

Cottam Solar Project

Statement of Common Ground West Lindsey District Council

Prepared by: Lanpro Services
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Contents

1	INTRODUCTION	3
	PURPOSE OF THIS DOCUMENT	3
	PARTIES TO THIS STATEMENT OF COMMON GROUND	3
	TERMINOLOGY	3
	TOPIC REFERENCING FOR ALL MATTERS	3
2	RECORD OF ENGAGEMENT	5
	SUMMARY OF CONSULTATION	5
3	MATTERS AGREED	7
	MATTERS AGREED (PRINCIPLE/GENERAL).	7
	MATTERS AGREED (LANDSCAPE AND VISUAL).	9
	MATTERS AGREED (TRAFFIC AND TRANSPORT).	11
	MATTERS AGREED (NOISE AND VIBRATION).	12
	MATTERS AGREED (AIR QUALITY).	25
	MATTERS AGREED (SOCIO-ECONOMICS, TOURISM AND RECREATION).	26
	MATTERS AGREED (SOILS AND AGRICULTURE).	27
	MATTERS AGREED (OTHER ENVIRONMENTAL MATTERS).	28
	MATTERS AGREED (CLIMATE CHANGE).	30
	MATTERS AGREED (CULTURAL HERITAGE).	31
4	MATTERS NOT AGREED	33
	MATTERS NOT AGREED (PRINCIPLE).	33
	MATTERS NOT AGREED (DRAFT DCO)	37
	MATTERS NOT AGREED (ALTERNATIVES AND DESIGN EVOLUTION)	38
	MATTERS NOT AGREED (LVIA)	39
	MATTERS NOT AGREED (CULTURAL HERITAGE)	58
	MATTERS NOT AGREED (SOCIO -ECONOMICS, TOURISM AND RECREATION)	59
	MATTERS NOT AGREED (TRAFFIC AND TRANSPORT)	66
	MATTERS NOT AGREED – NOISE AND VIBRATION	69
	SOILS AND AGRICULTURE (NOT AGREED)	74
5	SIGNATORIES	75

APPENDIX A: 784-B031438 COTTAM SOLAR PROJECT NOISE RESPONSE

Issue Sheet

Report Prepared for: Cottam Solar Project Ltd.
Examination Deadline 5

Statement of Common Ground

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1 Introduction

Purpose of this document

- 1.1.1 This Statement of Common Ground (SoCG) has been prepared as part of the proposed Cottam Solar Project Development Consent Order (the Application) made by Cottam Solar Project Ltd (the Applicant) to the Secretary of State for Energy Security & Net Zero (the Secretary of State) pursuant to the Planning Act 2008 (PA 2008).
- 1.1.2 This SoCG does not seek to replicate information which is available elsewhere within the Application documents. All documents are available on the Planning Inspectorate’s website.
- 1.1.3 This SoCG has been produced to confirm to the Examining Authority (ExA) where agreement has been reached between the parties, and where agreement has not been reached. SoCGs are an established means in the planning process of allowing all parties to identify and focus on specific issues that may need to be addressed during the examination.

Parties to this Statement of Common Ground

- 1.1.4 This SoCG has been prepared by (1) Cottam Solar Project Ltd. as the Applicant and (2) West Lindsey District Council. West Lindsey is a host authority with a prescribed statutory role in the DCO process. The majority of the Scheme is located within West Lindsey District with the exception of the Point of Connection at the former Cottam Power Station and the section of the cable route connecting into this.
- 1.1.5 Collectively, Cottam Solar Project Ltd. and West Lindsey District Council (WLDC) are referred to as ‘the parties’.

Terminology

- 1.1.6 In the tables in **Sections 3 - 5** of this SoCG:
- “Agreed” indicates where the issue has been resolved and
 - “Not Agreed” indicates a final position.

Topic Referencing for all matters

- 1.1.7 All matters agreed and not agreed have been given unique references which relate to the topic matter. The referencing system is defined as follows:

Topic	Unique Identifying Code
Principle of Development/ General matters	PD-XX
Alternatives and Design Evolution	ALT-XX
Climate Change	CC-XX
Landscape and Visual	LAN-XX

Ecology and Biodiversity	ECO-XX
Hydrology	HY-XX
Cultural Heritage	CUL-XX
Noise and Vibration	NOI-XX
Air Quality	AIR-XX
Socio-Economics, Tourism and Recreation	STR-XX
Ground Conditions and Contamination	GRO-XX
Transport and Access	TRA-XX
Soils and Agriculture	SAA-XX
Other Environmental Matters	OEM-XX
Development Consent Order	DCO-XX

2 Record of Engagement

Summary of consultation

2.1.1 The parties have been engaged in consultation since September 2021. A summary of the meetings and correspondence that has taken place between Cottam Solar Project and West Lindsey District Council in relation to the Application is outlined in **Table 2-1**.

Table 2-1 - Record of Engagement

Date	Form Correspondence	Key topics discussed and key outcomes
Principle of Development/General		
09.09.21	Initial Project kick off meeting	The range of topics addressed in the SoCG.
22.09.21	Member briefing	The range of topics addressed in the SoCG.
Since Feb 2022	Monthly meetings with Planning Officers.	The range of topics addressed in the SoCG.
March 2023	West Lindsey DC relevant representation [RR-004]	Policy framework and decision making Cumulative impacts Project specific impacts Mitigation Draft DCO
14.02.24	Meeting with Planning Officers	To discuss outstanding Statement of Common Ground issues
19.02.24	Meeting with Planning Officers	To discuss outstanding Statement of Common Ground issues
Hydrology		
27/07/23	Section 42 Consultation	Flood Risk Assessment and Drainage Strategy [APP-090] and ES Chapter 10: Hydrology, Flood Risk and Drainage [APP-045]. West Lindsey District Council stated that Flood Risk Assessments (FRA) had to be undertaken and that FRA will need to maintain the predevelopment surface water regime post development.

- 2.1.2 It is agreed that this is an accurate record of the key meetings and consultation undertaken between (1) Cottam Solar Project Ltd. and (2) West Lindsey District Council in relation to the issues addressed in this SoCG.

3 Matters Agreed

Tables 3-1 to 3-12 below detail by topic the matters agreed with West Lindsey District Council.

Matters Agreed (Principle/General).

Table 3-1

Topic	Sub-topic	Details of Matters Agreed
PD-01 General	Site description	The Site description set out at ES Chapter 3: The Development Site [APP-038] is accurate.
PD-02 General	Planning History	The relevant planning history for the Scheme is set out at Planning Statement [REP4-039], Appendix 1: Planning Application History Search Cottam Sites and Appendix 2: Planning Application History Search Cable Route Corridor respectively.
PD-03 General	Legislation and policy	<p>The updated National Policy Statements were published on 22 November 2023 and designated by the Secretary of State on 17 January 2024. Section 1.6 of NPS EN-1 (November 2023) sets out the transitional provisions and states that for DCO applications submitted prior to the designation of the November 2023 NPSs (such as the Scheme), the 2011 suite of NPSs will continue to have effect and therefore the DCO application for the Scheme will be determined under s105 of the Planning Act 2008.</p> <p>The extent to which the updated NPS's are relevant is a matter for the relevant Secretary of State to consider within the framework of the Planning Act 2008 and with regard to the specific circumstances of each Development Consent Order application. The NPSs designated in January 2024 will be an important and relevant consideration for the Secretary of State in determining the application for the Scheme.</p>

		The Scheme has been assessed against the relevant and up to date West Lindsey District Council and Lincolnshire County Council planning policies as set out within Section 6 of the Planning Statement [APP-341] noting that any references to the draft Central Lincolnshire Local Plan now mean the Central Lincolnshire Local Plan DPD (Development Plan Document) adopted 13 April 2023.
PD-04 Principle of Development	Need for large scale solar	The principle of the need for large scale solar projects is established in national planning policy, as detailed in Section 4 of the Planning Statement [REP4-039] and the Statement of Need [APP-350]. The overarching need case for the deployment of low carbon energy generation infrastructure is agreed.

Matters Agreed (Landscape and Visual).

Table 3-3

Topic	Sub-topic	Details of Matters Agreed
LAN-01 Landscape	Assessment Methodology and Significance Criteria	The assessment methodology and significance criteria set out within the LVIA Chapter, Section 8.4 [REP2-008] and Appendix 8.1 [APP-068], provides an appropriate approach to assessing the potential likely significant effects on receptors.
LAN-02 Landscape	Study Area/Scope of Assessment	The existing Study Areas/Scope of Assessment set out within the LVIA Chapter 8, Section 8.5 [REP2-008] are sufficient to inform the assessment baseline conditions.
LAN-03 Landscape	Baseline Conditions	The description of the existing baseline landscape and visual conditions set out within the LVIA Chapter, Section 8.5 [REP2-008] and Appendix 8.2 [REP-020] and Appendix 8.3 [REP4-023], are accurate and sufficient to inform the assessment.
LAN-05 Lighting, Glint and Glare	Glint and Glare Baseline, Assessment methodology and assessment outcomes	<p>The assessment baseline, methodology and assessment outcomes as set out within the ES Glint and Glare Chapter [APP-051] ES Appendix 16.1 Solar Photovoltaic Glint and Glare Study [APP-140] ES Addendum Appendix 16.1 [REP-077] are agreed.</p> <p>It is agreed that Headon Airfield has been excluded from the assessment as it lies outside the standard assessment area. Aviation infrastructure within 10km of the Scheme is identified. Headon Airfield is approximately 14.5km from the closest point of the Scheme.</p> <p>The landscape mitigation measures set out in para. 8.6.1-22 and para. 8.8.1-9 of C6.2.8_A ES Chapter 8 Landscape and Visual Impact Assessment Revision A [REP2-008] provides the proposed mitigation approach to new planting to minimise the potential impacts and effects of glint and glare, which will include new native hedgerows and tree cover, and this will also include the management and maintenance of this new planting. This plan details the heights of the screening and growth timeline. This has been produced in conjunction with the results of C6.3.16.1 ES Appendix 16.1 Solar</p>



		Photovoltaic Glint and Glare Study [APP-140] to ensure any potential glint and glare effects are screened.
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Matters Agreed (Traffic and Transport).

Table 3-4

Topic	Sub-topic	Details of Matters Under Discussion
TRA-01 Transport and Access	Methodology	The methodology adopted within Section 14.4 of Chapter 14: Transport and Access of the Environmental Statement [APP-049] has been derived from the information obtained through consultation with stakeholders and by reviewing relevant guidance and studies and is considered acceptable.
TRA-02 Transport and Access	Baseline Assessment	The baseline conditions which are detailed in Section 14.5 of Chapter 14: Transport and Access of the Environmental Statement [APP-049] are representative of the baseline site conditions at the dates to which they relate. West Lindsey DC consider that the baseline assessment would have been more robust and representative had more recent data been obtained.
TRA-03 Transport and Access	Mitigation	The proposed mitigation measures set out within Section 14.6 of Chapter 14: Transport and Access of the Environmental Statement [APP-049] are acceptable provided they are as set out in paragraph 7.2 (point xxvi) of the Outline Construction Traffic Management Plan [EX5/C6.3.14.2_F] which states that a Joint CTMP could be implemented in the event that the construction schedules associated with this Scheme and other schemes in the area overlap.

Matters Agreed (Noise and Vibration).

Table 3-5

Topic	Sub-topic	Details of Matters Agreed
NOI-01 Noise and Vibration	Baseline Monitoring	The baseline noise monitoring detailed within Section 15.4 of Chapter 15: Noise & and Vibration [APP-050] and Appendix 15.1 [APP-137] is representative of the sound levels in the vicinity of the site and experienced by nearby sensitive receptors.
NOI-05 Noise and Vibration	WLDC 2ndWQ response point 1: WLDC welcomes confirmation that the magnitude of effect criteria for construction noise has been mapped incorrectly and the clarification that, notwithstanding this, the construction noise assessment has utilised the correct threshold value for significance (65dB). This clarification has addressed WLDCs concerns.	The Applicant acknowledges this comment.
NOI-06 Noise and Vibration	WLDC 2ndWQ response point 2: The clarification of the approach adopted within the cable route corridor is	The Applicant acknowledges this comment. Two receptors exceed the 70 dB threshold. It should be noted that whilst the cable route corridor red line boundary narrows where the route crosses Normanby Road adjacent to the property, the red line boundary adjacent to CR06 is approx 140m wide. Worst-case (shortest distance) assessment locations have been selected along the cable route for all receptors. It is

	<p>helpful. This addresses WLDCs concerns with regard to the specific issue raised, but it is noted that exceedance of the 70dB threshold at three receptors remains an assessed impact.</p>	<p>therefore likely that the noise impact experienced at CR06 would be less when the exact location of the route is finalised. It should also be noted that paragraph 15.6.7 of the ES chapter 15 [APP- 050] states that approximately 10 dB of noise attenuation can be provided by temporary acoustic screening. Therefore, the temporary noise impact from cable route construction is considered to be not significant.</p>
<p>NOI-07 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 3: The response does not adequately address the matter raised by WLDC. The response cites that information on the noise assessment locations are ‘summarised’ in Chapter 15, para. 15.5.5 / 6, however these paragraphs do not provide a description of each location. The Applicant’s response states that “full details of the noise monitoring surveys are presented in Appendix 15.1” however this Appendix simply identifies each location on a map and records the assessment</p>	<p>See additional information in Appendix to this Statement of Common Ground: ‘784-B031438 Cottam Solar Project Noise Response’.</p>

	<p>results. There continues to be no information on the physical characteristics of each assessment location, which WLDC would expect to find within the ES.</p>	
<p>NOI-08 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 4: The Applicant’s response is noted, however, WLDC are seeking more detailed descriptions of locations to validate that appropriateness of the proxy locations to the receptors.</p>	<p>See additional information in Appendix to this Statement of Common Ground: ‘784-B031438 Cottam Solar Project Noise Response’</p>
<p>NOI-09 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 5: The applicant’s response has misunderstood the matter raised by WLDC. The adopted Scoping Opinion (March 2022) states (ID 3.10.2) that whilst the Inspectorate was content to ‘scope out’ vibration effects during operation, it also adds that “The ES should describe the potential</p>	<p>Operational vibration was scoped out of the ES and agreed. The proposed electrical equipment will not emit significant levels of vibration and therefore, vibration levels will be imperceptible at the nearest receptors and also at the site boundary.</p>

	<p>sources of vibration arising from the operation of e.g. substation and battery storage infrastructure and any measures to control emissions". The applicant refers to ES Ch15 section 15.7, however this does not provide such a description. The ES is therefore wholly silent on any potential sources of operational vibration. The Applicant's response does not therefore address the matter raised and WLDC would welcome clarification on this matter.</p>	
<p>NOI-10 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 6: WLDC notes the Applicant's response, however it does not address the matter raised. The information sought relates to the piling technique to adopted; that is whether percussive piling methods are assumed and whether these are in steady-state or start-up/run down</p>	<p>The method of piling utilised in the calculation of vibration levels was vibratory piling, in the 'all operations' state. As stated in paragraph 15.4.6 - 15.4.7 of the ES Chapter [APP-050].</p> <p>Although the exact method of piling is yet to be determined, it has been assumed that vibratory piling is the most likely choice for inserting the mounting structures. Table E.1 of BS 5228-2:2009+A1:2014 Part 2 describes a method for calculating the level of groundborne vibration arising from the mechanical works. The formula for vibratory piling contains a variable (sigma), which identifies the operational state. The variable can take three values; 1.3 = 'all operations', 1.2 = 'start up and run down' and 1.4 'steady state operation'. The value of 1.3 'all operations' was used in the calculation. Therefore to summarise, the method of piling was vibratory piling and the operational state was</p>

	<p>conditions. The references provided by the Applicant do not clarify this matter.</p>	<p>'all operations', as described in the relevant BSI standard. It should be noted that the vibratory piling calculation predicts higher levels of vibration than the percussive piling calculation and therefore the method assumed represents the worst-case scenario.</p>
<p>NOI-11 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 7: WLDC's maintained concern is that, despite the potential for night-time working, the impacts have not been assessed. The ES relies upon the use of best most practicable means (as defined in Section 72 of the Control of Pollution Act 1974) to minimise noise and vibration effects outside of the assessed hours of work (night-time working). This results in there being no assessment of the likely significant effects that may occur and these impacts are not before the decision maker to take into the planning balance. Due to the potential cumulative situation, receptors may experience these effects</p>	<p>See additional information in the Appendix to this Statement of Common Ground: '784-B031438 Cottam Solar Project Noise Response' The OCEMP [EX5/C7.1_D] has been updated for Deadline 5 to include additional night time construction mitigation measures.</p>

	<p>from multiple sources (projects and their respective activities) which could give rise to impacts on residential amenity that should be given due weight in the planning balance. The Applicant is acknowledging that noise and vibration impacts during the night-time are likely to occur and that they have not been assessed. Although the Applicant relies upon BS 5228-1:2009 as it is applied in Table 3.6 of the Outline Construction Environmental Management Plan (Rev C) (oCEMP), the 'Potential Impact' only relates to the practical activity and does not provide any assessed impact on receptors in terms of significance. It therefore remains that the impacts of acknowledged night-time working have not been assessed. The oCEMP provides some practical</p>	
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	<p>remedy, but is based upon un-assessed impacts and is imprecise as a controlling measure (mitigation).</p>	
<p>NOI-12 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 8: The Applicant’s response does not address WLDC’s concern. To provide more clarity, WLC would appreciate details relating to the following:</p> <ul style="list-style-type: none"> • A plant list for a road resurfacing sub-activity linked to the cabling works, • The predicted activity noise levels for each construction activity (although sound power levels for each plant item are reported), • The predicted noise levels for each activity at each receptor, • Whether hard or soft intervening ground is assumed, 	<ul style="list-style-type: none"> • The plant list for road resurfacing linked to the cabling works is presented in Paragraph 15.7.8, Table 15.23 of Chapter 15: Noise and Vibration [APP-050]. • With regard to the cabling works, the activities in Table 15.23 have been added together to provide a combined sound power level, therefore assuming that all activities are occurring simultaneously. • Construction activities for the solar array sites have been modelled so that all activities detailed in Table 15.22 are occurring simultaneously. Piling activities have been placed in worst-case positions relative to the nearest sensitive receptors. It is considered that predicted noise levels from construction noise are worst-case and that in reality noise levels will be lower. Predicted noise levels at each receptor will therefore contain elements of noise from solar panel erection (piling and telehandler) and substation compound construction activities depending on their relative distance from the noise sources. It is considered unlikely that both sub-activities will occur at the same time and therefore the assessment is likely to over-estimate the construction noise at any given time, thus providing a worst-case robust assessment. • Ground absorption factor of G=0.8 (soft ground) has been assumed as stated in paragraph 15.7.76 of the ES chapter [APP-050]. • No screening/hoarding has been assumed in the construction noise assessment. • Distances for the cable route have been based on the red line boundary of the cable corridor and source locations have been positioned at the closest distance to the sensitive receptors within the red line. Construction activities for

	<ul style="list-style-type: none"> • Presence of screening from existing structures or construction noise barriers that could reduce construction noise levels, • How the distances between the receptors and various construction activities were obtained (for example, whether they reflect the distance from the red line boundary or site plans with more detailed information), • How construction phasing has been considered, • Reasons for the receiver heights for the cabling being 1.5m only when 4m is also used for other activities (shown in Tables 15.17 and 15.19), • Contextual information that explains what the predicted construction noise levels in Appendix 15.3 represent (e.g. the worst-case construction activity, all construction activities 	<p>the solar array sites have been placed at locations identified from proposed site plans. As stated above, piling locations have been chosen close to the red line boundaries and adjacent to the nearest sensitive receptors, to represent the worst-case.</p> <ul style="list-style-type: none"> • All construction activities as detailed in Table 15.22 have been assessed as occurring simultaneously. • It was assumed cable route construction would be daytime hours only. Therefore receptors representing the ground floor were assessed.
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	<p>occurring simultaneously), and</p> <ul style="list-style-type: none"> • Noise impacts at night at locations where night time working may occur. 	
<p>NOI-13 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 9: WLDC notes the Applicant's response, however it does not address the matter raised. The information sought relates to the piling technique to adopted; that is whether percussive piling methods are assumed and whether these are in steady-state or start-up/run down conditions. The references provided by the Applicant do not clarify this matter.</p>	<p>See NOI-10 above</p>
<p>NOI-14 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 10: The matter raised by WLDC relates to information about sound sources considered in the operation phase. This is to enable confirmation of the scope of the assessment</p>	<p>See additional information in the appendix to this Statement of Common Ground: '784-B031438 Cottam Solar Project Noise Response'</p>

	<p>and the assumptions applied in the noise modelling. The Applicant's response is to refer to paras. 15.7.63-15.7.70 of ES Chapter 15, however the information sought is not addressed in those paragraphs. To provide more clarity, WLDC seeks confirmation on the following:</p> <ul style="list-style-type: none"> • The number of conversion units, transformers and inverters proposed by the project, • Clarification on whether the values presented for transformers and inverters include the sound insulation of the conversion unit housing and louvre, • Supporting evidence that the 'typical' frequency spectra applied to the conversion units, transformers and inverters are appropriate in absence of manufacturers' data 	
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	<p>(paragraphs 15.7.55, 15.7.58, 15.7.60),</p> <ul style="list-style-type: none"> • Clarification that the data presented in Tables 15.25, 15.26 and 15.27 represent the equipment at full capacity. • The operation phase results tables shown in Appendix 15.3.5 consistently show that the rating levels (specific sound level plus acoustic penalty) are higher at night than during the daytime (i.e. Table 15.3.11, Table 15.3.16, and Table 15.3.21). It is not clear from the Noise and Vibration chapter why the proposed development would emit more noise at night. The tabulated noise levels seem to contradict paragraph 15.7.68, which states that “the night-time noise levels are likely to be substantially lower in practice”. Further clarification is required to confirm the level of impact. 	
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	<ul style="list-style-type: none"> • The rationale behind the selection of the background sound levels used in Appendix 15.3.5 remains unclear in this section of the ES and can affect the stated outcomes of the assessment. Paragraphs 15.7.74 and 15.7.78 in the ES chapter state that the rating levels are below 35dB for West Burton 2 and West Burton 3, whereas Appendix 15.3.5 shows rating levels above 35dB (Table 15.3.16, Table 15.3.21). Further clarification is required to confirm the level of impact. 	
<p>NOI-15 Noise and Vibration</p>	<p>WLDC 2ndWQ response point 11: WLDC note the Applicant’s confirmation that no uncertainty has been included in the assessment. The justification provided is that this is due to ‘robust baseline noise data, octave band frequency data utilised</p>	<p>Measurement of existing ambient or background noise levels will be subject to a degree of uncertainty. Environmental noise levels vary between days, weeks, and throughout the year due to variations in source levels and conditions, meteorological effects on sound propagation and other factors. Therefore, any measurement survey can only provide a sample of the ambient levels. Every effort has been made such that measurements were undertaken in such a way as to provide a representative sample of conditions, such as avoiding periods of adverse weather conditions, and school holiday periods (which are often considered to result in atypical sound levels). However, a small degree of uncertainty will always remain in the values taken from such a measurement survey.</p>

	<p>in the noise model'. WLDC maintain, however, that there will always be a degree of uncertainty in any measurement of existing ambient of background sound levels due to, for example, environmental variation between days, weeks and throughout the year due to changes in source levels, conditions and meteorological effects on sound propagation. Such uncertainties are typically acknowledged withing noise assessments, including other solar farm NSIP projects.</p>	<p>Specific details regarding construction works are not currently available as the Contractor who would finalise the detailed design work has not yet been commissioned. Therefore, the assessment undertaken has been based on the previous experience or professional judgement of the assessor with regard to similar types of development.</p> <p>Construction noise predictions in CadnaA have been undertaken using BS 5228:2014+A1:2019 'Code of practice for noise and vibration control on construction and open sites' methodologies of sound sources associated with the proposed construction activities. These sound sources are taken to be representative of the plant and/or activities that will be used during the construction process of the Scheme. Noise predictions were carried out to represent a worst-case scenario where construction plant is operational nearest to the identified receptors and does not take into account quieter periods when limited activities take place or at further distances. Consequently, noise predictions may overestimate construction noise levels and are therefore considered to be reasonable likely worst case.</p>
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Matters Agreed (Air Quality).

