FIVE ESTUARIES OFFSHORE WIND FARM

ENVIRONMENTAL STATEMENT

VOLUME 6, PART 3, CHAPTER 1: ONSHORE PROJECT DESCRIPTION (TRACKED)

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Revision	C
Pursuant to	Change Request
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Date	October 2024

In preparation of this document Five Estuaries Wind Farm Ltd has made reasonable efforts to ensure that the content is accurate, up to date and complete for purpose.

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	Mar 24	DCO Application	VE OWFL	GOBE	VE OWFL
B	Apr 24	S.51 Advice Response	GOBE	VE OWFL	VE OWFL
C	Oct 24	Change Request	GOBE	VE OWFL	VE OWFL

CONTENTS

TABLES

FIGURES

DEFINITION OF ACRONYMS

Term	Definition
AIS	Air Insulated Switchgear
AIL	Abnormal Indivisible Load
Array areas	The area where the WTGs will be located.
CBS	Cement Bound Sand
CfD	Contract for Difference
CoCP	Code of Construction Practice
CoSHH	Control of Substances Hazardous to Health
DCO	Development Consent Order
DOB	Depth of burial
DOE	Depth of Excavation
EACN	East Anglia Connection Node
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Gas Insulated Switchgear
HDD	Horizontal Directional Drilling
HDPE	High Density Polyethylene
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
IEMA	Institute of Environmental Management & Assessment
LBBG	Lesser Black-Backed Gull
LGV	Light Goods Vehicles
MDS	Maximum Design Scenario
LEMP	Landscape and Ecology Management Plan
MOT	Ministry of Transport
NGET	National Grid Electricity Transmission
North Falls	North Falls Offshore Wind Farm
NPS	National Policy Statement

Term	Definition
O&M	Operation and Maintenance
OnSS	Onshore Substation
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PRoW	Public Right of Way
SMA	Stone Mastic Asphalt
SoS	Secretary of State
TCCs	Temporary Construction Compound
TDC	Tendring District Council
TJB	Transition Joint Bay
VE	Five Estuaries Offshore Wind Farm
VE OWFL	Five Estuaries Offshore Wind Farm Limited
WTG	Wind Turbine Generators

GLOSSARY OF TERMS

Term	Definition
400 kV connection	400 kV cable connection between the proposed VE substation (OnSS) and the grid connection point
DCO	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) which would be approved by the relevant Secretary of State (SoS).
ES	Environmental Statement (the documents that collate the processes and results of the EIA).
Grid Connection Point	The point at which the Onshore ECC connects to the National Grid.
Jointing Pit	An underground structure where sections of onshore cable are joined within cable ducts.
Landfall	The landfall denotes the location where the offshore export cables are brought ashore and jointed to the onshore cable circuits in TJBs.
MDS	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures are commitments made by the project to reduce and/or eliminate the potential for significant effects that may arise as a result of the project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts through the assessment process.
Onshore ECC	The Onshore ECC is the working area for the onshore cable construction.
OnSS	Where the power supplied from the wind farm is adjusted (including voltage, power quality and power factor as required) to meet the UK System-Operator Transmission-Owner Code for supply to the National Grid substation.
OnSS access zone	The area which will contain the final OnSS access route north of Ardleigh Road (both construction and operational).
OnSS construction zone	The area in which the final OnSS temporary construction compound (TCC) footprint will be located.

Term	Definition
OnSS zone	The area in which the final operational OnSS footprint will be located.
Order Limits	The extent of development including all works, access routes, Temporary Construction Compounds (TCCs) and visibility splays.
Route section	A defined section of the onshore project.
TJB	Transition Joint Bay is an underground concrete unit where the offshore cable is jointed to the onshore cable.

1 ONSHORE PROJECT DESCRIPTION

1.1 INTRODUCTION

1.1.1 This Chapter of the Environmental Statement describes the onshore elements of the proposed Five Estuaries Offshore Wind Farm project (VE). It sets out the VE design and components for the onshore infrastructure associated with the construction, operation and maintenance (O&M) and decommissioning of the Project.

1.1.2 This chapter has been prepared by Five Estuaries Offshore Wind Farm Limited (the Applicant), and sets out:

- The design envelope approach, setting out the design envelope for the onshore project components and the techniques used to build, operate and decommission the onshore elements of VE;
- Details of the approach to onshore construction co-ordination with the proposed North Falls Offshore Wind Farm (North Falls);
- An overview of the project location and proposed onshore site boundaries; and
- The onshore project programme.

1.1.3 The Landfall for the purpose of this chapter means the point at which the offshore export cables meet the onshore export cables in the transition joint bay (TJB). Full details of the offshore elements of VE, including the description of the Landfall and associated works, is provided in Volume 6, Part 2, Chapter 1: Offshore Project Description.

1.1.4 A detailed description of the site selection process that has resulted in the selection of the locations of project infrastructure and routes taken is also provided in Volume 6, Part 1, Chapter 4: Site Selection and Alternatives.

CO-ORDINATION AND WORKING WITH NORTH FALLS OFFSHORE WIND FARM

1.1.5 The onshore export cable corridor and substation arrangement have been designed in co-ordination with the adjacent North Falls Offshore Wind Farm project, and the onshore cable routes of the two projects will run immediately adjacent. Moreover, the substations have been co-located to the west of Little Bromley. Due to electrical requirements, separate cables and transformers are required for each project. Therefore, while the projects have considered physical sharing of assets it is not considered to yield significant benefits. However, the chosen approach does allow for opportunities to minimise environmental and community disruption through a co-ordinated delivery.

1.1.6 Three scenarios for the construction of the onshore components of VE in coordination with North Falls are foreseen:

- **Scenario 1** – VE proceeds to construction and undertakes the additional onshore cable trenching and ducting works for NF as part of a single programme of works (ducting for four electrical circuits). VE may also carry out some ground works (vegetation clearance, levelling, grading) in the wider substation zone where the North Falls substation will be located. VE would undertake the cable installation and OnSS build for its project only (two electrical circuits). The two projects would share accesses from the public highway for cable installation and substation construction. The projects would utilise and share the site accesses, haul roads and Temporary Construction Compounds (TCC) with North Falls for the cable installation works.

- **Scenario 2** – Both VE and North Falls projects proceed to construction on different but overlapping timescales (between 1 and 3 years apart). Civil works would be undertaken independently but opportunities for reuse of enabling infrastructure e.g. haul roads, temporary construction compounds and site accesses are utilised with the other project reinstating.
- **Scenario 3 –** North Falls does not proceed to construction; or both VE and North Falls projects proceed to construction on significantly different programmes (over 3 years apart). In the latter case the significantly different programmes would mean that haul roads and TCC's are reinstated prior to the second project proceeding. In such case cumulative impacts are for a potential construction period of 6 years+. No reduction in overall impacts for the schemes from sharing of infrastructure.

1.1.7 Scenario 1 is assumed to be the Maximum Design Scenario for the ES assessment of the Project. Further information on the assessment approach, including the approach to Cumulative Effects Assessment is included within EIA Methodology Chapter 6.1.3. Further detail on the scenarios and proposed construction activities is provided in the Co-ordination Document (Application document 9.30).

1.1.8 VE will continue to work with North Falls Offshore Wind Farm to identify opportunities for co-ordination during construction to minimise the overall impact of the two projects.

LESSER BLACK BACKED GULL COMPENSATORY HABITAT MEASURES

1.1.9 Compensatory measures are proposed at an onshore location in East Suffolk for Lesser Black Backed Gull (LBBG) to compensate for the predicted worst-case impacts of VE on this species in relation to Habitats Regulation Assessment. Further details of the location of these measures and an assessment of the potential impacts are available in Volume 6, Part 8: LBBG EIA.

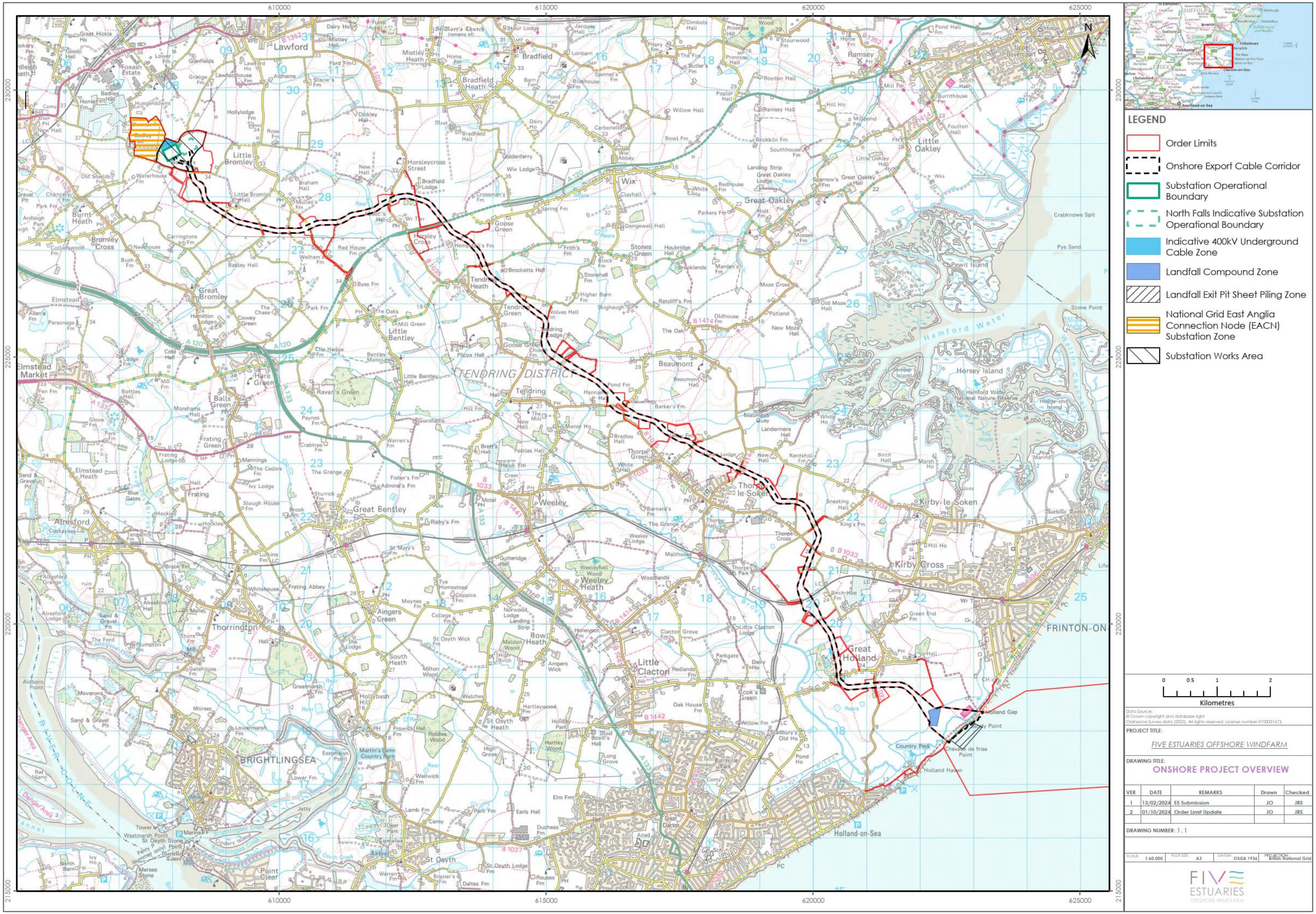
1.2 ONSHORE PROJECT OVERVIEW

1.2.1 The onshore elements of VE other than LBBG compensation are located entirely within the administrative boundary of Essex County Council and Tendring District Council (TDC) in south-east England.

