

Hornsea Project Three
Offshore Wind Farm



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Other Documents
Outline Landscape Management Plan

PINS Document Reference: A8.7
APFP Regulation 5(2)(a)

Date: May 2018

Hornsea 3
Offshore Wind Farm

Orsted

Other Documents

Outline Landscape Management Plan

Report Number: A8.7

Version: Final

Date: May 2018

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

www.hornseaproject3.co.uk

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

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Glossary

Term	Definition
Code of Construction Practice	Code to ensure that best practice construction work is undertaken with minimal impacts upon local people and the environment.
Development Consent Order as made	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects.
Horizontal Directional Drilling	Method for the installation of pipes, conduits and cables using a surface launched drilling rig. This is used as a proxy for trenchless technology.
Onshore elements of Hornsea Three	Hornsea Three landfall area, onshore cable corridor, the onshore HVAC booster station, the onshore HVDC converter/HVAC substation and the interconnection with the Norwich Main National Grid substation.

Acronyms

Acronyms	Description
DCO	Development Consent Order
EMP	Ecological Management Plan
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
LMP	Landscape Management Plan

Units

Unit	Description
km	Kilometre (distance)
m	Metre (distance)

1. Introduction

- 1.1.1.1 This Outline Landscape Management Plan (Outline LMP) has been prepared on behalf of Orsted in support of the application for a Development Consent Order (DCO) for Hornsea Three.
- 1.1.1.2 This Outline LMP is the framework to agree detailed masterplans and operations for the management and maintenance of the soft landscape proposals (planting and seeding) for the onshore HVAC booster station (if required) and onshore HVDC converter/HVAC substation, and management and maintenance of hedges and trees replaced and additional planting along the onshore cable corridor to ensure that the design and mitigation intent is realised. The landscape proposals and management prescriptions will provide the necessary information to help ensure successful establishment and growth of proposed planting and seeding.
- 1.1.1.3 This Outline LMP describes management to be carried out during the first five years following planting or seeding.
- 1.1.1.4 Local planning authorities will be consulted on this Outline LMP after submission of the DCO application and a final LMP will be agreed with them.
- 1.1.1.5 This Outline LMP should be read in conjunction with the Outline Ecological Management Plan (Outline EMP) (document reference A8.6) which will also accompany the DCO application, which describes the ecology and nature conservation mitigation measures that will be implemented prior to, during and post construction of the onshore elements of Hornsea Three, and the long-term management measures to be set in place for reinstated and enhanced habitats.

2. Existing Landscape Context

- 2.1.1.1 Onshore export cables will be buried underground in up to 6 trenches, running in a south / south westerly direction from the proposed landfall area at Weybourne in north Norfolk for approximately 55 km, before connecting into the national grid. The final corridor will be 80 m in width, of which 20 m will be used for temporary working areas. It runs across a primarily rural landscape incorporating farmland with fields and roads frequently enclosed by hedgerows, areas of woodland, river valleys and frequent small settlements.
- 2.1.1.2 The site of the onshore HVAC booster station is adjacent to an area of woodland to the east and arable fields enclosed by hedgerows to the west. The landscape within 5 km of the onshore HVAC booster station encompasses a largely rural area primarily given over to agriculture with frequent small blocks of woodland and contains a number of small settlements. The landform is undulating with some shallow valleys.
- 2.1.1.3 The site of the onshore HVDC converter/HVAC substation lies south of the A47 and east of the B1113. Arable fields enclosed by hedgerows lie to the west and south of the site, and a sand and gravel quarry under restoration lies to the east. Two lines of pylons and overhead electricity cables cross the landscape immediately south west of the site. North of the A47 lies the southern edge of Norwich and its suburbs which are cut through by the River Yare valley and surrounded by wetlands and parkland. To the south of the A47 the landscape becomes more rural and primarily in agricultural use. There are numerous settlements within this rural landscape ranging from hamlets to large villages and the area is scattered with small woodlands. Landform within 5 km of the site of the onshore HVDC converter/HVAC substation gently undulates with two distinct river valleys, those of the Yare and the Tas, cutting through it.

3. Illustrative Landscape Proposals for the Onshore HVAC Booster Station and Onshore HVDC Converter/HVAC Substation

3.1 Concept and Design Justification

3.1.1.1 The landscape proposals for the proposed onshore HVAC booster station and onshore HVDC converter/HVAC substation are both based upon the generic objectives below. Proposals are designed to:

- Reduce the landscape and visual impacts of Hornsea Three during operation by filtering and screening views of the developments and integrating them into their landscape contexts;
- Retain and protect all existing trees, hedgerows and other vegetation except where removal is necessary to construct and maintain Hornsea Three;
- Enhance existing landscape features such as hedgerows by planting gaps with hedgerow plants and trees along field edges adjacent to the onshore HVAC booster station and onshore HVDC converter/HVAC substation;
- Compliment, extend and join existing landscape elements and habitats including hedgerows, trees and woodlands; and
- Utilise native species that are present locally.

3.1.1.2 The onshore HVAC booster station and onshore HVDC converter/HVAC substation lie within different landscapes and are different in terms of, inter alia, scale and appearance. In addition to the generic objectives listed above, the design principles followed are specifically designed to respond to the proposals and contexts for each development as described below.

3.1.2 Onshore HVAC Booster Station

3.1.2.1 The illustrative landscape proposals for the onshore HVAC booster station are shown on the following drawings in Appendix A:

Drawing number	Drawing title
6117_499	Onshore HVAC Booster Station Illustrative Landscape Proposals
6117_500	Onshore HVAC Booster Station Illustrative Planting and Seeding Proposals Sheet 1 of 2

Drawing number	Drawing title
6117_501	Onshore HVAC Booster Station Illustrative Planting and Seeding Proposals Sheet 2 of 2

3.1.2.2 Key principles followed during the design process were as follows and would be maintained during the preparation of the final landscape plans:

- The onshore HVAC booster station would be located close to existing woodlands and in local low point in the landscape so that it would be largely screened in views from the east, and seen with a woodland backdrop in views from the west.
- Create a HVAC booster station enclosed by a mixed wood which appears as an extension to the existing woods to the east. This would be appropriate to local landscape character and also help to screen and filter views of the onshore HVAC booster station infrastructure from surrounding landscape and visual receptors, and integrate it into its landscape context.
- Along the line of the onshore cable corridor, a strip of mature trees and scrub along the field boundary immediately north of the onshore HVAC booster station, and hedgerows bounding fields further to the north and to the south, would be retained by installation of cables by trenchless techniques (e.g. Horizontal Directional Drilling, HDD).
- Create areas of new woodland and scrub, and new and strengthened hedgerows with hedgerow trees that would provide further screening and filtering of views, enhance landscape character and provide enhanced habitats for wildlife.