Table 3-6

Topic	Sub-topic	Details of Matters Agreed
AIR-01 Air Quality	Baseline Conditions	The baseline conditions which are detailed in Section 17.5 of Chapter 17: Air Quality of the Environmental Statement [APP-052] are representative of the site conditions.
AIR-02 Air Quality	Methodology and Assessment	The methodology adopted in the Air Quality assessment [APP-052] has been derived from the information obtained through consultation with stakeholders and by reviewing any relevant guidance and studies. The assessment methodology is detailed within Section 17.4 of Chapter 17: Air Quality Environmental Statement [APP-052] and is considered acceptable.
AIR-03 Air Quality	Methodology and Assessment (construction vehicles)	As detailed within the Air Quality assessment [APP-141 to APP-143] the proposed construction vehicle numbers will not exceed the relevant IAQM/EPUK thresholds e.g., 100 HGV Annual Average Daily Traffic (AADT), therefore there is no requirement for detailed construction air quality modelling and assessment has been scoped out of Chapter 17: Air Quality Environmental Statement [APP-052]. This approach is considered acceptable.
AIR-04 Air Quality	Methodology and Assessment (operational vehicles)	As detailed within the Air Quality assessment [APP-141 to APP-143] the proposed operational vehicle numbers will be limited and will not exceed the relevant IAQM/EPUK thresholds (e.g., 100 HGV Annual Average Daily Traffic (AADT), therefore there is no requirement for detailed air quality modelling and assessment has been scoped out of Chapter 17: Air Quality Environmental Statement [APP-052]. This approach is considered acceptable.
AIR-05 Air Quality	Mitigation	The proposed mitigation measures set out within Section 17.8 of Chapter 17: Air Quality of the Environmental Statement [APP-052] are acceptable.

Matters Agreed (Socio-Economics, Tourism and Recreation).

Table 3-7

Topic	Sub-topic	Details of Matters Agreed
STR-01 Socio-Economics, Tourism and Recreation	Methodology	The methodology used in the assessment of socio-economic, tourism and recreation impacts as set out in Section 18.4 of ES Chapter 18 [APP-053] is appropriate, given that there is no standard methodology for the assessment of socio-economic and associated impacts for EIA.
STR-02 Socio-Economics, Tourism and Recreation	Cumulative Assessment methodology	The cumulative assessment of socio-economic, tourism and recreation effects as set out in Section 18.10 of ES Chapter 18 [APP-053] has been carried out in an acceptable manner.

Matters Agreed (Soils and Agriculture).

Table 3-8

Topic	Sub-topic	Details of Matters Agreed
SAA-01 Soils and Agriculture	Baseline Conditions	The baseline conditions detailed at Section 19.8 of Chapter 19: Soils and Agriculture of the Environmental Statement [REP-010] and within Appendix 19.1 [APP-145] are representative of the baseline site conditions.
SAA-02	Methodology and Assessment	The methodology and assessment undertaken in relation to soils is agreed.
SAA-03 Soils and Agriculture	Proposed Mitigation	The proposed mitigation measures set out within Section 19.10 of Chapter 19: Soils and Agriculture of the Environmental Statement [REP-010] are acceptable. It is agreed that a Soil Management Plan secured through a DCO requirement is the appropriate mechanism to deliver mitigation.
SAA-04 Soils and Agriculture	Cumulative Impacts	The cumulative impacts detailed in Section 19.11 of Chapter 19: Soils and Agriculture of the Environmental Statement [REP-010] are considered to be properly assessed.

Matters Agreed (Other Environmental Matters).

Table 3-9

Topic	Sub-topic	Details of Matters Agreed
OEM-01 Other Environmental Matters	Major Accidents and Disasters (fire safety)	The assessment undertaken with regard to fire safety as set out in Section 21.6 of ES chapter 21 [APP-056] and as set out in the Outline Battery Storage Safety Management Plan [REP3-018] has been carried out in a robust and proportionate manner and is considered acceptable. The Impacts are acceptable with a robust outline Battery Storage Safety Management Plan. WLDC defers to LCC on fire safety matters.

Matters agreed (Ecology and Biodiversity).

Table 3-10

Topic	Sub-topic	Details of Matters Agreed
ECO-01 Ecology and Biodiversity	ES Chapter 9: Baseline	The baseline conditions detailed in Chapter 9: Ecology and Biodiversity of the Environmental Statement [APP-044] are representative of the baseline site conditions.
ECO-02 Ecology and Biodiversity	ES Methodology	The assessment methodology detailed in Chapter 9: Ecology and Biodiversity of the Environmental Statement [APP-044] is considered acceptable.
ECO-03 Ecology and Biodiversity	Cumulative Impacts	The cumulative impacts detailed in Chapter 9: Ecology and Biodiversity of the Environmental Statement [APP-044] are considered acceptable.

Matters agreed (Climate Change).

Table 3-11

Topic	Sub-topic	Details of Matters Agreed
CC-01 Climate Change	ES Chapter 7: Baseline	Whether or not the baseline conditions detailed in Chapter 7: Climate Change of the Environmental Statement [REP-014] are representative of the baseline site conditions.
CC-02 Climate Change	ES Chapter 7: Methodology	Whether or not the assessment methodology detailed in Chapter 7: Climate Change of the Environmental Statement [REP-014] is considered acceptable.
CC-03 Climate Change	ES Chapter 7: Mitigation	Section 7.9 of Chapter 7: Climate Change of the Environmental Statement [REP-014] has not identified the need for any additional mitigation or enhancement measures

Matters agreed (Cultural Heritage).

Table 3-12

Topic	Sub-topic	Details of Matters Agreed
CUL-01 Cultural Heritage	ES Chapter 13: Baseline	Whether or not the baseline conditions detailed in Chapter 13: Cultural Heritage of the Environmental Statement [APP-048] are representative of the baseline site and study area conditions.
CUL-02 Cultural Heritage	ES Methodology	Whether or not the assessment methodology detailed in Chapter 13: Cultural Heritage of the Environmental Statement [APP-048] is considered acceptable.
CUL-03 Cultural Heritage	Impact of the Scheme on the setting of Scheduled Monument Thorpe medieval settlement (NHLE ref 1016978)	The potential impact of the Scheme on the setting of Scheduled Monument Thorpe medieval settlement (NHLE ref 1016978), as identified in Paragraph 3.4.6 of the Heritage Statement [APP-125 to APP-128], is 'moderate adverse' – 'significant', which equates to less than substantial harm using NPS/NPPF classification.
CUL-04 Cultural Heritage	Shared Cable Corridor Route	As detailed in the SoCG for Lincolnshire [EX5/C8.3.2_D], the scope and results of works carried out to assess the potential impact on archaeological remains within the 'Shared Cable Route Corridor', proposed to be shared by the Cottam Solar Project, the West Burton Solar Project and the Gate Burton Solar Project, between Stow Park Road and the Cottam Power Station were discussed during meetings between the Applicant and LHPT, archaeological advisors for West Lindsey District Council, on 12.01.2023, 22.02.2023 and 22.03.2023.

		<p>LHPT in agreement that the extent and quality of collected baseline data was sufficient to inform an appropriate mitigation strategy (WSI; ES Chapter Appendix 13.7) [REP4-025].</p> <p>This approach is considered acceptable.</p>
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4 Matters Not Agreed

4.1.1 The matters which are ‘Not Agreed’ with West Lindsey District Council are as follows:

Matters Not Agreed (Principle).

Table 4-1

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
PD-05 Principle of Development	Project components	Whether the siting of the individual project components, as set out in the draft Development Consent Order (dDCO) [EX5/C3.1_G] and Design and Access Statement [APP-342 to APP-345], is acceptable.	<p>WLDC:</p> <p>WLDC considers the project layout to be contrary to policy and unacceptable. This is due to the project representing poor design, resulting in the highly inefficient use of land that delivers a project that has multiple ad-hoc areas of infrastructure (included associated development such as converter stations) and construction access points, cable lengths and internal access roads. The impacts is that the project exerts significant adverse impacts across a wide geographical area, affecting a wide range of communities and being experienced for a significant distance when travelling through the landscape.</p> <p>Applicant:</p> <p>The Applicant considers the project layout to be acceptable and has provided responses in relation to West Lindsey DC’s comments on siting, design and layout at 1.2.28 of Applicant Responses to Deadline 2 submissions [REP3-039]. Further detailed responses to comments raised on the issues of good design and site selection can be found at WLDC 6.1 - 6.5 of Applicants Responses to Local Impact Reports [REP2-047] and at WLDC-09, WLDC-10 and WLDC-13 of Applicant’s Responses to Written Representations Part 1 [REP2 -048].</p>

<p>PD-07 Principle of Development</p>	<p>Cumulative Effects</p>	<p>Approach taken to cumulative assessment</p>	<p>WLDC:</p> <p>WLDC considers the scope of the EIA should include an assessment of the various scenarios that could occur through a scenario of more than one, but fewer than all of the projects assessed on a cumulative basis.</p> <p>In the event that all three of the current projects in examination (Cottam, Gate Burton and West Burton) are determined at the same time by the Secretary of State, WLDC contend that, due to the approach taken to the cumulative assessment, the environmental information provided only allows the Secretary of State as decision maker to consider three decision options to be made:</p> <ul style="list-style-type: none"> i. To grant consent for a single project only; or ii. To grant consent for all three projects; or iii. To refuse consent for all three projects. <p>During Issue Specific Hearing 4 'Cumulative Effects' (06/12/2023) this position was fairly described as an 'all or nothing' scenario by the ExA in respect of cumulative significant effects, a definition that WLDC considers appropriate.</p> <p>Applicant:</p> <p>The Applicant disagrees with WLDC's position. There is no need to cumulatively assess the various potential combination of projects as the Applicant has assessed the worst case. In the event that the Secretary of State considers that the cumulative significant effects of all three projects is not acceptable in the planning balance, they can request further information during the decision-making period to establish whether the cumulative significant effects of only two of the projects would be acceptable. In any event, the Applicant's position is</p>

			that the benefits of the Scheme outweigh the significant cumulative effects identified.
PD-08 Principle of Development	Policy	Compliance with the National Policy Statements and the adopted development plan.	<p>WLDC:</p> <p>Deems the scheme to fail to accord with the National Policy Statements EN-1 and EN-3, and fails to accord with the adopted Central Lincolnshire Local Plan 2023.</p> <p>The key matters of non-compliance are:</p> <p>Project site selection, design and non-efficient use of land.</p> <p>Landscape visual effects</p> <p>Landscape character effects</p> <p>Insufficient information to ensure the co-ordination of construction impacts where two or more of the nearby NSIP applications.</p> <p>Insufficient assessment of the impact of the project (in solus and cumulatively with other projects) on the wider impact of the loss of agricultural activity on the wider agricultural sector and supply chain.</p> <p>Lack of guaranteed 'availability' of land for the production of food.</p> <p>Impact upon a Scheduled Monument.</p> <p>Applicant:</p> <p>The Planning Statement [REP4-039] has been revised to align with the latest national policy position. Appendix 3 of the Planning Statement [REP4-039] sets out the modifications to the November 2023 NPSs and outlines the Scheme's compliance to these revisions.</p>

			Section 1 of Appendix 4 of the Planning Statement [REP4-039] sets out the accordance of the Schem to the Central Lincolnshire Local Plan 2023.
PD-09 Principle of Development	Project lifespan / Scope of DCO	Extension in the project lifespan from 40-60 years.	<p>WLDC:</p> <p>It is not accepted that the assessed impacts will remain unchanged with an increase in lifespan of 20 years to a total of 60 years.</p> <p>The applicant has not carried out an adequate assessment of the likely impact of the extension of the project lifespan of 20 years. It is noted that the ES chapter 23 has been updated, but the table that forms that chapter neither carried out an assessment and its function is to summarise the topic specific ES chapters which has equally not been updated.</p> <p>The ES chapters, particularly chapter 8 LVIA, does not provide an explanation of how the judgements of have been reached. Such an approach fails to follow the GLVIA methodology, particularly in terms how the assessor has treated the assessment of the duration of affects, and what weight is given to reversibility of effects over an period in excess of half a century.</p> <p>Applicant:</p> <p>The Applicant considers that the environmental impacts of the operational period being 60 years has been adequately assessed.</p> <p>The Applicant’s position is set out in Review of Likely Significant Effects at 60 Years [REP2-058] and the Written Summary of the Applicant’s Oral Submissions and Responses at Issue Specific Hearing 4 [REP3-035]. The Applicant confirms that the assessment methodology underpinning this review is as set out in Chapter 2: EIA Process and Methodology [APP-037] and, where applicable, the relevant chapter of the Environmental Statement.</p>

Matters Not Agreed (Draft DCO)

Table 4-2

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
DCO-01 Draft DCO	- Schedule 17	The time period provided for the determination of information submitted for approval pursuant to DCO 'requirements'.	<p>WLDC:</p> <p>The period does not adequately allow for the consideration of a significant volume of complex information (including environmental) that also required consultation with, and the consideration of representations by, statutory bodies.</p> <p>The proliferation of NSIP solar projects occurring within the West Lindsey District with similar consenting and construction timescales is highly likely to result in significant volumes of information being submitted for approval for a range of projects, placing a significant demand upon the approval authority to robustly assess and determine the submissions.</p> <p>Applicant:</p> <p>The Applicant considers the drafting to be reasonable and acceptable, and considers that it represents an appropriate balance between providing the local authority with sufficient time to consider the application, in the context of the urgent need to deliver low carbon energy infrastructure.</p>

Matters Not Agreed (Alternatives and Design Evolution)

Table 4-3

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
ALT-01 Alternatives and Design Evolution	Site selection, alternatives and design	Use of land	<p>WLDC:</p> <p>WLDC deem the project unacceptable as it represents a wholly inefficient use of land, resulting in the creating of wide ranging adverse impacts that extend beyond that of other solar project that provide similar public benefit.</p> <p>The failure to demonstrate an inefficient use of land is contrary to NPS EN-3.</p> <p>Applicant:</p> <p>Paragraph 2.10.17 of NPS EN-3 (November 2023) states <i>“Along with associated infrastructure, a solar farm requires between 2 to 4 acres for each MW of output. A typical 50MW solar farm will consist of around 100,000 to 150,000 panels and cover between 125 to 200 acres. However, this will vary significantly depending on the site, with some being larger and some being smaller. This is also expected to change over time as the technology continues to evolve to become more efficient. Nevertheless, this scale of development will inevitably have impacts, particularly if sited in rural areas.”</i></p> <p>Table 7.1 of Statement of Need [APP-350] shows a comparison of annual energy yield per hectare for different technologies, including for solar and onshore wind the range from high to low generation density per technology. The conclusion drawn from this table is that the average annual energy yield per acre of land from solar is of a comparable order of magnitude as the average annual energy yield per acre of land from onshore wind; and both are significantly higher than the average energy yield from bio-crops.</p>

Matters Not Agreed (LVIA)

Table 4-4

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
<p>LAN-04</p> <p>Landscape and Visual</p>		<p>Cumulative impacts</p>	<p>WLDC:</p> <p>The cumulative impacts of Cottam Solar Project with Gate Burton Energy Park, West Burton Solar Project and Tillbridge Solar Project are a key concern for WLDC. The scale of the projects, in isolation as well as cumulatively, will give rise to significant environmental impacts that will require scrutiny and assessment by WLDC and should be a key focus of the examination phase.</p> <p>The cumulative impacts of Cottam Solar Project with Gate Burton Energy Park and West Burton Solar Project are of particular importance as these projects are likely to be examined under the PA2008 concurrently. It is therefore essential that consistent information and evidence is presented at all three examinations to enable a fair and consistent recommendation (and decision) to be made.</p> <p>Tillbridge Solar Project is expected to be submitted in Q1 2024, with more detailed project information becoming public prior to the Cottam Solar Park being determined, including its 'acceptance' for examination. WLDCs view is that all current environmental information must be before a decision maker at the point a decision is made and the emergence of the Tillbridge Solar Project should be accounted for in cumulative assessments.</p> <p>Cumulative impacts of concern will relate to construction, operational and decommissioning impacts across a range of matters including, <i>inter alia</i>,</p>

			<p>landscape and visual effects, land use (loss of agricultural land), public access and recreation, noise, traffic and transport, cultural heritage and ecology.</p> <p>WLDC maintain significant concerns regarding the approach to cumulative assessment. The concern relates not to outcomes of the applied methodology of assessing the scenarios of cumulative projects together being constructed either all at the same time or in sequence, but that there is no assessment of the potential combinations between the projects.</p> <p>WLDC considers it essential that the combinations of each cumulative project are understood and assessed so that that ExA and the Secretary of State can reach sound conclusion on NSIPs that are all being examined at the same time and situated in the same locality.</p> <p>At present, the only cumulative scenario that can be considered for the purpose of decision making is one where all projects are consented. There is no assessment of how each combination of projects perform (e.g. 2 projects together)</p> <p>WLDC are concerned that, if all DCO applications are considered individually without proper regard to the cumulative impacts and/or only in a scenario where all cumulative projects are consented, they may all be considered acceptable as isolated schemes, but with no consideration of whether there is a 'tipping point' from acceptability into unacceptability. This approach to decision making is flawed as it would allow projects to progress that could have unacceptable cumulative impacts with each other.</p> <p>WLDC's strong view is that, in order for the decision maker to have adequate information before them to make a sound decision, a cumulative assessment that addresses the following combinations should be provided as a minimum:</p>
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			<ul style="list-style-type: none"> • Cottam + Gate Burton • Cottam + West Burton • Cottam + Tillbridge • Cottam + Gate Burton + West Burton • Cottam + Gate Burton + Tillbridge • Cottam + West Burton + Tillbridge • Cottam + Gate Burton + West Burton + Tillbridge <p>Unless such assessments are carried out, there is no ability for the decision maker to determine whether a combination of two projects could be acceptable cumulatively; they could only consider the total cumulative impacts of all projects that form the assessment.</p> <p>Should the cumulative impacts of all projects be concluded to be unacceptable, WLDC is unclear about how the decision maker determines which project(s) influence that unacceptable conclusion the greatest. WLDC are therefore concerned about whether the decision maker is able to conclude a single DCO application is unacceptable based upon its cumulative impacts and, if the cumulative situation was concluded to be unacceptable, the current assessment does not allow for a decision where two of the project are considered to be acceptable.</p> <p>The reasoning behind WLDC’s concern is triggered by the overlapping nature of cumulative projects, where by each ExA is assessing the single project in front of them only, but that none of the application are consented, and may be determined at the same time by the Secretary of State</p>
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			<p>WLDC reiterated its request for an assessment of various combinations of projects to be carried out and not just a reliance upon a ‘worst case’ assessment of all projects taken together.</p> <p>WLDCs position is that, in the event that all three of the current projects in examination (Cottam, Gate Burton and West Burton) are determined at the same time by the Secretary of State, the environmental information provided only allows for three decision options to be made:</p> <ul style="list-style-type: none"> i. To grant consent for a single project only; or ii. To grant consent for all three projects; or iii. To refuse consent for all three projects. <p>During Issue Specific Hearing 4 'Cumulative Effects' (06/12/2023) this position was fairly described as an 'all or nothing' scenario by the ExA, a definition to that WLDC considers appropriate.</p> <p>WLDC have consistently requested that the cumulative assessments for all projects assess the various combinations between them. Such an assessment would allow the decision maker, in the event that they find all three projects unacceptable, to consider whether two projects could be granted.</p> <p>Based upon the current approach, such a decision is unable to be made due to the lack of environmental assessment to demonstrate the comparative impacts between each combination to allow a reasoned judgement to be made.</p> <p>WLDC maintain objections to the cumulative assessment.</p>
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			<p>Applicant:</p> <p>A cumulative assessment has been undertaken as part of the LVIA Assessment process, and the findings are set out within the individual receptor sheets within Appendix 8.2 [REP-020], and Appendix 8.3 [REP4-023]. Proposed cumulative developments are shown on LVIA Figure 8.15.1 [APP-290]. All sites and development included within the cumulative assessment have been discussed and agreed with the Lincolnshire County Council. The judgements on the likely cumulative effects and conclusions for the landscape and visual receptors, as set out within the LVIA Chapter, Section 8.10 [REP2-008] and Appendix 8.2 [REP-020] and Appendix 8.3 [REP4-023], are sufficient to inform the findings of the assessment. This assessment includes any likely in-combination/cumulative effects from other known Solar Projects in the area.</p> <p>Whilst the Gate Burton scheme does share some landscape character areas with the Cottam Solar project, the Gate Burton scheme is a singular site located partially within the Laughton Wood Area of Greater Landscape Value (AGLV). The Cottam Solar Project is not located within an AGLV and is comprised of a series of disparate sites that are separated with tracts of land and with landscape features between that assist with its integration and assimilation into the landscape.</p> <p>There is no direct comparable position with the Gate Burton solar project as this Scheme has a different baseline or starting point. As set out above, Gate Burton occupies (in part) a landscape that affords local designation (AGLV), whereas the landscape at Cottam is not nationally or locally designated.</p>
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			<p>The landscape at Cottam is subject to a notable pressure for change from its predominant use as agriculture and the bench line or starting point for the landscape baseline affected by these sensitivities is associated with this condition and quality. The benefits to landscape character have the scope to restore the landscape baseline.</p> <p>The Environmental impact Assessments for each of the Schemes have been undertaken independently, and different impact assessments can reach different conclusions. The differences between the conclusions of the Cottam Solar Project LVIA and the one undertaken for the Gate Burton Energy Park are not unexpected given the elevated value of the receiving landscape at Gate Burton compared to Cottam, and the difference in approach to design and mitigation between the two schemes.</p> <p>The difference in opinion therefore rests on five key areas relating to the starting points for both sites as follows:</p> <ol style="list-style-type: none"> 1. Landscape Value: Gate Burton is host to the Area of Greater Landscape Value (AGLV). Cottam is not host to an AGLV and is also a series of disparate sites that are separated with tracts of land and with landscape features between that assist with integration. 2. National Policy Statements: Both assessments are based on published landscape character assessments (dated 1999 and 2010). These assessments take account of forces for change that are likely to have a bearing on the value, susceptibility and sensitivity of the landscape but do not take full account of the current position on climate change and the delivery of energy projects and also the capacity of the receiving landscape to integrate these projects. Please refer to NPS (EN-3) (designated January 2024) on the approach to
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			<p>assessing overall cumulative impacts at paragraph 2.51.2 that sets out how solar projects are likely to be in low-lying areas of good enclosure. In the context of Cottam, this would refer to landscape character types such as 4a Unwooded Vales. Please also refer NPS (EN-5) (designated January 2024) which places emphasis on sub-stations and other above ground installations to draw out the implications of their footprint in the context of landscape and visual effects. The Applicant has adjusted their assessment to make allowances for these factors in reaching conclusions on the sensitivity and the capacity of the landscape to adapt to climate change and how this is strongly dependent of mitigation to bring forward beneficial effects and help improve the capacity of the receiving landscape to absorb the Scheme (based on professional experience).</p> <p>3. GLVIA3: The measures to avoid or reduce the adverse effects at Gate Burton are shown to be not possible or are not able to promote beneficial effects by the author of the LVIA. The Applicant has reached a difference of opinion and consider this is a result of their baseline scenario which differs from Cottam due to point 1 above. The Applicant’s difference of opinion is also set in the context of green infrastructure benefits that are derived in the context of Bio-diversity Opportunity Mapping (BOM).</p> <p>4. Professional Opinion: The author of the Cottam assessment has extensive experience in the design of large-scale infrastructure projects and associated mitigation required to bring these forward through the planning system. The mitigation for Cottam is also practicable and deliverable, and can be secured through Requirement 7 of the DCO and the mitigation measures will also be updated at Year</p>
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			<p>15 to take account of changes to the landscape. The author of the Cottam assessment also has extensive experience in the landscape planning sector.</p> <p>5. Published Landscape Character Assessment and other guidance: The Applicant has incorporated material within the baseline to take account of green infrastructure planning and biodiversity net gain in the context of climate change. This also takes account of the Trent Vale Landscape Partnership Landscape Character Assessment that sets out for example:</p> <p>The Applicant has provided an In-Combination Assessment taking account of the Cottam Sites (C1, C2, C3a and C3b). Please refer to response LAN-08 below. With regards to the independent scenarios of In-Combination between Cumulative Developments and the approach to multiple DCOs which may be inter-dependent in some way, this decision will typically be made by the Secretary of State.</p>
LAN-06 Landscape and Visual		Assessment Methodology	<p>WLDC:</p> <p>The adverse impact on landscape character has been understated.</p> <p>The project results in an extensive change to land use over a larger geographical area (as a consequence of poor project design).</p> <p>The introduction of alien structures within the rural landscape character will result in an urbanising effect resulting in definite and adverse impacts/changes.</p> <p>It appears to WLDC that the assessment has been ‘sliced’ into separate sections for the purpose of the assessment, resulting in the cutting down of the project into smaller elements and Landscape Character Areas. This approach affects the assessed significance of the impact on Landscape</p>

