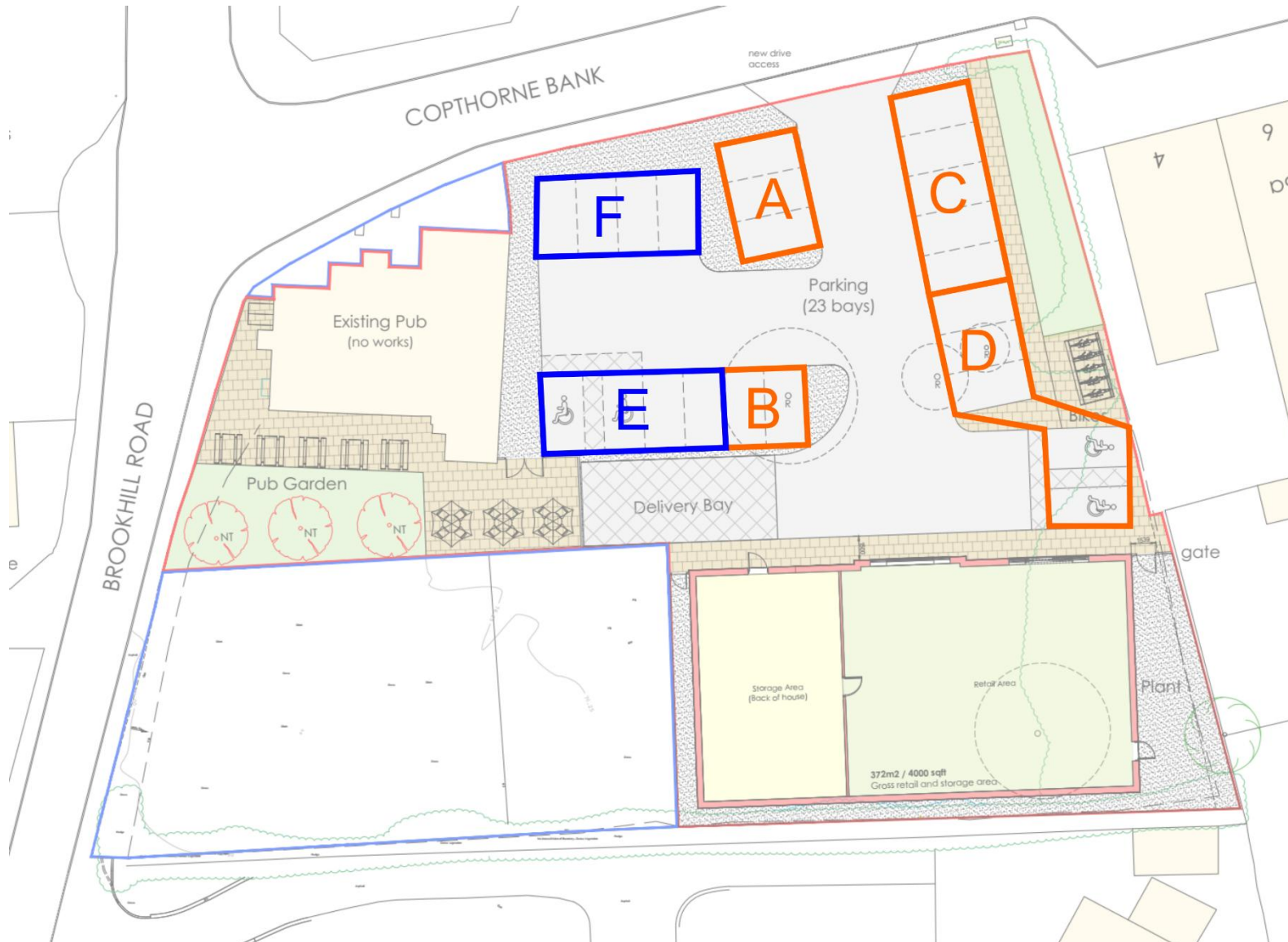


Photograph 1 Courtesy of Google Earth

Site layout, showing areas of interest



Car park layout showing (notional) zones for calculations



Appendix C Environmental sound survey

Details of environmental sound surveys

- C.1 Measurements of the existing environmental sound levels were undertaken between 12.45 hours on Wednesday 23rd October and 16.45 hours on Monday 28th October 2024.
- 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 on east side of Brookhill Road, representative of the nearest noise-sensitive property (location indicated on the site plan in [Appendix B](#)). 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.4 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.

