

NOISE IMPACT ASSESSMENT

Proposed Residential Dwelling

Mill Farm, Endon

Issue Date: 20 June 2024

QUALITY ASSURANCE & REPORT INFORMATION

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Project: Proposed Residential Dwelling

Client: Nicole Williamson

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EXECUTIVE SUMMARY

This Assessment has been undertaken to identify the key sources of noise surrounding the Site which may adversely impact upon the proposed residential amenity. Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance in addition to appropriate British Standards and guidance documents relevant to the assessment of noise impacts.

This Assessment has shown that the rated level of noise from commercial activity at the Site will not exceed the external or internal noise criteria levels and as such, no noise mitigation is required.

The existing noise climate around the Site is sufficiently low enough which affords noise levels in external and internal habitable areas to accord with the 'No Observed Adverse Effect Level' as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Site.

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1 INTRODUCTION

1.1 Appointment

- 1.1.1 Professional Consult Limited was instructed by Nicole Williamson to prepare a Noise Impact Assessment ('the Assessment') in support of a proposed residential dwelling ('the Proposed Dwelling') at Mill Farm, Gratton Lane, Endon, Stoke-on-Trent ST9 9AG to be referred to hereafter as 'the Site'.

1.2 Purpose of Assessment

- 1.2.1 Staffordshire Moorlands District Council granted planning consent (Ref. DET/2023/0045) for the 'change of use of agricultural building to one dwelling house at Mill Farm' on 2nd February 2024, subject to conditions, of which condition No.3 relates to noise, as follows:

'The development shall be carried out to include and incorporate a scheme for protecting the dwellinghouse from noise resulting from the use of the neighbouring agricultural building and activity from the adjacent excavator training centre to the east. The scheme shall be designed to reflect and meet the findings and recommendations of a site specific noise assessment that has been undertaken in compliance with the criteria set out in BS4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS4142) and BS8233:2014 Sound insulation and noise reduction for buildings (Code of Practice).

Reason:- To protect the amenity of the future residential occupier from the noise generated by adjacent commercial uses.'

- 1.2.2 Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance in addition to appropriate British Standards and guidance documents relevant to the assessment of noise impacts.
- 1.2.3 All acronyms used within this report are defined in the Glossary presented in Appendix 2.

1.3 The Development

- 1.3.1 The Development will comprise of a dwelling house.

1.4 The Site, Locality & Soundscape

- 1.4.1 The Site is used as a plant and machinery operator training facility and has a number of earth and ground works machinery used to train plant operators. The Site operates over the following time periods:

Monday – Friday: 09:00 – 16:00; and

Saturday: 09:00 – 13:00.

- 1.4.2 The Proposed Dwelling is located off the main driveway to the Site and adjacent to a number of existing barn buildings used for storage.
- 1.4.3 The soundscape at the Proposed Dwelling is comprised of noise from distant off-Site agricultural operations and occasional vehicle noise from vehicles using the Site driveway.

1.5 Limitations

- 1.5.1 The limitations of this report are presented in Appendix 1.

1.6 Confidentiality

- 1.6.1 Professional Consult has prepared this report solely for the use of the Client. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Professional Consult; a charge may be levied against such approval.

2 POLICY & GUIDANCE

2.1 National Planning Policy Framework & National Planning Practice Guidance

- 2.1.1 The Government updated the National Planning Policy Framework (NPPF) on 20th December 2023 and its associated National Planning Practice Guidance (NPPG) on 20th November 2023. Together, the NPPF and NPPG set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments.
- 2.1.2 The NPPG adds further context to the NPPF and it is intended that the two documents should be read together.
- 2.1.3 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.
- 2.1.4 Local planning authorities' plan-making and decision making should take account of the acoustic environment and in doing so consider:
- ② Whether or not a significant adverse effect is occurring or likely to occur;
 - ② Whether or not an adverse effect is occurring or likely to occur; and
 - ② Whether or not a good standard of amenity can be achieved.
- 2.1.5 In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever 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.
- 2.1.6 The Observed Effect Levels are as follows:
- ② Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
 - ② 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; and
 - ② 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.
- 2.1.7 Table 1 summarises the noise exposure hierarchy, based on the likely average response.

Table 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
<i>Lowest Observed Adverse Effect Level</i>			
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; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
<i>Significant Observed Adverse Effect Level</i>			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed 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, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

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

2.1.9 These factors include:

- ② 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 - this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;
- ② For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- ② the spectral content of the noise and the general character of the noise. The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

2.1.10 More specific factors to consider when relevant:

- ② where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- ② 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. Further information on ventilation can be found in the Building Regulations; and

- ☞ If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

2.2 BS8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’

Noise Criteria Limits

- 2.2.1 The scope of this standard is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate.
- 2.2.2 The standard suggests suitable internal noise levels within different types of buildings, including dwellings, as shown in Table 3.

Table 2. BS8233:2014 Internal Target Noise Levels

Criterion	Typical Situation	Design $L_{Aeq,T}$ (dB)
Suitable resting / sleeping conditions	Living Room	35
	Bedroom*	30

*For a Reasonable standard in bedrooms at night, individual noise events (measured with fast time weighting) should not exceed 45dB L_{max}

- 2.2.3 BS8233 goes on to recommend noise levels for gardens as follows:

“It is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors might be warranted”.

- 2.2.4 BS8233 goes on to say:

“In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited”.

- 2.2.5 With regards to external noise within balcony areas, BS8233: 2014 provides the following advice:

“Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels”

Ventilation Requirements

- 2.2.6 Where a partially open window cannot be relied upon to provide an adequate level of facade sound insulation performance, it is necessary to consider alternative ventilation for habitable rooms. Section 8.4.5.4 within BS8233 states:

“The Building Regulations’ supporting documents on ventilation [48, 49, 50] recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant’s choice.

