



Noise Impact Assessment

The Anchor Inn, Hitchin

Reference: 50-815-R1-3

Date: January 2025



NOISE IMPACT ASSESSMENT

Erection of new convenience retail unit (Class E); minor alterations to means of access and reorganisation and extension of car park, including change of use of land from residential gardens; demolition of outbuildings to pub and minor external alterations; erection of garden pergola and structures, new patio, and external lighting; installation of new cold store and covered walkway to back of house and replacement of kitchen extraction system.

Prepared for:

Greene King Commercial Investments Limited

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EXECUTIVE SUMMARY

BACKGROUND

Site Address	The Anchor Inn, Cambridge Road, Hitchin SG4 0JH
National Grid Reference	E 519874 N 230015
Proposed Development	Erection of new convenience retail unit (Class E); minor alterations to means of access and reorganisation and extension of car park, including change of use of land from residential gardens; demolition of outbuildings to pub and minor external alterations; erection of garden pergola and structures, new patio and external lighting; installation of new cold store and covered walkway to back of house and replacement of kitchen extraction system.
Report Objectives	The objectives of this report are to: Identify, measure, and assess the potential impact of any proposed sound sources associated with the development upon existing and proposed receptors in the immediate vicinity of the Site. The report follows current and relevant British Standards to provide a robust assessment.

ASSESSMENT

Surveys Completed	An unattended background and ambient sound survey has been undertaken during a full weekday and weekend period on the southern boundary of the site representative of receptors along Cambridge Road.
Assessments	A 3D noise model has been constructed to assess potential commercial sound impact. The model has been used to predict the Rating Level at the receptors which has been compared with the typical background sound level, accounting for any acoustic characteristics associated with the sound in accordance with BS 4142:2014+A1:2019.
Mitigation Requirements	The assessment determined that the predicted rating level during the daytime periods, at existing receptors, would exceed the criterion of -5 dB. As such, a 1.8 m and 2.1 m high close boarded fence is recommended along the north western and north eastern edges of the car park.

CONCLUSIONS

This assessment has shown that no adverse impact is predicted day or night at the receptors due to commercial sound with mitigation measures in place.

As such, noise need not be a material consideration in the granting of planning permission if the recommendations of this report are followed and included within the design stage.



TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
Background	2
Assessment.....	2
Conclusions	2
1. INTRODUCTION	4
1.1. Background	4
1.2. Proposed Development.....	4
1.3. Limitations	4
2. ASSESSMENT METHODOLOGY	5
2.1. National Planning Practice Guidance.....	5
2.2. BS 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' 7	
3. SURVEY RESULTS.....	9
3.1. Source Noise Levels – Deliveries	9
3.2. Unattended Background and Ambient Sound Survey	9
4. NOISE IMPACT ASSESSMENT	11
4.1. Daytime Assessment	12
4.2. Night-time Assessment – 06:00-07:00	12
4.3. Night-time Assessment - Fixed Plant Only.....	13
5. MITIGATION	14
6. CONCLUSION AND RECOMMENDATIONS.....	15
APPENDIX I GLOSSARY OF ACOUSTIC TERMINOLOGY	16
APPENDIX III MEASURED SOUND PRESSURE LEVELS.....	19
APPENDIX IV.....	31
FIGURES.....	31



1. INTRODUCTION

1.1. BACKGROUND

E3P were commissioned by Greene King Commercial Investments Limited to undertake a Noise Impact Assessment for the Erection of new convenience retail unit (Class E); minor alterations to means of access and reorganisation and extension of car park, including change of use of land from residential gardens; demolition of outbuildings to pub and minor external alterations; erection of garden pergola and structures, new patio and external lighting; installation of new cold store and covered walkway to back of house and replacement of kitchen extraction system at the Anchor Inn, Hitchin, to be referred to hereafter as '*the Site*'.

This assessment looks to determine the key noise sources associated with the proposed development and to assess their impact, if any, upon existing and proposed residential receptors and to specify mitigation measures, where required.

1.2. PROPOSED DEVELOPMENT

The key sources of sound associated with the development will be heavy goods vehicle (HGV) deliveries, car park and external plant. The proposed trading hours are 07:00-23:00 Monday to Sunday.

This assessment has been undertaken in accordance with the following supplied drawings:

-  Proposed Site Plan (Drawing Number 2097-18 Rev G).

The Site Plan is shown in Figure 1 of Appendix II.

1.3. LIMITATIONS

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

E3P will endeavour to capture all existing and proposed sources of sound and vibration at the time of the surveys and/or assessments. However, should new sources of sound be introduced, existing sources modified/changed, or characteristics of the sound be altered following completion of such, E3P cannot be held accountable for this.

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



2. ASSESSMENT METHODOLOGY

2.1. NATIONAL PLANNING PRACTICE GUIDANCE

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

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

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

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

The "observed effect levels" are as follows:

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

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



TABLE 2.1 NOISE EXPOSURE HIERARCHY

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

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



These factors include the following:

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

More specific factors to consider when relevant:

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

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

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

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

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

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

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



Tonality

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

Impulsivity

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

Intermittency

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

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

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

- ✳ Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact.
- ✳ A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- ✳ A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- ✳ The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

It is common that a Local Planning Authority (LPA) will specify their own criterion and, where this is the case, this criterion will usually take precedence over a simple comparison of the rating level against the background sound level.



