



Noise Impact Assessment

South Heywood Commercial Plot 3

Reference: 50-733-R1-4

Date: November 2022



NOISE IMPACT ASSESSMENT

**South Heywood
Commercial Plot 3**

Prepared for:

Russells South Heywood (Commercial) Limited

Report Ref: 50-733-R1-4

Date Issued: 7th November 2022

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EXECUTIVE SUMMARY

BACKGROUND

Site Address	Pilsworth Road, Heywood OL10 2TT
National Grid Reference	E 384064 N 409132
Proposed Development	Outline application for proposed industrial/commercial development with an increase in development quantum by an additional 40,000 sq m above that under Hybrid Planning Permission 16/01399/HYBR).
Report Objectives	To identify, measure and assess the potential impact of the proposed commercial development upon existing residential receptors in the immediate vicinity of the Site. The report follows current and relevant British Standards in order to provide a robust assessment.

ASSESSMENT

Surveys Completed	E3P have relied upon previously measured data submitted as part of the outline planning application and the wider site. A background sound survey was conducted in a position representative of the closest receptors to this plot over a weekday and weekend period. Since the survey was conducted, works have taken place on site which will have increased background sound levels and, as such, the previously measured data is considered worst-case.
Assessments	A BS4142:2014+A1:2019 assessment has been undertaken accounting for any unloading/loading activities and car park usage associated with the proposed development and noise break-out potential. The predicted rating level has been compared to the existing typical background sound level for the daytime and night-time periods. As a site layout is not available, E3P have used noise model outputs from similar sized sites of this usage to inform the assessment and determine whether the increase in development would result in adverse impact.
Mitigation Requirements	The assessment predicted no adverse impact at the closest receptors and, as such, no mitigation measures are required.

CONCLUSIONS

E3P has undertaken detailed 3D noise modelling of all the proposed sources in order to predict noise levels within gardens and at 1st floor windows for the daytime and night-time periods, in accordance with BS 4142:2014, at the closest receptors.

The assessment has determined that the predicted noise from the proposed development would not result in an exceedance of the background sound level at any receptor during both daytime and night-time periods. As such, the additional development floor space beyond that all approved under 16/01399/HYBR is not considered to result in adverse impact.



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1. INTRODUCTION

1.1. BACKGROUND

E3P were commissioned by Russells South Heywood (Commercial) Limited to undertake a Noise Impact Assessment for the proposed commercial development at Plot 3 of the South Heywood Development, to be referred to hereafter as '*the site*'.

This assessment looks to determine the key noise sources associated with the development and undertake an assessment of any impacts upon existing noise sensitive receptors.

1.2. PROPOSED DEVELOPMENT

This is in outline planning application for the sole purpose of increasing the overall development of the site by an additional 40,000 sq m which is set within the approved red line boundary. It is assumed the use class would be B8.

The key sources of sound associated with the development will be Heavy Goods Vehicle (HGV) loading/unloading activities, noise break-out from the units and car park usage.

No detailed plans are available and, as such, E3P have drawn on previous experience of similar sites to inform the assessment.

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 POLICY FRAMEWORK

To prevent unacceptable risks from pollution, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be considered.

The national planning policy framework states that planning policies and decisions should aim to:

- ✿ Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development.
- ✿ Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions.
- ✿ Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.
- ✿ Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

2.2. 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.

2.3. 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 rather 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

-  +3dB: 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

3.1. UNATTENDED BACKGROUND AND AMBIENT SOUND SURVEY

E3P have relied upon previously measured data, conducted by REC Ltd, now Ensaf, in May 2016, submitted as part of the Hybrid Planning Permission 16/01399/HYBR for the wider South Heywood Development.

Given that works are taking place at the site, the previously measured data is considered worst-case.

The survey was carried out over the following time periods:

- 📍 14:00 Friday 13th May to 13:00 Monday 16th May 2016.

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

- 📍 Noise Measurement Position 4 (NMP4): Located in the north west area of the Site adjacent to the south of Pilsworth Road and on the most westerly boundary of the Site. Noise measurements were taken during a typical weekday and weekend period. The microphone of the sound level meter was located at a height of 1.5m above ground level, in free-field conditions. The noise climate at this location consisted predominantly of road traffic on the local road network.

Table 3.1 details the measured ambient and background sound levels. The daytime levels correspond to the $L_{A90,1hr}$ and the night-time levels to the $L_{A90,15mins}$.

