Blackford Energy Park BESS – Planning Representation: Noise Assessment Review

1. Introduction

This representation relates to the operational noise impacts of the proposed Blackford Energy Park Battery Energy Storage System (BESS). It is based on a review of the applicant's original and revised Noise Impact Assessments, together with an independent professional acoustic review commissioned by local residents.

Noise is a determining issue for this proposal due to the very low existing background noise environment, the scale and elevation of proposed plant, and the proximity of residential receptors. Although a revised noise assessment has been submitted, independent review concludes that the revisions do not materially alter predicted outcomes nor address the fundamental methodological and worst-case modelling deficiencies identified previously.

This document explains why, as submitted, the noise evidence does not robustly demonstrate acceptability in accordance with British Standards (BS) and established planning practice.

2. Executive Review – Headline Conclusions

- The applicant's own British Standards 4142 (referred to as BS 4142) assessment identifies outcomes consistent with a **risk of significant adverse impact**, particularly during night-time operation.
- The assessment relies heavily on **mitigation measures whose effectiveness has not been demonstrated**, especially given the sloping and terraced nature of the site.
- Several modelling assumptions are **non-conservative**, including source characterisation, ground absorption, cumulative treatment, and operational duty.
- **Critical geometric information is absent**, preventing independent verification of predicted noise levels and mitigation performance.

An illustrative **site–receptor cross-section (Appendix 1)** highlights why effective screening cannot be assumed for elevated plant and receptors, and why this should have been explicitly demonstrated in the noise assessment.

Taken together, these issues mean that **compliance with BS 4142 has not been demonstrated**. The assessment does not represent a reasonable worst-case scenario, and the risk of significant adverse impact remains unresolved. On this basis, the application should either be **refused** or **deferred pending a substantially revised and more conservative noise assessment**.

As part of the independent review, our sound expert concluded that realistic corrections to the applicant's modelling assumptions would be expected to increase predicted noise levels by approximately 3 dB (a doubling of sound energy). Such an increase would materially worsen the BS 4142 outcome and move the scheme beyond that presented as acceptable in the assessment.

3. Detailed Technical Review (BS-Linked)

3.1 Elevated Dominant Noise Sources on Terraced Ground

(BS 4142 Clauses 5.3, 9.1, 11; ISO 9613-2)

The proposed development includes **large transformers up to approximately 13 m in height**, located on the **uppermost terraces of a sloping site**. These items represent dominant and persistent noise sources.

The assessment relies on **boundary bunding (reported elsewhere in the application as up to ~8 m in height)** as primary mitigation. Under ISO 9613-2, the effectiveness of barriers depends on the **relative geometry of source height, barrier crest level, receptor height, and intervening ground**, and in particular whether line-of-sight is broken.

For elevated sources located upslope, boundary bunding typically provides **limited attenuation**, especially for **first-floor residential receptors**. The noise assessment does not demonstrate that effective screening is achieved for these elevated sources, nor does it quantify diffraction losses.

The geometric implications of this arrangement are illustrated in **Appendix 1**, which shows that for elevated plant on terraced ground, boundary mitigation of the scale proposed does not reliably break line-of-sight to elevated receptors. As a result, the specific sound level used in the BS 4142 assessment cannot be assumed to be representative of the sound likely to occur.

3.2 Failure to Demonstrate Mitigation Effectiveness (Absence of Cross-Sections)

(BS 4142 Clauses 5.5, 8, 11; ISO 9613-2)

Despite relying on mitigation to support acceptability, the noise assessment provides **no cross-sections** between the proposed plant and the nearest residential receptors. In particular, the assessment does not present:

terrace elevations and source heights,

barrier or bund crest levels,

receptor heights (including upper-floor windows), or

the intervening ground profile along the propagation path.

Given the **sloping and terraced nature of the site**, this omission is material. Without cross-sections, it is not possible to verify whether line-of-sight is broken, whether barriers are effective, or whether predicted attenuation is realistic.

