Hornsea Project Four: Consultation Report

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Version A

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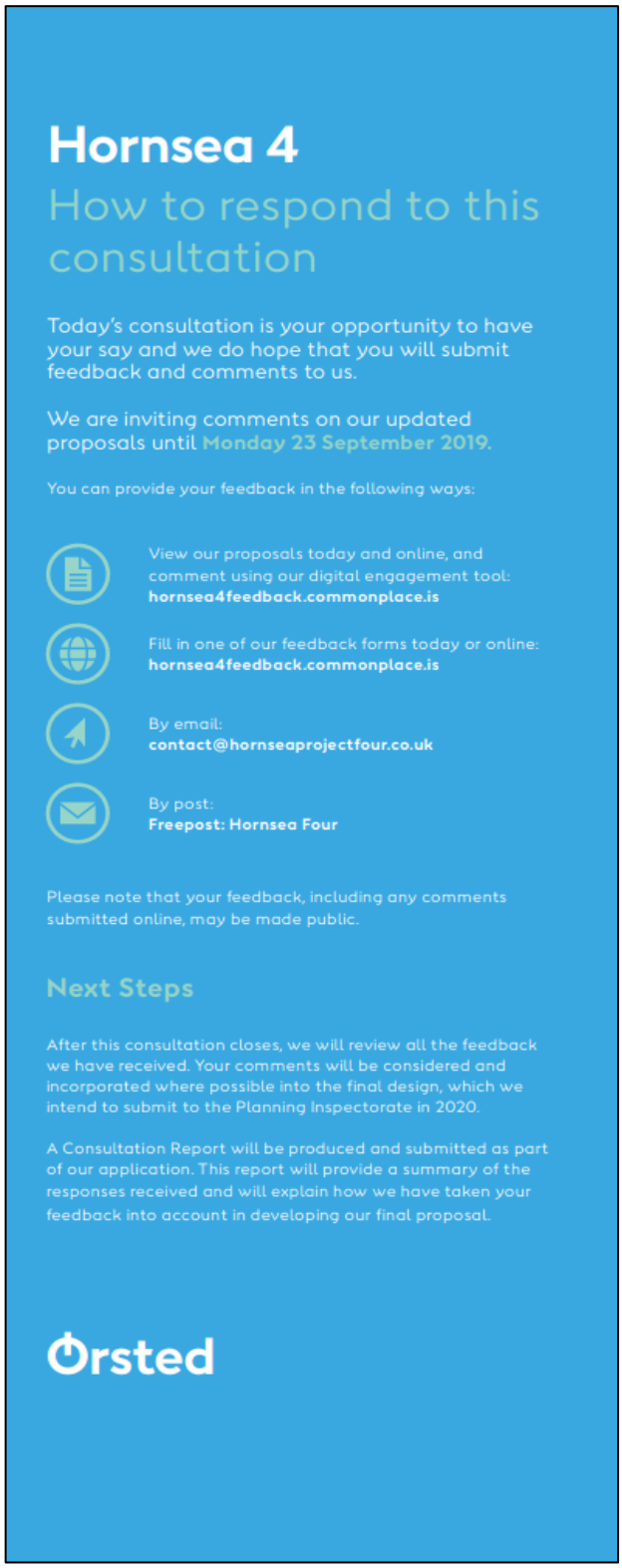

Hornsea 4
Project timeline

2018

September
Our Statement of Community Consultation was published

October
Our Scoping Report was published

October/November
We held our first set of local information events and welcomed feedback on our Scoping Report between 10 October and 21 November

November
A Scoping Opinion was published by the Planning Inspectorate

August
Our Preliminary Environmental Information Report (PEIR) was published

2019

August/September
We will be holding local information events and welcoming feedback on our PEIR between 13 August and 23 September

Q4
The Environmental Statement and application documents will be finalised

2020

Q1
The anticipated submission date for our Development Consent Order application

*All dates remain indicative

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Hornsea 4
Protecting local heritage and minimising visual impact

East Riding of Yorkshire has a rich historical and archaeological heritage and landscape.

We have carried out detailed surveys to assess the potential impacts of Hornsea Four on all sensitive and protected natural and historical landscape and structures.

Observational studies have been undertaken from roads, historic buildings and Public Rights of Way to inform our appraisal of potential landscape and visual effects.

To minimise the visual impact of our work and to avoid or reduce impacts on local heritage and landscape, we have brought forward commitments to:

- Bury the onshore export cables underground **(Co25).**
- Replace any hedgerow or trees which need to be removed for construction and reinstate land as far as practical **(Co26, Co10).**
- Avoid listed buildings, scheduled monuments, conservation areas and ancient woodland **(Co2).**
- Avoid sensitive landscape and visual features including woodlands, wetlands and natural vegetation **(Co2).**
- Employ mitigation measures to minimise the visual impact of the onshore substation on the landscape **(Co30).**
- Avoid obstructing views of Beverley Minster from St Mary's Church Cottingham and the A1079 **(Co145).**

A design vision document has been produced to highlight how landscaping and visual mitigation will help to blend the substation into the landscape.

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Onshore ecology and nature conservation

Surveys for habitats of badgers, birds, bats, water voles, otters and great crested newts are currently being undertaken to develop an understanding of ecology in the area. These will continue until October 2019.

Water Vole

Once completed, potential impacts of Hornsea Four on local ecology and the requirement for mitigation and enhancement will be fully assessed this will be reported within the final Environmental Statement, which will accompany our Development Consent Order application.

In addition to undertaking in depth surveys, we have made a number of commitments to reduce the potential impacts of Hornsea Four on local ecology.

A selection of these are listed below:

- Avoiding registered parks, gardens and 19 conservation area sites by the permanent project footprint **(Co2)**.
- Retaining hedgerows and vegetation where possible, or replacing with locally appropriate native species if required **(Co26)**.
- Undertaking habitat manipulation outside of bird breeding seasons, where possible, via a suitably qualified ecologist **(Co33)**.
- Developing an Outline Ecological Management Plan, which sets out plans to ensure protection of habitats and specific species along with long-term mitigation **(Co168)**.

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Traffic and transport

Construction of Hornsea Four could take place as early as 2023.

An assessment of potential impacts associated with an increase in construction traffic has been undertaken in close consultation with the East Riding of Yorkshire Council to ensure that all road users are considered.

Our assessment work has been informed by site visits, a desk study and collection of existing traffic flow and collision data.

During the height of construction there may be up to 1,097 vehicle movements per day. Onshore construction is expected to last for approximately 36 months with peaks and troughs of activity throughout.

A range of mitigation measures have been committed to by Hornsea Four to manage the impact of construction traffic.

We propose to:

- Cross all main roads and railways by Horizontal Directional Drilling (HDD) or other trenchless technology to minimise impacts on road users **(Co1)**.
- Propose mitigation measures such as road improvement and travel planning where significant traffic impacts could be experienced **(Co144)**.
- Create a Construction Traffic Management Plan which will manage and detail traffic movements during the construction phase **(Co144)**.
- Keep core working hours for onshore construction of Hornsea Four to 7am – 6pm Monday-Friday and 7am – 1pm on Saturdays **(Co36)**.
- Create a new access from the A1079 to route construction traffic away from Cottingham and Dunswell **(Co150)**.
- Avoid HGV construction traffic through Foston on the Wolds **(Co171)**.

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Hydrology and Flood Risk

Consultation with the community has highlighted that flood risk is an important issue for the people of East Riding of Yorkshire.

We have continued our assessments and surveys to estimate the potential impact that Hornsea Four will have on hydrology and flood risk during the lifetime of the project.

Our flood risk assessment concludes that the landfall and the majority of the onshore cable corridor and onshore substation is at low risk of flooding.

To limit flood risk in locations where flood risk may be higher, so far we have made commitments to:

- Cross main rivers and Internal Drainage Board maintained drains by Horizontal Directional Drilling (HDD) or other trenchless technology where technically feasible, to limit flood risk **(Co1)**.
- Select a landfall site that avoids the Barmston Main Drain **(Co143)**.
- Reinstate working areas to their pre-existing condition post-construction wherever possible to ensure no increased flood risk **(Co157)**.
- Bury cables a minimum of 1.2 metres below the bed of watercourses **(Co18)**.

Both a construction drainage scheme and operational drainage strategy will be developed in consultation with landowners, the Lead Local Flood Authority, the Environment Agency and the Internal Drainage Board, as necessary.

Once operational, there will be no flood risk to the onshore cables from surface water or groundwater flooding.

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Offshore Development: Environmental Considerations

Our site-specific surveys, conducted over a two-year period, highlighted the highest density of seabird species, including kittiwakes, gannets and guillemots, in the southern part of the offshore developable area.

To minimise the risk to these species, we have made commitments to:

- Remove the southern portion of our offshore developable area to avoid areas with the highest concentrations of birds **(Co87)**.
- Ensure that the offshore export cable corridor and landfall avoids special areas of conservation (SACs) and protected areas (SPAs) such as Flamborough Head and Filey Coast **(Co86)**.

We have also undertaken site specific surveys to assess the potential impact of underwater noise, increased vessel activity and disturbance and reduction of prey on marine mammals such as the harbour porpoise, minke whale, white-beaked dolphin, harbour seal and grey seal.

Although no significant impacts have been identified, to minimise any potential impacts on these species we have made commitments to implement:

- A vessel management plan **(Co108)**.
- A piling marine mammal mitigation protocol **(Co110)**.
- A marine pollution contingency plan **(Co111)**.

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Phase two section 47 local information event pop-up banners

Ørsted in the UK

Hornsea 4

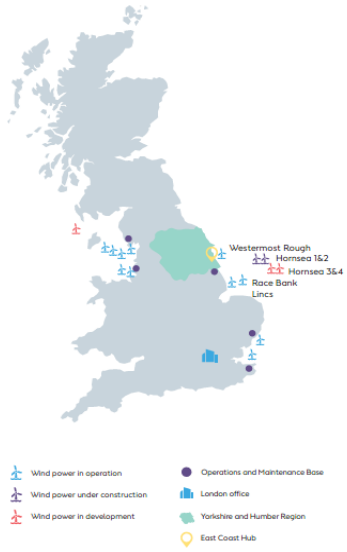
The UK has world-leading capabilities in offshore wind. By 2030, one third of British electricity is set to be produced by offshore wind power and Ørsted is at the forefront of this green energy revolution, supporting the UK government's commitment to reach net zero carbon emissions by 2050.

Yorkshire and the Humber sits at the heart of our development strategy. If Hornsea Four is granted consent for development, the region will benefit from associated job creation, training opportunities and economic growth.

Globally, we have built enough offshore wind farms to power **9.5 million** people. By **2025**, our ambition is to power **30 million** people with offshore wind.

We have invested **£8 billion** building offshore wind farms in the UK, and we are investing a further **£4 billion** by **2020**.

The offshore wind sector deal will see industry invest **£250 million** to develop the UK supply chain.



We are committed to identifying opportunities for local businesses to access the supply chain for Hornsea Four.

We have established the world's largest Operations and Maintenance base in Grimsby, our **£14 million** East Coast Hub. Over **350 jobs** will be based here.

We will work with the Humber Local Enterprise Partnership (LEP), Local Authorities and local education providers to maximise access to job opportunities for Hornsea Four.

