


MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Annex 5.3 to the Applicants response to Hearing Action Points: ISH1 13, 14, 16, 17



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Glossary

Term	Meaning
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in the ES.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bay inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Generation Assets	The generation assets associated with the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm include the offshore wind turbines, inter-array cables, offshore substation platforms and platform link (interconnector) cables to connect offshore substations.
Mean High Water Springs	The height of mean high water during spring tides in a year
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Morecambe Offshore Windfarm: Generation Assets	The offshore generation assets and associated activities for the Morecambe Offshore Windfarm.
Morecambe Offshore Windfarm: Transmission Assets	The offshore export cables, landfall, and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.
Morecambe OWL	Morecambe Offshore Windfarm Ltd is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra) and Flotation Energy Ltd.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore export cables, landfall, and onshore infrastructure for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Morgan Offshore Wind Project: Generation Assets	The offshore generation assets and associated activities for the Morgan Offshore Wind Project.
Morgan Offshore Wind Project: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morgan Offshore Wind Project to the National Grid.
Morgan OWL	Morgan Offshore Wind Limited is a joint venture between bp Alternative Energy Investments Ltd. and Energie Baden-Württemberg AG (EnBW).
Offshore export cables	The cables which would bring electricity from the Generation Assets to the landfall.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.

Term	Meaning
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Transmission Assets Order Limits	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 (such as construction compounds).
Transmission Assets Order Limits: Onshore	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). Also referred to in this report as the Onshore Order Limits, for ease of reading.
Underground Cable Ducts	Protective conduits buried below ground that are used to house and protect the onshore export cable cables, designed to withstand ground pressure, environmental exposure and thermal loads generated by the cables.

Acronyms

Acronym	Meaning
CoCP	Code of Construction Practice
CoT	Project Commitment
DCO	Development Consent Order
EIA	Environmental Impact Assessment
ES	Environmental Statement
MDS	Maximum Design Scenario
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
O&M	Operations and Maintenance
PDE	Project Design Envelope
PRoW	Public right of way
SSSI	Site of Special Scientific Interest
PDE	Project Design Envelope
TJB	Transition Joint Bay

Units

Unit	Description
%	Percentage
KJ	Kilojoules
km	Kilometres
km ²	Kilometres squared
kV	Kilovolt
m	Metres
m ²	Metres squared
m ³	Metres cubed

1 Introduction

1.1 Purpose of this document

1.1.1.1 In line with Agenda Item 5, Hearing Action Points 13, 14, 16 and 17 of the Issue Specific Hearing 1 (ISH1) actions, this note sets out the works proposed at the Lytham St. Annes Beach to facilitate the landfall of the Morgan OWL and Morecambe OWL offshore export cables. For clarity, **Table 1.1** details the Hearing Action Points and where the responses can be found within the document.

Table 1.1: Issue Specific Hearing 1 Action Points 13, 14, 16 and 17

No	Hearing Action	Location within the document (link)
ISHI_13	Confirm how many car parking spaces at the North Beach car park will remain available whilst the construction compound is in place [Work Nos 38A and 38B). The expectation is that this will be more than 75.	Section 4 – Temporary Construction Compounds Paragraph 4.1.1.4 Figure 5
ISHI_14	Provide an indicative plan setting out a) the position of exit pits at landfall; b) the indicative positions and heights of cofferdams; and c) an indicative layout of the beach works including proposed crossing points and restrictions on public access.	Section 3 – Indicative Layout for Beach Works a) Figure 3 b) Figure 3 & Figure 4, paragraph 3.1.1.5 c) Figure 3 & Figure 4
ISHI_16	Provide an explanation as to the timings for the cable pull at landfall.	Section 3 – Indicative Layout for Beach Works <u>Section 3.2 – Offshore Export Cable Pull-ins</u>
ISHI_17	Provide a time estimate for the construction works on either side of the care home.	Section 2 – Summary of the Landfall Works Paragraph 2.2.1.5

1.1.1.2 **Section 2** provides context for the landfall works occurring at the beach relative to the information requested in the Hearing Action Points. Full details of the landfall works are provided in Volume 1, Chapter 3: Project Description (AS-024). No new information has been provided to inform this note.