Appendix 1 provides an illustrative site–receptor cross-section prepared using conservative assumptions for plant height, boundary mitigation, and receptor height. While illustrative and not an acoustic model, it demonstrates the type of geometric relationship that the noise assessment itself should have presented and highlights why effective screening—particularly to first-floor receptors—cannot be assumed without explicit evidence.

BS 4142 requires sufficient transparency to allow professional judgement to be exercised. That requirement has not been met.

3.3 Underestimation of Sound Power from Plant Items

(BS 4142 Clauses 5.3, 5.4, 8)

The assessment relies primarily on manufacturer-supplied noise data, often derived from near-field measurements and converted to sound power assuming point-source behaviour. For large plant items such as battery containers, inverters, and transformers, this approach is known to risk **systematic underestimation of sound power**.

The report does not provide sufficient dimensional detail to demonstrate that source characterisation is appropriate, nor does it test sensitivity to alternative source representations. This undermines confidence that the specific sound level used in the BS 4142 assessment is representative.

3.4 Non-Conservative Ground Absorption Assumptions

(BS 4142 Clauses 5.5, 7.7, 8)

A ground absorption factor of **0.9** is adopted for surrounding agricultural land. This is significantly more favourable than values typically required by Aberdeenshire Council for rural farmland.

At the receptor distances involved, this assumption alone can materially reduce predicted noise levels. No justification or sensitivity testing is provided, contrary to BS 4142's requirement to recognise and address uncertainty.

3.5 Tonal and Perceptual Characteristics Not Robustly Assessed

(BS 4142 Clauses 9.2, 9.3; Annex C)

No penalties for tonality, intermittency, or audibility have been applied. However, third-octave spectra show frequency features associated with inverter and transformer operation.

Annex C of BS 4142 notes that third-octave data may be insufficient to identify tonal components, particularly in very low background noise environments. Narrowband tonal analysis has not been undertaken, representing a further non-conservative assumption.

3.6 Background Noise Characterisation Uncertainty

(BS 4142 Clauses 8.1, 8.2, 11)

Background noise measurements were undertaken at proxy locations and were partly influenced by existing infrastructure. Handling of weather-affected data is not fully transparent, particularly for night-time periods.

In a very quiet rural environment, small errors in background level selection materially affect BS 4142 outcomes. The robustness of the background reference level is therefore uncertain.

3.7 Non-Conservative Cumulative Assessment

(BS 4142 Clauses 5.5, 7.7, 11)

Cumulative noise has been assessed using **predicted operational levels** from nearby schemes rather than their **consented noise limits**. This approach understates cumulative impact and does not represent a reasonable worst-case scenario

3.8 Absence of Full Operational (100%) Cooling / Fan Duty Modelling

(BS 4142 Clauses 5.3, 9.1, 11)

The assessment does not demonstrate modelling under **full operational cooling and fan duty**, despite cooling systems being the dominant noise source at BESS sites and known to increase output during high ambient temperatures and grid-stress events.

Without a defined operational envelope or enforceable limits, the rating level cannot be assumed to represent the sound likely to occur under worst-case conditions.

