RUSCOTE AVENUE, BANBURY: SITE 3

NOISE IMPACT ASSESSMENT

VC-0050697-EN-RP-0001-R02

NOVEMBER 2021

VANGUARDIA

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R00	FIRST ISSUE	13TH SEPTEMBER 2021
R01	SECOND ISSUE FOLLOWING CLIENT REVIEW	14TH SEPTEMBER 2021
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1. INTRODUCTION

1.1. Vanguardia has been instructed to carry out a noise impact assessment to support the planning application for the proposed redevelopment of part of an existing car park on Ruscote Avenue in Banbury. The application is for Site 3, which will be submitted concurrently and is linked to two further applications, one on the existing Jacobs Douwe Egberts (JDE) car park which adjoins this site (Site 4 – Van Storage Facility) and the second for the erection of a surface car park to provide replacement employee parking for JDE site (Site 2 – Replacement Car Park Application).

1.2. A baseline noise survey was undertaken at the site in May-June 2018 in order to characterise the existing noise environment and help assess the potential impacts and effects of noise at the nearby noise-sensitive receptors. Further attended noise measurements were taken at the site in August 2019 to confirm the existing noise levels close to the receptors considered for this assessment.

1.3. This report provides a description of the site and the proposed development, discusses the relevant national and local planning policy, presents the results of the surveys and the approach to the assessment of potential noise impacts and effects from the various sources associated with the development, and details the results of the assessment together with any required mitigation measures that have been identified to comply with policy.

1.4. To assist with the understanding of this report a glossary of acoustic terms is provided in Appendix A.

2. SITE AND PROPOSED DEVELOPMENT

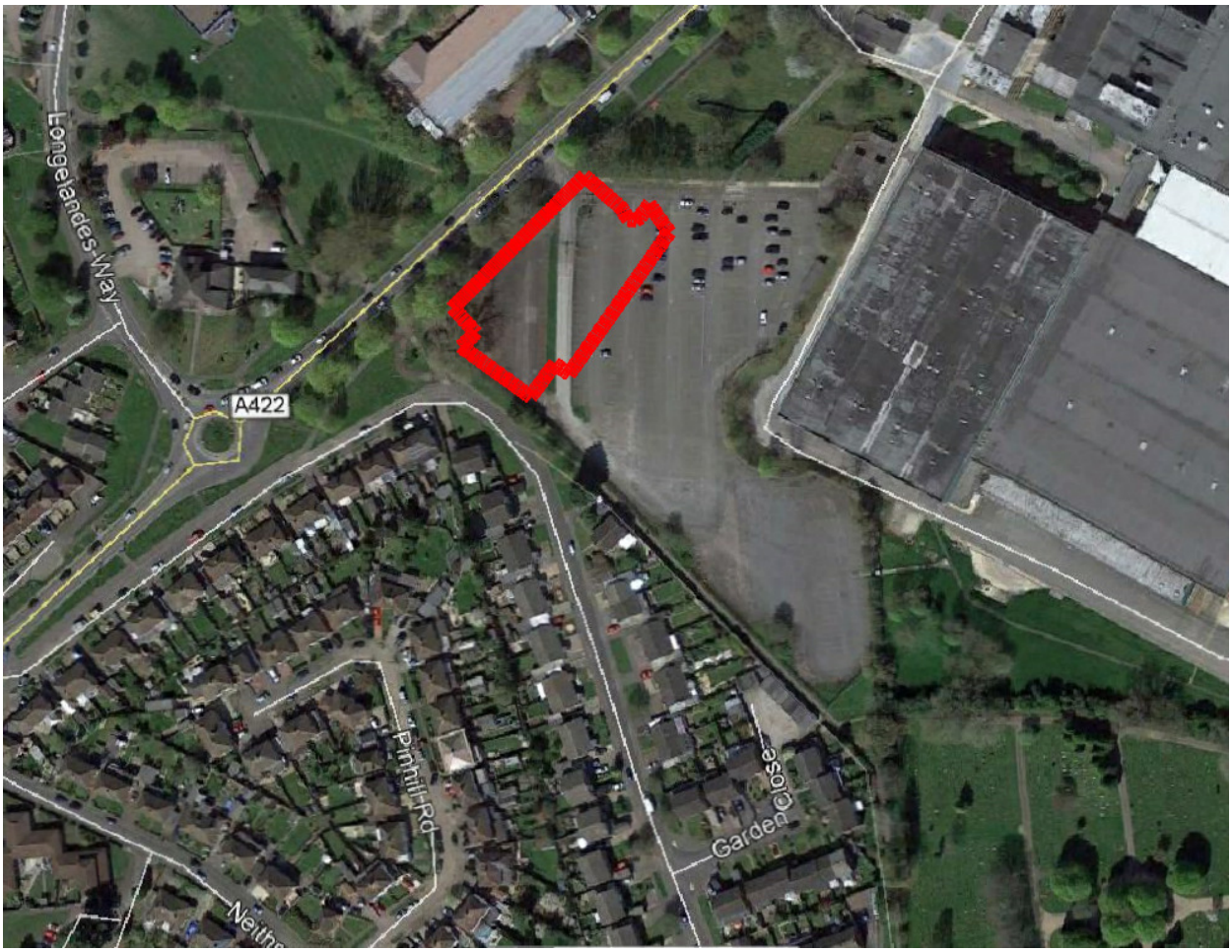
CURRENT SITE

2.1. The application site is located circa 1 mile north-east of Banbury Town Centre and currently forms part of the wider Jacobs Douwe Egberts (JDE) site, located on Ruscote Avenue.

2.2. The Site 3 application is for the redevelopment of part of the existing car park at the south-west of the wider JDE site. An indicative site boundary for the works together with an image of the existing site are shown in Figure 1 below.

2.3. Currently, part of the site is in use as a car park for JDE staff with 345 spaces. This application will be submitted concurrently and is linked to two other applications, one on the existing JDE car park adjoining this site (Site 4) and the second for the erection of a surface car park to provide replacement employee parking for JDE (Site 2).

FIgure 1 Indicative Site 3 boundary and existing site



2.4. To the east of the application site is an existing warehouse previously within the JDE site; the first phase of works was for Site 1 and related to the refurbishment and change of usage classification of this warehousing, which was submitted as a separate application with planning permission granted in December 2018 (Cherwell DC planning ref. 18/01246/F). This application also comprised the creation of a new access onto Southam road.

2.5. To the north/north-west of the site is the A422, which runs along the site boundary. On the other side of the road are commercial premises, a park, and a public house with attached residential use building. To the south/south-west are residences on Nursery Drive and Ruscote Avenue.

2.6. In terms of the existing noise climate around the site, in the daytime this is generally dominated by road traffic travelling on the A422. During the night-time, road traffic flows decrease significantly, with the primary noise sources being the use of the existing commercial premises and elements such as the wind in the trees.