2 Summary of the Landfall Works

2.1 Offshore Export Cable Landfall

- 2.1.1.1 Landfall describes the area where the six offshore cable circuits from the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Wind Project: Generation Assets, transition from offshore to onshore. The Transmission Assets cable landfall will be to the north of Lytham St. Annes adjacent to Blackpool Airport (see **Figure 1**). The Lytham St Annes Dunes Site of Special Scientific Interest (SSSI), the A584 Clifton Road North, the Lytham St Annes Local Nature Reserve, Preston to Blackpool South Railway Line and the St Anne's Old Links Golf Course are sensitive receptors located within the landfall area. Therefore, the landfall construction will install cables via trenchless techniques in order to minimise potential impacts to the landfall area.
- 2.1.1.2 A full description of the landfall works can be found in the Section 3.14 of the Project Description (AS-024); however, an outline summary is provided in **Section 2.3** below.

2.2 Landfall Working Area and route

- 2.2.1.1 The Transmission Assets Order Limits represents the area where all components of the Transmission Assets will be located. Within the order limits, the areas have been divided into Work Numbers (Work nos) to clearly define the allowable works within Schedule 1: Authorised Development of the draft Development Consent Order (AS-004). All landfall working areas within the Order Limits are presented within the application document, Works Plans – Onshore and Intertidal (AS-014 and AS-015). The Work nos. related to the Landfall area are used throughout this note, and are visually represented in **Figure 1** below.
- 2.2.1.2 The landfall working area comprises of the area between Mean Low Water Spring (MLWS) (4A/4B), and the Transition Joint Bays (TJBs) located within Blackpool Airport (10A/10B), as described in Section 3.14 of the Project Description (AS-024).
- 2.2.1.3 The offshore export cables will be permanently installed underground within Work Nos. 4A/4B, 5A/5B, 6A/6B, 7A/7B, 8A/7B, 9A/9B and 10A/10B. Within these Work nos, the cables will permanently occupy a limited corridor underground, with the final route determined based on further detailed design.
- 2.2.1.4 The export cables will be buried underground between the beach (4A/4B or 5A/5B) and the TJB working area (10A/10B) via the trenchless technique. Any construction activity between these two locations is associated only with access purposes for construction, e.g. monitoring progress of works via pedestrian access tracking the underground trenchless installation.
- 2.2.1.5 Regarding the routing optionality in 6A/6B and 8A/8B, the Applicants have retained flexibility to route the offshore export cables either to the north or south of the care home. This is necessary as the final offshore cable alignment within 4A/4B and 5A/5B will only be confirmed following

detailed design post consent. Depending on this alignment, the cables may be installed through the northern or southern route, or split across both. It is not currently possible to confirm the duration of the underground trenchless installation works between the beach (4A/4B or 5A/5B) and TJB working area (10A/10B), as it will depend on the final cable route selection and the ground conditions encountered (ISH1_17). All of which will be determined through further detailed design and post-consent site investigations. Note that construction activities will be carried out west of the care home within Work Nos 4A/4B and 5A/5B or east within Work Nos 10A/10B, as the cables passing the care home (to the North and/or South) will be installed underground via the trenchless technique.