3.1.3 Onshore HVDC Converter/HVAC Substation

3.1.3.1 Illustrative landscape proposals for the onshore HVDC converter/HVAC substation are shown on the following drawings in Appendix A:

Drawing number	Drawing title
6117_509	Onshore HVDC Converter/HVAC Substation Illustrative Landscape Proposals
6117_510	Onshore HVDC Converter/HVAC Substation Illustrative Planting and Seeding Proposals Sheet 1 of 2
6117_511	Onshore HVDC Converter/HVAC Substation Illustrative Planting and Seeding Proposals Sheet 2 of 2

Drawing number	Drawing title
6117_512	Onshore HVDC Converter/HVAC Substation Indicative Areas of Vegetation to be Removed

3.1.3.2 Key principles followed during the design process were as follows and would be maintained during the preparation of the final landscape plans:

- v. The onshore HVDC converter/HVAC substation would be contained within existing hedged field boundaries, two lines of pylons and overhead lines to the south west, the B1113 to the west and the A47 to the north. These features and associated vegetation would help to limit the spread of effects on landscape character beyond the site and provide some filtering and screening of views.
- vi. Existing hedgerows and hedgerow trees along the route of the onshore cable corridor would be retained at the site boundaries of the onshore HVDC converter/HVAC substation by use of trenchless techniques (e.g. HDD) except where removal is necessary to allow construction and operation access. There would be some locations where hedges and trees would need to be removed such as at the proposed site entrance and where cables are to be installed; the locations for this removal would be confirmed post consent / pre commencement of the onshore HVDC converter/HVAC substation. Indicative areas of vegetation which may potentially be removed are shown on drawing 6117_512 in Appendix A.
- vii. New woodland and scrub planting is proposed around the onshore HVDC converter/HVAC substation. This would be appropriate to local landscape character and also help to screen and filter views of the onshore HVDC converter/HVAC substation from surrounding landscape and visual receptors, and integrate it into its landscape context.
- viii. Strengthen existing hedgerows by planting gaps with new hedge plants and hedgerow trees that would provide further screening and filtering of views, enhance landscape character and provide enhanced habitats for wildlife.
- ix. Minimise harm to the Norwich Southern Bypass Landscape Protection Zone (NSBLPZ). Policy DM4.6 Landscape Setting of Norwich of the South Norfolk Development Management Policies Document (2015) aims to protect the openness of the NSBLPZ around the southern bypass (A47) and, where possible, enhance the landscape setting of the southern bypass. There are existing open views of countryside looking south across the site from the A47 and these would be obscured by the onshore HVDC converter/HVAC substation. A short distance west and east of the site existing southern views from the A47 are obscured by roadside vegetation or embankments, restricting views of open countryside (see the Environmental Statement chapter 6, annex 4.5: Photograph Panels, Wirelines and Photomontages, section 4: Views from the A47).
The proposed onshore HVDC converter/HVAC substation would be set back from the A47 with woodland and woodland edge planting proposed between the substation and the road. This would, as planting matures, create a view of woodland in the foreground with the onshore HVDC converter/HVAC substation beyond. This would create a longer section of A47 with views of open

countryside obscured, but views of the onshore HVDC converter/HVAC substation would be filtered by proposed and existing vegetation and existing landform.

- x. Minimise harm to the Undeveloped Approaches to Norwich. Policy DM4.6 Landscape Setting of Norwich of the South Norfolk Development Management Policies Document (2015) aims to protect Undeveloped Approaches to Norwich, including the B1113. The policy states that all development proposals within the visual zone of influence viewed from the identified Undeveloped Approaches to Norwich should reinforce and avoid undermining the rural character of the Undeveloped Approaches to Norwich.

The onshore HVDC converter/HVAC substation would be set back from the B1113 with woodland and woodland edge planting proposed between the substation and this road. Existing trees and hedges along the B1113 would be retained and protected except where it is necessary for them to be removed for construction and operation of the onshore HVDC converter/HVAC substation. A permanent gap would be required at the site entrance on the B1113, but its width would be the minimum required for construction and operation in order to maximise screening of the onshore HVDC converter/HVAC substation.

- 3.1.3.3 The illustrative landscape proposals on drawings 6117_509 and 6117_511 in Appendix A also show potential tree planting within the edges of fields adjacent to residential properties to the south west (House on the Hill) and south east (Pond Cottage, Holly View Cottage, Park View Cottage, Mangreen Cottage) to provide additional screening. This would be offered as optional mitigation, to be taken forward should residents wish this, and it is not essential to mitigate the effects. Some residents may prefer to retain the openness of views (including some visibility of the onshore HVDC converter/HVAC substation) rather than having a tree belt close to their house.

4. Onshore Cable Corridor Trees and Hedges

- 4.1.1.1 Section 2.2.7 of the Outline EMP describes that approximately 14.35 km of hedgerows occur within the Hornsea Three onshore cable corridor, many of these would be retained by methods including crossing using trenchless techniques such as HDD and, in total, up to approximately 7.39 km of existing hedgerows would be removed to allow construction of Hornsea Three. Some of these hedges contain trees which will also be removed.
- 4.1.1.2 Protection and re-planting of hedgerows will be implemented to minimise adverse landscape, visual and other potential effects arising as a result of Hornsea Three. Furthermore, enhancement of hedgerows that are retained, currently in poor condition, provides an opportunity to achieve long term benefits.
- 4.1.1.3 Section 2.2.7 of the Outline EMP states that all sections of hedgerow removed to enable construction of the onshore cable corridor will be replanted as soon as practicable after each phase of cable installation. Replacement planting will comprise native shallow-rooting hedgerow species typical of the area, planted as 40 – 60 cm high whips, protected with spiral rabbit guards or other forms of protection from grazing. To prevent future root damage to cables, no trees will be planted along the Hornsea Three onshore cable corridor. In addition to the reinstatement of hedgerows severed by the onshore cable corridor, where practicable and as agreed with the land owner, hedgerow enhancement will be undertaken within a 100 m wide corridor that will contain the working corridor. The aim of enhancement will be to increase native species diversity and / or improve habitat structure and connectivity across the landscape. Trees will not be planted above the onshore cable corridor. However, where practicable, broadleaved native trees will be planted along hedgerows elsewhere in the enhancement corridor.
- 4.1.1.4 Where hedgerows and tree lines are crossed using open cut trenching techniques, measures will be taken to minimise vegetation removal and damage. These measures are likely to include reducing the length of hedgerow removed at crossing points, where this is possible.

5. Management

- 5.1.1.1 This section sets out the management prescriptions (regimes) for proposed vegetation, to be carried out during the first five years following planting.

5.2 Health & Safety

- 5.2.1.1 At all times it is a requirement that the relevant British Standards, Statutory Regulations and Codes of Practice are complied with. Particular attention should be paid to the latest issues of the following:

- The Food and Environment Protection Act;
- The Control of Pesticides Regulations;
- The Control of Substances Hazardous to Health Regulations;
- The Code of Practice for using Plant Protection Products; and
- The Health and Safety Work etc. Act.

- 5.2.1.2 The work should be undertaken using appropriate and well-maintained equipment operated by qualified and supervised staff.

- 5.2.1.3 Work should be planned and carried out in a manner and at times to minimise unnecessary disturbance to local residents, as well as taking into account the correct timing of seasonal works such as pruning and hedge cutting to comply with good horticultural practice and any restrictions imposed by ecological constraints.

5.3 Woodland and Woodland Edges

- 5.3.1.1 Woodland is a key component of the landscape proposals for the onshore HVAC booster station and onshore HVDC converter/HVAC substation. The aim of the management prescriptions is to guide the creation of a well-balanced, naturalistic woodland, with a dense and varied woodland edge and a dense canopy to provide screening.

- xi. Adjust stakes and ties at the end of each growing season or at any other time as necessary to maintain support and avoid chafing damage and thus minimise the possibility of infection taking hold within any wounds.
- xii. Inspect and if necessary repair deer, livestock and rabbit protection fencing regularly to ensure that it is effective at preventing browsing of plants by deer, livestock and rabbits.
- xiii. Maintain the ground around each plant weed free for the first five years to minimise competition allowing plants to grow unimpeded.
- xiv. Replace all plants that die annually at the end of each growing season during the first five years, or when it is agreed that the woodland has established effectively and individual plant replacement is unnecessary.