			<p>Character as a result of the whole scheme when the disparate sections are put together.</p> <p>The impacts on a number of character areas (in solus and cumulatively with other projects) result will affect the Regional Landscape Areas as whole, not just local.</p> <p>It is unclear how the applicant justifies only 'negligible' or 'minor adverse' in early years construction when impacts will be experienced over a wider area and it will take many years for mitigation to be established.</p> <p>It is disagreed that to have large, multiple dispersed sites across a very wide geographical area minimises impacts and results in a beneficial impact. The effect will be significant adverse landscape character impacts (changes to the existing baseline) across a very wide area that would be minimised through the adoption of good project design principles that avoid such disaggregation.</p> <p>The screening of the project through vegetation will not ameliorate the significant impact upon the character of the landscape and its defining fabric (large scale rural agricultural fields).</p> <p>The LVIA assessment has not been updated to provide an assessment of the increase of the project lifespan by 20 years (50%) and does not follow the GLVIA methodology as a consequence.</p> <p>WLDC disagrees with the applicant's reliance upon the screening of the development to conclude that there are 'beneficial' impacts. The project will not be whole screened across its entirety and communities will experience adverse visual impacts sequentially across a wide geographical area.</p> <p>WLDC disagrees with the conclusions reached in the assessment.</p>
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			<p>Applicant:</p> <p>The Applicant disagrees that the assessment methodology is erroneously applied. The Landscape and Visual Assessment is undertaken in accordance with ES Appendix 8.1 LVIA Methodology [APP-068].</p> <p>The assessment methodologies and significance criteria set out within Section 8.4 of ES Chapter 8: Landscape and Visual Impact Assessment Revision A [REP2-008] (the 'LVIA') provides an appropriate, proportionate and robust approach to assessing the potential likely significant effects on receptors; and has been undertaken with consideration of the appropriate and relevant guidance in full consultation with Lincolnshire County Council (LCC) and Nottinghamshire County Council (NCC). At the time the methodology was being agreed LCC acted as the main consultee with the Applicant with the understanding that information relevant to landscape and visual matters would be forwarded to WLDC by LCC for comment. At the time the methodology was being agreed, WLDC did not have landscape architect advisory services in place and it was agreed that once these specialist services had been procured WLDC would be able to engage further.</p> <p>The LVIA includes a full and detailed assessment that deals with both effects (see paragraph 8.4.23) on the landscape itself and effects on the visual amenity of people, as well as changing views. The LVIA process is iterative (see paragraphs 8.1.1, 8.4.5, 8.6.1, 8.8.2, 8.8.3 and 8.11.1) and as a result, the design of the Scheme changes to respond to the findings of the assessment to ensure that landscape mitigation is fully considered as part of the process. This approach to the assessment is undertaken in accordance with the LVIA</p>
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			<p>Methodology agreed in full consultation with Lincolnshire County Council and Nottinghamshire County Council.</p> <p>The LVIA includes an assessment of landscape effects at a range of scales, including a finer grain landscape assessment that includes the Sites, Cable Routes and Substations, their immediate area and the wider landscape setting. This finer grained assessment considers individual contributors under the topics of land use, topography, communications and infrastructure, settlement, industry, commerce and leisure, public rights of way and access, Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens and Ancient Woodlands and natural designations. The assessment and evaluation of the potential impacts and effects of these individual contributors is set out within ES Appendix 8.2 Revision A [REP-020] and ES Appendix 8.3 Revision A [REP2-012] of the LVIA and was agreed with Lincolnshire County Council and Nottinghamshire County Council at LVIA Workshops.</p> <p>The Applicant was informed by Lincolnshire County Council during these LVIA Workshops that a list of potential projects to be considered as part of the cumulative assessment had been forwarded to West Lindsey District Council (WLDC) who would be better placed to provide more detailed information. Feedback from WLDC was not received during this process. Instead, Nottinghamshire County Council provided final comment on the list of cumulative developments in their email 1 September 2022. The LVIA considers the cumulative effects and the methodology is set out within Appendix 8.3.1 and has been agreed with Lincolnshire County Council and Nottinghamshire County Council.</p>
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			<p>Mitigation, including offsets and planting, has been proposed within the LVIA to address and minimise adverse effects on the character of the landscape. This mitigation is in line with the agreed methodology and the hierarchy of approach advocated by the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition and was agreed with Lincolnshire County Council and Nottinghamshire County Council at the series of workshops, as set out in C6.3.8.4 ES Appendix 8.4 Consultation [APP-076].</p>
<p>LAN-07 Landscape and Visual</p>	<p>Visual impacts</p>	<p>Extent of harm caused by visual effects.</p>	<p>WLDC:</p> <p>It is disagreed that to have large, multiple dispersed sites across a very wide geographical area minimises impacts and results in a beneficial impact. The effect will be significant adverse landscape character impacts (changes to the existing baseline) across a very wide area that would be minimised through the adoption of good project design principles that avoid such disaggregation.</p> <p>The dispersal of several large solar sites across the landscape will have a significant visual effect for receptors experiencing the wider landscape (i.e. travelling through it). It increases the number of receptors affected and significantly increases the ZTV, capturing a wider scope of harmful impacts.</p> <p>Applicant:</p> <p>The Applicant disagrees that the multiple dispersed sites will lead to a greater impact. The six primary reasons are set out below:</p> <p>Dispersed nature of the Sites: The dispersed nature of the Sites will assist with assimilation. The low-lying areas between the separate Sites are effective as</p>

			<p>visual buffers on a horizontal plane. This likely helps in reducing the visual impacts of the panels.</p> <p>Nature of Scheme being ‘overlaid’ and reversable: Schemes for <u>mineral extraction fundamentally change the nature of the landscape in which they operate, whereas solar projects, with the exception of the footprint of the buildings, are ‘overlaid’ on the landscape allowing the important landscape features such as hedgerows, trees and watercourses to remain.</u></p> <p>Strong framework of existing vegetation: The strong framework of existing vegetation means that this will provide the structure for the Scheme to be set comfortably and not become intrusive. This will be evident at year 1 when the existing hedgerows will have grown out to allow the Scheme to remain low-level. The intermediary areas between the separate Sites boast a strong network of existing vegetation providing structural benefits to the landscape. The existing vegetation also acts as a backdrop for the panels and helps them integrate, particularly in views towards the horizon. By contrast, some areas between the separate Sites provide open character. Whilst this may not be a requirement in all locations, the character of these areas can also be celebrated, emphasizing the importance of preserving these unique landscape qualities.</p> <p>The benefits of mitigation: Year 15 would bring forward the benefits of the new planting in reducing the adverse effects. Please refer to the LVIA [REP2-008] specifically Table 8.21 which sets out the strategic approach to the landscape design parameters that have been adopted in the process of developing the environmental masterplan and associated landscape mitigation measures. These measures are particularly suited to a series of separate sites and also beneficial for the features of importance for example, the watercourses are noted as distinct features in the landscape, and careful</p>
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			<p>use of scattered tree and shrub planting helps reinforce their presence in a generous open context while setting panels back.</p> <p>Biodiversity Net Gain: In following the mitigation hierarchy, the Scheme will deliver significant areas of mitigation that will enhance the natural environment by providing net gains for biodiversity. This will deliver additional enhancement and connections to wider ecological networks as well as contributing to the enhancement of the quality of the landscape going well beyond biodiversity net gain.</p> <p>Defining legacy: The defining legacy of the landscape would be the robust framework of features that have become improved through the mitigation and landscape enhancements. This mitigation in turn would giving rise to long-term wider benefits, including maintaining and enhancing biodiversity and in promoting the resilience of ecosystems. A key policy objective is the incorporation of new planting and green infrastructure in all landscape mitigation measures. The receiving landscape is designed to allow space for such green infrastructure between areas. Public rights of way are also buffered, maintaining accessibility while minimising the impact of the panels along these routes for the long-term. The areas between the Sites also provide scope for extended enjoyment of the landscape in these areas either through interpretation, access or exponentially. The time depth within the landscape involves considering historical and cultural aspects such as the setting of settlements and the views of churches. The receiving landscape between the Sites provides scope to preserve and enhance the time depth.</p>
LAN-08	Landscape character impacts	Extent of harm caused on the landscape character.	WLDC:

<p>Landscape and Visual</p>			<p>The adverse impact on landscape character has been understated.</p> <p>The project results in an extensive change to land use over a larger geographical area (as a consequence of poor project design).</p> <p>The introduction of alien structures within the rural landscape character will result in an urbanising effect resulting in definite and adverse impacts/changes.</p> <p>It appears to WLDC that the assessment has been ‘sliced’ into separate sections for the purpose of the assessment, resulting in the cutting down of the project into smaller elements and Landscape Character Areas. This approach affects the assessed significance of the impact on Landscape Character as a result of the whole scheme when the disparate sections are put together.</p> <p>The impacts on a number of character areas (in solus and cumulatively with other projects) result will affect the Regional Landscape Areas as whole, not just local.</p> <p>It is unclear how the applicant justifies only ‘negligible’ or ‘minor adverse’ in early years construction when impacts will be experienced over a wider area and it will take many years for mitigation to be established.</p> <p>It is disagreed that to have large, multiple dispersed sites across a very wide geographical area minimises impacts and results in a beneficial impact. The effect will be significant adverse landscape character impacts (changes to the existing baseline) across a very wide area that would be minimised through the adoption of good project design principles that avoid such disaggregation.</p> <p>The screening of the project through vegetation will not ameliorate the significant impact upon the character of the landscape and its defining fabric (large scale rural agricultural fields).</p>
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			<p>Applicant:</p> <p>The Applicant disagrees that the adverse impact on landscape character has been understated.</p> <p>It is agreed by the Applicant and LCC that there are no In – Combination Significant Adverse Effects on the following Landscape receptors at construction and year 1:</p> <p>National Scale Landscape Character. Regional Scale Landscape Character Area LCT 3a Flood Plain Valleys. Regional Scale Landscape Character Area LCT 4b Wooded Vales. Regional Scale Landscape Character Area LCT 6a Limestone Scarps and Dipslopes. Regional Scale Landscape Character Area LCT 2b Planned and Drained Fens and Carrlands. Topography and Watercourses. Communication and Infrastructure. Settlements, Industry, Commerce and Leisure. Public Rights of Way and Access. National and Locally Designated Landscapes Analysis & Evaluation. Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens.</p> <p>It is agreed by the Applicant and LCC that there are no In-Combination Significant Adverse Residual Effects to the following Landscape receptors:</p> <p>National Scale Landscape Character.</p>
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			<p>All Regional Scale Landscape Character Areas. Topography and Watercourses. Communication and Infrastructure. Settlements, Industry, Commerce and Leisure. Public Rights of Way and Access. National and Locally Designated Landscapes Analysis & Evaluation. Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens. Ancient Woodlands and Natural Designations.</p> <p>It is agreed by the Applicant and LCC that there are no In-Combination Significant Adverse Effects to any Landscape Receptor associated with the Cable Route Corridor at any point in time.</p> <p>It is agreed by the Applicant and LCC that there are no In-Combination Significant Adverse Residual Effects to any Landscape Receptor associated with the Substation sites.</p> <p>It is agreed by both parties that there are no Cumulative Significant Adverse Effects on the following landscape receptors at construction and year 1:</p> <p>National Scale Landscape Character. Regional Scale Landscape Character Area LCT 3a Flood Plain Valleys. Regional Scale Landscape Character Area LCT 4b Wooded Vales. Regional Scale Landscape Character Area LCT 6a Limestone Scarps and Dipslopes. Regional Scale Landscape Character Area LCT 2b Planned and Drained Fens and Carrlands.</p>
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			<p>Settlements, Industry, Commerce and Leisure. Public Rights of Way and Access. National and Locally Designated Landscapes Analysis & Evaluation. Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens.</p> <p>It is agreed by the Applicant and LCC that there are no Cumulative Significant Adverse Residual Effects to the following Landscape receptors:</p> <p>National Scale Landscape Character. Regional Scale Landscape Character Area LCT 3a Flood Plain Valleys. Regional Scale Landscape Character Area LCT 4b Wooded Vales. Regional Scale Landscape Character Area LCT 6a Limestone Scarps and Dipslopes. Regional Scale Landscape Character Area LCT 2b Planned and Drained Fens and Carrlands. Topography and Watercourses. Communication and Infrastructure. Settlements, Industry, Commerce and Leisure. Public Rights of Way and Access. National and Locally Designated Landscapes Analysis & Evaluation. Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens.</p> <p>It is agreed by the Applicant and LCC that there are no Cumulative Significant Adverse Effects to any Landscape Receptor associated with the Cable Route Corridor at any point in time.</p>
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			It is agreed by the Applicant and LCC that there are no In-Combination Significant Adverse Effects to any Landscape Receptor associated with the Substation Sites at any point in time.
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Matters Not Agreed (Cultural Heritage)

Table 4-5

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
CUL4 Cultural Heritage	Mitigation	Extent of mitigation to protect the setting of Scheduled Monument Thorpe medieval settlement (NHLE ref 1016978)	<p>WLDC:</p> <p>The assessed impact of the project equates to 'less than substantial' impact upon the Thorpe Medieval village Scheduled Monument.</p> <p>Under their statutory duty, the SoS must give great weight to the asset's conservation where less than substantial harm is found. This harm can readily be addressed through minor amendments to the project (removal of solar panels as advised by Historic England) and therefore the public benefits do not outweigh the harm caused.</p> <p>The impact of the project of the Scheduled Monument is therefore unacceptable in both legislative and policy compliance terms.</p> <p>Applicant: The Applicant considers the proposed mitigation to be sufficient, which comprises an offset c.50m from the northern edge of the Scheduled Monument, and a hedgerow that is proposed to be located to the north of Thorpe in the Fallows to provide screening between the village and the Scheme.</p>

Matters Not Agreed (Socio -Economics, Tourism and Recreation)

Table 4-6

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
STR-06 Socio-Economics, Tourism and Recreation	Assessment Outcomes		<p>WLDC: WLDC questions the impacts on long-term indirect agricultural job losses. It is considered that the likelihood of jobs returning following a 40-60 year gap has not been adequately accounted for.</p> <p>The impact on the wider agricultural sector supply chain do not seem to have been accurately considered. This applies to the assessment of the Cottam Solar Project solely and cumulatively with other projects over the 40-60 year operational period. There is no level of certainty that jobs will simply return when the land use is restored when WLDC consider that the sector will have been materially harmed.</p> <p>Applicant: The Applicant has assessed the level of impact on the agricultural economy and employment sector and the assumptions made in its determination of effects both in solus and cumulatively, and at the point of decommissioning and restoration of the land to agricultural use.</p> <p>The cumulative assessment of losses to the agricultural sector identifies a total of 41 FTE agricultural jobs lost as a result of the cumulatively assessed projects set out in Table 18.25. These are determined to be worst-case scenario job losses over the lifetime of each project. This is determined to be a long-term (albeit reversable) moderate-minor adverse and is therefore not significant in EIA terms. The projected economic impact of a loss of 41 FTE jobs in this sector is approximately £2.0 million gross value added (GVA) per annum. This is equivalent to a long-term minor adverse effect. Again, this is not significant in EIA terms.</p>

			<p>The Applicant has not concluded any significant adverse effects to the agricultural economy or employment sector at any point during the Scheme's lifetime in-solus or when assessed cumulatively. As such, it is not considered that there is material harm to this economic sector or that there are substantive barriers to agricultural employment recommencing following the restoration of the land after the Scheme is decommissioned.</p>
<p>STR-07 Socio-Economics Tourism and Recreation</p>	<p>Human health</p>	<p>Health Impact Assessment</p>	<p>WLDC:</p> <p>In order to comply with development plan policies, a Health Impact Report should have been submitted with the application.</p> <p>The report is separate to the EIA, as its purpose goes beyond the scope of simply identifying 'likely significant' impacts, to the identification of all potential impact.</p> <p>A HIA would allow the assessor to be more qualitative in its assessment and seek to identify impacts that, although may not be 'significant' in EIA terms, will still be adverse impacts that every effort should be made to mitigate and taken into the overall planning balance.</p> <p>Applicant:</p> <p>The "Health Impact Assessment for Planning Applications: Guidance Note" April 2023, is primarily to support policy S54 of the Central Lincolnshire Local Plan (2023) which states the requirements for a Health Impact Assessment for any development over 5 ha in area. Whilst the Applicant understands the Scheme is able to beneficially contribute towards the general themes of health and wellbeing the policy is written to achieve, this policy has not been considered by the Applicant as the policy is aimed almost entirely at TCPA planning applications and requirements at that scale. As the Scheme is an NSIP, the scoping for a HIA is to be determined by PINS. In the EIA Scoping</p>

			<p>Opinion [APP-064], the Applicant’s approach to assessing health and wellbeing impacts was agreed with no requirement made for a separate HIA to be undertaken.</p> <p>The Applicant has submitted ES Addendum 21.1: Human Health and Wellbeing Effects [REP4-068] which provides a collation of human health and wellbeing impacts as assessed in the ES.</p>
STR-03 Socio-Economics, Tourism and Recreation		Cumulative Assessment outcomes	<p>WLDC: Whether the outcome of the cumulative assessment of socio-economic, tourism and recreation effects as set out in Section 18.10 of ES Chapter 18 [APP-053] is acceptable.</p> <p>WLDC consider that the cumulative impacts of projects will have an unacceptable significant negative impact on tourism and socio-economics (agricultural sector). Lack of clarity in the assessment as to what the impacts with other projects will be.</p> <p>Applicant: The cumulative assessment of economic impacts to the tourism and visitor sector has determined a worst-case peak minor adverse impacts during construction, a long-term cumulative minor adverse impact during operation, and a peak moderate-minor adverse impact during decommissioning. This is based on a loss of spending from visitors as a result of displacement from accommodation by workers, and reductions to the desirability of the Till Valley and Trent Valley areas for visitors, as a result of the location of the cumulatively assessed projects. None of the assessed effects to the tourism and visitor sector (with regard to economic performance or employment) are significant in EIA terms.</p>

			<p>The cumulative assessment of losses to the agricultural sector identifies a total of 41 FTE agricultural jobs lost as a result of the cumulatively assessed projects set out in Table 18.25. These are determined to be worst-case scenario job losses over the lifetime of each project. This is determined to be a long-term (albeit reversible) moderate-minor adverse and is therefore not significant in EIA terms. The projected economic impact of a loss of 41 FTE jobs in this sector is approximately £2.0 million gross value added (GVA) per annum. This is equivalent to a long-term minor adverse effect. Again, this is not significant in EIA terms.</p>
<p>STR-03 Socio-Economics, Tourism and Recreation</p>		<p>Assessment of Likely Significant Effects. Whether the assessment of project-specific socio-economic, tourism and recreation effects as set out in Section 18.7 and 18.9 of ES Chapter 18 [APP-053] has been carried out in a robust and sufficiently detailed manner. Whether the assessment has duly considered effects on public amenity and recreation, and safety and human health, and is therefore considered acceptable.</p>	<p>WLDC: consider that the project will have a significant negative impact on the local tourism sector, causing damage to its image and recovery.</p> <p>WLDC consider there is a lack of detail and clarity around the in-solus and cumulative assessment with regard to accommodation particularly.</p> <p>WLDC considers the assessment shows that there are insufficient accommodation space in the Local Impact Area during construction, but with limited consequential assessment of the implications of this lack of accommodation.</p> <p>WLDC comment there is no assessment of the wider impacts on the supply-chain within the agricultural sector.</p> <p>WLDC considers that an assumption that the agricultural sector and jobs will simply re-establish post-decommissioning is false.</p> <p>Applicant:</p>

			<p>The assessment of accommodation impacts were based on the Visit England Accommodation Stock Audit 2016, room occupancy rates for England in 2019, and Business Register and Employment Survey Data up to 2019. Data for 2020 and 2021 were not used due to the impact of the COVID-19 pandemic, whilst full year data for 2022 was not available at the time the assessment was published.</p> <p>The assessment of accommodation need is based on a worst-case scenario of 35.8% of the workforce for the Scheme requiring temporary accommodation within the Local Impact Area. The Applicant concurs that there is not sufficient accommodation stock for construction employment to be accommodated without displacement of visitors. The Applicant has therefore assessed the consequential loss of visitor spending as a result of this displacement on the tourism and visitor employment and economic sector. The Applicant has also considered the knock-on consequences of reduction in the desirability of the Local Impact Area for visitors as a result of the Scheme. The assessment does not determine any significant adverse effects to the tourism and visitor sector when assessed in-solus or cumulatively.</p> <p>The assessment of losses to the agricultural sector identifies a worst-case scenario over the lifetime of each project. As the in-solus and cumulative assessment has not anticipated any significant adverse impacts, a broader assessment of impacts upon the agricultural supply chain was not considered to be proportionate as no additional significant effects are anticipated at any stage of the assessed lifetime of the Scheme.</p> <p>The Applicant considers that it is a reasonable assumption for a similar level of agricultural employment to be reintroduced at the point the Scheme is restored to agricultural use. This is based on the assumption that the current level of employment needed to work the land for agriculture is not likely to be substantially different in the future. Furthermore, the Applicant seeks to</p>
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			<p>reiterate that the farm businesses that are landowners for the Scheme area also have land beyond the Order Limits which will continue to be in agricultural use, and there are some (even if limited) opportunities for some level of continues agricultural (grazing) use on the Sites themselves. Even considering changes to business ownership, or changes to land ownership, the Applicant does not consider that at the end of the Scheme agricultural management of the land would have to be re-established instantaneously or from scratch, and would instead come about as a result of the Scheme land being re-integrated with neighbouring active agricultural activities.</p>
<p>STR-04 Socio-Economics, Tourism and Recreation</p>		<p>Proposed Mitigation and Enhancement Measures. Whether the proposed embedded and additional mitigation and enhancement measures as set out in Section 18.6 and 18.9 of ES Chapter 18 [APP-053] are considered proportionate and acceptable</p>	<p>WLDC: consider clarity required on likely displacement of construction workers (in solus and cumulatively). Clarification on the implications of a wider displacement of workers upon other technical assessments in the ES (e.g. traffic and transport).</p> <p>WLDC consider lack of mitigation through control documents/management plans to demonstrate how construction activity will be managed (in solus and cumulatively).</p> <p>Applicant: The Applicant has embedded mitigation to control and manage the level of construction activities to limit the requirement for accommodation, and to limit cumulative construction impacts through the measures set out in Table 3.8 of C7.1_C Outline Construction Environmental Management Plan_ [EX5/C7.1_D]. This is secured through Requirement 13 of Schedule 2 to C3.1_F Draft Development Consent Order Revision F [EX5/C3.1_G]. The applicant is confident that these measures provide sufficient scope to suitable manage the level of on-site activity from the Scheme in-solus, and can be used in co-</p>

			ordination with neighbouring NSIP schemes to ensure that where construction activities overlap, that these are co-ordinated to avoid peak times for visitors to the Local Impact Area, or directed to locations with sufficient capacity.
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Matters Not Agreed (Traffic and Transport)

Table 4-7

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
<p>TRA-04</p> <p>Traffic and Transport</p>	<p>Cumulative Effects</p>	<p>Whether or not the cumulative impacts detailed in Section 14.9 of Chapter 14: Transport and Access of the Environmental Statement [APP-049] are acceptable.</p>	<p>WLDC:</p> <p>WLDC consider the design and layout of the project results in multiple access points and the use of more highways to construct and operate the project. The access points are a consequent of the scheme’s design and layout, which WLDC considers unacceptable. The benefits of the project could be delivered with fewer such impacts had a better designed project been promoted.</p> <p>The current oCTMP [EX5/C6.3.14.2_F] does not provide sufficient detail to demonstrate how construction traffic will be co-ordinated and managed in the event two or more projects are being constructed concurrently.</p> <p>Until an approach to co-ordination is proposed The design and layout of the project results in multiple access points and the use of more highways to construct and operate the project. The access points are a consequent of the scheme’s design and layout, which WLDC considers unacceptable. The benefits of the project could be delivered with fewer such impacts had a better designed project been promoted.</p> <p>WLDC consider the current oCTMP does not provide sufficient detail to demonstrate how construction traffic will be co-ordinated and managed in the event two or more projects are being constructed concurrently. Until an approach to co-ordination is proposed which also enables consideration of how to minimise cumulative traffic impacts further, the negative impact of traffic upon the amenity of communities remain unacceptable. sed which also</p>

