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Madsar Arlington Energy

70 Jermyn Street
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Battery Energy Storage Site (BESS), Royle Barn Road, Rochdale – Noise

Introduction

Enzygo Limited has been commissioned by Madsar Arlington Energy to provide a Technical Note to consider noise arising from minor material changes at their proposed Battery Energy Storage System (BESS) at Royle Barn Road, Rochdale.

This Technical Note uses the baseline survey data documented in Enzygo Limited report reference SHF.349.013.NO.R.001, dated July 2021, and has been provided to quantify noise emissions arising from minor material changes to the site layout, BESS equipment and the reduction in height of the perimeter acoustic fence from 6m to 3m.

Noise Modelling

The predictions made within the noise model are based on the calculation of methodology described in the latest version of ISO9613¹. The results have been assessed in accordance with the guidance contained in British Standard 4142:2014+A1:2019 and British Standard 8233:2014 as considered appropriate.

Noise Emission Levels of Equipment

The proposed BESS will comprise the equipment shown in Table 1. The noise source data has been supplied by the client. The site layout detailing the location of the equipment is shown in Figure 1.

Table 1: Noise Source Data

Description	Qty	Sound Pressure Level (each)
Battery Racks	24	80dB(A) @ 1m
Inverter/Transformer Skids	6	80dB(A) @ 1m
Auxiliary Transformer	1	76dB(A) @ 2m

The site also includes a welfare building, a metering substation, a switch, LV & control room and a standby generator. This additional equipment would not generate significant levels of noise audible beyond the site boundary. The standby generator will only operate in an emergency and has not been considered further within this technical note.

¹ BS ISO 9613 – 2: 2024. Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors

Revisions to the site include changing the battery containers from a double stack to a single level and a 3m high acoustic fence would replace the existing proposed 6m high acoustic fence along the northeast, southwest and northwest facing boundaries. The acoustic fence is identified in green on Figure 1 below.

Figure 1 – Site Layout



Noise Modelling Protocols

The noise model was constructed using the proprietary noise modelling software package CadnaA. Noise levels at the nearby receptors have been predicted using the calculation methodology outlined in ISO9613.

The noise model was constructed using Google Maps geo-referenced 1:1 scaled aerial photography and noise source data supplied by the client. Topographical information is based on Ordnance Survey data.

Modelled noise levels form the basis of the calculated specific sound level. Noise emissions from the site have been plotted graphically and are shown in Appendix A.

Predicted Noise Levels

Noise levels generated by the revised development have been predicted to the site facing outdoor amenity spaces and/or site facing façades of the nearest noise-sensitive receptors identified in the July 2021 assessment.

For 2-storey properties on Gypsy Lane and Manchester Road predictions have been made to heights of 1.5m and 4.0m to represent ground floor daytime and first-floor night-time periods. For the bungalows on Roylelands, predictions have been made to 1.5m for both day and night-time periods. For the hotel, predictions have been made to the 2nd floor window of the site facing façade at 6.5m. The resulting predicted noise levels are shown in Table 2.

Table 2: Predicted Noise Levels

Location	Period	Height	Predicted Specific Noise Level, dB $L_{A5,T}$
Gypsy Lane	Day	1.5	39.4
	Night	4.0	42.1
Roylelands	Day & Night	1.5	39.7
Manchester Road	Day	1.5	41.7
	Night	4.0	42.6
Hotel	Day & Night	6.5	43.7

As per the previous assessment, it is considered that there would be no acoustic features, such as tone, impulsivity, or intermittency, audible at the receptors due to the masking of existing noise sources in the area, i.e., road traffic, existing industry, etc., therefore no acoustic feature corrections have been applied to the predicted noise levels and the rating level would equal the predicted noise level.

BS4142 Assessment

As stated above, background noise levels have been taken from the July 2021 assessment. It is considered that this would return a robust assessment as it will not include any 'creep' in background noise levels due to any new development in the area in the intervening period.

Background noise levels are therefore taken as 47dB L_{A90} during the day and 35dB(A) L_{A90} at night.

