

# Norfolk Boreas Offshore Wind Farm

# Consultation Report

## Appendix 13.24 Landowner Information Pack

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*Photo: Ormonde Offshore Wind Farm*

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# COMMERCIAL

## What rights will you be seeking for the cable?

Vattenfall will be seeking a permanent easement with landowners for the underground cable rights. This is to allow; electricity to run through the cable, the cable to remain in the ground, access to the cable for repairs and maintenance and restrictions on the surface use (noting that standard farming operations can continue).

## What about ELS / HLS / OLS agreements and payments and BPS payments?

Agri – Environment agreements should not be prejudiced as Vattenfall and its agents will, on behalf of the land user, obtain all necessary permissions and derogations from Natural England. All business losses directly caused as a consequence of the construction and operation of the project will be compensated, including losses from agricultural subsidy payment schemes (BPS).

## Will you pay my agents / solicitors fees?

We will pay for land agent fees in relation to survey access where a licence is requested for intrusive works. These payments will be capped at £500 per landowner.

For discussions regarding HoTs for an option agreement we will meet reasonable land agent fees up to a cap per landowner. Details of the cap will be issued at a later date.

## As a landowner, what compensation will I receive?

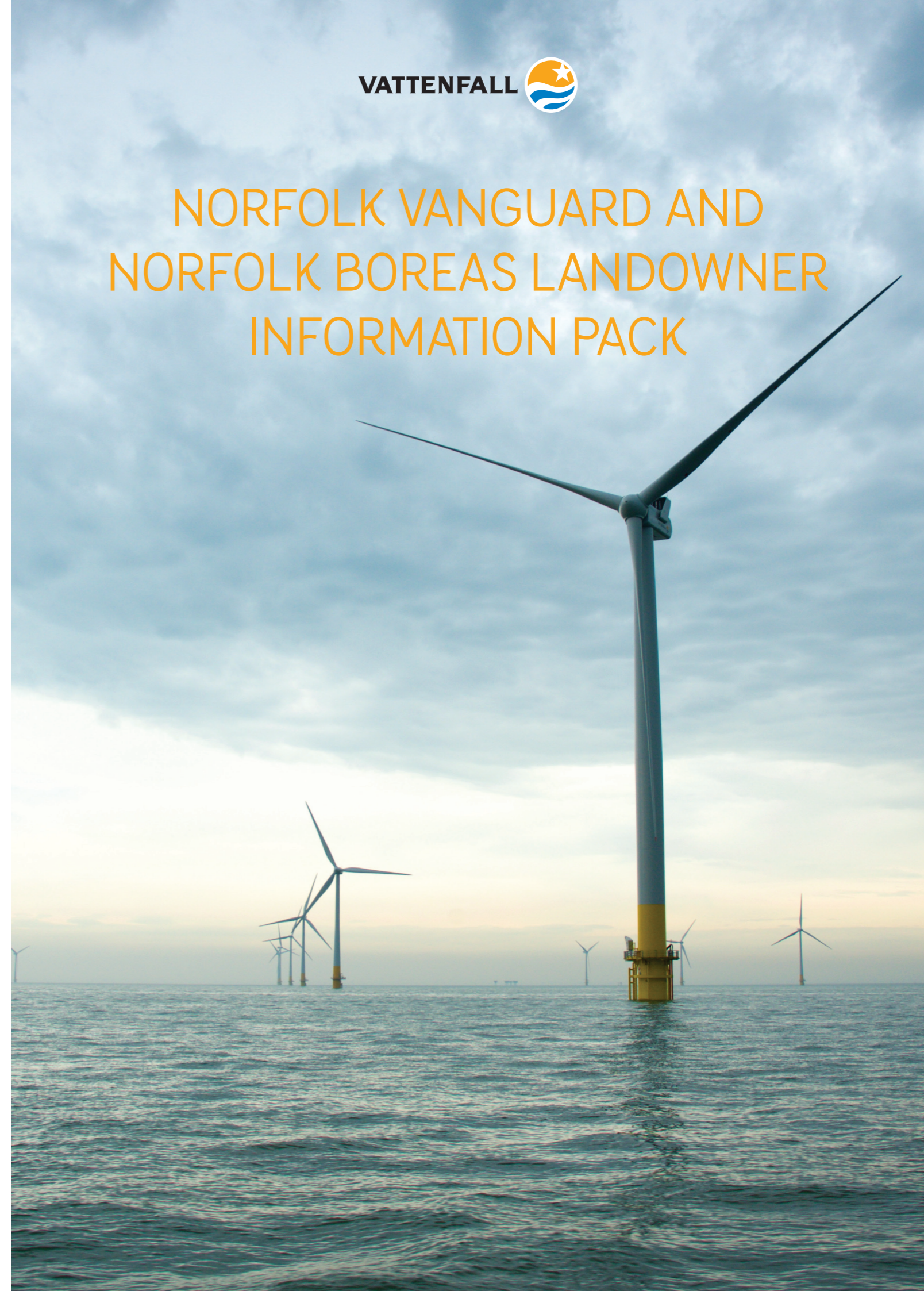
As a landowner you will be compensated for the land/ rights sought across your land. Vattenfall's preferred approach is to reach an agreement with all affected landowners in order to secure the land and rights required for the project before any statutory powers are utilised. Compensation will also be payable for any temporary occupation of land along with any crop losses and other direct disturbances to business operations.