3. SURVEY RESULTS

The measurement positions are detailed in Figure 1 of Appendix III.

3.1. SOURCE NOISE LEVELS – DELIVERIES

To inform assessments of this and similar sites, E3P have used library source data for similar deliveries that can take place at the proposed site. The following Table details the measured levels for deliveries to be used in the assessment. This was based on a large delivery vehicle with delivery of goods via trolleys and tailgate lift.

The measured levels have been analysed in detail and corrected for façade conditions and residual noise levels, where applicable. Only close measurement distances were possible due to the restricted space at the test site. However, this distance relates to the worst-case measured levels, i.e., next to the tailgate where all rattling, motor noise and banging was noted. Operations further from this position only consisted of movements of trolleys across smooth concrete floors with little to no rattling.

TABLE 3.1 DELIVERY NOISE SOURCE LEVELS

DELIVERY	SOURCE	AVERAGE MEASURED SOUND LEVEL, $L_{Aeq,T}$ (dB)	MEASURED ON-TIME (seconds)	MEASURED DISTANCE (m)	HOURLY NOISE LEVEL, $L_{Aeq,1hr}$ (dB)	15 MINUTE NOISE LEVEL, $L_{Aeq,15mins}$ (dB)
Delivery with engine off	Reversing	64.5	16	1	36.5	42.5
	Tailgate Operation	70.4	295	0.5	57.7	63.7
	Unloading Operations	74.6	1400	0.5	69.8	75.9

For the delivery, the tailgate being retracted and the HGV leaving were included in the unloading/loading operations as it was at a low level and of very short duration.

Respective sound power levels to be used in the assessment are given in Section 4.0.

3.2. UNATTENDED BACKGROUND AND AMBIENT SOUND SURVEY

E3P has conducted an unattended Background and Ambient Sound Survey to quantify the existing levels of background and ambient sound at existing receptors in the immediate vicinity of the Site over a full weekday and weekend period. The survey was carried out over the following time period:

- 📍 12:00 Friday 21st April to 13:45 Monday 24th April 2023.

The following noise measurement position was chosen for the Background Sound Survey:

- 📍 Noise Measurement Position 1 (NMP1): Located on the southern boundary of the site within the hedgerow area bounding the car park and fenced off compound. The microphone of the sound level meter was set at a height of 1.5 m above ground level and in free-field conditions. Sound sources consisted of road traffic on the local road network and local sources.



Table 3.2 details the measured background sound levels. The daytime levels correspond to the $L_{A90,1hr}$ and the night-time levels to the $L_{A90,15mins}$.

TABLE 3.2 MEASURED BACKGROUND SOUND PRESSURE LEVELS

DATE	TIME PERIOD	RANGE OF MEASURED BACKGROUND SOUND LEVELS, $L_{A90,T}$ (dB)	MEDIAN MEASURED BACKGROUND SOUND LEVEL, $L_{A90,T}$ (dB)
Friday 21st April 2023	Daytime	43.6-48.2	45
	Night-time	28.1-46.0	38
Saturday 22nd April 2023	Daytime	42.2-48.5	46
	Night-time	30.5-43.5	37
Sunday 23rd April 2023	Daytime	40.6-49.0	48
	Night-time	23.1-49.9	32

During the survey, conditions remained dry and wind speeds rarely exceeded 5 m/s.

The equipment outlined in Table 3.3 was used for the noise survey.

TABLE 3.3 NOISE MEASUREMENT EQUIPMENT AND CALIBRATION DATES

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER & TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE AT TIME OF SURVEY
NMP1	Sound Level Meter	Cirrus CR:171A	G303884	20th September 2024
	Pre-amplifier	Cirrus MV:200F	12731F	
	Microphone	Cirrus MK:224	215899D	
	Calibrator	Cirrus CR:515	99403	20th September 2023

The sound level meter was field calibrated on site using the above-mentioned calibrator prior to and after noise measurements were taken. No significant drift was witnessed as noted above. Calibration certificates are available upon request.



4. NOISE IMPACT ASSESSMENT

For the purposes of this assessment, E3P has used noise modelling software, CadnaA 2023 MR1, to determine the impact of noise from the proposed sound sources associated with the development.

The following inputs have been included in the model:

- ✳ Proposed Site Plan Rev G.
- ✳ Ground elevations have been taken as existing by way of a 2 m grid Digital Terrain Model (DTM) which contains public sector information licensed under the Open Government License v3.0.
- ✳ Existing buildings have been included in the model and assumed to have a structured façade.
- ✳ With regards commercial/industrial sound, corrections have been applied to the inputted sound power levels to account for acoustic characteristics, as per BS 4142:2014. As such, the model output is the Rating Level, $L_{A,r}$.
- ✳ A reflection order of one has been used in all calculations.
- ✳ Ground absorption is set at 0.5.
- ✳ Noise levels generated using ISO 9613-1 and ISO 9613-2 "*Acoustics – Attenuation of sound during propagation outdoors*" as incorporated into CadnaA software.