TABLE 3.1 MEASURED BACKGROUND SOUND PRESSURE LEVELS

DATE	TIME PERIOD	RANGE OF MEASURED BACKGROUND SOUND LEVELS, $L_{Aeq,T}$ (dB)	RANGE OF MEASURED BACKGROUND SOUND LEVELS, $L_{A90,T}$ (dB)
Friday 13th May 2016	Daytime	45.1-52.7	41.5-50.5
	Night-time	39.7-51.4	37.4-42.0
Saturday 14th May 2016	Daytime	42.9-52.4	36.4-42.5
	Night-time	40.1-54.1	36.6-39.9
Sunday 15th May 2016	Daytime	43.1-52.9	33.9-41.9
	Night-time	40.0-48.4	34.1-44.5
Monday 16th May 2016	Daytime	46.7-51.8	43.6-45.7

The assessment within the application used the lowest measured average background sound levels to set plant noise emission limits for any proposed commercial sound. As such, the lowest average day and night-time background sound levels are used, which are 38 dB during the day and 40 dB during the night. Given these levels, 38 dB will be considered the limit for day and night.



4. NOISE IMPACT ASSESSMENT

At this stage of the application process, no detailed layout plan is provided. As such, E3P have used previously assessed sites of similar scale and use to inform the assessment.

Given the total floor space and size of development, it is considered that there could be up to 58 loading docks with associated HGV parking on either side of the site. It is considered that, through discussions with the client, car parking would be in the western area of the site with a capacity of up to 300 spaces.

The dominant sources of sound with a development of this type are car park usage, HGV parking and loading/unloading activities. As such, parking areas are located at the extremities of the site as above with point sources included for loading docks on one side of the building. It is assumed that loading docks on the northern elevations of the building would benefit from shielding to the receptors to the south and south west. However, they are included to inform a worst case assessment but sound power levels are reduced to account for shielding by the proposed building, the location of which is unknown.

This assessment has used previously measured noise levels for HGVs and unloading/loading activities, applied at previous similar B8 use sites, to predict the noise level impact on the existing closest residential dwellings during the daytime and night-time periods. At this stage, it is assumed that all units will operate 24/7.

A sound power level of 78 dB is used for loading/unloading activities as per measurements of similar operations. Parking areas are inputted as parking lots within the software and factored to number of spaces and vehicle type.

Regarding assumptions for the assessment, the following has been considered for the full planning application aspects:

- ✿ 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.
- ✿ The daytime period has been assessed between the hours of 07:00 to 23:00. For the assessment, BS 4142:2014+A1:2019 has been used to determine the likelihood of adverse impact within the garden areas over a reference time period of 1 hour.
- ✿ The night-time period has been assessed between the hours of 23:00 and 07:00 for a reference time period of 15 minutes.
- ✿ During the daytime and night-time periods, it is assumed, to inform a worst-case assessment, that an HGV will attend each loading bay at once with HGVs driving up and reversing into the bays and then unloading/loading activities then taking place.
- ✿ The measured on-time periods have been corrected to account for the hourly and 15-minute assessment periods given in BS 4142:2014+A1:2019; and
- ✿ Soft ground attenuation has been applied, where necessary.

At this stage, the exact noise sources for the proposed B8 usage are not known. As such, the only viable sources that can be modelled are HGV movements and unloading/loading activities along with car park usage. Advice is provided on fixed plant sound. This would provide a worst-case assessment for most operations, especially B8 usage. Any noise break-out would be at a much lower level than external sources.



For the BS 4142:2014+A1:2019 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. However, the site is within a well-established industrial area with surrounding units and usage already operating with similar sources of sound. As such, the development is not likely to introduce any new noise source of a particular character and, as such, no penalties are applied.

4.1. DAYTIME ASSESSMENT

Table 4.1 details the resultant rating level at each receptor, output from the model. The grid noise map can be seen in Figure 2 of Appendix II.

The lowest average background sound level during the daytime periods have been used for each corresponding receptor. This informs a worst-case assessment. Levels correspond to worst case garden noise levels.

TABLE 4.1 BS 4142:2014+A1:2019 ASSESSMENT - DAYTIME

RECEPTOR	CALCULATED RATING LEVEL, $L_{A,r}$ (dB)	LOWEST AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	CRITERION, $L_{A90} = L_{A,r}$ (dB)	DIFFERENCE +/- (dB)
PILSWORTH ROAD	32	38	38	-6
MOSS HALL ROAD	33	38	38	-5
SOUTH RECEPTORS	35	38	38	-3

Table 4.2 indicates that the predicted rating level falls below the existing typical background sound level during daytime periods at the closest residential receptors. As such, no consideration towards mitigation measures is required.