## Will you be able to compulsorily acquire the rights/land?

As above it is Vattenfall's preferred approach and intention to reach agreements with all affected landowners in order to acquire the necessary land/ rights. However we appreciate that for a project of this size and length this will not always be possible. Through the DCO application, compulsory powers will be sought in order to acquire any land/rights where attempts to reach an agreement have been unsuccessful.



# NORFOLK VANGUARD AND NORFOLK BOREAS LANDOWNER INFORMATION PACK



## Landowner enquiry?

Please contact Consent Solutions

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# CABLE INSTALLATION - PHYSICAL REQUIREMENTS

## Will AC or DC technology be used and why has this technology been selected?

A decision on the use of AC or DC technology will not be taken until after consent has been achieved as part of the detailed design and Final Investment Decision of the project. The inclusion of both transmission technology options through consent submission is required to meet full technical and economic flexibility to deliver against government targets for offshore wind cost reduction. Whilst both technology options are being considered, only one transmission option will be developed during the final design.

## Why are you going below ground rather than over ground on pylons?

The project has recognised the likely concerns the community will have with regards to long term visual impact of overhead lines and have chosen to bury the cables underground which will have no residual visual impact once installed.

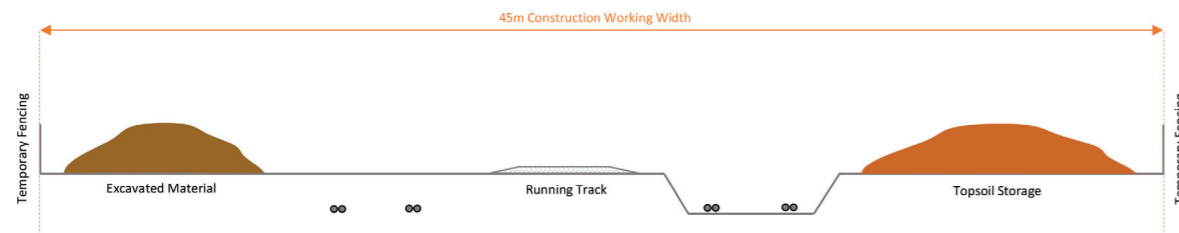
## How wide is the cable corridor and what does it comprise?

A temporary working width will be required during the construction phase which provides an area for storage of excavated substrate and a track alongside the trench. The diagrams below provide an indication of the areas required for the HVDC and HVAC options, showing the maximum temporary construction working width of 100m for Norfolk Vanguard and Norfolk Boreas.

