

NOISE IMPACT ASSESSMENT

Westfield Energy Conservation Park

VERSION 1

July 2025

Metrica Environmental Consulting Ltd.

info@metricaconsulting.co.uk

www.metricaconsulting.co.uk

Registered in England & Wales No. 14475772

TABLE OF CONTENTS

1	INTRODUCTION-----	1
2	DEVELOPMENT OVERVIEW -----	1
3	GUIDANCE-----	1
3.1	The National Planning Policy Framework -----	1
3.2	The Noise Policy Statement for England-----	2
3.3	BS 4142:2014 -----	2
3.4	Noise Rating Curves -----	3
3.5	BS 5228:2009+A1:2014 code of practice for noise and vibration control on construction and open sites-----	3
4	CONSULTATION -----	4
5	BACKGROUND NOISE SURVEY -----	5
6	SURVEY RESULTS -----	6
6.1	Noise Monitoring Location 1 -----	6
6.2	Noise Monitoring Location 2-----	8
6.3	Noise Monitoring Location 3-----	10
7	NOISE MODELLING -----	12
7.1	Noise Emission Data-----	12
7.2	Modelling Parameters-----	13
7.3	Rating Level Corrections-----	13
8	ASSESSMENT OF IMPACT -----	14
8.1	Daytime (0700 – 2300) Impact Assessment -----	14
8.2	Night-Time (2300-0700) Impact Assessment-----	15
9	CONSTRUCTION NOISE -----	16
10	CUMULATIVE ASSESSMENT -----	17
11	CONCLUSION -----	18
12	GLOSSARY OF TERMS -----	19

1 INTRODUCTION

Metrica Environmental Consulting Ltd ('Metrica') has been commissioned by Lanpro ('the Client') to undertake a Noise Impact Assessment in relation to the development of Westfield Energy Conservation Park ('the Proposed Development') comprising a Battery Energy Storage System (BESS) and co-located ground mounted solar farm, associated infrastructure, access, biodiversity enhancements and landscaping on land south of A507 at Westfield Common, Hertfordshire ('the Site').

The aim of this assessment is to assess the noise generated by the Proposed Development against relevant guidance and incorporate mitigation measures as necessary to ensure the amenity of residents surrounding the Proposed Development is not unreasonably impacted.

2 DEVELOPMENT OVERVIEW

The Proposed Development is situated in a predominantly rural area, 1.3 km southeast of Clothall and adjacent to the southwest of Cumberlow Green. The A507 runs along the northern boundary of the Site, while the remaining Proposed Development is surrounded by agricultural fields. The closest noise-sensitive receptors (NSRs) are located in Cumberlow Green to the east / northeast of the Site. A small number of other NSRs are located to the north and south of the Site boundary.

The Proposed Development is located to the west of the proposed Beane Solar Farm (application reference: 3/24/2245/FUL), which was submitted to East Herts Council in December 2024, and at the time of writing is currently awaiting decision.

A figure detailing the Proposed Development layout is presented in Appendix 1.

3 GUIDANCE

The following guidance and standards are pertinent to the assessment:

- ◆ The National Planning Policy Framework (NPPF);
- ◆ The Noise Policy Statement for England (NPSE);
- ◆ BS 4142:2014 +A1:2019 *Method for rating and assessing industrial and commercial sound* ('BS 4142');
- ◆ NR Curves – ISO 1996-1:2016 (en) Acoustics – Description, measurement, and assessment of environmental noise – Part 1: Basic quantities and assessment procedures; and
- ◆ BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 (Noise).

3.1 THE NATIONAL PLANNING POLICY FRAMEWORK

The NPPF sets out the Government's planning policies for England, providing a framework within which local policies can be developed. The key principle of the NPPF is a presumption in favour of sustainable development. With regards to noise, the NPPF states that sustainable development can be achieved by:

- ◆ Avoiding noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- ◆ Mitigating and reducing to a minimum potential adverse impacts resulting from noise from new development, including through the use of conditions; and

- ◆ Identifying and protecting areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

3.2 THE NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The NPSE sets out the purpose of noise policy, together with the Government's Noise Policy Vision and Aims, consistent with the NPPF.

The aims of the NPSE require that:

- ◆ Significant adverse effects on health and quality of life are avoided, while taking into account the guiding principles of sustainable development;
- ◆ Adverse impacts on health and quality of life are mitigated or minimised; and
- ◆ Where possible, noise management should seek to improve health and quality of life within the context of Government policy on sustainable development.

Paragraph 2.24 of the NPSE states that in relation to minimising and mitigating adverse impacts:

"...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur."

3.3 BS 4142:2014

BS 4142:2014 provides a method for rating and assessing noise in order to provide an indication of its likely impact on nearby NSRs.

The standard provides advice for monitoring background noise and the subsequent derivation of an appropriate representative background level (dB L_{A90}).

The 'Specific' noise level at NSRs due to noise from a development (generally predicted using noise modelling software) is rated by applying corrections to account for the acoustic characteristics of the sound. Acoustic characteristics considered are tonality, impulsivity, intermittency and distinctiveness. Each characteristic has its own penalty based on how noticeable the characteristic is at the NSR location. The resultant 'Rating' level is then assessed against the representative background sound level at the NSR to determine a likely level of impact.

An initial assessment is undertaken based on the level by which the Rating level exceeds the representative background sound level, as follows:

- ◆ A difference of 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
- ◆ Where the rating level does not exceed the background level, this is an indication of the specific sound source having a low impact, depending on context.

Once an initial estimate of the impact has been undertaken, the level of impact can be modified up or down, due to the site context, including the absolute level of noise, character of the sound and / or sensitivity of the NSR.

BS 4142 states that where the rating level and background levels at a receptor are low, changes in the absolute level should be taken into account. It states:

"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."

BS 4142:1997 included a note stating that background levels below 30 dB(A) were considered "very low", and that care should be taken when making assessments in such conditions.

3.4 NOISE RATING CURVES

Noise Rating (NR) curves were developed by the International Organisation for Standardisation¹ (ISO) to determine acceptable indoor sound environment for hearing preservation, speech intelligibility, and annoyance. NR curves serve as a standardised way to measure and specify noise within buildings / occupied spaces, taking into account the frequency content of the noise.

To obtain an NR rating level, the noise spectrum is compared to a series of unweighted (dB) octave-band values. The resulting NR level is that which is entirely above the predicted noise level spectrum. Table 1 below presents the octave band levels for NR20, which is typically used by Local Authorities for the assessment of internal noise within bedrooms during night-time periods.

Table 1: NR Curve Levels for NR20

	Octave Band Frequencies (Hz)							
	63	125	250	500	1000	2000	4000	8000
	Octave Band Noise Level dB(Z)							
NR20	51	39	31	24	20	17	14	13

3.5 BS 5228:2009+A1:2014 CODE OF PRACTICE FOR NOISE AND VIBRATION CONTROL ON CONSTRUCTION AND OPEN SITES

BS 5228 refers to the need for the protection against noise and vibration of persons living and working in the vicinity of and those working on construction and open sites. It recommends procedures for noise and vibration control in respect of construction operations. The discussion below relates mainly to Part 1- Noise, however, the recommendations of Part 2 in terms of vibration are very similar.

The standard stresses the importance of community relations, and states that early establishment and maintenance of these relations throughout site operations will go some way towards allaying people's concerns. In terms of neighbourhood nuisance, the following factors are likely to affect the acceptability of construction noise:

- ◆ Site location, relative to the noise sensitive premises;
- ◆ Existing ambient noise levels;
- ◆ Duration of site operations;

¹ ISO 1996-1:2016(en) *Acoustics – Description, measurement, and assessment of environmental noise – Part 1: Basic quantities and assessment procedures.*

- ◆ Hours of work;
- ◆ The attitude of local residents to the site operator; and
- ◆ The characteristics of the noise produced.