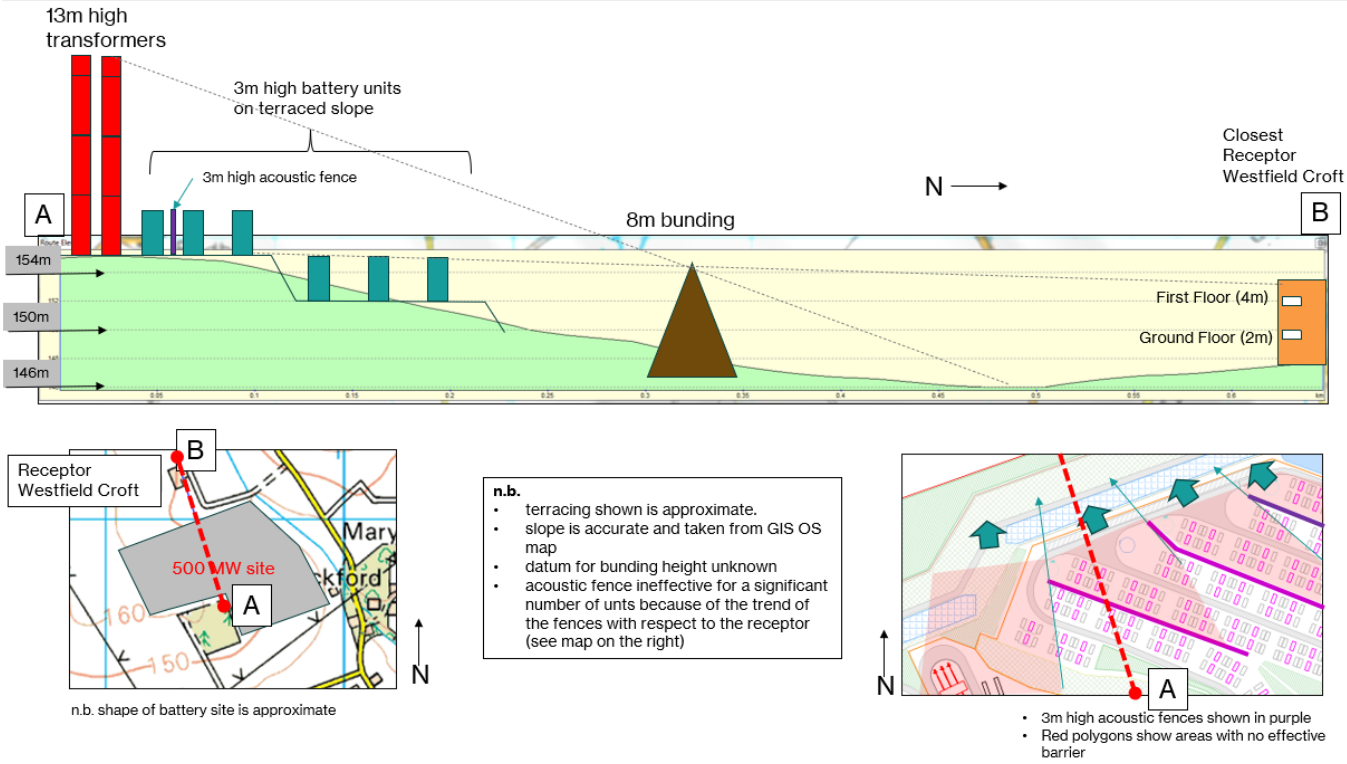
Standards-Based Conclusion

When assessed against BS 4142:2014 +A1:2019, the submitted noise evidence **does not demonstrate compliance**. The assessment relies on optimistic assumptions, lacks transparency in key modelling inputs, and fails to demonstrate mitigation effectiveness under realistic site geometry and operating conditions.

The applicant's own results already indicate outcomes consistent with significant adverse impact. In the absence of robust worst-case modelling and verifiable geometry, the risk to residential amenity remains unresolved.

Accordingly, the application should be **refused**, or at minimum **deferred pending a substantially revised, conservative, and transparent noise assessment**, including explicit geometric disclosure and worst-case operational testing.

Appendix 1



n.b. shape of battery site is approximate

n.b.
- terracing shown is approximate.
- slope is accurate and taken from GIS OS map
- datum for bunding height unknown
- acoustic fence ineffective for a significant number of unts because of the trend of the fences with respect to the receptor (see map on the right)

- 3m high acoustic fences shown in purple
- Red polygons show areas with no effective barrier

Appendix 1 provides an illustrative site–receptor cross-section (slope is accurate and extracted from an OS map) using conservative assumptions for plant height, boundary mitigation, and receptor height. While illustrative and not an acoustic model, it demonstrates the type of geometric relationship that the noise assessment itself should have presented and highlights why effective screening—particularly to first-floor receptors—cannot be assumed without explicit evidence.

References:

British Standards Institution (BSI)
BS 4142:2014+A1:2019
Methods for rating and assessing industrial and commercial sound.
London: British Standards Institution.

International Organization for Standardization (ISO)
ISO 9613-2:1996
Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation.
Geneva: International Organization for Standardization.