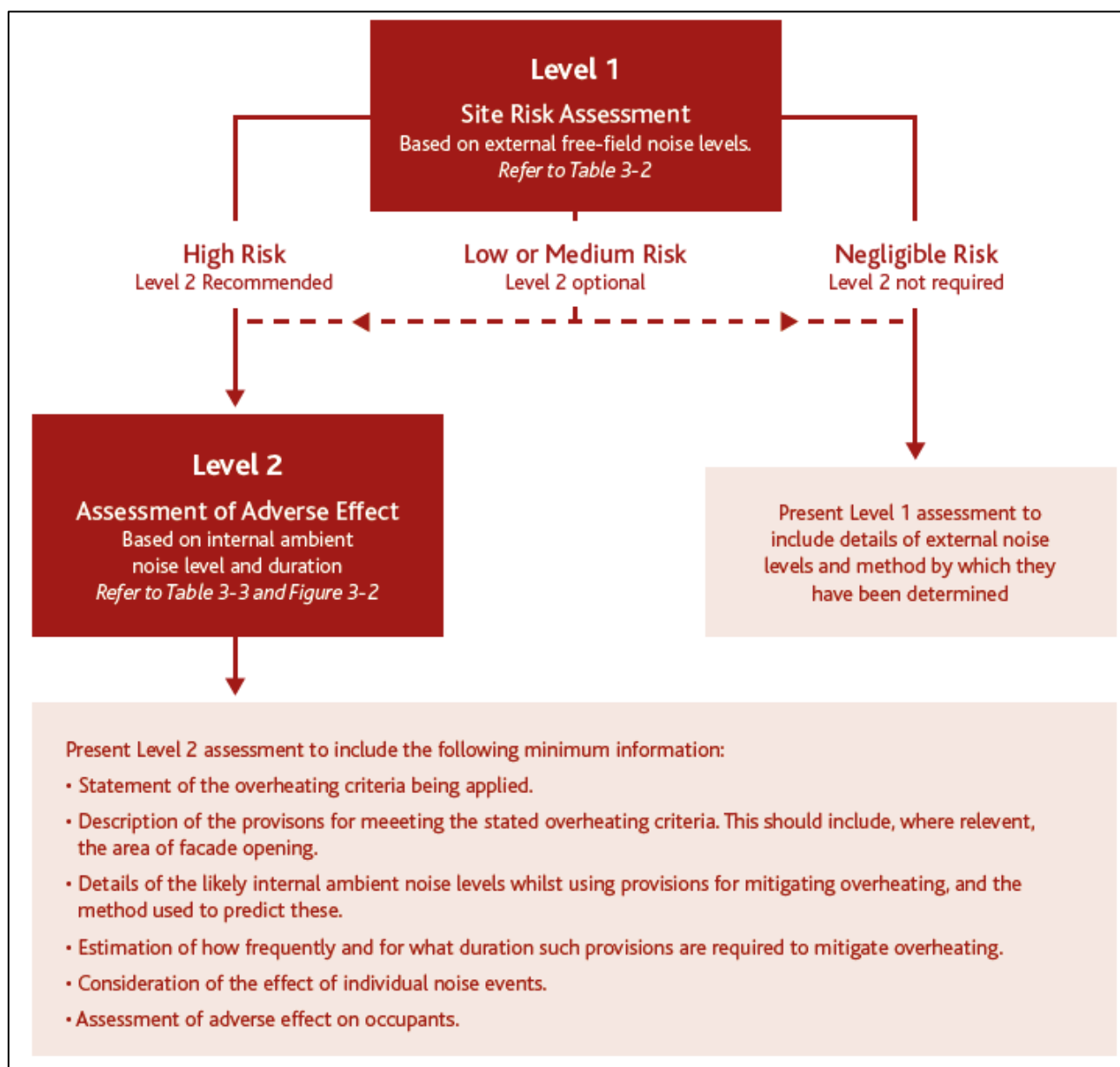
Alternatively, acoustic ventilation units (see 7.7.2 below) are available for insertion in external walls. These can provide sound reduction comparable with double glazed windows. However, ducted systems with intakes on the quiet side of the building might be required in very noisy situations, or where appearance rules out through-the-wall fans.”

Section 7.7.2 states:

“NOTE 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.”

2.3 INSTITUTE OF ACOUSTICS AND ASSOCIATION OF NOISE CONSULTANTS (2020) ACOUSTICS VENTILATION & OVERHEATING: RESIDENTIAL DESIGN GUIDE

2.3.1 The Acoustics Ventilation and Overheating (AVO) Residential Design Guide provides an approach as to how the competing aspects of thermal and acoustic comfort can be managed. The AVO Guide aims to assist designers to adopt an integrated approach to the acoustic design within the context of the ventilation and thermal comfort requirements. The AVO Guide provides a method for assessing the impact of opening windows and providing whole house ventilation due to the impact of noise via a two-level noise assessment procedure, as below:



2.3.2 A level 1 risk assessment is based on external free-field noise levels with the assumption of a partially opened window in use for mitigation of overheating. A level 1 assessment is appropriate for scenarios where the risk to a development is deemed 'Negligible'. 'Low' and 'Medium' risk sites only require a level 2 assessment on an optional basis in order to give further confidence in the suitability of internal noise conditions.

2.3.3 The noise levels suggested in Tables 3 and 4 assume steady road traffic noise source but can be adapted for other transport sources.

Table 3. Guidance for Level 1 Site Risk Assessment for Transportation Noise Sources Relating to Overheating Condition

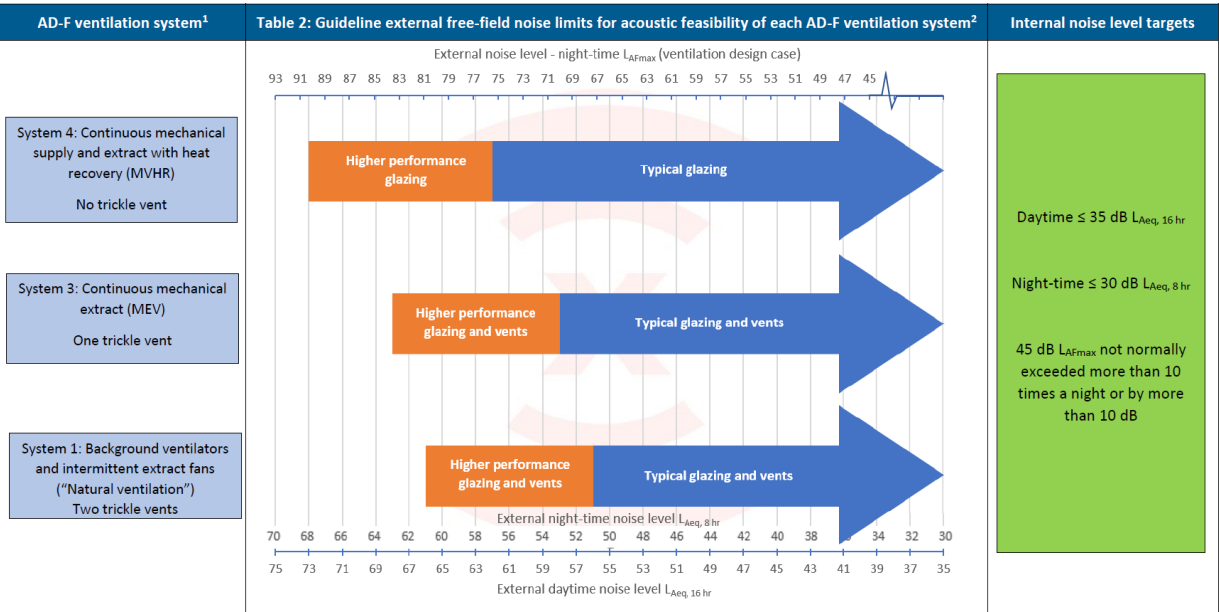
Risk Category for Level 1 Assessment - External		Risk Level	Potential Effect Without Mitigation	Recommendation for Level 2 Assessment
Daytime Noise Level, $L_{Aeq,t}$ (07:00 – 23:00)	Night-time Noise Level, $L_{Aeq,t}$ (23:00 – 07:00)			
$\geq 65\text{dB}$	$\geq 55\text{dB}$	High	Increasing risk of adverse effect	Recommended
$>55\text{dB}$ & $<63\text{dB}$	>45 & $<55\text{dB}$	Medium		Optional
$>50\text{dB}$ & $<55\text{dB}$		Low		
$\leq 50\text{dB}$	$\leq 45\text{dB}$	Negligible	Use of opening windows as means of mitigating overheating is not likely to result in in adverse effect	Not required

