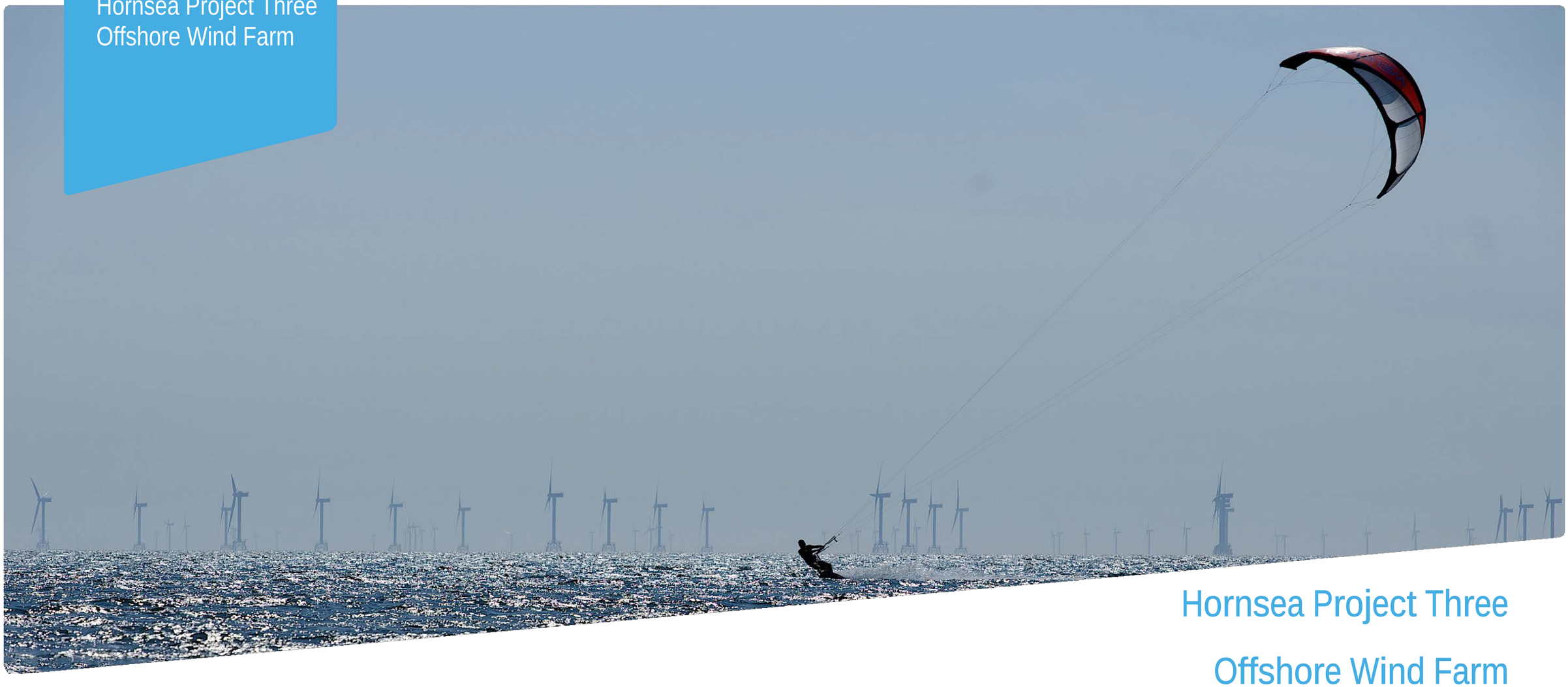
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Environmental Statement
Volume 4, Annex 3.7 - Layout Development Principles

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Hornsea 3
Offshore Wind Farm

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Environmental Impact Assessment

Environmental Statement

Volume 4

Annex 3.7 - Layout Development Principles

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This report is also downloadable from the Hornsea Project Three offshore wind farm website at:

www.hornseaproject3.co.uk

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Front cover picture: Kite surfer near a UK offshore wind farm © Orsted Hornsea Project Three (UK) Ltd., 2018.

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Glossary

Glossary of terms as defined in collaboration with the MCA.

Term	Definition
Bridge Linked Platform	Surface Infrastructure connected by a bridge link; are assumed to be a single unit of Surface Infrastructure for the purpose of these principles.
Close Proximity	For the purpose of these rules close proximity is defined as no closer than 250m minimum radius around any SAR Asset.
Defined Navigation Corridor	Corridor intended for the purposes of navigation, between Hornsea Project One, Hornsea Project Two and Hornsea Three. A vessel is defined to be within the defined Navigation Corridor when it has Surface Infrastructure on its beam to both port and starboard, and leaves the defined Navigation Corridor when it no longer has Surface Infrastructure on its beam (port and starboard), but abaft of its beam.
Helicopter Refuge Area	Area that is clear of any Surface Infrastructure between Phases or turbines. Helicopter Refuge Areas are not defined navigation corridors under the principles of Marine Guidance Note (MGN) 543.
Hornsea Three Array Area	Consented development area where surface infrastructure shall be installed.
Internal Development Lane	A defined straight lane within which Surface Infrastructure shall be constructed.
Line of Orientation	Consistent transit lines on the same bearing throughout the Hornsea Three Array Area or a Phase. The Lines of Orientation form the centre lines of the SAR Access Lanes.
Perimeter Development Lane	Surface Infrastructure within a defined lane around the perimeter of the Hornsea Three Array Area or a Phase in which infrastructure shall be constructed.
Phase	Refers to a defined portion of developed area within the Hornsea Three Array Area.
SAR Access Lane	A defined lane which allows a SAR Asset to transit safely on the Line of Orientation through the Hornsea Three Array Area or a Phase.
Search and Rescue (SAR) Asset	Surface or air based resource tasked to a SAR event.
Surface Infrastructure	Includes for the purpose of these principles wind turbines, substations, accommodation platforms and Bridge Linked Platforms.