Figure 1: Landfall Permanent Work Areas

2.3 Description of proposed works

- 2.3.1.1 The trenchless installation of the offshore export cables will be installed in two distinct construction activities, noting that construction activities on the beach will be coordinated to ensure that only one Applicant carries out work on the beach at any given time:
1. The installation of underground cable ducts between the Transition Joint Bays at Blackpool Airport (Work No 10A/10B) and the exit pits on the beach (Work No 4A/4B and/or Work No 5A/5B)
 2. The pull-in of the offshore export cables onto the beach and through the pre-installed duct.
- 2.3.1.2 The first construction activity involves the installation of underground ducts, one for each cable circuit, using a trenchless installation technique between two key points:
- ‘Entry Pits’ which will be located inside the Blackpool Airport boundary (Work nos 10A/10B), and
 - ‘Exit Pits’ which will be located on the beach (Work nos 4A/4B or 5A/5B).
- 2.3.1.3 The exit pits will be located at least 100 m seaward of the western boundary of the Lytham St Annes Dunes SSSI, as secured in Schedule 2A & 2B, Requirement 8 of the Draft DCO (AS-04) (CoT44). The ducts between the entry and exit pits will be installed completely underground between 10 m and 30 m below the sensitive receptors highlighted above in **section 2.1.1.1**, with further details provided in Table 3.13 of the Project Description (AS-024). This avoids any direct impact on sensitive surface receptors.
- 2.3.1.4 The second construction activity involves the pull-in of the offshore export cables through the duct. Once the duct installation is complete, a cable lay vessel will approach the nearshore. The export cable will then be pulled ashore from the vessel using equipment and machines temporarily located on the beach towards the exit pit. The cables will then be pulled through the underground duct via a winch system installed at the entry pit (located at Blackpool Airport). Finally, the cables on the beach will be buried using diggers and subsea trenching machines, after which the landfall area will fully reinstated, with no visible infrastructure remaining on the beach. Further detail regarding the cable pull-in activities is provided in Section 3.14.5 of the Project Description (AS-024).
- 2.3.1.5 Temporary cofferdams may be installed around each exit pit to facilitate the construction works of both the exit pits and pull-in. A cofferdam is a structure made of sheet metal that is sunk into the surface of the beach. Its purpose is to stabilise the sand and prevent seawater from entering the excavation area of the exit pit, ensuring a safe working environment. An example of a cofferdam is presented in **Figure 2**.



Figure 2: Temporary cofferdam installed on a beach (brown sheet metal), with trenchless technique equipment inside of it. [Plate 3.4 of AS-024]

3 Indicative Layout for Beach Works

3.1 Trenchless Technique Works

- 3.1.1.1 The trenchless technique involves establishing underground ducts between the entry pits located within Blackpool Airport (10A/10B), and the exit pits located on the beach (Work Nox 4A/4B and/or 5A/5B). Equipment required for trenchless drilling will be primarily located at the entry pits, with limited construction works required on the beach for the exit pits.
- 3.1.1.2 Up to six exit pits will be established in total, up to 4 cable circuits for Morgan OWL and up to 2 cable circuits for Morecambe OWL. Note that there will never be six exit pits located at the beach at the same time, as only one Applicant will carry out construction works at any given time.
- 3.1.1.3 As described in Table 3.13 in the Project Description (AS-024), the maximum working area of each exit pit, with or without cofferdams, is up to 875m² per circuit. Each working area will be at least 100m seaward of the Lytham St Annes sand dunes SSSI as secured in Schedule 2A & 2B, Requirement 8 of the dDCO (AS-004) (CoT44)
- 3.1.1.4 A temporary cofferdam, approximately 15m by 5m (maximum 75m² as per Table 3.13 of the Project Description AS-024), may be installed inside the exit pit working area to create a dry and stable working area by preventing the ingress of seawater as the trenchless drilling reaches the exit pit.
- 3.1.1.5 Due to the natural variability in the level of the beach constantly changing due to the influence of tides, weather, and longshore drift, the precise cofferdam height above the surface of the beach can only be determined prior to installation during detailed engineering. However generally, the top of the cofferdam will not be greater than 2m above the highest anticipated water level (ISH1_14).
- 3.1.1.6 To ensure public safety, trenchless technique working areas will be fenced off and secured while construction works are taking place. Public access between the exit pit working areas and the sea will remain unrestricted. However during drilling activities, access between the exit pits and the sand dunes may be temporarily managed (but not blocked) for up to two weeks per exit pit. This is to maintain public safety while the

trenchless technique machines are working below the surface of the beach. Public access of the beach during construction is further detailed in Appendix A, of the Outline Public Rights of Way (PRoW) Management Plan (AS-048)

3.1.1.7 Up to four temporary construction compounds may be established to support the trenchless installation construction activities and are further described below in **section 4**.

3.1.1.8 It is currently not possible to define the exact location of the exit pit Working Areas, as the final alignment of the cables and positioning of exit pits will be determined post consent as part of the detailed design. However, an indicative layout is presented in **Figure 3**, presenting six exit pits if both alignments were to be utilised (ISH_14).