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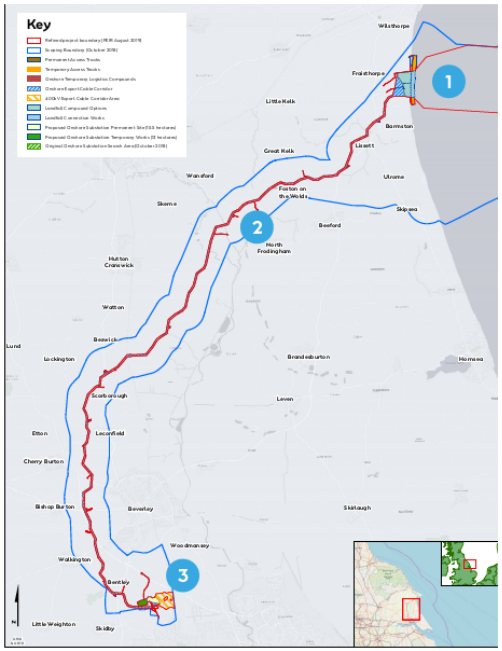
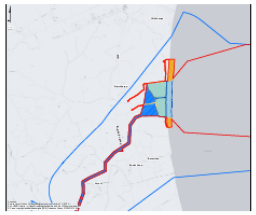
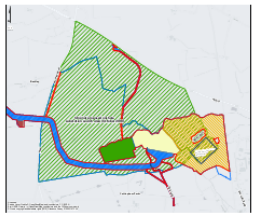
Our onshore proposals

Hornsea 4

We have gained valuable feedback from engaging with local communities and stakeholders. This has helped us to refine our onshore proposals for our underground export cable corridor, onshore substation site and two landfall sites.







1 Landfall

We are consulting on two landfall sites assessed in our Preliminary Environmental Information Report and located near Fraisthorpe, one of which will be taken forward as part of our DCO application.

2 Temporary logistics compounds

Onshore temporary logistics compounds are required along the cable corridor to store materials, plant and staff facilities and will be removed post-construction.

3 Proposed onshore substation

We have selected a site within the original onshore substation search area, which was presented in October 2018.

The onshore substation and Energy Balancing Infrastructure could be up to 25m in height and may require an area of up to 155,000m² (15.5 hectares).

As part of our DCO application, we will apply for an 80m wide onshore export cable corridor. The cables will run underground from our proposed landfall near Fraisthorpe for approximately 40 km, before connecting into the existing Creyke Beck National Grid Substation.

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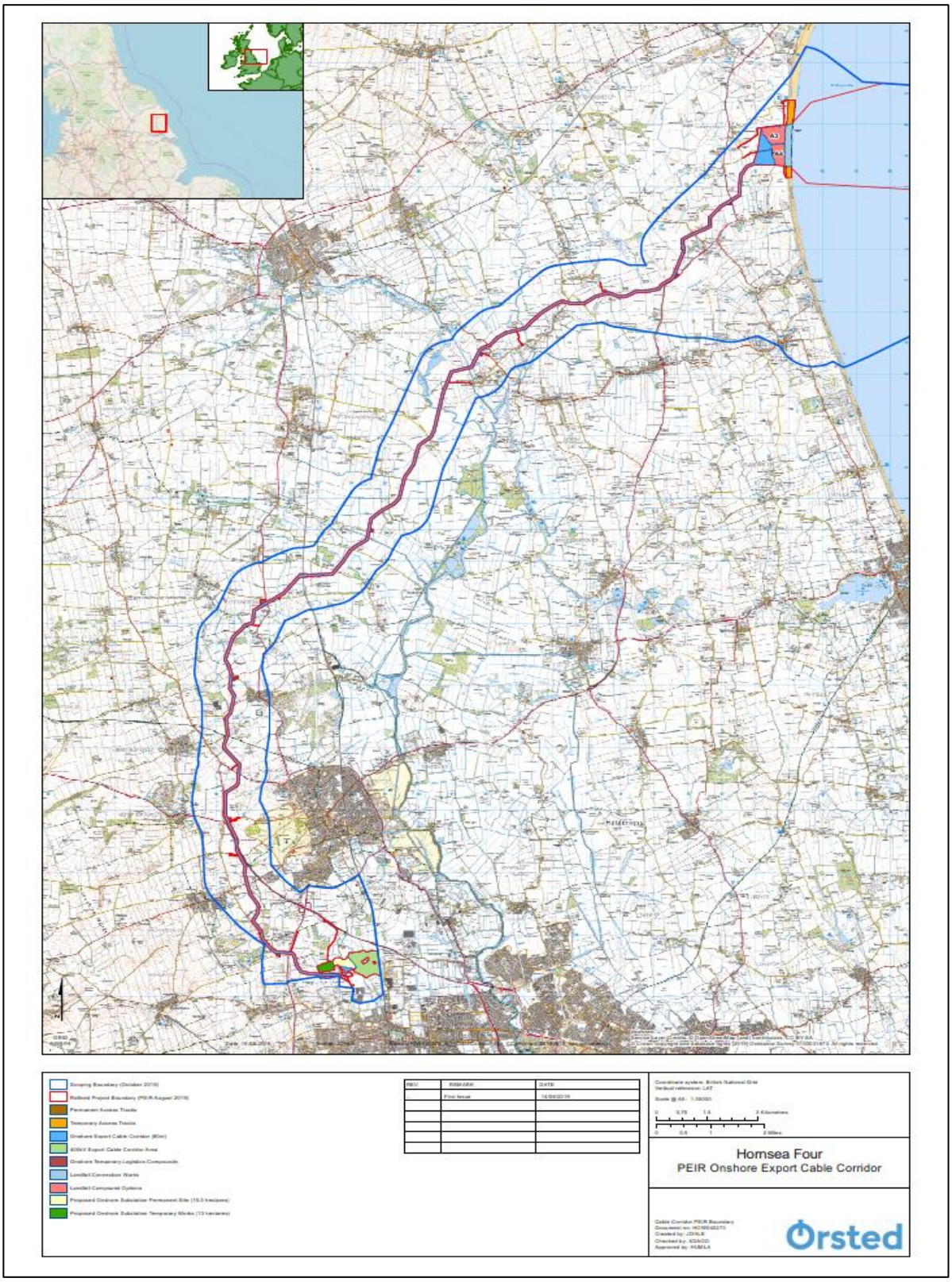
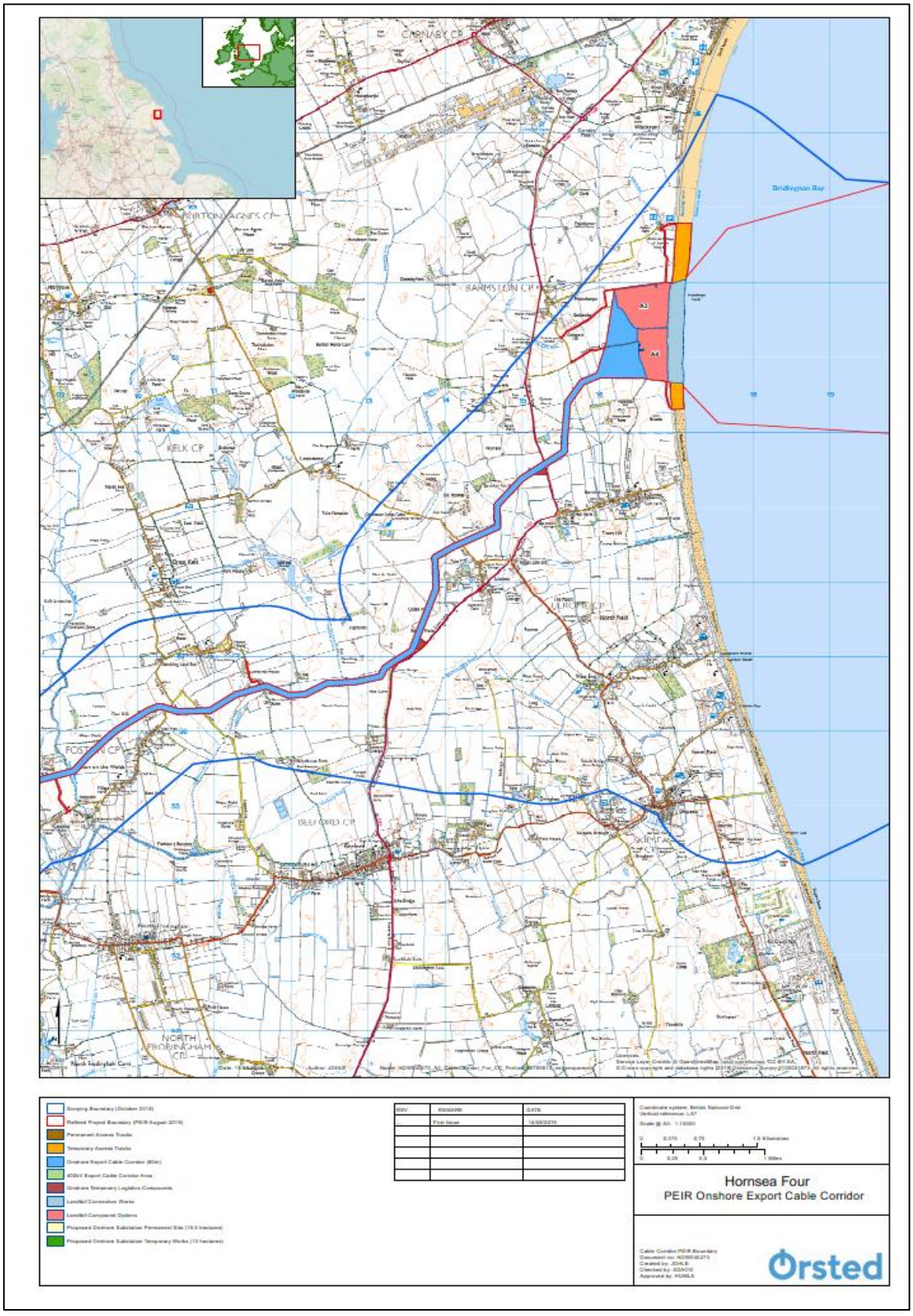
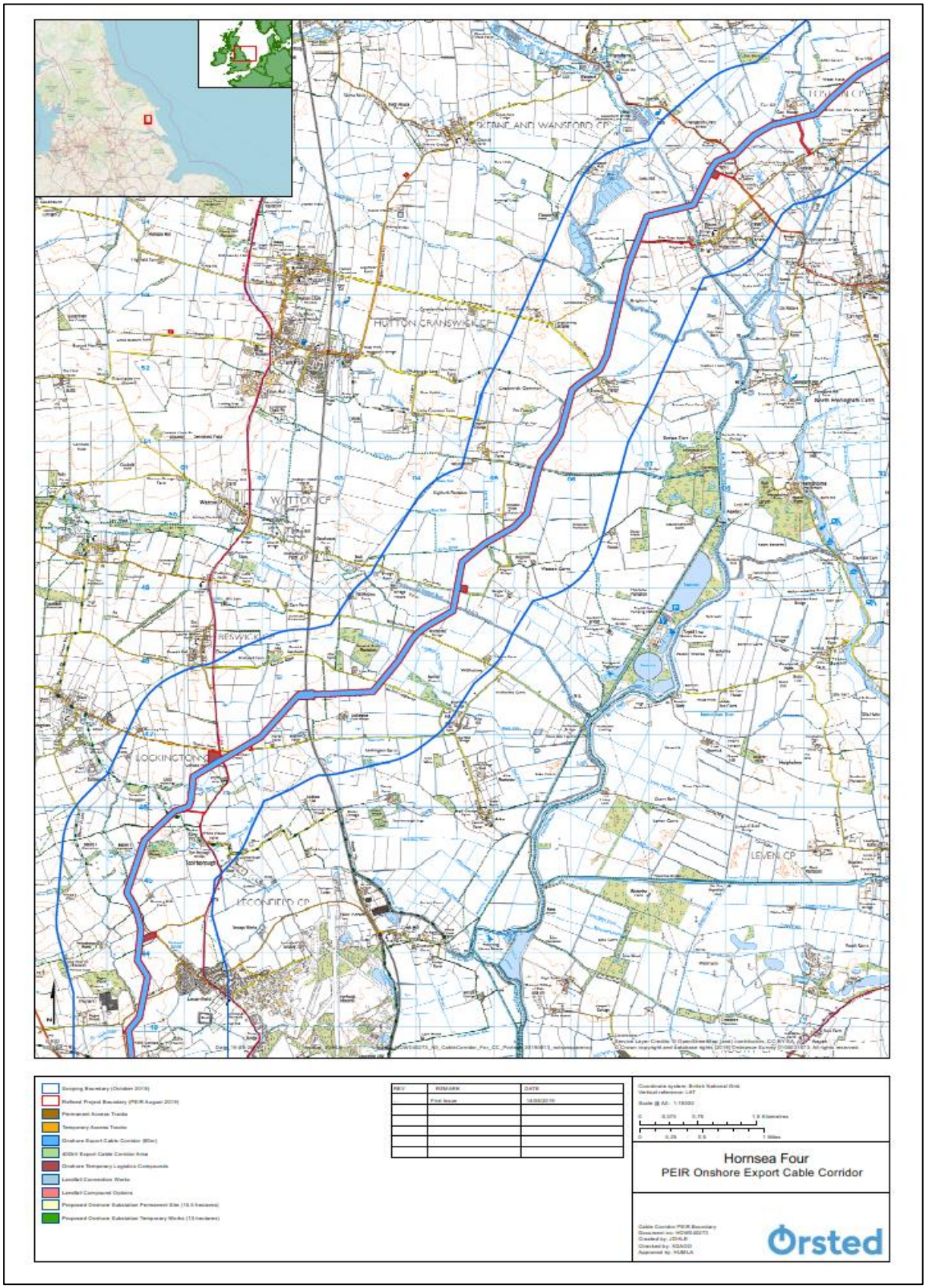
Phase two section 47 local information event foam boards and OS maps