1.2.2 LBBG compensation is proposed at Orford Ness within East Suffolk. Given the physical separation between the LBBG compensation site and the other onshore works, as well as the differences in works to be undertaken and potential impacts, the LBBG compensation works have been assessed in a standalone EIA Chapter and associated annexes (Volume 6, Part 8: LBBG EIA]. This Chapter assesses the LBBG works both in isolation and in combination/cumulatively with the other elements of VE. The onshore chapters of this ES (Volume 6, Part 3) accordingly consider the onshore works necessary to deliver the electrical connection but not the LBBG compensation as the works being assessed.

1.2.3 The export cable configuration will include up to two cable circuits connecting the offshore substation to the proposed Onshore Substation (OnSS) and into the proposed National Grid East Anglia Connection Node Substation (EACN). The exact location for this is still being considered by National Grid Electricity Transmission (NGET) at this stage and is subject to a separate consent process. In addition, in scenario 1 the onshore cable works include the construction of ducts for an additional two circuits which would run parallel to the VE circuits.

1.2.4 Figure 1.1 shows the proposed Order Limits for VE, which include the onshore Export Cable Corridor (ECC), OnSS and the landfall location.



LEGEND
Order Limits
Onshore Export Cable Corridor
Substation Operational Boundary
North Falls Indicative Substation Operational Boundary
Indicative 400kV Underground Cable Zone
Landfall Compound Zone
Landfall Exit Pit Sheet Piling Zone
National Grid East Anglia Connection Node (EACN) Substation Zone
Substation Works Area
0 0.5 1 2
Kilometres
Data Source:
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PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM
DRAWING TITLE:
ONSHORE PROJECT OVERVIEW
VER DATE REMARKS Drawn Checked
1 13/02/2024 ES Submission JO JRS
2 01/10/2024 Order Limit Update JO JRS
DRAWING NUMBER: 1.1
SCALE: 1:60,000
PLOT SIZE: A3
DATUM: OSGB 1936
PROJECTION: British National Grid
FIVE ESTUARIES
OFFSHORE WIND FARM
TENDRING DISTRICT

1.2.5 The onshore aspects of the project are:

- **Landfall:** the area from Mean Low Water Springs to where the offshore export cables are connected to the onshore cable circuits within TJBs.
- **Onshore Export Cable Corridor (ECC)**: where permanent infrastructure connects the cables at Landfall to the proposed OnSS;
- **Onshore Substation (OnSS)** where the power supplied from the wind farm is adjusted (including voltage, power quality and power factor as required) to meet the UK System-Operator Transmission-Owner Code (STC) for supply to the EACN Substation; and
- **Connection to the National Grid which** will include 400kV underground circuit(s) running from the proposed VE OnSS to the new National Grid EACN Substation

1.2.6 Within these areas, VE will comprise cable circuits and associated infrastructure required to transmit the electricity generated to the National Grid network via a proposed grid connection. The transmission voltage will be up to 400 kV, with a maximum two circuits, and will use High Voltage Alternating Current (HVAC) technology.

1.2.7 The key permanent onshore components of VE will include:

- Infrastructure at landfall where the offshore cables are brought ashore;
- Up to two TJBs connecting the offshore cables to the onshore cables;
- Underground cable ducts, joint pits and cables;
- The construction of the proposed OnSS, access, drainage and landscaping; and
- Underground cable ducts, joint pits and cables for the grid connection from the proposed OnSS to the proposed EACN.

1.2.8 The onshore cable corridor will be approximately 22 km from the landfall compound to National Grid's proposed EACN substation, within which cables will be installed in lengths of around 500 to 800m typically. A maximum design scenario length of 24.5 km per circuit of onshore cabling has been included to allow for micrositing within the Onshore ECC.

1.2.9 Along the Onshore ECC a number of off route haul roads are identified, where works access will be required. These generally allow routing of vehicles through existing gaps in the hedgerows or over existing watercourse crossings, which are nearby but not exactly within the Onshore ECC.

1.2.10 To support the operational phase, operation and maintenance access routes have been defined which generally follow existing farm tracks. These will primarily be used for routine maintenance access to joint pits during operation, with access in 4x4 vehicles or similar.

1.2.11 Table 1.1 VE onshore infrastructure information, summarises the key onshore infrastructure information, with more detail on each component described in the subsequent sections of this Chapter.

Table 1.1. VE onshore infrastructure information

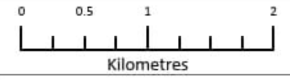
Project Parameter	Maximum Design Scenario
TJB footprint area (area per TJB)	100 m^2
Number of TJBs	Up to 2 (1 per export cable)
Total onshore ECC length	Up to 24.5 km
Number of onshore export cable circuits	Up to 2 (with ducting for additional 2 circuits)
Number of power cables per circuit	3
Number of ducts per circuit	Up to 7 (3 x power cables, 3 x comms. cables and 1 x earth)

DESCRIPTION OF ONSHORE ROUTE SECTIONS

1.2.12 Given that the length of the onshore ECC is up to 24.5 km running in a general east-west direction, it has been sub-divided into Route Sections (Figure 1.2; Route Sections Overview). These have been used in describing the onshore elements of VE and reporting its potential environmental effects. The Route Sections do not reflect any proposed phasing of works.

LEGEND

- Order Limits
- Onshore Export Cable Corridor
- Substation Operational Boundary
- North Falls Indicative Substation Operational Boundary
- Indicative 400kV Underground Cable Zone
- Landfall Compound Zone
- Landfall Exit Pit Sheet Piling Zone
- National Grid East Anglia Connection Node (EACN) Substation Zone
- Substation Works Area



PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ONSHORE PROJECT OVERVIEW

VER	DATE	REMARKS	Drawn	Checked
1	13/02/2024	ES Submission	JO	JRS
2	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.1

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:60,000	A3	OSGB 1936	British National Grid

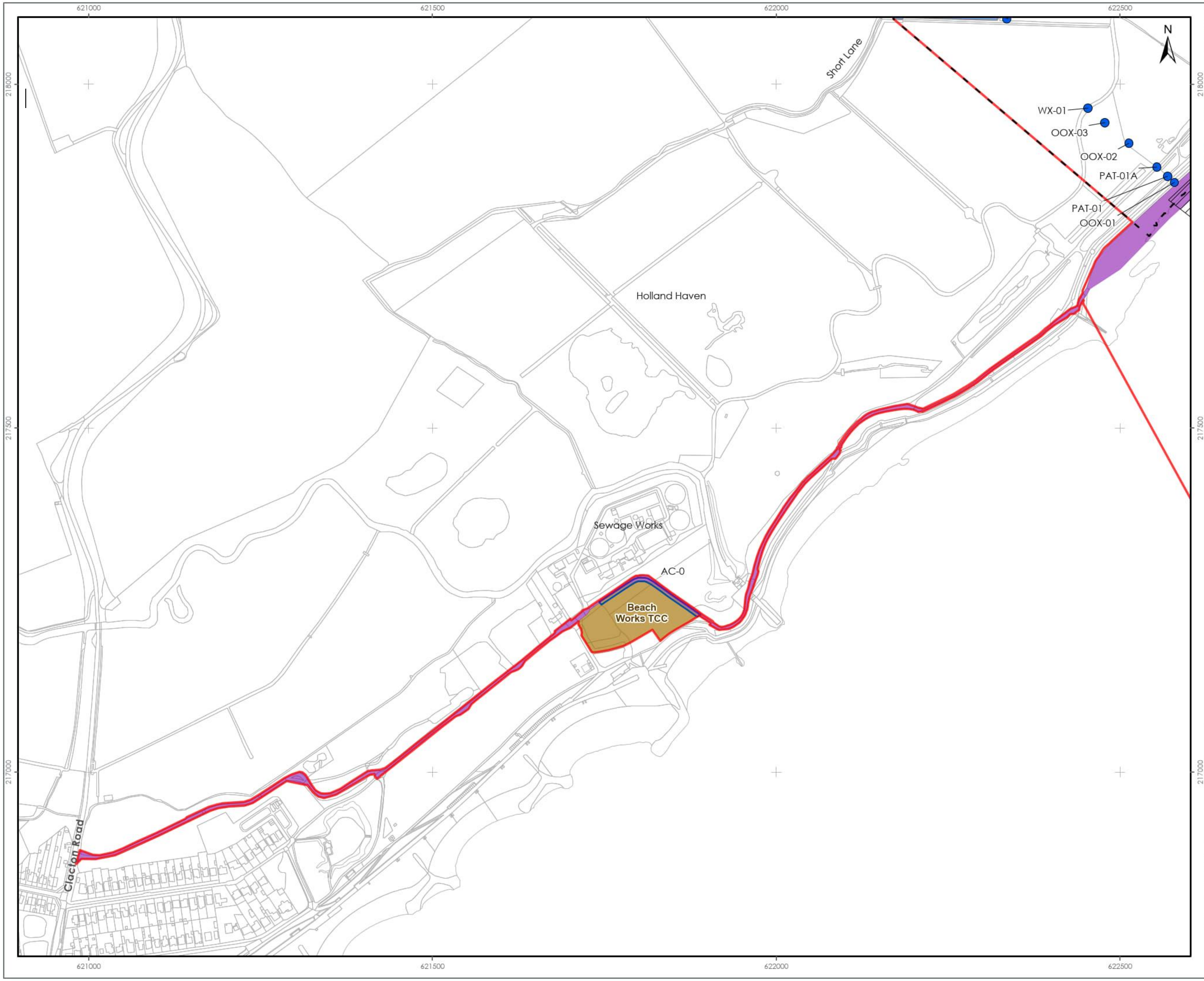
FIVE ESTUARIES
OFFSHORE WIND FARM

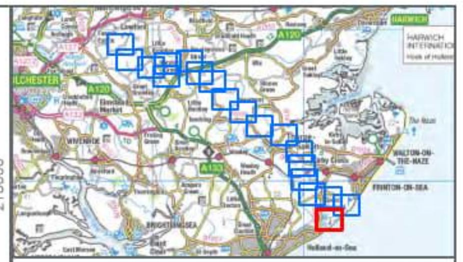
1.2.13 The following Onshore Route Sections to be used in the project are identified as follows:

ROUTE SECTION 1 (INCL. LANDFALL)

1.2.14 Section 1 shown on Figure 1.3 (split across five sheets to show detail) encompasses the landfall at Sandy Point between Frinton-on-sea and Holland-on-sea. From the Landfall compound, located to the north west of Frinton golf course, adjacent to Short Lane, the onshore ECC continues northward to the Great Eastern Mainline spur between Holland Brook and Pork Lane. The rail line will be crossed using a trenchless crossing technique, such as Horizontal Directional Drilling (HDD), which will require a drilling compound to the south of the rail line.

1.2.15 Within this section is the provision for three Temporary Construction Compounds (TCCs). The proposed Beach Works TCC is located at Manor Way to support any works or access which may be required on the beach. Proposed TCC no.1 and TCC no.2 are located either side of Clacton Road. TCC no.1 is intended to service the landfall and cable route running south from Clacton Road. TCC no.2 will likely be a smaller TCC and is intended to service the short section running northwards to the railway crossing. By having TCCs either side of Clacton Road it is anticipated the amount of traffic crossing Clacton Road can be minimised. The crossings of Clacton Road and Little Clacton Road will be by trenchless means.





LEGEND

- Order Limits
- Onshore Export Cable Corridor
- Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)
- Committed Trenchless
- Temporary Beach Access Zone
- Temporary Construction Compound
- Access and Crossing Zone
- Landfall Compound Zone
- Landfall Exit Pit Sheet Piling Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: **ONSHORE EXPORT CABLE CORRIDOR SECTION 1**

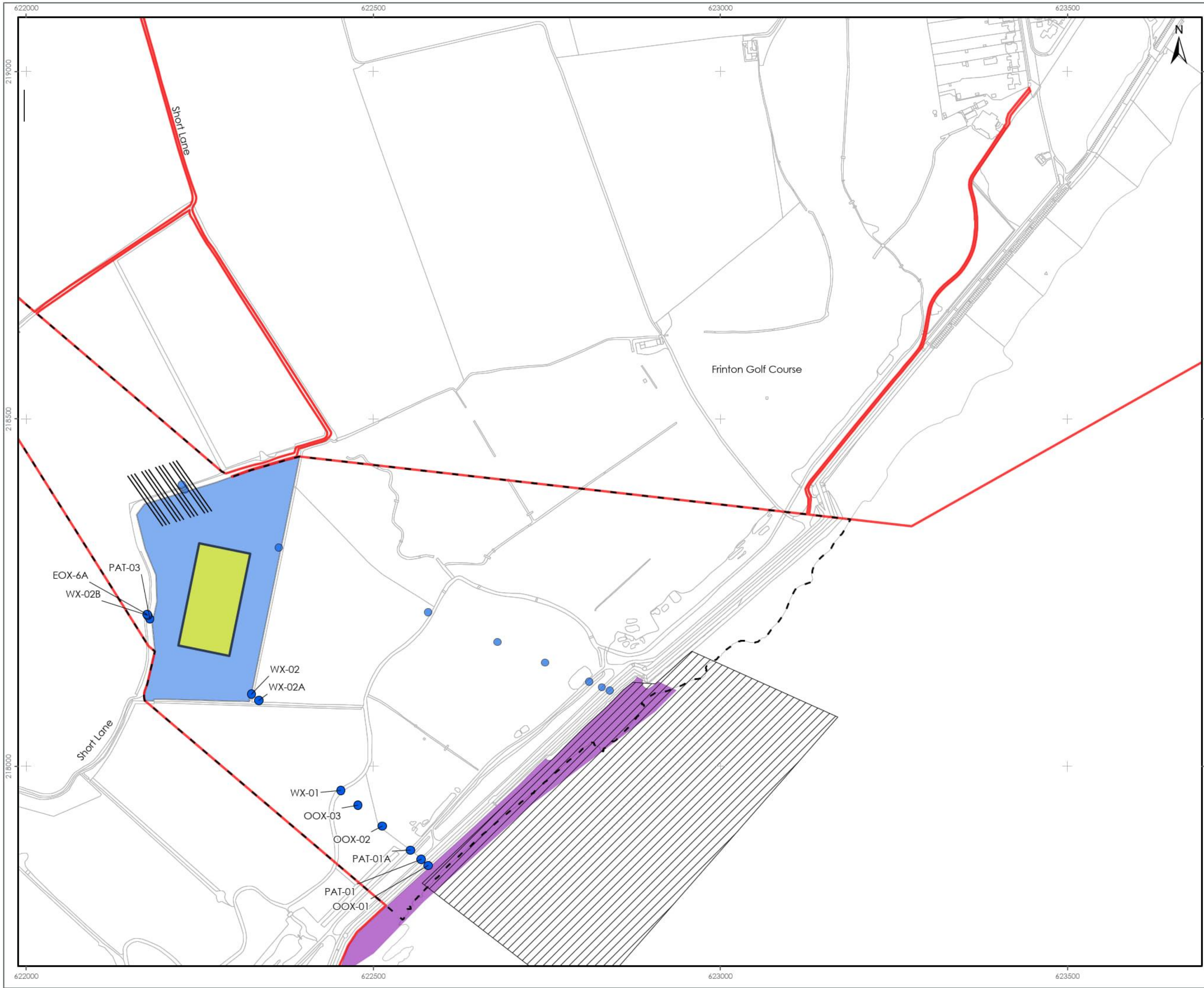
VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.3

Sheet No: 1 of 5

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Temporary Beach Access Zone
- Landfall Compound Zone
- Indicative Landfall Compound
- Landfall Exit Pit Sheet Piling Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

Data Source:

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: ONSHORE EXPORT CABLE CORRIDOR SECTION 1

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
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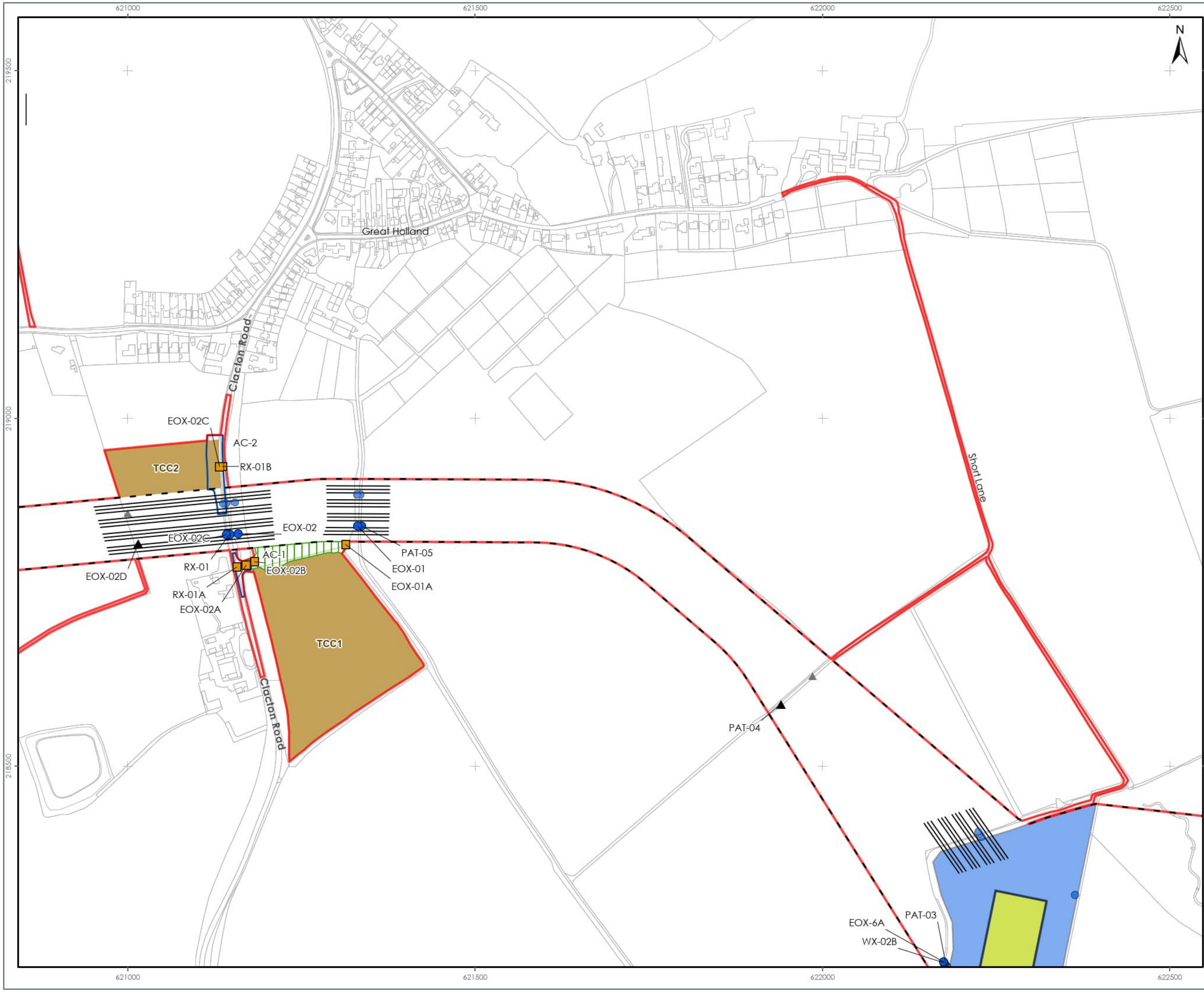
FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone
- Landfall Compound Zone
- Indicative Landfall Compound