Figure 3: Indicative Beach Working Areas for Trenchless Installation Works

3.2 Offshore Export Cable Pull-ins

- 3.2.1.1 During the offshore export cable pull-ins, the offshore export cables will be pulled in from the cable lay vessel located in the nearshore area to the previously installed underground ducts. A working area extending 25m either side of the offshore export cable and exit pits will be established for cable preparation and installation activities.
- 3.2.1.2 Temporary cofferdams, as described in **Section 3.1**, may be installed inside the exit pit working area to create a dry and stable working area by preventing the ingress of seawater during offshore export cable pull-in activities.
- 3.2.1.3 To ensure public safety, the cable pull-in working areas will be fenced off and secured while works are taking place. The edge of the cable installation Working Area will be maintained at least 100m seaward of the Lytham St Annes sand dunes SSSI as secured in Schedule 2A & 2B, Requirement 8 of the dDCO (AS-004)(CoT44)
- 3.2.1.4 Public access between the cable pull-in working areas and the sand dunes will remain largely unrestricted throughout the cable installation works. However during the offshore cable pull-in and burial, a section of the beach from the exit pits to MLWS would need to be closed off to public access, while certain activities are taking place. In such cases, the Applicants will implement managed crossings either to the seaward or landward side to allow users to maintain access from one side of the works area, to the other. Further details of the public access of the beach during construction is further detailed in Appendix A, of the Outline Public Rights of Way (PRoW) Management Plan (AS-048).
- 3.2.1.5 Up to four temporary construction compounds may be established to support the cable pull-in, and are further described below in **Section 4**. The final alignment of the cables and positioning of exit pits will be determined post consent during detailed design. **Figure 4** presents a possible offshore cable pull locations if both alignments were to be utilised (ISH_14).
- 3.2.1.6 The timings for the cable pull-in activities comprise three sequential activities per cable: mobilisation, cable pull-in and burial, and demobilisation (ISH1_16):
- Mobilisation: Includes preparation of equipment and cable handling on-site, will take up to 1 week per cable
 - Cable pull-in and burial: involves the physical installation of the cable from the cable lay vessel through the underground cable ducts, and burial beneath the beach surface. Will take up to 4 weeks per cable
 - Demobilisation: Includes the removal of installation equipment and reinstatement of working area, will require up to 1 week per cable.
- 3.2.1.7 In total, each cable pull-in will take a maximum of 6 weeks (ISH1_16). For Morgan OWL (up to 4 cables), the maximum active construction duration will be 24 weeks. For Morecambe OWL (up to 2 cables), the

duration will be up to 12 weeks. Therefore, the maximum active duration for cable pull-in activities on the beach is up to 36 weeks. Further detail of the cable pull-in activities and timings are provided in Section 3.14.5 and Table 3.17 respectively of the Project Description (AS-024). Note that for all Construction Scenarios between the Applicant (Isolation, concurrent and sequential) only one project would be able to undertake cable pull-in activities at any one time.



Figure 4: Indicative Beach Working Areas for Cable Installation Works

4 Temporary Construction Compounds

4.1 Purpose of Temporary Construction Compounds

- 4.1.1.1 Up to four compounds will be required to support the Landfall construction works as fully described in section 3.14 and Table 3.11 of the Project Description (AS-024). These areas will be used by the Applicants to store equipment and machinery, and for temporary site offices and parking for workers.
- 4.1.1.2 Storing equipment in the Temporary Construction Compounds reduces the volume of construction traffic on the public road network as equipment and vehicles can be stored close to the working areas rather than removed from site every night.
- 4.1.1.3 The compounds will be fenced off and inaccessible to the public when in use, noting that the duration for their use is as detailed in Table 3.11 of the Project Description (AS-024). Once associated landfall activities are complete, the compounds will be removed and the land reinstated. The locations of the temporary construction compounds can be seen in **Figure 3** and **Figure 4**.
- 4.1.1.4 The temporary compound located within the North Beach Car Park (Work no. 38A/38B) will temporarily remove 22 standard parking bays from public use. However, of the total 126 standard parking bays located at the North Beach Car Park, 104 standard bays will remain open and available to the public for the duration of the works. Further details on the impact on the North Beach Car Park are presented in **Figure 5** (ISH1_13).