CARNABY CP
Bridlington Bay
BARMSTON CP
KELK CP
FOSTON CP
BEEFORD CP
NORTH FROBISHAM CP
Hornsea Four
PEIR Onshore Export Cable Corridor
Ørsted


SKIRLAUGH CP
HUTTON CRANSWICK CP
WATTON CP
LOCKINGTON
LEVEN CP
Hornsea Four
PEIR Onshore Export Cable Corridor
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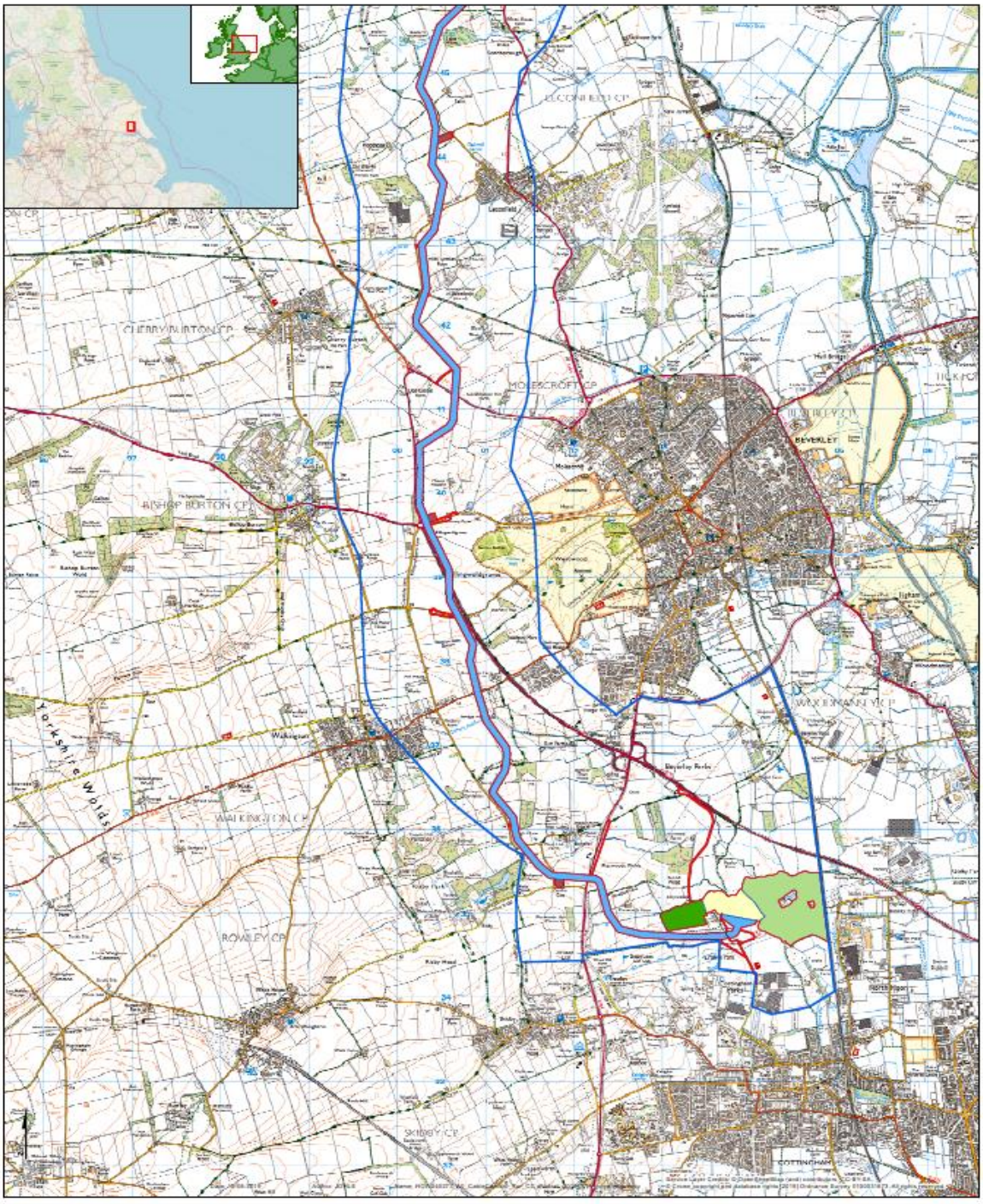
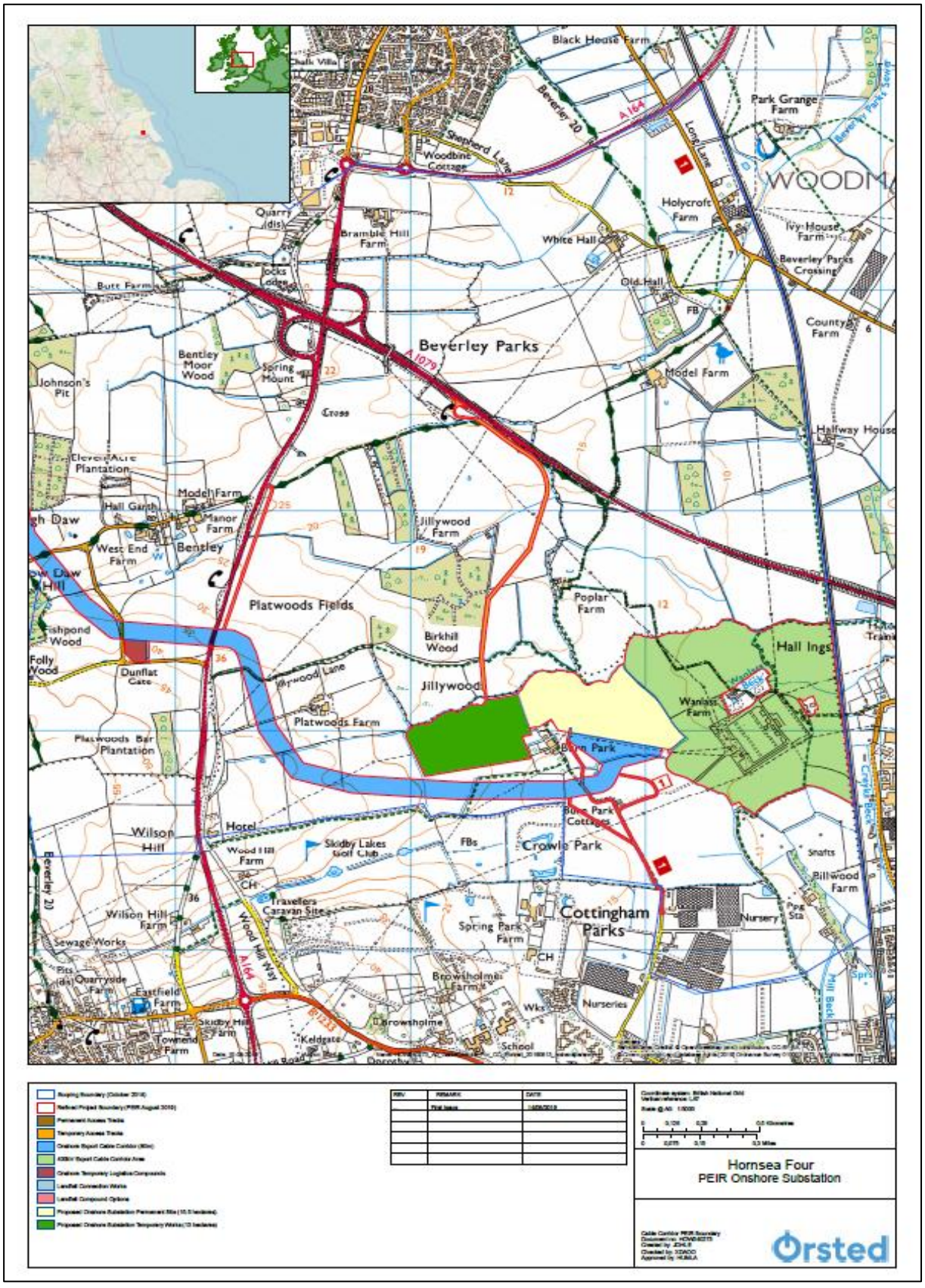

CHERRY BURTON CP
BISHOP BURTON CP
BEVERLEY
ROWLEY CP
SKIDBY CP
COTTINGHAM
Yorkshire Wolds
Hornsea Four
PEIR Onshore Export Cable Corridor
Ørsted


Black House Farm
Park Grange Farm
Holycroft Farm
Ivy House Farm
White Hall
Old Hall
Beverley Parks Crossing
County Farm
Model Farm
Halfway House
Beverley Parks
Bramble Hill Farm
Woodbine Cottage
Shepherd Lane
Long Lane
Quarry (dis)
Butt Farm
Locks Lodge
Bentley Moor Wood
Spring Mount
Johnson's Pit
Cross
Cleeves Acre Plantation
Hall Garth
Manor Farm
Bentley
West End Farm
Jillywood Farm
Platwoods Fields
Poplar Farm
Birkhill Wood
Jillywood
Hall Ings
Wanlass Farm
Barn Park
Platwoods Farm
Platwoods Bar Plantation
Dunflat Gate
Folly Wood
Wilson Hill
Hotel
Skidby Lakes Golf Club
FBs
Crowle Park
Wood Hill Farm
Travellers Caravan Site
Cottingham Parks
Spring Park Farm
Nursery
Snafts
Billwood Farm
Wilson Hill Farm
Sewage Works
Quarryside Farm
Eastfield Farm
Skidby Hill Farm
Townend Farm
Keldgate
Browsholme Farm
Browsholme
Nurseries
School
Hornsea Four
PEIR Onshore Substation
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Horizontal Directional Drilling (HDD)

The cable route for Hornsea Four may need to cross a number of structures such as roads and rail crossings.

To minimise disturbance to the local community and to reduce the need for diversions or road closures, we employ a trenchless cable laying method called Horizontal Directional Drilling (HDD).

HDD involves installing ducts beneath the relevant structure through which the cable can be pulled.