E3P has used library source data for deliveries and have made reasonable assumptions on the car park usage. E3P have been provided with the following information from Sainsbury's Consultant as noted on drawing Refrigeration Plant Planning Layout:

- ✳ Condenser/Gas cooler – 28 dB(A) at 10 m during the daytime only.
- ✳ Retail condensing unit 1 – 52 dB(A) at 1 m.
- ✳ Retail condensing unit 2 – 52 dB(A) at 1 m.
- ✳ Cash office condensing unit 3 – 52 dB(A) at 1 m.

All of which are located in the service yard area of the site to the south of the building.

The above have been converted to sound power levels and added to the noise model using point sources.

Additionally, E3P note that the following works are to take place associated with The Anchor which may have implications in relation to noise and will be considered in the assessment:

- ✳ Replace extract fan for the kitchen with housing unit on roof adjacent to existing kitchen extract fan.
- ✳ Installation of new free-standing fridge/freezer with external condenser unit.

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



TABLE 4.1 ACOUSTIC FEATURES

ACOUSTIC FEATURE	APPLICABLE?	ATTRIBUTABLE PENALTY	COMMENT
Tonality	Yes	2 dB	New plant items are not expected to be tonal, however, just perceptible tonality is applied.
Impulsivity	No	-	It is assumed that no impulsive sounds will exist.
Intermittency	Yes	3 dB	Intermittent delivery operations at the site will be audible and noticeable to the receptors.
Other Sound Characteristics	No	-	Other penalties applied

Figures 2 to 3 determine the rating levels across the Site during the daytime and night-time periods due to commercial sound.

E3P have considered the typical BS 4142 criterion stipulated by North Hertfordshire District Council which is known to be $L_{A,r} = L_{A90,T} - 5 \text{ dB}$.

4.1. DAYTIME ASSESSMENT

Figure 2 should be used to view the daytime rating level, $L_{A,r}$, at the existing receptors. To inform a worst-case assessment, the lowest median measured background sound level has been used, specifically 45 dB.

As can be seen, the highest predicted rating level within rear gardens of existing receptors to the north and north west is 49 dB due to car park noise and sound from the condenser. This exceeds the background sound level by 4 dB.

As such, mitigation measures are required.

4.2. NIGHT-TIME ASSESSMENT – 06:00-07:00

Figure 3 should be used to view the night-time rating level, $L_{A,r}$, at the receptors. This scenario assumes plant operational and a delivery prior to store opening hours to inform a worst-case assessment. The modal measured 15-minute background sound level across the above periods has been used, specifically 42 dB.

As can be seen, the highest predicted façade rating level at existing receptors is 29 dB to the west and 29 dB for associated 1st floor windows of The Anchor, as such, the predicted rating level falls below the background sound level at all receptors by at least 10 dB.

Accordingly, no adverse impact is predicted during night-time periods were deliveries to take place at these periods.



4.3. NIGHT-TIME ASSESSMENT - FIXED PLANT ONLY

Figure 4 details the rating level at receptors with only plant operational between 23:00 and 07:00. As can be seen, the highest predicted rating level is 19 dB at receptors to the west and 29 dB at The Anchor and 20 dB for receptors to the north. Background sound levels during the night are approximately 32 dB. As such, the criterion of 5 dB below is achieved at all receptors except for The Anchor.

However, as the plant noise here is associated with the receptor, freestanding fridge/freezer condenser, this rating level is not considered significant and the difference between the background sound level and the rating level (-3 dB) is considered acceptable.

Accordingly, no adverse impact is predicted as a result of fixed plant operational noise.



5. MITIGATION

The daytime noise model and assessment determined an exceedance of the background sound level by up to 3 dB due to car park usage and condenser sound. This exceeded the LPA criterion by 8 dB.

As such, an additional grid noise map, Figure 5, has been run with a close boarded fence along the north western and north eastern boundary of the car park at a height of 1.8 m in order to achieve a rating level of up to 40 dB in the rear gardens. Additionally, a small run of a 2.1 m high fence is required along the boundary with the walk in condenser unit, highlighted on the plan.

Any proposed barriers can be of wooden fence or brick wall construction but must be free from holes, sealed at the base and have a minimum mass of 10 kg/m².



6. CONCLUSION AND RECOMMENDATIONS

E3P were commissioned to undertake a Noise Impact Assessment for a proposed convenience retail unit and associated works at the Anchor Inn, Hitchin.

An unattended background and ambient sound survey has been undertaken to the rear of the site to quantify the existing levels of background sound at receptors to the immediate north and east during a full weekday and weekend period.

A 3D noise model has been constructed to assess commercial sound impact. The model has been used to predict the rating level at the receptors which has been compared with the typical background sound level, accounting for any acoustic characteristics associated with the sound in accordance with BS 4142:2014+A1:2019.

The assessment determined that the predicted rating level during the night-time periods would fall below the background sound level at receptors to the north and west.

During the daytime, marginal exceedances were noted to the north and, as such, a 1.8 m and 2.1 m high close boarded fence has been recommended.