- xv. By year 3 woodland may need to be thinned. When choosing the specimens to be retained, it should be remembered that the primary functions of the woodland are to lessen landscape and visual impacts of Hornsea Three and help to integrate it into its setting. Some specimens with interesting form, windswept habit etc. should be retained alongside more conventional specimens.
- xvi. Remove stakes and ties in year 5, or when each plant is deemed firm and self-supporting.
- xvii. If used, plant shelters and guards should be removed once the trees/shrubs reach a level of maturity where they can withstand browsing wildlife and livestock.
- xviii. If the thinned specimens are intended to grow back as coppice the cut needs to be angled to ensure water will not pool on the cut.
- xix. Brushwood and other vegetative arisings, will be stacked within the woodland as small habitat piles, or disposed of off site as instructed.
- xx. Deadwood is a particularly important woodland habitat and is of value to bats, birds, invertebrates and fungi. To ensure the woodland has the requisite deadwood habitat, dead and dying trees, where they do not present a significant safety risk, should be retained in a variety of situations. This may include creating eco-stick monoliths, a process of severe pollarding that removes all but the trunk of the tree to create standing deadwood
- xxi. Plants that pose a health and safety risk will be managed appropriately.

5.3.2 Longer Term Management

- xxii. Beyond the first five years the woodland will require thinning, starting a coppicing process. Cuts will be made on a cyclical rotation to ensure that the screening benefits are not compromised. Coppice cuts should 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.
- xxiii. As the woodland matures it is important to identify and develop a plan of succession. The age structure should to be diversified to benefit the widest range of wildlife, the highest level of resilience, and long term effectiveness of screening.

5.4 Hedges

- 5.4.1.1 New and replacement hedges, and existing hedges with gaps planted with new hedge plants and trees, will be managed as described below.

- 5.4.1.2 The objective is to increase the habitat potential of the hedges, some of which may also have mature trees in them, whilst maintaining them as key features of the surrounding landscape, and to provide screening of Hornsea Three.

- xxiv. Adjust stakes and ties of hedgerow trees at the end of each growing season or at any other time as necessary to maintain support and avoid chafing damage and thus minimise the possibility of infection taking hold within any wounds.
- xxv. Maintain the ground around each plant weed free for the first five years to minimise competition allowing plants to grow unimpeded.

- xxvi. Replace all plants that die annually at the end of each growing season.
- xxvii. Remove stakes and ties in year 5, or when the trees are deemed firm and self-supporting.
- xxviii. If used, plant shelters and guards should be removed once the trees/shrubs reach a level of maturity where they can withstand browsing wildlife.
- xxix. Cut hedges annually between September and February to approximately 2m height, or the height of existing hedges as appropriate. The hedgerows should be managed to create a thick base with a good density of stems.
- xxx. Plants that pose a health and safety risk will be managed appropriately.

5.5 Meadow Grass

- 5.5.1.1 A strip of meadow grass is proposed along the north side of the onshore HVDC converter/HVAC substation to retain a gap between an existing French drain and proposed woodland and woodland edge planting, to allow access for maintenance of the French drain.
- 5.5.1.2 Meadow grass will be cut every 6 to 8 weeks during the first year following seeding. From the second year onwards it will be cut twice per year, in early spring and late summer. All cuttings will be removed and unwanted weed species (e.g. creeping thistle and spear thistle) will be removed, either by topping before flowering or using spot treatment with an appropriate herbicide.

6. References

Department for Environment, Food and Rural Affairs (2006). The Code of Practice for using Plant Protection Products 2006;

South Norfolk Council (2015). South Norfolk Local Plan Development Management Policies Document Adoption Version.

The Control of Pesticides Regulations 1986. London, The Stationary Office;

The Control of Substances Hazardous to Health Regulations 2002. London, The Stationary Office;

The Food and Environment Protection Act 1985. London, The Stationary Office; and




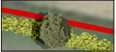

The Health and Safety Work etc. Act 1974. London, The Stationary Office.

Appendix A Drawings

Drawing number	Drawing title
6117_499	Onshore HVAC Booster Station Illustrative Landscape Proposals
6117_500	Onshore HVAC Booster Station Illustrative Planting and Seeding Proposals Sheet 1 of 2
6117_501	Onshore HVAC Booster Station Illustrative Planting and Seeding Proposals Sheet 2 of 2
6117_509	Onshore HVDC Converter/HVAC Substation Illustrative Landscape Proposals
6117_510	Onshore HVDC Converter/HVAC Substation Illustrative Planting and Seeding Proposals Sheet 1 of 2
6117_511	Onshore HVDC Converter/HVAC Substation Illustrative Planting and Seeding Proposals Sheet 2 of 2
6117_512	Onshore HVDC Converter/HVAC Substation Indicative Areas of Vegetation to be Removed

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- LEGEND
-  Order limits
 -  Proposed Woodland
 -  Proposed woodland edge and planting over cables
 -  Existing hedgerows. Gaps planted with hedgerow plants and oak trees
 -  Illustrative HVAC booster station layout. Design including potential additional planting and seeding areas will be determined post consent / pre commencement of the booster station.

REV.	DESCRIPTION	APP.	DATE

L D A DESIGN

PROJECT TITLE
HORNSEA PROJECT THREE

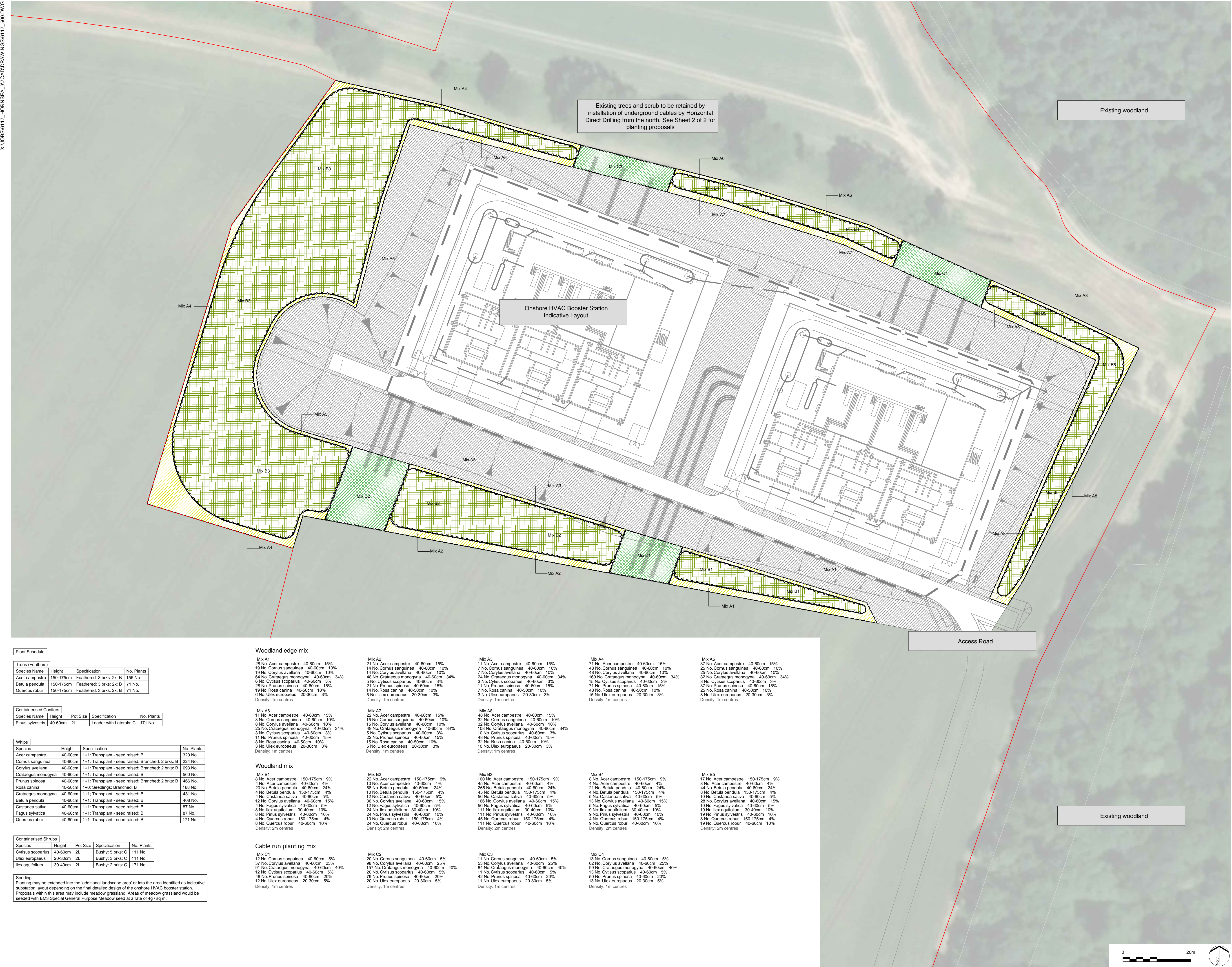
DRAWING TITLE
Onshore HVAC Booster Station
Illustrative Landscape Proposals

