



# Hornsea Project Four

## Outline Landscape Management Plan

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## Revision Summary

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01	29/09/2021	Land Use Consultants	Thomas Watts	Julian Carolan
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## Revision Change Log

<i>Rev</i>	<i>Page</i>	<i>Section</i>	<i>Description</i>
01	N/A	N/A	Submitted as part of DCO Application
02	16	4.1.1	Addition of text relating to local / UK provenance in response to the Environment Agency Relevant Representation.

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## Glossary

Term	Definition
Attenuation feature(s)	Area within which SuDS measures are to be adopted to facilitate attenuation and/or storage of surface water drainage. Measures can be, but are not limited to, the use of filter drains, swales, attenuation and flow control structures.
Commitment	<p>A term used interchangeably with mitigation and enhancement measures. Commitments are Embedded Mitigation Measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in EIA terms.</p> <p>Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or ES).</p> <p>Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.</p>
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Energy balancing infrastructure (EBI)	The onshore substation includes energy balancing Infrastructure. These provide valuable services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability.
Export cable corridor (ECC)	The specific corridor of seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Project Four array area to the Creyke Beck National Grid substation, within which the export cables will be located.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Important Hedgerow	Defined in the Hedgerow Regulations (1997) if a hedgerow has been in existence for 30 years or more and satisfy one of the criteria set out in Part II Schedule 1 of the Regulations (which include archaeological, historical, wildlife and landscape criteria).

Term	Definition
Landfall	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all construction works, including the offshore and onshore ECC, intertidal working area and landfall compound. Where the offshore cables come ashore east of Fraisthorpe.
Mitigation	A term used interchangeably with Commitment(s) by Hornsea Four. Mitigation measures (Commitments) are embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, PEIR or ES).
National Grid Electricity Transmission (NGET) substation	The grid connection location for Hornsea Four at Creyke Beck.
Onshore substation (OnSS)	Comprises a compound containing the electrical components for transforming the power supplied from Hornsea Project Four to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. If a HVDC system is used the OnSS will also house equipment to convert the power from HVDC to HVAC.
Order Limits	The limits within which Hornsea Project Four (the 'authorised project') may be carried out.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Principal Contractor	The Principal Contractor(s) leads the construction phase of Hornsea Four, managing sub-contractors.
Trenchless Techniques	Also referred to as trenchless crossing techniques or trenchless methods. These techniques include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.

## Acronyms

Acronym	Definition
DCO	Development Consent Order
EBI	Energy Balancing Infrastructure
ECC	Export Cable Corridor
ERY	East Riding of Yorkshire
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IDB	Internal Drainage Board
LMP	Landscape Management Plan
LVIA	Landscape and Visual Impact Assessment
MHWS	Mean High Water Springs

Acronym	Definition
NGET	National Grid Electricity Transmission
oLMP	Outline Landscape Management Plan
OnSS	Onshore substation
PEIR	Preliminary Environmental Information Report
SuDS	Sustainable Drainage Solutions

## Units

Unit	Definition
km	kilometre
kV	kilovolt
m	metre
m <sup>2</sup>	metres squared

## 1 Introduction

### 1.1 Project Background

1.1.1.1 Orsted Hornsea Project Four Limited (the 'Applicant') is proposing to develop Hornsea Project Four offshore wind farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and on to an onshore substation (OnSS) with energy balancing infrastructure (EBI), and connection to the electricity transmission network.

1.1.1.2 Details of the activities and infrastructure associated with Hornsea Four are fully set out in [Volume A1, Chapter 4: Project Description](#). This Outline Landscape Management Plan (oLMP) has been developed for onshore elements of Hornsea Four, landwards of Mean High Water Springs (MHWS). In summary, the onshore elements of Hornsea Four will comprise:

- **Landfall** – including transition joint bays connecting the offshore export cable corridor (ECC) and onshore ECC, one temporary landfall compound and temporary access tracks;
- **Onshore ECC** – including the onshore export cables, eight temporary logistics compounds, joint bays and link boxes, and temporary access tracks;
- **OnSS and EBI** – including the temporary working area, temporary and permanent access tracks, the permanent working area (inclusive of the OnSS, EBI and associated landscaping and attenuation feature(s)); and
- **400 kV National Grid Electricity Transmission (NGET) connection area** – the area within which a 400 kV section of the onshore ECC will connect to the existing NGET substation at Creyke Beck.

1.1.1.3 Hornsea Four has adopted several commitments (primary design principles inherent as part of the project). These commitments (set out within [Volume A4, Annex 5.2: Commitment Register](#)) include; installation techniques and engineering designs/modifications, to avoid a number of impacts or to reduce impacts as far as possible.

### 1.2 Purpose and Implementation of the oLMP

1.2.1.1 This oLMP will form the basis for a final LMP (Commitment (Co)30), which will be prepared by the Principal Contractor, at the direction of the Applicant, and submitted prior to the commencement of the connection works for approval by the relevant planning authority (East Riding of Yorkshire Council (ERYC)). This commitment is supported by inclusion of Requirement 8 of the draft Development Consent Order (DCO) ([Volume C1.1: Hornsea Four Draft Development Consent Order](#)) which states:

**8. —(1)** No stage of the connection works may commence until a written landscape management plan and associated work programme (which accords with the outline landscape management plan and outline ecological management plan) for that stage of the connection works has been submitted to and approved in writing by the relevant



*planning authority in consultation with the relevant SNCBs and the Historic Buildings and Monuments Commission for England.*

**(2)** *The landscape management plan must include details of—*

- a) surveys, assessments and method statements as guided by BS 5837 and the Hedgerows Regulations 1997;*
- b) location, number, species, size and planting density of any proposed planting;*
- c) cultivation, importing of materials and other operations to ensure plant establishment; and*
- d) implementation timetables for the relevant stage of the landscaping works.*

**(3)** *The landscape management plan must be carried out as approved.*

1.2.1.2 Much of the detail set out in the above Requirement 8, such as method statements, number and location of plants, and timetables, will be included in the final LMP but are not covered in this oLMP. The oLMP provides the framework to agree these details, as well as the management and maintenance of the soft landscape proposals (planting and seeding) around the OnSS and the replacement hedgerows and trees along the onshore ECC. It outlines the landscape management requirements that will be undertaken during the first five years following completion of the landscape works, as specified by Requirement 9 of the draft DCO (**Volume C1.1: Hornsea Four Draft Development Consent Order**) which states:

**9. —(1)** *All landscape works must be carried out in accordance with the landscape management plans approved under requirement (1) (provision of landscaping), and in accordance with the relevant recommendations of appropriate British Standards.*

**(2)** *Unless otherwise stated in the approved landscape management plan or enhancement strategy, any tree or shrub planted as part of an approved landscape management plan that, within a period of five years after planting, is removed by the undertaker, dies or becomes, in the opinion of the relevant planning authority, seriously damaged or diseased must be replaced in the first available planting season with a specimen of the same species and size as that originally planted unless otherwise approved in writing by the relevant planning authority.*

1.2.1.3 Hornsea Four will adopt a staged approach to the approval of DCO requirements enabling requirements to be approved in part or in whole prior to the commencement of the relevant stage of works according to whether a staged approach is to be taken to construction of the works in question. This approach will be governed by the inclusion of Requirement 27 within the draft DCO which requires a written scheme setting out the stages of construction to be approved prior to the commencement of the authorised development. The Construction Staging Scheme must be approved by the relevant Planning Authority in respect of the onshore connection works and by the MMO in relation to authorised works seaward of MHWS.

1.2.1.4 The Construction Staging Scheme will detail the stages of construction and the timing of approval of relevant DCO requirements with respect to the relevant construction stages identified within the scheme.

- (1) The authorised development may not be commenced until a written scheme setting out the stages of construction of the authorised development has been submitted to and approved by the relevant planning authority, in relation to the connection works, or the MMO, in relation to works seaward of MHWS.
- (2) The stages of construction referred to in sub-paragraph (1) shall not permit the authorised development to be constructed in more than one overall phase.
- (3) The scheme must be implemented as approved.

1.2.1.5 This oLMP references the following documents:

- [Volume A3, Chapter 4: Landscape and Visual Assessment](#);
- [Volume A4, Annex 4.2: Onshore Crossing Schedule](#); and
- [Volume A6, Annex 3.14: Hedgerow and Arboricultural Survey Report](#).

1.2.1.6 This oLMP stands alongside a number of other plans as set out in [Table 1](#).

**Table 1: Relevant Hornsea Four plans and documents.**

Document	Purpose
<a href="#">Volume A4, Annex 4.6: Design Vision Statement</a>	Presents the 'vision' of Hornsea Four design onshore, setting out how the project mitigation and further enhancement and net gain measures interact.
<a href="#">Volume C1.1: Hornsea Four Draft Development Consent Order</a> and <a href="#">Volume A1, Chapter 4: Project Description</a>	Consents the construction and operation of Hornsea Four using the relevant maximum design parameters associated with Hornsea Four infrastructure.
<a href="#">Volume F2, Chapter 13: Outline Design Plan</a>	Provides the outline approach and key embedded design mitigations of the OnSS and EBI which will inform the detailed design to be approved under Requirement 7 of the draft DCO; ('detailed design' as per the DCO includes layout, scale, finished ground levels, external appearance and materials, hard surfacing materials, vehicular and pedestrian access, parking and circulation areas, minor structures (such as furniture, refuse or other storage units, signs and lighting) and proposed and existing functional services above and below ground).
<a href="#">Volume F2, Chapter 8: Outline Landscape Management Plan</a>	(This document) Sets out the outline approach to landscaping works which will inform the design to be approved under Requirement 8 of the draft DCO.
<a href="#">Volume F2, Chapter 14: Outline Enhancement Strategy</a>	Sets out outline enhancement measures (measures identified over and above mitigation measures) associated with both the natural and human environment. The outline measures will be developed further post-consent of Hornsea Four and approved under Requirement 22 of the draft DCO.

Document	Purpose
<a href="#">Volume F2, Chapter 15: Outline Net Gain Strategy</a>	Covering only matters that are measurable, linked to biodiversity net gain. The outline measures will be developed further post-consent of Hornsea Four and approved under Requirement 6 of the draft DCO.