Considering this, it is concluded that there should be no adverse impact due to the operations of the proposed unit upon existing receptors, day, or night.

As such, noise need not be a material consideration in the granting of planning permission if the recommendations of this report are followed and included within the design stage.

END OF REPORT



APPENDIX I

GLOSSARY OF ACOUSTIC

TERMINOLOGY

NOISE

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

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should consider all these factors when assessing the significance of a noise source. The most widely used weighting mechanism that best corresponds to the response of the human ear is the "A"-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

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

TABLE A1 TYPICAL SOUND PRESSURE LEVELS

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



ACOUSTIC TERMINOLOGY

TABLE A2 TERMINOLOGY

DESCRIPTOR	EXPLANATION
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2E-05 Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e., "A" weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L_{Aeq, T}	L _{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
L_{Amax}	L _{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L _{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, 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.
L₁₀ and L₉₀	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L _n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L ₁₀ is the level exceeded for 10% of the time and as such can be regarded as the "average maximum level". Similarly, L ₉₀ is the "average minimum level" and is often used to describe the background noise. It is common practice to use the L ₁₀ index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Fast	A time weighting used in the root-mean-square section of a sound level meter with a 125-millisecond time constant.
Slow	A time weighting used in the root-mean-square section of a sound level meter with a 1000-millisecond time constant.



APPENDIX III

MEASURED SOUND PRESSURE LEVELS

TABLE A.1 HOURLY MEASURED BACKGROUND AND AMBIENT SOUND LEVELS

MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
21/04/2023 12:00	62.3	47.1
21/04/2023 13:00	50.7	45.5
21/04/2023 14:00	50.7	45.6
21/04/2023 15:00	49.0	44.5
21/04/2023 16:00	51.5	44.0
21/04/2023 17:00	50.2	43.8
21/04/2023 18:00	50.1	43.6
21/04/2023 19:00	50.6	44.2
21/04/2023 20:00	51.5	47.1
21/04/2023 21:00	52.3	47.2
21/04/2023 22:00	51.6	45.2
21/04/2023 23:00	51.1	44.1
22/04/2023 00:00	47.1	38.6
22/04/2023 01:00	48.0	35.5
22/04/2023 02:00	47.4	34.8
22/04/2023 03:00	45.0	30.1
22/04/2023 04:00	41.9	30.7
22/04/2023 05:00	52.3	39.2
22/04/2023 06:00	52.7	39.3
22/04/2023 07:00	52.1	43.5
22/04/2023 08:00	50.4	44.9
22/04/2023 09:00	50.7	46.3
22/04/2023 10:00	51.7	46.0
22/04/2023 11:00	52.1	46.3
22/04/2023 12:00	52.1	46.2
22/04/2023 13:00	51.0	46.1
22/04/2023 14:00	52.2	47.1
22/04/2023 15:00	51.1	47.0
22/04/2023 16:00	52.2	47.8
22/04/2023 17:00	54.5	48.4
22/04/2023 18:00	53.1	47.7
22/04/2023 19:00	54.3	48.4
22/04/2023 20:00	54.6	48.5



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
22/04/2023 21:00	51.3	44.6
22/04/2023 22:00	47.9	42.2
22/04/2023 23:00	46.7	41.3
23/04/2023 00:00	45.9	37.9
23/04/2023 01:00	46.2	35.7
23/04/2023 02:00	45.5	31.9
23/04/2023 03:00	43.6	31.1
23/04/2023 04:00	43.7	32.7
23/04/2023 05:00	51.0	39.8
23/04/2023 06:00	54.0	41.0
23/04/2023 07:00	52.2	42.9
23/04/2023 08:00	53.0	45.2
23/04/2023 09:00	54.3	47.6
23/04/2023 10:00	53.7	49.0
23/04/2023 11:00	52.6	48.3
23/04/2023 12:00	54.1	48.3
23/04/2023 13:00	51.0	46.3
23/04/2023 14:00	51.5	45.8
23/04/2023 15:00	53.2	47.9
23/04/2023 16:00	52.5	47.8
23/04/2023 17:00	53.0	48.5
23/04/2023 18:00	53.2	48.8
23/04/2023 19:00	53.1	48.2
23/04/2023 20:00	52.2	46.5
23/04/2023 21:00	53.5	45.7
23/04/2023 22:00	50.2	40.6
23/04/2023 23:00	45.8	32.5
24/04/2023 00:00	44.9	28.3
24/04/2023 01:00	41.0	25.4
24/04/2023 02:00	39.2	23.7
24/04/2023 03:00	42.5	26.6
24/04/2023 04:00	46.7	32.4
24/04/2023 05:00	54.6	42.6
24/04/2023 06:00	54.3	47.2



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,1hr}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
24/04/2023 07:00	54.6	49.9
24/04/2023 08:00	53.3	47.5
24/04/2023 09:00	52.6	48.5
24/04/2023 10:00	53.6	48.7
24/04/2023 11:00	52.8	48.3