PROPOSED DEVELOPMENT

2.7. The proposed Site 3 development comprises the removal of part of the existing car park and the *'erection of a drive-thru café within Use Class E, together with associated car parking, servicing and access; landscaping and all associated works'*. Access to the proposed development would be through the same point as the existing car park entrance on Ruscote Avenue.

2.8. The proposed layout is presented in Appendix B.

2.9. The proposed development has the potential to cause noise effects from the following sources:

- The associated construction works (temporary);
- Changes in road traffic flows on the road network outside the site;
- Operational activities within the site, including vehicles travelling on the internal access roads and use of the drive-through coffee shop; and
- Mechanical services plant associated with the commercial units.

3. NATIONAL AND LOCAL POLICY

NATIONAL PLANNING POLICY FRAMEWORK (2021)

3.1. The National Planning Policy Framework (NPPF), last amended in July 2021, sets out the government planning policy for England. At its heart is an intention to promote more sustainable development.

3.2. The relevant paragraphs concerning noise in the NPPF are:

- Paragraph 174e: *"Planning policies and decisions should contribute to and enhance the natural and local environment by, preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution*". Furthermore, development should, wherever possible, should help to improve local environmental conditions.
- Paragraph 185: "*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
  - *a) 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 the quality of life;"*

3.3. The NPPF makes direct reference to the Noise Policy Statement for England for advice on the achievement of these policy aims.

NOISE POLICY STATEMENT FOR ENGLAND (2010)

3.4. The Noise Policy Statement for England[1] (NPSE) sets out the government's overall policy on noise. It aims to promote good health and a good quality of life by effective management of noise in the context of government policy on sustainable development.

3.5. It uses the established concepts of No Observed Effect Level (NOEL) and Lowest Observed Adverse Effect Level (LOAEL). The NPSE extends these by introducing the Significant Observed Adverse Effect Level (SOAEL). This is the level above which significant adverse effects on health and quality of life occur. However, the explanatory note to the NPSE states that it is not possible

[1] Noise Policy Statement for England, Defra (2010)

to identify a single objective value to define SOAEL for noise that is applicable to all sources of noise in all situations. It is likely to be different for different noise sources, for different receptors and at different times.

3.6. The NPSE's sets out the following long-term vision of noise policy and supporting aims:

Noise Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life.*

3.7. The second aim of the NPSE refers to noise impacts that lie somewhere between LOAEL and SOAEL; while these may be considered as adverse effects, they are not considered as significant. The NPSE asserts that, while all reasonable steps should be taken to mitigate and minimise adverse effects, this does not mean that such adverse effects cannot occur.

PLANNING PRACTICE GUIDANCE: NOISE (2019)

3.8. Further government guidance on the consideration of noise for planning has been published as the Planning Practice Guidance for Noise[2] (PPG:N), last revised in July 2019. The PPG:N supports the NPPF by providing a range of advice and includes a noise exposure hierarchy table, and again makes reference to the NPSE.

3.9. The PPG:N provides descriptive (i.e. non-numerical) guidance on the potential effects of noise exposure at levels corresponding to the NOEL, LOAEL and SOAEL as described in the NPSE, and confirms that adverse effects (between LOAEL and SOAEL) should be mitigated and reduced to a minimum, and significant adverse effects (above SOAEL) should be avoided, taking account of the economic and social benefit of the activity causing or affected by the noise.

[2] Planning Practice Guidance: Noise, Ministry of Housing, Communities & Local Government (2019)

LOCAL POLICY AND CONSULTATION

3.10. The relevant local authority (LA) are Cherwell District Council (CDC), who provide a noise policy document last reviewed in January 2019[3] which sets out the general principles and approach to the council's management of noise. Due to the high-level nature of this document, the CDC Environmental Health and Licensing team were consulted by email on the 23rd May 2019 regarding the proposed methodology for the assessment of the previous proposals and raised no concerns. This assessment has followed the principles of the previous assessment with the exception of traffic as there is now anticipated to be a net decrease in traffic.

[3] CDC Noise Policy available from: https://www.cherwell.gov.uk/download/downloads/id/108/noise-policy.pdf

4. ASSESSMENT METHODOLOGY

4.1. In general, the method of prediction and assessment for each of the different noise sources associated with the proposed development (see paragraph 2.9) is different. The assessment methodologies used for each element are described below.

CONSTRUCTION NOISE AND VIBRATION

4.2. Prior to the appointment of a contractor, detailed information regarding the proposed construction methods and programme are unknown. Therefore, it is only possible to produce indicative predictions of the likely effects of construction activities at this stage.

4.3. The importance of considering the potential adverse effects that construction noise can have upon local communities is recognised. Consequently, consideration will be given to the sensitive management of construction works to avoid, as far as is reasonably practicable, significant adverse noise effects at the earliest possible stage. Suggestions are made within this report as to how potential adverse effects can be minimised through working practices.

4.4. Based on discussions with the project team, and work carried out on similar projects, estimates of possible construction activities, associated plant and its usage have been made in order to provide indicative predictions and subsequent assessment for planning; these are presented in Appendix C. It is understood that piling will not be required as part of the works. The activities considered are summarised as follows:

- Earthworks/Drainage/External Works.
- Tarmac Works.
- Concreting.
- Superstructure and Envelope.
- Welfare Generator.

4.5. Predictions of construction noise have been calculated at the relevant noise-sensitive receptors separately for each activity using the methodology described in Annex F of BS 5228-1:2009+A1:2014[4]. This takes into account the type and number of construction plant and equipment, their estimated usage (or on-time) for a typical working day, their distance from the receptors, and any intervening screening. The construction plant associated with each activity

[4] BS 5228-1:2009+A1:2014 – Code of Practice for noise and vibration control on construction and open sites, Part 1: Noise

has been modelled as a single source to simplify the predictions, i.e. one source represents the combined noise emission from the activity.

4.6. The predictions assume that the construction activity is taking place around the middle of the site. Given the size of the site and where most activity is likely to be concentrated, this is considered to provide a reasonable indication of the typical construction noise levels that would be expected at the receptors. In practice, there will be some variation in construction noise at the receptors depending on where the activity is taking place, i.e. it may be closer to or further from the receptor than has been predicted, with a resulting increase or decrease in construction noise.

4.7. While it is possible that some activities may overlap to some degree, this cannot be confirmed at this stage, and therefore the potential effects of noise have been considered separately for each activity.

4.8. The significance of potentially adverse construction noise effects has been determined using the thresholds set out in table 1 below. The values are based on the guidance in Annex E of BS 5228-1:2009+A1:2014 and expressed in terms of government noise policy (see paragraphs 3.3-3.6). It is assumed that works will take place during daytime hours only.