1.2.1.7 Elements of the enhancement and net gain plans related to landscaping will be provided in the final LMP.

## 2 Landscape and Visual Context

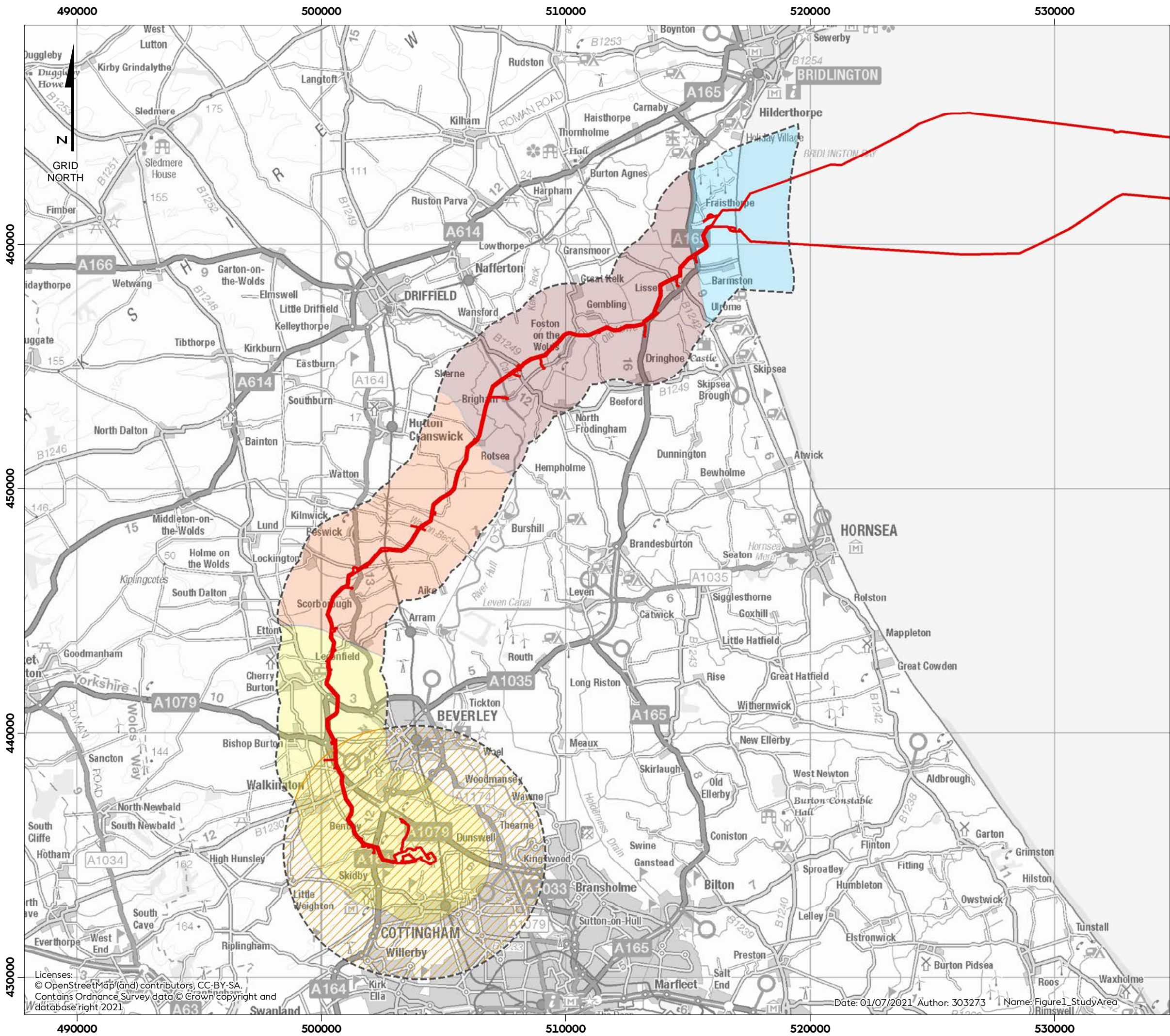
### 2.1 Existing landscape character

2.1.1.1 The landscape baseline for Hornsea Four is described in Section 4.7 of [Volume A3, Chapter 4: Landscape and Visual Assessment](#). A detailed local context analysis is set out in [Volume A4, Annex 4.6: Design Vision Statement](#). Details of habitats and species found within the Hornsea Four Order Limits are presented in [Volume A3, Chapter 3: Ecology and Nature Conservation](#). An arboricultural survey has been undertaken for Hornsea Four and details of the species and condition of all trees and hedgerows can be found in [Volume A6, Annex 3.14: Hedgerow and Arboricultural Survey Report](#), with information on 'Important' hedgerows (as according to the Hedgerow Regulations 1997) and Tree Preservation Orders shown in [Volume D1, Annex 11.1: Tree Preservation Order and Hedgerow Plan](#).








2.1.1.2 For the purposes of the landscape and visual impact assessment (LVIA), the Hornsea Four landscape and visual study area was divided into subareas as shown in [Figure 1](#), based on underlying landscape character, as described in Section 4.5 of [Volume A3, Chapter 4: Landscape and Visual Assessment](#). The subareas are characterised as follows:

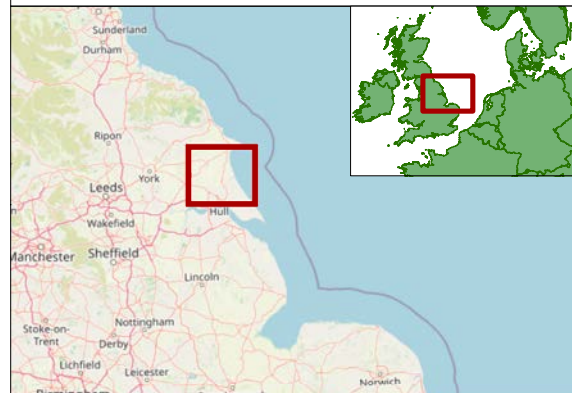
- **Subarea 1: Landfall area** – including the coastal edge and open exposed farmland with large fields, bounded by fragmented hedgerows with occasional small trees;
- **Subarea 2: A165 to Rotsea Lane** – open and largely flat arable farmland, set within a low floodplain with little tree cover; large-scale rectilinear fields, bounded by deep drainage ditches and hedgerows with gaps, containing occasional hedgerow trees;
- **Subarea 3: Rotsea Lane to Leconfield** – intensively farmed rectilinear arable fields of medium scale, bounded by drains and hedgerows, with streams dispersed across the area; predominantly flat, although with gentle undulation along the northern and southern edges;
- **Subarea 4: Leconfield to the OnSS and the 400 kV NGET connection area** – including the section of the onshore ECC that passes through the fringes of the Wolds landscape up to the OnSS, and the 400 kV NGET connection area to the east of the OnSS to the NGET substation; and
- **Subarea 5: OnSS** – the 5 km buffer around the OnSS, comprising flat or gently sloping arable farmland, divided by transport corridors and extensively settled. Irregular fields are bounded by a mixture of hedgerows in various states of repair, as well as drainage ditches and post and wire fencing, with some hedgerow trees.

- 2.1.1.3 As noted in **Volume A3, Chapter 3: Ecology and Nature Conservation**, much of the land within the Hornsea Four Order Limits is arable, with small areas of grassland and smaller areas of woodland and scrub. Broadleaved woodland within the onshore ECC typically consists of a mix of ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and oak (*Quercus robur*). Plantation woodlands additionally contain sweet chestnut (*Castanea sativa*), oak (*Quercus robur*), Scots pine (*Pinus sylvestris*) and hazel (*Corylus avellana*).
- 2.1.1.4 **Volume A3, Chapter 3: Ecology and Nature Conservation** also identifies the majority of hedgerows within the Hornsea Four Order Limits as species-poor, with only occasional species-rich examples. A minority of hedgerows contain field boundary trees. A few small to medium sized blocks of deciduous woodland are found in the area. Higher levels of bat activity have been noted in the hedgerow immediately north of the OnSS.