Hornsea 4
Our commitments

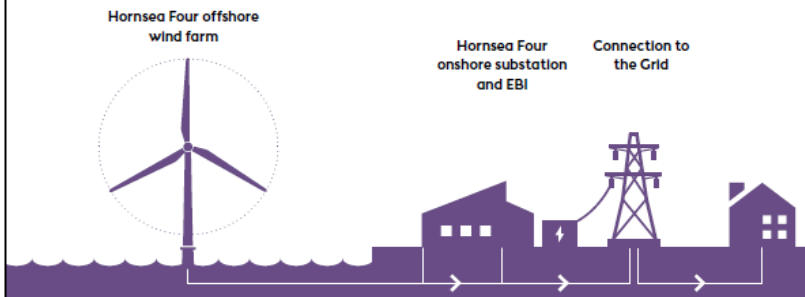
We have already committed to:

- Bury the onshore export cable corridor completely underground for its entire length (Co25)
- Cross all main rivers, roads and railways via Horizontal Directional Drilling (HDD) or other trenchless technology (Co1)
- Avoid crossing the Holderness Inshore Marine Conservation Zone (MCZ) and Greater Wash Special Protection Area off the East Yorkshire coast (Co44, Co86)
- Route the onshore export cable corridor to avoid all residential properties by at least 50m (Co49)
- Locate cable installation works at least 200m from residential receptors at the landfall area (Co134)
- Take a new access directly from the A1079, to direct construction traffic away from Cottingham and Dunswell (Co15)

Speak to a member of our project team today to better understand how you can input into our commitments register.

Introducing Energy Balancing Infrastructure

For Hornsea Four, we are proposing to develop Energy Balancing Infrastructure (EBI) which will be included within the footprint of our onshore substation electrical infrastructure.



Across our homes and businesses, we use electricity for heat, light, to power appliances, gadgets and much more.

Electricity production needs to match the energy we consume at all times. Balancing production and consumption involves accurate forecasting and careful management of energy sources by our Electricity System Operator, National Grid.

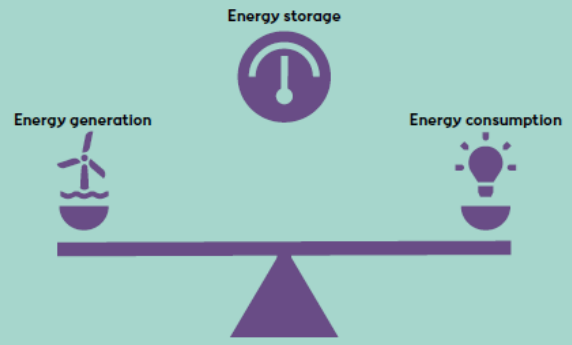
How does Energy Balancing Infrastructure work?

As renewable energy becomes an increasingly significant source of our energy, the production of this energy will, by its nature, become more variable. The ability to store any excess energy which is produced or fill in gaps when not enough energy is produced will be essential to maintaining a stable electricity network system which keeps our lights on and our appliances running.

The benefit of EBI is that it can resemble both a generator and a consumer. By using technologies such as Batteries, EBI can import energy when too much is being generated or export energy when not enough is being generated. Energy storage is also extremely fast to respond and is therefore a very useful tool to help keep everything balanced.

In the past, much of this balancing has been provided by conventional power plants such as coal or gas-fired stations, but as we move towards decarbonising our energy sector, these power stations are being retired and we need replacement flexible resources to replace them.

By combining EBI with an offshore windfarm it enables our newer energy production to not only be green but behave in a way that is easy to manage, thus paving the way for even more renewable energy production.

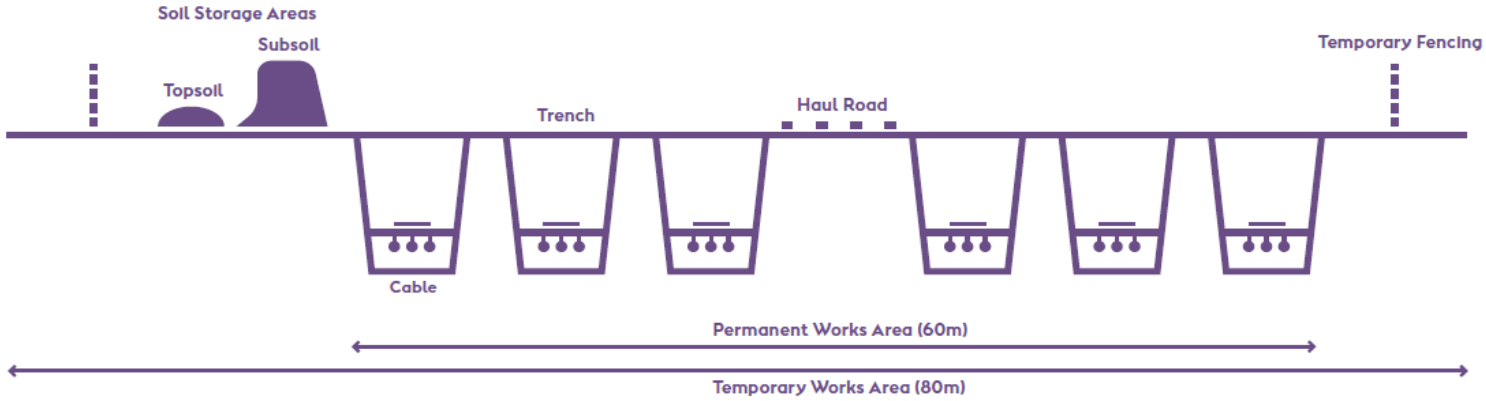


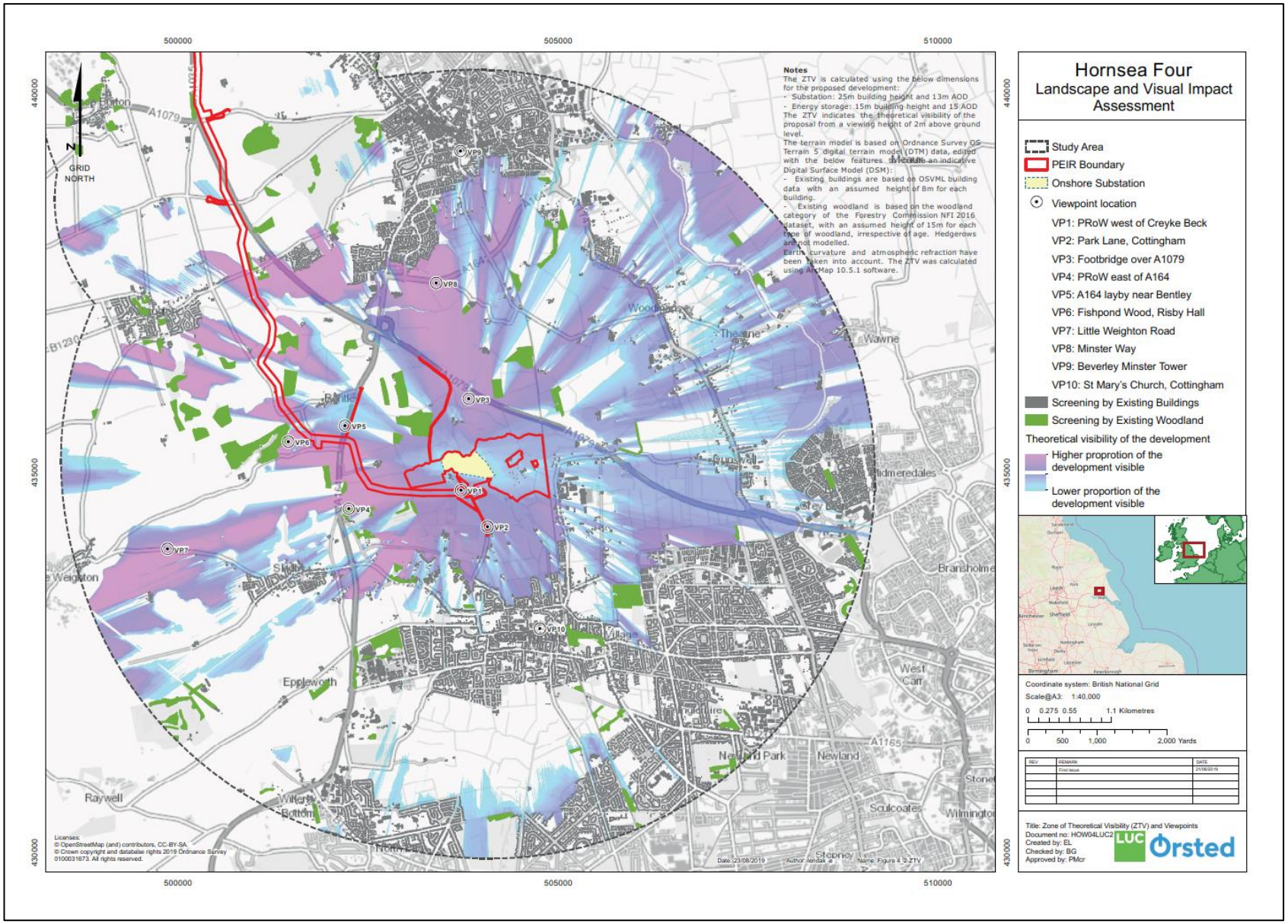
Hornsea 4

Onshore Export Cable Corridor Indicative Layout

The Hornsea Four onshore export cable corridor consists of an 80m wide temporary construction corridor within which a 60m permanent corridor will be located.

Electrical export cables will be installed in separate trenches within the cable corridor. Small fibre optic cables may also be buried alongside the onshore export cables to allow the various control systems to communicate with the wind farm.




Notes
The ZTV is calculated using the below dimensions for the proposed development:
- Substation: 25m building height and 13m AOD
- Energy storage: 15m building height and 15 AOD
The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level.
The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data, edited with the below features to create an indicative Digital Surface Model (DSM):
- Existing buildings are based on OSVML building data with an assumed height of 8m for each building.
- Existing woodland is based on the woodland category of the Forestry Commission NFI 2016 dataset, with an assumed height of 15m for each type of woodland, irrespective of age. Hedgerows are not modelled.
Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.5.1 software.
Hornsea Four
Landscape and Visual Impact Assessment
Study Area
PEIR Boundary
Onshore Substation
Viewpoint location
VP1: PRoW west of Creyke Beck
VP2: Park Lane, Cottingham
VP3: Footbridge over A1079
VP4: PRoW east of A164
VP5: A164 layby near Bentley
VP6: Fishpond Wood, Risby Hall
VP7: Little Weighton Road
VP8: Minster Way
VP9: Beverley Minster Tower
VP10: St Mary's Church, Cottingham
Screening by Existing Buildings
Screening by Existing Woodland
Theoretical visibility of the development
Higher proprotion of the development visible
Lower proportion of the development visible
Coordinate system: British National Grid
Scale@A3: 1:40,000
0 0.275 0.55 1.1 Kilometres
0 500 1,000 2,000 Yards
Title: Zone of Theoretical Visibility (ZTV) and Viewpoints
Document no: HOW04LUC2
Created by: EL
Checked by: BG
Approved by: PMcr
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GRID NORTH
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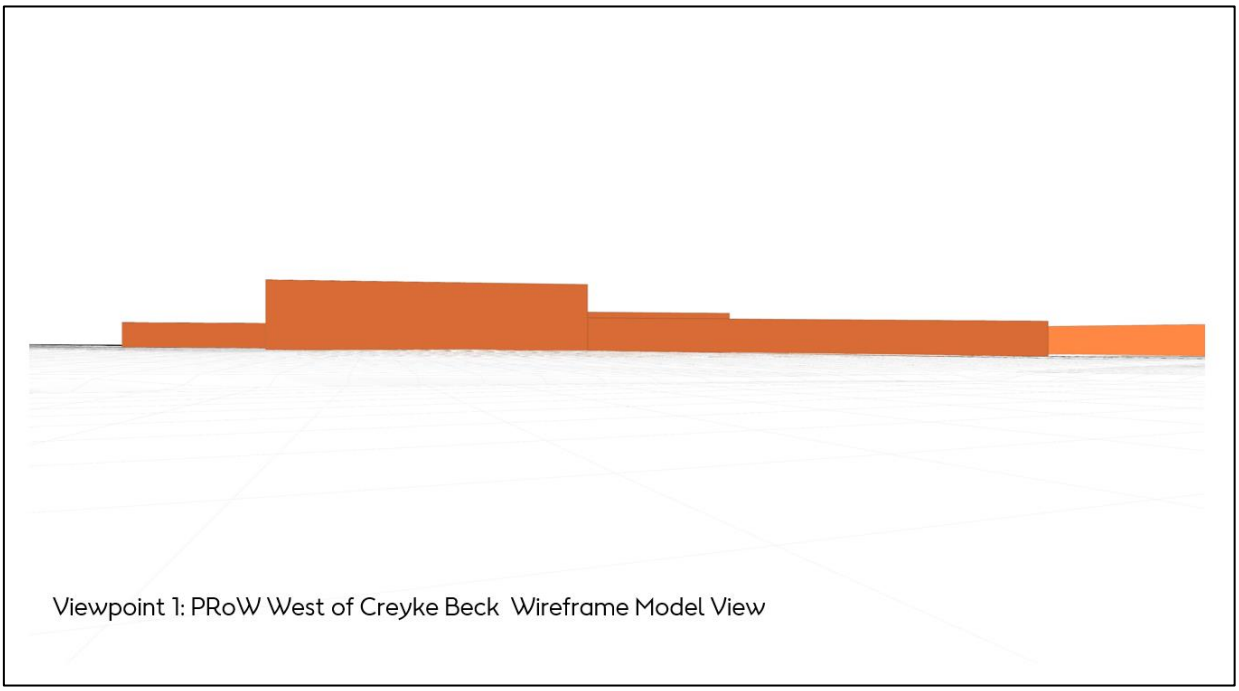
Phase two section 47 local information event photomontages (presented online)