Recommendations are made regarding the supervision, planning, preparation and execution of works, emphasising the need to consider noise at every stage of the operation.

Measures to control noise are described, including:

- ◆ Control of noise at source by e.g.:
 - ◇ Substitution of plant or activities by less noisy ones;
 - ◇ Modification of plant or equipment to reduce noise emissions;
 - ◇ The use of noise control enclosures;
 - ◇ The siting of equipment and its method of use;
 - ◇ Equipment maintenance; and
- ◆ Controlling the spread of noise, e.g., by increasing the distance between plant and noise-sensitive premises or by the provision of acoustic screening.

4 CONSULTATION

A pre-app request for the Proposed Development was initially submitted to North Herts Council ('the Council') in February 2025, with a response provided in June 2025. With regard to noise, the response stated that a noise assessment should be submitted to support the application, and the assessment should consider impacts arising from both construction and operational noise. The response also stated that the assessment should consider cumulative noise impacts arising from the Proposed Development and the adjacent Beane Farm Solar within East Herts district.

A consultation email was sent to the Environmental Health Department (EHD) of North Herts Council in February 2025 prior to the survey to allow the EHD to comment further on the proposed assessment methodology and criteria, if required. The email confirmed that:

- ◆ The assessment would be undertaken in accordance with the methodology in BS 4142;
- ◆ Monitoring would be undertaken over a period of 5 days to determine the background sound levels during daytime and night-time periods. The monitoring would be undertaken at locations representative of NSRs to the north and south of the proposed solar array, and to the east of the proposed BESS plant;
- ◆ Noise emissions from the Proposed Development would be predicted at the closest (and therefore most noise-sensitive) NSRs using noise modelling software;
- ◆ The assessment would include consideration of the cumulative impacts from the Proposed Development and Beane Solar Farm;
- ◆ Predicted Rating levels will be assessed against BS 4142 criteria, with a target of no more than 5 dB above the representative background level;
- ◆ Where background levels are found to be low, the assessment will consider absolute noise levels at the nearest receptors, in line with the recommendations of BS 4142; and
- ◆ Due to the temporary nature of the works, it is not considered necessary to undertake a detailed assessment of construction noise.

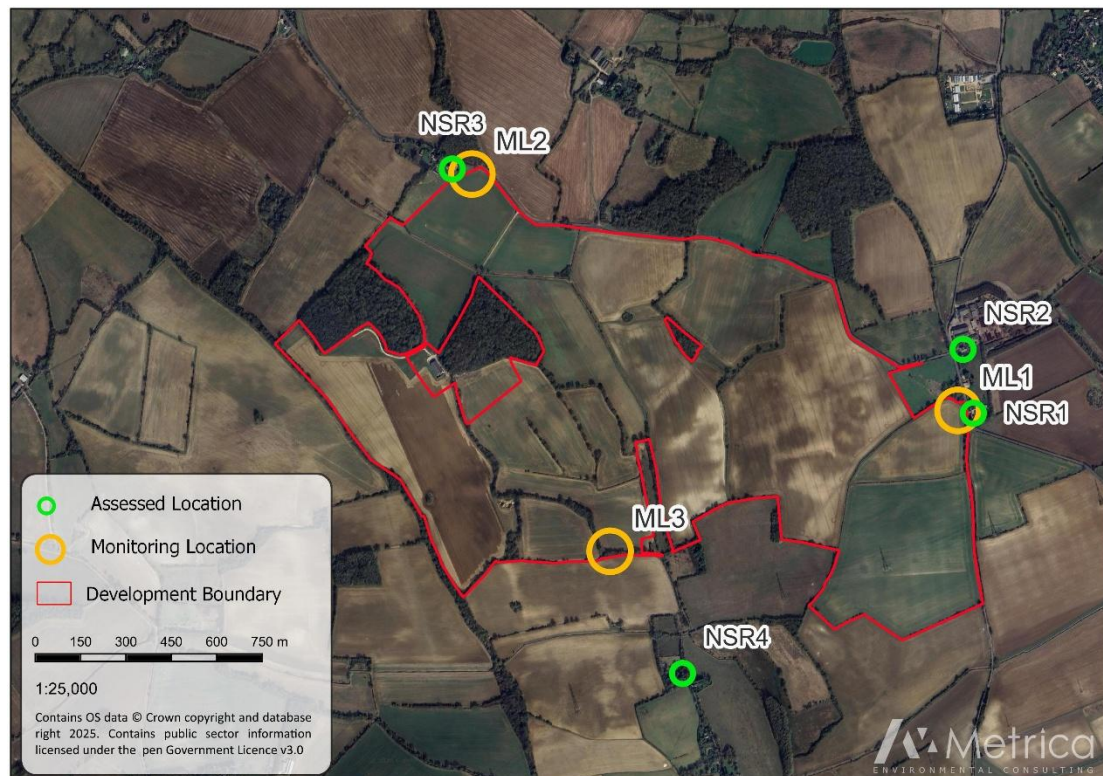
No response was received from the EHD, and as such the assessment has been undertaken in line with the pre-app response and the methodology and assessment criteria set out above.

5 BACKGROUND NOISE SURVEY

To establish the background sound environment in the locality of the Proposed Development, background noise monitoring was undertaken at three locations between Friday 14th and Tuesday 18th February 2025.

Figure 1 shows the background monitoring locations, the NSR locations and the Proposed Development boundary.

Figure 1: Monitoring and Assessment Locations



The monitoring equipment consisted of three Class 1 sound level meters, calibrated to traceable standards and housed in an all-weather case with long-life batteries. The microphones were positioned at a height of 1.4 m above ground level, with suitable proprietary windshields. The meters were field calibrated at the start and end of the survey period; no significant calibration drift was found.

Various indices were measured by the equipment during the survey period, including $L_{A90,15\text{mins}}$. The L_{A90} index represents the A-weighted sound pressure level exceeded for 90% of a time period, in this case, 15 minutes (i.e., the background sound level).

With regard to weather conditions², intermittent rainfall occurred between 1015 and 1700 on 15th February. As a conservative measure, this period has been omitted from further analysis. Wind speeds were below 5 m/s throughout the survey.

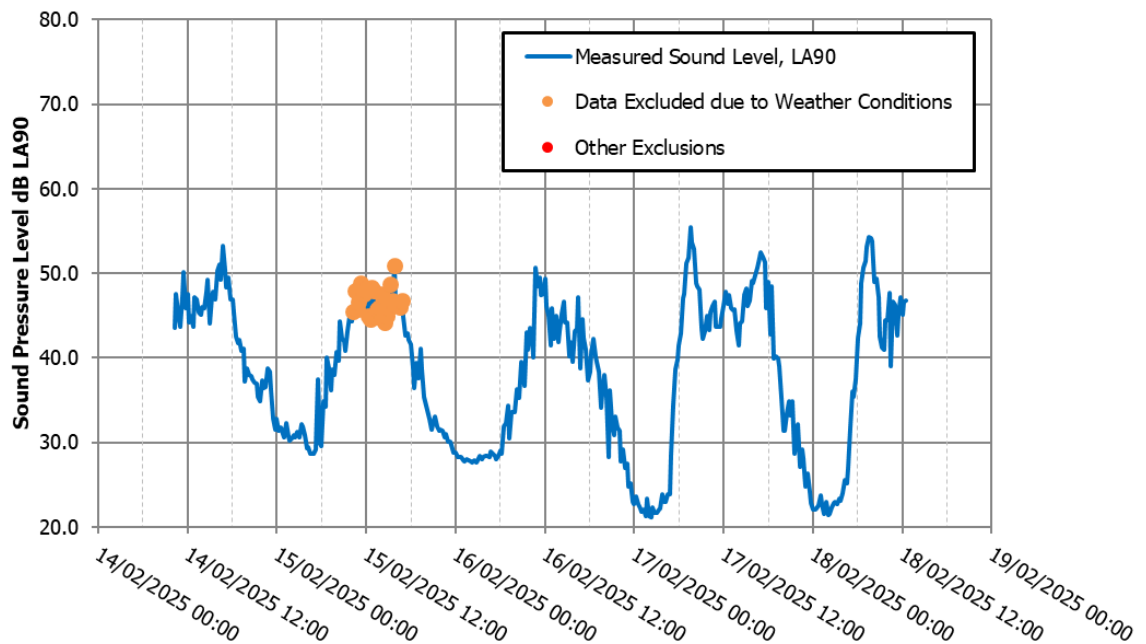
² Data available from: <https://www.metoffice.gov.uk/observations/details/20250228gghuw9i5oe69kyhcbn55ayc9y>