The predicted noise levels at the residential receptors have been assessed against the guidance contained in BS4142. The results of the assessment are shown in Table 3. The predicted noise levels have been rounded to the nearest whole number.

Table 3: BS4142 Assessment

Location	Period	Background Noise Level dB $L_{A90,T}$	Predicted Rating Level dB $L_{Ar,T}$	Level Exceeding Background dB
Houses on Gypsy Lane	Daytime	47	39	-8
	Night-time	35	42	+7
Bungalows on Roylelands	Daytime	47	40	-7
	Night-time	35	40	+5
Houses on Manchester Road	Daytime	47	42	-5
	Night-time	35	43	+8

Table 3 shows that the predicted noise rating level would remain below the background noise levels at all receptors assessed during the daytime (07:00 to 23:00 hrs). This would indicate that the predicted noise rating level would have a 'low impact'.

Table 3 also shows that predicted noise rating level would be 5dB to 8dB above the background noise levels during the night-time (23:00 to 07:00 hrs) which would indicate that the predicted noise rating level would have an 'adverse impact', depending on the context.

The context remains the same as for the previous assessment, that is, BS4142 is not intended to assess the extent of impact at indoor locations. As it is highly unlikely that residents would be outside during the night, an assessment has been made of the predicted internal noise levels in accordance with the guidance contained in BS8233, specifically those relating to sleeping in bedrooms, as suggested by BS4142.

BS8233 Assessment

Internal noise levels at the residential receptors, including the hotel bedrooms, have been assessed against the guidance contained in BS8233 for daytime resting and sleeping at night based on a window being left partially open for ventilation purposes. As stated above, internal noise levels have been assessed against the guidance contained in BS8233, specifically those relating to sleeping/resting in bedrooms. The results of the assessment are shown in Table 4.

Table 4: BS8233 Assessment

Location	Period	Predicted External Noise Level dB L _{Aeq,T}	Reduction from an Open Window, dB	Predicted Internal Noise Level dB L _{Aeq,T}	Guidance Level dB	Excess dB
Hotel 2 nd Floor Room	Daytime	44	15	29	35	-6
	Night-time				30	-5
Gipsy Lane Houses	Night-time	42		27		-3
Roylelands Bungalows	Night-time	40		25		-5
Manchester Rd Houses	Night-time	43		28		-2

Table 4 shows that predicted internal noise levels would meet the guidance levels for daytime resting and sleeping in bedrooms at night outlined in BS8233 with the windows open.

Summary of Findings

The results of July 2021 study and those contained within the Technical Note show a similar outcome in that predicted noise levels during the day are well below the background noise levels and internal levels at the hotel and the residential receptors meet the guidance set out in BS8233.

Conclusion

The assessments detailed above indicate that the proposed revised development would have a similar outcome to that originally assessed insofar as:

- The daytime BS4142 assessment shows that predicted noise levels would remain below the background noise levels used in the July 2021 assessment at all receptors assessed.

- The night-time BS8233 assessment at the residential receptors shows that predicted internal noise levels would meet the 30dB $L_{Aeq,8hr}$ guidance level for sleeping in bedrooms with the windows open.
- The daytime and night-time BS8233 assessment in a 2nd floor room at the hotel would meet the 35dB $L_{Aeq,16hr}$ guidance level for daytime resting and the 30dB $L_{Aeq,8hr}$ guidance level for sleeping at night with the windows open.

Overall, the development may be audible during quieter portions of the night-time period, though it would not result in any loss of amenity, i.e., sleep disturbance. Furthermore, operation of the facility would not necessitate any change in behaviour or attitude, i.e., closing windows, etc. In relation to the Planning Practice Guidance: Noise, the development is considered at the '*Present and not intrusive*' level, resulting in '*No Observed Adverse Effect*'.

Therefore, it is considered that noise generated by the revised development would not change significantly from that previously assessed with the outcome of the assessment remaining the same.

We trust that the above is clear. If you have any queries or comments, please do not hesitate to contact me on **0114 321 5151**.