Viewpoint 1: Public Right of Way (PRoW) West of Creyke Beck (Baseline)

Viewpoint 1: PRoW West of Creyke Beck with AC Infrastructure

Viewpoint 1: PRoW West of Creyke Beck with DC Infrastructure

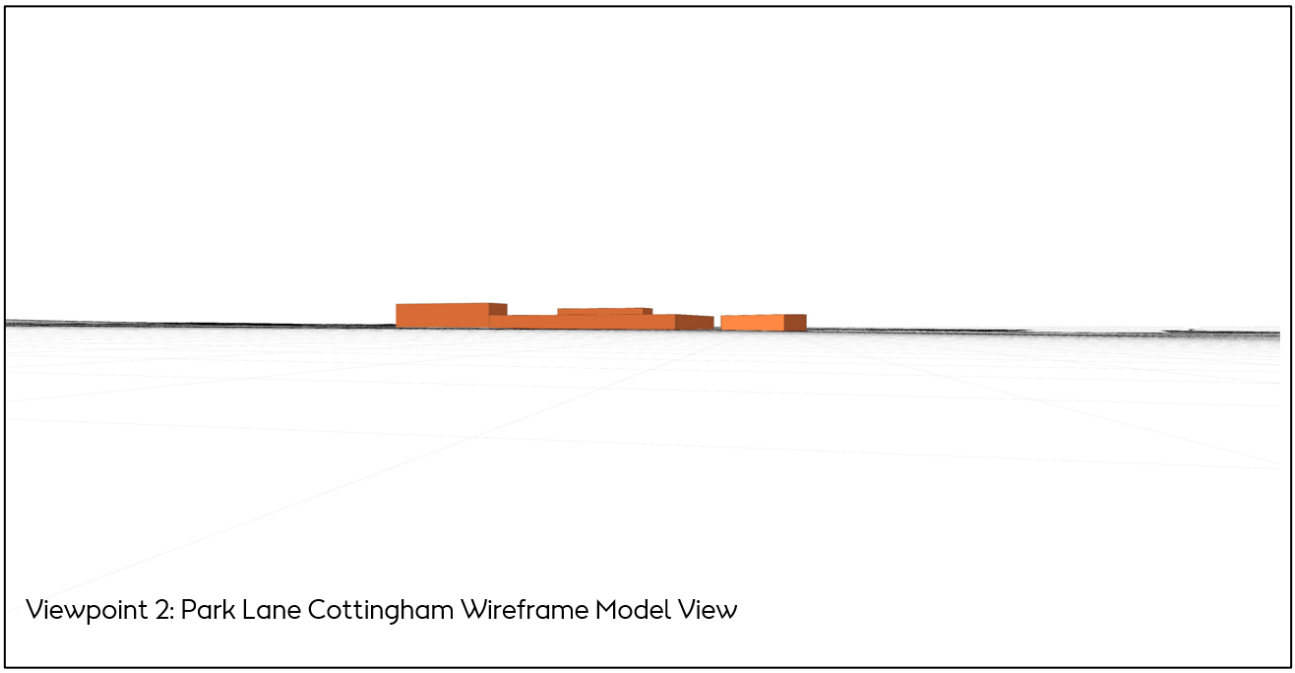


Viewpoint 1: PRoW West of Creyke Beck Wireframe Model View

Viewpoint 2: Park Lane Cottingham (Baseline)

Viewpoint 2: Park Lane Cottingham with AC Infrastructure

Viewpoint 2: Park Lane Cottingham with DC Infrastructure



Viewpoint 2: Park Lane Cottingham Wireframe Model View

Viewpoint 3: Footbridge over A1079 (Baseline)

Viewpoint 3: Footbridge over A1079 with AC Infrastructure

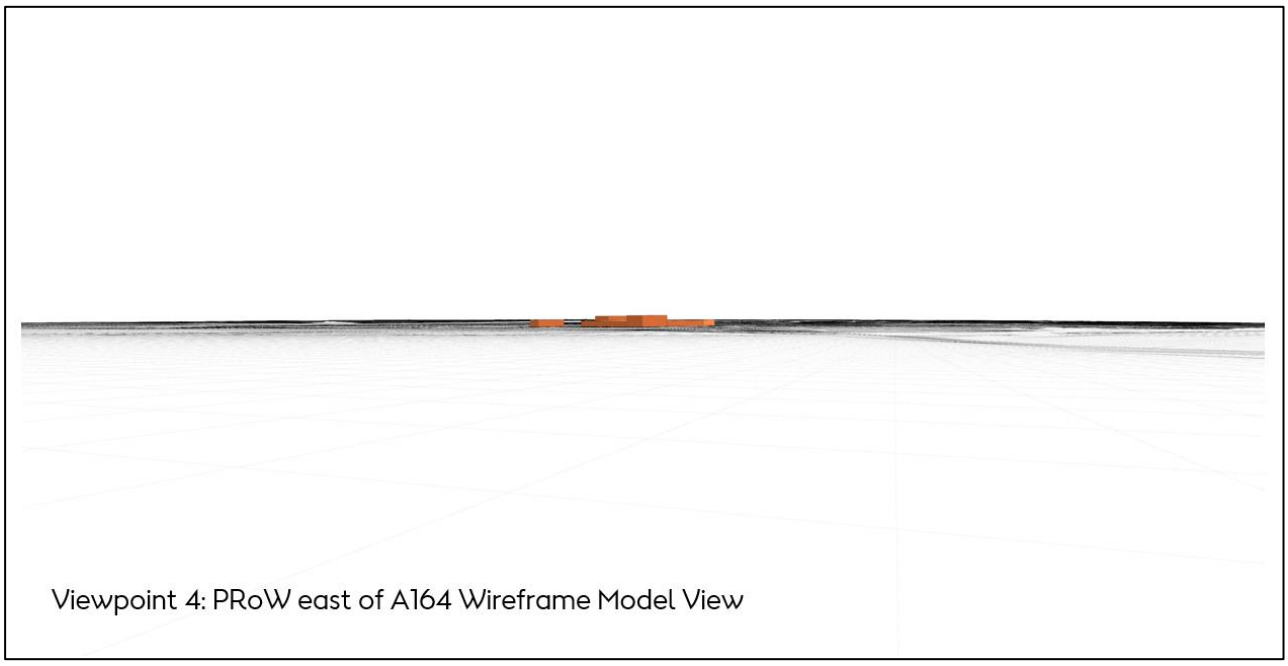
Viewpoint 3: Footbridge over A1079 with DC Infrastructure

Viewpoint 3: Footbridge over A1079 Wireframe Model View

Viewpoint 4: PRoW east of A164

Viewpoint 4: PRoW east of A164 with AC Infrastructure

Viewpoint 4: PRoW east of A164 with DC Infrastructure



Viewpoint 4: PRoW east of A164 Wireframe Model View

Viewpoint 5: A164 layby near Bentley

Viewpoint 6: Fishpond Wood Risby Hall

Viewpoint 7: Little Weighton Road

Viewpoint 8: Minster Way

Viewpoint 9: Beverley Minster Tower

Viewpoint 10: St Marys Church Cottingham

[Phase two section 47 local information event non-technical fact sheets]

Hornsea 4
Environmental Impact Assessment (EIA)

The purpose of EIA is to identify and reduce the potential for significant environmental effects arising from the construction, operation and decommissioning of a development. This information is then presented in an Environmental Statement, which will be published in Q1 2020 and submitted as part of our Development Consent Order (DCO) application. This will assist regulators in the decision-making process.

What is the proportionate approach?

To ensure a robust EIA, the 'maximum design scenario' has been assessed for potential construction methodologies and infrastructure design.

This approach is referred to as the 'Rochdale Envelope' and is well established for large scale infrastructure projects. It ensures that the maximum design scenario is assessed, and no adverse environmental effects will occur other than those predicted in the EIA.

How have the environmental impacts been identified and assessed?

Hornsea Four has taken a proportionate approach to the EIA, which began with submission of an EIA Scoping Report to the Planning Inspectorate in October 2018. A response to this (the 'Scoping Opinion') was received from the Planning Inspectorate in November 2018 which included comments from a range of stakeholders.

The Scoping Opinion has formed the basis of the EIA by identifying and confirming what topics require assessment. Consultation with the public, stakeholders, landowners and statutory bodies has also been undertaken throughout the EIA process to inform the approach to each assessment.

For each topic, a description of the environmental baseline has been identified through a combination of desk-based study, environmental surveys and consultation.

Impacts Register

As part of our approach to delivering a proportionate EIA process for Hornsea Four, we have developed an 'impacts register'.

This register presents all potential significant impacts of the construction, operation and decommissioning of the project which have been identified.

An assessment has been made of the severity of each potential impact. Where associated significant environmental effects are predicted, mitigation measures are proposed to reduce impacts to acceptable levels, where possible.

Commitments Register

Hornsea Four has taken a proactive approach to avoid or minimise environmental effects. All mitigation measures (commitments) are presented within a Commitments Register.

These mitigation measures include avoidance, best practice and design commitments. They are classified as primary, secondary or tertiary measures in accordance with the Institute of Environmental Management and Assessments' (IEMA) definitions:

- **Primary (inherent) mitigation:** measures that form an intrinsic part of the design, are described in the design evolution narrative and included within the project description, e.g. reducing development heights to reduce visual impact.
- **Secondary (foreseeable) mitigation:** measures that require further activity in order to achieve the anticipated outcome, e.g. development of the optimal reinstatement measures for restoring a disturbed sensitive natural habitat.
- **Tertiary (inexorable) mitigation:** measures which will be required regardless of the EIA process as they are imposed, e.g. as a result of legislative requirements and/or standard industry practices (such as a Construction Environment Management Plan or a Code of Construction Practice or similar).

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Summary of our key Environmental Assessments

Below is a summary of our key studies and assessments as part of our EIA.