			<p>enables consideration of how to minimise cumulative traffic impacts further, the negative impact of traffic upon the amenity of communities remain unacceptable.</p> <p>Applicant:</p> <p>HGVs associated with the cumulative schemes will be spread around the highway network. For example,</p> <ul style="list-style-type: none"> • HGVs associated with the Cottam Scheme will use the A1500, Ingham Lane/Stow Lane, the A631 and B1205. • HGVs associated with the West Burton Scheme will use the A1500, A57 and B1241. • HGVs associated with the Gate Burton Scheme will utilise the A156; and • HGVs associated with the Tillbridge Scheme HGVs will utilise the A631. <p>The key roads which will have a cumulative effect if all schemes are constructed at the same time are the A15, A1500 and A631. All of these roads are A-Roads which already support significant HGV movement. The local roads that have been identified as the construction vehicle routes for the Cottam Scheme will not be used by the other cumulative schemes.</p> <p>Therefore, the cumulative effects will not be significant in transport and access terms.</p> <p>Notwithstanding this, as set out in paragraph 7.2 (point xxvi) of the Outline Construction Traffic Management Plan [EX5/C6.3.14.2_F], a Joint CTMP could be implemented in the event that the construction schedules associated with this</p>
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			<p>Scheme and other schemes in the area overlap. Other Schemes that come forward in the area could be included as appropriate. This is also committed to in the Joint Report on Interrelationships [REP3-027] between the West Burton, Cottam, Gate Burton and Tillbridge Schemes.</p>
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Matters Not Agreed – Noise and Vibration

Table 4-8

Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
NOI-03 Noise and Vibration	Assessment Outcomes	Whether the effects of noise and vibration detailed in Chapter 15: Noise and Vibration of the Environmental Statement [APP-050] and Appendix 15.3 [APP-139] from the construction and operational phases of the Scheme do not result in a significant impact and are acceptable.	<p>WLDC: WLDC consider that whilst the outcomes of the EIA process are agreed, negative impacts as a consequence of noise and vibration will still be experienced. Even though below the EIA threshold of 'significant', the impacts must still be weighed as a negative in the planning balance.</p> <p>The co-ordinated management of noise and vibration (including dust) Operational phase vibration effects have not been assessed despite being referenced in the Scoping Opinion.</p> <p>No night-time construction is assessed – please clarify that no working will occur at night-time and explain how the cable construction that intersects the railway will be carried out during day-time hours.</p> <p>Clarify the piling methodology to be used (is a percussive method to be used and will it be operated with a steady-state or start-up/run down conditions). Please provide further details on the sound sources considered in the operational phase assessment.</p> <p>Provide details of uncertainties in the assessment as required by BS4142.</p> <p>Provide further details on the proposed acoustic louvres required to mitigate impacts.</p> <p>Applicant: <i>'Operational phase vibration effects have not been assessed despite being referenced in the Scoping Opinion'.</i></p>

			<p><i>'No night-time construction is assessed – please clarify that no working will occur at night-time and explain how the cable construction that intersects the railway will be carried out during day-time hours.'</i></p> <p>This issue was addressed in response to WLDC 14.1 [REP-091]</p> <p><i>'Clarify the piling methodology to be used (is a percussive method to be used and will it be operated with a steady-state or start-up/run down conditions).'</i></p> <p>Vibratory piling has been assumed in the noise and vibration chapter as stated in Section 15.4 Chapter 15: Noise and vibration [APP-050].</p> <p><i>'Provide details of uncertainties in the assessment as required by BS4142.'</i></p> <p>Assumptions and limitations Sound level data for operational noise-producing plant (i.e inverters, transformers and BESS units) have been based on industry sound pressure level measurement data. See Chapter 15: Noise and Vibration [APP-050]. Surrounding ground conditions are farmland and have been modelled as soft (G=0.8) One order of reflection was modelled. Land topography has been incorporated into the noise modelling and receptor points have been set at a standard height of 1.5m above local ground levels to represent daytime ground floor level and 4.0m for night-time, first-floor receptors. Operational noise has been predicted with all plant being in maximum operation at all times of day. Consequently, noise predictions represent a reasonable worst-case.</p> <p><i>'Provide further details on the proposed acoustic louvres required to mitigate impacts.'</i></p>
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			<p>This issue was addressed in response to WLDC 14.1 [REP-091]. Acoustic louvres were modelled to provide broadband attenuation of at least 10 dB. The performance of acoustic louvres will vary between manufacturers. However, a generic acoustic louvre was utilised in the noise model and a reduction of 10 dB was achieved. It is considered that a 10 dB reduction is readily achievable and is not considered to be a constraint regarding embedded mitigation.</p>
<p>NOI-04 Noise and Vibration</p>	<p>Cumulative Impacts</p>	<p>Whether or not the cumulative impacts detailed in Chapter 15: Noise and Vibration of the Environmental Statement [APP-050] are considered acceptable. WLDC requests more details on how cumulative noise impacts will be managed, especially within the shared cable corridor.</p>	<p>WLDC:</p> <p>The approach to joint construction with other projects are not adequately explained. The oCEMP recognises the issue, but does not provide details of how developers will work together in practice.</p> <p>Applicant:</p> <p>The Cable route Corridor has the potential to be shared with other nearby solar projects as detailed in Chapter 4: Scheme Description REP-012. There is the possibility that either all the projects’ ducts and cables are installed within the same construction programme or works on the projects will be built sequentially. If the projects are built sequentially, there will be no cumulative effects greater than those identified in the residual effects, although the effect would occur for longer. If the works are undertaken concurrently, then cumulative effects may occur.</p> <p>The assessment of noise due to the Cable Corridor activities was based on a worst-case scenario where works were assumed to undertaken at the closest boundary to residential receptors. Consequently, the residual effects identified for the Cable Corridor would be unchanged if installation of the</p>

			Cable Corridor for all the projects occurred concurrently. However, the duration of these works is likely to be extended and, hence the duration that receptors may be exposed to noisy works out of core hours.
NOI-16 Noise and Vibration	<p>WLDC 2ndWQ response point 12:</p> <p>WLDC maintains its concerns regarding the lack of details provided with regard to the proposed acoustic louvres as a mitigation measure. Clarification is required to confirm whether the 10dB noise reduction refers to the overall performance of the product or specific frequencies. As Table 15.23 (ES Chapter 15) shows that noise emissions from conversion units are highest at 4000Hz, it is unclear whether there are</p>		<p>WLDC:</p> <p>The response from the applicant does not address the clarification asked. No technical specifications (height, materials, construction method) of the louvres have been provided despite them being a mitigation relied upon to reduce impacts to an acceptable level.</p> <p>Applicant:</p> <p>See additional information in the Appendix to this Statement of Common Ground: '784-B031438 Cottam Solar Project Noise Response'</p> <p>The applicant's response on the specification of the acoustic louvres provides octave band noise reduction data for an acoustic louvre provided by Wakefield Acoustics. The example louvre provided will comfortably meet the noise reduction (10dB) specified in the ES chapter, the octave band data provided confirms that the 4000Hz tone will also be reduced sufficiently. Details of construction of the louvres is provided in the technical data sheet appended to the additional information document referenced above.</p>

	proposals for this frequency to be targeted in the specification of the acoustic louvre.		
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Soils and Agriculture (Not Agreed)

Table 4-9

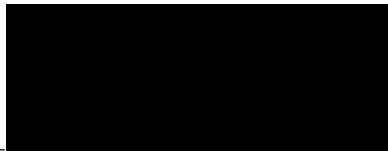
Topic	Sub-topic	Details of Matters Not Agreed	Applicant/WLDC comment
SAA-01 Soils and Agriculture	Baseline Conditions	Methodology and assessment in relation to the agri-food sector and the wider agricultural supply chain.	<p>WLDC:</p> <p>The assessment inadequately considers the baseline and subsequent assessment with regards to the impacts on the agri-food sector and the wider agricultural supply chain.</p> <p>Applicant:</p> <p>The impacts of the Scheme on the agri-food sector and the wider agricultural supply chain are not within the scope of the Soil and Agriculture chapter of the ES [REP-010].</p> <p>The potential impacts of the scheme on supply chains and economic sectors were considered within the ES Chapter on Socio-Economics [APP-053]. The approach adopted with regard to agricultural supply chains is set out in response STR-03 within this document.</p>

5 Signatories

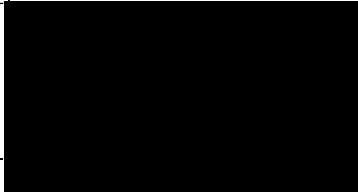
Overview

5.1.1 The above SoCG is agreed between Cottam Solar Project Ltd. (the Applicant) and West Lindsey District Council, as specified below.

Duly authorised for and on behalf of **Cottam Solar Project Ltd.**

Name:	Eve Browning
Job Title:	Senior Project Development Manager
Date:	27/02/2024
Signature:	

Duly authorised for and on behalf of **West Lindsey District Council.**

Name:	Russell Clarkson
Job Title:	Development Management Team Manager
Date:	27/02/2024
Signature:	



Appendix A: 784-B031438 Cottam Solar Project Noise Response

Cottam Solar Project – Noise Comments Response

784-B031438

19th February 2024

This Noise Comments Response should be read in conjunction with the Statement of Common Ground between the Applicant and West Lindsey District Council. It provides additional information to address the comments made by the Council in its response to the ExA Second Written Question 2.11.2[REP4-072]. The Council’s comments have been added as “Under Discussion Items within the SoCG”.

Tetra Tech Responses in Blue

WLDC Comment NOI-08

“The Applicant’s response is noted, however, WLDC are seeking more detailed descriptions of locations to validate that appropriateness of the proxy locations to the receptors.”

Tetra Tech Response NOI-08

Table 1 below summarises the receptors assessed in the ES chapter and the corresponding monitoring location utilised to provide the existing baseline noise level for Cottam 1.

Cottam 1

Table 1: Assessed Location and Corresponding Monitoring Location – Cottam 1

Location	Monitoring Location
R01	LT1
R02	LT1
R03	LT3
R04	LT3
R05	LT3
R06	LT3
R07	LT2
R08	LT1
R09	LT1
R10	LT1
R11	LT1
R12	LT4
R13	LT4
R14	LT4
R15	LT1
R16	LT1
R17	LT1
R18	LT1
R19	LT1
R20	LT1
R21	LT1
R22	LT1
R23	LT1

Cottam Solar Project – Noise Comments Response

Location	Monitoring Location
R24	LT1
R25	LT1
R26	LT1
R27	LT1
R28	LT1
R29	LT1
R30	LT1
R31	LT1
R32	LT1
R33	LT1
R34	LT1
R35	LT2
R36	LT2
R37	LT4
R38	LT1
R39	LT1
R40	LT1
R41	LT1
R42	LT1
R43	LT2
R44	LT2
R45	LT3
R46	LT3
R47	LT3
R48	LT3
R49	LT3
R50	LT3
R51	LT3
R52	LT4
R53	LT4
R54	LT4
R55	LT4
R56	LT4
R57	LT4
R58	LT4
R59	LT4
R60	LT4
R61	LT4
R62	LT4
R63	LT4
R64	LT4
R65	LT1
R66	LT1

Cottam Solar Project – Noise Comments Response

A description of the monitoring locations for Cottam 1 are presented in Table 2 below.

Table 2: Noise Monitoring Locations – Cottam 1

Ref	Description
LT1	On Fillingham Lane on the corner of the redline boundary
LT2	On Long Lane to the West of Ingham village just before the bend in the road
LT3	Just North of Thorpe Lane on the field boundary to the west of Thorpe in the Fallows
LT4	On the field boundary north of Stow pastures and the houses situated on Ingham Road

The ambient noise climate was mainly dominated by Road Traffic Noise and occasional farming noise. The main sources of this noise include; Kexby road, Willingham Road, Stow road, the A1500 and the B1241.

Cottam 2

Table 3 below summarises the receptors assessed in the ES chapter and the corresponding monitoring location utilised to provide the existing baseline noise level for Cottam 2.

Table 3: Assessed Location and Corresponding Monitoring Location – Cottam 2

Location	Monitoring Location
R01	LT1
R02	LT1
R03	LT1
R04	LT1
R05	LT2
R06	LT2
R07	LT2
R08	LT2
R09	LT1
R10	LT1
R11	LT1

A description of the monitoring locations for Cottam 2 are presented in Table 4 below.

Table 4: Noise Monitoring Locations – Cottam 2

Ref	Description
LT1	Adjacent to Corringham Grange Farm, positioned on the field boundary.
LT2	To the East of the houses positioned on East Lane.

The ambient noise climate was dominated by Road Traffic Noise with the main sources being; the A631 and Corringbeck Road during the day and evening. But the Road Traffic Noise is reduced at night with the dominant noise source being background animal noises.

Cottam Solar Project – Noise Comments Response

Cottam 3a

Table 5 below summarises the receptors assessed in the ES chapter and the corresponding monitoring location utilised to provide the existing baseline noise level for Cottam 3a.

Table 5: Assessed Location and Corresponding Monitoring Location – Cottam 3a

Location	Monitoring Location
R01	LT1
R02	LT1
R03	LT1
R04	LT1
R05	LT2
R06	LT2
R07	LT2
R08	LT3
R09	LT3
R10	LT2 from Cottam 3b
R11	LT2 from Cottam 3b
R12	LT2 from Cottam 3b
R13	LT1
R14	LT1
R15	LT1

A description of the monitoring locations for Cottam 3a are presented in Table 6 below.

Table 6: Noise Monitoring Locations – Cottam 3a

Ref	Description
LT1	Laughton Road, northwest of Irwin Road
LT2	Northeast of Blyton Park Racetrack
LT3	Southeast of Blyton Park Driving Centre

The dominant noise sources found in the area include: road traffic noise from Laughton Road, Kirkton Road and Church Road.

Cottam Solar Project – Noise Comments Response

Cottam 3b

Table 7 below summarises the receptors assessed in the ES chapter and the corresponding monitoring location utilised to provide the existing baseline noise level for Cottam 3b.

Table 7: Assessed Location and Corresponding Monitoring Location – Cottam 3b

Location	Monitoring Location
R01	LT1
R02	LT1
R03	LT1
R04	LT2
R05	LT2
R06	LT2
R07	LT2
R08	LT2
R09	LT1
R10	LT1
R11	LT1
R12	LT1 from Cottam 3a
R13	LT1
R14	LT1

A description of the monitoring locations for Cottam 3b are presented in Table 8 below.

Table 8: Noise Monitoring Locations – Cottam 3b

Ref	Description
LT1	South-western boundary of the site
LT2	Northern boundary of the site

The dominant noise sources found in the area include road traffic noise from Station Road and Pilham Lane

WLDC Comment NOI-11

“LDC’s maintained concern is that, despite the potential for night-time working, the impacts have not been assessed. The ES relies upon the use of best most practicable means (as defined in Section 72 of the Control of Pollution Act 1974) to minimise noise and vibration effects outside of the assessed hours of work (night-time working). This results in there being no assessment of the likely significant effects that may occur and these impacts are not before the decision maker to take into the planning balance. Due to the potential cumulative situation, receptors may experience these effects from multiple sources (projects and their respective activities) which could give rise to impacts on residential amenity that should be given due weight in the planning balance. The Applicant is acknowledging that noise and vibration impacts during the night-time are likely to occur and that they have not been assessed. Although the Applicant relies upon BS 5228-1:2009 as it is applied in Table 3.6 of the Outline Construction Environmental Management Plan (Rev C) (oCEMP), the ‘Potential Impact’ only relates to the practical activity and does not provide any assessed impact on receptors in terms of significance. It therefore remains that the impacts of

Cottam Solar Project – Noise Comments Response

acknowledged night-time working have not been assessed. The oCEMP provides some practical remedy, but is based upon un-assessed impacts and is imprecise as a controlling measure (mitigation). ”

Tetra Tech Response NOI-11

Some works activities may need to occur out of the core working hours/times due to activities requiring to be undertaken continuously (such as horizontal direction drilling (HDD) and cable jointing). Noise mitigation measures are set out within Table 3.6 of the C7.1_D Outline Construction Environmental Management Plan [REP3-012]. These measures include prior notification to be provided to the Local Planning Authority where work outside core hours is necessary.

Furthermore, Table 3.6 of the C7.1_D Outline Construction Environmental Management Plan [REP3-012] will be updated for Deadline 5 to provide additional controls over night-time working; namely a hierarchy of mitigation measures similar to those agreed within the outline Construction Environmental Management Plan for the Gate Burton Solar Project (see EN010131/[REP5-023]) as outlined below.

As requirements and locations for HDD activities will not be finalised until contractor is appointed, a hierarchy of mitigation measures is listed below:

- a) Where practicable, avoid HDD works within 200m of residential receptors.
- b) Where HDD activities may occur within 200m of sensitive receptors, the option for open-cut cable laying will be explored as an alternative to HDD.
- c) The potential use of quieter equipment will be explored by the principal contractor.
- d) Depending on location, plant and timing of works, noise matting will be installed on Heras fencing around the HDD site boundary to screen receptors from noise emissions. This mitigation could provide 10 dB of attenuation when the noise screen completely hides the sources from the receiver.
- e) If the HDD activities result in noise at nearby sensitive receptors that is predicted to exceed the night-time level of 45 dB $L_{Aeq,T}$, acoustic fencing would be used to screen the affected receptor from HDD noise and reduce noise levels to below 45 dB.

It should be noted that predicted construction noise levels for the cable route have been based on excavating ground and installation of ducts, which, is considered to emit a higher overall noise level than HDD activities. Therefore, when HDD activities are being undertaken, the noise assessment will over-estimate the noise emission.

WLDC Comment NOI-14

“The matter raised by WLDC relates to information about sound sources considered in the operation phase. This is to enable confirmation of the scope of the assessment and the assumptions applied in the noise modelling. The Applicant’s response is to refer to paras. 15.7.63-15.7.70 of ES Chapter 15, however the information sought is not addressed in those paragraphs. To provide more clarity, WLDC seeks confirmation on the following:

- *The number of conversion units, transformers and inverters proposed by the project,*

Cottam Solar Project – Noise Comments Response

- Clarification on whether the values presented for transformers and inverters include the sound insulation of the conversion unit housing and louvre,
- Supporting evidence that the ‘typical’ frequency spectra applied to the conversion units, transformers and inverters are appropriate in absence of manufacturers’ data (paragraphs 15.7.55, 15.7.58, 15.7.60),
- Clarification that the data presented in Tables 15.25, 15.26 and 15.27 represent the equipment at full capacity.
- The operation phase results tables shown in Appendix 15.3.5 consistently show that the rating levels (specific sound level plus acoustic penalty) are higher at night than during the daytime (i.e. Table 15.3.11, Table 15.3.16, and Table 15.3.21). It is not clear from the Noise and Vibration chapter why the proposed development would emit more noise at night. The tabulated noise levels seem to contradict paragraph 15.7.68, which states that “the night-time noise levels are likely to be substantially lower in practice”. Further clarification is required to confirm the level of impact.
- The rationale behind the selection of the background sound levels used in Appendix 15.3.5 remains unclear in this section of the ES and can affect the stated outcomes of the assessment. Paragraphs 15.7.74 and 15.7.78 in the ES chapter state that the rating levels are below 35dB for West Burton 2 and West Burton 3, whereas Appendix 15.3.5 shows rating levels above 35dB (Table 15.3.16, Table 15.3.21). Further clarification is required to confirm the level of impact.”

Tetra Tech Response NOI-14

Table 9 below presents the assessed number of plant items across the Schemes.

Table 9: Number of Plant Items

Scheme	Plant item		
	Conversion Units	Transformers	Battery Inverters
Cottam 1	119	5	233
Cottam 2	30	2	0
Cottam 3a	28	2	0
Cottam 3b	13	1	0

The manufacturers sound power level for the conversion units has been assumed to include the conversion unit housing and ventilation louvres.

The frequency spectra applied to the single value sound levels for each item type can be found in the reports supplied by the applicant in the appendix below.

All proposed plant has been assessed operating at full capacity.

The final two points were addressed in the response to the Local Impact Report.

WLDC Comment NOI-16

“WLDC maintains its concerns regarding the lack of details provided with regard to the proposed acoustic louvres as a mitigation measure. Clarification is required to confirm whether the 10dB noise reduction refers to the overall performance of the product or specific frequencies. As Table 15.23 (ES Chapter 15)

Cottam Solar Project – Noise Comments Response

shows that noise emissions from conversion units are highest at 4000Hz, it is unclear whether there are proposals for this frequency to be targeted in the specification of the acoustic louvre.”

Tetra Tech Response NOI-16

Table 10 below presents the typical acoustic performance of an acoustic louvre taken from Wakefield Acoustics Technical data sheet, which can be found appended below.

Table 10: Typical Acoustic Louvre Performance

Louvre	Sound Reduction R_w (dB)	Sound Reduction (dB) at Octave Band Centre Frequency Hz							
		63	125	250	500	1000	2000	4000	8000
WA-ACL-300SB	18	6	6	9	13	20	20	16	15

End of Document

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Appendices

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Reference: INR/2893C.

Date: May/2019.

Report.

Subject: Noise Survey at Madingley Road Substation, Cambridge.

Noise survey of the substation, prior to a major redevelopment.

Client: UK Power Networks plc.

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Report reference: INR/RR/2893C.

Client: UK Power Networks plc.

Subject: Noise levels at Madingley Road Substation, Cambridge.

Date: May/2019.

1.0 Introduction and Summary.

This report describes a noise survey of the Substation at Madingley Road, Cambridge. The aim was to make a record of the current noise levels prior to an extensive redevelopment of the substation. The sound level measurements were carried out on the 24th/April/2019.

Madingley Road is a main route to and from the City centre. The substation site is set back from the road, on the outskirts of the city, and not far from the M11 motorway. Noise from road traffic was very noticeable all around the site, with L90 (near minimum) levels of around 55dBA in the daytime and 45dBA at the end of the evening (10-30pm).

The substation site is a roughly rectangular compound with a steel paling fence at the boundary. It contains two identical modern transformers which are housed within very substantial brick enclosures. The transformers emit small humming sounds, as is normal, but the hum is very well contained by the enclosures and was not audible outside them. The mean sound level inside the enclosures is practically the same for the two transformers at around 59dBA, and I estimate the sound power level for them is about 70dBA (each). When the attenuation of the enclosure is taken into account, the effective sound power level of each transformer is about 50dBA: a very low figure.

I understand that the demand upon the substation is rising, and it is intended to replace the two transformers with two new ones of higher rating, and located differently. The manufacturer has given a figure for the sound power level of these as 'less than or equal to 86dBA'. The actual sound power level may be lower than the guaranteed maximum, of course, but it appears these transformers could be much noisier than the existing ones are.

The area around the substation site is mostly not residential in nature, but there is a pair of semi detached houses close to the boundary, called Merton Hall Farm Cottages. My calculations indicate that the existing transformers are inaudible at the facade of the Cottages, but the new ones will be clearly audible. If we take the sound power level of each transformer to be 86dBA, they will give a sound level of about 50dBA at the facade, and the sound will be strongly tonal. When this situation is rated using the method of BS4142:2014, the conclusion is that there is a 'significant adverse impact' at night.

In view of the above, I suggest that a provision should be made for the new transformers to be fitted with acoustic enclosures (as the present ones are). Enclosures made from an acoustic panel system should give a reduction in the range 15-20dBA, and this would eliminate the 'adverse impact' mentioned above. I estimate a pair of such enclosures would cost about £80,000, installed: an additional cost for fitting lighting inside them should be added to this.

2.0 Site description.

Madingley Road runs roughly East-West and is a main route from the M11 motorway to the city centre. The substation site is set back on the South side of the road, on the outskirts of the city and only about 650 metres from the motorway. The area around the substation is mainly occupied by departments of the University, but there are two houses very close by, called Merton Hall Farm Cottages, and some more, further away, on the North side of Madingley Road. The substation and the cottages, actually semi-detached houses, are shown in the satellite image of Figure 1 and in the photographs in Figure 2.

The substation layout is shown in Figures 3 and 4. The site has steel paling fences at the boundaries and contains two transformers, two switch rooms and some smaller items. The transformers are the same: they are modern units made by Brush Transformers in 2003, rated at 11/18/24MVA. Both are contained in very solidly constructed brick enclosures, and each has a free-standing radiator outside the enclosure. The transformers emit humming sounds, as is normal, but this sound is very well contained by the enclosures: I could not hear it at all outside them. There are no other significant sound sources in the substation.