2.3.4 A level 2 assessment will be carried out when the risk of adverse effect is ‘High’ or it is deemed appropriate for a ‘low’ or ‘medium’ risk site. An increase in internal ambient noise level can cause a change in human behaviour. At high levels this creates situations where occupants can no longer open windows for ventilation due to high external noise levels. A level 2 assessment identifies these situations and allows for appropriate alternative ventilation systems to be recommended.

Table 4. Guidance for Level 2 Assessment of Noise from Transport Noise Sources Relating to Overheating Condition

Internal Ambient Noise Level			Example of Outcome
Daytime $L_{Aeq,t}$ (07:00 – 23:00)	Night-time $L_{Aeq,t}$ (23:00 – 07:00)	Individual Noise Events During 23:00 – 07:00	
$>50\text{dB}$	$>42\text{dB}$	Normally exceeds $65\text{dB } L_{Af,max}$	Noise causes a material change in behaviour eg. having to keep windows closed most of the time
Increasing noise level			Increasing the likelihood of impact on reliable speech communication during the daytime or sleep disturbance at night

2.3.5 The Table below details guideline external free-field noise limits and determines the appropriate AD-F ventilation system (Systems 1 – 4).



2.4 BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

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

- ② Sound from industrial and manufacturing processes;
- ② Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- ② Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and,
- ② 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.

2.4.2 The procedure detailed in the standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources 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.'

2.4.3 The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- ② Daytime (07:00 - 23:00): 1 hour; and
- ② Night-time (23:00 - 07:00): 15 minutes.

2.4.4 There are a number of 'penalties' which can be attributed to the specific sound level, either subjectively or objectively, depending upon the 'acoustic features' of the sound level under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows (with regards to the subject method):

Tonality

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

Impulsivity

- ② +3dB: where the impulsivity is just perceptible;
- ② +6dB: where the impulsivity is clearly perceptible; and
- ② +9dB: where the impulsivity is highly perceptible.

Intermittency

- ② +3dB: where the intermittency is readily distinctive against the acoustic environment.

- 2.4.5 Where the assessment is carried out using the objective method, the tonality penalty is either 0dB or 6dB and the impulsivity penalty can range from 0dB up to 9dB in increments of 1dB, depending on the level of impulsivity identified.
- 2.4.6 In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3dB where a sound exhibits characteristics that are neither tonal nor impulsive, though is readily distinctive against the acoustic environment.
- 2.4.7 BS4142 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.
- 2.4.8 Assessment of the rating level relative to the background noise level can yield the following commentary:
- ② Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact;
 - ② A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
 - ② A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
 - ② 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.
- 2.4.9 Whilst the amended 2019 Standard does make various references to it not being intended to assess noise impacts at indoor locations, section 1.1 does state 'The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident'. Example 6 in the Standard states 'In addition to the rating/background sound level comparison shown in Table A.6, the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows. Other guidance, such as BS 8233, might also be applicable in this instance'.
- 2.4.10 With the above in mind, and for a clear need to ensure that any potential commercial or industrial noise impacts at the building façade do not give rise to internal noise level which causes sleep disturbance in bedrooms, this Assessment will ensure that the predicted rating level (specific sound level including any character corrections) does not exceed 30dB in bedrooms.

2.5 Local Authority Guidance and Criteria – Staffordshire Moorlands District Council's Environmental Health Department

- 2.5.1 Consultation was provided to Staffordshire Moorlands District Council on 6th June 2024, which stated:

'We have been appointed by a client to undertake a Noise Impact Assessment in support for a proposed residential development at Mill Farm in Gratton ST9 9AG.

It is understood that planning permission has been received for the development, subject to the following condition relating to noise:

'The development shall be carried out to include and incorporate a scheme for protecting the dwellinghouse from noise resulting from the use of the neighbouring agricultural building and activity from the adjacent excavator training centre to the east. The scheme shall be designed to reflect and meet the findings and recommendations of a site specific noise assessment that has

been undertaken in compliance with the criteria set out in BS4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS 4142) and BS8233:2014 Sound insulation and noise reduction for buildings (Code of Practice).'

Professional Consult will complete the following noise surveys:

1. *Existing Commercial Noise: A noise survey for any existing commercial noise sources associated with the adjacent commercial uses will be completed; and*
2. *Background Noise Survey: A background noise survey will be complete at the dwelling over a full weekday and weekend period.*

Professional Consult will complete the following assessment:

3. *Commercial Noise: An assessment of commercial noise upon the proposed dwelling will be assessed against the noise criteria presented in BS4142:2014+A1:2019.*

Where exceedances of any noise criteria are identified, Professional Consult will recommend appropriate and reasonable noise mitigation measures to ensure that the noise level criteria will not be exceeded at the proposed residential dwellings.

If you have any comments, then please do advise at your earliest convenience.'

2.5.2 At the time of issuing this Assessment, no response had been received.

3 NOISE SURVEYS

3.1 Plant & Machinery Noise Survey

3.1.1 Professional Consult has completed noise measurements as follows:

 **Plant & Machinery Noise:** Noise measurements were taken of all plant and machinery which can operate and are detailed in Table 5 below.

Table 5. Measured Noise Levels

Plant Item	Measured Specific Noise Level, $L_{Aeq,t}$ (dB)	Measurement Distance (m)	Source Noise On-time Duration / Hour (mins)
JCB Dumper 6T	70.7	5	20
JCB Excavator	70.3	5	20
Tracked Excavator	71.0	4	20
Articulated Dump Truck – Tipping	75.2	2	20
JCB Wheeled Excavator	77.3	2	20
CAT 930H Loading Shovel	75.2	2	20
JCB 170 Skid Steer	73.2	2	20
Komatsu 210 Tracked Excavator	69.0	10	20

3.1.2 It should be noted that there is no regular noise associate with operations from the adjacent barn which is used for storage purposes only.

3.2 Background Sound Survey

3.2.1 Professional Consult has completed noise measurements as follows:

 **Noise Measurement Position 1:** Located 8m north west of the existing building which has received consent for conversion to residential use. Noise measurements were completed, in free-field conditions, between 13:00 on 13th June to 11:00 on 17th June 2024, thus capturing a full weekday and weekend period when the Site can operate. The sound climate at the microphone location comprised of distant off-Site agricultural operations associated with a neighbouring farm and occasional vehicles using the access driveway for the Site. There was no audible noise from any plant activity at the Site.