TABLE A.2 15 MINUTE MEASURED BACKGROUND AND AMBIENT SOUND LEVELS

MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
21/04/2023 11:48	79.8	48.2
21/04/2023 12:00	68.1	46.6
21/04/2023 12:15	51.5	47.0
21/04/2023 12:30	50.8	47.4
21/04/2023 12:45	51.5	47.5
21/04/2023 13:00	48.4	45.8
21/04/2023 13:15	48.5	44.6
21/04/2023 13:30	52.5	45.7
21/04/2023 13:45	51.8	47.8
21/04/2023 14:00	48.4	45.0
21/04/2023 14:15	50.1	46.2
21/04/2023 14:30	49.5	46.6
21/04/2023 14:45	53.2	45.4
21/04/2023 15:00	48.2	44.5
21/04/2023 15:15	47.6	44.7
21/04/2023 15:30	51.1	44.1
21/04/2023 15:45	48.3	44.5
21/04/2023 16:00	47.9	44.4
21/04/2023 16:15	49.4	43.9
21/04/2023 16:30	47.6	43.0
21/04/2023 16:45	55.5	44.6
21/04/2023 17:00	46.1	43.0
21/04/2023 17:15	47.8	44.0
21/04/2023 17:30	48.8	43.9
21/04/2023 17:45	53.8	44.3



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
21/04/2023 18:00	49.9	44.8
21/04/2023 18:15	46.5	43.2
21/04/2023 18:30	47.8	43.3
21/04/2023 18:45	53.2	43.7
21/04/2023 19:00	52.9	44.0
21/04/2023 19:15	48.2	43.8
21/04/2023 19:30	49.7	44.2
21/04/2023 19:45	50.0	45.6
21/04/2023 20:00	49.6	45.9
21/04/2023 20:15	52.0	48.2
21/04/2023 20:30	52.1	47.6
21/04/2023 20:45	52.0	48.0
21/04/2023 21:00	51.8	47.8
21/04/2023 21:15	53.8	48.3
21/04/2023 21:30	51.7	46.9
21/04/2023 21:45	51.2	46.3
21/04/2023 22:00	52.9	47.7
21/04/2023 22:15	51.9	46.0
21/04/2023 22:30	50.2	42.9
21/04/2023 22:45	50.7	45.5
21/04/2023 23:00	52.4	46.0
21/04/2023 23:15	50.9	43.9
21/04/2023 23:30	51.0	44.0
21/04/2023 23:45	49.5	43.4
22/04/2023 00:00	47.2	41.2
22/04/2023 00:15	47.4	38.4
22/04/2023 00:30	47.3	38.6
22/04/2023 00:45	46.7	36.8
22/04/2023 01:00	48.4	39.1
22/04/2023 01:15	47.1	35.1
22/04/2023 01:30	49.4	37.8
22/04/2023 01:45	46.7	33.7
22/04/2023 02:00	47.6	35.0
22/04/2023 02:15	46.8	35.0



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
22/04/2023 02:30	45.6	33.7
22/04/2023 02:45	49.0	35.8
22/04/2023 03:00	44.8	32.2
22/04/2023 03:15	46.1	33.5
22/04/2023 03:30	46.1	28.1
22/04/2023 03:45	41.7	29.2
22/04/2023 04:00	40.1	29.8
22/04/2023 04:15	40.2	30.4
22/04/2023 04:30	42.2	30.9
22/04/2023 04:45	44.0	35.4
22/04/2023 05:00	46.2	37.4
22/04/2023 05:15	54.1	43.9
22/04/2023 05:30	54.4	39.0
22/04/2023 05:45	50.5	40.2
22/04/2023 06:00	53.6	37.7
22/04/2023 06:15	50.3	40.1
22/04/2023 06:30	51.6	39.2
22/04/2023 06:45	54.2	42.3
22/04/2023 07:00	51.3	42.0
22/04/2023 07:15	50.6	43.3
22/04/2023 07:30	53.6	44.0
22/04/2023 07:45	52.3	44.8
22/04/2023 08:00	51.1	44.2
22/04/2023 08:15	49.4	43.0
22/04/2023 08:30	50.6	45.8
22/04/2023 08:45	50.3	46.8
22/04/2023 09:00	50.4	46.6
22/04/2023 09:15	50.4	45.9
22/04/2023 09:30	51.2	46.3
22/04/2023 09:45	50.9	46.2
22/04/2023 10:00	53.9	46.7
22/04/2023 10:15	51.9	46.2
22/04/2023 10:30	49.3	45.3
22/04/2023 10:45	49.9	46.1