ISSUED BY	Peterborough	T: 01733 310471	
DATE	Feb 2018	DRAWN	SH
SCALE@A3	1:1,500	CHECKED	PB
STATUS	Planning	APPROVED	PB

DWG. NO. 6117_499

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.
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Sources: Esri

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Plant Schedule

Trees (Feathers)			
Species Name	Height	Specification	No. Plants
Acer campestre	150-175cm	Feathered: 3 brks: 2x: B	155 No.
Betula pendula	150-175cm	Feathered: 3 brks: 2x: B	71 No.
Quercus robur	150-175cm	Feathered: 3 brks: 2x: B	71 No.

Containerised Conifers			
Species Name	Height	Pot Size	Specification
Pinus sylvestris	40-60cm	2L	Leader with Laterals: C

Whips			
Species	Height	Specification	No. Plants
Acer campestre	40-60cm	1+1: Transplant - seed raised: B	320 No.
Cornus sanguinea	40-60cm	1+1: Transplant - seed raised: Branched: 2 brks: B	224 No.
Corylus avellana	40-60cm	1+1: Transplant - seed raised: Branched: 2 brks: B	693 No.
Crataegus monogyna	40-60cm	1+1: Transplant - seed raised: B	560 No.
Prunus spinosa	40-60cm	1+1: Transplant - seed raised: Branched: 2 brks: B	466 No.
Rosa canina	40-50cm	1+0: Seedlings: Branched: B	168 No.
Crataegus monogyna	40-60cm	1+1: Transplant - seed raised: B	431 No.
Betula pendula	40-60cm	1+1: Transplant - seed raised: B	408 No.
Castanea sativa	40-60cm	1+1: Transplant - seed raised: B	87 No.
Fagus sylvatica	40-60cm	1+1: Transplant - seed raised: B	87 No.
Quercus robur	40-60cm	1+1: Transplant - seed raised: B	171 No.

Containerised Shrubs			
Species	Height	Pot Size	Specification
Cytisus scoparius	40-60cm	2L	Bushy: 5 brks: C
Ulex europaeus	20-30cm	2L	Bushy: 3 brks: C
Ilex aquifolium	30-40cm	2L	Bushy: 2 brks: C

Seeding:
Planting may be extended into the 'additional landscape area' or into the area identified as indicative substation layout depending on the final detailed design of the onshore HVAC booster station. Proposals within this area may include meadow grassland. Areas of meadow grassland would be seeded with EM3 Special General Purpose Meadow seed at a rate of 4g / sq m.

Woodland edge mix

Mix A1
28 No. Acer campestre 40-60cm 15%
19 No. Cornus sanguinea 40-60cm 10%
19 No. Corylus avellana 40-60cm 10%
64 No. Crataegus monogyna 40-60cm 34%
6 No. Cytisus scoparius 40-60cm 3%
28 No. Prunus spinosa 40-60cm 15%
19 No. Rosa canina 40-50cm 10%
6 No. Ulex europaeus 20-30cm 3%
Density: 1m centres

Mix A2
21 No. Acer campestre 40-60cm 15%
14 No. Cornus sanguinea 40-60cm 10%
14 No. Corylus avellana 40-60cm 10%
48 No. Crataegus monogyna 40-60cm 34%
5 No. Cytisus scoparius 40-60cm 3%
21 No. Prunus spinosa 40-60cm 15%
14 No. Rosa canina 40-50cm 10%
5 No. Ulex europaeus 20-30cm 3%
Density: 1m centres

Mix A3
11 No. Acer campestre 40-60cm 15%
7 No. Cornus sanguinea 40-60cm 10%
7 No. Corylus avellana 40-60cm 10%
24 No. Crataegus monogyna 40-60cm 34%
3 No. Cytisus scoparius 40-60cm 3%
11 No. Prunus spinosa 40-60cm 15%
7 No. Rosa canina 40-50cm 10%
3 No. Ulex europaeus 20-30cm 3%
Density: 1m centres

Mix A4
71 No. Acer campestre 40-60cm 15%
48 No. Cornus sanguinea 40-60cm 10%
48 No. Corylus avellana 40-60cm 10%
160 No. Crataegus monogyna 40-60cm 34%
15 No. Cytisus scoparius 40-60cm 3%
71 No. Prunus spinosa 40-60cm 15%
48 No. Rosa canina 40-50cm 10%
15 No. Ulex europaeus 20-30cm 3%
Density: 1m centres

Mix A5
37 No. Acer campestre 40-60cm 15%
25 No. Cornus sanguinea 40-60cm 10%
25 No. Corylus avellana 40-60cm 10%
82 No. Crataegus monogyna 40-60cm 34%
8 No. Cytisus scoparius 40-60cm 3%
37 No. Prunus spinosa 40-60cm 15%
25 No. Rosa canina 40-50cm 10%
8 No. Ulex europaeus 20-30cm 3%
Density: 1m centres

Woodland mix

Mix B1
8 No. Acer campestre 150-175cm 9%
4 No. Acer campestre 40-60cm 4%
20 No. Betula pendula 40-60cm 24%
4 No. Betula pendula 150-175cm 4%
4 No. Castanea sativa 40-60cm 5%
12 No. Corylus avellana 40-60cm 15%
4 No. Fagus sylvatica 40-60cm 5%
8 No. Ilex aquifolium 30-40cm 10%
8 No. Pinus sylvestris 40-60cm 10%
4 No. Quercus robur 150-175cm 4%
8 No. Quercus robur 40-60cm 10%
Density: 2m centres

Mix B2
22 No. Acer campestre 150-175cm 9%
10 No. Acer campestre 40-60cm 4%
58 No. Betula pendula 40-60cm 24%
10 No. Betula pendula 150-175cm 4%
12 No. Castanea sativa 40-60cm 5%
36 No. Corylus avellana 40-60cm 15%
4 No. Fagus sylvatica 40-60cm 5%
24 No. Ilex aquifolium 30-40cm 10%
24 No. Pinus sylvestris 40-60cm 10%
10 No. Quercus robur 150-175cm 4%
24 No. Quercus robur 40-60cm 10%
Density: 2m centres

Mix B3
100 No. Acer campestre 150-175cm 9%
45 No. Acer campestre 40-60cm 4%
265 No. Betula pendula 40-60cm 24%
46 No. Betula pendula 150-175cm 4%
56 No. Castanea sativa 40-60cm 5%
166 No. Corylus avellana 40-60cm 15%
59 No. Fagus sylvatica 40-60cm 5%
111 No. Ilex aquifolium 30-40cm 10%
111 No. Pinus sylvestris 40-60cm 10%
45 No. Quercus robur 150-175cm 4%
111 No. Quercus robur 40-60cm 10%
Density: 2m centres