3.2.2 Table 6 details the measured background sound levels.

Table 6. Summary of Measured Background Sound Levels

Noise Measurement Position	Period	Measured Background Sound Level, $L_{A90,15mins}$ (dB)	
		Range	Typical (Mode Average)

NMP1	Weekday Daytime (09:00 – 16:00)	40 - 52	43
	Weekend Daytime (09:00 – 13:00)	40 - 44	43

3.3 Noise Survey Equipment

3.3.1 The following equipment was used for the noise surveys.

Table 7. Noise Measurement Equipment

Measurement Position	Equipment Description	Manufacturer & Type No	Serial No.	Calibration Due Date
On-Site Noise Measurements of Plant & NMP1 – Background Noise Survey	Sound Level Meter	01dB Fusion	15676	2 April 2026
	Pre-amplifier	01dB PRE22	2343059	
	Microphone	GRAS 40CD	606283	
	Calibrator	01dB CAL-31	104057	8 April 2025

3.3.2 The sound level meters were field calibrated prior to and following the noise surveys and there was no drift beyond the allowable limit of 1dB.

3.3.3 Table 8 indicates a summary of the measured weather conditions.

Table 8. Range of Measured Wind Speeds

Period	Range of Measured Wind Speeds (m/s)	Rainfall Recorded?
All periods	0 – 3.8	No

4 NOISE IMPACT ASSESSMENT

4.1 Commercial Noise

4.1.1 It is necessary to calculate a time-corrected sound power level, for each item plant item, for inclusion in the noise model and this is completed in Table 9.

Table 9. Calculation of Sound Power Levels

Plant	Location on Site	Measured Noise Level, $L_{Aeq,T}$ (dB)	Noise Measurement Distance (m)	On-time (mins)	Calculated Sound Power Level, L_{WA} (dB)	Point or Line Source in Noise Model
JCB Dumper 6T	Operates across Site	70.7	5	20	85.7	Line*
JCB Excavator	Operates in one location	70.3	5	20	85.3	Point
Tracked Excavator	Operates in one location	71	4	20	85.0	Point
Articulated Dump Truck - Tipping	Operates in one location	75.2	2	20	86.2	Point
JCB Wheeled Excavator	Operates across Site	77.3	2	20	88.3	Line*
CAT 930H Loading Shovel	Operates across Site	75.2	2	20	86.2	Line*
JCB 170 Skid Steer	Operates in one location	73.2	2	20	84.2	Point
Komatsu 210 Tracked Excavator	Operates in one location	69	10	20	87.0	Point
*Cumulative sound power level of the three line sources is 93.7dB L_{WA}						

4.1.2 For the purposes of this Assessment, Professional Consult has used noise modelling software CadnaA to determine the impact of Site noise at the proposed residential dwelling. A noise model has been constructed in order to calculate the noise level accordingly.

4.1.3 The following inputs have been included in the model:

- ② Proposed Scheme Layout;
- ② Site elevations have been taken as existing using 1m contours;
- ② Existing buildings or features that provide shielding have been included in the model;
- ② All plant has been assumed to operate at the same time in order to inform a robust assessment;
- ② The three items of plant which operate across the Site have been included as one cumulative line source, with the remaining plant items included as individual point sources;
- ② A reflection order of 2 has been used in all calculations; and
- ② Noise levels generated using ISO 9613-1 and ISO 9613-2 “Acoustics – Attenuation of sound during propagation outdoors” as incorporated into CadnaA software.

4.1.4 The grid noise map is detailed in Figure x of Appendix x and shows a specific noise level of 50dB at the Proposed Dwelling.

4.1.5 The following has been considered in determining if any acoustic features exist in the predicted noise level at the closest residential receptors:

- ② Tonality - In determining if any tones exist in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the objective method – either a 0dB penalty is allocated where no tones are present or 6dB penalty is allocated where tonality is present;
- ② Impulsivity – in determining if any impulsiveness is evident in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the objective method which can result in a penalty from 0dB to 9dB being allocated depending upon the extent of impulsiveness;
- ② Intermittency – whether or not the measured operations turn on or off during the (1hr) assessment period; and
- ② Other sound characteristics – where no penalties are allocated for the above features, but there will be an audible noise at the closest receptor.

4.1.6 Table 10 applies appropriate character corrections.

Table 10. Applicable Character Corrections

Measured Noise Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Comments
Mobile Plant	0	0	3	0	Possibility of intermittent noise audible at the Proposed Dwelling
Highest Correction for Assessment Period	0	0	3	0	
Overall Correction to be added to Specific Noise	+3dB				

4.1.1 Table 11 calculates the rated level of noise at the Proposed Dwelling for the period that the Site can operate and compares this with the typical background sound level.

Table 11. Calculation of Rated Noise Level & BS4142 Assessment

Period	Calculated Specific Noise Level at Receptor (dB)	Character Correction (dB)	Rating Level (dB)	Typical Background Sound Level (dB)	Difference +/- (dB)
Weekday	37.7	+3	40.7	43	-2.3
Weekend	37.7	+3	40.7	43	-2.3

4.1.2 Table 11 indicates that the rated level of noise does not exceed the background sound level at the façade of the Proposed Dwelling and so there is no requirement for noise mitigation. Nevertheless, it is necessary to consider internal noise levels within the Proposed Dwelling and so Table 12 calculates the rated level of noise in a living room for the daytime period.

Table 12. Calculation of Internal Noise Level

Period	Windows Closed / Open	Calculated Rated Noise Level at Receptor (dB)	Noise Attenuation Afforded (dB)	Calculated Internal Noise Level (dB)	Noise Criteria Level (Living Rooms) (dB)	Difference +/- (dB)
Daytime	Closed	40.7	-30	10.7	35	-24.3
	Open	40.7	-13	27.7	35	-7.3

4.1.3 Table 12 indicates that the rated level of noise internally within the Proposed Dwelling does not exceed the noise criteria level presented in BS8233:2014.

5 MITIGATION

- 5.1.1 The previous section has shown compliance with external and internal noise level criteria and so there is no requirement to consider noise mitigation.

6 CONCLUSION

- 6.1.1 Professional Consult Limited was instructed by Nicole Williamson to prepare a Noise Impact Assessment in support of a proposed residential dwelling at Mill Farm, Gratton Lane, Endon, Stoke-on-Trent ST9 9AG.
- 6.1.2 Staffordshire Moorlands District Council granted planning consent (Ref. DET/2023/0045) for the 'change of use of agricultural building to one dwelling house at Mill Farm' on 2nd February 2024, subject to conditions, of which condition No.3 relates to noise, as follows:

'The development shall be carried out to include and incorporate a scheme for protecting the dwellinghouse from noise resulting from the use of the neighbouring agricultural building and activity from the adjacent excavator training centre to the east. The scheme shall be designed to reflect and meet the findings and recommendations of a site specific noise assessment that has been undertaken in compliance with the criteria set out in BS4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS4142) and BS8233:2014 Sound insulation and noise reduction for buildings (Code of Practice).'