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 971A / 124660	01/06/2023	1505421-1
Condenser microphone	ACO Pacific 7052E / 81197		
Preamplifier	Svantek SV18A / 130661		
Calibrator	Svantek SV33B / 125546	04/06/2024	1508883-1

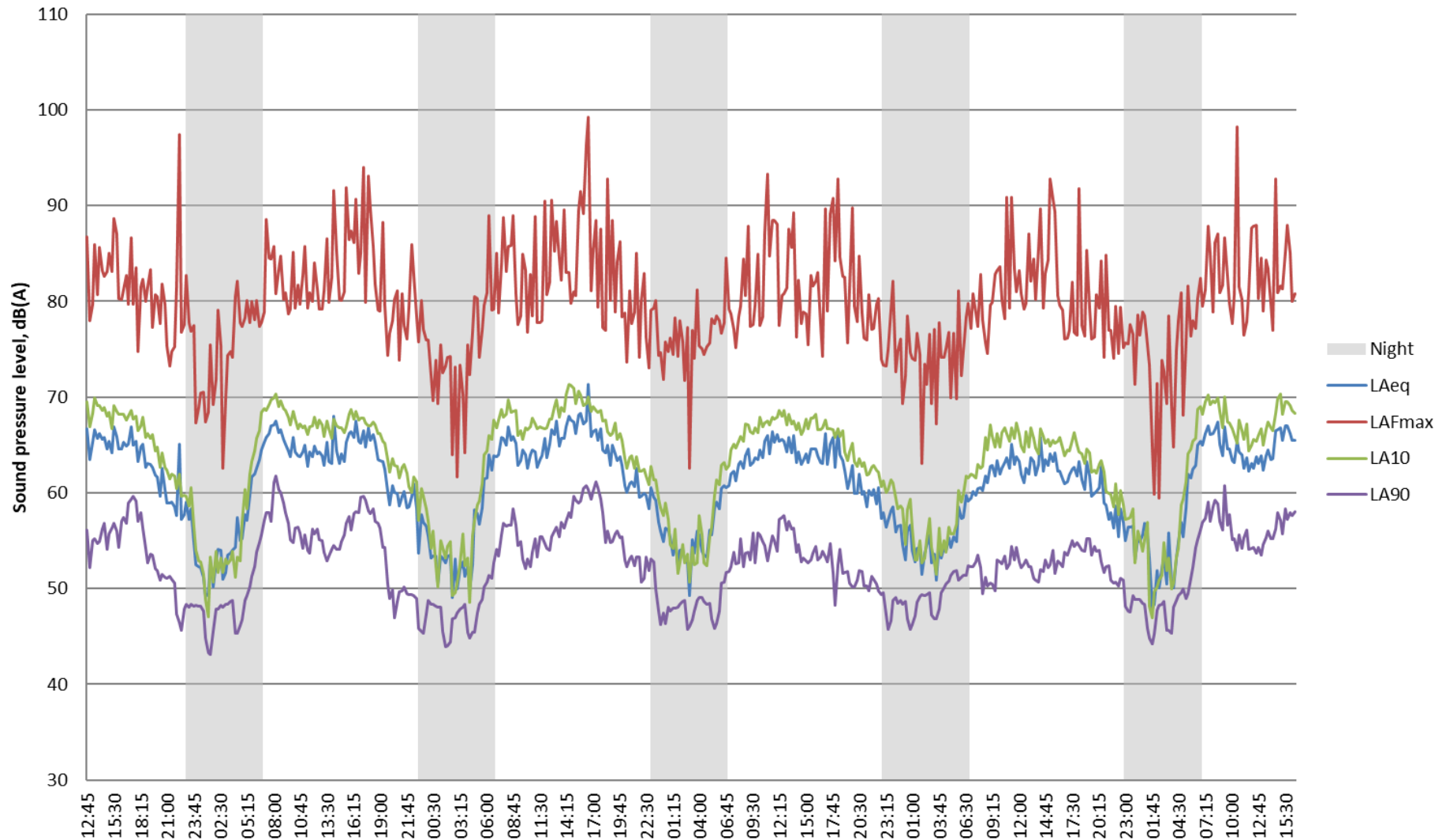
- C.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the installation and removal of the meter.