6 SURVEY RESULTS

6.1 NOISE MONITORING LOCATION 1

Chart 1 provides a summary of background noise levels during the survey period at Noise Monitoring Location 1, detailing $L_{A90,15min}$ levels.

Chart 1: Background Noise Survey Time History



As can be seen, the noise profile is diurnal, and typical of a rural area where daytime background levels increase due to vehicles on the local road network.

When determining typical daytime and night-time levels for assessment purposes, BS 4142 advises against assuming that it can be determined using any single approach (mean, median, mode etc.). To determine the prevailing background noise level for the purposes of this assessment, Charts 2 -3 present the range of $L_{A90,15min}$ noise levels recorded, along with the percentage of periods for which they occurred, for daytime (0700-2300) and night-time (2300-0700) periods respectively.

It should be noted that the $L_{A90,15min}$ parameter was used for both daytime and night-time periods. BS 4142 permits the use of longer (1 hour) measurements for daytime periods, however the use of $L_{A90,15min}$ for both daytime and night-time periods is a conservative approach, as $L_{A90,15min}$ values are more sensitive to short-term noise events.

Charts 2 and 3 present the range of $L_{A90,15min}$ noise levels recorded, along with the percentage of periods for which they occurred, for daytime (0700-2300) and night-time (2300-0700) periods respectively.

Chart 2: Daytime Background Statistical Analysis (0700 – 2300)

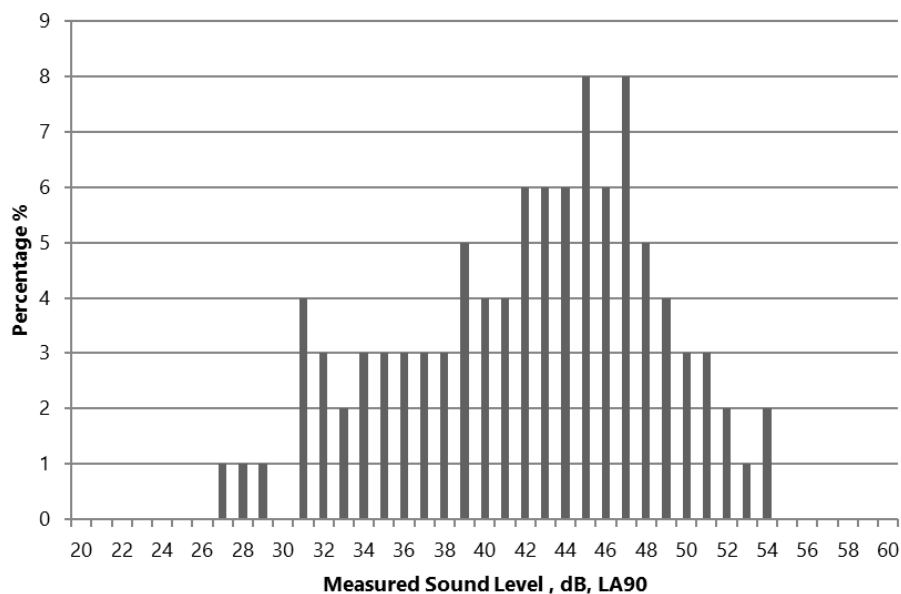


Chart 3: Night-time Background Statistical Analysis (2300 – 0700)

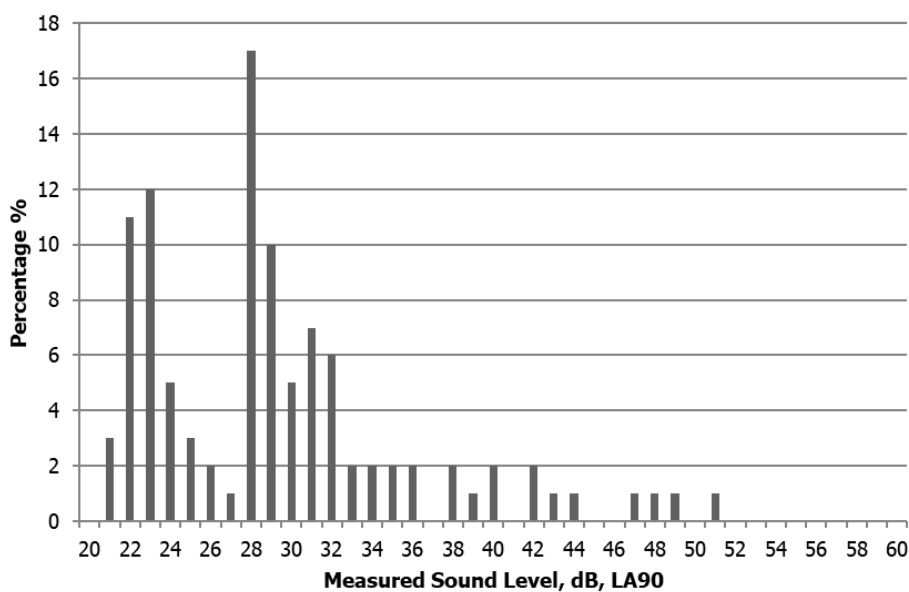


Table 2 presents the mean, median and mode averages of the measured dataset.

