

MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Construction Noise and Vibration Assessment Clarification Note



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Glossary

Term	Meaning
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
400 kV grid connection cable corridor	The corridor within which the 400 kV grid connection cables will be located.
Decibel	A unit used to measure or compare the intensity of a sound by comparing it with a given reference level on a logarithmic scale
Noise	An unwanted or unexpected sound.
Onshore Order Limits	Onshore Order Limits See Transmission Assets Order Limits: Onshore (below).
Peak Particle Velocity	An indicator of the magnitude of ground vibration which refers to the movement of molecular particles through the ground.
Sound	Fluctuations of pressure within a medium (gas, solid or fluid) within the audible range of loudness and frequencies with excite the sensation of hearing.
Sound Power Level, L_w	The total sound energy emitted by a source pre unit of time.
Sound Pressure Level, L_p	The amount of force a sound wave exerts on a surface area perpendicular to the direction of travel. A measure of the variation of sound level over a distances
Transmission Assets	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning.
Transmission Assets Order Limits	<p>The area within which all components of the Transmission Assets landward of Mean High-Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds).</p> <p>Also referred to in this report as the Onshore Order Limits, for ease of reading.</p>

Acronyms

Acronym	Meaning
ES	Environmental Statement
HDD	Horizontal Directional Drilling
MHWS	Mean High Water Springs
NSR	Noise Sensitive Receptor
PPV	Peak Particle Velocity
TJB	Transition Joint Bay

1 Construction Noise and Vibration Assessment Clarification Note

1.1 Introduction

- 1.1.1.1 The Rule 9 letter issued on 14th February 2025 by the Examining Authority (PD-005) requested that the Applicants provide further explanation of and justification for the assessment of the sequential scenario with a gap of up to a maximum of four years. As part of the response to the Rule 9 letter (AS-067), the Applicants reviewed the construction scenarios used for the maximum design scenarios (MDS). Within this review, the Applicants identified that the following matters required further clarification and committed to providing a technical note to address these clarifications at the earliest opportunity in the Examination:
- construction noise impacts associated with transient works along the onshore export cable corridor and 400kV grid connection cable corridor; and
 - construction vibration impacts associated with vibratory compaction and vibratory piling.
- 1.1.1.2 As noted in Table 1.16 of technical note S_R9_2 ES assessment of Construction Scenarios F01 (AS-070), the assessment reported in Volume 3 Chapter 8 Noise and Vibration of the Environmental Statement (APP-117) currently reports these impacts as associated with the sequential construction of Project A (Morgan) and Project B (Morecambe). However, upon giving this matter more detailed consideration, in order to ensure a precautionary and robust approach it has been determined that the MDS for the assessment should be concurrent construction. Consequently, the Applicants have reviewed the construction noise and vibration assessment to clarify the potential impacts and effects associated with the concurrent construction of these activities associated with the construction of the Transmission Assets.
- 1.1.1.3 Following review by local authority Environmental Health Officers and discussion at appropriate Statement of Common Ground meetings, the Applicants propose to incorporate any amendments or clarifications into an updated version of Volume 3, Chapter 8: Noise and Vibration of the Environmental Statement at Deadline 6.
- 1.1.1.4 This technical note provides clarification on these impacts and effects for the concurrent construction scenario and demonstrates that the conclusions of the assessment (as reported in Volume 3 Chapter 8 Noise and Vibration of the Environmental Statement (APP-117)) remain unchanged.

1.2 Detailed scope of the review to inform clarifications

1.2.1 Concurrent construction of transient and vibratory works

1.2.1.1 As noted in Table 1.16 of technical note S_R9_2 ES assessment of Construction Scenarios F01 (AS-070), the assessment reported in Volume 3 Chapter 8 Noise and Vibration of the ES (APP-117) currently reports impacts associated with the following activities in line with sequential construction of Project A (Morgan) and Project B (Morecambe).

- Construction noise impacts associated with transient works:
 - site preparation – fencing and topsoil strip;
 - haul road construction;
 - trench excavation and duct installation;
 - trench backfill;
 - trench route and topsoil reinstatement; and
 - haul road removal.
- Construction vibration impacts associated with vibratory compaction and vibratory piling:
 - the use of vibratory piling techniques for the installation of entry and exit pits for HDD (or other trenchless techniques); and
 - the use of vibratory rollers for the dynamic compaction of the haul road, temporary construction compounds, and the Onshore Substation platforms during the groundworks phase of construction.