It is now intended to replace both transformers with new ones, in new positions: I understand this is in response to increased demand. The locations for these are shown in Figure 2, it may be seen that they are closer to Merton Hall Farm Cottages than the existing ones are.

Madingley Road and the motorway were both very busy on the day of the survey, and traffic noise was very evident all around the substation. There was also some major building works going on at two sites: one is a development of houses and flats on the North side of Madingley Road, immediately opposite the substation, the other in the green area belonging to the University Department of Veterinary Medicine, on the South side of Madingley Road about 100 metres to the East. Both sites were busy on the day of the survey, with large cranes being used to position materials and so-on.

3.0 Sound level readings.

Two sound level meters were used for the survey, a Rion NA-27 and a Svantek SVAN971. The Rion meter was hand held, and used to take 'spot' readings in and around the site. The Svan meter was used as a data logger, to record the varying level of the background noise. Both meters are calibrated annually in our in-house facility, most recently on the 11th/January/2019.

3.1 Weather.

The day of the survey was mild to warm and intermittently sunny, with practically no breeze: more or less ideal conditions for the survey.

3.2 Readings using the Rion meter.

The Rion meter is a Real Time 1/3 Octave Integrating Sound Analyser (meter), type NA-27, which was checked before and after the survey using a Rion calibrator type NC-74. The meter was hand-held for the survey and a windshield was used throughout. The Rion meter is able to take several measurements at once, and to store the results. At each measuring point, readings of Leq, L90, L50 and L10, expressed as dBA, dBC and one-third octave bands, were stored.

3.2 Readings using the Rion meter (Continued).

The survey was carried out on Wednesday the 24th/April/2019 in two sessions in the afternoon and evening. The humming sound of the transformers was obvious inside the enclosures: the readings in them were taken for durations of about 15 seconds and the meter was moved in a circular path so as to average out the spatial variation that commonly occurs with transformer noise (it is often possible to get a variation of 10dB or more in the 100Hz band reading by moving the meter by a foot or two). This method is sometimes referred to as the 'Acoustician's Tai Chi': the result presented is the Leq value. The hum was not audible outside the enclosures, but the same Tai Chi technique was used for the readings there.

For the readings taken outside the substation, the meter was held still and for a duration of five minutes (each), to give a measure of the varying level of background noise in the area. Two positions were used for these measurements, one at the substation gate, the other in the road leading to the Department of Veterinary Medicine: this latter was chosen to be at about the same distance from Madingley Road as the rear facade of Merton Hall Cottages is.

3.3 Logging readings using the Svan meter.

The Svantek SVAN971 is a third octave sound level meter, analyser and data logger, which was checked before and after the survey using the Rion calibrator. It was set up on a tripod near the Eastern boundary of the site, as close as possible to Merton Hall Farm Cottages. The meter was set to log the sound level at this position, from 3-02pm to 3-36pm. Transformer hum was entirely inaudible at this position: the record from the meter gives a 'picture' of the varying levels of traffic related noise.

4.0 Results and discussion.

4.1 Transformer sound levels.

The sound levels measured inside and outside the transformer enclosures are shown in Figure 4, and some typical third octave spectra are in Figure 5A. It may be seen that the sound levels inside the enclosures are much the same for the two transformers: the averages of them are 58dBA/68dBC for T1 and 60dBA/67dBC for T2. It may also be seen that the spectra have prominent tones at 100Hz and a number of low multiples of 100Hz. In the readings taken immediately outside the enclosures none of these tones are visible in the spectrum, as may be seen in the example in Figure 5A. As has been said, transformer hum was not audible anywhere outside the enclosures.

4.2 Background sound levels.

Background sound level readings taken outside the substation are shown in Figure 2, typical spectra in Figure 5B, and the trace from the Svan meter in Figure 6. The readings reflect the generally high levels of background noise in the area, coming mostly from road traffic. At positions close to Madingley Road, the sound level 'peaks' each time a vehicle passes: further away from it the peaks are smaller but the general 'traffic hum' remains. On the basis of these results, I suggest that conservative (meaning low) values for the background sound level at the rear facades of Merton hall Farm Cottages are 50dBA in the daytime and 40dBA at midnight.

5.0 Calculations and assessment.

5.1 The existing transformers.

I have used the sound levels measured inside the transformer enclosures to estimate their sound power levels and then the sound level that they would produce at the facades of Merton Hall Cottages, and the results are as follows. (Since the sound levels for the two transformers are almost the same, I have averaged them and taken them as being equal).

Sound power level of one transformer (inside enclosure):	70dBA/79dBC
Sound power level of one transformer outside enclosure:	50dBA/60dBC
Estimated sound level at Cottages, from two transformers:	11dBA/21dBC

For comparison background level at facade, at midnight:	40dBA/50dBC
---	-------------

I have compared the transformer sound power level with others from our database. I find that these units are quieter than the average for modern transformers of similar rating, and modern transformers are generally quieter than old ones (dating, say from the 1960's). In sum, these are quiet transformers contained in very effective enclosures.

It is also clear that the transformer-related sound level at the Cottages facade is far lower than the lowest value for background noise. When this situation is rated using the method of BS4142, the conclusion is that there is (absolutely) no 'adverse impact' from transformer noise.

5.2 The proposed new transformers.

The new transformers are rated at 20/30MVA, and the manufacturer's guaranteed figure for their sound power level is 86dBA (each). It may be seen that this is significantly higher than the figures for the existing transformers, above. Since no figure for sound power level as dBC is given, I have estimated a value based on experience of other units, and calculated the sound level from two transformers at the facade of Merton Hall Farm Cottages, as follows.

Sound power level of one new transformer (maximum):	86dBA/96dBC
Estimated sound level at Cottages, from two transformers:	50dBA/60dBC

For comparison background level at facade, at midnight:	40dBA/50dBC
---	-------------

It may be seen that the estimated sound level is now higher than the background level at night, and the sound will also contain significant tones at 100Hz and its multiples.

5.3 Assessment (for the new transformers).

British Standard BS4142:2014 'Methods for rating industrial and commercial sounds' is the most widely used method for rating sounds affecting residences. The Standard was updated in 2014: a brief summary of it is given in an appendix herewith. The essence of the rating method is to compare the 'specific sound level' outside the residential facade with the background sound level that would exist in its absence. BS4142 uses sound levels measured as dBA (not dBC or third octave bands), and I have used the value calculated above, 50dBA near the facade, for the rating calculation below.

Level at facade of flats.	Daytime	Midnight
Transformer specific sound level:	50dBA	50dBA
Correction for tonal content:	+4dBA	+6dBA
Rating level:	54dBA	56dBA
Background level:	50dBA	40dBA
Rating over background:	+4dBA	+16dBA
Conclusion:	Significant adverse impact at night	

5.4 Noise control for the new transformers.

It is common practice for transformers to be housed in acoustic enclosures, and these normally give a reduction of 15 - 20dBA (coming from the same reduction in the level of the tone at 100Hz). Where the transformer has a free standing radiator, as the new ones at Madingley Road will do, it is normal to enclose the transformer, leaving the radiator outside. Once the enclosure is in place, it is generally found that a small amount of sound (hum) is still coming from the radiator, and this limits the overall performance that is achievable (to 15 - 20dBA).

An acoustic enclosure for one of these transformers would have dimensions approximately 5.8m x 6.0m x 3.5m high, standing on the bund wall. I estimate the cost for a pair of them would be about £80,000, installed. There would be additional costs for the fitting of lighting etc inside it.

Appendix.

BS4142:2014 'Methods for rating and assessing industrial and commercial sounds'

Industrial noise affecting housing is covered by the Environmental Protection Act 1990, which is administered by the Local Authority. There is a British Standard that the Authority may use to assess any given case: this is BS 4142:2014 'Methods for rating and assessing industrial and commercial sounds'. This Standard has recently replaced its predecessor, dated 1997. In essence the method consists of comparing the 'industrial' noise level measured outside the houses with the background level which would exist in the absence of the industrial noise. The greater the difference between the two, the greater the 'adverse impact' of the noise is judged to be.

In the context of the Standard, the 'noise level at the houses' is the **specific noise level** that is attributable to the industrial operation in question. If this noise has an irritating feature such as tonality or repeated impulses, a number of penalties, ranging from 3dBA upwards, may be added to the specific level before making the comparison: this adjusted level is called the **rated noise level**. The **background noise level** is always lower at night than by day, so if the noise continues through the night the Standard automatically sets a stricter criterion than applies if it does not.

BS4142 uses two ways of representing noise levels, L90 and Leq, as follows.

L90 is the level which is exceeded for 90% of the time and thus represents more or less the lowest level one is likely to measure, given that the actual level varies all the time. In the standard, L90 is used to define the background noise level, the view being that this measure will eliminate events such as occasional passing traffic, so that a 'true' figure for background level will be recorded.

Leq is a kind of average of the actual varying levels, and in BS4142 it is used as the measure of the specific noise level. Because of the way the average is taken, the Leq figure is in fact weighted somewhat towards the higher end of the range of actual levels. It is intended that the Leq should be a measure of how annoying or disturbing the noise is.

At the end of the calculations, the method produces a number referred to as **rating over background**, being the difference between the rated noise level and the background noise level: the greater the difference, the greater the **adverse impact** of the noise is judged to be. A difference +10dBA is described as a **likely to be an indication of a significant adverse impact**. +5dBA and +0dBA are described as having an **adverse impact** or **little impact**, depending on context. The Standard emphasises the importance of context, when considering the result from this numerical procedure.

It is, perhaps, worth pointing out that if the noise level is constant, as is often the case for transformers, then L90 and Leq are equal. Transformer noise always has a strong tone at 100Hz (not 50Hz) and usually has tones at multiples of 100Hz. A strong tone at 100Hz does not always show up well in a dBA measurement, since the A weighting emphasises contributions at higher frequencies. For this reason, I generally record dBC, as well as dBA, but note that the legislation and Standards are based on dBA values (only).



Substation.

Merton Hall Farm Cottages.

Figure 1. Satellite image.



Switch room.

Merton Hall Farm Cottages.

Figure 2. Photographs.

Top: The two transformer houses, with radiators outside them. The Unite office building is behind them.

Bottom: Merton Hall Farm Cottages, viewed from near the transformer bay.

Reading	Time	Leq	L90
130	15-30	56/70/54	54/67/51
131	16-10	67/75/59	57/73/55
132	22-32	65/68/53	43/54/39
133	22-39	55/61/48	45/53/38

XX/YY = dBA/dBC/dB(100Hz).
 Readings taken over five minutes.
 Transformer hum was not audible at any of the readings positions.
 Sounds were from road traffic and crane movements in afternoon.
 ⊙ Shows the position of the Svan meter.

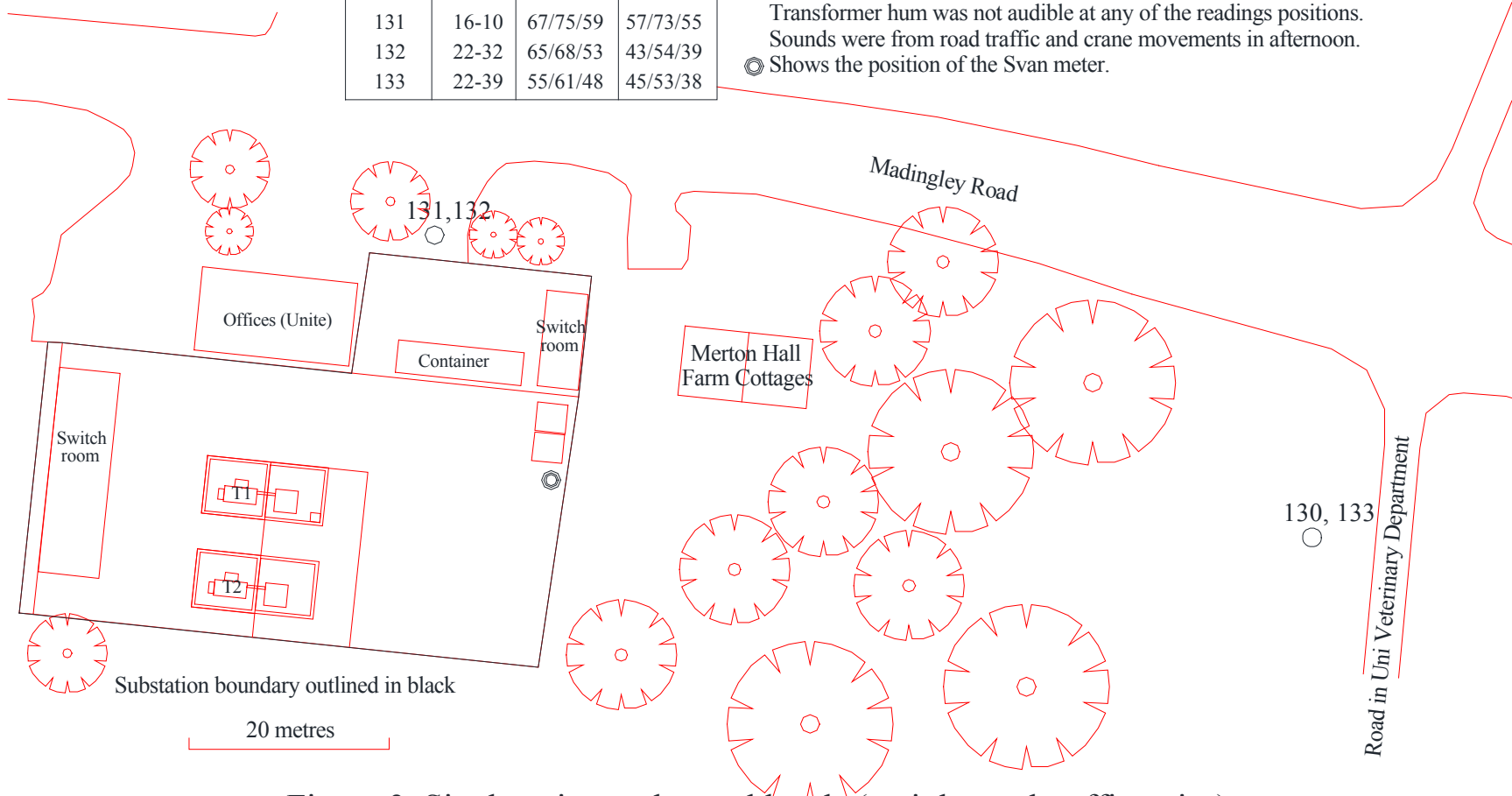
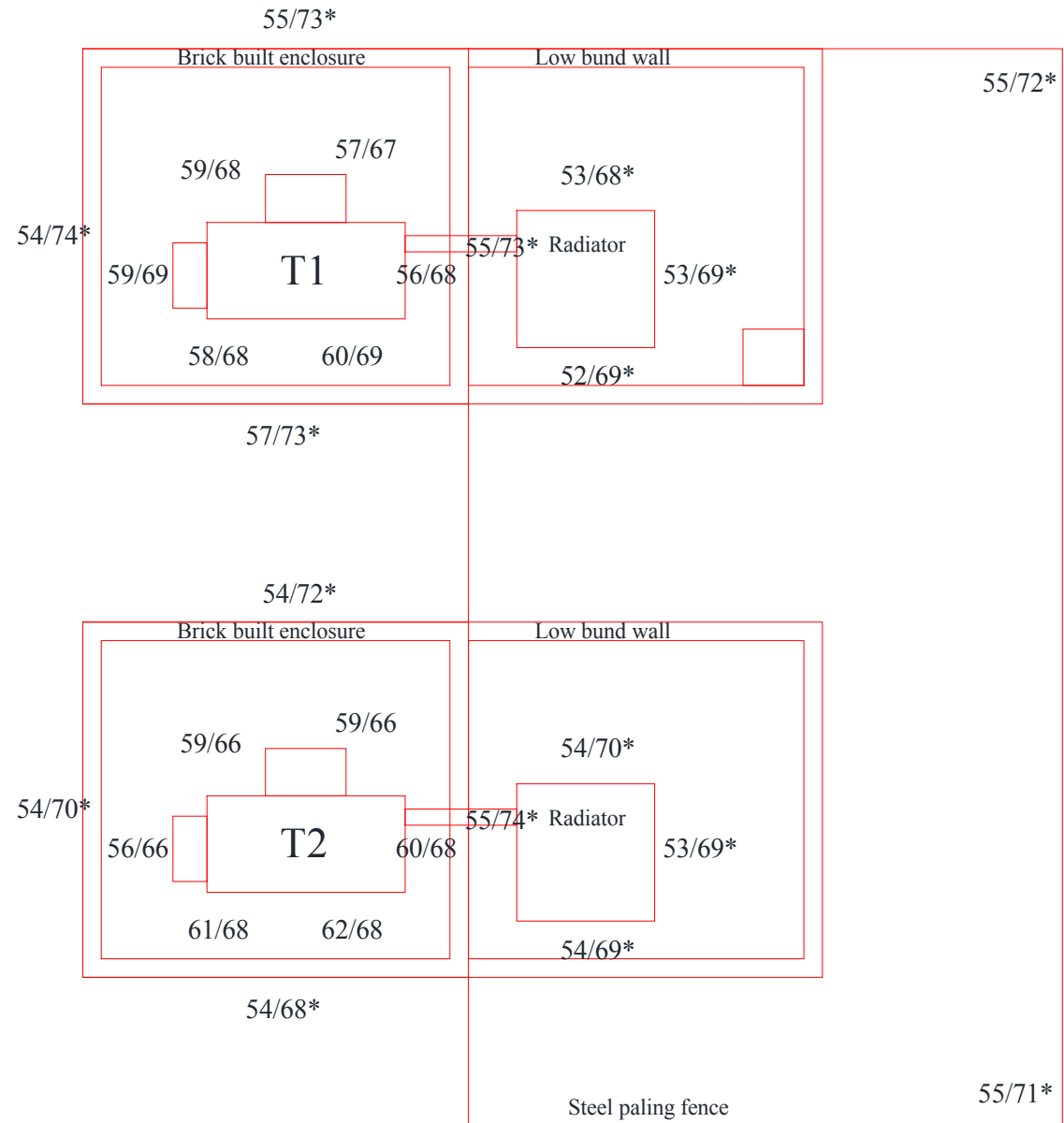


Figure 3. Site location and sound levels (mainly road traffic noise).

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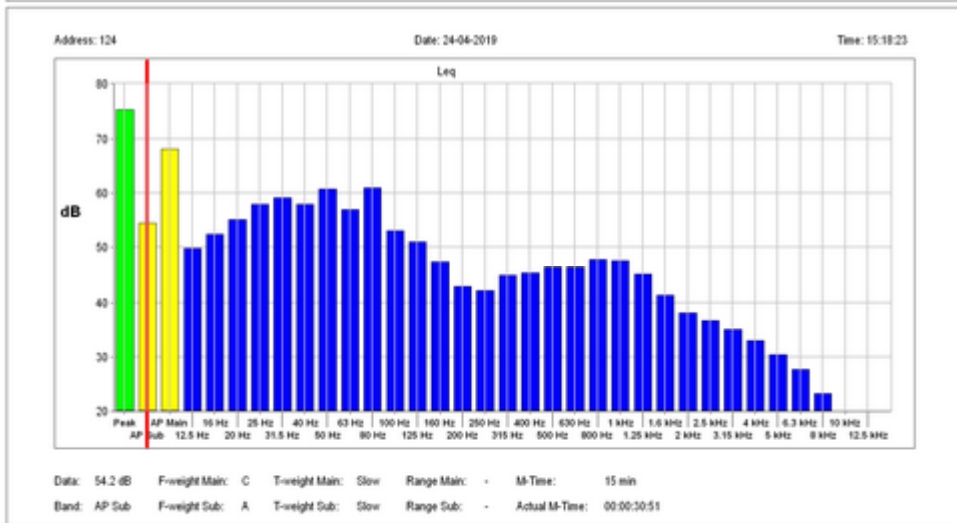
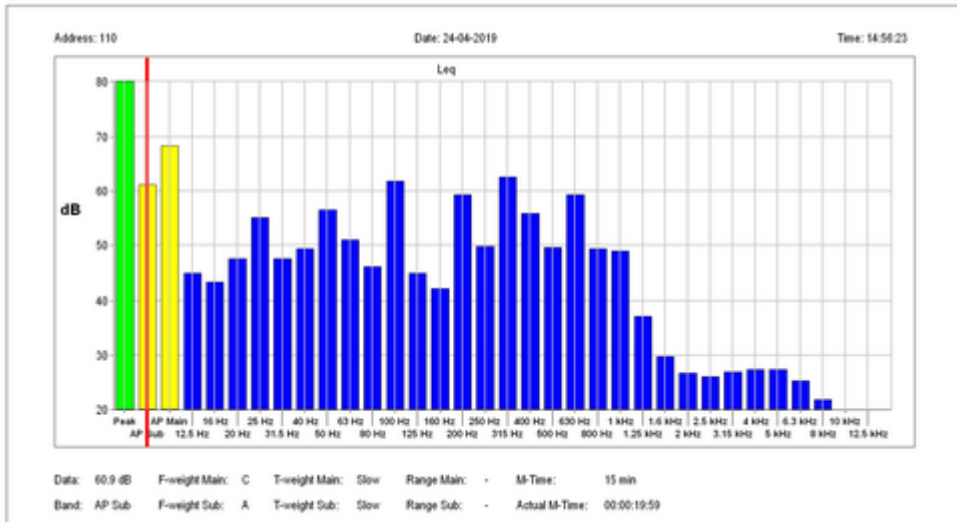
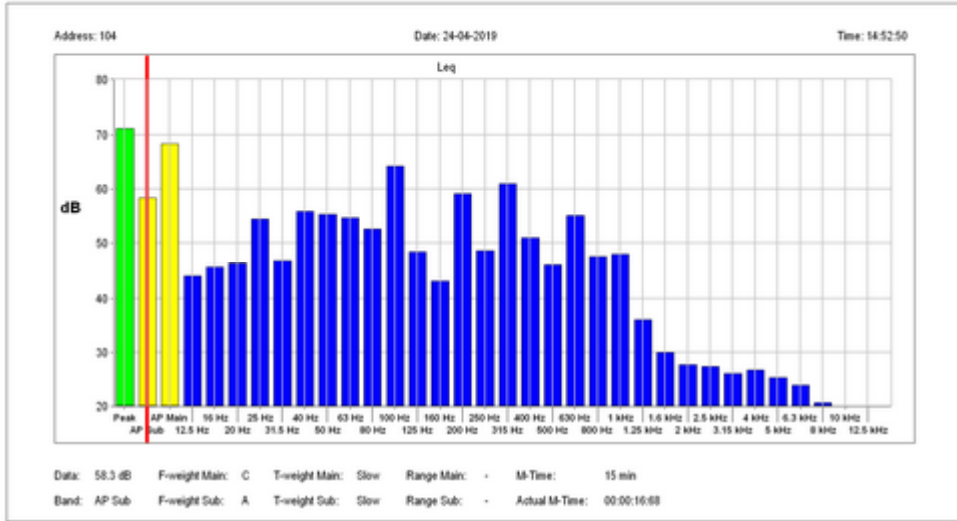
XX/YY = Sound level, Leq, dBA/dBC.

Readings were taken over about 15 seconds each, using 'Tai Chi' technique.

Asterisk indicates there are no transformer related tones in the spectrum.

Figure 4. Sound levels around the transformers.

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**Figure 5A. Typical sound level readings. The red marker is dBA.
 Top, middle: Inside T1 and T2 enclosures.
 Bottom: Outside T2 (furthest position from Madingley Road: no transformer tones).**

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Figure 5B. Background sound levels in Dept of Vet. Med. The red marker is dBA
 Top: Leq ('average') level at 5-30pm.
 Middle and bottom: Leq and L90 ('near minimum') levels at 10-40pm.