**Hornsea Four**  
Figure 1  
Landscape and Visual Study Area

-  Order Limits
-  Study Area
-  Sub area 1
-  Sub area 2
-  Sub area 3
-  Sub area 4
-  Sub area 5



Coordinate system: British National Grid  
Scale@A3: 1:150,000

0 2 4 8 Kilometres

0 1 2 4 Miles

REV	REMARK	DATE
	First Issue	21/06/2019
A	Updated following PEIR consultations, for DCO	01/07/2021

Title: Landscape and Visual Study Area  
Document no: HOW04LUC1  
Created by: EL  
Checked by: BG  
Approved by: PMcr



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## 2.2 Predicted landscape and visual effects

- 2.2.1.1 The onshore ECC runs from the landfall near Fraisthorpe, passing west of Beverley, to the OnSS north of Cottingham. The onshore ECC is approximately 39 km in length and will include a maximum 80 m wide temporary, and 60 m wide permanent easement. The OnSS will be located between Cottingham and the A1079 and includes a maximum permanent works area of 164,000 m<sup>2</sup>, of which 34,000 m<sup>2</sup> will comprise landscaping and 4,000 m<sup>2</sup> will comprise attenuation feature(s), with the remainder comprising the OnSS infrastructure. An additional maximum of 130,000 m<sup>2</sup> will be used for temporary works. All areas are shown in [Volume D1, Annex 4.2: Works Plan – Onshore](#).
- 2.2.1.2 The location of the landfall and the route of the onshore ECC have been selected and designed to avoid trees and woodlands (Co2). Horizontal direct drilling (HDD) will be used in key locations, such as at Environment Agency Main rivers, Internal Drainage Board (IDB) drains, railways and main roads (Co1), to avoid surface disturbance.
- 2.2.1.3 The LVIA notes that there will be temporary disturbance along the entire onshore ECC during construction, including excavation, fencing, the use of areas for logistics compounds and construction works. There are 130 individual trees, including six veteran trees, within and/or adjacent to the Hornsea Four Order Limits. Where possible, these trees will be retained and protected in accordance with BS5837:2012 (Trees in relation to design, demolition and construction – Recommendations). The arboricultural survey ([Volume A6, Annex 3.14: Hedgerow and Arboricultural Survey Report](#)) indicates that Ash (*Fraxinus excelsior*) is the most common species, along with elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*). More occasional specimens of oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*), and field maple (*Acer campestre*) are also identified.
- 2.2.1.4 A total of 127 hedgerows have been recorded within the Hornsea Four Order Limits. During onshore ECC construction works, breaches of up to a maximum of 80m length may need to be made through those hedgerows that need to be crossed by the onshore ECC. Seven of the hedgerows within the Hornsea Four Order Limits are considered to be 'important' in terms of the Hedgerow Regulations 1997. Hedgerows alongside the ECC will not be affected.
- 2.2.1.5 There will be temporary disturbance across both permanent and temporary works areas at the OnSS. A small number of hedgerow sections will be removed to facilitate construction, and a native, species-poor hedgerow (approximately 210 m in length) will be removed as it is within the permanent works area. In the longer term, the presence of the OnSS is predicted to have adverse effects on landscape character and visual amenity, though these will be reduced through mitigation as described in [Volume A3, Chapter 4: Landscape and Visual Assessment](#). Mitigation measures are further described in this oLMP.
- 2.2.1.6 Temporary disturbance to landscape and visual amenity due to construction impacts will be mitigated and over time made good through reinstatement and replacement of landscape features as noted in [Section 4](#) of this document, while the proposed mitigation

for the permanent effects of the OnSS includes landscape planting, as described in [Section 3](#) of this document.

## 3 Commitments

3.1.1.1 Co30 is the only commitment currently secured by the oLMP, however [Table 2](#) lists the Hornsea Four Commitments ([Volume A4, Annex 5.2: Commitment Register](#)) that are relevant to the landscape proposals described in this oLMP. These additional commitments are secured through other plans (as set out in [Table 2](#)) but also inform the oLMP.

**Table 2: Hornsea Four commitments relevant to the oLMP.**

Commitment Reference	Hornsea Four Commitment	How the measure will be secured
Co10	Tertiary: Post-construction, the working area will be reinstated to pre-existing condition as far as reasonably practical in line with DEFRA 2009 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PB13298 or latest relevant available guidance.	DCO Requirement 17 (Code of Construction Practice)  DCO Requirement 20 (Restoration of land used temporarily for construction)
Co25	Primary: The onshore export cable corridor (inclusive of the 400kV export cables) will be completely buried underground for its entire length. No overhead pylons will be installed as part of the consented works for Hornsea Four.	DCO Schedule 1, Part 1 Authorised Development
Co26	Primary: Where hedgerows and/or trees require removal, this will be undertaken prior to topsoil removal. Sections of hedgerows and trees which are removed will be replaced using like for like hedgerow species.	DCO Requirement 17 (Code of construction practice); and; DCO Requirement 10 (Ecological Management Plan)
Co27	Primary: Trees identified to be retained within the Onshore Crossing Schedule will be fenced off and worked around. Where works are required close to trees that will remain in situ, techniques will be used to safeguard the root protection zone.	DCO Requirement 17 (Code of Construction Practice); and; DCO Requirement 10 (Ecological Management Plan)
Co30	Secondary: A Landscape Management Plan will be developed in accordance with the Outline Landscape Management Plan. The Landscape Management Plan will include details of mitigation planting at the onshore substation site, including the number, location, species and details of management and maintenance of planting. Where	DCO Requirement 8 (Provision of landscaping)

Commitment Reference	Hornsea Four Commitment	How the measure will be secured
	practical, landscape mitigation planting will be established as early as possible in the construction phase.	
Co68	Secondary: All logistics compounds will be removed, and sites will be reinstated when construction has been completed.	DCO Requirement 17 (Code of Construction Practice)  DCO Requirement 20 (Restoration of land used temporarily for construction)
Co79	Primary: Disturbance to PRowS will be temporary where possible and PRowS will be reinstated as soon as reasonably practical. A PRow Management Plan will be developed in accordance with the Outline PRow Management Plan. The PRow Management Plan will include details of temporary and permanent diversions, closures, gated crossings and signage to be provided during construction.	DCO Requirement 17 (Code of Construction Practice)
Co157	Secondary: Fences, walls, ditches and drainage outfalls will be retained along the onshore export cable corridor and landfall, where possible. Where it is not possible to retain them, any damage will be repaired and reinstated as soon as reasonably practical. The Environment Agency must be notified if damage occurs to any EA Main river or related flood infrastructure.	DCO Requirement 17 (Code of Construction Practice)
Co194	Enhancement: Where agreed with landowners, removed hedgerows and trees will be replaced with hedgerows of a more diverse and locally native species composition than that which was removed.	DCO Requirement 22 (Enhancement Strategy)
Co196	Enhancement: The design of the attenuation feature will incorporate an appropriate landscaping scheme to create an area of biodiverse habitat, as outlined in the Outline Enhancement Strategy.	DCO Requirement 22 (Enhancement Strategy)

