

REPORT

Boston Alternative Energy Facility

Boston Alternative Energy Facility Examination Technical Note:
Updated Piling Noise Assessment

Client: Alternative Use Boston Projects Ltd.

Planning Inspectorate EN010095

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Note / Memo

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Industry & Buildings

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1 Introduction

This technical note has been produced to investigate potential noise impacts associated with construction of the Boston Alternative Energy Facility (BAEF), hereby referred to as 'the Facility' following further details of the wharf piling construction programme becoming available since the Development Consent Application (DCO).

A construction noise assessment for the Facility was undertaken as part of Environmental Statement (ES) Chapter 10 Noise and Vibration (document reference: 6.2.10, APP-048). Following submission of the ES, the construction programme (document reference 9.8 to be submitted to the Examination at deadline 1) associated with the Facility has been refined to reduce the window when piling works at the wharf are being undertaken (noting that the overall duration of the construction programme remains as per the ES Chapter 5 Project Description (document reference 6.2.5, APP-043)). The updated period for wharf piling works is approximately 4 months in duration, over the months of June to September, in order to help protect ecological receptors.

The aim of the noise assessment reported in this technical note is to establish potential noise impacts during the piling construction period, therefore presenting a worst-case for potential impacts at nearby residential premises during the construction of the Facility. The assessment presented in the ES Chapter 10 is still considered representative of potential noise impacts during the overall construction programme.

2 Piling Operations

Piling works at the wharf will comprise of construction a sheet pile wall followed by tubular wharf piles. Sheet piling activities will be undertaken by piling rigs and whilst one rig is in operation the other rig will be mobilising to the next piling location. A number of piling rigs would be on site at any one time, allowing for the next pile to be placed in readiness for piling, while the previous pile is installed. It is likely that there would be continuous piling, as there would be sufficient rigs on site to allow for changeover times to occur while other piles are installed. However, it is unlikely that there would be any simultaneous piling as each pile location would have its own specific requirements, that would require previous piles to be installed in order for the next to be installed.

Tubular wharf piling activities will commence two weeks after the sheet piling commences and will similarly use multiple piling rigs; again, one rig in operation whilst another rig mobilises to the next piling location.

In addition to piling works at the wharf, there is also potential for piling works within the main facility. Piling activities will consist of a combination of continuous flight auger piling and impact piling of pre-cast concrete piles. At worst, it is anticipated that three piling rigs within the main facility will be in simultaneous operation.

3 Methodology

3.1 Study Area and Receptor Identification

The closest residential premises to the Facility were determined during consultation with relevant stakeholders and are considered the Noise Sensitive Receptors (NSRs) for the assessment, as set out in ES Chapter 10.

For each identified receptor or group of receptors (NSRs) a representative location was chosen for the assessment as detailed in **Table 1**.

Table 1 Receptor identification and location

NSR identifier	Description	British National Grid coordinates	
		X	Y
R1	Slippery Gowt Lane	533941.53	341622.40
R2	Marsh Lane	533532.25	342101.33
R3	Nursery Road	533665.84	342446.35
R4	Powell Street	534150.89	342647.31
R5	River Way	534024.37	342812.69
R6	Windsor Bank	533546.84	343116.80

All NSRs are residential premises and are defined as medium sensitivity, as detailed in Section 10.4 of ES Chapter 10.

3.2 Assessment Methodology

The approach utilised for assessing construction noise impacts is the threshold based ‘ABC’ method detailed within British Standards Institution (2014) BS 5229-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise. The approach specifies construction noise limits based on the existing ambient noise level for different periods of the day. **Table 2**, reproduced from BS 5228-1 Table E.1, presents the criteria for selection of a noise limit for a specific receptor location.

Table 2 Construction noise threshold levels based on the ABC method (BS 5228-1)

Assessment category and threshold value period	Threshold value, in decibels (dB L _{Aeq,T})		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07:00 - 19:00) and Saturdays (07:00 - 23:00)	65	70	75
^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.			
^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.			
^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.			
^{D)} 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays			

The ‘ABC method’ described in BS 5228-1 establishes that there is no impact below the three thresholds presented above. BS 5228-1 states:

“If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated. The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect.”