Table 2: Background Sound Survey Results

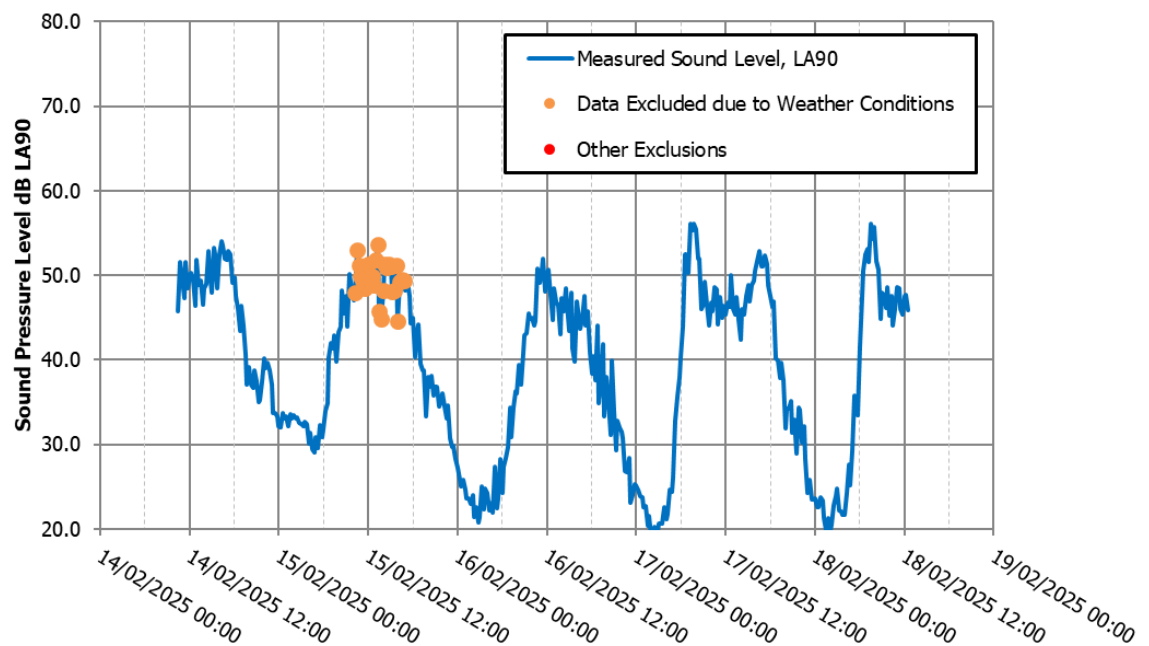
Period	Mode	Median	Mean	Representative
Daytime (0700-2300)	47	43	42	44
Night-time (2300-0700)	28	28	29	28

Based upon the results presented in Table 2, along with the spread of data presented in Charts 2 and 3, background sound levels of 44 dB, L_{A90} and 28 dB, L_{A90} , are considered appropriate for daytime and night-time periods respectively.

6.2 NOISE MONITORING LOCATION 2

Chart 4 provides a summary of background noise levels during the survey period at Noise Monitoring Location 2, detailing $L_{A90,15min}$ levels.

Chart 4: Background Noise Survey Time History



As per Noise Monitoring Location 1, the noise profile is diurnal, and typical of a rural area where daytime background levels increase due to vehicles on the local road network.

Charts 5 and 6 present the range of $L_{A90,15min}$ noise levels recorded, along with the percentage of periods for which they occurred, for daytime (0700-2300) and night-time (2300-0700) periods respectively.

Chart 5: Daytime Background Statistical Analysis (0700 – 2300)

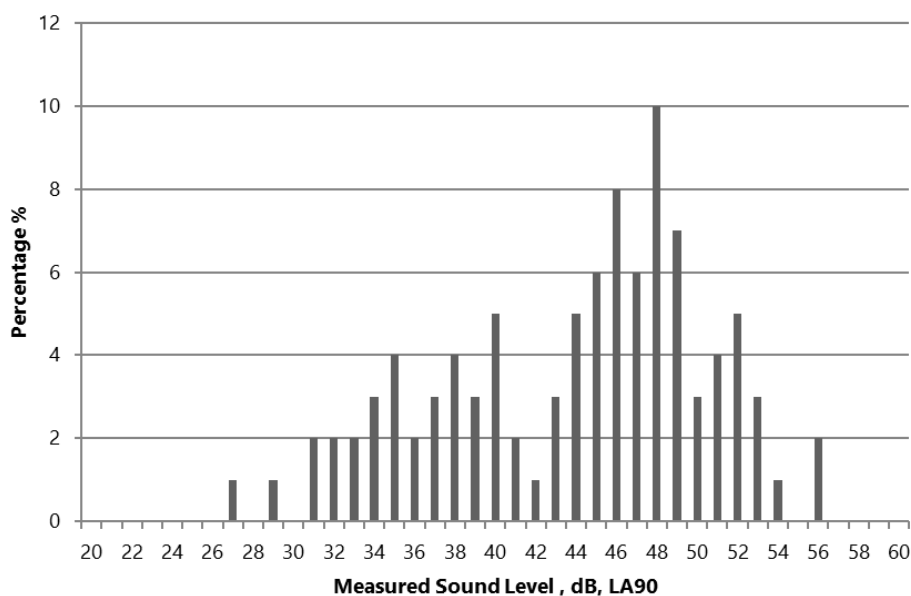


Chart 6: Night-time Background Statistical Analysis (2300 – 0700)

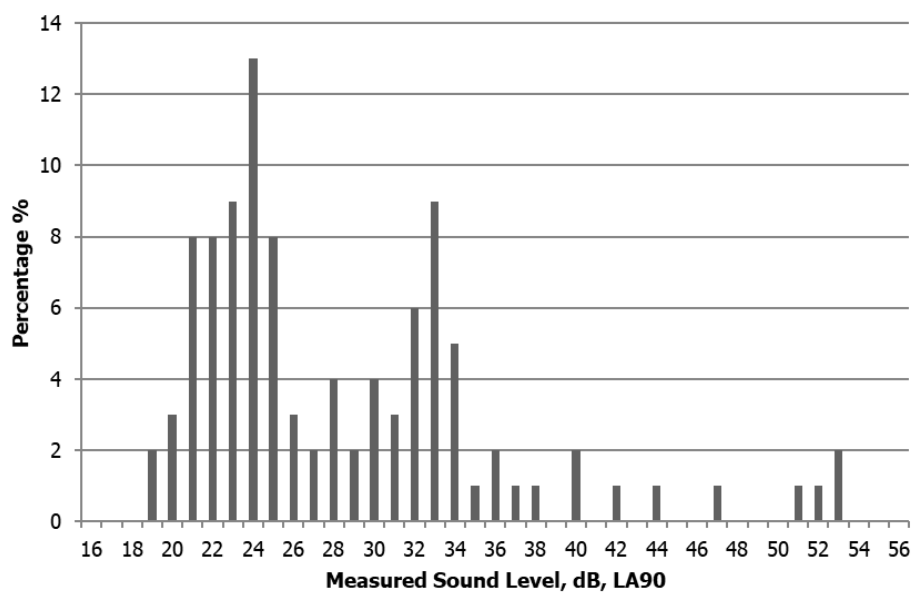


Table 3 presents the mean, median and mode averages of the measured dataset.

Table 3: Background Sound Survey Results

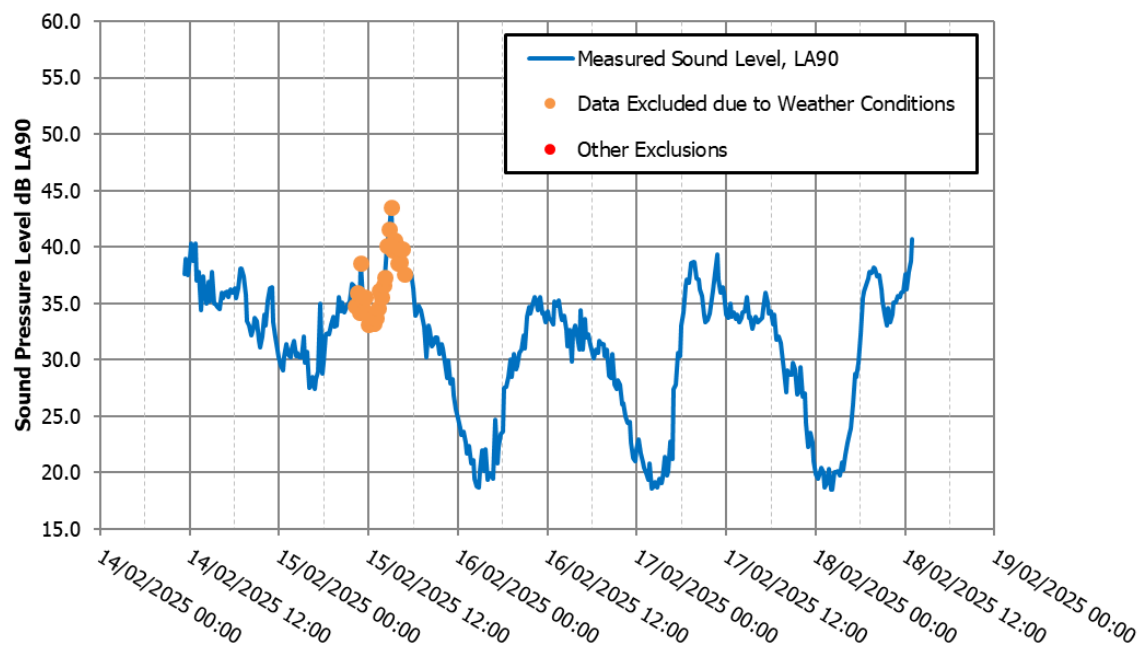
Period	Mode	Median	Mean	Representative
Daytime (0700-2300)	48	46	44	46
Night-time (2300-0700)	24	25	28	26