## 4 Illustrative landscape proposals

### 4.1 Landfall and Onshore ECC

#### 4.1.1 Mitigation

4.1.1.1 Where removal of trees and hedgerows is necessary to facilitate construction, these will be replaced in line with Co10 (reinstatement of the working area to pre-existing conditions) and Co26 (replacement of hedgerows and trees with like for like species). Replacement will take place as soon as is practicable after installation of the cables. Trees which are removed will be replaced with locally native species to match those removed, where feasible.

4.1.1.2 Replacement planting will comprise native shallow-rooting hedgerow species typical of the local area and existing landscape, planted as 40 – 60 cm high whips (or larger), protected



with spiral rabbit guards or other forms of protection from grazing. To prevent future root damage to cables, no trees will be planted within the cable easement of the onshore ECC.

4.1.1.3 An indicative list of native (and of local and/or UK provenance) hedgerow species that may be used is included in [Table 3](#). Species mixes will be developed further along with the detailed landscape proposals as part of the final LMP. Placement and selection of each species will depend on existing site specific species, conditions and also livestock around the hedgerow such as horses. All species mixes will be subject to approval by ERYC prior to construction through the agreement of the final LMP. This will include a requirement for the appointed planting contractors to consider the source and plant stock where feasible and subject to supply chain.

## 4.1.2 Enhancement

4.1.2.1 In areas identified as water vole habitat, planting will be carried out under the supervision of a suitably qualified ecologist and monitored during establishment (see Section 5.3.4 of [Volume F2, Chapter 3: Outline Ecological Management Plan](#)).

4.1.2.2 Where possible, the LMP will incorporate enhancement measures including:

- Replacement of hedgerows to an improved ecological standard;
- Selecting species with an emphasis on nectar, berries, fruit and nuts which will enhance the foraging opportunities of local fauna and provide benefits for nesting birds, invertebrates and bats, and will create a good continuous and a rich food source (see Section 5.3.2 of [Volume F2, Chapter 3: Outline Ecological Management Plan](#));
- Inclusion of ground flora planting designed to encourage insect biomass;
- Re-seeding of disturbed ground with native species rich seed mixes, pollen and nectar strips, and clover leys;
- Where possible hedges will be double planted with 2 m grassland strips on both sides so there is always a leeward side to forage; and
- Where agreed with landowners, removed hedgerows and trees will be replaced with hedgerows of a more diverse and locally native species composition than that which was removed (Co194).

Table 3: Indicative hedgerow species.

Latin name	Common name
<i>Crataegus monogyna</i>	Hawthorn
<i>Prunus spinosa</i>	Blackthorn
<i>Corylus avellana</i>	Hazel
<i>Alnus glutinosa</i>	Alder
<i>Tilia cordata</i>	Small-leaved lime
<i>Viburnum opulus</i>	Guelder rose
<i>Acer campestre</i>	Field Maple
<i>Ilex aquifolium</i>	Holly
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Rosa arvensis</i>	Field rose
<i>Rosa canina</i>	Dog rose

## 4.2 Onshore Substation

### 4.2.1 Mitigation

4.2.1.1 The LVIA recommends that woodland and hedgerow planting be incorporated around the perimeter of the OnSS, in so far as service, access and maintenance restrictions allow. This will help screen or filter views of the OnSS and will help integrate it into the existing landscape, particularly in the summer months when deciduous vegetation is in leaf. [Figure 2](#) shows an indicative landscape plan for the OnSS, designed to integrate with the indicative OnSS layouts developed in [Volume A1, Chapter 4: Project Description](#). The following sections set out the key elements of the landscape proposals at the OnSS.



**Indicative Plant Species List**

Woodland & Hedgerow

- Acer campestre
- Alnus glutinosa
- Betula pendula
- Pinus sylvestris
- Prunus avium
- Quercus robur

- Corylus avellana
- Crataegus monogyna
- Ilex aquifolium

Scrubland

- Prunus padus
- Prunus spinosa
- Crataegus monogyna
- Corylus avellana
- Malus sylvestris
- Salix caprea

Riparian Scrub

- Alnus glutinosa
- Betula pendula
- Salix caprea
- Prunus spinosa
- Corylus avellana
- Crataegus monogyna
- Ilex aquifolium
- Malus sylvestris
- Viburnum opulus

Wildflower and Grassland

- British Wildflower Seeds,
- Special General Meadow
- Seed Mix or similar

Wetland Planting

- British Wildflower Seeds,
- Wet Meadow Seed Mix or similar

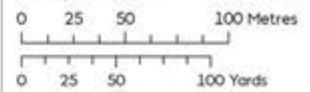
**Hornsea Four**  
**Figure 2**  
**Indicative Landscape Plan**

**Onshore Substation**

- Proposed Trees
- Proposed Scrub
- Proposed Riparian Scrub
- Proposed Attenuation Feature
- Proposed Wildflower Planting
- Proposed Landscape Bund
- Proposed Hedgerow
- Existing Woodland & Hedgerow
- Indicative Building Footprint
- Existing Pylons and OHL
- Proposed Public Footpaths
- Existing Public Footpaths
- Potential Vehicular Entrance into Site
- Proposed Barrier Fence