Table 1 Thresholds of potential effects of construction noise at residential buildings

Effect	Threshold Value ($L_{Aeq,T}$)*
LOAEL	65
SOAEL	75

Notes:
** Adverse or significant adverse effects are expected to occur at these thresholds if the programme of works indicates that the relevant values are likely to be exceeded over a period of at least one month. The values apply to a location one metre from a residential building façade containing a window, without the effect of an acoustic reflection from that façade.*

4.9. With regard to construction vibration, typically, for works associated with developments of this type, only piling would be anticipated to result in potentially significant levels of vibration at nearby receptors. As piling is not expected to be carried out as part of the works, it is considered unlikely that any significant vibration effects would occur at the nearby receptors as a result. On this basis, construction vibration has not been considered any further in the assessment.

ROAD TRAFFIC NOISE

4.10. Liaison with the project transport consultant has indicated that there would be an overall net reduction in traffic as a result of the proposed development. On this basis, further assessment

was not considered necessary. A discussion of the net decrease and supporting evidence is provided as part of this assessment.

OPERATIONAL SOUND

4.11. The primary sources of operational sound at the proposed development have been identified as vehicles travelling on the internal access roads and use of the drive-through coffee shop.

4.12. With regard to the prediction of sound from these sources, a 3D model of the proposed development and the surrounding area, including topography, has been constructed using the software package IMMI.

Vehicles using internal access roads

4.13. Predictions of sound from vehicles travelling on the internal access roads have been modelled within IMMI using the methodology described in the Calculation of Road Traffic Noise[5] (CRTN) based on an hourly vehicle profile provided by the project transport consultant.

4.14. This considers the traffic accessing the site during the peak hour of both the day and night-time periods, including the proportion of heavy vehicles. Note that the assessment period during the night-time is 15-minutes (see below), but it is considered that the predicted one-hour level is equivalent to 15-minutes during that hour, assuming vehicle movements are reasonably even.

4.15. The vehicle numbers used in the assessment are summarised in the following table; the speed was assumed to be 20 km/h for all vehicles.

Table 2 Number of vehicles assumed to be accessing site during peak hour of day/night

Period	No. of Vehicles (2-way)	Heavy Vehicles
Day (1 hour)	56	0%
Night (1 hour)	4	0%

4.16. By default, the levels produced by CRTN use the dB $L_{A10,T}$ metric; these have been converted to dB $L_{Aeq,T}$ for summation with the other operational sound sources by subtracting 2 dB from the result, as advised by Department for Transport guidance[6].

[5] Calculation of Road Traffic Noise, Department of Transport (1988)
[6] Transport Appraisal Guidance Unit A3: Environmental Impact Appraisal, Department for Transport (2015)

Coffee shop drive-through

4.17. Predictions of sound from use of the coffee shop drive-through have been modelled within the IMMI model as a line source for the stacking lane and point sources for the order/collection points using the propagation methodology described in ISO 9613-2:1996 based on an hourly vehicle profile provided by the project transport consultant.

4.18. This considers the likely number of cars moving around the stacking lane and making/receiving orders during the peak hour of the daytime period and the peak 15 minutes of the night-time period. The octave band source levels for these activities are based on attended measurements made by Vanguardia for the purpose of this assessment, taken at the Starbucks drive-through located at the Greyhound Retail Park in Southend-on-Sea on 3rd May 2019, considered to be similar to the proposed drive-through in all respects. Measurements were taken at several points around the stacking lane while cars were proceeding through the drive-through, and the sources in the IMMI model were calibrated so that the measured levels were predicted at locations equivalent to those used during the survey.

4.19. Due to the low number of vehicles expected to be using the drive-through in the peak night-time hour, it has been assumed that these all take place during the 15-minute night-time assessment period to provide a robust assessment (rather than occurring during different 15-minute periods during that hour). The number of vehicles used in the assessment are summarised in the following table; note that during the daytime hour, the number of vehicles indicates reasonably constant use.

Table 3 Number of cars assumed to be using drive-through during peak hour/15 mins of day/night

Period	No. of cars using drive-through
Day (1 hour)	28
Night (15 mins)	2

Assessment of operational sound

4.20. The total predicted operational sound has been calculated by logarithmically summing the predicted levels from the drive-through and the vehicles using the internal access road for the day and night-time assessment periods. The likelihood of any adverse effects arising from operational sound has been assessed based on methodology described in BS 4142:2014+A1:2019[7], the standard method for assessing sources of this type in the UK.

4.21. The methodology provides an initial estimate of impact based on the difference between the existing background sound level and the sound from the source being assessed corrected for

[7] BS 4142:2014+A1:2019: Method for rating and assessing industrial and commercial sound, BSI (2019)

certain characteristics if required (the rating level; see below) at the relevant receptor. The initial estimate is then modified if required based on context, such as consideration of the absolute level of sound from the source and the character of the receptor. The text regarding the initial estimate is reproduced as follows:

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

4.22. With regard to background sound levels, the standard states that the value used should be typical of that which occurs at the receptor locations during the assessment periods; the objective is not simply to identify the lowest level. Typical background sound levels are usually identified using statistical analysis; see the baseline survey section below for further information.

4.23. As mentioned above, the sound from the source being assessed can be corrected for certain characteristics if these are expected to be present at the receptor locations. These corrections consider tonality, impulsivity and intermittency, as well as "other sound characteristics" used when the sound is readily distinctive against the residual acoustic environment, but doesn't clearly align with the other three characteristics; this may be considered more relevant for sound that isn't from large items of machinery or manufacturing processes. Two methods for identifying suitable corrections are provided: the subjective method has been considered for this assessment.

MECHANICAL PLANT

4.24. While any fixed mechanical plant installed as part of the proposed development (e.g. used for ventilation or cooling) is considered to be a component of operational sound, the specific mechanical units, locations and operational details can only be identified when the commercial unit occupiers and their requirements are known. Therefore, no assessment has been made of the noise arising from such sources in this assessment. As well as careful consideration of the type and location of any plant, specific mitigation measures such as local screening, enclosures and in-duct attenuators can also be implemented if required.

4.25. On this basis, it was previously agreed with CDC that noise from fixed mechanical plant will be covered by a suitable planning condition; this will require an assessment to be submitted once details of the proposed plant installation are known, demonstrating that any noise emissions will comply with national and local policy.

RECEPTORS

Construction Noise

4.26. With regard to construction noise, the potential effects have been considered at four residential receptors. Three of these are on Nursery Drive and were selected to be representative of the other properties in the area around the specific receptor, which is considered to be a suitable approach due to the variation in location of the construction activities across the site.