Full detail of our Environmental Assessments can be found in our PEIR and non-technical summary, which can be found at: https://hornseaprojects.co.uk/Hornsea-Project-Four/Documents-Library/Formal-Consultation

Offshore and Intertidal Ornithology

The assessment has considered impacts from disturbance and displacement of birds, and from effects on their prey species during the construction phase. Operational effects that have been assessed include collision risk and barrier effects (i.e. blocking of flight paths) from the wind turbines.

We have committed to increasing the gap between the sea and the lowest blade tip height to 35m above Lowest Astronomical Tide, on order to reduce the risk of bird collisions.

Hydrology and Flood Risk

Hornsea Four onshore infrastructure will be located within two main surface water drainage catchments: the Barmston Sea Drain, and the River Hull. The flood risk assessment undertaken concludes that landfall is at low risk from flooding by rivers or the sea, as is the majority of the onshore cable corridor and onshore substation.

We have committed to crossing main rivers and internal Drainage Board maintained drains by drilling underneath, via Horizontal Directional Drilling (HDD). Post-construction, we have committed to reinstating the working area to pre-construction conditions wherever possible.

Ecology and Nature Conservation

Surveys are being undertaken to characterise the ecology of the area (including surveys for habitats, badgers, birds, bats, water voles, otters and Great crested newts). In order to coincide with accepted survey timings for these species, these surveys are currently ongoing.

We have avoided designated ecological sites where possible through the route planning and site selection process.

Landscape and Visual

No significant effects have been identified as a result of construction of the cable corridor or at the landfall area, with the exception of localised effects of the landfall works on views experienced by the local community and visitors to the beach.

Construction works at the substation are likely to have significant effects on the local landscape within the immediate vicinity of the site. A landscape plan and a design vision document have been produced to reduce landscape and visual effects and to help integrate the substation into the local landscape.

Traffic and Transport

Assessments into the potential impacts associated with an increase in construction traffic take into account forecast construction traffic generation (e.g. HGVs and construction personnel) and the proposed access locations required to construct Hornsea Four.

We have committed to developing a Construction Traffic Management Plan (CTMP) in addition to adherence to the core working hours.

Noise and Vibraation

A series of noise surveys were undertaken in April 2019 at landfall, along the onshore cable route and at the onshore substation site to determine the baseline noise environment.

A key part of the route planning and site selection work ensured that the onshore cable route avoided all noise sensitive properties by at least 50m, with construction access roads along the cable route taking access from the highway network at least 150m from such properties.

We have committed to limiting the operational noise of the onshore substation to be no greater than 5 dB above the representative background noise levels during daytime and night.

More information on this can be found in Preliminary Environmental Information Report (PEIR) and accompanying Non-Technical Summary, which can be found at: https://hornseaprojects.co.uk/Hornsea-Project-Four/Documents-Library/Formal-Consultation

Hard copies of the non-technical summary are also available at today's local information event.

Hornsea 4
Horizontal Directional Drilling (HDD)

All onshore cables for Hornsea Project Four will be installed by open-cut trenching and/or Horizontal Directional Drilling (HDD). When developing our proposals for the project, consideration has been given to the onshore construction methods which are employed and ways in which disturbance to the local community can be minimised.

What is Horizontal Directional Drilling (HDD)?

HDD is a trenchless drilling method used to install ducts beneath the ground through which cables from the offshore wind farm can be pulled.

The HDD process involves drilling an initial small pilot borehole through a predetermined bore path. The small pilot bore is subsequently enlarged until large enough for the ducts to be pulled though. HDD provides minimum disturbance to the surrounding area and is a less intrusive method than the more commonly used open-cut trenching.

Where will HDD be carried out?

Hornsea Four have prepared an Onshore Crossing Schedule that outlines the techniques that will be deployment at crossing points along the onshore export cable corridor, onshore substation, and at landfall. The locations of all HDDs are presented in **Volume 4, Annex 4.2: Onshore Crossing Schedule,** which accompanies our Preliminary Environmental Information Report.

We have made a commitment to cross all main rivers, Internal Drainage Board (IDB) maintained drains, main roads, railways and major underground utility assets by HDD or other trenchless technology as set out in the Onshore Crossing Schedule.

The impacts on major watercourses from construction activities involving the use of HDD techniques are minimal. On account of the nature of the technique, the method ensures that there is no interaction between the works and the watercourse to be crossed.

It may be the case that HDD is not possible or preferred at certain locations (due to ground conditions, cable design, or other factors), in which case open cut techniques would be required to install the cables. It may also be the case that a combination of these two methodologies may be utilised. This will be determined in consultation with the relevant stakeholders.

Open-cut crossings could range from smaller drains, roads, water, gas and other utility infrastructure. Open-cut crossings are also detailed in the Onshore Crossing Schedule.

Installation of onshore cables

During installation of the onshore cables, the topsoil will be stripped on site within the temporary working corridor and stored in stockpiles. The trenches will then be excavated using a mechanical excavator, and the export cables, or ducts to contain the cables, will be installed into the open trench. The cables or ducts are then buried by backfilling the trench with the excavated material before the land is reinstated to its previous condition.

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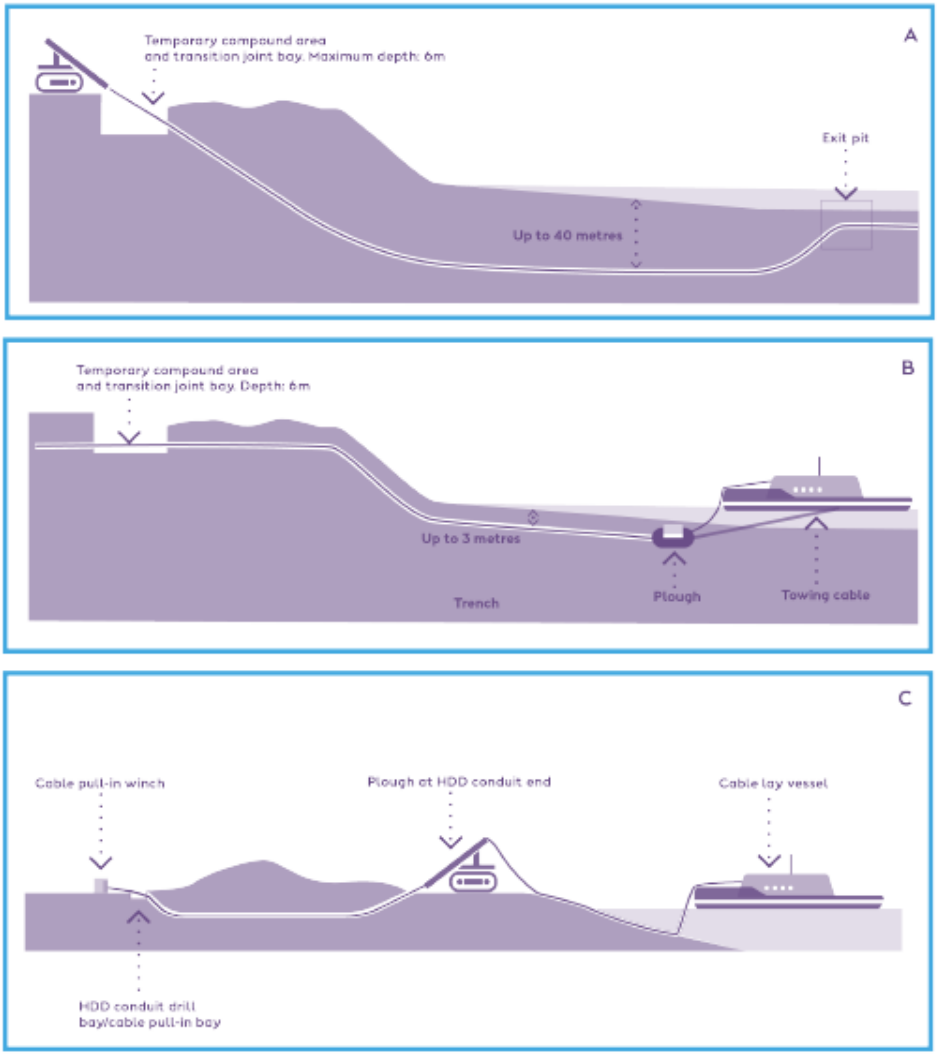
Construction at landfall

The preferred option will be to use a trenchless drilling technique (such as HDD) to install a number of ducts under the beach through which the offshore cables are pulled to the landing site onshore. However, it may be the case that this not possible (e.g. due to ground conditions), in which case open cut techniques would be required. A logistics compound will be required during construction and this will be located immediately landward of the beach.

Below are indicative arrangements for HDD and open cut installation techniques.



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Hornsea 4
Project Infrastructure & Construction

Two main transmission technologies are being considered for Hornsea Four, defined by the type of current: High Voltage Alternative Current (HVAC) and High Voltage Direct Current (HVDC). The project will decide on which transmission type it will use during the detailed design and procurement stage post-consent, based on a range of factors including project economics and technology risk.

Offshore infrastructure

The proposed offshore development area for Hornsea Four will consist of:

Array area
The area where the offshore wind farm will be located, comprising turbines, offshore substations, electrical cables and an offshore accommodation platform.

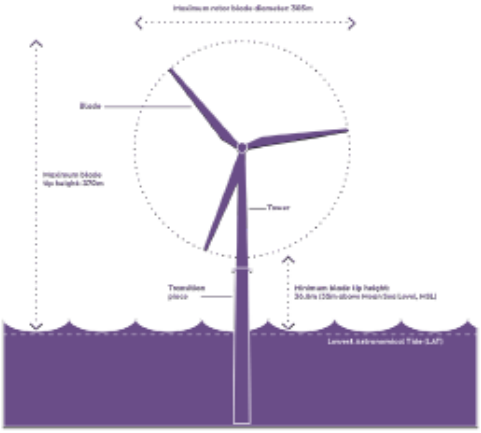
Offshore export cable corridor
The area where the offshore export cables that bring the power generated by the wind farm ashore will be installed.

HVAC booster station area
The area where, in the case of a HVAC transmission system, HVAC booster station platforms will be located.

Landfall area
The area where the offshore export cables will be brought ashore and buried beneath the beach, to connect to the onshore transmission system for onward transmission to the onshore substation and ultimately to the National Grid.

Wind turbine generators

The tips of the turbine blades will be no taller than 370m above the sea, with a clearance between the lowest blade and the Lowest Astronomical Tide of no less than 35m. A typical turbine is shown below:



All wind turbines and other offshore structures will be secured to the seabed via foundations. The final design of these foundations depends on seabed conditions and the infrastructure being supported.

Key offshore components of Hornsea Four

The key offshore components of Hornsea Four are as follows:

- Up to 180 wind turbine generators;
- Up to six offshore transformer substations;
- Up to three offshore convertor substations (High Voltage direct Current (HVDC) system only);
- Up to one offshore accommodation platform to house operations and maintenance staff;
- Up to three HVAC booster stations (HVAC system only);
- Subsea inter-array cables linking wind turbines to each other and to offshore substations;
- Subsea interconnector cables linking the offshore substation to one another;
- Subsea export cables to connect the wind farm to landfall; and
- Cable protection,

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Onshore infrastructure

The proposed onshore development for Hornsea Four will consist of:

Onshore export cables corridor and cable crossings

The Hornsea Four onshore export cable corridor consists of an 80m wide temporary construction corridor within which a 60m permanent corridor will be located.

Electrical export cables will be installed in separate trenches within the cable corridor. Small fibre optic cables may also be buried alongside the onshore export cables to allow communication to the wind farm via various control systems.

Logistics compounds

During construction, temporary logistics compounds of various sizes will be required along the cable corridor for laydown and storage of materials, plant and staff facilities. All logistics compounds will be removed and sites restored to their original condition when construction has been completed.

Access and haul roads

Access will be required from the public highway onto various parts of the Hornsea Four onshore site. Temporary access points will be installed at the start of export cable construction to facilitate vehicular access from the road during construction. This will limit damage to the surrounding agricultural land.