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: ONSHORE EXPORT CABLE CORRIDOR SECTION 1

VER	DATE	REMARKS	Drawn	Checked
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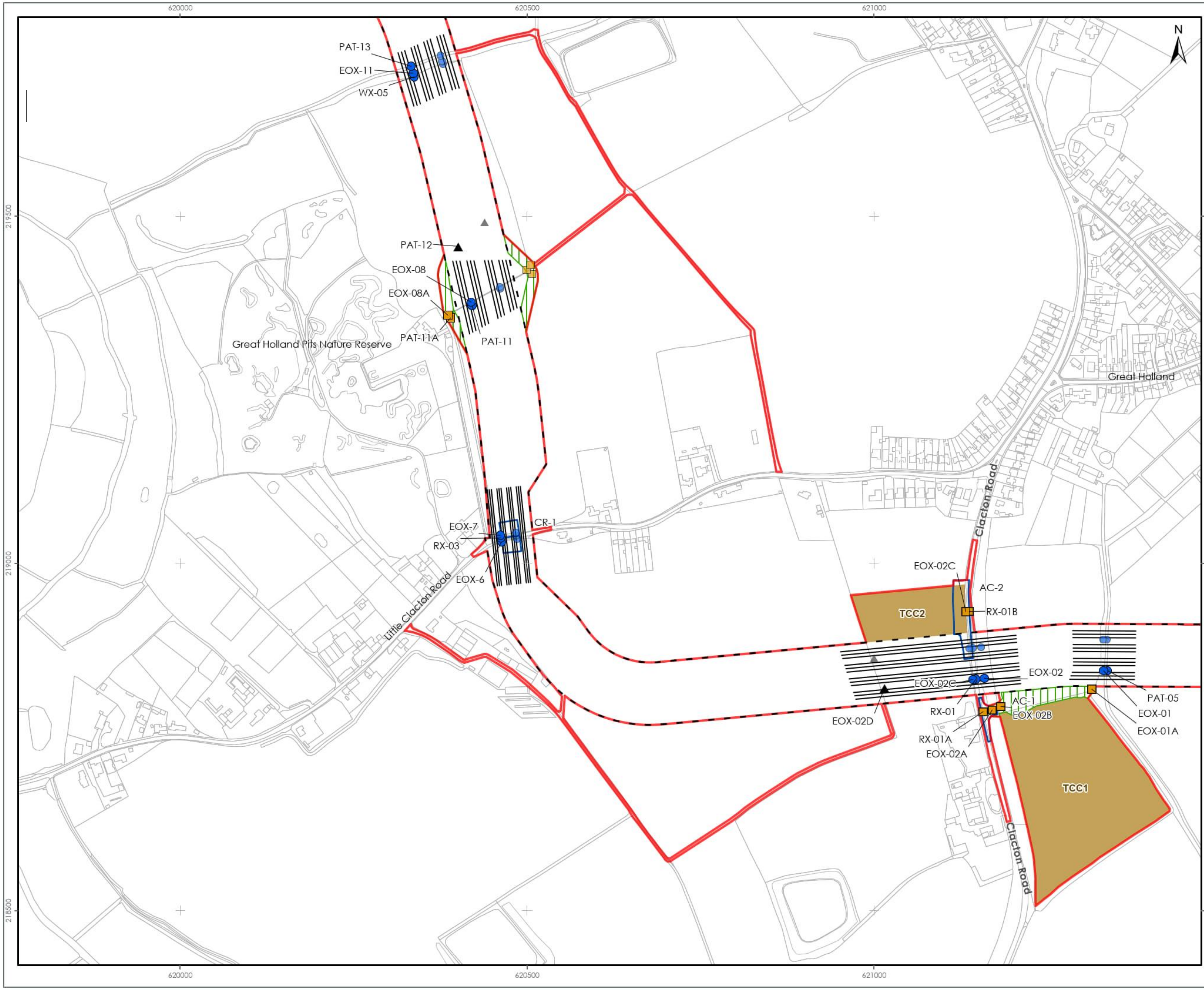
FIVE ESTUARIES OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: **ONSHORE EXPORT CABLE CORRIDOR SECTION 1**

VER	DATE	REMARKS	Drawn	Checked
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Sheet No: 4 of 5

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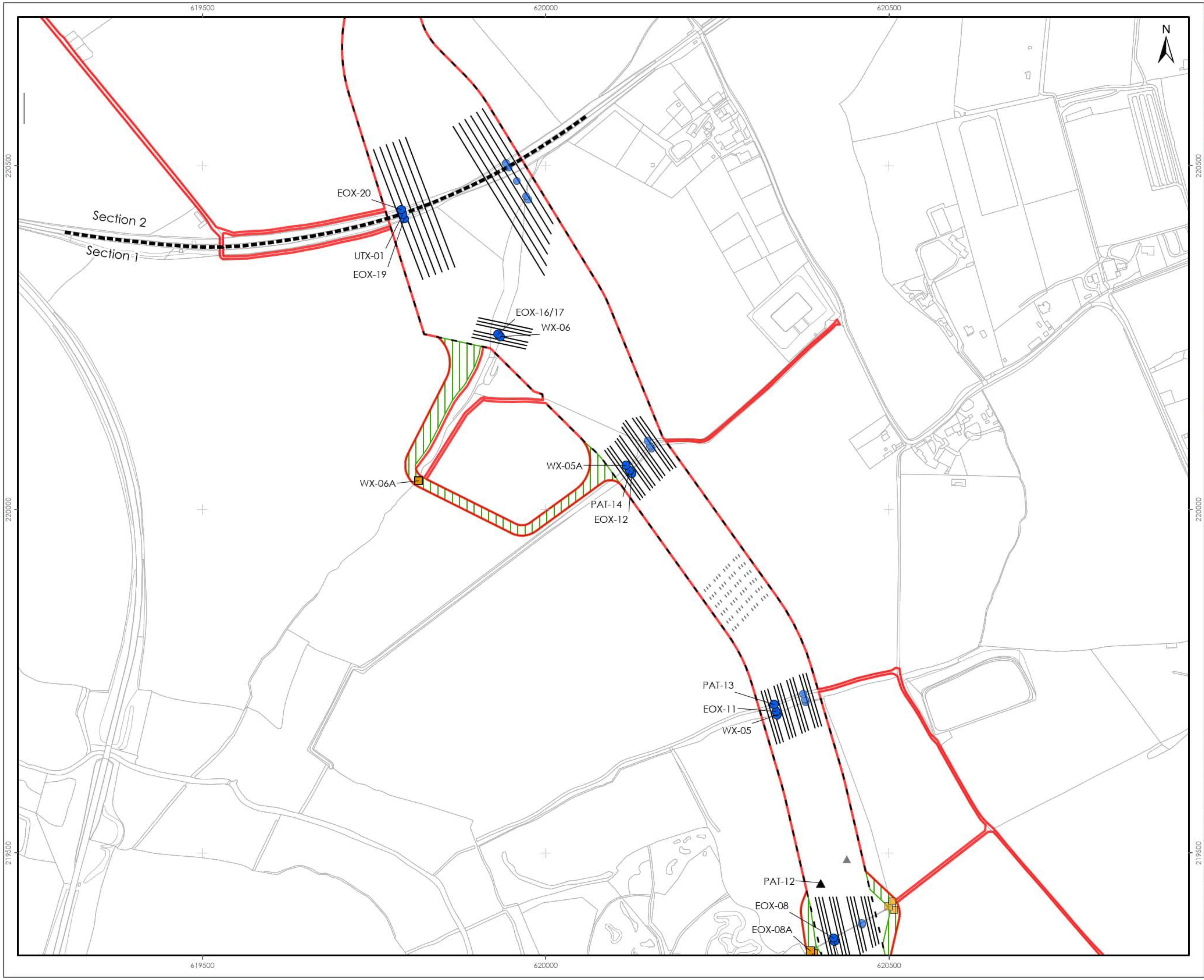
FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Off Route Haul Road

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: **ONSHORE EXPORT CABLE CORRIDOR SECTION 1**

VER	DATE	REMARKS	Drawn	Checked
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DRAWING NUMBER: 1.3

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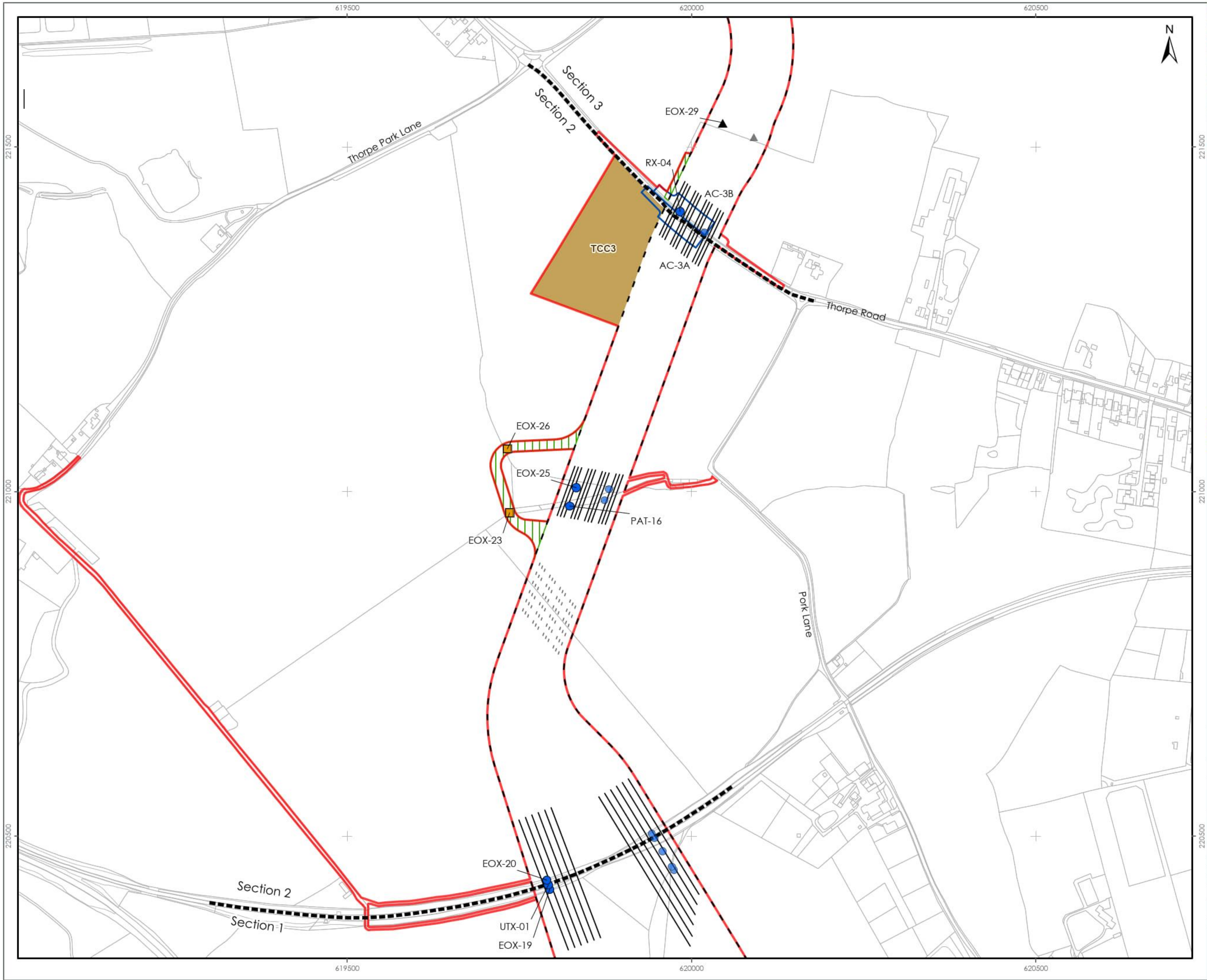
SCALE: 1:5,000	PLOT SIZE: A3	DATUM: OSGB 1936	PROJECTION: British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