4.27. The construction noise receptors are presented in the following table and figure.

FIgure 2 Construction noise receptors

Table 4 List of construction noise receptors

Receptor	
C1	68-70 Nursery Drive
C2	76-78 Nursery Drive
C3	125-127 Nursery Drive
C4	North side of Ruscote Avenue

Operational Sound

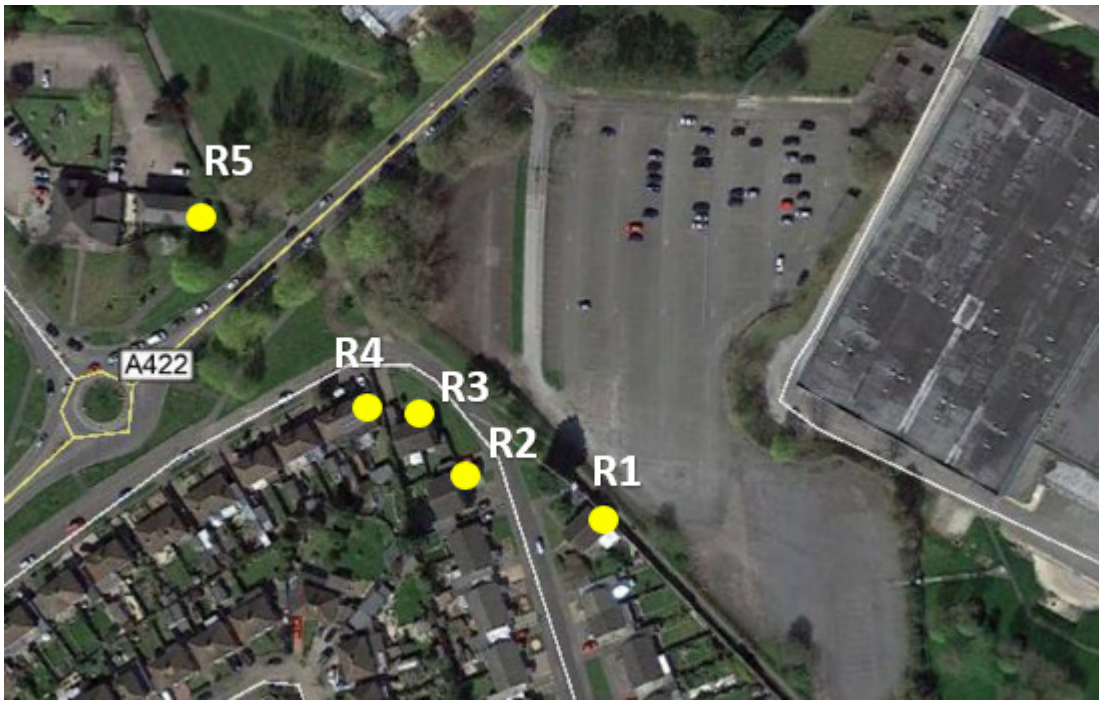
4.28. With regard to operational sound, the potential effects have been considered at several residential receptors that are most exposed to the side of the proposed development facing Ruscote Avenue where the primary sources are located. Other potential receptors, such as those further south along Nursery Drive, would be expected to have a lower level of exposure to operational sound than those considered due to greater distance from the source and therefore a lower likelihood of experiencing adverse effects.

4.29. The operational sound receptors are presented in the following table and figure; for the receptors to the south-west of the site on Ruscote Avenue and Nursery Drive, only the most affected façade of the building has been considered to provide a robust assessment.

Table 5 List of operational sound receptors

Receptor		Façade	Contains first-floor window
R1	76-78 Nursery Drive	NE	Y
R2	119-121 Nursery Drive	E	Y
R3	125-127 Nursery Drive	N	Y
R4	121-123 Ruscote Avenue	E	N
R5	North side of Ruscote Avenue	N	Y

Figure 3 Operational sound receptors



4.30. During the daytime period, the receptor height and the predicted sound levels are at a height of 1.5 m. During the night-period, where the primary sensitive area is likely to be bedrooms, the receptor height and predicted sound levels are at a height of 4.5 m, representing first-floor windows, unless the receptor does not have a window at that height as indicated in the table above. Sound has been predicted at a distance 1 m from the receptor façade, without the effect of an acoustic reflection from that façade (i.e. a free-field level).

5. BASELINE NOISE SURVEY

5.1. A long-term unattended baseline noise survey was undertaken at a single location close to the existing warehouse previously within the JDE site between 29th May and 6th June 2018 to characterise and quantify the existing noise environment as part of the assessment submitted with the Site 1 application for the adjacent site (see paragraph 2.4).

5.2. This data has been utilised for this assessment, together with additional short-term attended measurements at two locations made on 13th & 14th August 2019 during the day and night-time periods to indicate any variation in noise levels there may be at the operational sound receptors when compared to the original survey location. The survey locations are detailed as follows and shown on the figure below:

- L1: unattended survey position;
- S1: attended survey position representative of R1-R4; and
- S2: attended survey position representative of R5 (similar distance from road).

FIgure 4 Location of baseline noise survey measurements

5.3. All measurements were undertaken using Class 1 monitoring equipment at a height of 1.5 m above local ground level. The sound level meters were field calibrated prior to and following

the measurements using a Class 1 acoustic calibrator with no significant drift in sensitivity being indicated.

5.4. There were some periods of rainfall during the unattended survey; data affected by this has been excluded from further analysis. Further details of the surveys are presented in Appendix D.

5.5. Observations made during the surveys confirmed that, during the day, the dominant source of noise was from road traffic on Ruscote Avenue. During the night use of this and other nearby roads reduce significantly, and the dominant source of noise was observed to be from existing commercial premises in the area.

BACKGROUND SOUND LEVELS USED FOR ASSESSMENT

5.6. As described above, a typical background sound level at the receptors needs to be identified to undertake the assessment of operational sound from the proposed development. This has been selected using the following process:

- The modal background sound value, i.e. the most frequency occurring measured $L_{A90,15min}$ value, measured during the long-term unattended survey has been identified for the day and night-time periods using statistical analysis (see Appendix D). This is considered as the typical background sound level for these periods at this location.
- The background sound levels measured during the short-term attended survey have been averaged and compared to the same value from the unattended survey to produce a day and night-time offset between the positions.
- The offset has been applied to the unattended modal background sound values to arrive at a typical representative background sound level for receptors R1-R4 and R5. These are presented in table 6 below.

Table 6 Typical background sound levels used for assessment of operational sound

Receptor	Day (07:00-23:00)			Night (23:00-07:00)		
	Unattended Modal (dB $L_{A90,15min}$)	Attended Offset	Receptor Typical (dB $L_{A90,15min}$)	Unattended Modal (dB $L_{A90,15min}$)	Attended Offset	Receptor Typical (dB $L_{A90,15min}$)
R1-R4	47	+1	**48**	44	-1	**43**
R5	47	+9	**56**	44	-3	**41**

5.7. It can be seen that the main result of the offsets is to increase the daytime typical background sound level at R5; this is due to the proximity of this receptor to Ruscote Avenue and the higher volume of traffic using the road during the day.

6. ASSESSMENT

CONSTRUCTION NOISE

6.1. As described in section 4, the potential adverse effects from temporary construction noise have been assessed based on indicative estimates of activities and plant. These estimates have been based on discussions with the project team, and work carried out on similar projects. Equipment items have been located around the middle of the site to indicate typical construction noise levels.