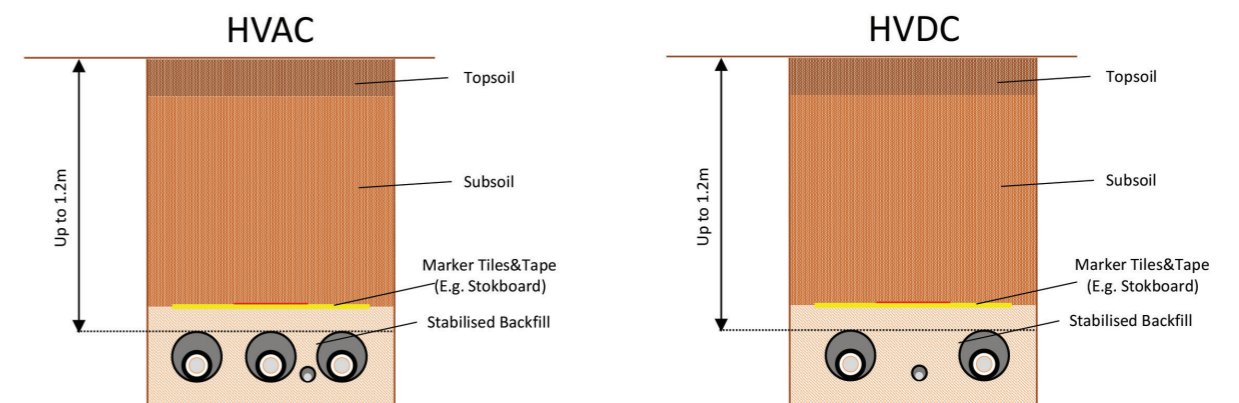
## How deep will the cables be laid and what is in the trench?

The cables will be laid at a minimum depth of 1.05m beneath the surface in normal arable land and 1.2m in arable land which is subject to deep ploughing. This depth is standard electricity industry practice and will be sufficient to allow normal agricultural working practices to continue on the surface

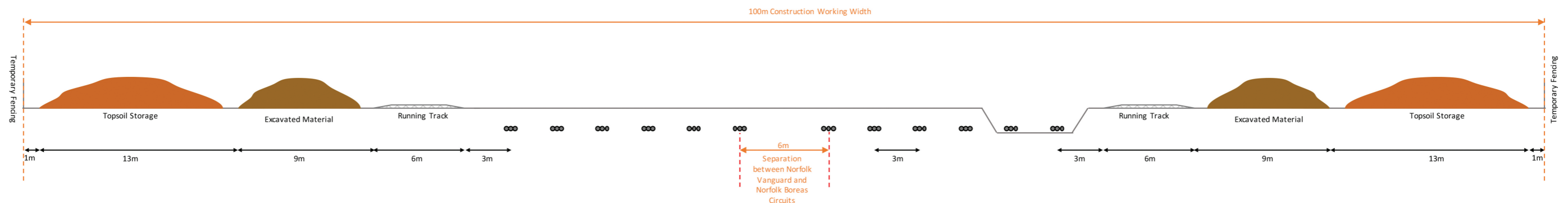
while still maintaining the efficiency of the electrical system. The cables will need to be buried significantly deeper in places in order to pass underneath large watercourses, roads and railway infrastructure.



Indicative HVDC Onshore Construction Working Width



Trench Detail



Indicative HVAC Onshore Construction Working Width



**Will the cable route require any inspection chambers or link boxes? Will these be fenced/ identified?**

Link boxes will be required at intervals along the length of the cable route where different sections of the cable are joined. The link boxes will be buried to ground level within an excavated pit with access provided via a secured access panel (manhole). The link boxes can be demarcated in a number of ways through discussions with landowners at the construction stage.

Link boxes will be required for each cable circuit and typically at every second or third joint bay location (e.g. 1000m – 3000m) depending on cable length selected, transmission technology selected and appropriate siting of joint bays and link boxes. Where possible, link boxes will be located on field boundaries to reduce the impact on farming operations. The exact siting of the joint bay and link box locations will be determined during the detailed design and pre-construction phase of the project in consultation with landowners.