Onshore Substation

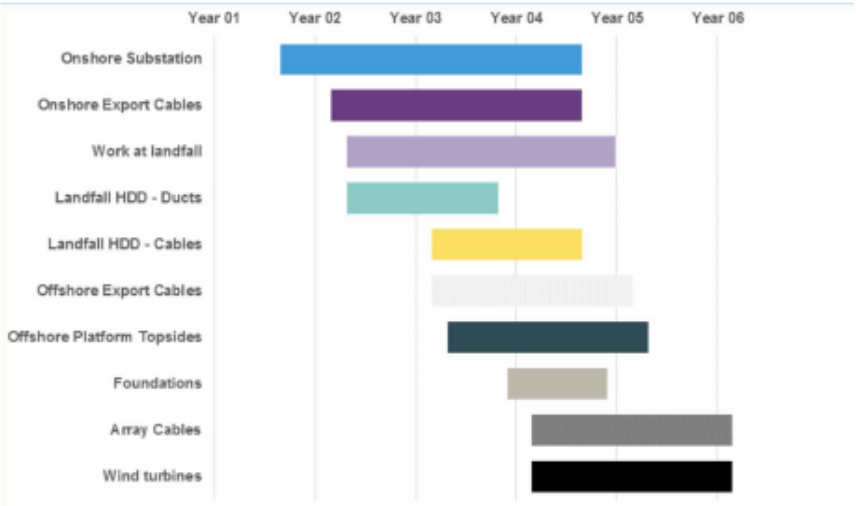
The onshore substation will be located to the north of Cottingham, approximately 175m west of the existing Creyke Beck National Grid substation, covering an area of 155,000m² (15.5 hectares). A temporary area immediately to the west of the site covering 130,000m² (13 hectares) will also be required during construction. The maximum height of any on-site building will be 25m.

Energy Balancing Infrastructure

The onshore substation will include up to two separate energy balancing infrastructure plants, which will provide valuable services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability.

Construction programme

The construction commencement date is dependent on several factors and the earliest possible date that onshore construction could commence is August 2023. The maximum total construction duration (for both onshore and offshore) is four years and six months (54 months). The likely duration of installing the major project elements of Hornsea Four is shown below:



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Hornsea 4
Reduction in the Hornsea Four Array Area for Lease (AfL)

The Hornsea Four Agreement for Lease (AfL) represents the original lease area from The Crown Estate. This is the area within which the offshore wind farm can be located, comprising of turbines, array cables, offshore accommodation platforms and a range of offshore substations as well as offshore interconnector cables and export cables. As a result of Hornsea Four's proportionate approach to the Environmental Impact Assessment (EIA), the AfL site has been significantly reduced.

The Hornsea Four 'Developable Area Approach' (DAA)

In keeping with Hornsea Four's proportionate approach towards the EIA, the DAA considered the size and location of the final AfL, which will be taken forward in the Development Consent Order (DCO) application.

This approach analysed physical, biological and human constraints in refining the developable area, such as seabed conditions, abundance of birds and marine mammals and location of human infrastructure. The DAA balanced consenting and commercial considerations alongside technical feasibility for construction.

DAA Process & Engagement

Hornsea Four have sought to engage with a number of key stakeholders as part of the DAA process, including The Crown Estate; Maritime Coastguard Agency; Natural England and RSPB.

We have worked with key stakeholders to refine the site to reduce impacts and effects where possible. This has resulted in a significant reduction in the AfL from 868 km² (presented at Scoping in October 2018) to 600 km² (presented in our Preliminary Environmental Information Report (PEIR) in August 2019).

Impacts and effects

In the site selection and refinement process, environmental assessments identified ornithology as a principal constraint due to the proximity of the Hornsea Four AfL site to the Flamborough and Filey Coast Special Protection Area (SPA).

This required detailed consideration through the DAA.

As a project, we have made a commitment to select an AfL area that avoids areas with the highest concentrations of birds (kittiwake, gannet and guillemot) that are more likely to be displaced by the construction activities, and birds that are more likely to fly at heights that brings them within the rotor swept zone and hence at risk of collision.

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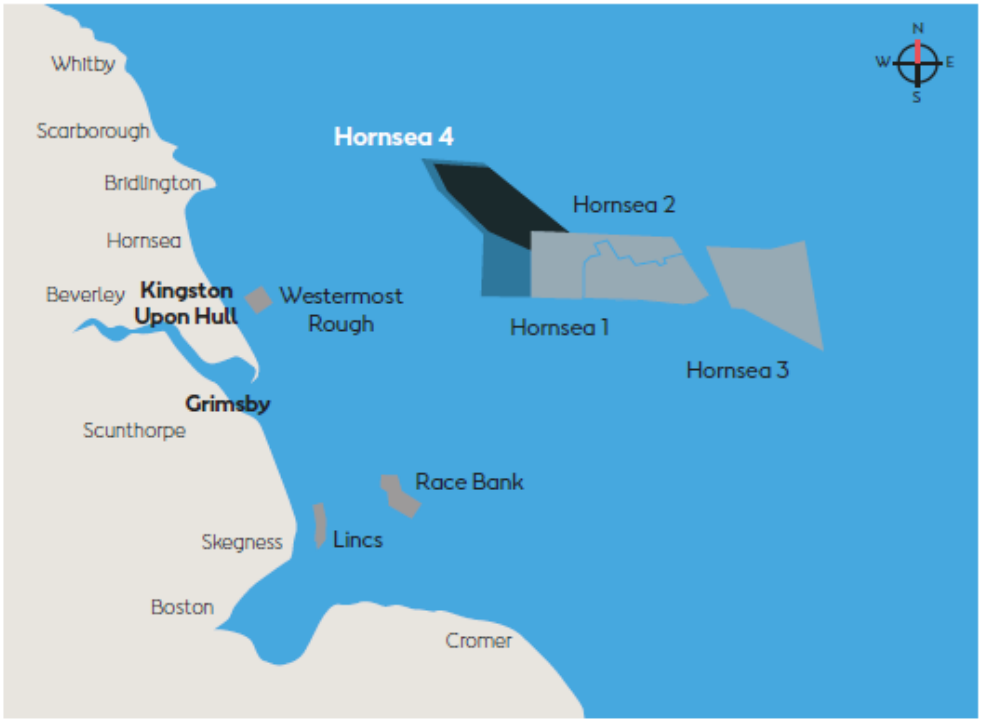
Reduction in the Hornsea Four AfL

Hornsea Four is located to the west of Hornsea One and Hornsea Two which are both under construction. Hornsea Four will also be to the west of Hornsea Three, which is under development and submitted its DCO application in May 2018.

The reduced Hornsea Four AfL is presented in the PEIR documentation and will be the location of up to 180 turbines.



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Hornsea 4
Ørsted Community Benefit Funds (CBFs)

We have established voluntary Community Benefit Funds (CBFs) for a number of our projects around the UK, which are currently under construction and in operation. These funds continue to make a valuable contribution to the local area, by supporting projects such as community building improvements, community activities & services, sports & recreation facilities and environmental conservation and wildlife projects.

Hornsea Four will review the interactions of the project, as the proposal is refined and consider an appropriate way to feed benefits back into the local community. Any decision to establish a CBF for Hornsea Four would be made post-financial investment decision (FID), when the project has been given the green light to go ahead.

Ørsted CBFs

We have established CBFs for our offshore wind projects. So far, funding has been as follows:

- Walney Extension Community Fund has provided over £1.7 million to over 100 projects.
- Burbo Bank Extension Community Fund has provided almost £800,000 to over 90 projects.
- East Coast Community Fund has provided over £1.1 million to almost 100 projects.

Ørsted East Coast Community Fund

The East Coast Community Fund is part of Ørsted's community engagement programme for Race Bank and Hornsea offshore wind farms which are located off the Yorkshire, Lincolnshire and North Norfolk coast.

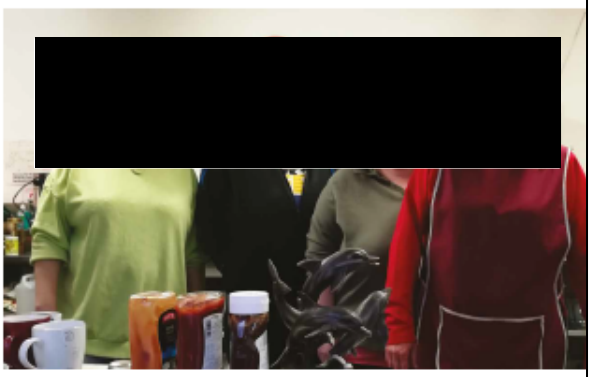
We have committed to a Community Fund worth £465,000 each year for the next 20 years, with grants from £1,000 up to £50,000 available for the benefit of communities within the funding area.

The Fund was launched in December 2016. To date, well over £900,000 has been donated to more than 80 deserving projects. In total, over the 20-year lifespan of the Fund, up to £9.3 million will be made available for community and environmental projects in the coastal areas of Yorkshire, Lincolnshire and North Norfolk.

The East Coast Community Fund is managed by independent grant-making charity, Grantscape. For more information on the Fund, visit: https://www.grantscape.org.uk/fund/eastcoastcommunityfund/

East Coast Community Fund awards

In April 2018, the results of the latest funding round of Ørsted's East Coast Community Fund were announced by our partners, GrantScape. Grants worth almost £190,000 have been awarded to 14 local projects whose applications were successful. Two of the successful projects are featured below:



Soup Kitchen volunteers at St John and St Stephen Church Soup Kitchen

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"Thank you so much for your donation of £9,915 which helps us to continue with our Soup Kitchen. This funding will ensure at least thirty different people a week get a hot meal twice a week. Not only that, they can come and get help with accessing benefits, health care, housing and much, much more. Security of funding is vital for everyone. You have made this difference".

Reverend Kay Jones, Priest in Charge at St John and St Stephen Soup Kitchen

Aerial photograph of the Oasis Garden at Your Place, Grimsby
Photo credit to Big Picture Charity Films

"We are delighted to receive a grant of £18,407 from the East Coast Community Fund for our Garden Buddy Scheme. This money will be used to run the project for the next two years.

Our project enables people who would not otherwise be able to cope with gardening tasks to be 'buddied' with more able volunteers who can befriend, support and encourage them to become a valuable and useful part of our volunteer team. Thank you so much, this money will make a great difference in the lives of many people."

Chris Taylor, General Manager at Your Place

Ørsted East Coast Skills Fund

Up to £75,000 of Ørsted's annual £465,000 East Coast Community Fund is ring fenced for a Skills Fund to support projects relating to Science, Engineering, Technology and Maths (STEM). The overall aim of the Skills Fund is to provide educational and learning opportunities for people within the Fund's benefit area to help to improve their skills and employment opportunities.

Round 2 of the Fund resulted in financial support to four projects.

This included:

- A £20,000 award to STEM Learning, to fund an ENTHUSE Partnership in the East Riding of Yorkshire.
- A £22,985 award to The Teacher Scientist Network, to provide 12 schools in the funding area free access to all the necessary components to run a four week, after-school, STEM club focused on the assembly of a working wind turbine.
- A £12,015 award to Franklin College, to support students in their STEM academy undertake paid internships, enabling them to gain vital work experience.
- A £10,000 award to support West Norfolk Academies Trust schools in King's Lynn, Hunstanton and West Walton through the West Norfolk STEM Catalyst project.

For more information on our other Community Benefit funds for our offshore wind projects, visit: https://www.grantscape.org.uk/fund/orstedcommunityfunds/

More information on this can be found in Preliminary Environmental Information Report (PEIR) and accompanying Non-Technical Summary, which can be found at: https://hornseaprojects.co.uk/Hornsea-Project-Four/Documents-Library/Formal-Consultation

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Hornsea 4
Traffic and Transport

The onshore construction for Hornsea Four is expected to last for approximately 36 months with peaks and troughs of activity throughout the construction period. A range of mitigation will be committed to by Hornsea Four to manage the impact of construction traffic throughout this period.