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
22/04/2023 11:00	52.1	44.7
22/04/2023 11:15	52.3	47.0
22/04/2023 11:30	52.8	47.6
22/04/2023 11:45	50.9	46.8
22/04/2023 12:00	49.9	45.9
22/04/2023 12:15	51.6	46.2
22/04/2023 12:30	54.3	46.4
22/04/2023 12:45	51.2	46.8
22/04/2023 13:00	51.4	47.6
22/04/2023 13:15	52.0	46.0
22/04/2023 13:30	50.4	45.6
22/04/2023 13:45	50.1	45.6
22/04/2023 14:00	52.5	46.9
22/04/2023 14:15	52.2	46.5
22/04/2023 14:30	51.6	47.4
22/04/2023 14:45	52.4	47.8
22/04/2023 15:00	51.0	47.1
22/04/2023 15:15	52.2	47.1
22/04/2023 15:30	50.6	47.6
22/04/2023 15:45	50.2	46.5
22/04/2023 16:00	51.7	47.9
22/04/2023 16:15	52.5	47.5
22/04/2023 16:30	51.7	47.5
22/04/2023 16:45	53.0	48.7
22/04/2023 17:00	55.2	48.8
22/04/2023 17:15	55.3	48.7
22/04/2023 17:30	52.7	47.8
22/04/2023 17:45	54.5	48.0
22/04/2023 18:00	52.5	47.7
22/04/2023 18:15	52.4	47.8
22/04/2023 18:30	51.4	47.2
22/04/2023 18:45	55.1	48.1
22/04/2023 19:00	55.5	48.2
22/04/2023 19:15	54.6	49.1



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
22/04/2023 19:30	52.9	47.9
22/04/2023 19:45	53.5	48.7
22/04/2023 20:00	55.0	49.2
22/04/2023 20:15	57.2	49.8
22/04/2023 20:30	52.9	48.2
22/04/2023 20:45	51.1	47.0
22/04/2023 21:00	51.1	46.5
22/04/2023 21:15	48.9	43.6
22/04/2023 21:30	54.0	45.5
22/04/2023 21:45	49.2	44.3
22/04/2023 22:00	48.9	43.7
22/04/2023 22:15	48.2	43.3
22/04/2023 22:30	46.6	41.4
22/04/2023 22:45	47.4	41.4
22/04/2023 23:00	47.0	41.6
22/04/2023 23:15	47.1	43.5
22/04/2023 23:30	45.8	40.2
22/04/2023 23:45	46.7	40.0
23/04/2023 00:00	46.7	37.6
23/04/2023 00:15	46.6	40.3
23/04/2023 00:30	44.8	37.2
23/04/2023 00:45	45.4	37.3
23/04/2023 01:00	45.7	36.8
23/04/2023 01:15	47.1	38.3
23/04/2023 01:30	46.5	35.7
23/04/2023 01:45	45.0	34.3
23/04/2023 02:00	46.1	34.4
23/04/2023 02:15	46.1	35.0
23/04/2023 02:30	44.9	30.8
23/04/2023 02:45	44.8	30.6
23/04/2023 03:00	44.2	32.5
23/04/2023 03:15	43.6	30.5
23/04/2023 03:30	44.6	31.4
23/04/2023 03:45	41.2	30.6



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
23/04/2023 04:00	44.6	32.1
23/04/2023 04:15	44.1	32.6
23/04/2023 04:30	43.1	32.9
23/04/2023 04:45	42.9	33.5
23/04/2023 05:00	48.4	38.8
23/04/2023 05:15	51.5	43.4
23/04/2023 05:30	50.8	40.3
23/04/2023 05:45	52.3	38.3
23/04/2023 06:00	54.7	40.1
23/04/2023 06:15	53.5	39.4
23/04/2023 06:30	54.2	42.7
23/04/2023 06:45	53.3	42.4
23/04/2023 07:00	53.4	43.1
23/04/2023 07:15	49.9	40.6
23/04/2023 07:30	53.1	45.0
23/04/2023 07:45	51.6	45.1
23/04/2023 08:00	50.9	45.0
23/04/2023 08:15	53.9	43.8
23/04/2023 08:30	54.2	45.9
23/04/2023 08:45	52.2	46.8
23/04/2023 09:00	51.1	46.0
23/04/2023 09:15	52.1	47.4
23/04/2023 09:30	55.6	49.3
23/04/2023 09:45	56.2	50.2
23/04/2023 10:00	54.3	50.0
23/04/2023 10:15	54.5	48.6
23/04/2023 10:30	52.7	48.6
23/04/2023 10:45	53.1	48.8
23/04/2023 11:00	52.9	48.3
23/04/2023 11:15	52.4	48.8
23/04/2023 11:30	52.6	48.2
23/04/2023 11:45	52.6	48.0
23/04/2023 12:00	53.9	48.6
23/04/2023 12:15	52.3	48.1



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
23/04/2023 12:30	56.4	48.2
23/04/2023 12:45	52.5	48.3
23/04/2023 13:00	52.3	48.3
23/04/2023 13:15	51.3	46.8
23/04/2023 13:30	50.5	46.0
23/04/2023 13:45	49.4	45.1
23/04/2023 14:00	50.5	46.6
23/04/2023 14:15	49.7	45.5
23/04/2023 14:30	50.9	45.3
23/04/2023 14:45	53.8	46.0
23/04/2023 15:00	50.3	46.0
23/04/2023 15:15	53.7	48.0
23/04/2023 15:30	54.5	49.5
23/04/2023 15:45	53.4	49.5
23/04/2023 16:00	52.5	48.2
23/04/2023 16:15	52.3	47.6
23/04/2023 16:30	51.9	47.3
23/04/2023 16:45	53.1	48.2
23/04/2023 17:00	52.3	47.9
23/04/2023 17:15	52.2	48.0
23/04/2023 17:30	54.5	49.3
23/04/2023 17:45	52.3	48.7
23/04/2023 18:00	53.1	49.1
23/04/2023 18:15	52.2	48.5
23/04/2023 18:30	53.1	49.3
23/04/2023 18:45	54.2	48.6
23/04/2023 19:00	52.8	48.0
23/04/2023 19:15	53.8	48.6
23/04/2023 19:30	53.0	48.5
23/04/2023 19:45	52.9	47.6
23/04/2023 20:00	52.3	46.5
23/04/2023 20:15	52.3	47.4
23/04/2023 20:30	51.8	46.3
23/04/2023 20:45	52.1	45.6