6.2. Based on this information, the predicted construction noise levels are presented in the following table.

Table 7 Predictions of typical construction noise at receptors

Receptor	Construction Activity and Predicted Noise Level (dB $L_{Aeq,T}$)				
	Earthworks, Drainage and Externals	Superstructure	Concreting	Tarmac Works	Welfare Generator
C1*	57	49	54	54	39
C2*	62	53	58	58	43
C3	69	61	66	66	50
C4	64	56	60	60	45
* Predictions include 5 dB screening attenuation for existing rear garden walls					

6.3. It can be seen from table 7 that typical construction noise levels at the receptors are not predicted to exceed the SOAEL threshold of 75 dB $L_{Aeq,T}$ at any receptor, and therefore no significant adverse effects are expected. In general, the predicted typical levels exceed the LOAEL at C3 for several stages of works, indicating that some adverse effects are likely. For the other three activities, the predicted typical levels are generally below the LOAEL and therefore no adverse effects are expected.

6.4. It should be noted that the construction noise levels presented above are considered to be typical; clearly, construction noise at the receptors will vary depending on what area of the site the activities are taking place in, i.e. the levels are likely to be lower when works are on the furthest part of the site, and higher when on the nearest part of the site. Considering the proximity of some of the receptors to the site boundary, it is possible that the SOAEL threshold may be exceeded when the activities are taking place in that area. However, it is unlikely that the activity would be in that location for a month, and therefore significant adverse effects from construction noise would not be expected.

6.5. To manage any potentially adverse effects from construction noise, particularly during the Earthworks and Drainage & Externals activities, and when works are taking place close to the receptors, best practicable means (BPM) will be used, i.e. the use of all reasonable measures to mitigate and minimise construction noise. This will follow the principles of the guidance in BS 5228-1:2009+A1:2014 and may include the following where appropriate:

- Selection of appropriate equipment and construction methods;
- Plant to be located as far away as is reasonably practicable from noise-sensitive receptors;
- Static plant/equipment fitted with suitable enclosures or screening where practicable;
- Temporary hoardings/screens around the site boundary or specific activities as appropriate;
- Site personnel instructed on BPM to reduce noise and vibration as part of their induction training and as required prior to specific work activities;
- Appropriate management of working hours for noisier tasks; and
- Liaison with residents in advance of works commencing to provide information regarding the programme.

6.6. The use of other specific BPM measures will be considered for all construction activities associated with the proposed development when detailed information regarding the proposed methods and plant are available.

ROAD TRAFFIC NOISE

6.7. As described in section 4 above, the proposed development is anticipated to lead to a net reduction in traffic on the wider road network due to the removal of the B1 office space and associated parking at Site 2. Table 8 below identifies the difference in trip rates on the network between the 'Do Minimum' (DM) scenario, which represents the current consented use, and the 'Do Something' (DS) situation with the proposed drive-through.

Table 8 Difference in trip rates on wider network between Do Minimum and Do Something Scenarios

	Total Flows								
	Do Minimum (DM)			Do Something			Difference		
Flow Type	In	Out	Total	In	Out	Total	In	Out	Total
AM Peak	74	9	83	1	18	54	-73	-8	-81
PM Peak	6	61	67	14	33	47	-5	-60	-65
AAWT 18 (0600-000)	303	294	596	14	14	29	-288	-279	-568

6.8. On the basis of the flows set out in Table 8 above, the proposed redevelopment will generate a net benefit in terms of development trips compared to the current lawful use and therefore any resulting change in road traffic noise would be a net decrease compared to the current situation. Therefore, no further assessment of road traffic noise impacts has been undertaken.

OPERATIONAL SOUND

6.9. As described in section 4, the potential adverse effects from operational sound at the receptors have been assessed based on the methodology described in BS 4142. The typical background sound levels for the day and night-time periods used in the assessment are presented in table 6.

6.10. Regarding the correction that can be applied to the operational sound levels to take account of certain characteristics that may be present at receptors, based on the types of source and the existing acoustic environment, it is considered unlikely that the sound will have any specifically tonal, impulsive or intermittent characteristics at the receptors to the extent where they will attract attention for these reasons. However, where the difference between the rating level and the background sound level is less than 10 dB below the background sound level, it is possible that the operational sound will have other features that are readily distinctive during both the day and night assessment periods. Where this occurs, a 3 dB correction has been applied to predicted operational sound levels to arrive at the rating level.

6.11. Based on this information, the predicted rating levels together with the initial estimate of impact (i.e. the difference between the rating level and the typical background sound level) is presented in the following table.

Table 9 Initial estimate of impact for operational sound at receptors (no mitigation)

Receptor	Day (07:00-23:00)			Night (23:00-07:00)		
	Rating Level (1 hr)	Typical Background Sound Level	Difference	Rating Level (15 min)	Typical Background Sound Level	Difference
R1	36	48	-12	32	43	-11
R2	29	48	-19	33	43	-10
R3	37	48	-11	40*	43	-3
R4	38	48	-10	33	43	-10
R5	38	56	-18	37*	41	-4
Note: *Rating Level includes 3 dB correction for other sound characteristics.						

6.12. It can be seen from table 9, that during the day and night-time periods the rating level is below the background sound level, indicating a low impact and therefore that no adverse effects are likely at these receptors.

7. CONCLUSIONS

7.1. Vanguardia has been instructed to carry out a noise impact assessment to support the planning application for the proposed redevelopment of part of an existing car park on Ruscote Avenue in Banbury. The application is for Site 3, which will be submitted concurrently and is linked to two further applications, one on the existing Jacobs Douwe Egberts (JDE) car park which adjoins this site (Site 4 – Van Storage Facility) and the second for the erection of a surface car park to provide replacement employee parking for JDE site (Site 2 – Replacement Car Park Application).

7.2. A baseline noise survey was undertaken at the site in May-June 2018 in order to characterise the existing noise environment and help assess the potential impacts and effects of noise at the nearby noise-sensitive receptors. Further attended noise measurements were taken at the site in August 2019 to confirm the existing noise levels close to the receptors considered for this assessment.

7.3. The assessment of construction noise has indicated that while some temporary adverse effects are expected during the 'Earthworks Drainage & Externals' and when works are taking place close to the receptors, however significant adverse effects are not expected. Noise from all construction works will be mitigated and minimised using appropriate best practicable means (BPM) measures as required. It should be noted that the predictions of construction noise are based on estimates of the likely activities and plant from similar projects and should therefore be considered indicative.

7.4. It is anticipated that the proposed development will result in a net reduction in traffic movements on the network compared to the current lawful use of the site therefore there are no adverse traffic noise impacts or effects arising from the proposed development.

7.5. Regarding the operation of the proposed development, sound from vehicles travelling on the internal access roads and use of the coffee shop drive-through has been considered. The assessment has shown that the predicted rating level is below the background sound level at all receptors. Consequently this would equate to a low impact and no adverse effects are anticipated at any of the receptors considered.