Reason:- To protect the amenity of the future residential occupier from the noise generated by adjacent commercial uses.'

- 6.1.3 The Development will comprise of a dwelling house.
- 6.1.4 The Site is used as a plant and machinery operator training facility and has a number of earth and ground works machinery used to train plant operators. The Site operates over the following time periods:
- 🔗 Monday – Friday: 09:00 – 16:00; and
 - 🔗 Saturday: 09:00 – 13:00.
- 6.1.5 The Proposed Dwelling is located off the main driveway to the Site and adjacent to a number of existing barn buildings used for storage.
- 6.1.6 The soundscape at the Proposed Dwelling is comprised of noise from distant off-Site agricultural operations and occasional vehicle noise from vehicles using the Site driveway.
- 6.1.7 This Assessment has been undertaken to identify the key sources of noise surrounding the Site which may adversely impact upon the proposed residential amenity. Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance in addition to appropriate British Standards and guidance documents relevant to the assessment of noise impacts.
- 6.1.8 This Assessment has shown that the rated level of noise from commercial activity at the Site will not exceed the external or internal noise criteria levels and as such, no noise mitigation is required.
- 6.1.9 The existing noise climate around the Site is sufficiently low enough which affords noise levels in external and internal habitable areas to accord with the 'No Observed Adverse Effect Level' as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Site.

APPENDIX 1: LIMITATIONS

This report and its findings should be considered in relation to the terms of reference and objectives agreed between Professional Consult Limited and the Client.

The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

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APPENDIX 2: GLOSSARY OF ACOUSTIC TERMINOLOGY

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.

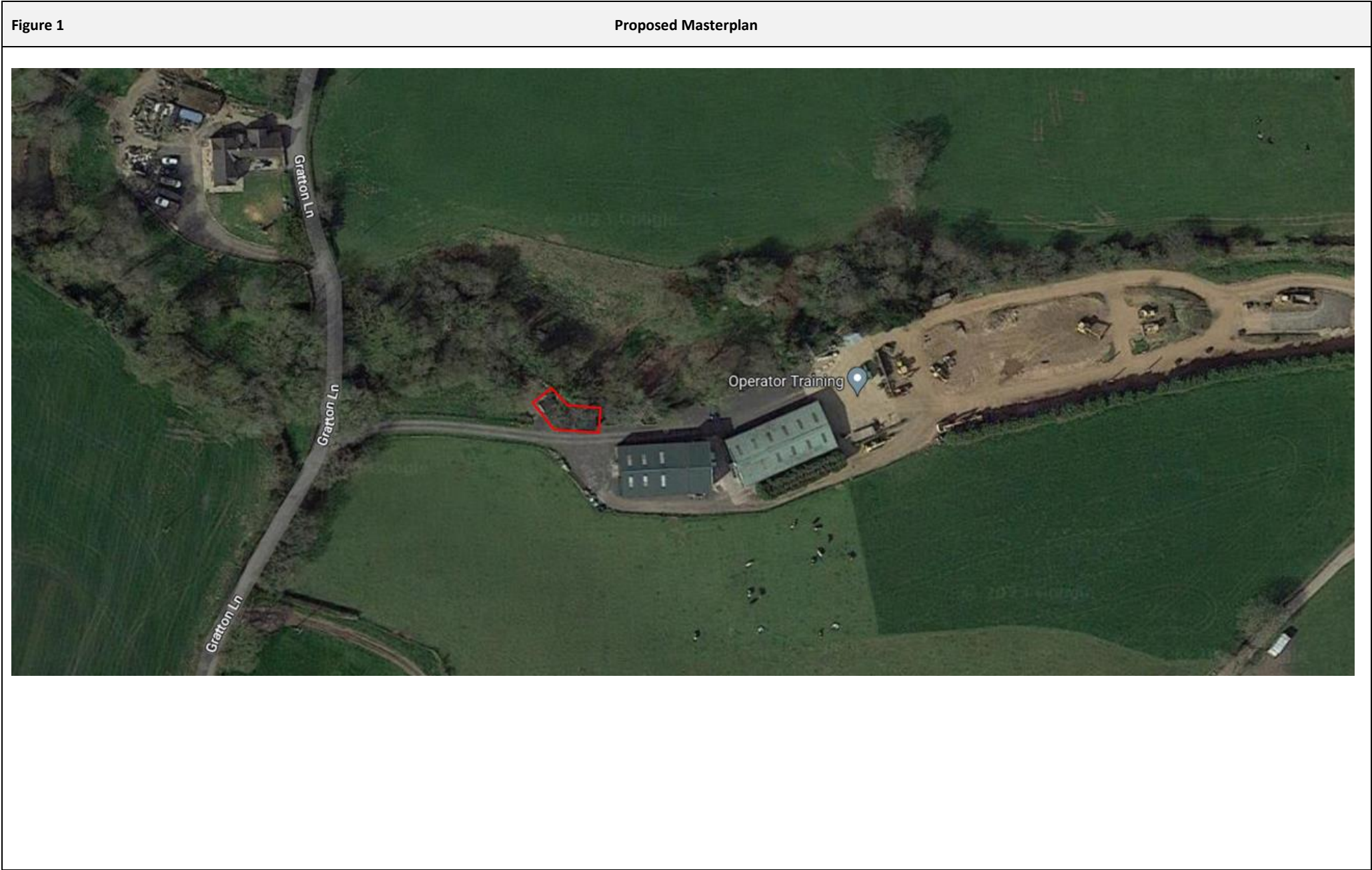
An indication of the range of sound levels commonly found in the environment is given in the following table.