4.2. NIGHT-TIME ASSESSMENT

The noise model has been used to predict the rating level at the receptors during the night-time period. Table 4.2 details the calculated rating level at the receptors and compares the rating level with the background sound level. Levels here correspond to façade levels.

It is assumed car parks would be at 50% capacity in any given 15-minute period.



TABLE 4.2 BS 4142:2014+A1:2019 ASSESSMENT - NIGHT

RECEPTOR	CALCULATED RATING LEVEL, $L_{A,r}$ (dB)	LOWEST AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)	CRITERION, $L_{A90} = L_{A,r}$ (dB)	DIFFERENCE +/- (dB)
PILSWORTH ROAD	32	38	38	-6
MOSS HALL ROAD	31	38	38	-7
SOUTH RECEPTORS	37	38	38	-1

Table 4.2 indicates that the predicted rating level falls below the background sound level during the night-time period at the closest receptors.

Furthermore, internal noise levels, with windows open, would be no more than 24 dB, well below the 30 dB criterion

As such, no mitigation measures are required.

4.3. PROPOSED FIXED PLANT

At the time of submission, details of proposed fixed plant items were unknown. As such, the following recommendations have been made:

- ✳ The resultant rating level from the cumulative impact of all proposed fixed plant items must not exceed the existing background sound levels, 38 dB, accounting for the above proposed noise levels, at the closest receptors.

It is assumed that any fixed plant items proposed would have a low noise level and most likely will consist of A/C units. Considering the typical noise levels of these units and the surrounding existing usage, the impact of these would be negligible.

Where this is not the case, it is recommended that an acoustician is involved to ensure the plant to be installed will not adversely affect the receptors.

4.4. DEVELOPMENT GENERATED TRAFFIC

Traffic along the road network was considered at the outline planning stage for the wider site. Due to the proposals here, E3P have considered the potential increase in road traffic flows. Accordingly, E3P have liaised with Focus Transport Planning who have prepared a Transport Assessment to support the proposals and have confirmed the following:

In terms of changes in network traffic changes between the Baseline Consented (BC = Background traffic + consented SH traffic) and the 'Do-Something' (DS = Baseline Consented + Plot 3), all links will only see an increase in general traffic of less than 5%. Changes in HGV traffic on links could be as high as 20%.

In terms of changes to noise levels, the above changes would result in less than a 0.5 dB increase above those previously assessed which would not be perceptible nor result in adverse impact at receptors along the affected routes.



As such, detailed noise assessments of development generated traffic is not warranted.



5. CONCLUSION AND RECOMMENDATIONS

E3P were commissioned by Russells South Heywood (Commercial) Limited to undertake a Noise Impact Assessment for the proposed commercial development at South Heywood, Plot 3.

This assessment looked to consider the increase in development area of the above plot and determine the key noise sources associated with the development and undertake an assessment of any impacts upon existing noise sensitive receptors.

E3P have relied upon a previously conducted and accepted unattended background and ambient sound survey to capture worst case baseline noise levels.

E3P has undertaken detailed 3D noise modelling of all the proposed sources to predict noise levels at ground and 1st floor windows for the daytime and night-time periods respectively, in accordance with BS 4142:2014+A1:2019, at the closest receptors to the site. Assumptions have been made on the number of sources and location of sources to inform a worst-case assessment.

The assessment has shown that the predicted rating level falls below the typical measured background sound level during the daytime and night-time periods. Furthermore, acceptable internal noise levels can be achieved at receptors in respect of suitable sleeping conditions.

This assessment has shown that there should be no adverse impact upon existing residential receptors due to the proposed development. As such, noise should not be a determining factor in the determination of the planning application.