A baseline noise survey was undertaken at the NSRs, as presented in Section 10.6 of ES Chapter 10. From the baseline survey it is seen that all NSRs are defined by category A during the daytime reference period.

Piling works, both at the wharf and the main facility, will only be undertaken on Mondays to Fridays between 8am and 8pm (with an option of 7am to 7pm) and from 7am to 1pm on Saturdays. Hence, most of the proposed piling works are limited to the corresponding BS 5228-1 daytime reference period, as detailed in **Table 2**. The hour from 7pm to 8pm is classed as evening; however, this time is less sensitive than the remainder of the evening period which covers when people may be going to bed, and it is only for one hour of the four-hour evening period. On this basis, it is considered appropriate to use the daytime construction noise level threshold for the assessment.

The resulting impact magnitude criteria for construction noise at the NSRs are presented in **Table 3**.

Table 3 Daytime construction noise impact magnitude criteria

Magnitude of effect	Construction noise level (dB L _{Aeq,T})
No Impact	≤ 65
Negligible	65.1 to 65.9
Low	66 to 67.9
Medium	68 to 69.9
High	≥ 70

3.3 Impact Significance

Following the identification of receptor sensitivity and magnitude of the impact, it is possible to determine the significance of effect. The matrix utilised in the ES and this construction noise assessment is presented in **Table 4**.

Table 4 Impact significance matrix

		Magnitude of effect				
		High	Medium	Low	Negligible	No Impact
Sensitivity	High	Major	Major	Moderate	Minor	Minor
	Medium	Major	Moderate	Minor	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible	Negligible
	Negligible	Minor	Minor	Negligible	Negligible	Negligible

4 Impact Assessment

4.1 Noise Modelling Assumptions

Noise modelling scenarios were derived from the proposed construction phase programme provided by AUBP's project engineers, detailing duration and equipment requirements for each phase and scenario. Details of the proposed piling works are described in **Section 2**.

The construction assessment considers noise associated with piling works at the wharf in addition to other construction activities at the main facility which would be carried out concurrently, to assess a representative worst-case scenario. Construction equipment assumptions are detailed in **Table 5**.

Table 5 Assumed construction plant

Location / Activity	Equipment	No.	L _{WAeq} (dB)	On-time (%)
Power export island	Concrete pump	1	103	40
	JCB	1	99	55
	20T Tipper lorry	1	116	15
Pre-construction enabling works	25T Backhoe	1	108	55
	Dumper	1	111	50
	20T Tipper lorry	1	116	15
Control room and office	Crane 100T	1	110	55
	Telehandler	1	99	40
	Angle grinder	1	108	15
	JCB	1	99	55
	Dumper	1	111	50
	20T Tipper lorry	1	116	15
Fuel + RDF conveyors	20T Tipper lorry	1	116	15
	Vibrating roller	1	110	40
	Concrete pump	1	103	40
Turbine house	Telehandler	1	99	40
	Dumper	1	111	50
	20T Tipper lorry	1	116	15
	Angle grinder	1	108	15
Wharf	Dumper	1	111	50
	20T Tipper lorry	2	116	15
	Vibrating roller	1	110	40
	Concrete pump	1	103	40

Location / Activity	Equipment	No.	L _{WAeq} (dB)	On-time (%)
	Tubular piling rig	2	115	35
	Sheet piling rig	2	116	35
	Crane 100T	1	110	55
EfW bases + main hall slab	Pre-cast concrete piling rig	1	117	35
	Crane 40T	1	89	55
	Concrete pump	1	103	40
	20T Tipper lorry	1	116	15
LWA facility	25T Backhoe	1	108	55
	20T Tipper lorry	1	116	15
	Auger piling rig	1	111	35
Air cooled condensers	Auger piling rig	1	111	35
	Crane 40T	1	89	55
	Concrete pump	1	103	40
	20T Tipper lorry	1	116	15
	Dumper	1	111	50
Concrete batching plant	Concrete pump	1	103	40
	JCB	1	99	55
	20T Tipper lorry	2	116	15

As part of the embedded measures for potential noise impacts during the construction, it is proposed that a construction phase Noise and Vibration Monitoring and Management Plan (NVMMP) will be submitted to and approved by the relevant planning authority and form part of the final Code of Construction Practice (CoCP)¹.