Access will be required to the link boxes approximately once per annum for a short period of time (~1hour) to conduct cable sheath testing.

**How will the cable route be marked and identified above ground?**

The cable alignment can be demarcated in a number of ways. One example technique would be using marker posts on the field boundaries, hedgerows and roads. Accurate GPS location data will also be recorded and made available to landowners who wish to work with GPS guided equipment. This will be confirmed at a later stage by Vattenfall.

**Will I be able to link my private wind turbine/solar farm into the cable?**

The cables, substation and any other infrastructure will be designed to only carry the power generated by the project and connect it to the national electricity network. Private connections will not be able to utilise the power or connect power to the grid.

**What will happen to the cables once the project is decommissioned?**

The cable ducts will remain in situ. The cables themselves may be removed in order to re-cycle the high-value materials. Extraction of the cables from the ducts will be achieved through a reversal of the cable pulling and jointing method which is limited to small scale excavation at the joint locations only. The cables will be extracted by excavating the joint bays, cutting the cable, pulling the cable from the ducts and reinstating the joint locations.

# CONSTRUCTION



Cable pulling preparation

**How long will the onshore project construction take?**

Construction of Norfolk Vanguard and Norfolk Boreas offshore wind farm is subject to receiving a Development Consent Order. Once all necessary consents, permissions and conditions are obtained, all onshore substation infrastructure (groundworks, roads and services, shared plant and buildings) and ducting for the onshore cables will be established prior to commissioning the first phase of the wind farm. Installation of cables and substation plant will then be carried out in sequence.

The overall programme of onshore construction activities across the entire route length is likely to be as follows:

- Onshore enabling works ~6 months (e.g. hedge removal, pre-construction drainage)
- Main cable duct installation works, 2 x 9-month seasons (assumed shut down over the winter period due to adverse weather conditions)
- Cable pulling and jointing, ~6 months. (NB. We may want to retain the option to procure and install export cables 'just in time' for each phase of the wind farm, in which case we would be returning (approximately annually) to pull in cables)
- Main works for substation and cable relay station infrastructure - ~1.5 years – in parallel to cable duct installation works

We have designed the cable route to allow the installation of Norfolk Boreas offshore wind farm cable ducts at the same time as Norfolk Vanguard offshore wind farm cable ducts, to minimise the length of time for landowner disruption and maximise installation efficiency.

**How long in any particular area and what is the proposed construction procedure for cable installation?**

In any one location along the cable route where standard open trench installation is being conducted, excavations are likely to be in the order of 1 week's activity per 100m, although certain locations will take longer dependent on ground conditions, complexity of the installation and use of AC or DC electricity transmission technology. The running track will be utilised for more extended periods during the duct installation works to allow ongoing access to other locations along the cable route whilst minimising impacts to the local highways network.

The process of duct installation in any given location (following enabling works) can be summarised as:

- Topsoil strip and store
- Creation of running track (may require bog mats, aggregate or similar dependent on ground conditions)
- Excavate trench and store subsoil (separate to topsoil)
- Lay ducts and associated materials in trench
- Reinstating subsoil within trench

Once the ducts are installed, topsoil is reinstated and the land will be returned to the landowner, limited disruption will be required at joint locations (approximately every 500m – 1000m) in subsequent years to allow cable pulls. At these locations a joint bay will be excavated and cables pulled through the installed ducts.



Cable easement post reinstatement, with link box at field boundary



The following storyboard provides a case study of a recent Vattenfall UK onshore wind farm open trench duct installation and subsequent cable pulling activities.



1. Topsoil Strip and Store



3. Ducts Covered and Protective Marker Tiles Laid



2. Excavate Trench. Subsoil Store separate to topsoil store and lay ducts



4. Replace Subsoil



5. Reinstate Topsoil



6. Excavate Joint Pit and Conduct Cable Pull (Post Duct Installation and Reinstatement)



7. Pull cables into ducts

**What will the working hours be? Will it be 7 days per week?**

Working hours will normally be 7am to 7pm five days per week, however there may be certain exceptions which will be discussed with the local authorities (for example, larger components may be best delivered outside these hours to avoid traffic impacts and limited 7 day 24hr working may be required during trenchless crossing activities).