Coordinate system: British National Grid  
Scale@A3: 1:3,000



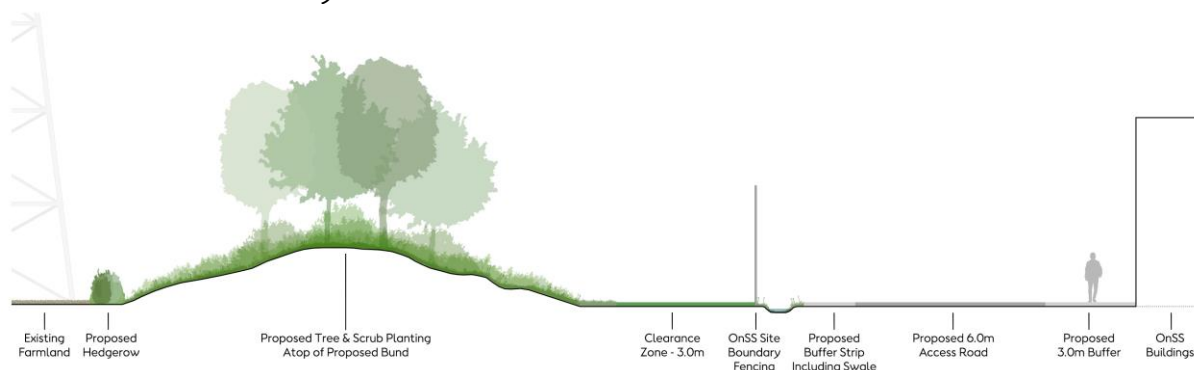
REV	REVISION	DATE
1	First Issue	31/06/2019
2	Updated following PER consultations, for DCO	07/08/2020

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

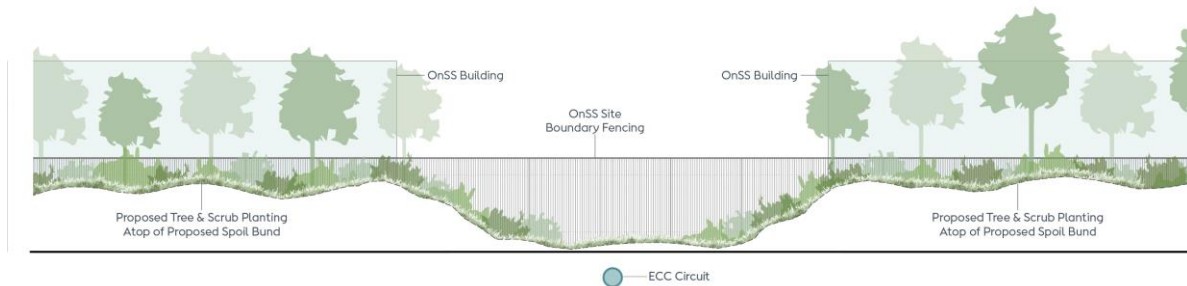
- 4.2.1.2 Low-level earth mounding will be formed along the south western and southern boundary; this will be up to approximately 1.85 m high, with a maximum slope of 1:3. The mounding will be intermittent, to allow open spaces where cables run into the OnSS compound.
- 4.2.1.3 The proposals for soft landscaping focus on the area outside the OnSS security fence, i.e. the 'landscape mitigation area' which has been dedicated for this purpose. The landscape plan also seeks to integrate landscape treatment with sustainable drainage solutions (SuDS) features including the proposed attenuation feature(s) in the south-eastern corner of the OnSS area (see Work No. 7e, [Volume D1, Annex 4.2: Works Plan – Onshore](#)). Retention of existing trees and vegetation is also proposed along the northern boundary (see Work No. 7f, [Volume D1, Annex 4.2](#)).
- 4.2.1.4 Indicative species mixes have been developed ([Figure 2](#)) that are locally appropriate and that will deliver the necessary screening function in order to mitigate the effects as predicted in the LVIA. These mixes will be developed along with the detailed landscape proposals as part of the final LMP. All species mixes will be subject to approval by ERYC prior to construction of the connection works.
- 4.2.1.5 Where practical, landscape mitigation planting will be established as early as possible in the construction phase (Co30). The use of fast-growing species such as blackthorn (*Prunus spinosa*) will ensure mitigation is effective as quickly as possible.
- 4.2.1.6 The following general principles have been applied in developing illustrative landscape proposals for the OnSS:
- Proposals, including species mix, are informed by the trees and vegetation already present in the local area;
  - Landscape planting will provide visual mitigation around the periphery of the OnSS;
  - Minimum clearance distances from fence lines, overhead power lines, and buried cables have been applied in accordance with relevant technical guidance;
  - Native woodland planting will follow an organic layout, incorporating a mix of herb, shrub and tree species to form canopy layers; and
  - Hedgerows will comprise a species-rich mix of native plants.
- 4.2.1.7 The indicative landscape mitigation plan is illustrated in [Figure 2](#). It comprises:
- Native woodland planting to the western and south-western boundaries, to provide visual screening, and incorporating a realigned public right of way;
  - Landscaped mounds along the southern boundary with woodland planting to provide visual screening;
  - Landscape planting around the attenuation pond to the south-east to increase biodiversity interest; and
  - Retention of existing vegetation along the northern boundary, which will be combined with a 'dark zone' to mitigate effects on bats, and establishment of additional hedgerow where space allows.

## 4.2.2 Enhancement

- 4.2.2.1 Enhancement and/or biodiversity net gain opportunities will be incorporated into the landscape mitigation measures where possible, as described in the following sections.
- 4.2.2.2 Mounds will be designed to be organic and sinuous in shape, with soft edges that create a subtle feature within the landscape. The mounds will be planted with grasses, wildflowers, scrub and trees to assist in integration of the new structures into the landscape as well as diversifying the ecological quality of these areas. Planting vegetation on the mounds will elevate the trees and enhance their screening potential. [Figure 3](#) and [Figure 4](#) provide indicative sections through the proposed earthwork mounds and planting along the southern boundary.