Best practice noise mitigation measures, to be implemented and controlled through the construction phase NVMMP, will typically include:

¹ Secured by DCO Requirement 10, Code of Construction Practice (Draft DCO, Schedule 2, Part 1) (document reference 2.1, APP-005) in line with the Outline CoCP (document reference 7.1, APP-120)

- Management of construction operating hours;
- Implementation of traffic management measures such as agreed routes for construction traffic;
- Use of screens and noise barriers / acoustic screens;
- Construction site layout to minimise or avoid reversing with use of banksmen where appropriate. Output noise from reversing alarms set at levels for health and safety compliance;
- Use of modern, fit for purpose, well maintained plant and equipment to minimise noise generation. Plant and vehicles will be fitted with mufflers / silencers maintained in good working order. Use of silenced equipment, as far as possible and low impact type compressors and generators fitted with lined and sealed acoustic covers. Doors and covers housing noise emitting plant will be kept closed when machines are in use;
- No audible music or radios to be played outdoors on site;
- Ensuring engines are switched off when machines are idle; and
- Regular communication with site neighbours to inform them of the construction schedule, and when noisy activities are likely to occur.

4.2 Results

The predicted noise levels at the NSRs, associated with the construction period when all piling activities is undertaken, are presented in **Table 6**. As works are being undertaken during the daytime reference period, noise predictions were undertaken at ground floor level, i.e. 1.5m.

Table 6 Predicted construction noise levels

NSR identifier	Predicted construction noise level (dB $L_{Aeq,T}$)	Daytime threshold value (dB $L_{Aeq,T}$)	Level above threshold value (dB)	Magnitude of effect
R1	55.6	65	-9.4	No Impact
R2	62.9	65	-2.1	No Impact
R3	62.9	65	-2.1	No Impact
R4	67.4	65	2.4	Low
R5	58.6	65	-6.4	No Impact
R6	51.1	65	-13.9	No Impact

Table 6 details that a magnitude of effect of no impact is predicted at all NSRs except R4 (Powell Street), therefore indicating **negligible** impact significance at medium sensitivity receptors in accordance with the matrix provided in **Table 4**.

At R4 low magnitude of effect is predicted, indicating **minor** impact significance at medium sensitivity receptors in accordance with the matrix provided in **Table 4**.

Neither **negligible** nor **minor** impact are considered significant in EIA terms, therefore no additional mitigation is necessary. The main contribution of construction noise at R4 is from piling activities at the wharf and are therefore are considered temporary, short-term, local and reversible.

5 Summary

This note presents a construction noise assessment at the nearby residential premises considering the updated construction programme, specifically during the proposed 4-month period where all wharf piling activities are to be undertaken.

All proposed piling works, both at the wharf and the main facility, are limited to a maximum 12 hour window, to be undertaken between 07:00 – 20:00 Monday to Friday and 07:00 to 13:00 on Saturday.

The updated assessment indicates **minor** impact significance, at worst, and therefore not considered significant in EIA terms. Potential noise impacts during the wharf piling phase of the construction programme are regarded to be temporary, short-term, local and reversible and additional mitigation is not considered necessary.

It is proposed that a construction phase NVMMP will be submitted to and approved by the relevant planning authority and form part of the final CoCP. The NVMMP will outline Best Practice Measures to be implemented during construction of the Facility to reduce potential noise impacts at NSRs.