ROUTE SECTION 2

1.2.16 Section 2 shown on Figure 1.4 continues north from the Great Eastern Mainline spur between Holland Brook and Pork Lane to the west of Kirby Cross across agricultural fields towards the B1033 (Thorpe Road). There will need to be a trenchless crossing technique, such as HDD, underneath the rail line for the cable. This will require a drilling compound to the north of the railway line. This section includes TCC (TCC no. 3) to service it. The crossing of the B1033 (Thorpe Road) and the Porklane Grove woodland will be by trenchless means.



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ONSHORE EXPORT CABLE CORRIDOR SECTION 2

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.4

Sheet No: 1 of 1

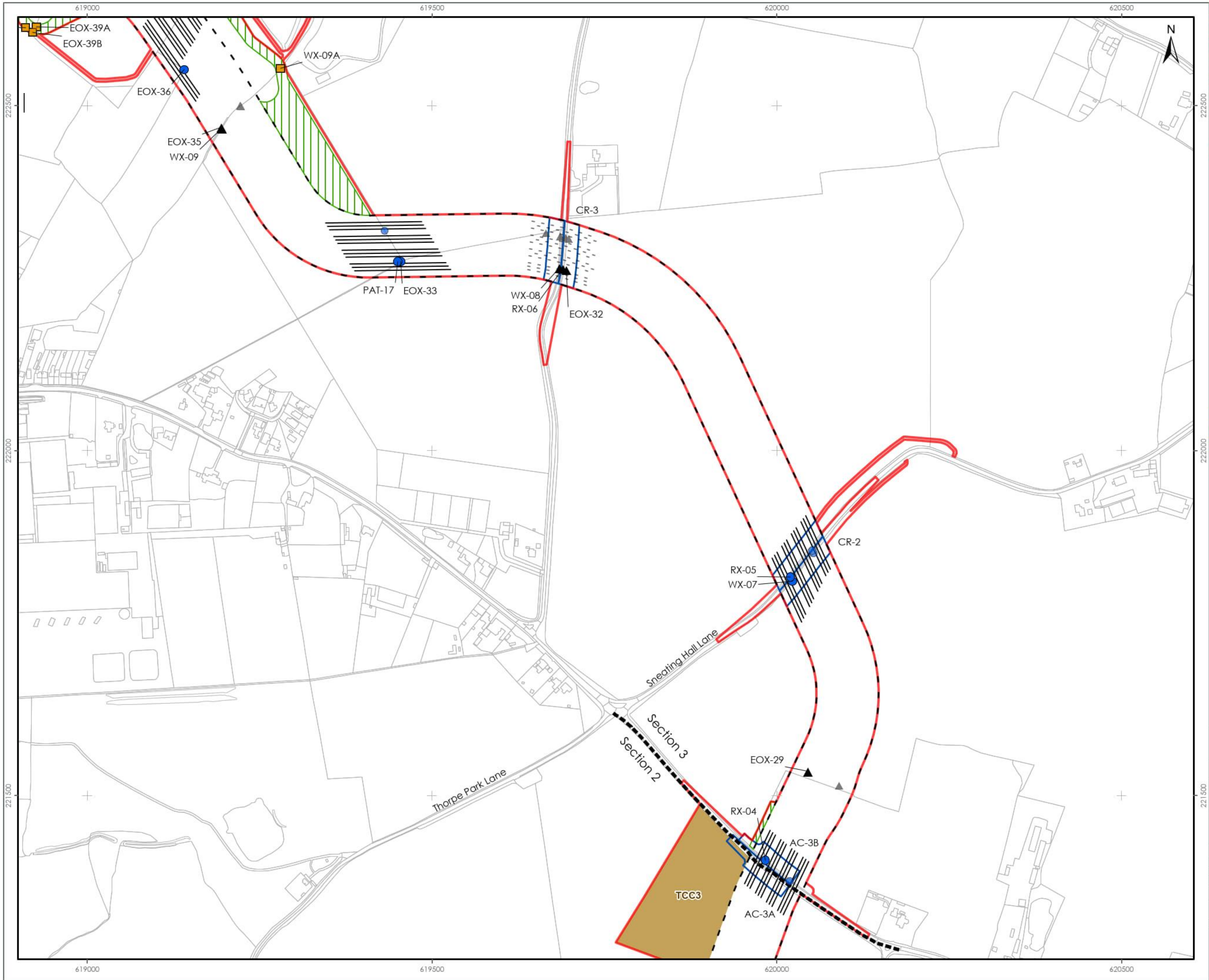
SCALE: 1:5,000 | PLOT SIZE: A3 | DATUM: OSGB 1936 | PROJECTION: British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

ROUTE SECTION 3

1.2.17 Section 3 shown on Figure 1.5Figure 1.5 (split across three sheets to show detail) passes north of the B1033 (Thorpe Road) and the B1034 (Sneating Hall Lane) then continues north-west through agricultural land around Thorpe Le Soken, then crossing Landermere Road and Golden Lane towards the intersection of Thorpe Road/Swan Road. This section includes provision for one TCC (TCC no.4) to the north of Tendring Road, which will be used for access to the section. The following crossings will be made by trenchless means:

- B1033 Thorpe Road,
- B1034 Sneating Hall Lane,
- The woodland block northeast of Thorpe-le-Soken
- B1414 Landermere Road
- Golden Lane
- Swan Road / Thorpe Road / Tendring Road Junction



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: **ONSHORE EXPORT CABLE CORRIDOR SECTION 3**

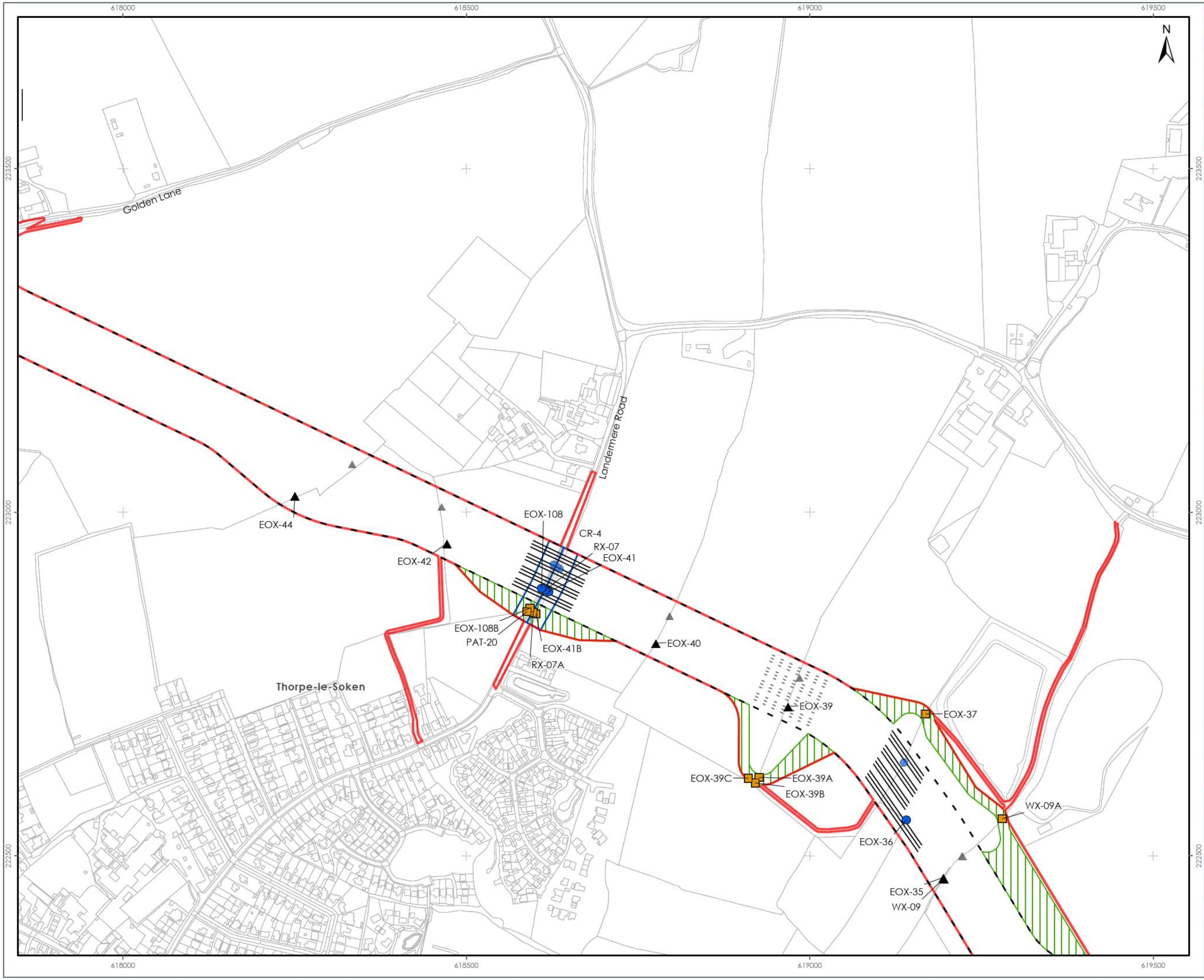
VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.5