Based upon the results presented in Table 3, along with the spread of data presented in Charts 5 and 6, background sound levels of 46 dB, L_{A90} and 26 dB, L_{A90} , are considered appropriate for daytime and night-time periods respectively.

6.3 NOISE MONITORING LOCATION 3

Chart 7 provides a summary of background noise levels during the survey period at Noise Monitoring Location 3, detailing $L_{A90,15min}$ levels.

Chart 7: Background Noise Survey Time History



Charts 8 and 9 present the range of $L_{A90,15min}$ noise levels recorded, along with the percentage of periods for which they occurred, for daytime (0700-2300) and night-time (2300-0700) periods respectively.

Chart 8: Daytime Background Statistical Analysis (0700 – 2300)

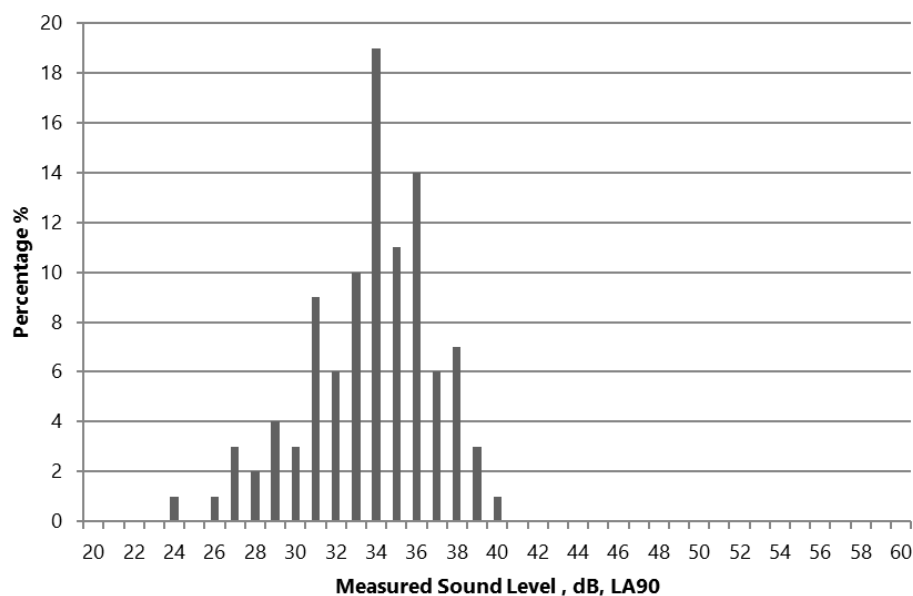


Chart 9: Night-time Background Statistical Analysis (2300 – 0700)

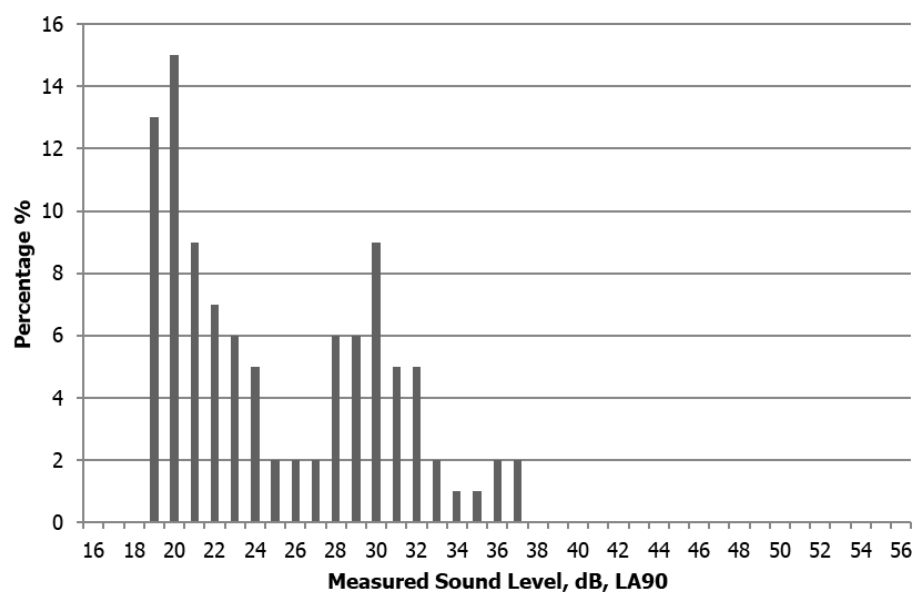


Table 4 presents the mean, median and mode averages of the measured dataset.

Table 4: Background Sound Survey Results

Period	Mode	Median	Mean	Representative
Daytime (0700-2300)	34	34	34	34
Night-time (2300-0700)	20	23	25	23

Based upon the results presented in Table 4, along with the spread of data presented in Charts 8 and 9, background sound levels of 34 dB, L_{A90} and 23 dB, L_{A90} , are considered appropriate for daytime and night-time periods respectively.

7 NOISE MODELLING

The Proposed Development consists of the following noise sources:

- ◆ 3 x Primary Transformers;
- ◆ 6 x Auxiliary Transformers;
- ◆ 868 x Battery Energy Storage cabinets;
- ◆ 217 x BESS Medium Voltage Stations (MVS);
- ◆ 46 x Centralised solar MVS distributed throughout the solar PV array.

Additional infrastructure includes (but is not limited to) storage containers, switchgear / metering equipment and the solar panels themselves. These elements will emit no / negligible levels of noise and therefore have not been considered further as part of this assessment.

The equipment modelled as part of this assessment has been based on similar BESS / solar developments. The actual plant ultimately chosen for installation is yet to be finalised, however these will be selected to comply with any noise limits specified in the Proposed Development's planning conditions.

The level of noise emitted by the solar PV aspects of the Proposed Development in particular will be related to both the intensity of light incident upon the solar panels and the air temperature. It is therefore anticipated that noise from these elements will be negligible for much of the time, particularly during night-time periods. However, as a worst-case approach, all plant is assumed to be operating simultaneously during both daytime and night-time periods.

7.1 NOISE EMISSION DATA

The sound power levels of the plant included in the noise model are included in Table 4. During night-time periods BESS fans operate at reduced speeds. As such Table 5 presents the BESS container noise emission levels during both daytime and night-time periods.