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
23/04/2023 21:00	52.0	45.8
23/04/2023 21:15	51.9	45.9
23/04/2023 21:30	54.1	47.4
23/04/2023 21:45	55.0	44.3
23/04/2023 22:00	50.8	44.2
23/04/2023 22:15	50.0	43.2
23/04/2023 22:30	50.8	39.8
23/04/2023 22:45	48.7	36.9
23/04/2023 23:00	45.7	32.1
23/04/2023 23:15	46.0	32.3
23/04/2023 23:30	44.9	33.4
23/04/2023 23:45	46.5	31.8
24/04/2023 00:00	46.5	32.8
24/04/2023 00:15	43.1	27.4
24/04/2023 00:30	42.6	27.1
24/04/2023 00:45	46.1	29.7
24/04/2023 01:00	42.3	24.3
24/04/2023 01:15	42.0	25.7
24/04/2023 01:30	39.3	27.8
24/04/2023 01:45	39.3	25.3
24/04/2023 02:00	41.0	26.6
24/04/2023 02:15	37.6	23.2
24/04/2023 02:30	39.1	24.8
24/04/2023 02:45	38.4	23.1
24/04/2023 03:00	42.0	26.0
24/04/2023 03:15	39.5	25.4
24/04/2023 03:30	42.6	29.5
24/04/2023 03:45	44.4	30.8
24/04/2023 04:00	43.5	31.3
24/04/2023 04:15	46.3	31.9
24/04/2023 04:30	46.1	32.1
24/04/2023 04:45	49.0	38.0
24/04/2023 05:00	56.0	41.8
24/04/2023 05:15	54.6	41.6



MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVEL, $L_{Aeq,15mins}$ (dB)	MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)
24/04/2023 05:30	55.1	43.8
24/04/2023 05:45	51.4	44.5
24/04/2023 06:00	50.8	43.7
24/04/2023 06:15	55.8	48.2
24/04/2023 06:30	54.4	48.9
24/04/2023 06:45	54.8	49.9
24/04/2023 07:00	54.5	49.8
24/04/2023 07:15	55.1	49.4
24/04/2023 07:30	54.8	50.8
24/04/2023 07:45	53.8	49.4
24/04/2023 08:00	54.0	49.1
24/04/2023 08:15	52.8	48.0
24/04/2023 08:30	51.1	46.4
24/04/2023 08:45	54.4	47.5
24/04/2023 09:00	53.2	48.9
24/04/2023 09:15	52.8	48.7
24/04/2023 09:30	52.3	48.6
24/04/2023 09:45	51.9	48.0
24/04/2023 10:00	53.3	48.4
24/04/2023 10:15	55.4	48.9
24/04/2023 10:30	52.7	49.0
24/04/2023 10:45	52.2	48.6
24/04/2023 11:00	53.5	49.7
24/04/2023 11:15	52.2	49.0
24/04/2023 11:30	52.5	47.5
24/04/2023 11:45	53.0	48.2
24/04/2023 12:00	51.5	45.8
24/04/2023 12:15	50.2	46.4
24/04/2023 12:30	51.4	47.0



APPENDIX IV

FIGURES

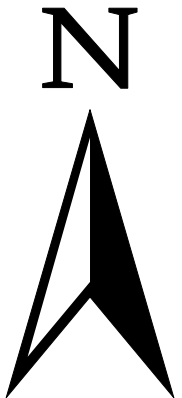
Figure 1 - Noise Survey Measurement Positions