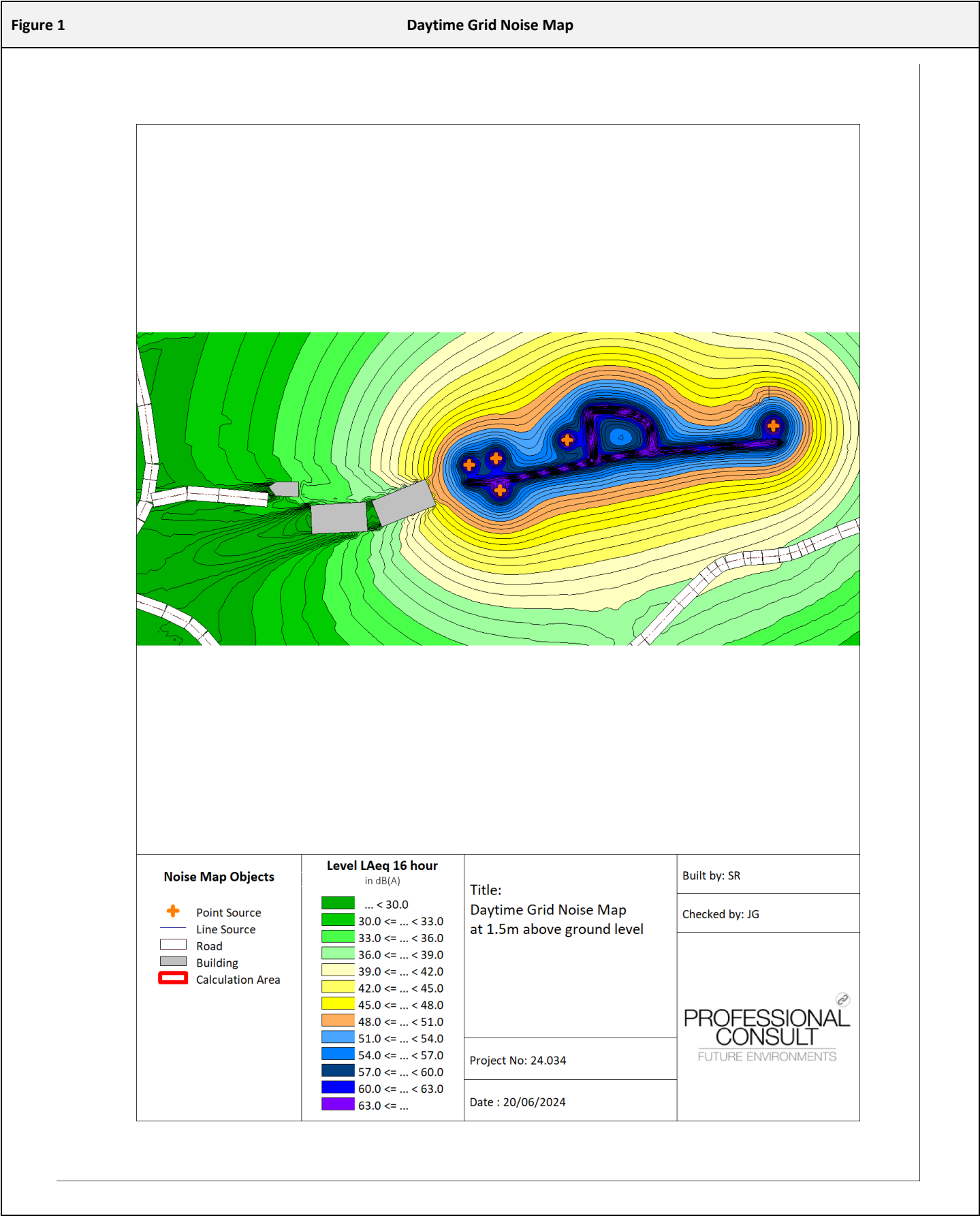
Table 1: Typical Sound Pressure Levels

Sound Pressure Level (dB)	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 factory
100 - 110	Burglar alarm at 1m away
110 - 130	Jet aircraft on take off
140	Threshold of pain

Table 2: 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 (2x10 ⁻⁵ 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 Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L ₁₀ & L ₉₀	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln 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	2A 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 125millisecond time constant.
Slow	A time weighting used in the root mean square section of a sound level meter with a 1000millisecond time constant.





APPENDIX 5: MEASURED BACKGROUND NOISE LEVELS

Period start	Measured Sound Pressure Level, dB	
	L _{Aeq}	L _{A90}
13/06/2024 13:00	54.9	47.6
13/06/2024 13:15	53.5	47.1
13/06/2024 13:30	49.5	44.6
13/06/2024 13:45	50.6	45.8
13/06/2024 14:00	54.5	46.6
13/06/2024 14:15	54.3	47.3
13/06/2024 14:30	54.5	48.8
13/06/2024 14:45	53.9	49
13/06/2024 15:00	53.3	47.5
13/06/2024 15:15	53.1	47.6
13/06/2024 15:30	53.3	47.8
13/06/2024 15:45	56.3	52
13/06/2024 16:00	55.4	49.4
13/06/2024 16:15	55	50.2
13/06/2024 16:30	57.6	52.7
13/06/2024 16:45	54.1	48.4
13/06/2024 17:00	56.3	49.5
13/06/2024 17:15	57.4	51.7
13/06/2024 17:30	57.8	53.5
13/06/2024 17:45	57.1	52
13/06/2024 18:00	54.3	49.1
13/06/2024 18:15	56.5	49.1
13/06/2024 18:30	52.5	47.6
13/06/2024 18:45	52.2	47.7
13/06/2024 19:00	53.8	48.1
13/06/2024 19:15	52.2	46.2
13/06/2024 19:30	53.5	47.6
13/06/2024 19:45	52.3	46.9
13/06/2024 20:00	50.8	45.3
13/06/2024 20:15	53.5	47.7
13/06/2024 20:30	53.3	47.9
13/06/2024 20:45	52.3	46.2
13/06/2024 21:00	54.5	49.7
13/06/2024 21:15	49.7	44.7
13/06/2024 21:30	51.5	45.8
13/06/2024 21:45	53.7	46.4
13/06/2024 22:00	51.4	45.7
13/06/2024 22:15	49	44.3
13/06/2024 22:30	49.3	43.2
13/06/2024 22:45	50.6	45.8
13/06/2024 23:00	49.5	43.8
13/06/2024 23:15	47.2	41.2
13/06/2024 23:30	43.6	40.6

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Date: 20 June 2024
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13/06/2024 23:45	44.3	39.2
14/06/2024 00:00	43.1	39.9
14/06/2024 00:15	41.2	38.6
14/06/2024 00:30	42.8	39
14/06/2024 00:45	42.3	39.8
14/06/2024 01:00	42.3	38.3
14/06/2024 01:15	42.9	38.9
14/06/2024 01:30	42.9	39.3
14/06/2024 01:45	42.9	38.9
14/06/2024 02:00	40.1	38.1
14/06/2024 02:15	43	38.5
14/06/2024 02:30	39.1	37.6
14/06/2024 02:45	39.8	37.9
14/06/2024 03:00	39.4	37.8
14/06/2024 03:15	40	37.9
14/06/2024 03:30	41.9	38.1
14/06/2024 03:45	50.2	41.1
14/06/2024 04:00	54.1	46.7
14/06/2024 04:15	51.5	44.5
14/06/2024 04:30	49.9	43.7
14/06/2024 04:45	51.7	43.6
14/06/2024 05:00	50.1	41.5
14/06/2024 05:15	51	41.3
14/06/2024 05:30	49.9	42.7
14/06/2024 05:45	51.4	41.3
14/06/2024 06:00	51.6	42.9
14/06/2024 06:15	50.4	42.5
14/06/2024 06:30	49.2	43.4
14/06/2024 06:45	51.2	44.2
14/06/2024 07:00	55.3	43.4
14/06/2024 07:15	59.5	43.6
14/06/2024 07:30	47.4	44
14/06/2024 07:45	49.6	44.6
14/06/2024 08:00	49.2	44
14/06/2024 08:15	48.3	43.9
14/06/2024 08:30	52.7	43.8
14/06/2024 08:45	50.7	44.2
14/06/2024 09:00	51.9	43.3
14/06/2024 09:15	52.2	44.3
14/06/2024 09:30	49.4	44.9
14/06/2024 09:45	50.2	44.1
14/06/2024 10:00	51.3	45.7
14/06/2024 10:15	49.9	42.9
14/06/2024 10:30	49.3	43.9
14/06/2024 10:45	49.7	43.1
14/06/2024 11:00	48.2	43