Table 5: Equipment Sound Power Levels

Plant Type / Description	Sound Power Level, dB, L _{WA}	Octave Band Centre Frequency, Hz, dBA							
		63	125	250	500	1000	2000	4000	8000
Primary Transformer	85	64	70	78	80	80	75	69	64
Auxiliary Transformer	80	59	65	73	75	75	70	64	59
Battery Container (Daytime Operation)	82	31	56	64	73	76	78	73	62
Battery Container (Night-time Operation)	74	23	49	56	65	68	70	65	54
BESS Inverter	87	59	61	62	71	69	74	75	87
Solar Inverter	87	59	61	62	71	69	74	75	87

7.2 MODELLING PARAMETERS

The Specific sound level at the nearest NSRs has been calculated in SoundPlan software, using the environmental noise propagation model ISO 9613-2:2024 - Acoustics, 'Attenuation of sound during propagation outdoors – Part 2: General method of calculation'.

The ISO 9613-2 method predicts the level of sound at a receptor by taking the octave-band sound power level spectrum of the source and applying a number of attenuation factors that determine the resulting rating level at the receptor location. The following parameters were used in the prediction model and are considered to provide a conservative prediction of the noise levels likely to be experienced in practice:

- ◆ Atmospheric conditions of 10°C and 70% relative humidity;
- ◆ A ground factor of $G=0$ (hard ground) for the BESS and substation compounds, and 1 (soft ground) for all other areas;
- ◆ A receiver height of 1.5 m in amenity spaces (i.e. head height) in the daytime or 4 m (i.e. First floor) at night;
- ◆ All plant operating simultaneously at full capacity;
- ◆ Includes local terrain and buildings;
- ◆ Battery and inverters cabinets have been inputted into the noise model as buildings with radiating sides;
- ◆ The primary and auxiliary transformers have been inputted into the noise model point sources at a height of 3 m;
- ◆ An acoustic fence has been incorporated into the design at 3.5 m above ground level (AGL), along boundary fence of the BESS and substation areas (see Appendix 1).

Grid references for the nearest NSRs are provided in Table 6, as presented in Figure 1. On the basis that noise levels are found to be acceptable at these locations, they will also be acceptable at other NSRs located further from the Proposed Development.

Table 6: Assessed Receptors

Receptor Name	Easting	Northing	Representative Background Location
NSR 1	530179	230348	NML1
NSR 2	530132	230548	NML1
NSR 3	528487	231142	NML2
NSR 4	529220	229496	NML3

7.3 RATING LEVEL CORRECTIONS

BS 4142 states that corrections should be applied to account for certain acoustic features which have the potential to increase the level of noise impact at nearby dwellings.

The four acoustic features to be considered in the application of rating corrections are as follows:

- ◆ Impulsivity: No impulsive characteristics are anticipated from the Proposed Development;
- ◆ Tonal Elements: The main noise-emitting plant in the Proposed Development will be the integrated inverter cooling systems. Based upon substantial prior experience of operational BESS developments, this noise is broadband in nature and therefore non-tonal;

- ◆ Intermittency: While certain plant cooling systems may operate on thermostats, there will be no synchronisation between the various units. The overall noise level change due to a single inverter or battery unit switching on / off would be negligible, and not distinguishable at the receptors. Therefore, when taken as a whole, the Proposed Development is highly unlikely to have “*identifiable on / off conditions*” in terms of BS 4142, and no correction for intermittency is therefore required; and
- ◆ Distinctiveness: Given the difference between the Specific and background levels presented in Table 6, it is considered that the Proposed Development would not be distinctive against the existing acoustic environment. As such, no correction for distinctiveness has been applied.

Based on the above, the Rating Levels at the receptor locations are therefore the same as the Specific Levels.

8 ASSESSMENT OF IMPACT

As noted in Section 3, BS 4142 states that where background sound levels and Rating levels are low, absolute levels should be considered, particularly during night-time periods.

While the most recent version of BS 4142 does not quantify what is considered ‘low’, the previous version of BS 4142 (published 1997) stated that “*background noise levels below 30 dB and rating levels below about 35 dB are considered to be very low.*”

As can be seen in Section 5, background noise measurements at the representative locations during night-time periods are well below 30 dB in all cases, and as such are considered ‘low’. Given this, and in line with the recommendations in BS 4142, a night-time assessment based on absolute levels is appropriate. As such, night-time noise has been assessed against an internal noise criterion of NR20, as described in Section 3.4.

8.1 DAYTIME (0700 – 2300) IMPACT ASSESSMENT

An assessment of the likely impact has been made based upon the difference between the Rating Levels and prevailing background levels for daytime, at each assessed NSR.

Table 7 presents an assessment of the impact at each assessed NSR based upon the difference between the predicted Rating and daytime Background noise levels as detailed in Section 6.

Table 7: Assessment of Impact - Daytime

	Specific Noise Level, dB(A)	Rating Level, dB	Background Noise Level, dB, LA90	Difference, dB
NSR 1	39	39	44	-5
NSR 2	36	36	44	-8
NSR 3	23	23	46	-23
NSR 4	36	36	34	2

As shown in Table 7, the predicted Rating Levels at NSRs 1 - 3 are below the corresponding background noise levels during the daytime period, indicating a low impact in accordance with BS 4142:2014+A1:2019. At NSR 4, the Rating level exceeds the background level by 2 dB/ The Proposed Development is therefore below the level at which adverse impacts will occur in terms of BS 4142.

8.1.1 CONTEXT

The Proposed Development is located in a rural area where the acoustic climate consists primarily of road traffic noise from the A507. It is also notable that the predicted Rating noise levels are in most cases substantially below the background noise levels, and as such the Proposed Development will not change the character of the existing acoustic environment.

8.1.2 UNCERTAINTY

Background noise monitoring was undertaken at three locations conservatively representative of nearby receptors for a period of 5 days to minimise uncertainty.

Modelling of the proposed plant has been undertaken on a worst-case basis and assumes all plant is operating simultaneously. In practice, the large majority of plant is temperature controlled; noise levels in practice are therefore likely be lower than presented during typical operation.

The conservative assumptions made in this assessment are likely to result in an over prediction of the level of impact in practice. The uncertainties inherent in the assessment will therefore have no material effect on the findings of the assessment.

8.2 NIGHT-TIME (2300-0700) IMPACT ASSESSMENT

In order to assess noise from the Proposed Development during night-time periods, predicted internal noise levels have been assessed against NR20.

This assessment accounts for an open window attenuation, based upon research undertaken by Napier University³. The research shows that typical attenuation of a slightly open or tilted windows range from 14 dB to 19 dB on average. A conservative 15 dB attenuation has been applied for the purposes of this assessment.

Tables 7-10 presents the predicted noise level incident upon the worst-case façade of each NSR at a height of 4 m (representing a bedroom window), the resulting internal noise level, and the headroom between the predicted internal noise levels and the assessment criterion of NR20 as outlined in Section 3.4.

Table 7: NR Assessment NSR1

NSR1	Octave Band Centre Frequency, Hz, dB(Z)							
	63	125	250	500	1000	2000	4000	8000
Predicted Noise Level, dB	49	35	34	36	33	32	20	11
Window Attenuation, dB	20	14	14	16	14	17	19	19
Resulting Internal Level	29	21	20	20	19	15	1	-8
Difference to NR20	-23	-18	-10	-4	-1	-2	-13	-21

Table 8: NR Assessment NSR2

NSR2	Octave Band Centre Frequency, Hz, dB(Z)							
	63	125	250	500	1000	2000	4000	8000
Predicted Noise Level, dB	47	33	29	33	30	27	13	-2
Window Attenuation, dB	20	14	14	16	14	17	19	19

³ NANSR116: 'Open/Closed Window Research – Sound Insulation Through Ventilated Domestic Windows: Napier University 2007 (Table 5-6, page 65)

Resulting Internal Level	27	19	15	17	16	10	-7	-21
Difference to NR20	-24	-21	-15	-7	-5	-7	-21	-33

Table 9: NR Assessment NSR3

NSR3	Octave Band Centre Frequency, Hz, dB(Z)							
	63	125	250	500	1000	2000	4000	8000
Predicted Noise Level, dB	41	23	19	21	16	11	-7	-47
Window Attenuation, dB	20	14	14	16	14	17	19	19
Resulting Internal Level	21	9	5	5	2	-6	-26	-66
Difference to NR20	-30	-30	-26	-20	-18	-23	-40	-79

Table 10: NR Assessment NSR4

NSR4	Octave Band Centre Frequency, Hz, dB(Z)							
	63	125	250	500	1000	2000	4000	8000
Predicted Noise Level, dB	46	31	30	33	30	28	11	-24
Window Attenuation, dB	20	14	14	16	14	17	19	19
Resulting Internal Level	26	17	16	17	16	11	-8	-43
Difference to NR20	-25	-22	-15	-7	-4	-6	-22	-56

As shown in the above tables, the predicted noise levels at all NSRs are below the internal night-time criterion of NR20 in all frequency bands.