END OF REPORT



APPENDIX I

GLOSSARY OF ACOUSTIC TERMINOLOGY

NOISE

Noise is defined as unwanted sound. Human ears are able to 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 give due consideration to all of 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 generally 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



APPENDIX III

FIGURES

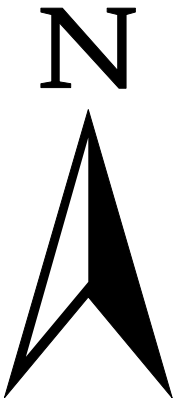
Figure 1 - Noise Survey Measurement Positions



Project:
South Heywood
Commercial Plot 3

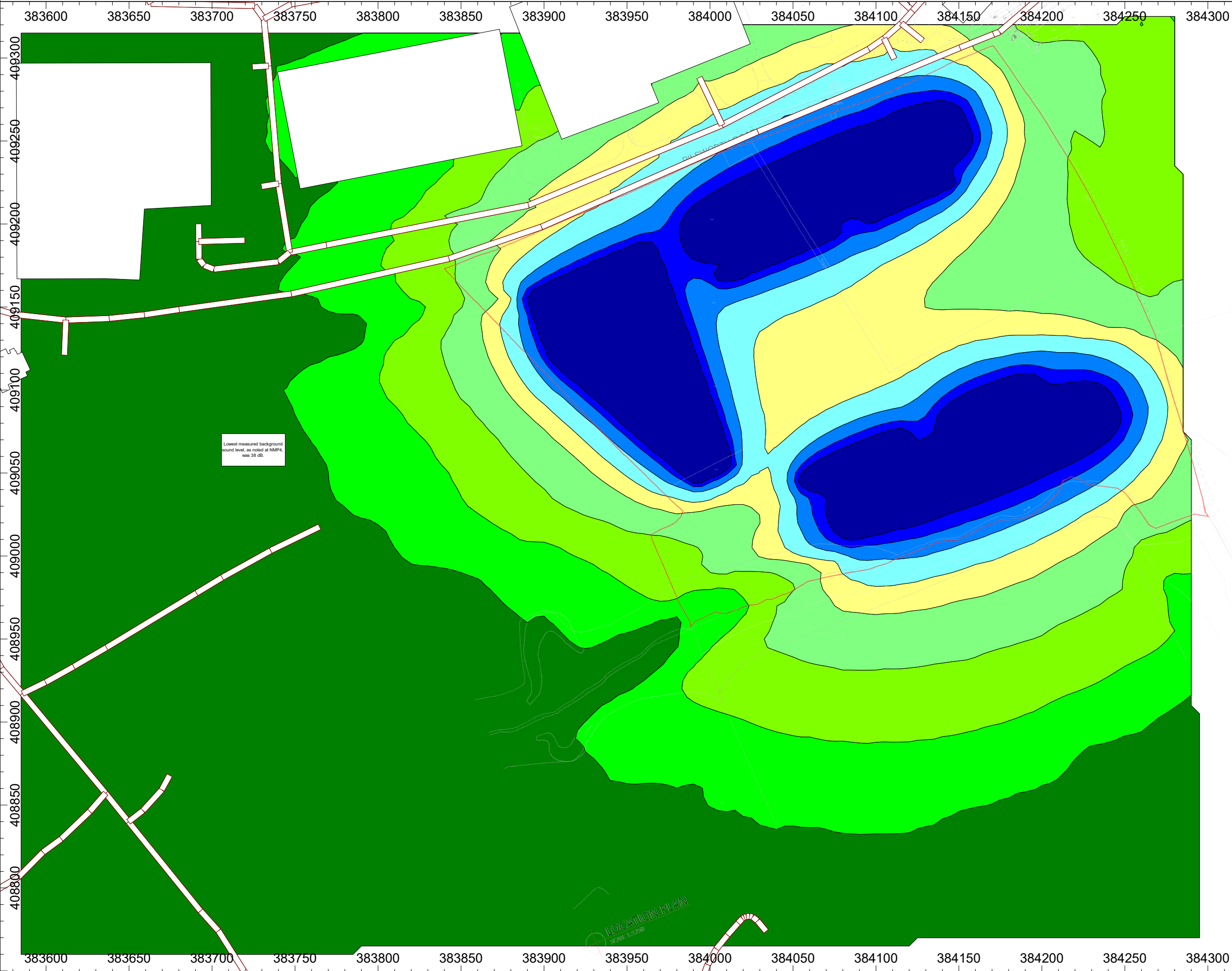
Project-No:
50-733

Client:
Russells South Heywood
(Commercial) Ltd



Project Engineer: L Faulkner
Date: 07/11/2022

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



Project:
South Heywood