Sheet No: 1 of 3

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: ONSHORE EXPORT CABLE CORRIDOR SECTION 3

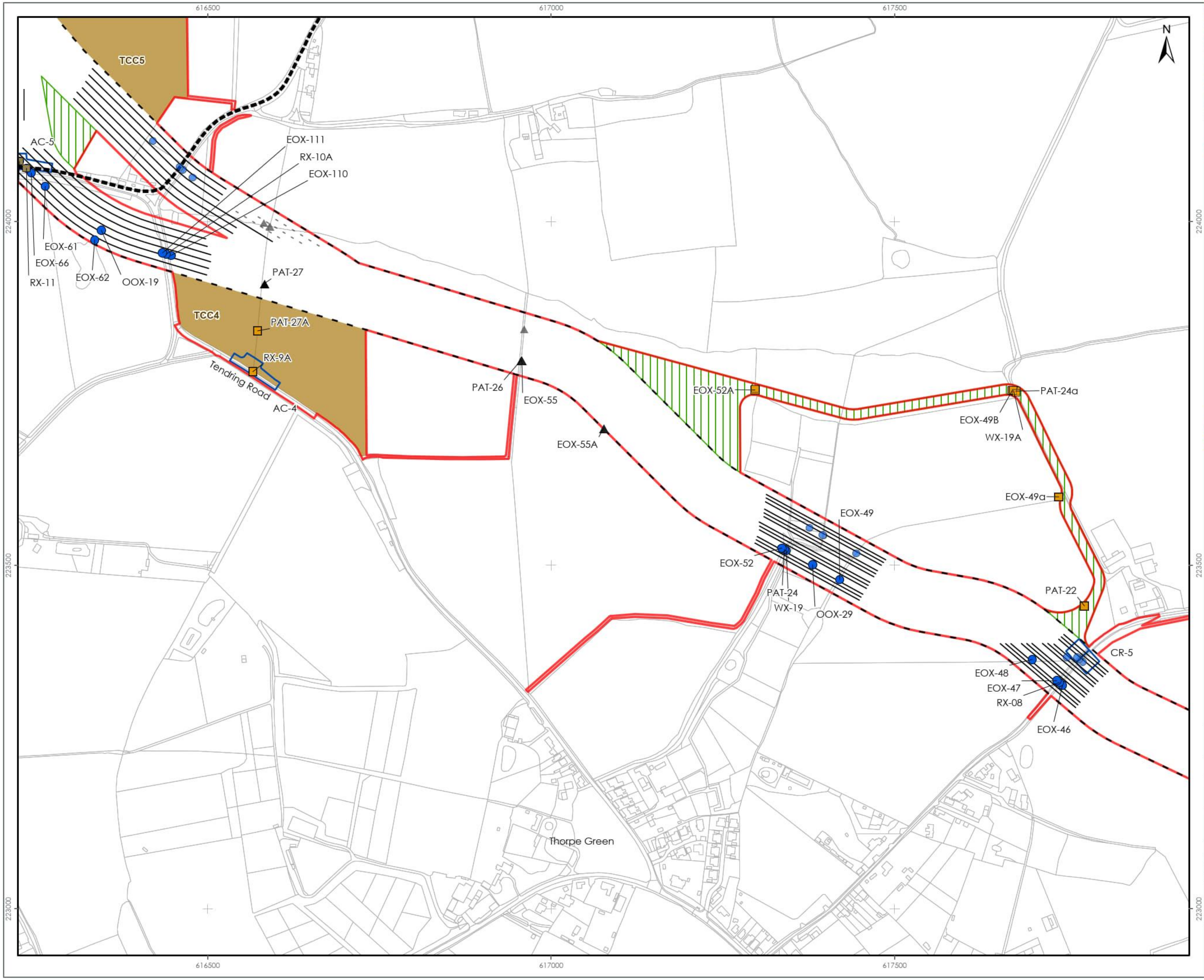
VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.5

Sheet No: 2 of 3

SCALE: 1:5,000	PLOT SIZE: A3	DATUM: OSGB 1936	PROJECTION: British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ONSHORE EXPORT CABLE CORRIDOR SECTION 3

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
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3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.5

Sheet No: 3 of 3

SCALE: 1:5,000 | PLOT SIZE: A3 | DATUM: OSGB 1936 | PROJECTION: British National Grid

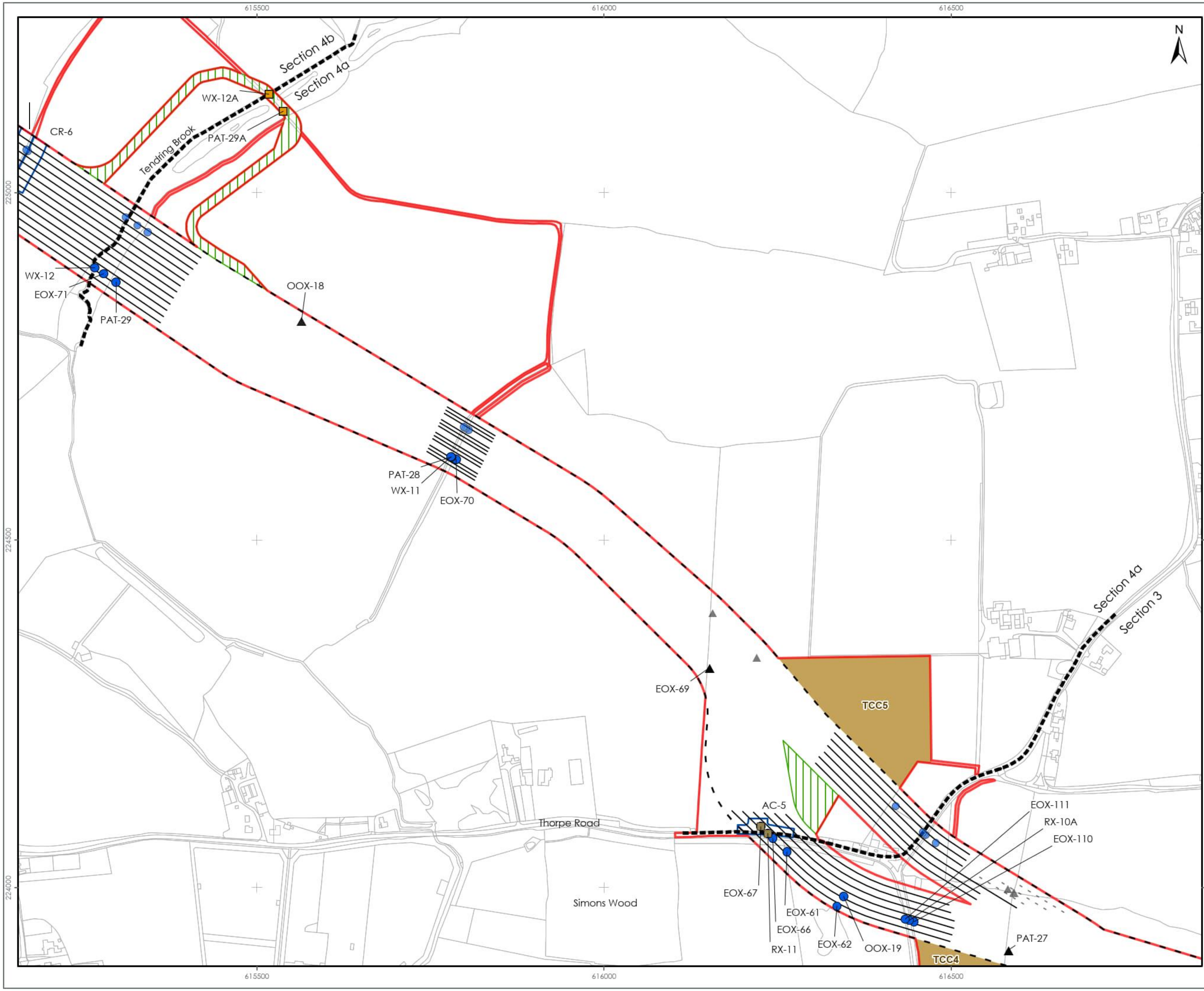
FIVE ESTUARIES
OFFSHORE WIND FARM

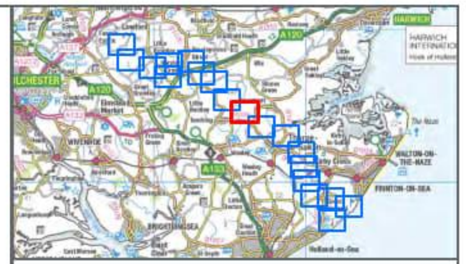
ROUTE SECTION 4

1.2.18 Section 4 shown on Figure 1.6 (split across four sheets to show detail) continues northwards through agricultural fields to the east of Tendring village, passing to the east of Tendring Heath towards the A120 (Harwich Road). The section is divided into Section 4A (south of Tendring Brook) and 4B (north of Tendring Brook). TCC (TCC no.5) is located north of Thorpe Road to service the south of this section (Section 4A), as it may not be suitable to use the existing crossing of the Tendring Brook to access this section from the north. A main TCC (TCC no.6) is located just south of the Horsley Cross roundabout on the A120, which will service the north of this section (Section 4B).