Mix B4
8 No. Acer campestre 150-175cm 9%
4 No. Acer campestre 40-60cm 4%
21 No. Betula pendula 40-60cm 24%
4 No. Betula pendula 150-175cm 4%
5 No. Castanea sativa 40-60cm 5%
13 No. Corylus avellana 40-60cm 15%
5 No. Fagus sylvatica 40-60cm 5%
9 No. Ilex aquifolium 30-40cm 10%
9 No. Pinus sylvestris 40-60cm 10%
4 No. Quercus robur 150-175cm 4%
9 No. Quercus robur 40-60cm 10%
Density: 2m centres

Mix B5
17 No. Acer campestre 150-175cm 9%
8 No. Acer campestre 40-60cm 4%
44 No. Betula pendula 40-60cm 24%
8 No. Betula pendula 150-175cm 4%
5 No. Castanea sativa 40-60cm 5%
28 No. Corylus avellana 40-60cm 15%
19 No. Fagus sylvatica 40-60cm 5%
19 No. Ilex aquifolium 30-40cm 10%
19 No. Pinus sylvestris 40-60cm 10%
8 No. Quercus robur 150-175cm 4%
19 No. Quercus robur 40-60cm 10%
Density: 2m centres

Cable run planting mix

Mix C1
12 No. Cornus sanguinea 40-60cm 5%
98 No. Corylus avellana 40-60cm 25%
157 No. Crataegus monogyna 40-60cm 40%
12 No. Cytisus scoparius 40-60cm 5%
46 No. Prunus spinosa 40-60cm 20%
12 No. Ulex europaeus 20-30cm 5%
Density: 1m centres

Mix C2
20 No. Cornus sanguinea 40-60cm 5%
98 No. Corylus avellana 40-60cm 25%
157 No. Crataegus monogyna 40-60cm 40%
20 No. Cytisus scoparius 40-60cm 5%
79 No. Prunus spinosa 40-60cm 20%
20 No. Ulex europaeus 20-30cm 5%
Density: 1m centres

Mix C3
11 No. Cornus sanguinea 40-60cm 5%
53 No. Corylus avellana 40-60cm 25%
94 No. Crataegus monogyna 40-60cm 40%
11 No. Cytisus scoparius 40-60cm 5%
42 No. Prunus spinosa 40-60cm 20%
11 No. Ulex europaeus 20-30cm 5%
Density: 1m centres

Mix C4
13 No. Cornus sanguinea 40-60cm 5%
62 No. Corylus avellana 40-60cm 25%
99 No. Crataegus monogyna 40-60cm 40%
20 No. Cytisus scoparius 40-60cm 5%
50 No. Prunus spinosa 40-60cm 20%
13 No. Ulex europaeus 20-30cm 5%
Density: 1m centres

LEGEND

Order limits

Minimum area of planting

Proposed woodland edge

Proposed woodland

Proposed cable run planting

Additional landscape areas

Additional potential landscape area within indicative scheme. See note 2 below.

Notes:

- Indicative onshore HVAC booster station layout is taken from Kelvin drawing number J00299-C-100-B and will change post consent / pre commencement of the onshore HVAC booster station. The detailed design will be informed by the project phasing and project capacity being taken forward.
- This drawing shows the minimum area of planting around the onshore HVAC booster station. Planting may be extended into the 'additional landscape area' or into the area identified as indicative substation layout depending on the final detailed design of the onshore HVAC booster station which will be determined at post consent / pre commencement of the onshore HVAC booster station. The area of 'additional landscape area' or area identified as indicative substation layout if not required to accommodate the onshore HVAC booster station will be subject to detailed design using the plant species and mixes outlined above in the 'minimum area of planting'.
- If the onshore HVAC booster station is constructed in two phases with a gap between phases, landscape proposals outside 'minimum area of planting' will be subject to a potentially temporary landscape scheme during the gap between phases.
- Within the Order Limits, the cable locations are illustrative and will be confirmed during the post consent / pre commencement of the onshore HVAC booster station. Cables may enter and leave the booster station anywhere along the northern and southern boundaries. A five metre offset between proposed woodland and cables is shown. It is proposed that the land within this offset is planted with a native shrub mix that excludes trees. Both the offset distance and species selection will be confirmed post consent / pre commencement of the onshore HVAC booster station.
- Extent of vegetation removal will be confirmed post consent / pre commencement of the onshore HVAC booster station. This indicative scheme does not propose removal of any existing trees, shrubs or hedges within the extents of this plan.
- The proposed planting will be enclosed and protected by 1.8m high deer fence with 800mm high rabbit proof mesh. The detailed design of the fencing will be confirmed post consent / pre commencement of the onshore HVAC booster station.
- Refer to drawing 6117_501 (Sheet 2 of 2) for proposed planting within wider landscape.

REV. DESCRIPTION

APP. DATE

LD&A DESIGN

PROJECT TITLE

HORNSEA PROJECT THREE

DRAWING TITLE

Onshore HVAC Booster Station
Illustrative Planting and Seeding Proposals
Sheet 1 of 2

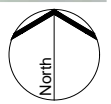
ISSUED BY Peterborough
DATE Jan. 18
SCALE: A1 1:500
STATUS Planning

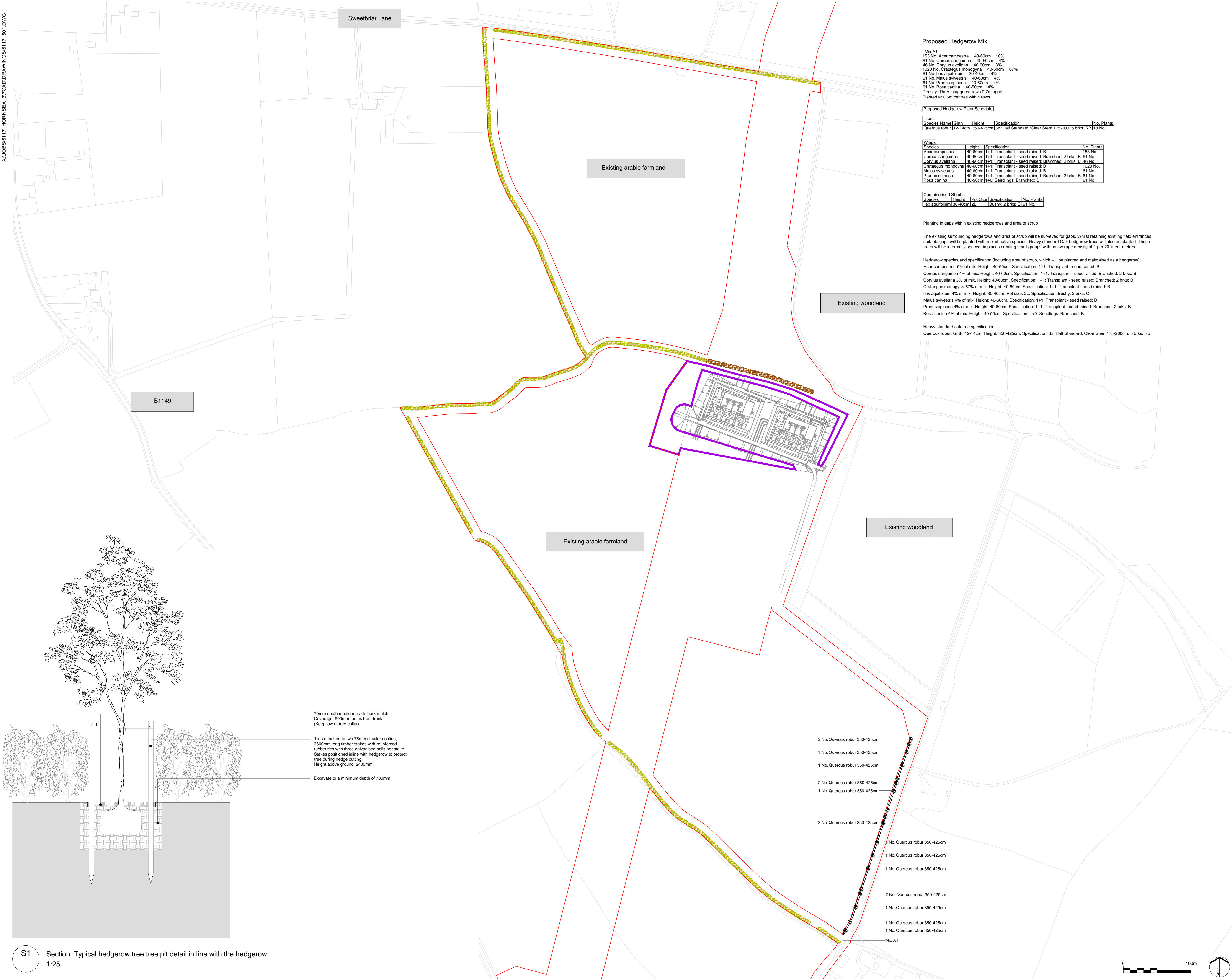
T: 01733 310 471
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CHECKED PB
APPROVED PB