Commercial Plot 3

Project-No:
50-733

Client:
Russells South Heywood
(Commercial) Ltd

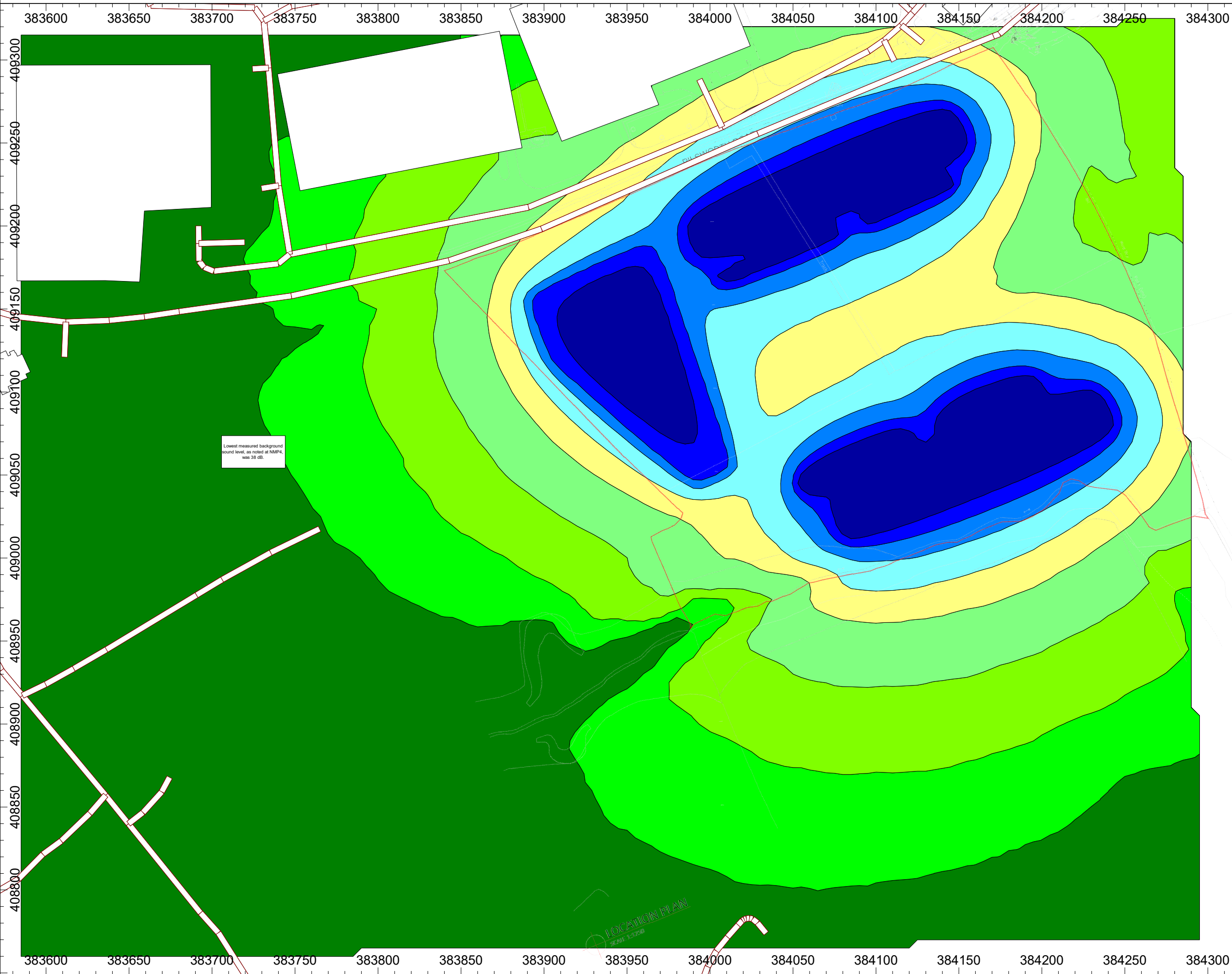
Rating Level, LA,r (dB)	
...	<= 38
38 < ...	<= 40
40 < ...	<= 42
42 < ...	<= 45
45 < ...	<= 48
48 < ...	<= 50
50 < ...	<= 52
52 < ...	<= 55
55 < ...	

Noise Map Objects	
	Point Source
	Road
	Parking Lot
	Building
	Contour Line



Project Engineer: L Faulkner
Date: 07/11/2022

Figure 3 - Night-time Grid Noise Map - Calculation at 4m above ground level



Project:
South Heywood
Commercial Plot 3

Project-No:
50-733

Client:
Russells South Heywood
(Commercial) Ltd

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
	Parking Lot
	Building
	Contour Line



Project Engineer: L Faulkner
Date: 07/11/2022