Our assessments

An assessment of potential impacts associated with an increase in construction traffic has been undertaken in close consultation with the East Riding of Yorkshire Council to ensure that all road users are considered.

The assessment work has been informed by site visits, a desk study and collection of existing traffic flow and collision data. The assessment takes into account forecast construction traffic generation (e.g. HGVs and construction personnel) and the proposed access locations required to construct Hornsea Four.

We have assessed an absolute worst case for peak Heavy Goods Vehicle (HGV) flows, based on the alignment of the most intensive construction activity occurring simultaneously across the entire Hornsea Four project. HGV traffic has been assumed to originate entirely from the south to further represent a worst case.

Assessing the significance

The significance of the effect upon traffic and transport is determined by both the magnitude of the impact and the sensitivity of the receptor.

Defining magnitude of the impact

Hornsea Four has set out the following criteria for defining magnitude of the effect upon transport and transport:

- Major – Changes in total traffic flows of over 90%.
- Moderate – Changes in total traffic flows of 60.1 to 90%.
- Minor – Changes in total traffic flows of 30.1 to 60%
- Negligible – Changes in total traffic flows of less than 30%.

Defining sensitivity of a road

The sensitivity of a road (link) can be defined by the type of user groups who may use it. This includes Non-Motorised Users (NMU), including pedestrians, cyclists and equestrians.

The different sensitivity levels applied to the assessment are broadly defined as:

- Very High – High concentrations of sensitive receptors (e.g. hospitals, schools, residential dwellings, areas with high footfall etc.) with limited or no separation from traffic provided by the highway environment and high levels of NMU) activity.
- High – Concentrations of sensitive receptors with limited separation from traffic provided by the highway environment and low to moderate levels of NMU activity.
- Medium – A low concentration of sensitive receptors and some separation from traffic provided by the highway environment.
- Low – Few sensitive receptors and / or highway environment can accommodate changes in volumes of traffic.

Traffic and Transport study area

The Hornsea Four traffic and transport study area is the area within which environmental impacts may occur and was agreed with East Riding of Yorkshire Council.

The area has been informed by determining the most probable routes for traffic, both for the movement of materials and employees during construction of Hornsea Four.

The area is divided into 90 separate highway sections known as links, which are defined as sections of road with similar characteristics and traffic flows. The traffic flow data for these links has been informed by traffic surveys and existing data.

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The Hornsea Four traffic and transport study area is the area within which environmental impacts may occur and was agreed with East Riding of Yorkshire Council.

The area has been informed by determining the most probable routes for traffic, both for the movement of materials and employees during construction of Hornsea Four.

The area is divided into 90 separate highway sections known as links, which are defined as sections of road with similar characteristics and traffic flows. The traffic flow data for these links has been informed by traffic surveys and existing data.

Impacts and effects

Hornsea Four has made a number of commitments to reduce the impacts and effects caused by an increase in construction traffic.

A selection of these are set out below with their relevant commitment ID assigned within the Hornsea Four Commitments Register:

- Create a new access from the A1079 to route construction traffic away from Cottingham and Dunswell **(Co150).**
- Installing temporary access of the highway network to facilitate vehicular access, in line with local authorities' requirements **(Co62).**
- Developing a Construction Traffic Management Plan **(Co144).**
- Keeping core working hours for the construction of the onshore components of Hornsea Four to 7am-6pm Monday to Friday and 7am-1pm on Saturdays **(Co36).**
- Avoiding HGV construction traffic through Foston on the Wolds **(Co171).**

Developing a Construction Traffic Management Plan (CTMP)

Hornsea Four has made a commitment to develop a CTMP in accordance with the outline CTMP to be submitted with our final Development Consent Order (DCO) application.

The final CTMP will set standards and procedures for:

1. Managing the numbers and routing of HGVs during the construction phase;
2. Managing the movement of employee traffic during the construction phase;
3. Details of localised road improvements necessary to facilitate safe use of the existing road network; and
4. Details of measures to manage the safe passage of HGV traffic via the local highway network.

More information on this can be found in Preliminary Environmental Information Report (PEIR) and accompanying Non-Technical Summary, which can be found at: https://hornseaprojects.co.uk/Hornsea-Project-Four/Documents-Library/Formal-Consultation

Hard copies of the non-technical summary are also available at today's local information event.

[Phase two section 47 local information event feedback form]

Ørsted

Hornsea 4 Feedback form

Formal Consultation: 13 August to 23 September 2019

We want to hear your thoughts on our proposals.
If you have attended one of our local information events, viewed our latest proposals online or in hard copy at one of our Community Access Points (CAP Sites), you can provide your feedback using this form or via the following contact details:

Email us at:
contact@hornseaprojectfour.co.uk

Call our freephone information line:
0808 169 3030

Write to us at:
Freepost Hornsea Four

View our proposals online at:
hornsea4feedback.commonplace.is

Please note that the deadline for the submission of feedback is **Monday 23 September 2019.**

You do not have to supply personal details however it will help us to work towards meeting the needs of the public during the consultation period and to enable us to contact you with updates on our project. Your personal details will be stored in compliance with GDPR by Counter Context acting on behalf of Ørsted.

About you

Name ..... Title ..... Date .....

Organisation: .....
(if applicable)

Address .....

Postcode ..... Telephone .....

Email .....

How would you describe your interest in Hornsea Four Offshore Wind Farm?

◯ Landowner ◯ Local resident ◯ Local representative ◯ Statutory body

◯ Local business ◯ Other (please specify) .....

If you are representing an organisation/business, please state above.

Our consultation process

Have you attended one of our local information events?

◯ Yes ◯ No

How did you find the consultation event and our updated proposals?

◯ Very informative ◯ Informative ◯ Quite informative ◯ Not informative

◯ No opinion

Would you like to receive our community newsletters to keep up to date with the progress of Hornsea Four offshore wind farm? (tick all that apply)

◯ Yes, via email ◯ Yes, via post ◯ No thanks

Our onshore and offshore proposals

When answering the questions below, please refer to a specific area of the project that you are providing feedback on. Let us know your main concerns/interests in this area (including whether the location is suitable for this element of Hornsea Four).

We would like your feedback on the following areas:

- Onshore export cable corridor
- Onshore substation
- Logistics compounds
- Construction access points
- Landfall site
- Offshore array area and offshore export cables

Do you have any comments on our onshore export cable corridor, currently 80m in width and 40 km in length?

Our onshore export cables will be buried underground from the landfall, routed via the onshore substation and connected to National Grid's Creyke Beck substation.

Do you have any comments on our proposed onshore substation, located near to the existing Creyke Beck substation?

The onshore substation and Energy Balancing Infrastructure (EBI) may require an area of up to 155,000m² (approximately 38 acres) of land, and a temporary works area of 130,000m² (approximately 32 acres).

Do you have any comments on the locations of our logistics compounds?

We are proposing eight temporary logistics compounds, which will be located along the cable corridor to store materials, plant and staff facilities. All logistics compounds will be removed, and sites restored to their original condition post-construction.

Do you have any comments on our construction access points?

Various access and haul roads are being proposed from the public highway onto parts of the Hornsea Four onshore route.

This includes temporary access points installed to facilitate access during construction for landfall, along the onshore cable corridor and at the onshore substation.

This will help to ensure that Hornsea Four can honour its commitments to avoid noise sensitive receptors and ensure environmental impacts on local residents are minimised.

Do you have any comments on our two landfall options, which have been assessed for our Preliminary Environmental Information Report (PEIR)?

Our export cable will be brought ashore near Fraisthorpe. We have assessed two landfall sites for our PEIR. Based on your feedback and further studies, a preferred landfall option will be taken forward as part of our Development Consent Order application.

Do you have any comments on our offshore array area and offshore export cable?

The offshore array area is 600 km². Located approximately 65 km off the Yorkshire coast, this is where up to 180 offshore wind turbines, array and interconnector cables, and up to 3 HVAC booster stations and offshore accommodation platforms will be situated.

Other (please detail)

Please provide feedback on any other aspects of the project infrastructure that are important to you.

Our mitigation proposals and commitments

We are proposing a range of mitigation measures and commitments to reduce and/or eliminate significant effects of Hornsea Four throughout the project's lifespan.

Our commitments register sets out the mitigation measures and commitments made in the design and delivery of Hornsea Four to minimise any impacts and effects. If you are unfamiliar with our commitments register, please speak to a member of the project team at one of our events or get in touch via the contact details at the end of this feedback form.

We welcome your feedback on the design elements of our proposals. You can find this information online at **hornsea4feedback.commonplace.is** or on our displays shown at our local information events. We are showing:

1) Visualisations of how Hornsea Four could look once constructed, including various photomontages.
2) Design finishes of the Hornsea Four onshore substation.
3) Landscape and screening mitigation plans around the Hornsea Four onshore substation

Based on the information you have seen, do you have any comments on our mitigation proposals for Hornsea Four?

What further commitments/mitigations would you like to see Ørsted make within the design of Hornsea Four to reduce any significant effects?

- ◯ Landscape planting
- ◯ Biodiversity enhancements
- ◯ Reinstatement of landscape
- ◯ Management plans
- ◯ Local road network works
- ◯ Noise attenuation
- ◯ Drainage
- ◯ Other (please specify)

Proposed commitment:

Topic-specific feedback

Which aspects of the project are most important to you?

Please tick all that apply and elaborate on any issues using the text boxes provided, informing us of any local issues that are important to you.

○ **Onshore ecology**

We have undertaken detailed assessments and surveys into the impact of Hornsea Four on local ecology.

Please indicate any animal, bird or plant species, habitats or ecological designated sites that are particularly important to you in your area and any concerns you may have should Hornsea Four be developed.

○ **Hydrology and flood risk**

Community consultation has highlighted that flood risk is an important issue for the people of East Riding of Yorkshire. Please indicate any concerns you may have about flood risk in the local area.

○ **Landscape and visual impact**

Please provide feedback on our mitigation proposals to limit landscape and visual impact onshore (including for our onshore export cable corridor, landfall and onshore substation).

○ **Land use, agriculture, socioeconomics and recreation**

Please indicate any issues that are important to you related to Public Rights of Way (PRoW), tourism and socioeconomics.

Please also indicate any PRoW and cycle paths that are important to you.

○ **Traffic and transport**

Please provide feedback on our local transport assessments, access roads and use of the local road network (e.g. A164 and A1079).

Noise and vibration

We have ensured that the onshore cable route avoids all noise sensitive properties by at least 50m.

Please indicate any concerns you may have about noise and vibration.

Offshore ecology

We have undertaken detailed assessments and surveys into the potential impact of Hornsea Four on offshore ecology.

Please indicate any concerns you have for offshore ecology (including marine mammals, birds, fish and shellfish).

Other (please detail)

Environmental Impact Assessment (EIA)

Do you have any comments on the surveys and assessments carried out to date by the project as detailed in the PEIR?

A non-technical summary (NTS) of the full PEIR, which summarises the key findings of our surveys and assessments, is also available to view online at **hornseaprojects.co.uk/Hornsea-Project-Four/Documents-Library/Formal-Consultation**

Based on the proposals you have seen presented and the information in the PEIR, what are your views on Hornsea Four?

- ◯ Strongly support
- ◯ Support
- ◯ No opinion
- ◯ Oppose
- ◯ Strongly oppose

If you answered oppose or strongly oppose, please provide a brief explanation for your selection.

Please return this feedback form to us in person at one of our events, via post, email or through our online feedback form.

To provide your views via post, put this feedback form in an envelope and address it to **Freepost: Hornsea Four. You will not need a stamp.**

Email us at:
contact@hornseaprojectfour.co.uk

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