DWG. NO 6117_500

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All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Sources: Esri





LEGEND

- Order limits
- Refer to 6117_500 (Sheet 1 of 2) for detailed proposals
- Proposed hedgerow
- Hedgerow to be surveyed and gaps planted.
- Area of scrub to be surveyed and gaps planted and maintained as hedgerow.

REV. DESCRIPTION APP. DATE

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PROJECT TITLE
HORNSEA PROJECT THREE

DRAWING TITLE
Onshore HVAC Booster Station
Illustrative Planting and Seeding Proposals
Sheet 2 of 2

ISSUED BY Peterborough T: 01733 310 471
DATE Jan. '18 DRAWN SH
SCALE@A1 1:2,500 CHECKED PB
STATUS Planning APPROVED PB

DWG. NO 6117_501

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Sources Ordnance Survey

S1 Section: Typical hedgerow tree tree pit detail in line with the hedgerow
1:25

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LEGEND

- Order limits
- Proposed woodland
- Proposed woodland edge and planting over cables
- Existing hedgerows. Gaps planted with hedgerow plants and oak trees.
- Potential woodland planting subject to agreement with residents of adjacent properties
- Illustrative HVDC converter/HVAC substation layout
Design including potential additional planting and seeding areas will be determined post consent / pre commencement of the substation.

REV.	DESCRIPTION	APP.	DATE

L D A DESIGN

PROJECT TITLE
HORNSEA PROJECT THREE

DRAWING TITLE
Onshore HVAC Converter/HVAC Substation
Illustrative Landscape Proposals

ISSUED BY	Peterborough	T: 01733 310471	
DATE	Feb 2018	DRAWN	SH
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STATUS	Planning	APPROVED	PB







DWG. NO. 6117_509

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LEGEND

	Order limits
<u>Minimum area of planting and seeding</u>	
	Proposed woodland edge
	Proposed woodland
	Proposed cable run planting
	Proposed meadow grass
<u>Additional landscape areas</u>	
	Additional potential landscape area within indicative scheme. See note 2 below.

1. Indicative onshore HVDC converter/HVAC substation layout taken from Kelvin drawing number J00299-C-300 and will be informed post consent / pre commencement of the HVDC converter/HVAC substation. The layout will be confirmed and/or changed by the project phasing and project capacity being taken forward.
2. This drawing shows the minimum area of planting around the onshore HVDC converter/HVAC substation. Planting may be extended into the 'additional landscape area' or into the area identified as 'additional sensitive area' or into the area identified in the final detailed design of the onshore HVDC converter/HVAC substation which will be determined post consent / pre commencement of the onshore HVDC converter/HVAC substation. The area of 'additional landscape area' or area identified as 'additional landscape layout' not required to accommodate the onshore HVDC converter/HVAC substation is shown in the detailed design using the plant species and mixes outlined above in the 'minimum area of planting and seeding'.
The onshore HVDC converter/HVAC substation will be constructed in two phases with a gap between phases.
The following proposals outline 'minimum area of planting and seeding' which is subject to a final detailed design and landscape scheme during the gap between phases.
The following proposals are illustrative and are illustrative and will be confirmed during post consent / pre commencement of the onshore HVDC converter/HVAC substation. Cables may cross the site boundary and extend into the landscape to the north and southern boundaries. A five metre offset between proposed woodland and cables is shown. It is proposed that the width of this offset will be determined by the planning authority that excludes trees. Both the offset distance and species selection will be confirmed by post consent / pre commencement of the onshore HVDC converter/HVAC substation.
3. The proposed planting will be enclosed and protected by 1.8m high deer fence with 800mm high rabbit proof mesh. The proposed planting will be confirmed by post consent / pre commencement of the HVDC converter/HVAC substation. Existing hedgways and trees will be maintained and protected. Existing hedgways and tree routes will be maintained and protected. Indicative extent of removal of existing trees, shrubs or other vegetation will be extended into the landscape. The proposed construction of the onshore HVDC converter/HVAC substation is shown on drawing 61152-2.
4. The proposed planting will be confirmed post consent / pre commencement of the HVDC converter/HVAC substation.
5. A French drain exists along the northern boundary of the site and will be replaced with a new French drain, made of wide strip fence of planting between the drain and woodland edge. The offset between planting and the French drain will be confirmed post consent / pre commencement of the HVDC converter/HVAC substation.
6. A landscape scheme for replacement of hedgerows removed by the proposed installation will be confirmed post consent / pre commencement of the HVDC converter/HVAC substation. This will need to address the requirements of the planning requirements and constraints including sightlines, easements to the site.
7. The key landscape principles along the B1113 are:
Retain all existing hedgerows, trees and scrub along the site boundary with B1113.
Minimise the need for new hedgerows and trees necessary to allow construction and operation access.
The import cables will be installed across the B1113 using a trench installation technique.
Drilling (which will not require removal of roadside hedgerows. On completion of construction, replace hedgways removed by the proposed installation with a new French drain, made of wide strip fence of planting that is proposed to the north and south of the site entrance, to minimise the gap in roadside hedgerows and maximise the extent of the landscape around the HVDC converter/HVAC substation.
Planting alongside existing pylons and overhead lines is to be maintained in accordance with the requirements of National Planning guidance.
Tree, to ensure no interference with power lines.
To protect 6117, 6118 (between 2 and 2) for proposed road planting within wider landscape.