7.6. Robust assumptions have been made for all elements of the assessment in order to consider a likely worst-case and reduce any uncertainty in the predictions and analysis.

7.7. It was previously agreed with CDC that noise from fixed mechanical plant will be covered by a suitable planning condition; this will require an assessment to be submitted once details of the proposed plant installation are known, demonstrating that any noise emissions will comply with national and local policy.

7.8. It is concluded that proposed development complies with all relevant national and local planning policy requirements regarding noise.

APPENDIX A: GLOSSARY

$L_{Aeq,T}$ The equivalent continuous A-weighted sound or noise level over the time period (T). This is the A-weighted sound pressure level of a continuous, steady sound that, over the given time period (T), contains the same sound energy as the actual fluctuating sound over the same time period.

$L_{A90,T}$ This is the 'A' weighted noise level exceeded for 90% of the measurement period, T. This is often described the background sound or noise level.

Façade Level: The sound level at a position 1 m in front of a reflecting façade of a building. The façade noise level is assumed to be 3 dB(A) higher than the level measured or predicted at the same position but without the influence of the reflecting façade.

Free-field Level: The sound level in an open area well away from any buildings or other sound reflecting surfaces other than the ground. Generally, the minimum distance from building facades required for free-field measurements is 3.5 m.

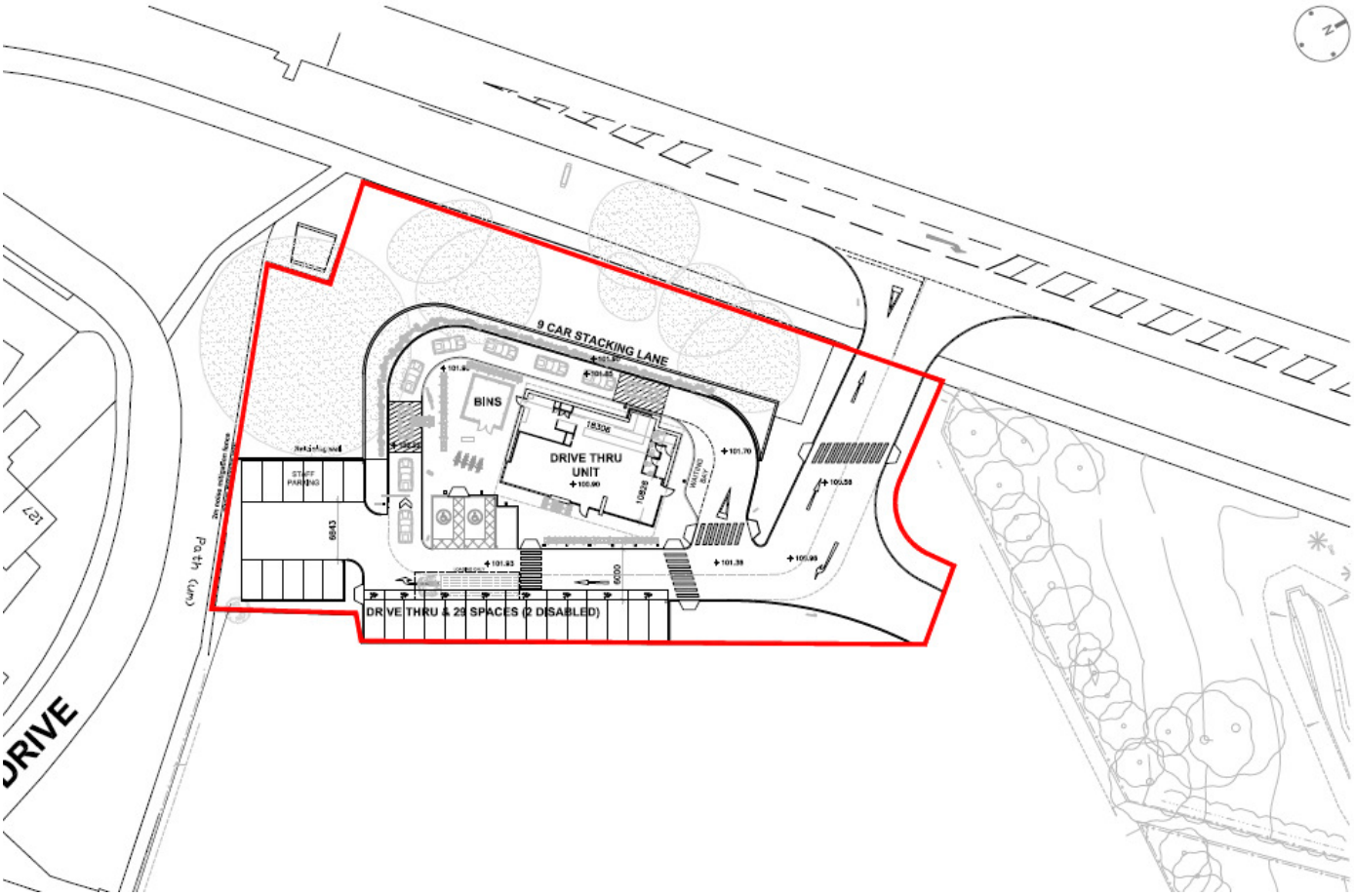
Noise Policy Statement for England (NPSE) Terminology

- **No Observed Effect Level (NOEL):** This is the level below which no effect can be detected. In simple terms, below this level, the sound has no effect at all.
- **Lowest Observed Adverse Effect Level (LOAEL):** This is the level above which adverse effects on health and quality of life can be detected.
- **Significant Observed Adverse Effect Level (SOAEL):** This is the level above which significant adverse effects on health and quality of life occur.

BS 4142:2014+A1:2019 Terminology

- **Background Sound Level:** The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval. Expressed as $L_{A90,T}$ and generally considered to be the average minimum noise level.
- **Ambient Sound Level:** Totally encompassing sound in a given situation at any given time, usually composed of sound from many sources near and far. Usually expressed in terms of $L_{Aeq,T}$ and includes the residual and specific sound when present.
- **Residual Sound Level:** The ambient noise remaining at the assessment location when the specific noise source is suppressed to such a degree that it does not contribute to the ambient noise. Expressed in terms of $L_{Aeq,T}$.
- **Specific Sound Level:** The equivalent continuous A-weighted sound pressure level produced by the specific sound source (being assessed) at the assessment position over a given reference time interval ($L_{Aeq,Tr}$).
- **Rating Level:** The specific sound level plus any adjustment for the characteristic features of the sound. Expressed in terms of $L_{Ar,Tr}$.