Project:
The Anchor Inn,
Hitchin

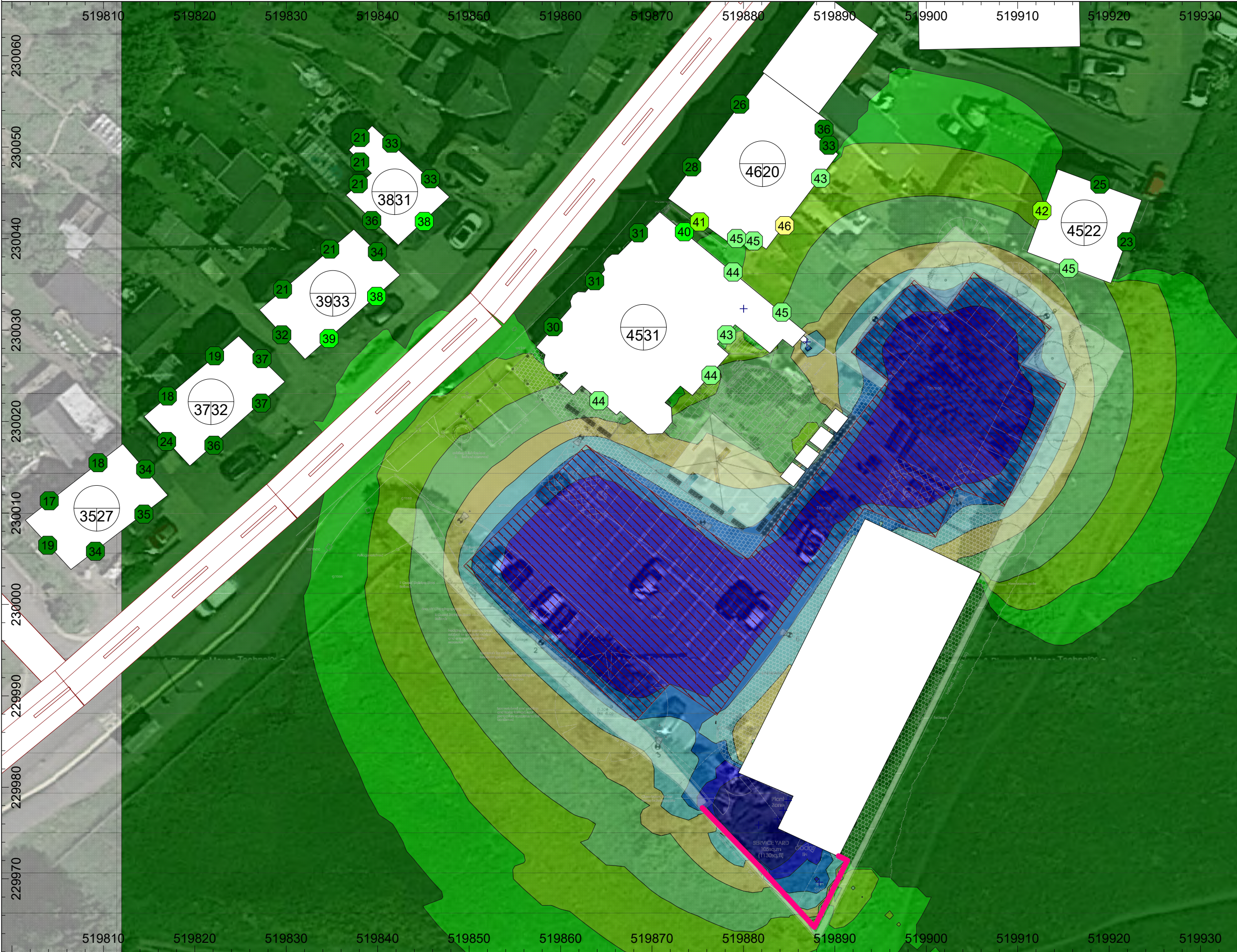
Project-No:
50-815

Client:
Greene King Commercial
Investments Limited



Project Engineer: L Faulkner
Date: 19/05/2023

Figure 2 - Daytime Grid Noise Map - Calculation at 1.5 m above ground level



Project:
The Anchor Inn,
Hitchin

Project-No:
50-815

Client:
Greene King Commercial
Investments Limited

**Rating Level,
LA,r (dB)**

...	<= 38
38 < ...	<= 40
40 < ...	<= 42
42 < ...	<= 45
45 < ...	<= 48
48 < ...	<= 50
50 < ...	<= 52
52 < ...	<= 55
55 < ...	

Noise Map Objects

- + Point Source
- ▭ Road
- ▧ Crossing
- ▨ Parking Lot
- ▭ Building
- ▭ Barrier
- ⊕ Building Evaluation
- ▭ Calculation Area

e3p

Project Engineer: L Faulkner
Date: 21/01/2025

[illegible]

Client:
Greene King Commercial
Investments Limited

...	≤ 38
38 < ...	≤ 40
40 < ...	≤ 42
42 < ...	≤ 45
45 < ...	≤ 48
48 < ...	≤ 50
50 < ...	≤ 52
52 < ...	≤ 55
55 < ...	

-  Point Source
-  Road
-  Crossing
-  Parking Lot
-  Building
-  Barrier
-  Building Evaluation
-  Calculation Area



Project Engineer: L Faulkner
Date: 21/01/2025

Figure 4 - Night-time Grid Noise Map with Fixed Plant 23:00-06:00 - Calculation at 4 m above ground level



Project:
The Anchor Inn,
Hitchin

Project-No:
50-815

Client:
Greene King Commercial
Investments Limited

**Rating Level,
LA,r (dB)**

...	<= 38
38 < ...	<= 40
40 < ...	<= 42
42 < ...	<= 45
45 < ...	<= 48
48 < ...	<= 50
50 < ...	<= 52
52 < ...	<= 55
55 < ...	

Noise Map Objects

- + Point Source
- ▭ Road
- ⊗ Crossing
- ▨ Parking Lot
- ▭ Building
- ▬ Barrier
- ⊕ Building Evaluation
- ▭ Calculation Area

Project Engineer: L Faulkner
Date: 21/01/2025