**Will there be mobilisation areas, how large and how many?**

It is standard practice to have primary and secondary mobilisation areas: secondary mobilisation areas are approximately 40m x 40m and typically placed 5 km apart, meaning there will be in the order of 10 secondary mobilisation areas; primary mobilisation areas are approximately 100m x 100m and typically placed 10 km apart, meaning there will be in the order of 5 or 6 primary mobilisation areas along the cable route. The number and size of the mobilisation areas is yet to be finalised and will be informed by traffic and transport assessments, landowner discussions and construction programme considerations to identify the suitable number and location.

**What is a trenchless crossing?**

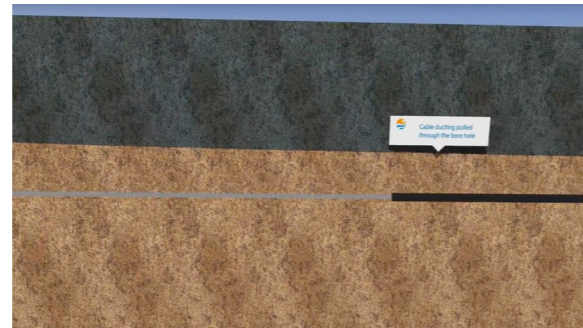
At a number of locations along the route the cables are required to be installed underneath linear features such as railways and large watercourses which are not suitable to be crossed using open trench excavation methods. At these locations, a trenchless installation method such as microtunnelling, auger boring or most likely horizontal directional drilling (HDD) will be employed. This method allows a surface to surface drilling approach for installation of the cable ducts. A compound of 60m x 50m will be required to accommodate the necessary drilling equipment at these locations. The timescale for any trenchless works will be determined by ground conditions, length of drill required and selection of electricity transmission technology, although can be expected to be in the order of 2 months to 9 months from mobilisation to demobilisation.



The following storyboard provides an indication of a HDD installation process at the landfall, with similar techniques available for land to land crossings within the onshore cable route.



1. Site establishment including topsoil strip and store



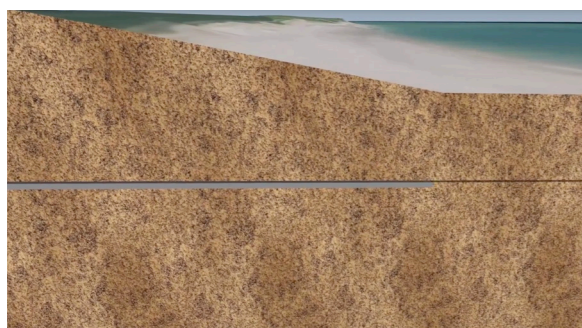
4. Pilot hole reamed (widened) and cable ducting pulled through from reception pit to drilling site



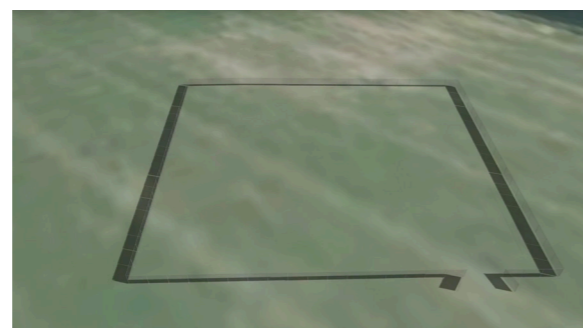
2. Excavation of joint pit, introduction of HDD rig and begin pilot bore



5. Cable pulled through ducting and jointed



3. Pilot bore exits at reception pit



6. Site reinstated



Example HDD rig

**How much traffic will it generate and what type of vehicles?**

The installation of the onshore cable and the construction of the onshore substation and cable relay station (HVAC only) would create a substantial amount of construction traffic. The majority of heavy goods vehicle movements will be associated with the delivery of materials, plant and equipment. Key locations will be identified along the route that can accommodate the larger delivery vehicles and these will be located adjacent to highways which have the capacity to deal with this type of traffic. Otherwise vans and 4x4 vehicles will be used to transport light equipment and personnel around the site.