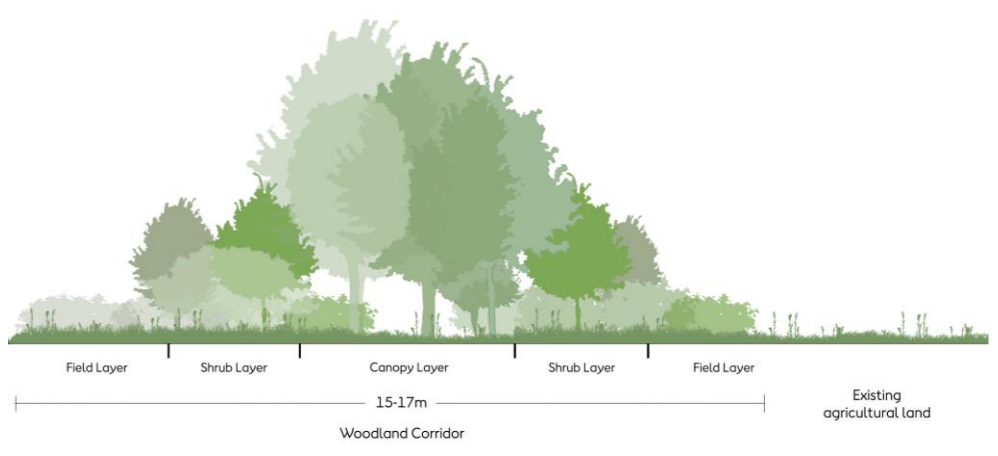


**Figure 3: Cross section of indicative landscape treatment along southern OnSS boundary.**



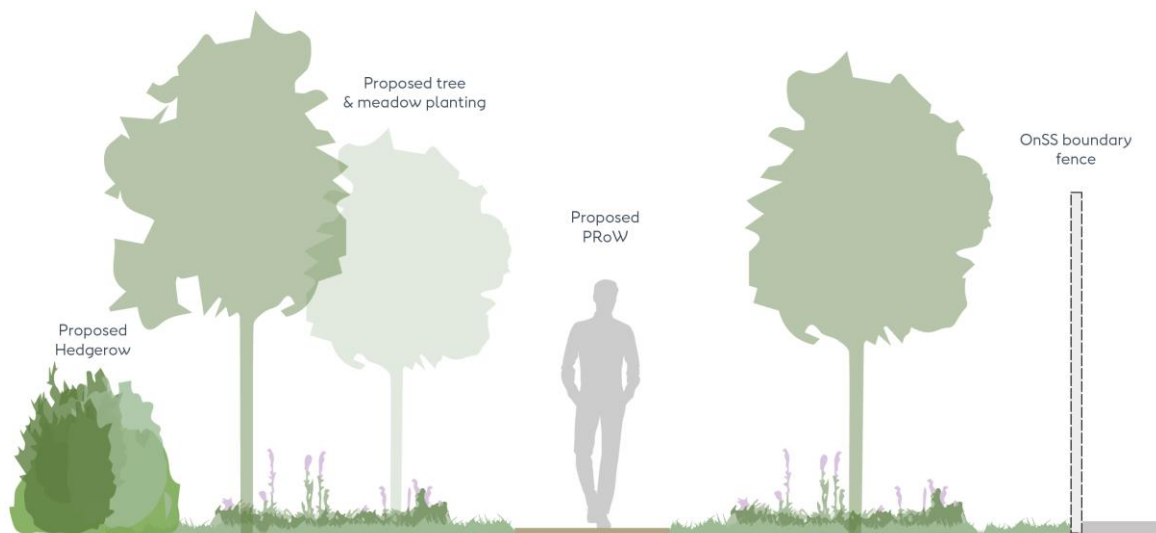
**Figure 4: Long section of indicative landscape treatment along southern OnSS boundary.**

- 4.2.2.3 Landscape treatments to the other OnSS site boundaries will be designed to provide visual mitigation and integration of the structures into the landscape as well as contributing towards the biodiversity net gain opportunities. Woodland planting to the western OnSS site boundary should involve an organic layout mimicking canopy layers found in the wider countryside. This would help integrate the planting into the wider landscape and contribute towards improving the ecological quality of the area.
- 4.2.2.4 Where feasible, the field layer would include native grasslands species and herbs. The shrub layer would introduce native shrub species whilst the canopy layer would include locally native tree species such as beech, alder and oak. An indicative cross section of the woodland to the western OnSS boundary is shown in [Figure 5](#).



**Figure 5: Cross section of indicative landscape boundary treatment.**

4.2.2.5 The realigned public right of way (PRoW) will be routed through the woodland to the west of the OnSS (see Appendix C (Outline PRoW Management Plan) of [Volume F2, Chapter 2: Outline Code of Construction Practice](#)). This route will be designed as an attractive access corridor, including wayfinding and interpretation around the Hornsea Four project. The exact details and specification of the route will be agreed with ERYC at detail design stage. The PRoW route is shown on [Figure 2](#) and indicative landscape treatment along the PRoW in [Figure 6](#).

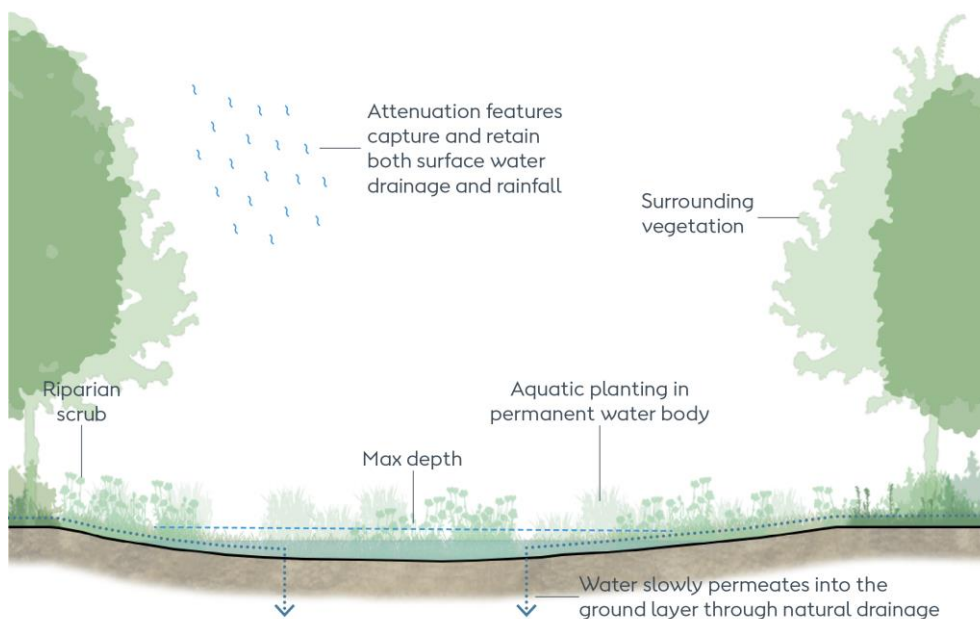


**Figure 6: Cross section of indicative PRoW treatment.**

4.2.2.6 A water attenuation feature will be located at the lowest point of the site (anticipated to be outside of the security fencing) to hold water, allowing it to slowly drain back into the ground and surrounding water courses. It will incorporate suitable wetland planning to enable suspended solids to fall out of the water and for the water and marginal planting to