APPENDIX B: PROPOSED SITE LAYOUT



APPENDIX C: CONSTRUCTION NOISE PLANT ASSUMPTIONS

Activity	BS 5228-1 Ref no.	BS 5228-1 Equipment description	LAeq,T at 10m (dB)	Quantity	On-time (%)
Earthworks, Drainage & Externals	C2.21	Tracked Excavator, 107 kW - 22t	71	1	80
	C4.7	Dumper*, 56 kW - 5t	78	2	80
	C5.26	Vibratory roller, - 4t	77	1	40
	C2.41	Vibratory plate (petrol), 3 kW - 62kg	80	1	20
	C5.36	Hand-held circular saw (petrol), 3 kW - 300mm diameter / 9.2kg	87	1	20
	C11.20	Lorry*, 160 kW - 18t	83	1	20
Superstructure	C4.43	Wheeled mobile crane, 275 kW - 35t	70	1	90
	C4.57	Lifting platform, 35 kW - 8t	67	1	90
	C4.54	Telescopic handler, 76 kW - 4t	79	1	40
Concreting	C4.20	Concrete mixer truck,	80	1	30
	C3.25	Concrete pump, 59 kW - 28t / 180mm diameter /59 bar	78	1	80
	C4.33	Poker vibrator,	78	1	80
	R1	Hand held power float *	66	2	30
Tarmac Works	C5.31	Asphalt paver (+tipper lorry), 94 kW - 18t	77	1	90
	C5.26	Vibratory roller, - 4t	77	1	90
	C11.20	Lorry*, 160 kW - 18t	83	1	20
Welfare Generator	C4.78	Diesel generator,	66	1	100

APPENDIX D: NOISE SURVEY DETAILS, RESULTS & ANALYSIS

UNATTENDED SURVEY (POSITION L1)

Instrumentation: Larson Davis SoundExpert LxT Class 1 sound level meter, serial number 5599. The instrument was calibrated before and after the survey with a Larson Davis CAL200 Class 1 acoustic calibrator, serial number 13715. No significant drift was recorded.

Measurement Period: The survey was conducted between 17:15 hours on Tuesday 29th May and 10:15 hours on Wednesday 6th June 2018.

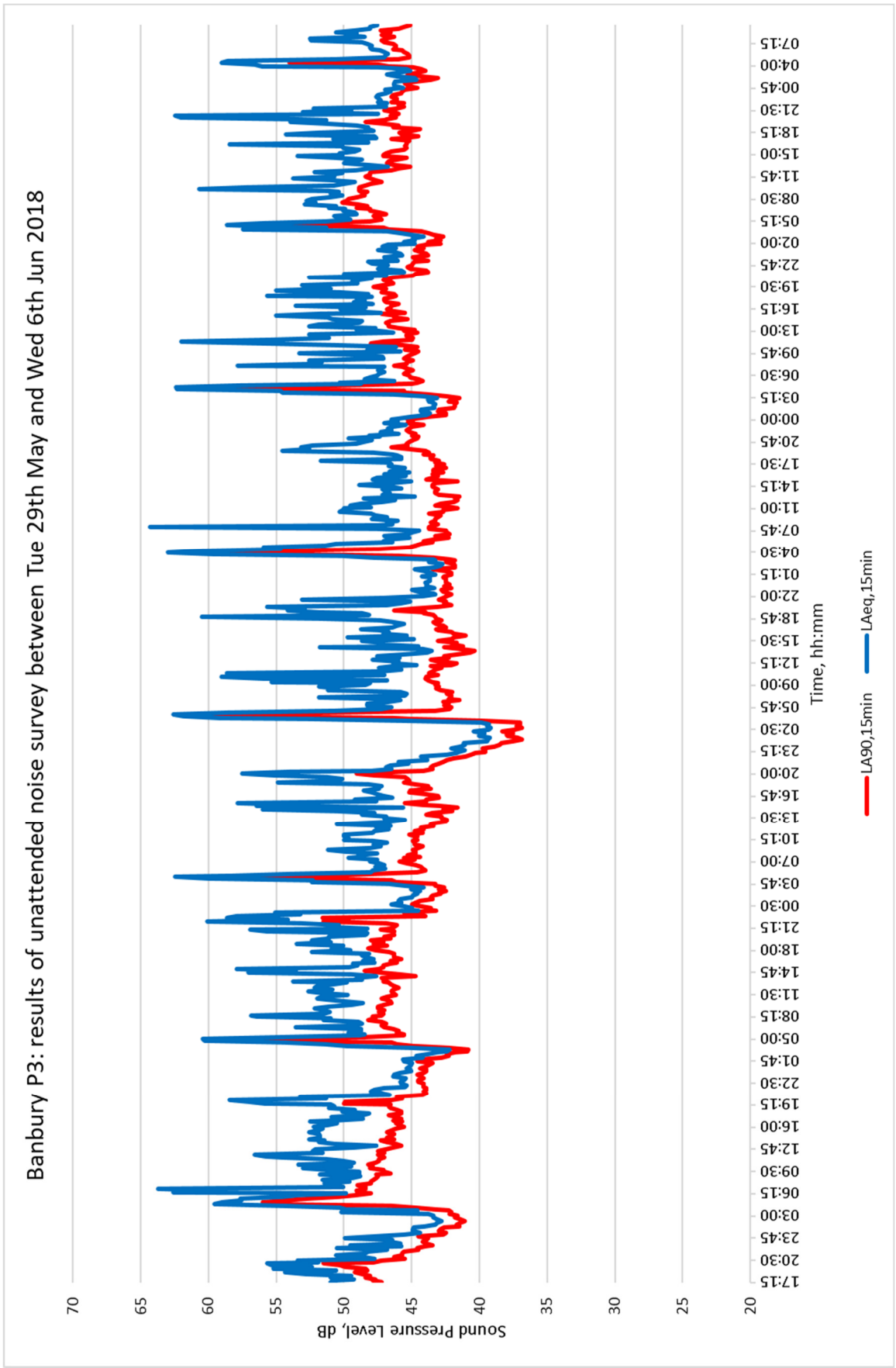
Weather Conditions: The weather conditions during the survey period were generally dry with little wind. The were some periods of precipitation during the survey, particularly during the evening of Thursday 31st June. A summary of the weather conditions is presented in the table below.

Date	Temperature, Average °C	Wind Speed, Average km/h	Wind Direction	Precipitation, Highest Accum. mm
29/05/2018	17	1	SSW	1.5
30/05/2018	15	0	SSE	10.5
31/05/2018	20	1	SE	28.4
01/06/2018	21	0	SE	0
02/06/2018	19	0	WSW	0
03/06/2018	19	0	SSW	0
04/06/2018	15	0	SSW	0
05/06/2018	14	1	S	0
06/06/2018	16	1	SSW	0