Acronyms

Acronym	Description
SAR	Search and Rescue
PIANC	The International Navigation Association

Units

Unit	Description
m	metres (distance)
nm	Nautical mile (distance)

1. Hornsea Three Development Principles

1.1 Introduction

1.1.1.1 The final layout of wind turbines, platforms and array cables will not be determined until after the consent has been awarded for Hornsea Project Three offshore wind farm (hereafter referred to as Hornsea Three). In the past, the MMO in consultation with the MCA has signed off this final layout prior to key pre-construction surveys (i.e. geotechnical investigations) commencing. Historically, the timings of this have been difficult to manage within the complex timeline of activities that must be conducted pre-construction. Hornsea Three has therefore sought to develop a set of principles in accordance with which the final layout will be designed. The intention of this is to streamline the process of finalising the layout design by working closely with the MCA on Development Principles pre-consent which can be utilised to develop a safe and acceptable layout of the offshore wind farm.

1.1.1.2 Development Principles are still being developed in collaboration with the MCA, and both parties see the benefit of establishing a set of rules to expediate post consent agreements on layout. The intention of these principles is to ensure that the MMO can easily sign off the final layout by simply confirming that the final proposed layout complies with the principles, without the need to re-consult with the MCA. Section 1.2 provides the principles that have been discussed with the MCA at the point of application.

1.2 Layout Principles

Table 1.1: Development principles.

Principle	Definition
Principle 1	All Surface Infrastructure shall be located within the Hornsea Three Array Area or a defined Phase. No blade overfly or structural overhang is permitted outside of the Hornsea Three Array Area.
Principle 2	A minimum spacing of 1,000 metres (m) shall be maintained between the centre points of all Surface Infrastructure.
Principle 3	The layout shall include SAR Access Lanes parallel to turbine development corridors (on a line of orientation) within the Hornsea Three Array Area or any Phase. The SAR Access Lanes shall satisfy width required by MGN 543 to facilitate SAR asset access.
Principle 4	As per MGN 543, SAR Access Lanes shall allow a SAR Asset (at altitudes below 500 feet) to enter the Hornsea Three Array Area from a position outside of the Hornsea Three Array Area (or each Phase) and exit the other side of the Hornsea Three Array Area (or each Phase) without altering its heading or coming into Close Proximity to any Surface Infrastructure. In the case of wind turbines this distance is measured from the blade tips that are transverse to the wind turbine, unless the blades can be rotated and parked away from the SAR Access Lane to increase the distance.
Principle 5	If a Phased development, with different SAR Corridor alignments in each phase, is constructed then Helicopter Refuge Areas are required. Helicopter Refuge Areas shall be located (minimum of XXX m [a]) between adjacent Phase boundaries and allow a SAR Asset to exit the current Phase and the Hornsea Three Array Area (in at least one direction) without coming into Close Proximity with any Surface Infrastructure. Where a Phased development is not used, at least one perpendicular (to the SAR Corridor) helicopter refuge area, within the Hornsea Three Array Area (where SAR access corridors exceed 10 nm) shall be required.
Principle 6	Dense boundaries are permitted either around the array or around individual phases but they shall comply with Principles 2 and 3.
Principle 7	Boundaries between adjacent Phases shall comply with Principles 1, 2 and 5.
Principle 8	The position of Surface Infrastructure within a Development Lane shall, be arranged to a tolerance of ±150m from the centre line of the Development lane.
Principle 9	Surface Infrastructure placement (foundation or structural body) is not permitted outside of the defined Development Lanes; blade overfly is allowed within Internal Development Lanes but shall comply with Principles 3 and 4.
Principle 10	SAR Access Lanes shall be principally determined by the boundary Surface Infrastructure, although dependent upon the spacing between the Development Lane boundaries, there may be a requirement for more than one adjacent SAR Access Lane. Any adjacent SAR Access Lanes shall comply with Principles 3 and 4.
Principle 11	The position of Surface Infrastructure within a Perimeter Development Lane around the Hornsea Three Array Area or a Phase shall, so far as is practicable, be arranged in straight or curved lines (to a tolerance of ±150m) in an easily understandable pattern, avoiding structures which break this pattern and without any dangerously projecting peripheral structures. Must comply with Principles 1 and 2.
Principle 12	The western boundary of the Hornsea Three Array Area (or Phases within) shall be aligned broadly parallel to the eastern boundaries of Hornsea Project One and Hornsea Project Two. The defined Navigation Corridor shall also be no less than 3.91nm and is exempt from Principle 11. Micro siting shall not exceed ±50 m on the western boundary development lane noting the minimum 3.91nm required for the defined navigation corridor. This rule will no longer apply when Hornsea Three is not considered an adjacent Project to Hornsea One and Two i.e. when it no longer needs to comply with minimum width parameters for defined navigational corridors (ref PIANC guidance on vessel manoeuvring).
Principle 13	Any perimeter Surface Infrastructure should not project from the Hornsea Three Array Area (or Phases) so as to become isolated or exposed from the rest of the Surface Infrastructure.

a Distance on Helicopter refuge areas are still being discussed between MCA and Hornsea Project Three. Hornsea Project Three understands the results of Helicopter trials are being written up and we await sight of the report to review.