take up excess nutrients in the water. The attenuation feature will help prevent flooding on-site and in the surrounding landscape, improve the quality of any surface water run-off and create a landscape feature that increases biodiversity, natural habitats and provide visual mitigation of the OnSS.

- 4.2.2.7 Enhancement and/or biodiversity net gain measures include, where appropriate, the incorporation of native aquatic planting and a varied wetland edge for bankside marginal planting, developing a mosaic that will maximise structural diversity. Varying depths will provide over-wintering refuges for wildlife. Ecological value can be further enhanced through the creation of small pools around the margins of any attenuation basin, to allow a wider range of animals and plants to use the site. Indicative planting is shown in [Figure 7](#).



**Figure 7: Cross section of indicative attenuation feature planting.**

## 5 Landscape Maintenance Recommendations

### 5.1 Establishment

- 5.1.1.1 Requirement 9 of the draft DCO ([Volume C1.1: Hornsea Four Draft Development Consent Order](#)) requires that the success of planting will be monitored for five years after planting. During this period any plants which die, are removed, or become seriously damaged or diseased, in the opinion of ERYC, shall be replaced in the first available planting season with a specimen of the same species and size as that originally planted. Unless otherwise approved in writing by ERYC. This is secured in 9(2), Schedule 1, Part 3, [Volume C1.1: Hornsea Four Draft Development Consent Order](#).

- 5.1.1.2 The purpose of the planting is to reinstate hedgerows removed to facilitate construction works, and to provide visual mitigation at the OnSS, as well as providing benefit to the landscape and biodiversity of the area more generally. Maintenance activities will be undertaken in accordance with these purposes and will aim towards the establishment of dense, diverse hedgerows and naturalistic woodland. Deadwood is a particularly important woodland habitat and any deadwood or brushwood arisings will be retained on site and stacked as small habitat piles, subject to landowner agreement.
- 5.1.1.3 During the five-year maintenance period, activities will be carried out in accordance with the Maintenance Schedule provided in [Appendix A](#) of this document.
- 5.1.1.4 Maintenance activities will be undertaken in accordance with the following, subject to any updates:
- BS4428: 1989 Code of practice for general landscape operations (excluding hard landscapes); and
  - BS8545: 2014 Trees: from Nursery to independence in the landscape – Recommendations.
- 5.1.1.5 In addition to the activities detailed in the Indicative Maintenance Schedule ([Appendix A](#)), progress in vegetation establishment will also be monitored to make sure that an appropriate mosaic of woodland, grassland and scrub habitats develop. Litter refuse and debris will be removed from site after every site visit.
- 5.1.1.6 At the end of the five-year maintenance period, all stakes, ties and plant shelters will be removed from the planting area.

## **5.2 Longer term management**

- 5.2.1.1 In the longer term, woodland within the permanent OnSS Order Limits will require regular maintenance to ensure that trees do not interfere with the operation and maintenance of the project.
- 5.2.1.2 Further enhancement would include thinning woodland and starting a coppicing process. Under a coppicing regime cuts will be made on a cyclical rotation to ensure that the screening benefits are not compromised. Coppice cuts will be made to the same level as the previous cut, without stumps proud of the knob. Cuts should be made at an angle, to direct water away from the knob and stop it pooling. As the woodland matures it is important to identify and develop a plan of succession. The age structure will be diversified to benefit the widest range of wildlife, the highest level of resilience, and long-term effectiveness of screening.



## 6 References

British Standards Institution (1989) British Standard (BS) 4428: 1989 Code of practice for general landscape operations (excluding hard landscapes).

British Standards Institution (2014) BS 8545: 2014 Trees: from Nursery to independence in the landscape – Recommendations.

British Standards Institution (2012) BS 5837: 2012 Trees in relation to design, demolition and construction.

## Appendix A – Indicative Maintenance Schedule.

YEAR 1	MONTHS	Visits
Watering and monitoring to ensure soil is constantly moist during the growing season, particularly during the first month after planting/seeding	First month after planting and continuing through growing season	As required
Check and repair guards, stakes and ties	May and October	2
Weed control maintaining weed-free ground around the base of new plants	July and October	2
Replacing failed planting if necessary	October or November	1
Cutting of grassland areas	Every 6-8 weeks	4
YEAR 2	MONTHS	Visits
Check and repair guards, stakes and ties	May & October	2
Weed control maintaining weed-free ground around the base of new plants	May & August	2
Removal of undesirable species	May	1
Overseeding (If necessary)	April or September	2
Replacement of failed planting	October or November	1
Cutting of grassland areas	March and August	2
YEAR 3	MONTHS	Visits
Weed control maintaining weed-free ground around the base of new plants	May and August	2
Removal of undesirable species	May	1
Replacement of failed planting	October or November	1
Cutting of grassland areas	March and August	2
Cut hedgerow down to 2 m height	October or November	1
YEAR 4	MONTHS	Visits
Weed control maintaining weed-free ground around the base of new plants	May and August	2
Removal of undesirable species	May	1
Overseeding (If necessary)	April or September	2
Replacement of failed planting	October or November	1
Cutting of grassland areas	March and August	2
Cut hedgerows down to 2 m height	October or November	1
YEAR 5	MONTHS	Visits
Weed control maintaining weed-free ground around the base of new plants	May and August	2
Removal of undesirable species	May	1
Restocking of failed planting if required	October or November	1
Thinning if required	October or November	1
Cut hedgerows down to 2 m height	October or November	1
Removal of guards, stakes and ties	October or November	1