1.2.19 Adjacent to the proposed TCC (TCC no.6) to the north and adjacent to the B1035/A120 is an indicative haul road access, providing access from the TCC to the cable route, The following crossings will be made by trenchless means:

- Swan Road / Thorpe Road / Tendring Road Junction
- Tendring Brook
- Lodge Lane
- Wolves Hall Lane
- Stones Green Road
- A120





LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
ONSHORE EXPORT CABLE CORRIDOR SECTION 4

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.6

Sheet No: 1 of 4

SCALE	PLOT SIZE	DATUM	PROJECTION
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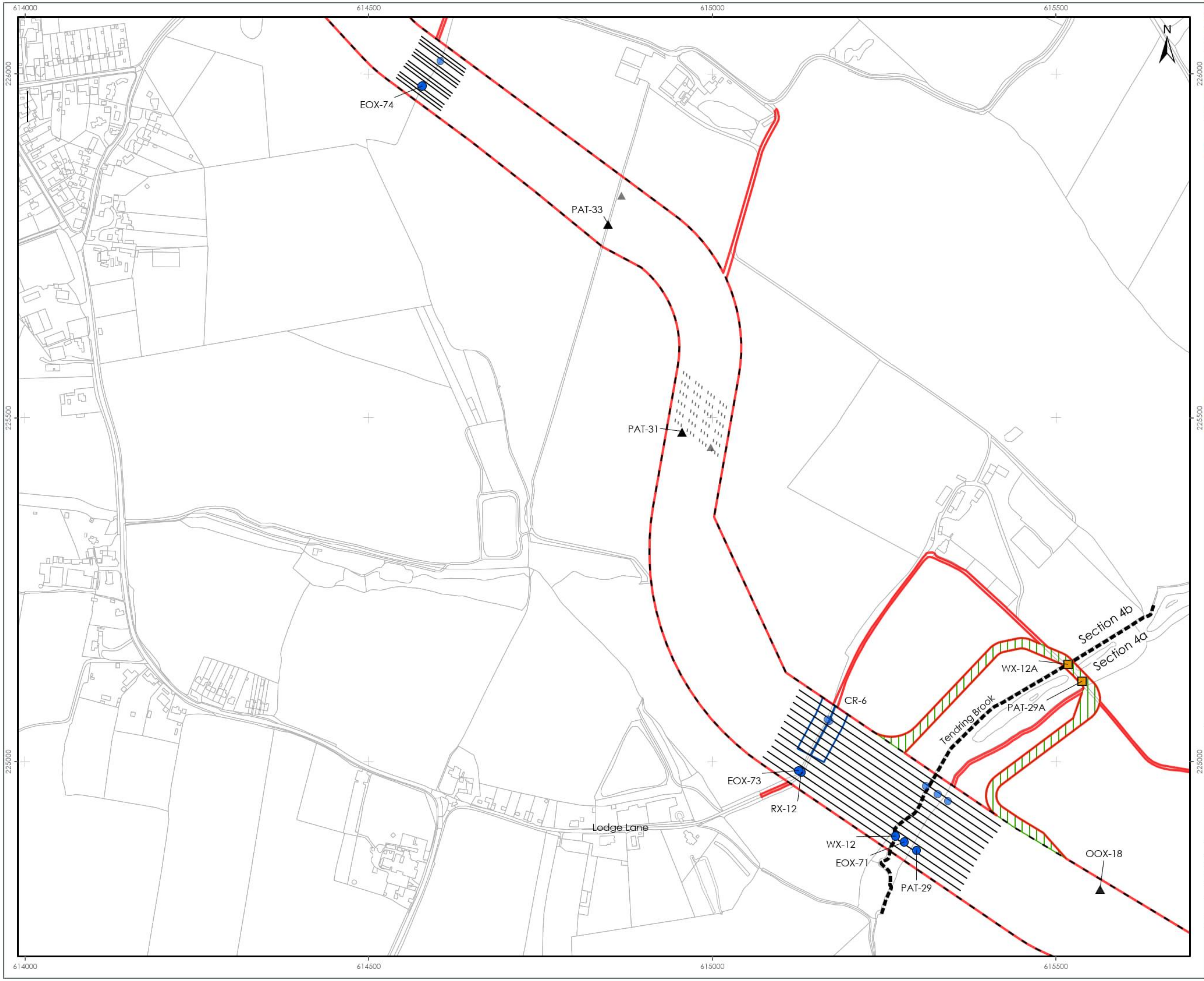
FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ONSHORE EXPORT CABLE CORRIDOR SECTION 4

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
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3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.6

Sheet No: 2 of 4

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
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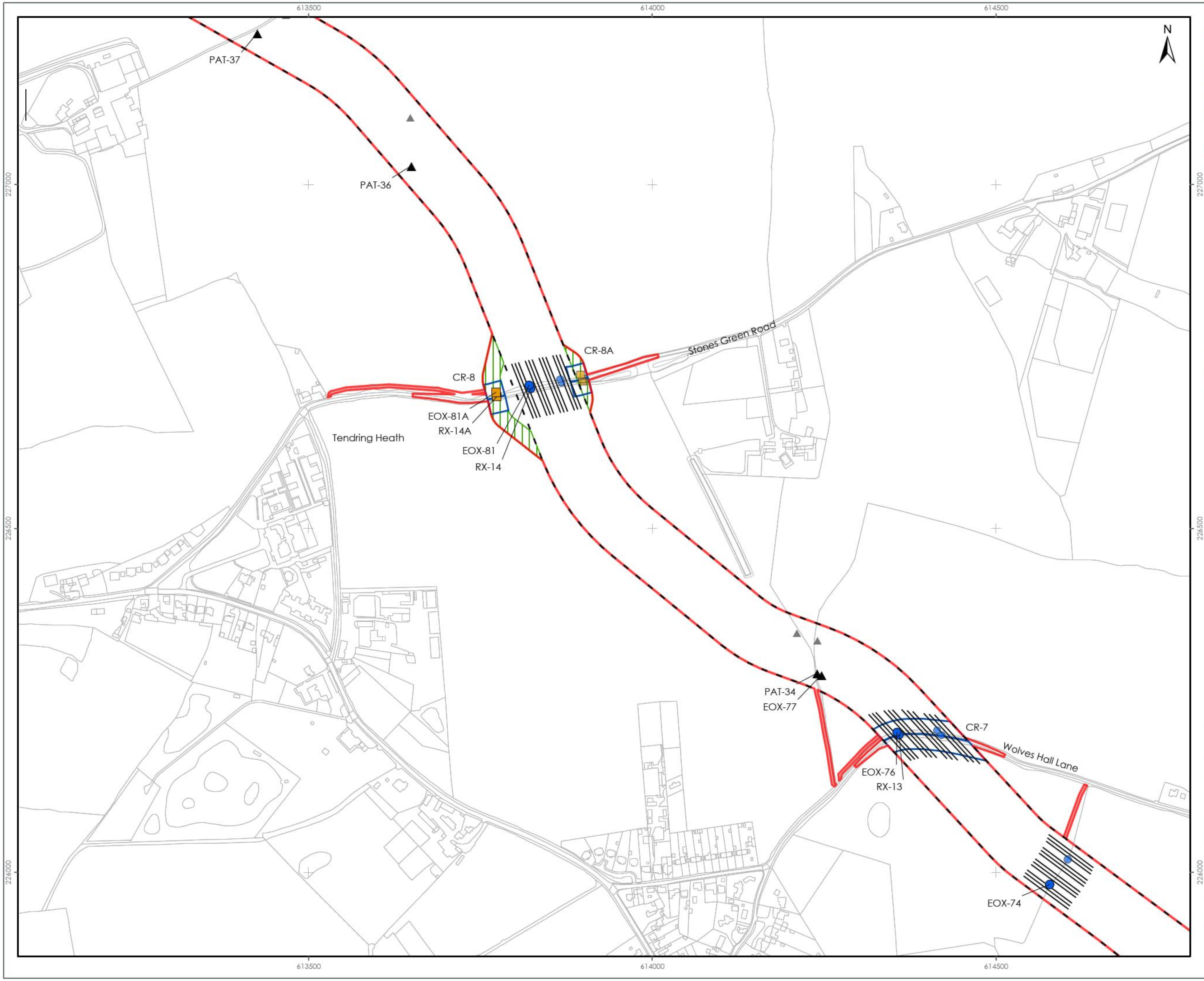
FIVE ESTUARIES
OFFSHORE WINDFARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: ONSHORE EXPORT CABLE CORRIDOR SECTION 4

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
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3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.6

Sheet No: 3 of 4

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
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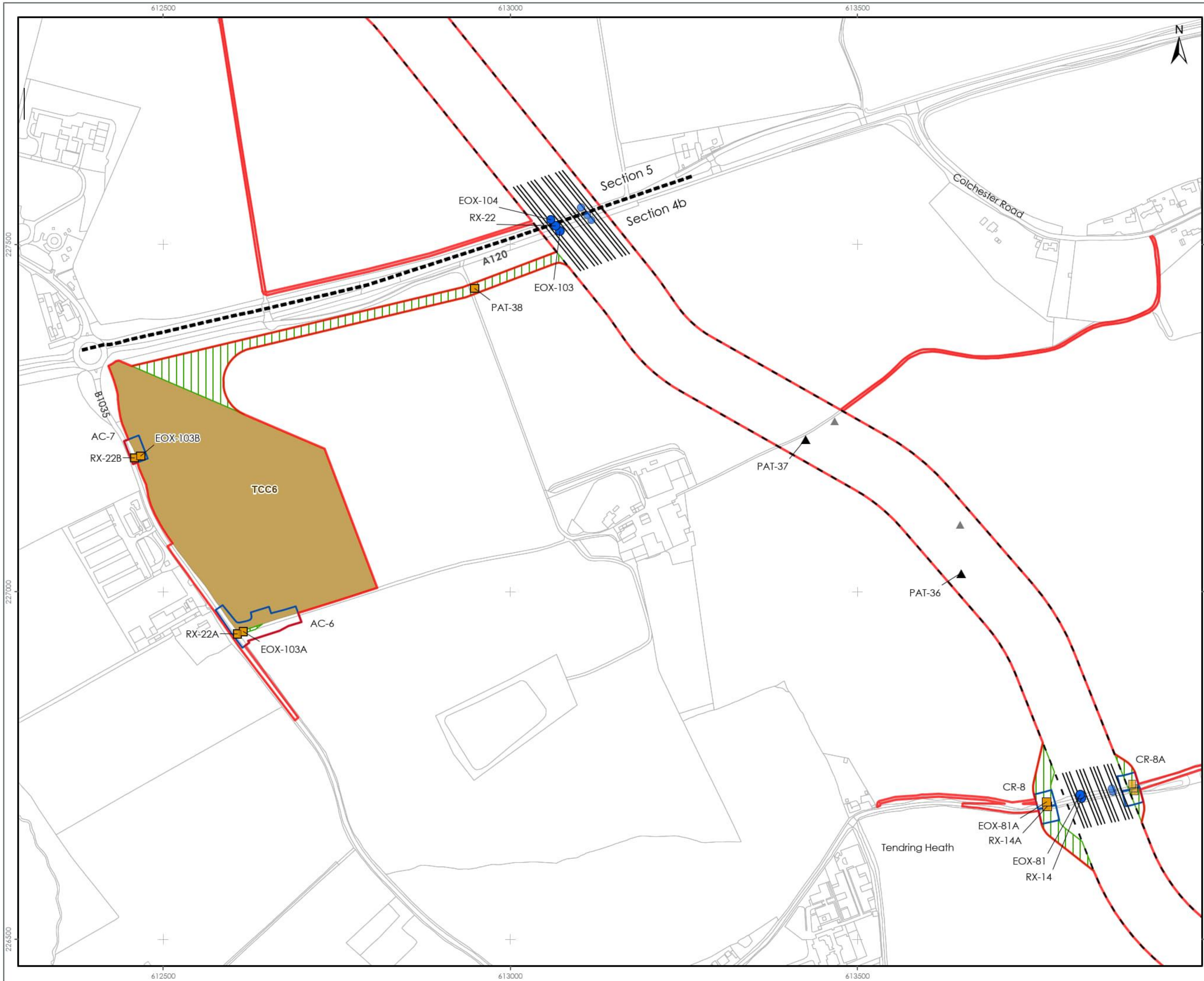
FIVE ESTUARIES OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
ONSHORE EXPORT CABLE CORRIDOR SECTION 4