Weather Conditions				
Measurement Location	Time/Date	Description	Beginning of Survey	End of Survey
As indicated on Appendix B	12.45 23 Oct - 16.45 28 Oct 2024	Temperature (°C)	14	14
Cloud Cover Symbol Scale in oktas (eighths)  0 Sky completely clear  1  2  3  4 Sky half cloudy  5  6  7  8 Sky completely cloudy  (9) Sky obstructed from view		Precipitation:	No	Yes
		Cloud cover (oktas – see guide)	7	8
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	Yes	Yes
		Wind Speed (m/s)	0.2	1.5
		Wind Direction	S	S
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	-	-

Results

- C.6 The results of the survey are considered to be representative of the background sound pressure levels at the façades of the nearest existing and proposed residences. During installation and removal of the meter, the noise climate at the measurement position was dominated by local, with occasional lower levels of noise from plant and aircraft.
- C.7 The results of the survey are presented in a time history graph overleaf.

Land at the Prince Albert, Copthorne Bank Wednesday 23 - Monday 28 Oct 2024



Appendix D Delivery noise impact calculations

Receptor 1 – Future houses to west

Activity	Measured noise levels		Correction for no. of occurrences		Distance correction		Screening correction (dB)	Resultant SEL at receptor (dB)	Resultant L _{Amax} at receptor (dB)	BS4142 feature corr'n	SEL + feature
	SEL @ 10m	L _{Amax} @ 10m	No.	Corr'n (dB)	Distance (m)	Corr'n (dB)					
Lorry arrival	68	62	1	0	11	-1	0	67	61	0	67
Lorry manoeuvring-first movement (no reversing alarms)	75	66	1	0	11	-1	0	74	65	3*	77
Unloading cages on to lift	71	74	10	10	19	-6	0	75	68	6**	81
Unloading pallets on to lift	75	73	10	10	19	-6	0	79	67	6**	85
Lift up	73	65	10	10	19	-6	0	77	59	3*	80
Lift down	71	71	10	10	19	-6	0	75	65	3*	78
Unloading cages into BoH	78	75	10	10	19	-6	0	82	69	6**	88
Lorry departure	75	68	1	0	11	-1	0	74	67	0	74
Combined								86			91
Overall feature correction											+5
L_{Aeq} (1hour)								50			
Range of L_{Amax}									59-69		

*+3dB correction for intermittency

**+6dB for impulsivity clearly perceptible

Appendix E Car park activity noise assessment

Receptor R2 – Flat above 4/6 Copthorne Bank

Activity	Measurement Data				Normalised at 10m	No. Events / Hour	L _{Aeq} , 1hr @ 10m	Receptor dist. m	Distance corr'n, dB	Screening corr'n, dB	Resultant at R1, dB(A)
	L _{Aeq,T}	Dist. (m)	Time (s)	SEL	SEL, 10m						
ZONE A (Spaces 1-3)											
Car Pass by	58	3	15	70	60	18*	37	16	-4	0	33
People talking	60	1	15	72	52	18*	29	16	-4	0	25
ZONE B (Spaces 4-5)											
Car Pass by	58	3	15	70	60	12	35	16	-4	0	31
People talking	60	1	15	72	52	12	27	16	-4	0	23
ZONE C (Spaces 6-10)											
Car Pass by	58	3	15	70	60	30	39	9	1	0	40
People talking	60	1	15	72	52	30	31	9	1	0	32
ZONE D (Spaces 11-15)											
Car Pass by	58	3	15	70	60	30	39	9	1	0	40
People talking	60	1	15	72	52	30	31	9	1	0	32
Total											44

*3no. Spaces, each used 3 times, with each car entering and exiting the car park. 3x3x2=18 movements.

Activity	Measurement Data				Normalised at 10m	No. Events / Hour	L _{Aeq} , 1hr @ 10m	Receptor dist. m	Distance corr'n, dB	Screening corr'n, dB	Resultant at R1, dB(A)
	L _{Aeq,T}	Dist. (m)	Time (s)	SEL	SEL, 10m						
ZONE E (Spaces 16-19)											
Car Pass by	58	3	15	70	60	8*	33	16	-4	0	29
People talking	60	1	15	72	52	8*	25	16	-4	0	21
ZONE F (Spaces 20-23)											
Car Pass by	58	3	15	70	60	8	33	16	-4	0	29
People talking	60	1	15	72	52	8	25	16	-4	0	21
Total											33

**4no. Spaces, each used once in an hour, with each car entering and exiting the car park. 4x1x2=8 movements.*