All vehicle movements are subject to a detailed traffic management plan agreed in advance with the relevant local authorities and any movements on the Strategic Road Network (SRN) would be agreed in advance with Highways England.

The majority of the components and equipment relating to offshore construction will be transported to site by sea.

**Will there be road closures / traffic management?**

It will be necessary to have road closures and traffic management for periods of time in order to complete the works. Efforts will be made to avoid or minimise traffic disruption.

Where road crossings are unavoidable, Vattenfall will identify the most appropriate crossing technique to minimise the level of disruption. For crossings where the level of disruption to traffic would be particularly problematic, HDD or other trenchless techniques will be considered.

We will be consulting closely with the local council and Highways England regarding any road closures and appropriate traffic management measures, and will detail our proposals in a construction traffic management plan.

**How many large vehicle movements will there be and over what period?**

At this moment, we cannot give an exact answer as we are very early in the planning stages of the project. However, traffic movements will be considered as part of the Environmental Impact Assessment (EIA) and will be discussed with Highways England and the local authority.

**Will the works be noisy? Dusty? Smelly?**

To avoid or minimise construction related impacts (such as noise disturbance, dust emissions and odour) the following key principles have already been incorporated and will continue to be so in the final site selection of the onshore cable route and associated onshore infrastructure, for example:

- Reduce proximity to residential dwellings;
- Reduce proximity to historic buildings;
- Minimise impacts to local residents in relation to access to services and road usage, including footpath closures;
- Install cables within open agricultural land where possible; and
- Minimise requirement for complex crossing arrangements, e.g. road, river and rail crossings.

Through the EIA we will be considering any potential impacts in relation to noise, dust and odour as a result of the construction or operation of the project.

If any potential impacts are identified, we will propose specific mitigation measures to be put in place which would need to be agreed with the Environmental Health Officer and relevant local authorities.

Vattenfall are committed to working closely with the local authorities to reduce disturbance to the general public throughout the course of the project.

**Who will benefit and what will the local community gain from this?**

As a leading energy company, Vattenfall is guided by principles of sustainable development. This means we actively seek opportunities for our investments to create lasting, meaningful benefits and particularly to deliver solutions for people living in the areas we operate. Norfolk is a unique place with its own identity and priorities. We'd like the local experts, people who live, work and play here, to tell us what is important for Norfolk's future – its environment, people and economy. We are excited to begin a conversation with local people and stakeholders, which over the next months and years gives us a chance to explore together opportunities for bringing meaningful, lasting benefit to the local area.

We will be able to provide some detail about specific local direct and indirect economic benefits for Norfolk after completing our impact assessments of the offshore wind farm on the local economy.



# IMPACT ON LAND USE DURING AND POST CONSTRUCTION

## What effect will all these high voltage cables have on people using the land?

The following key principles in relation to landowners have already been incorporated and will continue to be where practical in the final site selection of the buried onshore cable route and associated onshore infrastructure, for example:

- Install cables within open agricultural land where possible;
- Avoid rendering parcels of agricultural land inaccessible during construction;
- Avoid areas of important habitat, trees, ponds and agricultural ditches;
- Minimise impacts on agricultural practices and access;
- Reduce proximity to residential dwellings; and
- Minimise impacts to local residents in relation to access to services and road usage, including footpath closures.

We will be working closely with landowners to identify site specific issues and determine the most appropriate actions and mitigations.

## Will I be able to cross the cable corridor with agricultural vehicles during and after construction?

During construction the working corridor will be fenced off for the purposes of safety and security. We appreciate that farming occupiers will require access over the working corridor to access severed areas of fields and farms and this should generally be possible for the majority of the time and we will work with landowners to minimise disruption to their operations wherever possible. However, access will be limited when the trench excavations are being conducted. Provision for these crossing points can be discussed at a later stage once detailed design has been completed. After construction, the land will be reinstated to its previous condition and farming operations can continue as they did prior to construction.