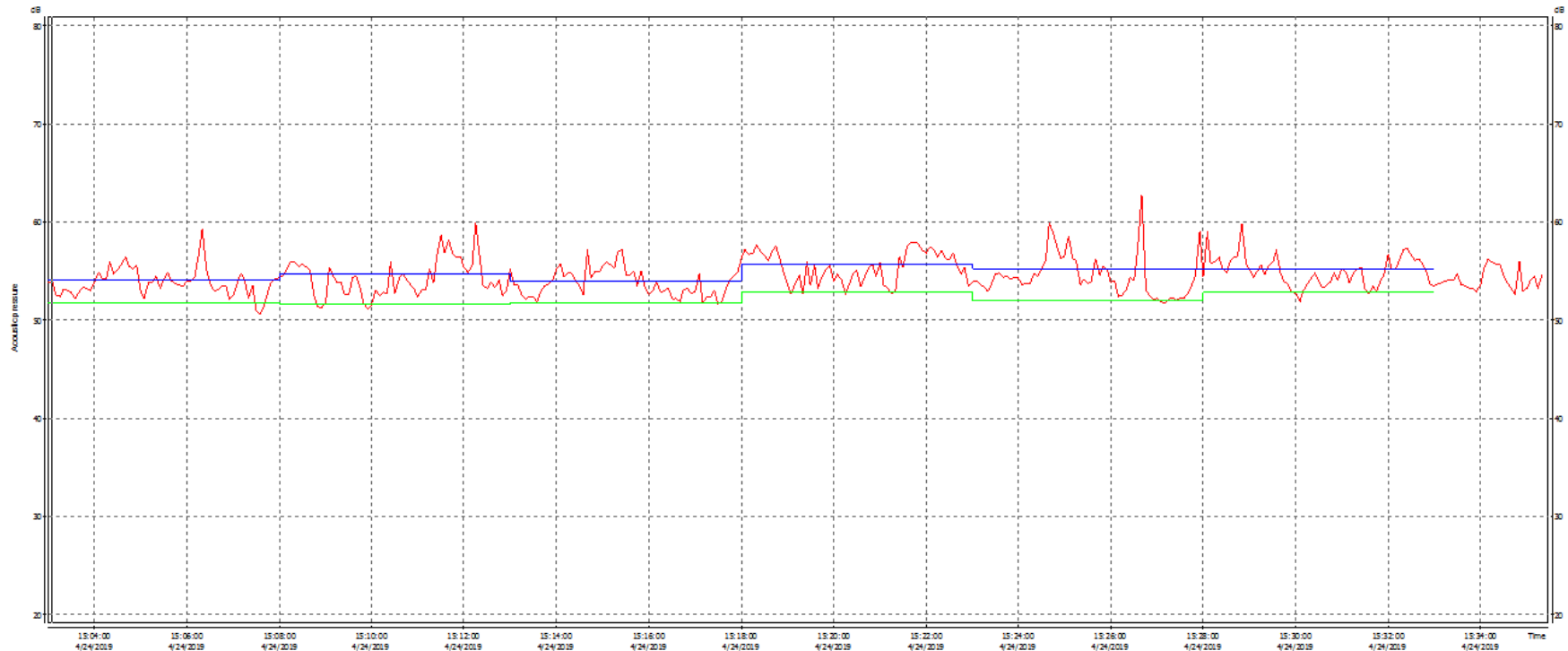


Figure 6. Results from the Svantek data logging sound meter. The record runs from 3-03pm to 3-35pm on the 24th/April/2019. The red trace is Leq, dBA, in five-second samples: essentially this is the instantaneous sound level. It may be seen that the level varies in a narrow range between about 50dBA and 60dBA. The blue trace is Leq, dBA, in five minute sections, giving a figure for the 'average' level in each period, and the green one is L90, dBA, which is close to the minimum observed in each period. It may be seen that Leq was generally around 55dBA and L90 around 53dBA. These levels relate to the steady hum of road traffic throughout the area, both on Madingley Road and the M11. The meter position is quite distant from Madingley Road and quite well shielded by buildings, so that individual vehicle passes are not much louder than the general hum. Note: transformer hum was not audible at this position.

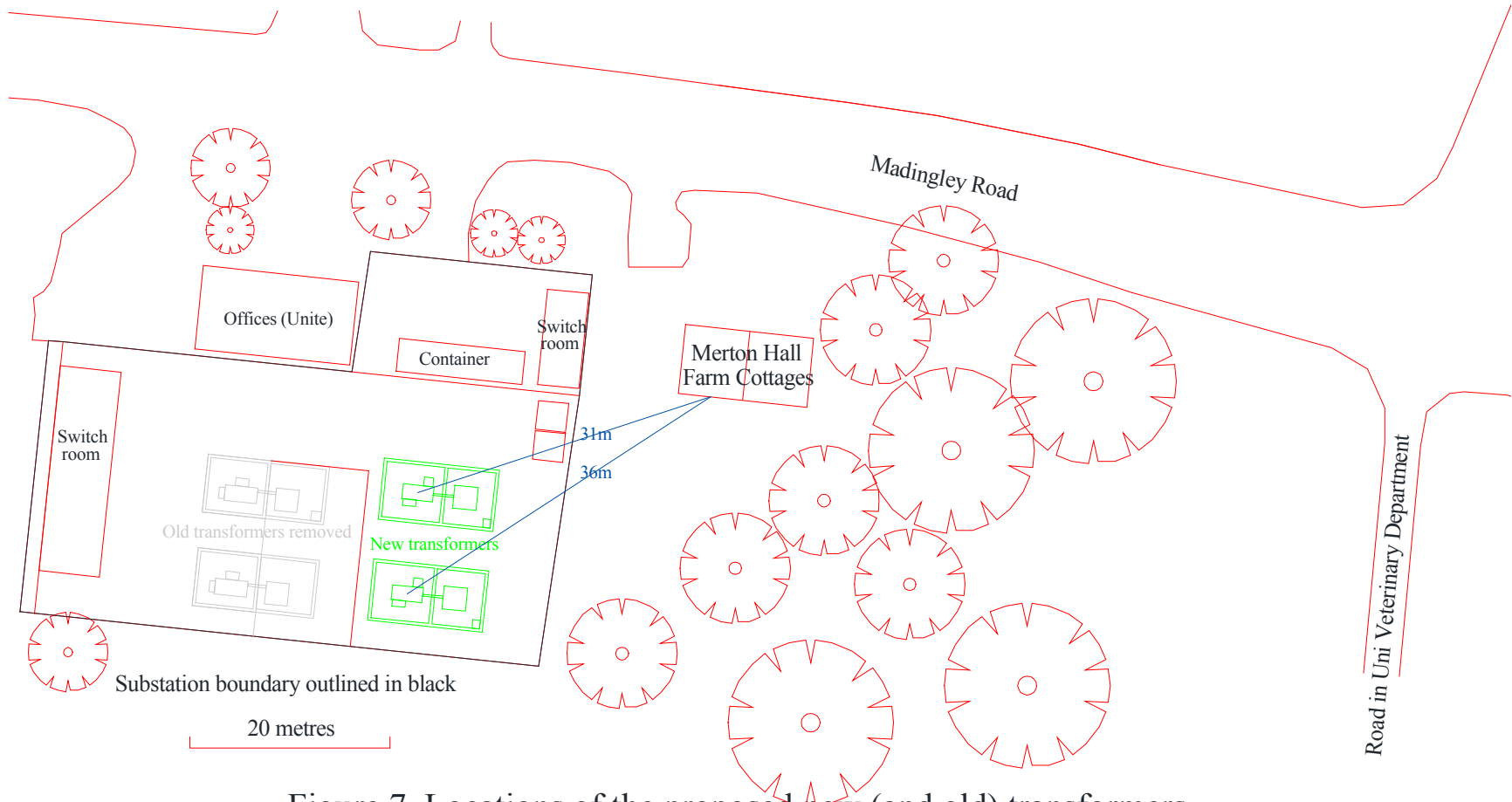


Figure 7. Locations of the proposed new (and old) transformers.

TECHNICAL REPORT

EUSTON SOLAR FARM
Environmental noise assessment

1	INTRODUCTION	3
1.1	BACKGROUND	3
1.2	STRUCTURE OF THIS REPORT	3
1.3	SOURCE INFORMATION	3
2	PLANNING POLICY.....	4
2.1	NATIONAL PLANNING POLICY FRAMEWORK.....	4
2.2	LOCAL PLANNING POLICY.....	4
2.3	DISCUSSION WITH WEST SUFFOLK COUNCIL	5
3	ASSESSMENT METHODOLOGY AND CRITERIA.....	6
3.1	BS 4142:2014+A1:2019	6
3.2	BS 7445-1:2003.....	7
3.3	NANR 45.....	7
4	DESCRIPTION OF SITE AND PROPOSALS.....	9
4.1	DESCRIPTION OF SITE AND PROPOSALS.....	9
4.2	DEVELOPMENT PROPOSALS AND NEW SOUND SOURCES	10
5	SOUND MEASUREMENTS	11
5.1	INTRODUCTION.....	11
5.2	MEASUREMENT LOCATIONS	11
5.3	SOUND MEASUREMENT SYSTEMS	12
5.4	WEATHER CONDITIONS	12
5.5	SUBJECTIVE IMPRESSIONS	12
5.6	MEASUREMENT RESULTS	13
6	BS 4142 ASSESSMENT	14
6.1	BACKGROUND SOUND LEVEL	14
6.2	SPECIFIC SOUND LEVEL	17
6.3	RATING LEVELS.....	21
6.4	ASSESSMENT OF IMPACTS	23
6.5	NANR 45.....	24
6.6	UNCERTAINTY.....	25
7	CONSTRUCTION NOISE	26
8	CONCLUSIONS	27
APPENDIX A	TECHNICAL TERMS AND UNITS RELEVANT TO THIS REPORT.....	28
APPENDIX B	MEASUREMENT SYSTEMS AND CALIBRATION.....	29

Adrian James Acoustics Document Control Sheet

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QA Control

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-	14 December 2020	Martyn Broom AMIOA and Mat Tuora MIOA	Gary Percival MIOA	Gary Percival MIOA
A	17 December 2020	Mat Tuora MIOA	Gary Percival MIOA	Gary Percival MIOA

Revision History

Rev	Details
A	Minor adjustments to section 6.6.2 and minor typo corrections

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1 INTRODUCTION

1.1 Background

We have been appointed by Island Green Power UK to assess the potential environmental noise impact of a proposed solar farm in Euston, Suffolk. The site is situated just north of RAF Honnington on land owned by Euston Estate & Farms.

This report considers the potential environmental noise levels that would be generated by plant and activities associated with the proposed solar farm, and provides an assessment of the impact of noise on the nearest residences.

1.2 Structure of this report

The structure of this report is as follows:

- Section 2 describes relevant planning policy
- Section 3 describes the relevant technical guidance;
- Section 4 describes the site proposals
- Section 5 sets out the methodology and findings of our sound measurements;
- Section 6 presents the results of the BS 4142 assessment;
- Section 7 discusses the construction noise;
- Section 8 sets out our conclusions.
- An explanation of technical terms used in this report is given in Appendix A.
- Appendix B sets out the sound measurement systems and calibration details.

1.3 Source information

The report is based on the following information provided by Lanpro and Island Green Power UK.

Document No.	Revision	Title
-	11-12-2020	Layout
I.17.050.1401.00028	-	Noise test report evaluation of noise emission per activity: solar tracker motors.
SC4xxx-UP-910:LE2019	-	Measurement at 4600 kVA, 1350 V DC U0N modulation 100% fan load
White Paper BU-LS--001	-	White Paper BU-LS-001: Sunny Central UP
SCS1900-2900-DS-en-15		Sunny central storage 1900 / 2200 / 2475 / 2900

Table 1 – Details of drawings and design information used to inform assessment

2 PLANNING POLICY

2.1 National Planning Policy Framework

The latest version of the National Planning Policy Framework (NPPF) was released in February 2019 and was last updated in June 2019.

The NPPF does not set out quantitative criteria for noise affecting proposed developments, but in paragraph 170 states that planning policies and decisions should actively contribute to the enhancement of the natural and local environment by:

“preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.”

According to paragraph 180, planning policies and decisions should also ensure new development is appropriate for its location, particularly considering the likely effects on health and living conditions. Planning policy and decision makers should aim to:

“mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life”.

The ‘agent of change principle’ has been part of the NPPF since the July 2018 revision. This principle means that a person or business (i.e. the agent) introducing a new land use is responsible for managing the impact of that change. Paragraph 182 states:

“Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

The NPPF also promotes “good design” (including good acoustic design) as a means of ensuring that development creates high quality, sustainable buildings, and places. Paragraph 124 states that “good design is a key aspect of sustainable development.

2.2 Local Planning Policy

Local environment and development planning policy are the remit of West Suffolk Council (WSC). The WSC Joint Development Management Policies Document (JDMPD) was adopted in February 2015 as part of the WSC’s Forest Heath and St Edmundsbury councils Local Plan. Policy DM2 within the JDMPD states that:

“Proposals for all development (including changes of use, shopfronts, and the display of advertisements) should, as appropriate take mitigation measures into account that do not affect adversely the amenities of adjacent areas by reason of noise, smell, vibration, overlooking, overshadowing, loss of light, other pollution (including light pollution), or volume or type of vehicular activity generated.

The intention of this assessment is consequently to determine whether the proposed development would be likely to comply with the requirement of Policy DM2.

2.3 Discussion with West Suffolk Council

We contacted Karen See, an environmental health officer at WSC who has confirmed that an assessment in accordance with BS 4142:2014+A:2019 would be suitable for this site. Details of this British Standard are provided in Section 3.1.

Karen See also stated that a baseline survey to establish the noise climate of the area must follow the guidelines in BS 7445-1:2003 and report L_{Aeq} , L_{A90} , L_{A10} and L_{AFmax} noise indicators. Details of this British Standard are provided in Section 3.2.

Ms See also stated that she expected that the outcomes of any noise impact assessment would also be required to consider the low frequency noise impact on the nearest residential receptors, both during construction and operation. In the absence of any quantitative low frequency criteria in BS 4142:2014+A:2019, Ms See suggested using the limits of set out in low frequency noise guidance note NANR45 . Details of the NANR45 guidance and associated assessment criteria are provided in Section 3.3.

3 ASSESSMENT METHODOLOGY AND CRITERIA

3.1 BS 4142:2014+A1:2019

3.1.1 Introduction

British Standard 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS 4142) describes appropriate technical methodology for the rating and assessment of sound of an industrial and/or commercial nature.

Sound of an industrial and/or commercial nature includes industrial and manufacturing processes, fixed mechanical and electrical plant installations, the unloading of goods and materials at industrial and/or commercial premises and sound from mobile plant that is an inherent part of the overall sound from industrial and/or commercial premises.

BS 4142 is applicable for the purposes of:

- Investigating complaints;
- Assessing sound from proposed, new, modified or additional source(s) of sound from an industrial and/or commercial nature; and
- Assessing sound at proposed new dwellings or premises used for residential purposes.

BS 4142 is not intended to be applied to the rating and/or assessment of sound from recreational activities (including motorsport), music and other forms of entertainment, shooting grounds, construction/demolition, domestic animals, people, public address systems and any other sources falling within the scope of other standards/guidance.

3.1.2 Summary of BS 4142 assessment methodology

The BS 4142 assessment methodology can be summarised as follows:

1. Determine the background sound level (dB $L_{A90,T}$) at the nearest noise sensitive receptor(s) of interest.
2. Determine the specific sound level of the source under assessment (dB $L_{Aeq,T}$) (T = 1 hour for day or 15 minutes at night) at the receptor location(s).
3. Apply a rating level acoustic feature correction if the sound source has tonal, impulsive, intermittent or other characteristics which attract attention.
4. Compare the rating level (dB $L_{Ar,Tr}$) with the background sound level; typically, the greater this difference, the greater the magnitude of impact.

Differences of around +10 dB are likely to be an indication of significant adverse impact, depending upon the context; a difference of +5 dB is likely to be an indication of adverse impact, depending upon the context. Where the rating level (dB $L_{Ar,Tr}$) does not exceed the background sound level ($L_{A90,T}$) at the nearest receptor of interest, the indication is that the specific sound source will have a low impact, depending upon the context.

Note: Adverse impacts include but are not limited to sleep disturbance. Not all adverse impacts will lead to complaints and not all complaints are proof of an adverse impact.

3.1.3 Acoustic features

Certain acoustic features (which include tonality impulsivity and/or intermittence) can also increase the significance of impact. Where such features are present a “*character correction*” should be added to the specific sound level to obtain the rating level.

The recommended BS 4142 character corrections are presented in Table 2.

Characteristic	Perceptibility		
	Just Perceptible	Clearly Perceptible	Highly Perceptible
Tonality	+2 dB	+4 dB	+6 dB
Impulsivity	+3 dB	+6 dB	+9 dB
Intermittency	0	+3 dB	+3 dB
Other	0	+3 dB	+3 dB

Table 2 – Details of drawings and design information used to inform assessment

BS4142:2014 describes suitable subjective methods for assessing character features, plus additional objective (one-third octave and reference) methods for tonality.

3.1.4 Uncertainty

The BS 4142 methodology also requires that the level of uncertainty in the technical data and/or calculations is reported. Where uncertainty could affect the conclusion, reasonable, practicable steps should be taken to reduce uncertainty. If appropriate, the level and potential effects of any identified uncertainty should also be reported.

3.2 BS 7445-1:2003

BS 7445-1:2003 ‘*Description and measurement of environmental noise*’ (BS 7445) sets out guidance for environmental noise surveys and brings many of these principles together. It describes common parameters, recommendations for instrumentation, appropriate measurement technique, and the information to be recorded.

BS 7445 does not set out any specific guidance of values which noise levels should achieve, but rather noise parameters and terminology, the requirements for calculating the noise descriptors and a list of information to be recorded during a noise survey.

3.3 NANR 45

There is no established guidance specifically intended for assessing the potential effects of noise from electrical equipment on new residential development.

However, it is recognised that low-frequency noise from electrical equipment (including solar farms) requires consideration when near to new or existing dwellings, and for this purpose reference is often made to guidance note NANR 45.

Guidance note NANR 45: ‘*Proposed criteria for the assessment of low frequency noise disturbance*’ was produced in 2005 by the University of Salford and was mainly devised to assist in investigating complaints of low-frequency noise (LFN) from substations and to provide appropriate technical methodology and criteria for doing so.

However, NANR 45 provides a reference criterion curve for use in assessing LFN and this is often used to identify where such noise exists that could result in complaints, particularly where a new electrical installation is proposed close to existing residents.

The NANR 45 reference curve is set out in Table 3 in all 1/3 octave-band frequencies between 10 Hz and 160 Hz. While the lower end of this range is generally outside the range of normal human hearing, this represents the range of potential LFN occurrence.

Frequency, Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB L _{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34

Table 3 – NANR 45 reference curve values

The NANR 45 criterion curve is also plotted in graphical form, reproduced in Figure 1.

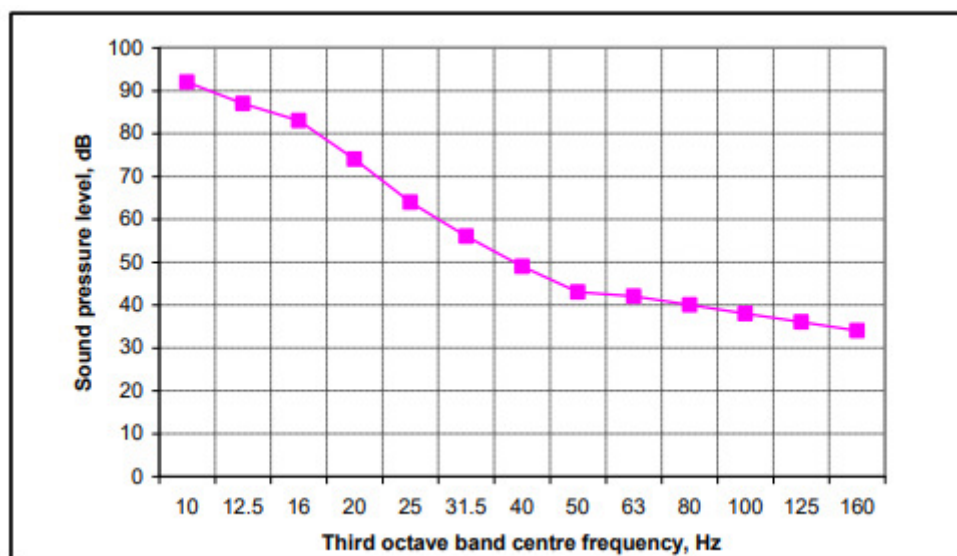


Figure 1 – NANR 45 criterion curve for assessment of low frequency noise

Low frequency noise from electrical equipment should ideally not exceed these criteria in any single 1/3 octave-band between 10 Hz and 160 Hz.

4 DESCRIPTION OF SITE AND PROPOSALS

4.1 Description of site and proposals

The proposed site of the new solar farm is in Euston, Suffolk. It is surrounded by existing agricultural land and outdoor activity centre involving activities such as ATV hire and clay shooting. The site is located approximately 330m from the nearest existing house to the west and 450m from the nearest existing house to the north-east.

The roads around the site are mostly minor roads and tracks used by farm vehicles. The A134 is located approximately 1 km to the east and is a single carriageway road with a speed limit of 60 mph. RAF Honnington is located approximately 90 m south of the site. It is our understanding that RAF Honnington is the RAF Regiment depot and is not a principal flying base. We understand that some flights do occasionally take off and land at the base, but this is for specialist training exercises which are infrequent.

The site boundaries and agricultural nature of the surrounding area are clearly shown in Figure 2 below.

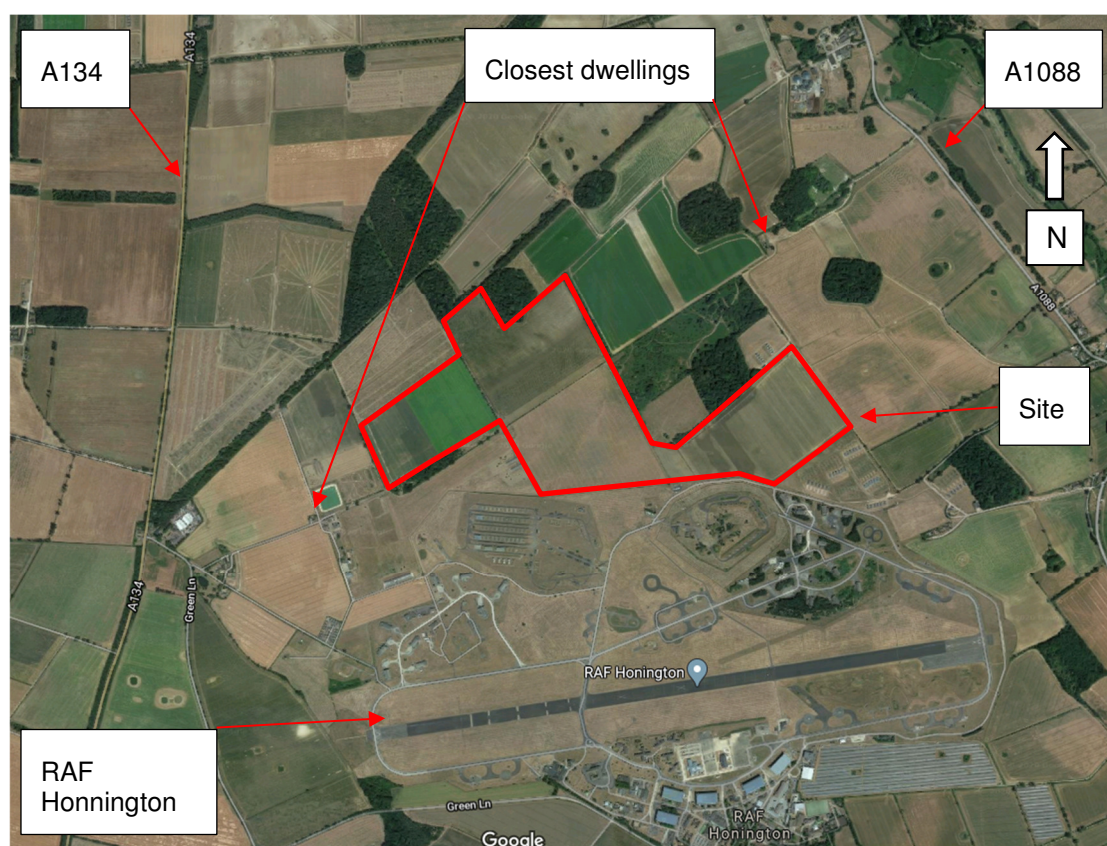


Figure 2 – Annotated aerial photograph/plan of site and surroundings © Google 2020

4.2 Development proposals and new sound sources

4.2.1 Fixed plant installations

Based upon discussions with Island Green Power UK we understand that the following items of fixed plant would be the only equipment serving the proposed solar farm which would generate potentially significant noise emissions:

- 12 x Sunny Central 4600 kVA, 1350 v DC U0N Inverters;
- 10 x Sunny Central battery storage units (either models 1900 / 2200 / 2475 / 2900);
- A 132 kV substation;
- Soltec tracker installed with each solar panel array;

4.2.2 Proposed site layout

The proposed site layout is shown in Figure 3 along with the proposed locations of the main noise-generating plant on the site.