9 CONSTRUCTION NOISE

Construction is temporary, with a main construction period duration of approximately 12 months. Throughout this phase, standard operating hours on Site will be implemented to minimise noise and construction impacts to the surrounding area. These working hours are usually secured via a suitably worded planning condition. Vehicles will attend Site during normal working/daytime hours which are outlined in the Construction Traffic Management Plan (CTMP) submitted as part of the planning application. For clarity, the proposed working hours are 08:00–18:00 Monday to Friday, with no working on Weekends or Bank Holidays.

As per the CTMP, the contractor will ensure, where practicable, that no Heavy Goods Vehicle (HGV) deliveries occur during weekday peak hours (08:00–09:00 and 17:00–18:00). A booking system will be implemented to avoid delivery ‘bunching’, and vehicle stacking on the highway will not be permitted.

Construction activities (particularly in the PV array area) will occur quickly and will not take place in any one area for a prolonged period. In addition, there is substantial distance from the nearest noise sensitive receptors to construction areas (minimum 100 m for solar PV, 200 m for the substation areas and 450 m for the BESS area).

As such, significant impacts resulting from construction noise are not anticipated due to the short duration of effects (12 months), appropriate operating hours onsite and effective management of deliveries to reduce overall noise and construction effects.

Notwithstanding the above, the good practice measures outlined below will be required of all contractors during construction, in order to minimise the effects of noise during construction operations:

- ◆ Operations shall be limited to times agreed with the Council;

- ◆ Deliveries of plant and materials by HGV to site shall only take place in accordance with the Traffic Management Plan, and within times agreed with the Council;
- ◆ The site contractors shall be required to employ the best practicable means of reducing noise emissions from plant, machinery and construction activities, as advocated in BS 5228;
- ◆ Where practicable, the work programme would be phased, which would help to reduce the combined effects arising from several noisy operations;
- ◆ Where practicable, noise from fixed plant and equipment would be contained within suitable acoustic enclosures or behind acoustic screens; and
- ◆ All sub-contractors appointed by the main contractor would be formally and legally obliged, and required through contract, to comply with all environmental noise conditions.

Application of the above measures to manage construction noise would ensure that potential effects are minimised as far as is reasonably practicable, and that the construction process is operated in compliance with relevant legislation.

10 CUMULATIVE ASSESSMENT

As part of the application for the adjacent Beane Solar Farm development (3/24/2245/FUL), a noise impact assessment⁴ was submitted to the East Herts Council planning portal in December 2024. As part of the assessment, predicted noise levels were undertaken at a number of NSRs, including at NSR 1, which is the closest receptor to both the Proposed Development and Beane Farm Solar Farm.

The assessment for Beane Solar Farm predicts a rating level of 18 dB L_{Ar} at NSR 1 during operation. This level is more than 10 dB below the daytime and night-time predicted noise levels associated with the Proposed Development. As such, the overall operational cumulative noise level will be no greater than noise from the Proposed Development in isolation.

Construction noise is not considered as part of the Beane Solar Farm noise impact assessment, and as such it is not possible to undertake a detailed consideration of cumulative construction noise. It is notable however that cumulative construction noise effects would only arise where noise-generating activities associated with both developments - including construction plant operation and construction vehicle movements - occur at the same time. In practice, while overall construction programmes may overlap, it is unlikely that noise emitting activities would occur simultaneously in close proximity to the same receptor.

Notwithstanding the above, where construction activities associated with the Proposed Development are likely to occur concurrently with the construction of Beane Solar Farm, the potential for cumulative noise impacts will be undertaken by the contractor, as stated in the Planning, Design and Access Statement. Where required, additional mitigation measures will be implemented such as phasing deliveries and construction activities to avoid concurrent working.

⁴ Beane Solar Farm, Acoustic Assessment, RES, September 2024

11 CONCLUSION

Metrica was commissioned by Lanpro to undertake a noise assessment in relation to Westfield Energy Conservation Park, Hertfordshire. The impact of operational noise due to the Proposed Development has been found to be below the level at which adverse impacts will occur in terms of BS 4142 at all NSRs, during the day.

Due to the low background noise levels at night, an NR assessment of the predicted noise levels has been undertaken, as advocated by BS 4142. To ensure adverse impacts are avoided during night-time periods, an internal assessment against NR20 has been undertaken. It has been found that internal predicted noise levels are lower than NR20 in all cases.

The cumulative effects of the Proposed Development in combination with the neighbouring proposed Beane Solar Farm (3/24/2245/FUL) have been considered and found to be acceptable.

Construction effects have been considered, and application of the best practice measures detailed in this report would ensure that potential effects are minimised as far as reasonably practicable, and that the construction process is operated in compliance with relevant legislation.

The Proposed Development has therefore been found to be acceptable in terms of noise.

12 GLOSSARY OF TERMS

Background Noise: The background noise level is the underlying level of noise present at a particular location for the majority (usually 90%) of a period of time.

Decibel (dB): The decibel is the basic unit of noise measurement. It relates to the cyclical changes in pressure created by the sound and operates on a logarithmic scale, ranging upwards from 0 dB. 0 dB is equivalent to the normal threshold of hearing at a frequency of 1000 Hertz (Hz). Each increase of 3 dB on the scale represents a doubling of the Sound Pressure, and is typically the minimum noticeable change in sound level under typical listening conditions.

dB(A): Environmental noise levels are usually discussed in terms of dB(A). This is known as the A-weighted sound pressure level, and indicates that a correction factor has been applied, which corresponds to the human ear's response to sound across the range of audible frequencies.

Frequency: The frequency of a sound is equivalent to its pitch in musical terms. The units of frequency are Hertz (Hz), which represents the number of cycles (vibrations) per second.

$L_{A90,t}$: This term is used to represent the A-weighted sound pressure level that is exceeded for 90% of a period of time, t. This is used as a measure of the background noise level.

$L_{Aeq,t}$: This term is known as the A-weighted equivalent continuous sound pressure level for a period of time, t. It is similar to an average, and represents the sound pressure level of a steady sound that has, over a given period, the same energy as the fluctuating sound in question.