Plant Schedule				
Trees (Feathers)				
Species Name	Height	Specification	No. Plants	
Acer campestre	150-175cm	Feathered: 3 brks; 2x: B	193	No.
Betula pendula	150-175cm	Feathered: 3 brks; 2x: B	322	No.
Prunus avium	150-175cm	Feathered: 5 brks; 2x: B	193	No.
Quercus robur	150-175cm	Feathered: 3 brks; 2x: B	322	No.
Whips				
Species	Height	Specification	No. Plants	
Acer campestre	40-60cm	1+1: Transplant - seed raised: B	1026	No.
Betula pendula	40-60cm	1+1: Transplant - seed raised: B	1601	No.
Castanea sativa	40-60cm	1+1: Transplant - seed raised: B	322	No.
Cornus sanguinea	40-60cm	1+1: Transplant - seed raised: Branched: 2 brks: B	784	No.
Fragaria vesca	40-60cm	1+1: Transplant - seed raised: Branched: 2 brks: B	2178	No.
Crataegus monogyna	40-60cm	1+1: Transplant - seed raised: B	1344	No.
Crataegus pinnatifida	40-60cm	1+1: Transplant - seed raised: B	1637	No.
Fagus sylvatica	40-60cm	1+1: Transplant - seed raised: B	322	No.
Malus sylvestris	40-60cm	1+1: Transplant - seed raised: B	193	No.
Prunus avium	40-60cm	1+0: Seedlings: B	137	No.
Prunus pissardi	40-60cm	1+1: Transplant - seed raised: Branched: 2 brks: B	1398	No.
Quercus robur	40-60cm	1+1: Transplant - seed raised: B	897	No.
Rosa canina	40-60cm	1+0: Seedlings: Branched: B	195	No.
Containerised Shrubs				
Species	Height	Pot Size	Specification	No. Plants
Cytisus scoparius	40-60cm	2L	Bushy: 5 brks: C	205
Ilex aquifolium	30-40cm	2L	Bushy: 5 brks: C	514
Ulex europaeus	20-30cm	2L	Bushy: 3 brks: C	205
Seeding:				
Meadow grassland				
Area to be seeded with EMS Meadow seed 1,750m2				
Seed at a rate of 40g / sq m				
EMS3 Special General Purpose Meadow seed required 7.0kg				

Woodland edge mix		
Mix A-1	Mix A-2	Mix A-3
50 No. Acer campestre 40-60cm 10%	59 No. Acer campestre 40-60cm 10%	16 No. Acer campestre 40-60cm 10%
135 No. Cornus sanguinea 40-60cm 15%	85 No. Cornus sanguinea 40-60cm 15%	24 No. Cornus sanguinea 40-60cm 15%
90 No. Corylus avellana 40-60cm 10%	58 No. Corylus avellana 40-60cm 10%	16 No. Corylus avellana 40-60cm 10%
314 No. Crataegus monogyna 40-60cm 35%	204 No. Crataegus monogyna 40-60cm 35%	5 No. Crataegus monogyna 40-60cm 35%
45 No. Prunus spinosa 40-60cm 5%	32 No. Malus sylvestris 40-60cm 5%	8 No. Malus sylvestris 40-60cm 5%
45 No. Prunus avium 40-60cm 5%	30 No. Prunus avium 40-60cm 5%	8 No. Prunus avium 40-60cm 5%
135 No. Prunus spinosa 40-60cm 15%	88 No. Prunus spinosa 40-60cm 15%	24 No. Prunus spinosa 40-60cm 15%
45 No. Rosa carolina 40-60cm 5%	70 No. Rosa carolina 40-60cm 5%	8 No. Rosa carolina 40-60cm 5%
Density: 1m centres	Density: 1m centres	Density: 1m centres
Mix A-4	Mix A-5	Mix A-6
51 No. Acer campestre 40-60cm 10%	157 No. Acer campestre 40-60cm 10%	13 No. Acer campestre 40-60cm 10%
76 No. Cornus sanguinea 40-60cm 15%	236 No. Cornus sanguinea 40-60cm 15%	20 No. Cornus sanguinea 40-60cm 15%
90 No. Corylus avellana 40-60cm 10%	58 No. Corylus avellana 40-60cm 10%	16 No. Corylus avellana 40-60cm 10%
176 No. Crataegus monogyna 40-60cm 35%	54 No. Crataegus monogyna 40-60cm 35%	45 No. Crataegus monogyna 40-60cm 35%
26 No. Malus sylvestris 40-60cm 5%	26 No. Malus sylvestris 40-60cm 5%	7 No. Malus sylvestris 40-60cm 5%
45 No. Prunus avium 40-60cm 5%	76 No. Prunus avium 40-60cm 5%	7 No. Prunus avium 40-60cm 5%
135 No. Prunus spinosa 40-60cm 15%	78 No. Prunus spinosa 40-60cm 15%	20 No. Prunus spinosa 40-60cm 15%
45 No. Rosa carolina 40-60cm 5%	70 No. Rosa carolina 40-60cm 5%	7 No. Rosa carolina 40-60cm 5%
Density: 1m centres	Density: 1m centres	Density: 1m centres
Woodland mix		
Mix B-1	Mix B-2	Mix B-3
52 No. Acer campestre 150-175cm 3%	63 No. Acer campestre 150-175cm 3%	57 No. Acer campestre 150-175cm 3%
174 No. Acer campestre 40-60cm 10%	63 No. Acer campestre 40-60cm 10%	38 No. Acer campestre 40-60cm 10%
43 No. Betula pendula 40-60cm 25%	132 No. Betula pendula 40-60cm 25%	117 No. Betula pendula 40-60cm 25%
132 No. Betula pendula 150-175cm 3%	132 No. Betula pendula 150-175cm 3%	117 No. Betula pendula 150-175cm 3%
87 No. Castanea sativa 40-60cm 5%	27 No. Castanea sativa 40-60cm 5%	195 No. Castanea sativa 40-60cm 5%
208 No. Corylus avellana 40-60cm 12%	64 No. Corylus avellana 40-60cm 12%	468 No. Corylus avellana 40-60cm 12%
150 No. Fagus sylvatica 40-60cm 10%	27 No. Fagus sylvatica 40-60cm 10%	150 No. Fagus sylvatica 40-60cm 10%
139 No. Ilex aquifolium 30-40cm 8%	43 No. Ilex aquifolium 30-40cm 8%	311 No. Ilex aquifolium 30-40cm 8%
150 No. Quercus robur 150-175cm 3%	150 No. Prunus avium 150-175cm 3%	117 No. Prunus avium 150-175cm 3%
87 No. Prunus avium 40-60cm 5%	27 No. Prunus avium 40-60cm 5%	195 No. Prunus avium 40-60cm 5%
243 No. Quercus robur 40-60cm 14%	74 No. Quercus robur 40-60cm 14%	544 No. Quercus robur 40-60cm 14%
150 No. Quercus robur 150-175cm 3%	27 No. Quercus robur 150-175cm 3%	150 No. Quercus robur 150-175cm 3%
Density: 2m centres	Density: 2m centres	Density: 2m centres

8	No. <i>Acer campestre</i>	150-175cm	3%
20	No. <i>Acer campestre</i>	40-60cm	10%
64	No. <i>Betula pendula</i>	40-60cm	25%
13	No. <i>Betula pendula</i>	150-175cm	5%
13	No. <i>Corylus sativa</i>	40-60cm	5%
31	No. <i>Corylus avellana</i>	40-60cm	12%
13	No. <i>Fagus sylvatica</i>	40-60cm	5%
13	No. <i>Ilex aquifolium</i>	30-40cm	8%
8	No. <i>Prunus avium</i>	150-175cm	3%
13	No. <i>Prunus avium</i>	40-60cm	5%
36	No. <i>Quercus robur</i>	40-60cm	14%
13	No. <i>Quercus robur</i>	150-175cm	5%