Reference: 24.034.1.R1
Date: 20 June 2024
Project: Proposed Residential Dwelling

14/06/2024 11:15	53.3	45.5
14/06/2024 11:30	53.2	47.1
14/06/2024 11:45	50.7	45.1
14/06/2024 12:00	49.3	44.3
14/06/2024 12:15	46.7	41.6
14/06/2024 12:30	47.5	42.4
14/06/2024 12:45	52.8	45
14/06/2024 13:00	51	44.8
14/06/2024 13:15	47.3	41.4
14/06/2024 13:30	48.1	42.1
14/06/2024 13:45	48.2	42.6
14/06/2024 14:00	49	42.7
14/06/2024 14:15	47.8	40.3
14/06/2024 14:30	45.4	40.4
14/06/2024 14:45	44.2	39.8
14/06/2024 15:00	47.4	42.3
14/06/2024 15:15	46.6	42
14/06/2024 15:30	49.1	41.5
14/06/2024 15:45	54.2	42.6
14/06/2024 16:00	46.7	40.9
14/06/2024 16:15	45.2	40.3
14/06/2024 16:30	48.2	40.7
14/06/2024 16:45	44.6	39.8
14/06/2024 17:00	44	39.9
14/06/2024 17:15	47.5	40.4
14/06/2024 17:30	48.8	40.4
14/06/2024 17:45	49.5	41.2
14/06/2024 18:00	46.7	42.1
14/06/2024 18:15	46.4	39.4
14/06/2024 18:30	48.1	39
14/06/2024 18:45	46.9	39.5
14/06/2024 19:00	46.5	39.9
14/06/2024 19:15	43.5	39.3
14/06/2024 19:30	47.1	41.2
14/06/2024 19:45	45.3	41
14/06/2024 20:00	45.1	40.3
14/06/2024 20:15	44.7	40.2
14/06/2024 20:30	50.1	41.1
14/06/2024 20:45	50.3	40.6
14/06/2024 21:00	47.2	40.1
14/06/2024 21:15	49.1	40.3
14/06/2024 21:30	50.2	41.6
14/06/2024 21:45	52.5	50.3
14/06/2024 22:00	48.4	45.3
14/06/2024 22:15	46	43.2
14/06/2024 22:30	43.4	40.6

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14/06/2024 22:45	51.3	40.9
14/06/2024 23:00	57	53.4
14/06/2024 23:15	56.2	54.8
14/06/2024 23:30	53.1	47.4
14/06/2024 23:45	50.5	45.5
15/06/2024 00:00	48.8	44.7
15/06/2024 00:15	45	43.1
15/06/2024 00:30	44.6	41.3
15/06/2024 00:45	41.7	40
15/06/2024 01:00	40.6	39.3
15/06/2024 01:15	40.6	39
15/06/2024 01:30	40.5	38.7
15/06/2024 01:45	40	38.7
15/06/2024 02:00	41	38.4
15/06/2024 02:15	43.6	38.3
15/06/2024 02:30	39.9	38.3
15/06/2024 02:45	39.4	38.1
15/06/2024 03:00	40.2	38.1
15/06/2024 03:15	39.6	38
15/06/2024 03:30	38.8	37.8
15/06/2024 03:45	42.5	38.1
15/06/2024 04:00	56.2	44.1
15/06/2024 04:15	52.9	45.3
15/06/2024 04:30	57.8	44.7
15/06/2024 04:45	53.4	44.5
15/06/2024 05:00	54.8	42.6
15/06/2024 05:15	59.7	41.6
15/06/2024 05:30	53	41.3
15/06/2024 05:45	54.4	40.9
15/06/2024 06:00	51.1	40.7
15/06/2024 06:15	52.7	41.3
15/06/2024 06:30	52.1	41.7
15/06/2024 06:45	49.7	41.4
15/06/2024 07:00	52.7	42.1
15/06/2024 07:15	61.2	42.6
15/06/2024 07:30	48	41.7
15/06/2024 07:45	48.8	41.8
15/06/2024 08:00	52.5	41.5
15/06/2024 08:15	59.9	42.4
15/06/2024 08:30	48.7	42.1
15/06/2024 08:45	48.9	42.5
15/06/2024 09:00	49.4	43.9
15/06/2024 09:15	46	43.5
15/06/2024 09:30	48.3	43.7
15/06/2024 09:45	56.6	44.2
15/06/2024 10:00	47.8	43.3