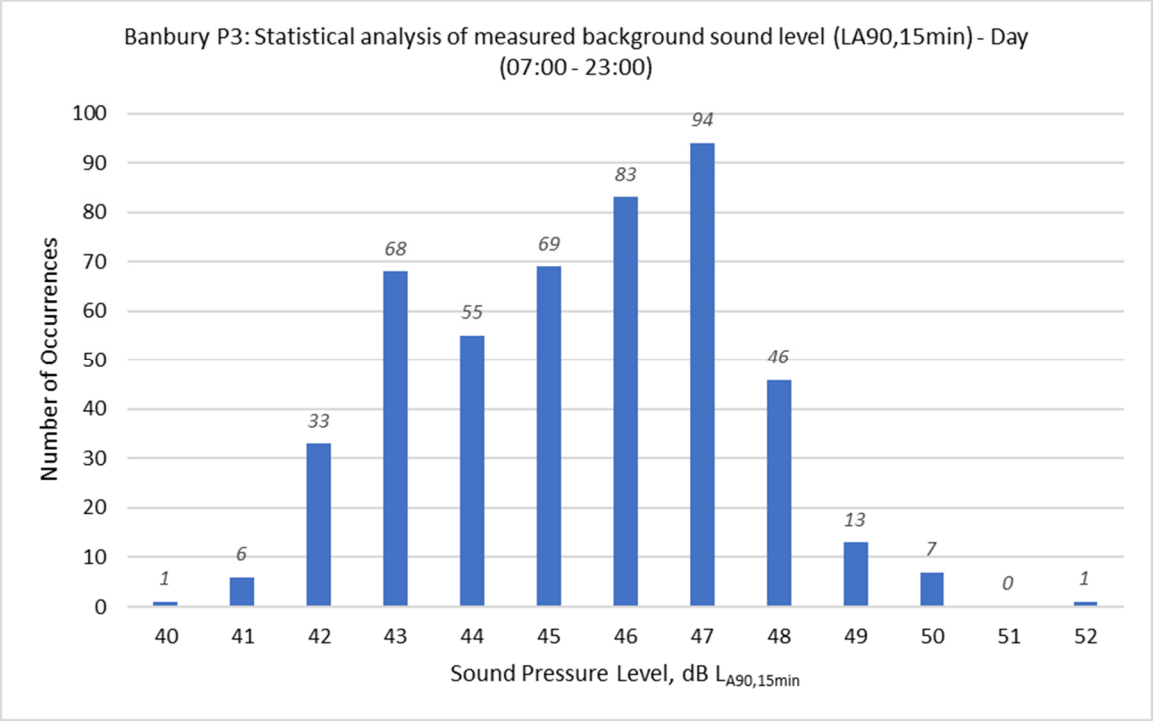
Weather Station: IBANBURY3

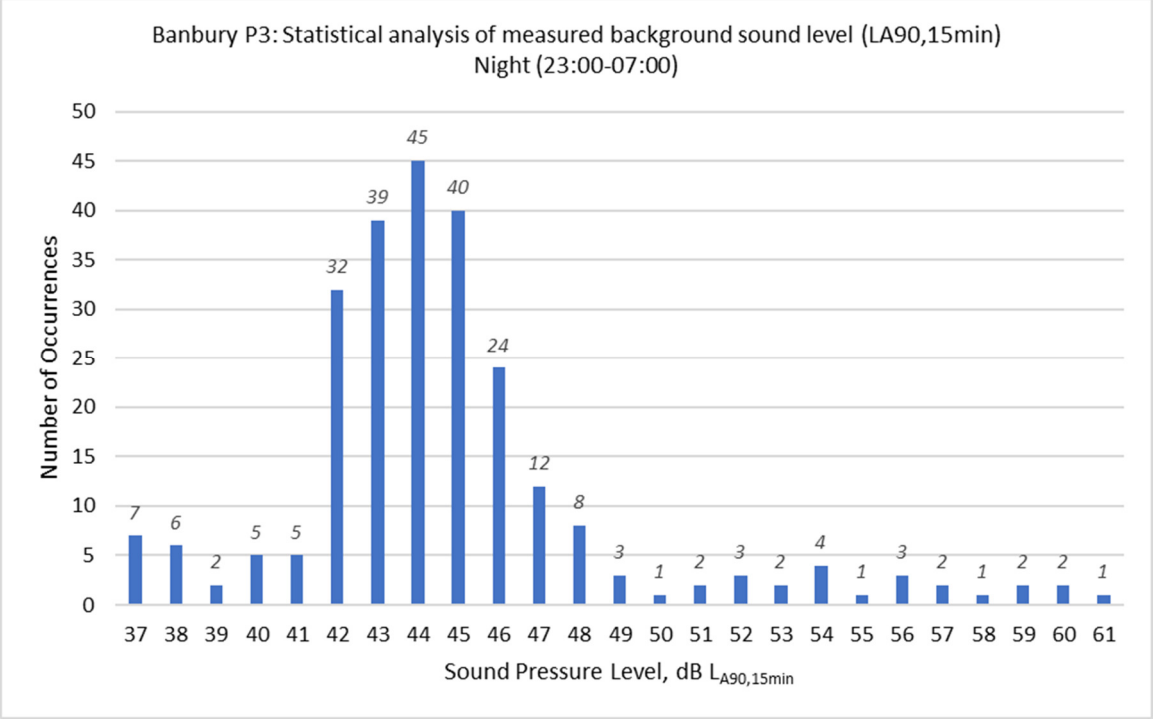
Personnel: I. Alli-Balogun MIOA

Results: The measured levels for residual (LAeq,15min) and background sound (LA90,15min), over the entire survey period, are presented below in graphical form.


Banbury P3: results of unattended noise survey between Tue 29th May and Wed 6th Jun 2018
Sound Pressure Level, dB
70
65
60
55
50
45
40
35
30
25
20
Time, hh:mm
LA90,15min
LAeq,15min

Background sound level: As detailed in the main body of the report, statistical analysis of the measured background sound levels was undertaken during the day and night-time periods in order to identify a typical level, considered to the modal value, or most frequently occurring measured value. The following graphs illustrate this analysis.





ATTENDED SURVEY (POSITIONS S1 AND S2)

Instrumentation: Larson Davis 831 Class 1 sound level meter, serial number 4096. The instrument was calibrated before and after the survey with a Larson Davis CAL200 Class 1 acoustic calibrator, serial number 13715. No significant drift was recorded.

Measurement Period: The survey was conducted during the afternoon of Tuesday 13th August 2019, and the early hours of Wednesday 14th August 2019 (see tables below for specific times).

Personnel: V. Parker AMIOA

Results: The measured levels for residual sound (LAeq,15min) and background sound (LA90,15min) are presented below in tabular form.

Results of attended survey measurements at S1

Start Time		Period	LAeq,15min	LA90,15min
13/08/2019	13:30	Day	53	48
13/08/2019	13:45		52	47
13/08/2019	14:00		55	49
13/08/2019	14:15		53	47
14/08/2019	01:30	Night	47	43
14/08/2019	01:45		44	42
14/08/2019	02:00		45	42

Results of attended survey measurements at S2

Start Time		Period	LAeq,15min	LA90,15min
13/08/2019	14:45	Day	64	56
13/08/2019	15:00		66	56
13/08/2019	15:15		62	55
14/08/2019	02:30	Night	49	40
14/08/2019	02:45		51	41
14/08/2019	03:00		49	40

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