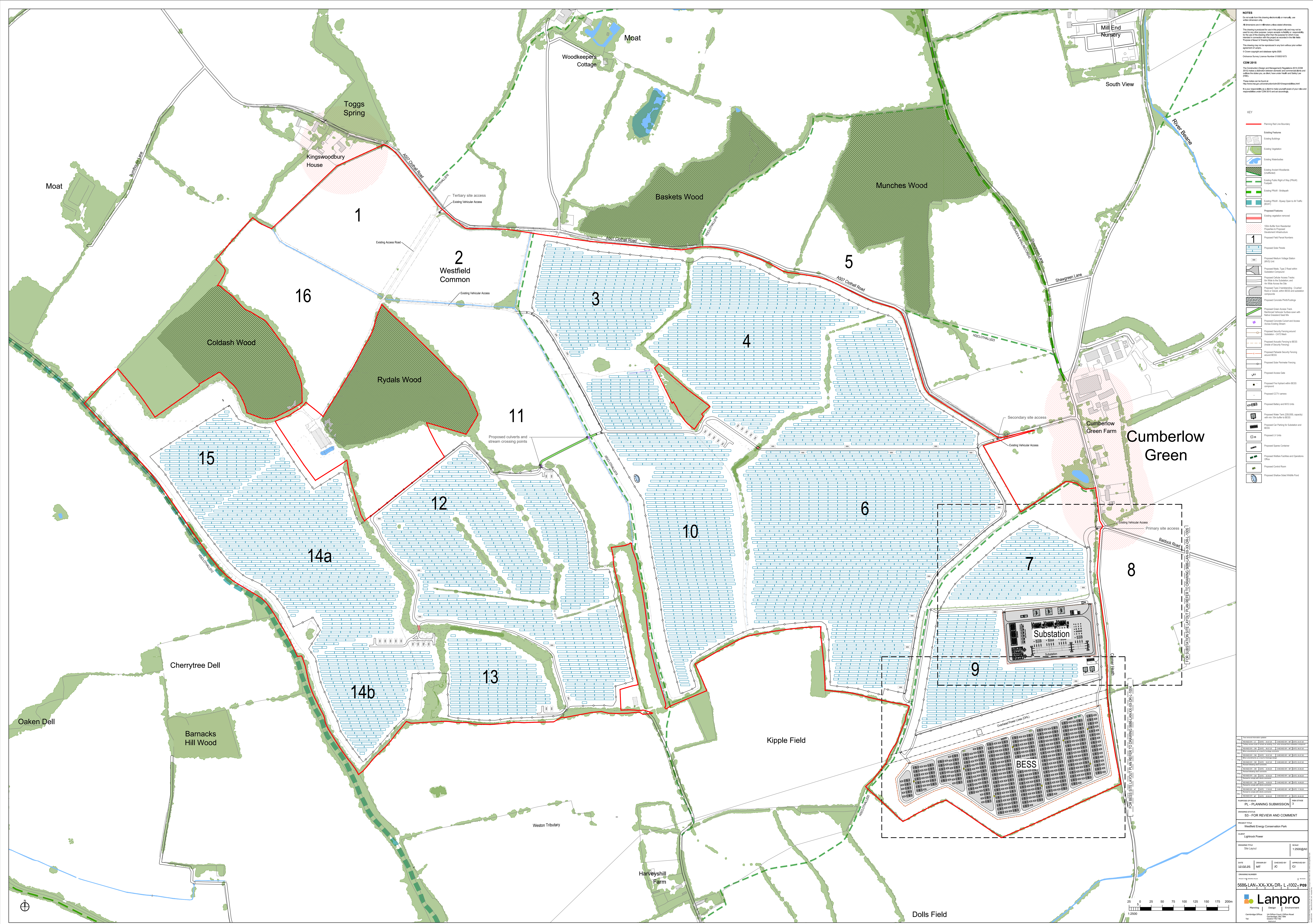
Rating Level: Noise levels which have been corrected for certain acoustic features, as required under BS4142 methodology.

Sound pressure (P): The fluctuations in pressure relative to atmospheric pressure, measured in Pascals (Pa).

Sound pressure level (L_p): Sound pressure measured on the decibel scale, relative to a sound pressure of 2×10^{-5} Pa.

Specific Level: In terms of BS4142 methodology, the specific level is the sound level produced by a source, without corrections for acoustic features.

APPENDIX 1: DEVELOPMENT LAYOUT



APPENDIX 2: SURVEY RECORD SHEETS

Project No.	0407	Project Name:	Westfield Energy Conservation Park
Location Number	NML1	Installed By:	AJ
Grid Reference	530133, 230353	Location Name	NML1
Start Date	14/02/25	Start Time	10:15

Equipment Details	Make/Model	Serial No.
Sound Level Meter:	NL-52	921231
Calibrator:	NC-75	35270122
Source of Equipment:	dB Hire	
Meter Timestamp (Start/End, GMT/BST):	Start GMT	

Description of Location	Adjacent to Baldrock Road, by Cumberlow Green, a similar distance from the road as NSRs 1 and 2 on the other side
Distance from Façade	N/A
Noise Sources Observed	Road noise with some air traffic
Weather Conditions	Slightly overcast, no wind

Set-Up / Visit 1

Date	14/02/25	Time	10:15
Filename	0101	Calibration Level	94.0
Range	20-130	Measurement Index	LA90,15mins
Frequency Weighting	A	Weather Monitoring?	No
Lp Logging?	No	Audio / Octave Bands?	No
Additional Notes			

Visit 2

Date	18/02/25	Time	12:45
Visited by	AJ	Calibration Level	94.0
Level Pre-Calibration	93.9	Batteries Replaced?	No
Equipment Removed?	Yes		
Additional Notes			



Project No.	0407	Project Name:	Westfield Energy Conservation Park
Location Number	NML2	Installed By:	AJ
Grid Reference	528526 , 231134	Location Name	NML2
Start Date	14/02/25	Start Time	10:30

Equipment Details	Make/Model	Serial No.
Sound Level Meter:	NL-52	375678
Calibrator:	NC-75	35270122
Source of Equipment:	dB Hire	
Meter Timestamp (Start/End, GMT/BST):	Start GMT	

Description of Location	Adjacent to A507, a similar distance from the road as NSR3
Distance from Façade	N/A
Noise Sources Observed	Dominated by road traffic noise with some overhead flights
Weather Conditions	Slightly overcast, no wind

Set-Up / Visit 1

Date	14/02/25	Time	10:30
Filename	0201	Calibration Level	94.0
Range	20-130	Measurement Index	L _{A90,15mins}
Frequency Weighting	A	Weather Monitoring?	No
Lp Logging?	No	Audio / Octave Bands?	No
Additional Notes			

Visit 2

Date	18/02/25	Time	12:45
Visited by	AJ	Calibration Level	94.0
Level Pre-Calibration	93.9	Batteries Replaced?	No
Equipment Removed?	Yes		
Additional Notes			



Project No.	0407	Project Name:	Westfield Energy Conservation Park
Location Number	NML3	Installed By:	AJ
Grid Reference	528983, 229887	Location Name	NML3
Start Date	14/02/25	Start Time	11:30

Equipment Details	Make/Model	Serial No.
Sound Level Meter:	NL-52	231656
Calibrator:	NC-75	35270122
Source of Equipment:	dB Hire	
Meter Timestamp (Start/End, GMT/BST):	Start GMT	

Description of Location	Southern boundary of development site, a similar distance from the B1037 and under the same flight path as NSR4
Distance from Façade	N/A
Noise Sources Observed	Distant road traffic and planes overhead
Weather Conditions	Slightly overcast, no wind

Set-Up / Visit 1

Date	14/02/25	Time	11:30
Filename	0301	Calibration Level	94.0
Range	20-130	Measurement Index	LA90,15mins
Frequency Weighting	A	Weather Monitoring?	No
Lp Logging?	No	Audio / Octave Bands?	No
Additional Notes			

Visit 2

Date	18/02/25	Time	13:15
Visited by	AJ	Calibration Level	94.0
Level Pre-Calibration	94.0	Batteries Replaced?	No
Equipment Removed?	Yes		
Additional Notes			