## Will I still be able to farm the land above the cable corridor?

Once construction is complete and the land has been reinstated you will be able to continue with normal agricultural practices. There will be restrictive covenants in place, for your safety and the safety of the cable infrastructure, which will regulate procedures for deeper farming practices. There will also be restrictions in place to restrict the construction of buildings and planting of deep rooted plant species along the cable corridor. This is common with other infrastructure projects of this type.

## What will you do with the topsoil, how will you avoid contaminating topsoil with subsoil?

Topsoil will be stripped back as one of the first stages of construction and stored in a tidy stockpile at the edge of the cable working area. This will also be sprayed as required to avoid weed contamination. The project team understand the importance of keeping topsoil and subsoil separate to prevent contamination. Reference is made to the 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites' – DEFRA.

## What about bio-security?

There is potential for biological contamination between different agricultural land holdings and between individual fields, particularly where tracked vehicles are crossing between field and landowner boundaries.

Biosecurity is the prevention of disease causing agents entering or leaving any place. It involves a number of measures and protocols designed to prevent disease causing agents from entering or leaving a property and being spread.

DEFRA has identified a number of best practice measures to minimise the risk of spreading disease. These measures include but are not limited to:

- Agreeing access arrangements with the landowner in advance of any construction works taking place;
- Minimising where possible the movements of people, vehicles or equipment into areas where farm animals are kept, including fields, sheds, markets or other holding areas; and
- Cleaning equipment upon arrival and departure

## What about land drains and field under drainage?

Agricultural drainage specialists will prepare pre-construction and post-construction drainage designs. Generally these will aim to intercept the existing land drains and drain the working width. The post construction drainage and reinstatement will seek to restore the land to the condition it was in prior to the works.

We will be asking all landowners for any existing records in relation to under-field drainage and will seek to discuss the land drainage proposals with the land-owners and tenants affected.

## How will the works affect footpaths / bridleways?

Wherever possible the cable route would seek to minimise impacts to local residents in relation to access to services and road usage, including footpath closures.

Should the development receive approval, during the construction phase it may be necessary to close or divert certain public rights of way. Any closures or diversions would need to be agreed with the local public rights of way officer and reinstatement will seek to restore the footpath or bridleway to the condition it was in prior to the works. There will be no requirement to close public rights of way while pre-construction surveys are being completed.



Cable easement prior to reinstatement, with link box

## How will you get through hedges, trees and will they be replaced?

Wherever possible, the cable route would seek to minimise the number of hedgerow crossings, utilising existing gaps in field boundaries if possible. Trees will also be avoided where possible.

As part of the EIA, Vattenfall will be undertaking ecological and habitat surveys to characterise the existing environment and identify the most environmentally acceptable and technically feasible locations for the cable route and associated onshore infrastructure.

Where hedgerow crossings are unavoidable, Vattenfall will identify opportunities to reduce the width of the cable corridor to minimise the amount of hedgerow removal. Any hedgerow removal will result in hedgerow replanting to match those existing and temporary fencing will be erected around the newly planted section of hedge in accordance with best industry practice.

We will be consulting closely with the local council and Natural England regarding any hedgerow crossings and appropriate mitigation will be identified.

In addition, depending on the locations of the onshore infrastructure, Vattenfall are exploring options for onsite and offsite screening proposals including planting. Any habitat creation part of the proposals would enhance the existing landscape features and improve biodiversity within and around the project.

## Will you affect any watercourses?

Wherever possible, the cable route would seek to avoid impacting watercourses and waterbodies. We will take measures to ensure that watercourses are not polluted by any run-off from the works.

Where water crossings are unavoidable, these will be assessed on a case by case basis. Vattenfall will seek to identify the most appropriate crossing technique in each case. We will be consulting closely with the local authority and the Environment Agency regarding any watercourse crossings and appropriate mitigation will be identified.

## What effect will the cables have on our GPS equipment?

The cables will have no effect on GPS equipment.