1.2.1.2 However, the MDS associated with these construction activities has subsequently been identified as concurrent construction through the review within AS-067. Therefore, the Applicants have applied the following approaches to review the assessment to derive impacts and effects likely to result from these activities, based on concurrent construction.

Transient works

1.2.1.3 The construction noise impacts associated with transient works reported in APP-117 and APP-119 were derived using the following approach:

- calculating a source sound power of the relevant construction activities associated with a single project (as the MDS was previously identified as sequential construction);
- siting this source on the boundary of the onshore export cable corridor and 400kV grid connection cable corridor; and
- deriving the construction noise levels at varying distances from these boundaries by correcting the source sound power for attenuation for distance over hard ground.

1.2.1.4 The Applicants have applied the same approach to derive construction noise impacts associated with concurrent construction of transient works, except

for using a sound source power associated with both projects. The resultant impacts and effects associated with the concurrent construction of transient works are reported in **Section 1.3.1** of this technical report.

Construction vibration impacts

- 1.2.1.5 The vibration assessment reported in APP-117 has been informed by the methodology set out in Annex E of BS 5228-2:2009+A1:2014. BS 5228-2 is the nationally accepted industry code of practice for construction vibration and has been applied in other consented Nationally Significant Infrastructure Projects. This method predicts peak particle velocity levels (PPV) from individual vibration sources associated with compaction and piling.
- 1.2.1.6 The Applicants acknowledge that in the concurrent construction scenario there is the potential for vibratory plant to be operated at the same time on each project. However, due to the complex nature of vibration propagation through the ground, the PPV values likely to result from multiple items of vibratory construction plant operating at the same time cannot be derived from a simple addition of PPV values predicted from each individual item of plant. Therefore, a qualitative approach has been applied using professional judgement to derive impacts resulting from concurrent construction. The outcome of this qualitative assessment is reported in **Section 1.3.2** of this technical report.

1.3 Clarifications and updated construction noise and vibration impacts and effects

1.3.1 Transient works

- 1.3.1.1 The noise impact assessment reported in Table 8.27 of APP-117 identified that properties were predicted to experience high, medium and low impacts from transient works to be undertaken along the onshore export cable corridor and 400V grid connection cable corridor due to sequential working.
- 1.3.1.2 For concurrent construction, the impacts associated with transient works are presented in **Table 1** below.

Table 1: Number of receptors per construction noise impact magnitude band

Location	Impact magnitude band distance (m)			Number of receptors		
	High	Medium	Low	High	Medium	Low
Site Preparation						
East of TJB, Blackpool Airport Land	84	150	597	290	476	2208
East of Blackpool Airport, West of Substations	84	150	2118	56	107	27922
400 kV grid connection cable corridor	84	150	2118	28	147	16043
Trench excavation and duct installation						

Location	Impact magnitude band distance (m)			Number of receptors		
	High	Medium	Low	High	Medium	Low
East of TJB, Blackpool Airport Land	73	129	515	261	423	1844
East of Blackpool Airport, West of Substations	73	129	1826	49	85	21663
400 kV grid connection cable corridor	73	129	1826	23	84	13413
Trench backfill						
East of TJB, Blackpool Airport Land	61	109	435	222	361	1548
East of Blackpool Airport, West of Substations	61	109	1544	42	67	15605
400 kV grid connection cable corridor	61	109	1544	17	48	10643
Trench route reinstatement						
East of TJB, Blackpool Airport Land	57	101	403	208	333	1423
East of Blackpool Airport, West of Substations	57	101	1428	40	63	13116
400 kV grid connection cable corridor	57	101	1428	15	40	9419
Haul road removal						
East of TJB, Blackpool Airport Land	68	120	479	249	398	1711
East of Blackpool Airport, West of Substations	68	120	1701	45	78	18841
400 kV grid connection cable corridor	68	120	1701	20	61	12143

1.3.1.3 In **Table 1**, the distances from the Order Limits at which high, medium and low impacts are predicted to occur due to concurrent construction are greater than those reported in APP-117. Consequently, increased numbers of properties are predicted to experience high, medium and low transient noise impacts as a result of concurrent construction.