Density: 2m centres

Cable run planting mix

Mix C0	Mix C1	Mix C1
120 No. Cornus sanguinea 40-60cm 5%	8 No. Cornus sanguinea 40-60cm 5%	127 No. Cornus sanguinea 40-60cm 5%
450 No. Corylus avellana 40-60cm 25%	32 No. Corylus avellana 40-60cm 25%	634 No. Corylus avellana 40-60cm 25%
560 No. Crataegus monogyna 40-60cm 40%	52 No. Crataegus monogyna 40-60cm 40%	1015 No. Crataegus monogyna 40-60cm 40%
70 No. Cydonia scoparium 40-60cm 5%	70 No. Cydonia scoparium 40-60cm 5%	127 No. Cydonia scoparium 40-60cm 5%
280 No. Prunus spinosa 40-60cm 20%	31 No. Prunus spinosa 40-60cm 20%	634 No. Prunus spinosa 40-60cm 20%
70 No. Ulex europaeus 20-30cm 5%	70 No. Ulex europaeus 20-30cm 5%	127 No. Ulex europaeus 20-30cm 5%
Density: 1m centres	Density: 1m centres	Density: 1m centres

REV.	DESCRIPTION	APP. DATE
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PROJECT TITLE
HORNSEA PROJECT THREE

DRAWING TITLE
Onshore HVDC Converter/HVAC Substation
Illustrative Planting and Seeding Proposals
Sheet 1 of 2

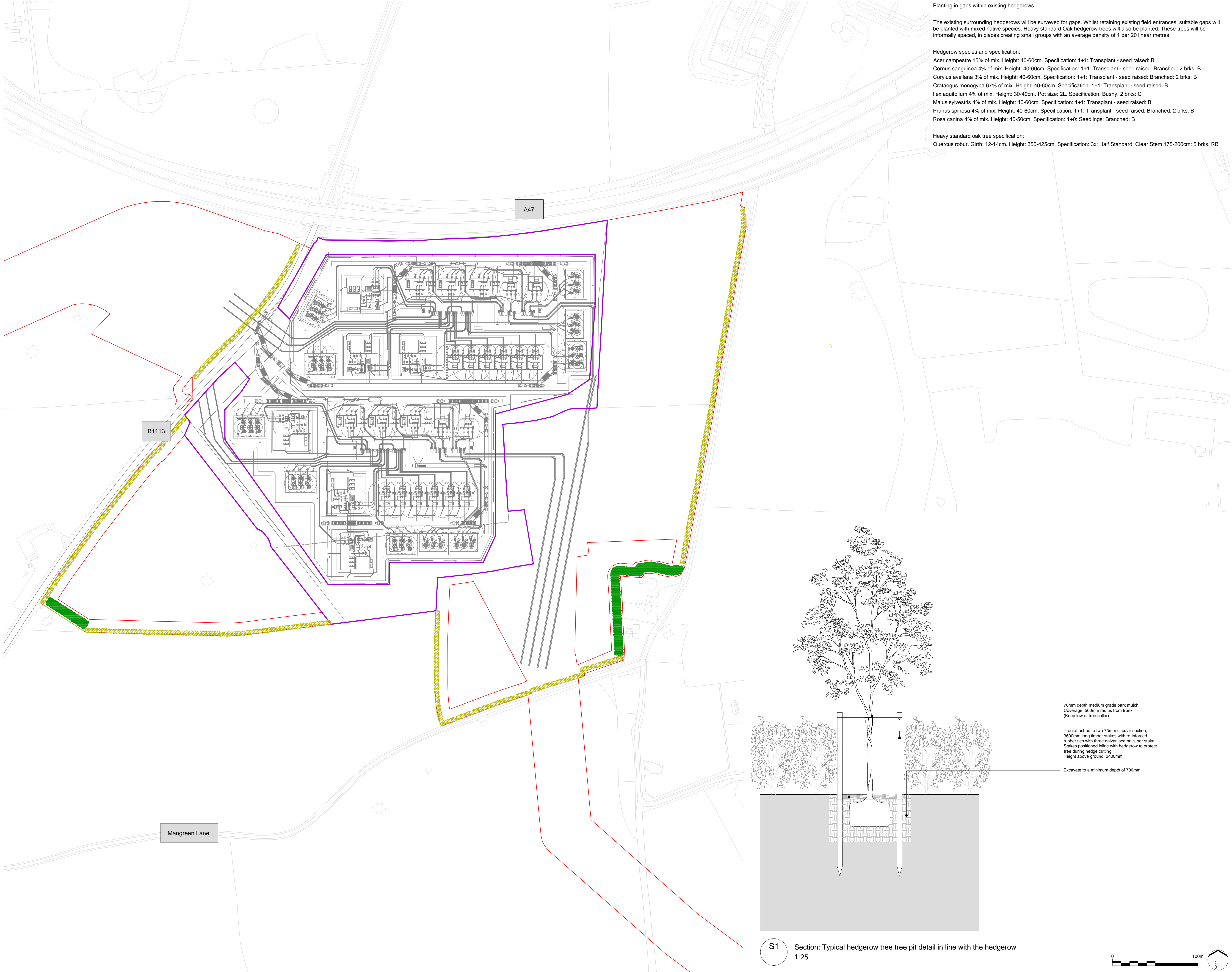
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DATE	Jan. '18	DRAWN	SH
SCALE@A1	1:1,000	CHECKED	PB
STATUS	Planning	APPROVED	PB

DWG. NO 6117_510

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Area measurements for indicative purposes only.

Sources Esri

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Planting in gaps within existing hedgerows

The existing surrounding hedgerows will be surveyed for gaps. Whilst retaining existing field entrances, suitable gaps will be planted with mixed native species. Heavy standard Oak hedgerow trees will also be planted. These trees will be informally spaced, in places creating small groups with an average density of 1 per 20 linear metres.

Hedgerow species and specification:

- Acer campestre 15% of mix. Height: 40-60cm. Specification: 1+1: Transplant - seed raised: B
- Cornus sanguinea 4% of mix. Height: 40-60cm. Specification: 1+1: Transplant - seed raised: Branched: 2 brks: B
- Corylus avellana 3% of mix. Height: 40-60cm. Specification: 1+1: Transplant - seed raised: Branched: 2 brks: B
- Crataegus monogyna 67% of mix. Height: 40-60cm. Specification: 1+1: Transplant - seed raised: B
- Ilex aquifolium 4% of mix. Height: 30-40cm. Pot size: 2L. Specification: Bushy: 2 brks: C
- Malus sylvestris 4% of mix. Height: 40-60cm. Specification: 1+1: Transplant - seed raised: B
- Prunus spinosa 4% of mix. Height: 40-60cm. Specification: 1+1: Transplant - seed raised: Branched: 2 brks: B
- Rosa canina 4% of mix. Height: 40-50cm. Specification: 1+0: Seedlings: Branched: B

Heavy standard oak tree specification:

Quercus robur. Girth: 12-14cm. Height: 350-425cm. Specification: 3x: Half Standard: Clear Stem 175-200cm: 5 brks. RB

LEGEND

- Order limits
- Refer to 6117_510 (Sheet 1 of 2) for detailed proposals
- Hedgerow to be surveyed and gaps planted.
- Potential woodland planting area, subject to consultation with adjacent residential land owners

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PROJECT TITLE
HORNSEA PROJECT THREE

DRAWING TITLE
Onshore HVDC Converter/HVAC Substation
Illustrative Planting and Seeding Proposals
Sheet 2 of 2

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STATUS	Planning	APPROVED PB

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LEGEND

Order limits

Indicative extent of removal of existing trees, shrubs or hedges within the extents of this plan to allow for the construction of the indicative onshore HVDC converter/HVAC substation. Extent of vegetation removal will be confirmed post consent / pre commencement of the HVDC converter/HVAC substation.

REV. DESCRIPTION APP. DATE

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PROJECT TITLE
HORNSEA PROJECT THREE

DRAWING TITLE
Onshore HVDC Converter/HVAC Substation
Indicative Areas of Vegetation to be Removed

ISSUED BY	Peterborough	T: 01733 310 471
DATE	March '18	DRAWN DaM
SCALE@A1	1:1,000	CHECKED PB
STATUS	Planning	APPROVED PB

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