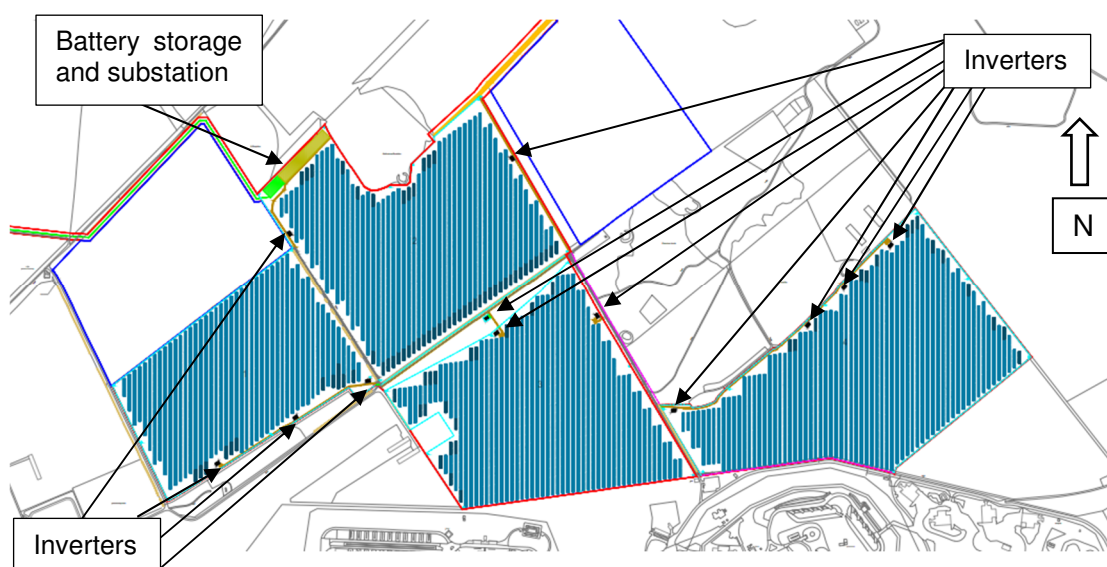


Figure 3 – Site layout plan

5 SOUND MEASUREMENTS

5.1 Introduction

We attended the site at approximately 17:00hrs on 11 September 2020 and installed unattended noise monitoring equipment to measure prevailing noise levels in the area for a week, returning at approximately 17:00hrs on 18 September 2020 to collect the equipment. Measurements were taken 1.5m above ground, at 15-minute intervals and recorded L_{F90} , L_{F10} , L_{Fmax} and L_{eq} noise levels in 1/3 octave-bands. Measurements were logged at 0.1 second resolution which allowed us to post process the data to obtain representative 1-hour daytime and 15-minute night-time background sound levels.

Prior to undertaking measurements, we walked around the site close to the nearest dwellings and noted any significant variations in noise. The noise climate was judged as being relatively constant around the site, although background sound levels were slightly higher towards the west of the site due to being closer to the A134. Average and maximum levels were slightly higher towards the east due to Euston Estate activity.

5.2 Measurement locations

As noise levels were relatively consistent around the site, we chose to measure on the eastern most and the western most boundaries. We expect both these positions to be representative of the noise-sensitive receptors in the vicinity of these boundaries. Both of our measurement positions are shown in Figure 4.



Figure 4 – Annotated aerial photograph of initial measurement positions © Google 2020

5.3 Sound measurement systems

5.3.1 Details of sound measurement systems

Details of the sound measurement systems used are presented in Table 4.

5.3.2 Operational calibration test

The measurement systems were calibrated before and after use using the reference calibrator described in Appendix B. The results of the test are presented in Table 4.

Instrument	Calibrator reference level (dB)	Level before (dB)	Level after (dB)	Calibration drift (+/- dB)
NTi Audio XL2 A2A-04410-D2	93.7	93.6	93.6	0
NTi Audio XL2 A2A-08643-E0	114.0	114.1	114.1	0

Table 4 – Details of operational calibration test

5.4 Weather conditions

During our survey we measured wind speeds and temperatures using a weather station located close to measurement position 1. Generally, wind speeds were low during our survey and did not typically exceed 5 m/s. However, the highest measured wind speed during our survey was 6.7 m/s. This is not ideal and periods where wind speeds measured exceeded 5 m/s were therefore excluded from our analysis.

Over the duration of our survey we measured temperatures between 9°C and 29°C, with the lowest temperatures being measured at night and the highest during the day.

5.5 Subjective impressions

The western boundary was slightly quieter with road traffic on the A134 judged as the main noise source during the day. At the eastern boundary, the site was slightly noisier as it is on the Euston Estate, which is a working farm. When on-site to setup our unattended equipment farm vehicle movements were noted as being clearly audible.

5.6 Measurement results

A summary of our daytime and night-time survey measurements are as follows:

Location and period	L_{AF90}, (1 hours for day) (15 mins for night)	L_{AF10}, (1 hours for day) (15 mins for night)	L_{AFMax}, (1 hours for day) (15 mins for night)	L_{Aeq}, (1 hours for day) (15 mins for night)
Position 1 Daytime	26 dB – 45 dB	32 dB – 56 dB	50 dB – 83 dB	32 dB – 56 dB
Position 1 Night-time	23 dB – 44 dB	29 dB – 54 dB	36 dB – 75 dB	28 dB – 50 dB
Position 2 Daytime	22 dB – 47 dB	28 dB – 64 dB	43 dB – 88 dB	26 dB – 62 dB
Position 2 Night-time	21 dB – 43 dB	23 dB – 53 dB	31 dB – 73 dB	22 dB – 50 dB

Table 5 - Summary of noise levels

6 BS 4142 ASSESSMENT

6.1 Background sound level

We have reviewed the measurements for daytime and night-time background sound levels at 1-hour and 15-minute intervals respectively.

Histograms for each position and period are shown in Figure 5, Figure 6, Figure 7 and Figure 8 below.

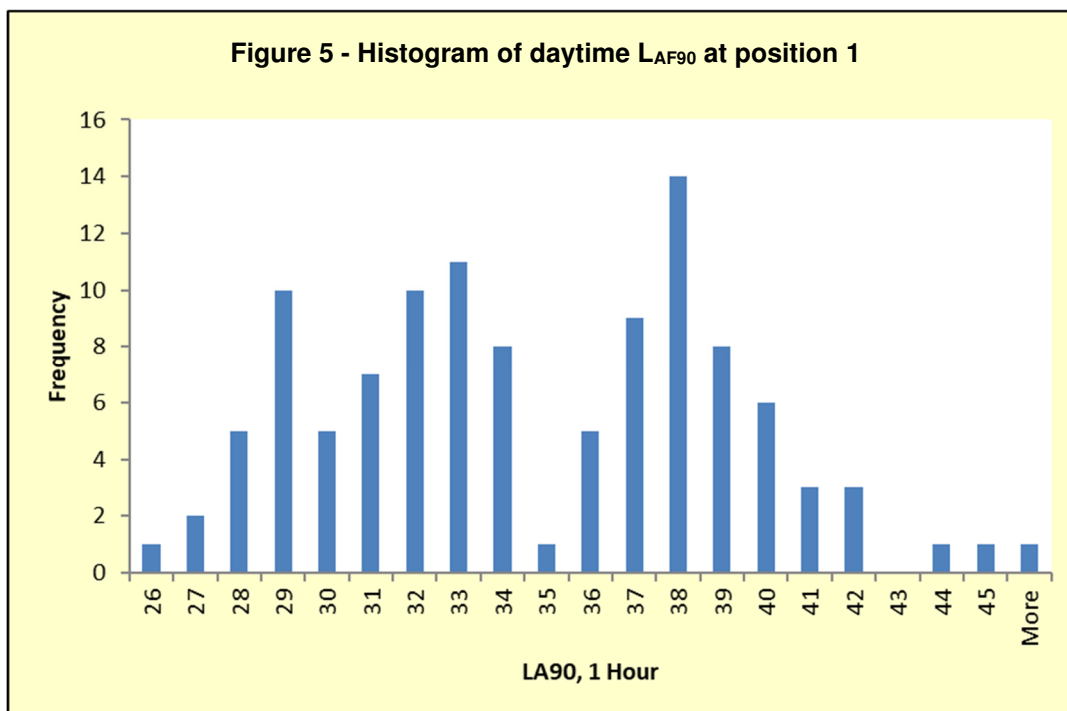


Figure 6 - Histogram of night-time L_{AF90} at position 1

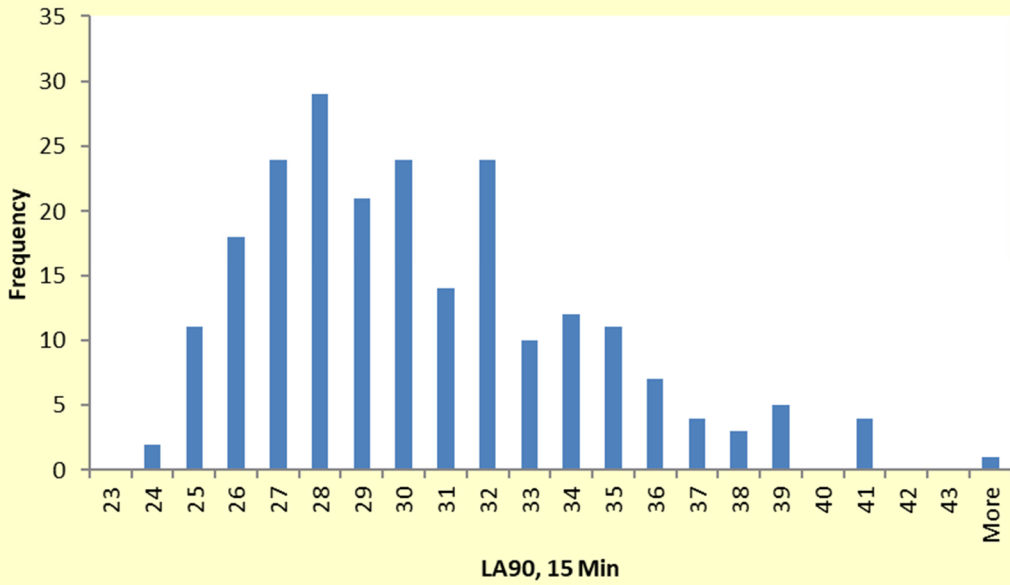
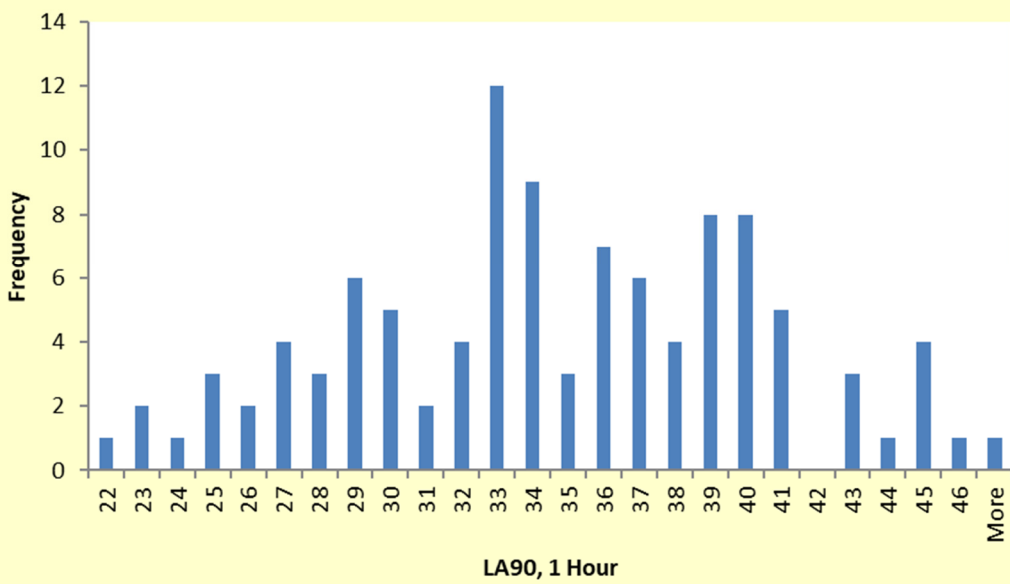
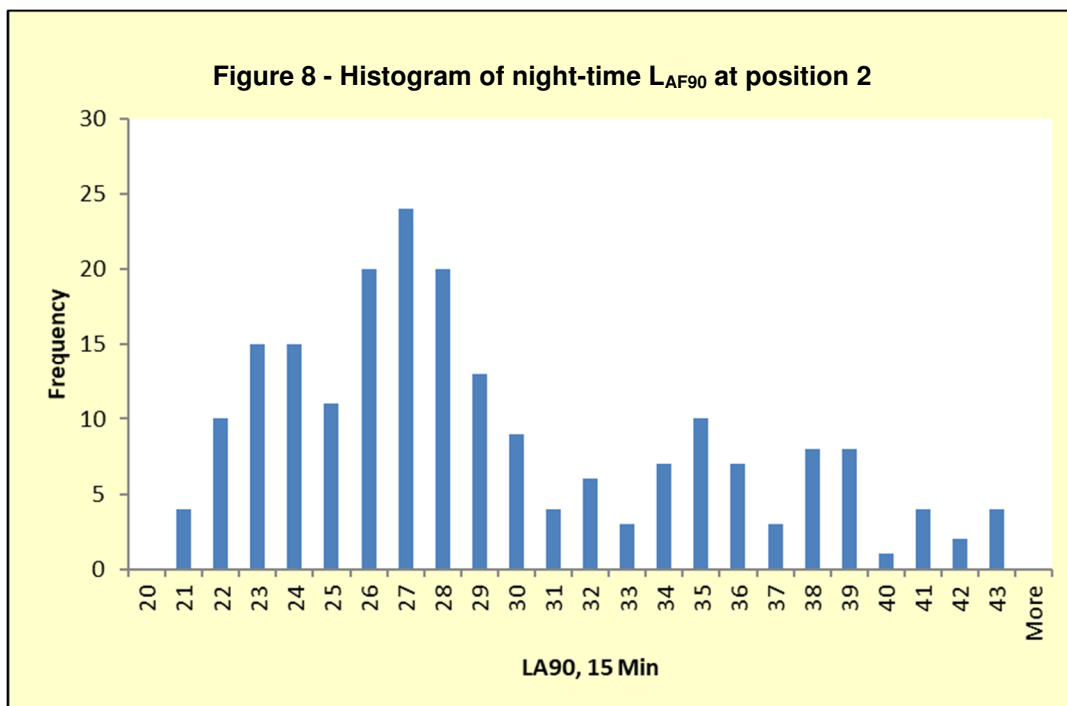


Figure 7 - Histogram of daytime L_{AF90} at position 2





We have, therefore, used the following background noise levels for the purposes of our assessment.

Location and period	LAF90
Position 1 Daytime	33
Position 1 Night-time	28
Position 2 Daytime	33
Position 2 Night-time	27

Table 6 – Background levels used for our assessment

6.2 Specific sound level

We have based our calculations of the specific sound levels that would be generated by the equipment on manufacturer's data for each unit as described in Section 4.2.1.

For the inverters we were provided with 1/3 octave spectrum data. For all other units we were only provided with single figure A-weighted sound pressure or sound power level data. Both our client and we contacted the manufacturers to query if 1/1 octave or 1/3 octave data is available. We understand our client has had confirmation that this type of data is not available, but we received no reply from the manufacturer.

In any case, the BS 4142 methodology is based on assessing the overall A-weighted sound level, and only requires consideration of spectral content with regard to tonality.

The NANR 45 guidance does, however, require third-octave band data to assess the impact of low frequency noise. Without this data it will not be possible to fully assess predicted noise emissions against the NANR 45 guidance and we have therefore set the LFN criteria which any new plant should comply with before being installed on site.

A summary of the noise levels used for our model are shown below:

Source	Data
Sunny Central 4600 kVA, 1350 v DC U0N Inverters	Third octave manufactures data shown in Figure 9
Sunny Central battery storage units (either models 1900 / 2200 / 2475 / 2900)	Battery unit <64.7 dB L _{Aeq} at 10 meters
132 kV substation	91 dB L _{WA}
Soltec tracker	50.1 dB L _{Aeq} at 1 metre from the tracker

Table 7 – Manufacture's data used for our assessment

Third octave band center frequency [Hz]	Sound - Power- level LwA [dBA/pW] 2475 kW
31,5 Hz	24,73
40 Hz	46,84
50 Hz	50,95
63 Hz	53,64
80 Hz	58,81
100 Hz	61,6
125 Hz	64,22
160 Hz	70,35
200 Hz	66,93
250 Hz	72,07
315 Hz	76,77
400 Hz	81,06
500 Hz	77,65
630 Hz	77,05
800 Hz	76,08
1 kHz	78,84
1,25 kHz	76,69
1,6 kHz	76,08
2 kHz	76,33
2,5 kHz	74,96
3,15 kHz	78,95
4 kHz	85,67
5 kHz	69,19
6,3 kHz	70,93
8 kHz	81,02
10 kHz	68,81
A	90,77
Z	95,76

Figure 9 - Manufacturer data for inverters

We created a computer model of the site using CadnaA software by DataKustik GmbH. CadnaA allows us to predict cumulative noise emissions and propagation from the site and determine noise levels at the dwellings, taking account the topography of the site.

For our model we have used contour information provided by Contour Map Creator to account for the general changes in topography over the whole site.

The software can be accessed from <https://contourmapcreator.urgr8.ch/>.

The model assumes relatively soft (hence acoustically absorbent) ground between the sources and the receiver.

A 2D view of the topography and noise sources in the model is shown in Figure 10.

Figure 8 shows the calculated specific noise levels at each assessment location

Source	Calculated noise level at property
<i>Eastern property (Ground Floor)</i>	
Batteries	29 dB(A)
Inverters	21 dB(A)
Substation	7 dB(A)
Trackers	12 dB(A)
<i>Eastern property (First Floor)</i>	
Batteries	34 dB(A)
Inverters	24 dB(A)
Substation	12 dB(A)
Trackers	16 dB(A)
<i>Western property (Ground Floor)</i>	
Batteries	28 dB(A)
Inverters	20 dB(A)
Substation	3 dB(A)
Trackers	12 dB(A)
<i>Western property (First Floor)</i>	
Batteries	32 dB(A)
Inverters	22 dB(A)
Substation	8 dB(A)
Trackers	15 dB(A)

Table 8 – Calculated BS 4142 Rating Levels

6.3 Rating levels

For the purposes of our calculations we have assumed that all inverters, battery storage and the substation units would operate constantly and simultaneously.

We understand that the trackers operate intermittently throughout the day as they guide the solar panels to follow the sun from east to west. At the end of the day they operate for a slightly longer period of time to position themselves for the following day. This can take several minutes. The tracker units do not operate during the night.

The absolute levels calculated in our model show that noise from the trackers is likely to be well below the background levels. We would therefore not expect these to be perceived as intermittent, and have therefore not applied a feature correction in accordance with BS 4142. We have assumed that over the course of the daytime assessment period (i.e. 1 hour), the trackers will move for no more than 15 minutes. This is likely to be worst-case.

Review of the 1/3 octave spectrum for the inverters indicates that tones are present at 4 kHz and 8 kHz when assessed against the BS 4142 objective 1/3 octave method. The absolute levels are likely to be below the background and we would therefore expect any noise from these units to generally be just perceptible. We have therefore included a +2 dB feature correction in accordance with BS 4142.

In our experience substations can produce tonal sound at low frequencies, particularly around 50 Hz and 63 Hz. The extent of any tonality is unknown as 1/3 octave-band data was unavailable. We assumed a +2 dB penalty for tonality on the basis that the absolute a-weighted level is well below background and we would therefore expect any tonality to either be inaudible or just perceptible. This may be overly cautious, but without review of more detailed data this is considered a robust worst-case.

We understand that noise associated with the battery storage unit is from cooling fans, which we would not expect to be tonal, providing that they are correctly maintained.

For our assessment we have predicted the noise impact at both ground floor and first floor of the nearest residential properties.

The resulting rating levels for each individual noise source are as follows:

Source	Calculated noise level at property	Estimated on time in assessment period (1 hour day, 15 min night)	Character corrections	Operational period	Rating level
<i>Eastern property (Ground Floor)</i>					
Batteries	29	100%	0	Day and Night	29
Inverters	21	100%	2	Day and Night	23
Substation	7	100%	2	Day and Night	9
Trackers	12	25%	0	Day	6
<i>Eastern property (First Floor)</i>					
Batteries	34	100%	0	Day and Night	34
Inverters	24	100%	2	Day and Night	26
Substation	12	100%	2	Day and Night	14
Trackers	16	25%	0	Day	10
<i>Western property (Ground Floor)</i>					
Batteries	28	100%	0	Day and Night	28
Inverters	20	100%	2	Day and Night	22
Substation	3	100%	2	Day and Night	5
Trackers	12	25%	0	Day	6
<i>Western property (First Floor)</i>					
Batteries	32	100%	0	Day and Night	32
Inverters	22	100%	2	Day and Night	24
Substation	8	100%	2	Day and Night	10
Trackers	15	25%	0	Day	9

Table 9 – Calculated BS 4142 Rating Levels

6.4 Assessment of impacts

The impact of the specific sound source can initially be estimated by subtracting the representative sound level from the rating level. Typically, the greater this difference, the greater the magnitude of impact (depending on context).

The results of the BS 4142 assessment are presented in Table 10.

Assessment Period	Combined rating level dB L_{Ar,Tr}	Background sound level dB L_{AF90,T}	Excess rating level over background
<i>Eastern property (Ground Floor)</i>			
Daytime 07:00-23:00hrs	29 dB (A)	33 dB (A)	- 4 dB
Night-time 23:00-07:00hrs	29 dB (A)	28 dB (A)	+ 1 dB
<i>Eastern property (First Floor)</i>			
Daytime 07:00-23:00hrs	33 dB (A)	33 dB (A)	0 dB
Night-time 23:00-07:00hrs	33 dB (A)	28 dB (A)	+ 5 dB
<i>Western property (Ground Floor)</i>			
Daytime 07:00-23:00hrs	30 dB (A)	33 dB (A)	- 3 dB
Night-time 23:00-07:00hrs	30 dB (A)	27 dB (A)	+ 3 dB
<i>Western property (First Floor)</i>			
Daytime 07:00-23:00hrs	34 dB (A)	33 dB (A)	+ 1 dB
Night-time 23:00-07:00hrs	34 dB (A)	27 dB (A)	+ 7 dB

Table 10 – Summary of BS 4142 assessment results

In accordance with BS 4142, the initial assessment indicates there is a low likelihood of adverse impact during the day as a result of the proposed development, because predicted rating levels would not exceed the representative background sound levels.

At night, predicted rating levels at ground floor level would indicate a low likelihood of adverse impact. At first floor level, the rating levels would exceed background sound levels, but only in one case (at the western property) would the rating level exceed the threshold at which BS 4142 indicates that adverse impacts can start to occur.

The absolute noise levels predicted at both receptors are relatively low. In this case it is the fact that the background noise levels are also very low at night which means that rating levels could exceed the BS 4142 threshold of adverse impact in one instance. The assessment results should therefore be considered in this context.

The BS 4142 methodology also only considers external sound levels, whereas at night it is usually internal noise levels that are most relevant, particularly at first floor level. Even with bedroom windows open the predicted rating levels would be at least 10 dB below the typical internal limit of 30 dB $L_{Aeq,2300-0700hrs}$ recommended in BS 8223:2014, ProPG: Planning and noise and the WHO 'Guidelines for community noise'.

Considering the above context, it is, in our view, unlikely that a 2 dB exceedance of the BS 4142 threshold of adverse impact is likely to unreasonably affect acoustic amenity, particularly given that this would only occur at first floor level at one residential property. The predicted rating levels at all other times/locations would not exceed the threshold, and in many cases, they would indicate a low impact – particularly during the day.

6.5 NANR 45

As discussed in Section 2.3 the Council have requested that any low frequency noise is assessed against NANR 45.

We have only been provided with 1/3 octave band data for the inverter units and can therefore only qualitatively assess predicted noise levels from these units. Based on a review of the data we can confirm that they are unlikely to exceed the NANR45 criteria.

Given that low frequency noise is relatively difficult to attenuate it will be important to ensure that cumulative LFN from all equipment does not exceed the following noise levels at the boundary of the either property. This can be secured by condition, if necessary.