Yours sincerely,



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Director of Acoustics

Appendix A – Noise Contour Plots

Figure A-1: Daytime Contour Plot

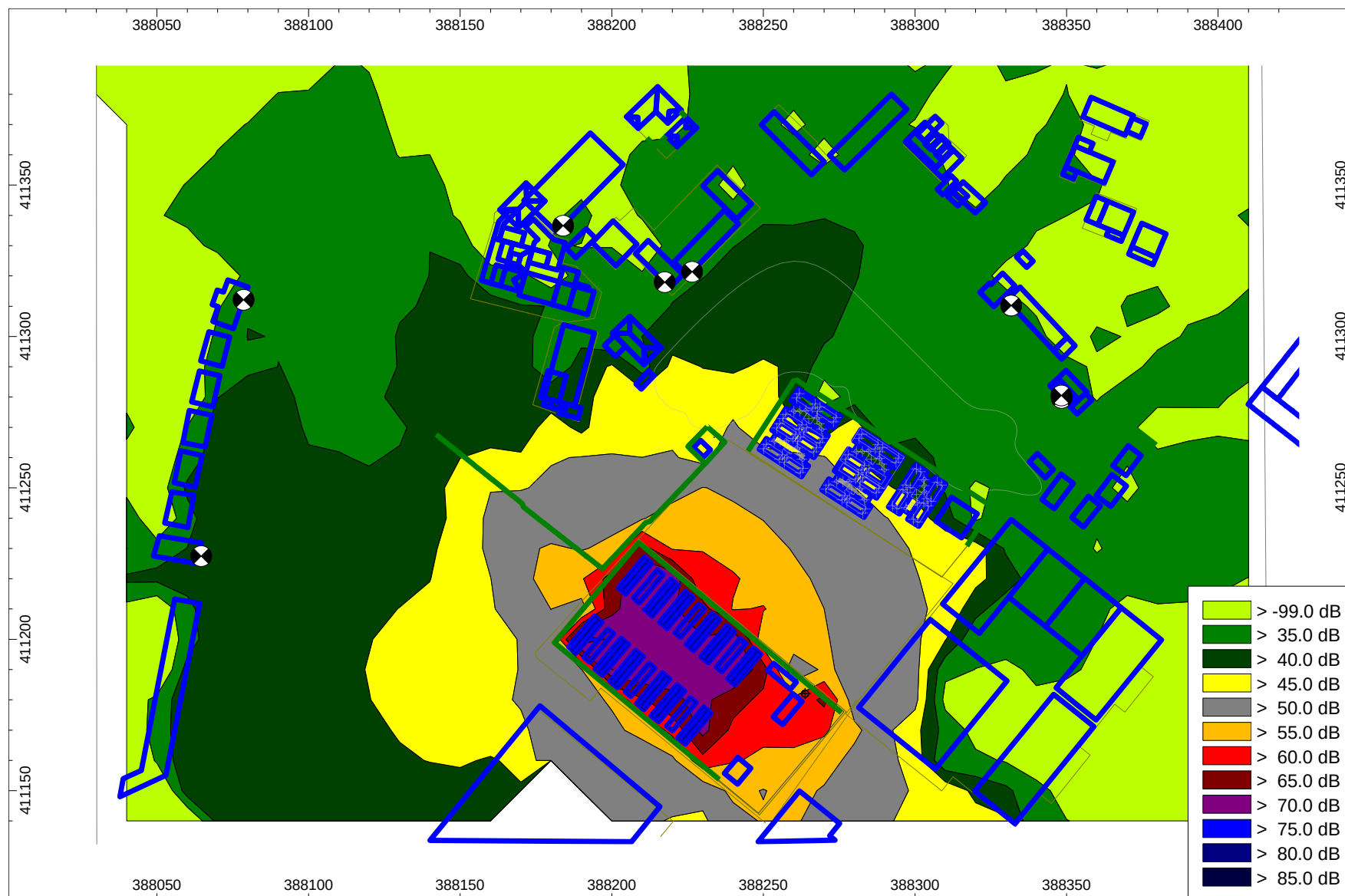


Figure A-2: Night-time Contour Plot