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15/06/2024 10:15	51.4	44.1
15/06/2024 10:30	53.8	43.3
15/06/2024 10:45	55	43.4
15/06/2024 11:00	50.5	43.1
15/06/2024 11:15	54.5	43.3
15/06/2024 11:30	57.4	43
15/06/2024 11:45	56.3	43.4
15/06/2024 12:00	55	44.2
15/06/2024 12:15	46.2	42
15/06/2024 12:30	48.6	41.9
15/06/2024 12:45	54.6	40
15/06/2024 13:00	49.3	40.9
15/06/2024 13:15	44.5	39.7
15/06/2024 13:30	44	40
15/06/2024 13:45	47.1	41.6
15/06/2024 14:00	46.9	40.7
15/06/2024 14:15	52.9	40.9
15/06/2024 14:30	47.5	41.1
15/06/2024 14:45	47.8	40.7
15/06/2024 15:00	49	41
15/06/2024 15:15	47.7	41.5
15/06/2024 15:30	49.6	42.3
15/06/2024 15:45	50.5	41.9
15/06/2024 16:00	44.8	40.6
15/06/2024 16:15	49.3	42.3
15/06/2024 16:30	51.8	42.4
15/06/2024 16:45	54	41.3
15/06/2024 17:00	56.9	40.2
15/06/2024 17:15	52	40.5
15/06/2024 17:30	51.4	40.8
15/06/2024 17:45	45.3	40
15/06/2024 18:00	48.8	40.8
15/06/2024 18:15	44.9	40.2
15/06/2024 18:30	46.1	40.3
15/06/2024 18:45	46.7	41.1
15/06/2024 19:00	45	41
15/06/2024 19:15	45	41.1
15/06/2024 19:30	45.2	41.6
15/06/2024 19:45	46.4	40.9
15/06/2024 20:00	47.6	40.9
15/06/2024 20:15	44.6	41
15/06/2024 20:30	44.4	41.2
15/06/2024 20:45	44.1	41.4
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15/06/2024 21:15	43.9	41.4
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15/06/2024 22:00	42.8	40.8
15/06/2024 22:15	41.7	40.6
15/06/2024 22:30	42.7	40.9
15/06/2024 22:45	41.6	40.6
15/06/2024 23:00	42.2	40.5
15/06/2024 23:15	43.3	40.5
15/06/2024 23:30	41.4	40.5
15/06/2024 23:45	50.4	42.8
16/06/2024 00:00	43.5	41.3
16/06/2024 00:15	42.5	41
16/06/2024 00:30	42.2	40.7
16/06/2024 00:45	41	40.2
16/06/2024 01:00	44.7	40.1
16/06/2024 01:15	42.8	40.2
16/06/2024 01:30	49.2	44.6
16/06/2024 01:45	51	48.7
16/06/2024 02:00	50.3	46.7
16/06/2024 02:15	46.5	43.3
16/06/2024 02:30	42.9	41.2
16/06/2024 02:45	41.7	40.5
16/06/2024 03:00	42.9	40.6
16/06/2024 03:15	54.6	44.7
16/06/2024 03:30	56.5	48.6
16/06/2024 03:45	49.9	46.8
16/06/2024 04:00	54.9	47.6
16/06/2024 04:15	52.7	45.2
16/06/2024 04:30	54.5	44.8
16/06/2024 04:45	53.5	44.9
16/06/2024 05:00	55.9	43.9
16/06/2024 05:15	59.8	43.5
16/06/2024 05:30	59.6	43.6
16/06/2024 05:45	75.3	44
16/06/2024 06:00	54.9	42.2
16/06/2024 06:15	55	42.7
16/06/2024 06:30	53.4	43.4
16/06/2024 06:45	51.6	43.5
16/06/2024 07:00	50.5	43.4
16/06/2024 07:15	48.1	42.7
16/06/2024 07:30	55.4	42.1
16/06/2024 07:45	49.2	42.6
16/06/2024 08:00	51.7	43.7
16/06/2024 08:15	49.4	43.3
16/06/2024 08:30	51.7	43.3
16/06/2024 08:45	49.5	42.2
16/06/2024 09:00	49.3	42.9

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16/06/2024 09:15	46.3	42.5
16/06/2024 09:30	48.6	42.7
16/06/2024 09:45	48.1	43.2
16/06/2024 10:00	49	42.3
16/06/2024 10:15	51.9	43.1
16/06/2024 10:30	49.6	42.3
16/06/2024 10:45	49.8	42.4
16/06/2024 11:00	45.8	42.1
16/06/2024 11:15	45.4	42.3
16/06/2024 11:30	47.6	42
16/06/2024 11:45	46.1	42.4
16/06/2024 12:00	47.5	43.2
16/06/2024 12:15	45.7	42
16/06/2024 12:30	48.4	42.1
16/06/2024 12:45	47.4	42.8
16/06/2024 13:00	47.9	42.6
16/06/2024 13:15	49.2	42.4
16/06/2024 13:30	45.1	42.5
16/06/2024 13:45	46.3	42.5
16/06/2024 14:00	45.8	42.6
16/06/2024 14:15	47.4	44.2
16/06/2024 14:30	46.8	41.7
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16/06/2024 15:15	47.4	42
16/06/2024 15:30	49.3	42.7
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16/06/2024 16:00	45.1	41.1
16/06/2024 16:15	52.7	40.9
16/06/2024 16:30	45.1	41
16/06/2024 16:45	45.9	41
16/06/2024 17:00	43	40.9
16/06/2024 17:15	47.3	41.1
16/06/2024 17:30	54.1	43.4
16/06/2024 17:45	51.8	41.6
16/06/2024 18:00	46.8	41.6
16/06/2024 18:15	48	41.3
16/06/2024 18:30	47.5	41.1
16/06/2024 18:45	43.6	40.4
16/06/2024 19:00	44.2	40.7
16/06/2024 19:15	47.3	41.5
16/06/2024 19:30	48.1	40.5
16/06/2024 19:45	48.9	41.9
16/06/2024 20:00	44.2	41.7
16/06/2024 20:15	45.5	41.2
16/06/2024 20:30	44.2	41

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16/06/2024 20:45	46.2	41.4
16/06/2024 21:00	48.7	41.2
16/06/2024 21:15	42.9	41.2
16/06/2024 21:30	42.1	40.6
16/06/2024 21:45	43.2	40.9
16/06/2024 22:00	44.5	41.3
16/06/2024 22:15	43.9	40.3
16/06/2024 22:30	41.6	40.1
16/06/2024 22:45	41.3	39.9
16/06/2024 23:00	40.9	39.8
16/06/2024 23:15	40.5	39.9
16/06/2024 23:30	40.2	39.7
16/06/2024 23:45	39.9	39.5
17/06/2024 00:00	41.1	39.6
17/06/2024 00:15	41.3	39.7
17/06/2024 00:30	40.1	39.5
17/06/2024 00:45	40.5	39.3
17/06/2024 01:00	43.6	39.4
17/06/2024 01:15	40.9	39.8
17/06/2024 01:30	40.5	39.6
17/06/2024 01:45	40	39.5
17/06/2024 02:00	39.9	39.4
17/06/2024 02:15	40.8	39.5
17/06/2024 02:30	39.9	39.6
17/06/2024 02:45	39.9	39.5
17/06/2024 03:00	39.7	39.3
17/06/2024 03:15	40.3	39.4
17/06/2024 03:30	42.4	39.5
17/06/2024 03:45	49.3	40
17/06/2024 04:00	55.5	44.3
17/06/2024 04:15	55.9	46
17/06/2024 04:30	50.7	45.1
17/06/2024 04:45	53.5	44.9
17/06/2024 05:00	52.4	43.3
17/06/2024 05:15	50.3	42.3
17/06/2024 05:30	52	42.8
17/06/2024 05:45	52.9	42.6
17/06/2024 06:00	51.1	41.8
17/06/2024 06:15	54.4	42.4
17/06/2024 06:30	51	41.6
17/06/2024 06:45	55.1	41.3
17/06/2024 07:00	54	41.2
17/06/2024 07:15	49.3	42.1
17/06/2024 07:30	51.7	43
17/06/2024 07:45	47.9	41.3
17/06/2024 08:00	49.9	42.6

17/06/2024 08:15	51.4	42.7
17/06/2024 08:30	49.5	41.3
17/06/2024 08:45	59.6	43.1
17/06/2024 09:00	50.1	44
17/06/2024 09:15	49.9	42.9
17/06/2024 09:30	50	41.3
17/06/2024 09:45	50.9	42.6
17/06/2024 10:00	51.3	42.5
17/06/2024 10:15	48.3	41.6
17/06/2024 10:30	50.8	41.6
17/06/2024 10:45	53.4	42.8

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