Frequency, Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB L_{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34

Table 11 – NANR 45 reference curve values

6.6 Uncertainty

BS 4142 recommends that any significant uncertainties are reported, potential effects highlighted and, where practicable, reasonable steps taken to reduce the effects.

6.6.1 *Uncertainty of measured values*

The survey was undertaken during the COVID19 lockdown in a period where the government's '*transport use statistics*' estimate approximately 93 - 107 % of vehicles are using UK roads as reported in <https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic>.

Our measurements are likely to be representative given these relatively minor changes in traffic flow compared to the '*typical*' situation.

6.6.2 *Uncertainty in calculations*

Plant noise data was provided by the manufacturer. We have no reason to believe that this is inaccurate. We have made assumptions of the tonality associated with the units as detailed in Section 6.3, which we expect to represent a robust assessment.

We recommend that if any alternative equipment is proposed it should be confirmed to not exceed the noise levels provided to us for this assessment.

7 CONSTRUCTION NOISE

It is not possible to carry out a detailed assessment of construction noise, as the construction proposals are not yet sufficiently development.

However, most construction noise impacts can usually be mitigated by limiting the construction hours and requiring contractors to adopt '*Best Practical Means*' in terms of construction noise mitigation, such as those set out in BS 5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites. Noise*'.

Appropriate construction hours and noise mitigation can be secured through planning conditions, if required. Conditions typically require that a Construction Management Plan (CMP) is submitted to and approved by the Local Planning Authority which would contain details of the construction hours and the measures to control noise emissions.

We understand that the majority of the work involves the use of telehandlers which are used to mobilise equipment on to site. There will be some excavation work which we understand may involve the use of either piles or screw piles for the substation and inverter bases. The exact method(s) would be confirmed prior to construction.

We would expect the closest receptors identified in this report to be the worst effected receptors for both noise and vibration. It will be important to plan construction activities so as to minimise noise impacts. Good communication with the owners/occupiers of these properties will also be important to minimise impacts from noisy activity.

8 CONCLUSIONS

- Island Green Power UK are proposing to construct a new solar farm near to Euston in Suffolk. The solar farm would require the installation of solar panels, inverters, storage batteries and a substation, all of which would produce noise.
- Predicted noise levels from the proposed equipment were rated and assessed in accordance with BS 4142. During the day the rating levels indicate a low likelihood of adverse impact. However, at night the rating level at first floor level would exceed the BS 4142 threshold of adverse impact at one residential property.
- In the context that absolute noise levels produced by the equipment would be relatively low, and that internal noise levels (with windows open) would be well below the limits normally adopted for general acoustic amenity, we consider that the noise would not unreasonably impact the residents of this property.
- 1/3 octave-band data was not available for all of the proposed equipment. Such data was provided for the inverters and we assessed these values against the NANR 45 criteria, which indicated that LFN from inverters would be acceptable.
- We have not been able to quantitatively assess the construction noise impact of the development because construction proposals are not fully developed. However, we expect that construction noise can be adequately controlled with sensible working hours and '*Best Practical Means*' in terms of noise mitigation. Both can be secured using planning conditions, if considered necessary.
- In our view this provides sufficient evidence that the proposed development would not adversely affect local acoustic amenity and also that it would meet the requirements of WSC Policy DM 2.

APPENDIX A TECHNICAL TERMS AND UNITS RELEVANT TO THIS REPORT

Acoustic environment - Sound from all sources as modified by the environment

Ambient sound level, $L_A = L_{Aeq,T}$ - Totally encompassing sound, usually composed of many sources. Comprises the residual sound and specific sound when present.

Background sound level, $L_{A90,T}$ - A weighted SPL exceeded by the residual sound for 90% of the a given time interval, T and rounded to the nearest whole dB.

Measurement time interval, T_m - Total time over which measurements are taken. May be the sum of multiple non-contiguous, short-term intervals

Rating level, $L_{Ar,Tr}$ - Specific sound level plus adjustment for characteristic features

Reference time interval, T_r - Specified interval over which the specific sound level is determined, i.e. 1h during the day (0700-2300) and 15mins at night (2300-0700).

Residual sound level, $L_r = L_{Aeq,T}$ - Ambient sound remaining when specific sound source does not contribute

Specific sound level, $L_s = L_{Aeq,Tr}$ - Level produced by specific sound source over reference time interval, T_r . Can also be calculated and/or predicted.

Sound Pressure Level (L_p or SPL) - This is a function of the source and its surroundings and is a measure in decibels of the total instantaneous sound pressure at a point in space. The SPL can vary both in time and in frequency. Different measurement parameters are therefore required to describe the time variation and frequency content of a given sound. These are described below.

Frequency - This refers to the number of complete pressure fluctuations or cycles that occur in one second. Frequency is measured in Hertz (Hz). The rumble of thunder has a low frequency, while a whistle has a high frequency. The sensitivity of the ear varies over the frequency range and is most sensitive between 1KHz and 5KHz.

Octave and One-Third Octave Bands - The human ear is sensitive to sound over a frequency range of approximately 20 Hz to 20,000 Hz and is more sensitive to medium and high frequencies than to low frequencies. To define the frequency content of a sound, the spectrum is divided into frequency bands, the most common of which are octave bands. Each band is referred to by its centre frequency, and the centre frequency of each band is twice that of the band below it. Where it is necessary for a more detailed analysis octave bands may be divided into one-third octave bands.

'A' Weighting - The sensitivity of the human ear varies with frequency, some frequencies sound louder than others. The 'A'-weighting curve represents the non-linear frequency response of the human ear and is incorporated in an electronic filter used in sound level meters. Measurements using an 'A'-weighting filter makes the meter more sensitive to the middle range of frequencies, which approximates to the response of the ear and the subjective loudness of the sound. Sound level measurements using 'A'-weighting will include the subscript A, e.g. dB(A).

Statistical Analysis - These figures are normally expressed as LN, where L is the sound pressure level in dB and N is the percentage of the measurement period. The LN figure represents the sound level that is exceeded for that percentage of the measurement period. L_{90} is commonly used to give an indication of the background level or the lowest level during the measurement period.

APPENDIX B MEASUREMENT SYSTEMS AND CALIBRATION

Job reference and title: 12461 Euston Solar Farm
 Measurement location: See Section 5.2 of this report
 Measurement date(s): 11 September 2020 - 18 September 2020

Measuring equipment used:

Equipment description / serial number	Type number	Manufacturer	Date of calibration expiration	Calibration certificate number
Precision sound level meter serial no. A2A-04410-D2	XL2	NTi Audio	21/08/2021	32657
Microphone serial no. A16324	MC230	NTi Audio	21/08/2021	32656
Microphone pre-amplifier serial no. 5309	MA220	Neutrik	21/08/2021	32657
Microphone calibrator serial no. 042951	GA607	Castle Group	21/08/2021	U32655
Calibration level Ref: 93.7 dB Before: 93.6 dB After: 93.6 dB @ 1 kHz				
Precision sound level meter serial no. A2A-08643-E0	XL2-TA	NTi Audio	12/11/2022	36281
Microphone serial no. 9185	MC230	NTi Audio	12/11/2022	36280
Microphone pre-amplifier serial no. 3489	MA220	Neutrik	12/11/2022	36281
Microphone calibrator serial no. 25993	NOR-1251	Norsonic	12/11/2022	36279
Calibration level Ref: 114.0 dB Before: 114.1 dB After: 114.1 dB @ 1 kHz				

Persons in charge of measurements: Martyn Broom AMIOA

Measurement parameters 1/3 octave band $L_{A90,T}$, $L_{A10,T}$, $L_{Amax,T}$, $L_{Aeq,T}$

Acoustic Louvres

Product and Technical Data



WAKEFIELDACOUSTICS
NOISE CONTROL TECHNOLOGY

INDUSTRIAL & ENVIRONMENTAL NOISE CONTROL SOLUTIONS WORLDWIDE

Wakefield Acoustics specialises in the design and fabrication of a wide range of noise control technologies. Since our formation in 1980, the company has developed a range of solutions for both industrial and commercial applications.

Acoustic louvres are commonly used as air intake paths for air intake and exhausts to plant rooms, and as environmental screens or barriers. Whilst providing noise reduction, acoustic louvres also provide a visual barrier for equipment located at the rear.

Products are fabricated in our modern 40,000 sq. ft. facility in West Yorkshire, and we are accredited to ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007, hence ensuring our products are fabricated to the highest levels of quality, with health and safety and environmental compliance being at the heart of our operations.

Wakefield Acoustics has the capability to undertake projects of all sizes from single louvre modules, to full turnkey packages involving large complex louvre banks or screens complete with associated support structures.

PRODUCT DESCRIPTION

Standard single bank acoustic louvres are available in depths of 150mm and 300mm, with high-performance chevron style louvres also available at an overall thickness of 300mm and 600mm. Non-standard louvre depths can also be accommodated to suit specific applications.

Louvres can be manufactured from a variety of materials including pre-galvanised sheet steel, pre-coated / coloured steel, stainless steel or aluminium. The robust outer casing is formed with fixing holes to allow connection to the builderswork or steelwork opening.

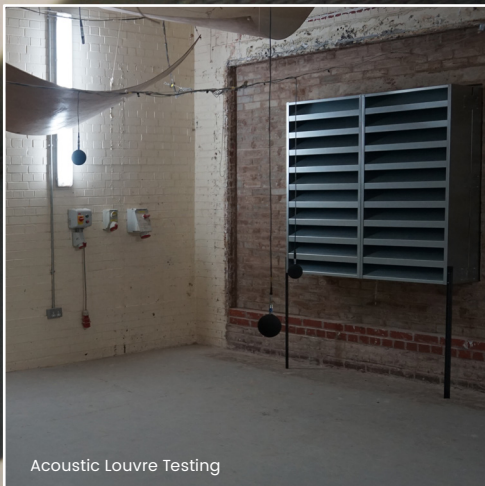
Contained within the casing are a series of horizontally mounted blades set at a standard pitch of 150mm, filled with a dense mineral fibre acoustic insulation. Blades are formed with an integral rain lip to improve weather protection. The acoustic insulation material is odourless, rot proof, non-hygroscopic, does not sustain vermin and will not encourage the growth of fungi, mould or bacteria. Where products are installed in an external application, or subject to high levels of moisture, the acoustic media can be further wrapped in an acoustically transparent polyester film. For mechanical protection, the media is faced with a layer of perforated steel.

ACOUSTIC PERFORMANCE

To ensure a quality installation, and to guarantee a noise reduction solution, our range of acoustic louvres has been independently tested at Salford University to BS EN ISO 10140-2:2010



Acoustic Louvre Installation



Acoustic Louvre Testing

OPTIONS

Louvres can be supplied with a variety of manufacture options to suit specific requirements:

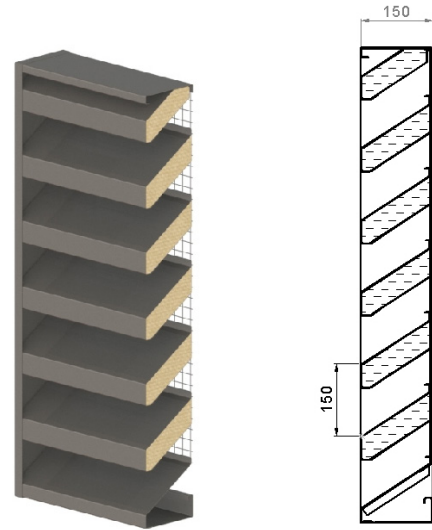
- + **Birdguard** – formed from welded mesh fitted to the rear of the louvre module. As a standard, the guard would be securely mounted to the louvre cassette, though can be removable where required
- + **External flashing** (normally supplied loose) – folded sheet metal facing ‘flange’ / flashing to provide masking of an aperture around the perimeter of the louvre. Flashing finished to suit main louvre
- + **Mounting frames / secondary support steelwork** – a variety of support frames are available where building facades are unable to support the imposed weight of an acoustic louvre
- + **Finish** – Self finish, Powder coat, pre-coated steel options available
- + **Doors** – Louvred doorsets are manufactured with louvre cartridges mounted into a steel hollow section framework for stability and integrity. Standard doorsets are supplied with a peripheral frame for fitting into a builderswork opening, complete with butt hinges, a D-handle and deadlock with internal thumbturn
- + **Industrial/Heavy Duty** – to suit demanding industrial applications louvre modules can be fabricated as full welded units for increased durability
- + **Penthouse** – Penthouse louvres supplied with integral support steel framework, corner flashings and pitched roof. Depending upon size penthouse arrangements can be supplied in a single factory assembled section for ease of installation

Louvre Type WA-ACL-150SB

150mm deep single bank louvre

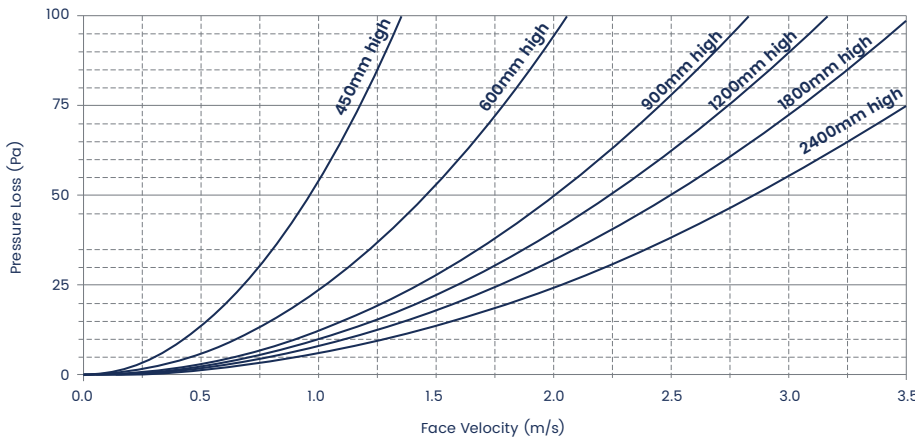
Specification: Single bank acoustic louvre 150mm deep, manufactured with horizontally mounted blades on a 150mm pitch, housed in an outer casing.

Louvre supplied with birdguard and polyester powder paint finish to a standard RAL / BS colour



Louvre			Sound Reduction (dB) at Octave Band Centre Frequency (Hz)							
Depth	Style	Product Code	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
150mm	Single Bank	WA-ACL-150SB	4	4	6	8	10	11	11	10

Pressure Loss Details



Pressure loss correction factors based upon installation conditions are given below:

Fresh air intake, ducted to rear	+0%
Exhaust air to atmosphere, ducted to rear	+10%
Non-ducted	+50%

Weight	Height	Free Area
56kg/m2 Approx	450	33%
	600	38%
	900	42%
	1200	44%
	1500	46%
	1800	46%
	2100	46%
	2400	47%

Options Available
+ Birdguard (BG)
+ Powder Coat finish (PC)
+ Pre-coated steel (CS)
+ Externally Flanged (F)
+ Support Frame (SF)

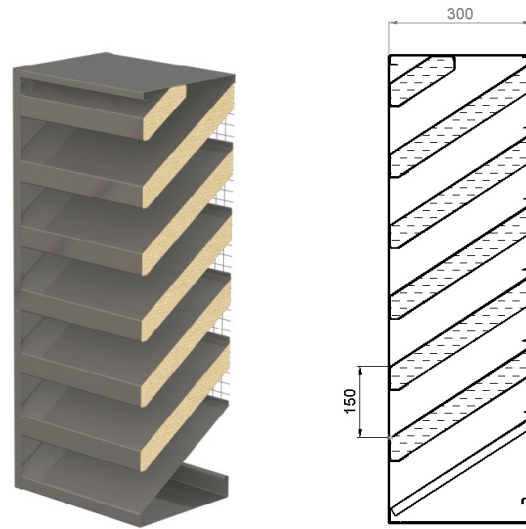
Coding Example: WA-ACL-150-SB/BG/PC/F

Louvre Type WA-ACL-300SB

300mm deep single bank louvre

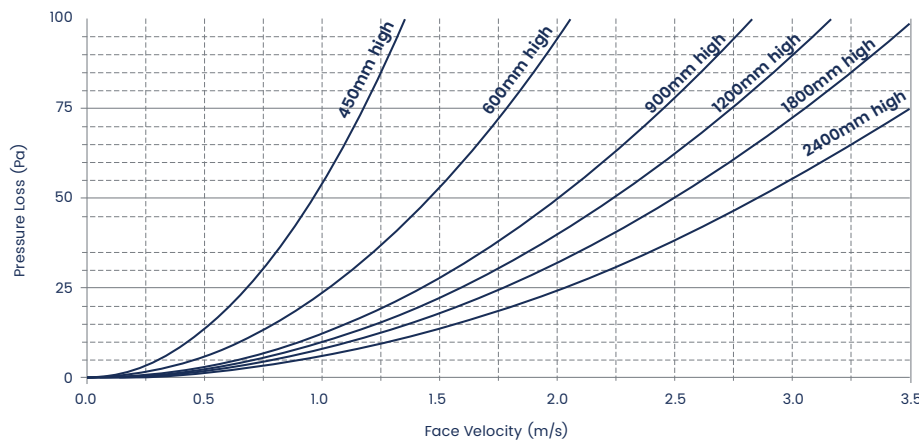
Specification: Single bank acoustic louvre 300mm deep, manufactured with horizontally mounted blades on a 150mm pitch, housed in an outer casing.

Louvre supplied with birdguard and polyester powder paint finish to a standard RAL / BS colour



Louvre			Sound Reduction (dB) at Octave Band Centre Frequency (Hz)							
Depth	Style	Product Code	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
300mm	Single Bank	WA-ACL-300SB	6	6	9	13	20	20	16	15

Pressure Loss Details



Pressure loss correction factors based upon installation conditions are given below:

Fresh air intake, ducted to rear	+0%
Exhaust air to atmosphere, ducted to rear	+10%
Non-ducted	+50%

Weight	Height	Free Area
56kg/m2 Approx	450	33%
	600	38%
	900	42%
	1200	44%
	1500	46%
	1800	46%
	2100	46%
	2400	47%

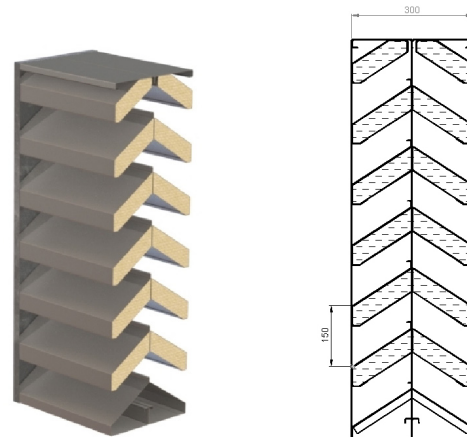
Options Available
+ Birdguard (BG)
+ Powder Coat finish (PC)
+ Pre-coated steel (CS)
+ Externally Flanged (F)
+ Support Frame (SF)

Louvre Type WA-ACL-300DB

300mm deep chevron style louvre

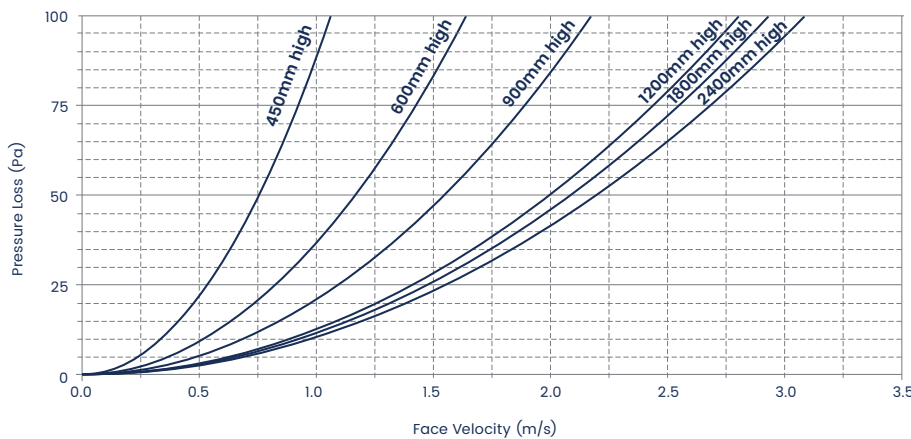
Specification: Double bank acoustic louvre formed from 2 x 150 louvre modules fitted back-to-back. Louvre manufactured with horizontally mounted blades on a 150mm pitch, housed in an outer casing.

Louvre supplied with birdguard and polyester powder paint finish to a standard RAL / BS colour



Louvre			Sound Reduction (dB) at Octave Band Centre Frequency (Hz)							
Depth	Style	Product Code	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
300mm	Chevron Double Bank	WA-ACL-300DB	5	6	8	12	19	19	20	18

Pressure Loss Details



Pressure loss correction factors based upon installation conditions are given below:

Fresh air intake, ducted to rear	+0%
Exhaust air to atmosphere, ducted to rear	+10%
Non-ducted	+50%

Weight	Height	Free Area
72kg/m ² Approx	450	33%
	600	38%
	900	42%
	1200	44%
	1500	45%
	1800	46%
	2100	46%

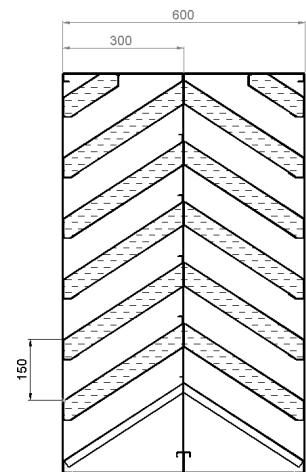
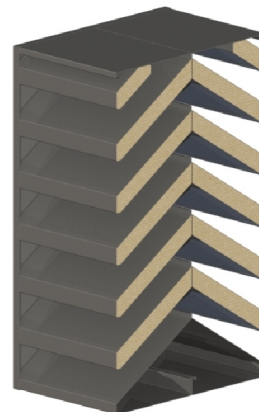
Options Available
+ Birdguard (BG)
+ Powder Coat finish (PC)
+ Pre-coated steel (CS)
+ Externally Flanged (F)
+ Support Frame (SF)

Louvre Type WA-ACL-600DB

600mm deep chevron style louvre

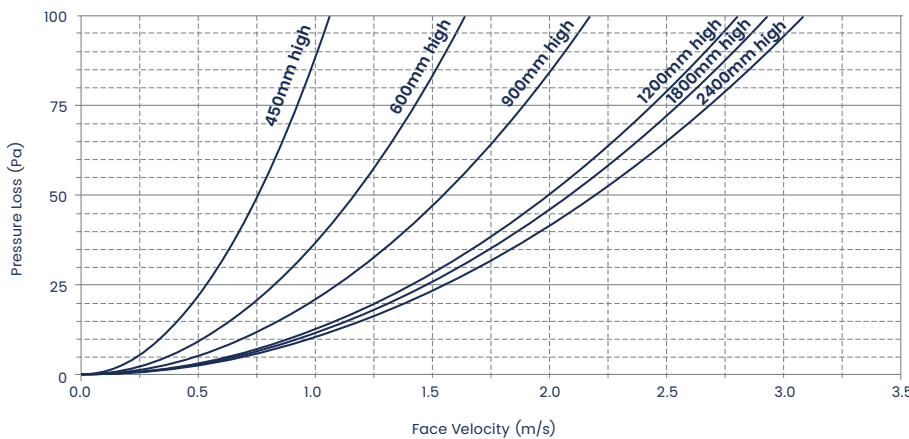
Specification: Double bank acoustic louvre formed from 2 x 300 louvre modules fitted back-to-back. Louvre manufactured with horizontally mounted blades on a 150mm pitch, housed in an outer casing.

Louvre supplied with birdguard and polyester powder paint finish to a standard RAL / BS colour



Louvre			Sound Reduction (dB) at Octave Band Centre Frequency (Hz)							
Depth	Style	Product Code	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
600mm	Chevron Double Bank	WA-ACL-600DB	7	8	12	21	28	30	28	27

Pressure Loss Details



Pressure loss correction factors based upon installation conditions are given below:

Fresh air intake, ducted to rear	+0%
Exhaust air to atmosphere, ducted to rear	+10%
Non-ducted	+50%

Weight	Height	Free Area
112kg/m ² Approx	450	33%
	600	38%
	900	42%
	1200	44%
	1500	45%
	1800	46%
	2100	46%

Options Available
+ Birdguard (BG)
+ Powder Coat finish (PC)
+ Pre-coated steel (CS)
+ Externally Flanged (F)
+ Support Frame (SF)

Coding Example: WA-ASL-600-DB/BG/PC/F



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