1.3.1.4 As with sequential construction, noise impacts resulting from the concurrent works would not be experienced at properties for the following temporal durations due to their transient nature:

- 10 or more days or nights in any 15 consecutive days or nights, or
- a total number of days exceeding 40 in any 6 consecutive months.

1.3.1.5 It should also be noted that this is an over-assessment as the precautionary, worst case assumption is that all equipment will be in operation at the same time on the boundary of the onshore export cable corridor and 400kV grid connection cable corridor which will not be the case in practice. Notwithstanding the updates to the impact assessment with the concurrent construction scenario, the conclusion set out in paragraph 8.11.4.17 of APP-117 (**minor adverse** significance) remains unchanged.

1.3.1.6 Therefore, the Applicants confirm the no further mitigation is required to control construction noise from these activities than is already set out in the Outline Construction Noise and Vibration Management Plan(s) (APP-196). These form part of the Outline Code of Construction Practice (OCoCP). The detailed CoCP(s) are secured by Requirement 8 of Schedules 2A and 2B of the draft DCO (AS-004). Detailed Construction Noise and Vibration Management Plan(s) will be implemented by the Applicants as approved by the relevant local planning authorities in consultation with the relevant statutory stakeholders, as appropriate.

1.3.2 Vibratory works

1.3.2.1 The construction vibration predictions reported in Table 8.30 of APP-117 show that medium and low impacts were predicted to occur due to works associated with vibratory compaction and vibratory piling. The construction vibration predictions reported in the ES (APP-117) are replicated in **Table 2** below.

Table 2: Construction vibration impact magnitude and number of receptors per impact magnitude band

Location	Impact magnitude band distance (m)			Number of receptors		
	High	Medium	Low	High	Medium	Low
Dynamic compaction						
Haul Road	7	38	88	0	51	96
Temporary Construction Compounds (Onshore Export Cable Corridor)				0	33	189
Temporary Construction Compounds (Onshore Substations)				0	0	1
Onshore Substation Platforms				0	0	0
Vibratory piling						
Trenchless Technique Entry/Exit Pits	8	41	100	0	72	173
Onshore Substation Platforms				0	0	1

1.3.2.2 The Applicants consider that it is unlikely that vibration impacts which could arise from concurrent construction would be different to those presented in **Table 2**. This appropriateness of this assumption will be agreed with the Environmental Health Officers (EHOs) of the relevant local authorities via Statement of Common Ground meetings. The Applicants conclude that

medium construction vibration impacts are also likely to occur due to concurrent working. However, these impacts from both compaction and piling activities are based on conservative assumptions and only likely to be experienced for no more than a few days. Therefore, taking these factors into consideration, the overall impact due to construction vibration from concurrent operation will be low and the effect is considered to be of **minor adverse** significance which is not significant in EIA terms. This remains unchanged from the conclusion reported in the ES (paragraph 8.11.7.12 of APP-117).

- 1.3.2.3 Therefore, the Applicants confirm the no further mitigation is required to control construction vibration from these activities than is already set out in the Outline Construction Noise and Vibration Management Plan (APP-196). These form part of the Outline Code of Construction Practice (OCoCP). The detailed CoCP(s) are secured by Requirement 8 of Schedules 2A and 2B of the draft DCO (AS-004). Detailed Construction Noise and Vibration Management Plan(s) will be implemented by the Applicants as approved by the relevant local planning authorities in consultation with the relevant statutory stakeholders

1.4 Conclusion

- 1.4.1.1 The Rule 9 letter issued on 14th February 2025 by the Examining Authority (PD-005) requested that the Applicants provide further explanation of and justification for the assessment of the sequential scenario with a gap of up to a maximum of four years. As part of the response to the Rule 9 letter (AS-067), the Applicants reviewed the construction scenarios used for the maximum design scenarios (MDS). Within this review, the Applicants identified that the following impacts required further clarification and committed to providing a technical note to address these clarifications at the earliest opportunity in the Examination:
- Construction noise impacts associated with transient works
 - Construction vibration impacts associated with vibratory compaction and vibratory piling
- 1.4.1.2 This technical note has provided further clarification on these impacts and has demonstrated that the assessment conclusions reported in Volume 3 Chapter 8 Noise and Vibration of the Environmental Statement (APP-117) remain unchanged.