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.6

Sheet No: 4 of 4

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

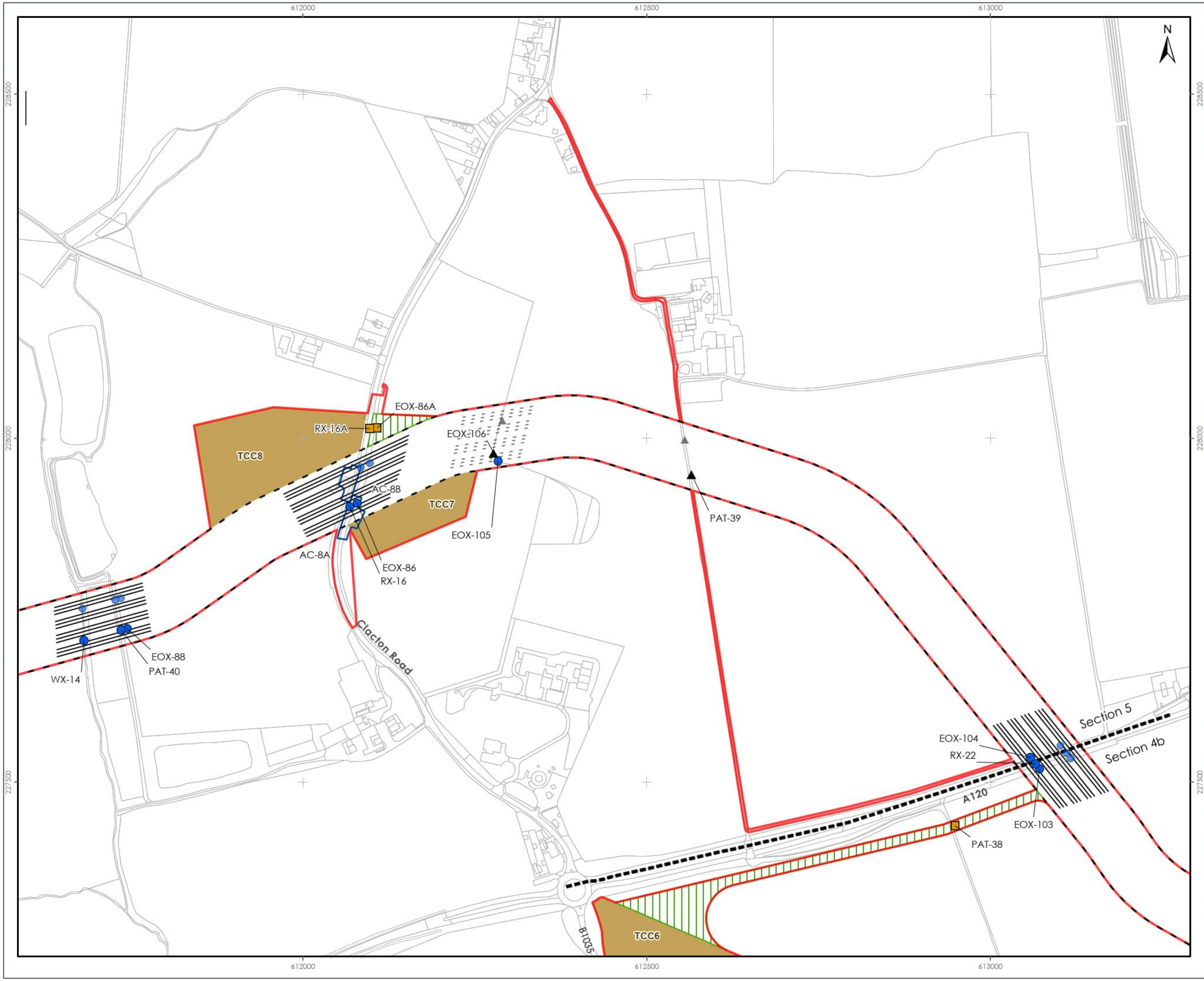
FIVE ESTUARIES
OFFSHORE WIND FARM

ROUTE SECTION 5

1.2.20 Section 5 extends from the north of the crossing of the A120 to Bentley Road as shown on Figure 1.7 (split across three sheets to show detail).

1.2.21 The onshore ECC continues westwards through agricultural fields passing Clacton Road towards Bentley Road.

1.2.22 Two potential TCC locations (TCCs no.7 and no.8) have been defined either side of Clacton Road to service the parts of the route on either side. The crossings of Clacton Road, Bentley Road as well as the watercourse to the west of Clacton Road will be by trenchless means. A further TCC (TCC no.9) is located to the east of Bentley Road but is primarily intended to service sections 6 and 7, but may also service the western parts of section 5.



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Temporary Construction Compound
- Off Route Haul Road
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

Data Source:
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PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ONSHORE EXPORT CABLE CORRIDOR SECTION 5

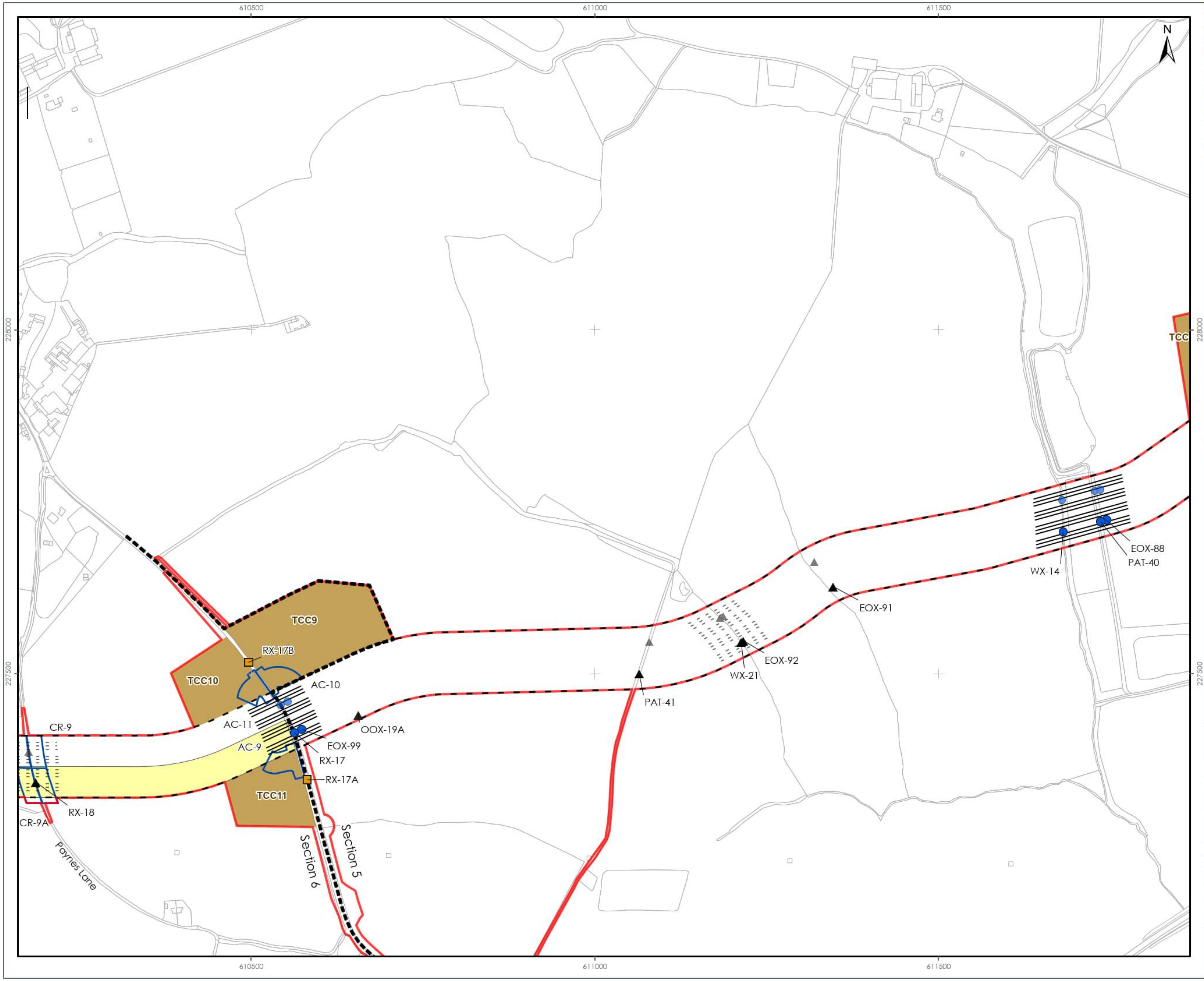
VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

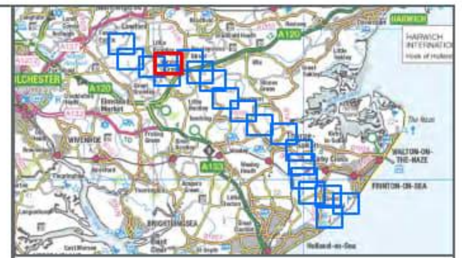
DRAWING NUMBER: 1.7

Sheet No: 1 of 3

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM





LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Substation Temporary Construction Haul Road
- Temporary Construction Compound
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: ONSHORE EXPORT CABLE CORRIDOR SECTION 5

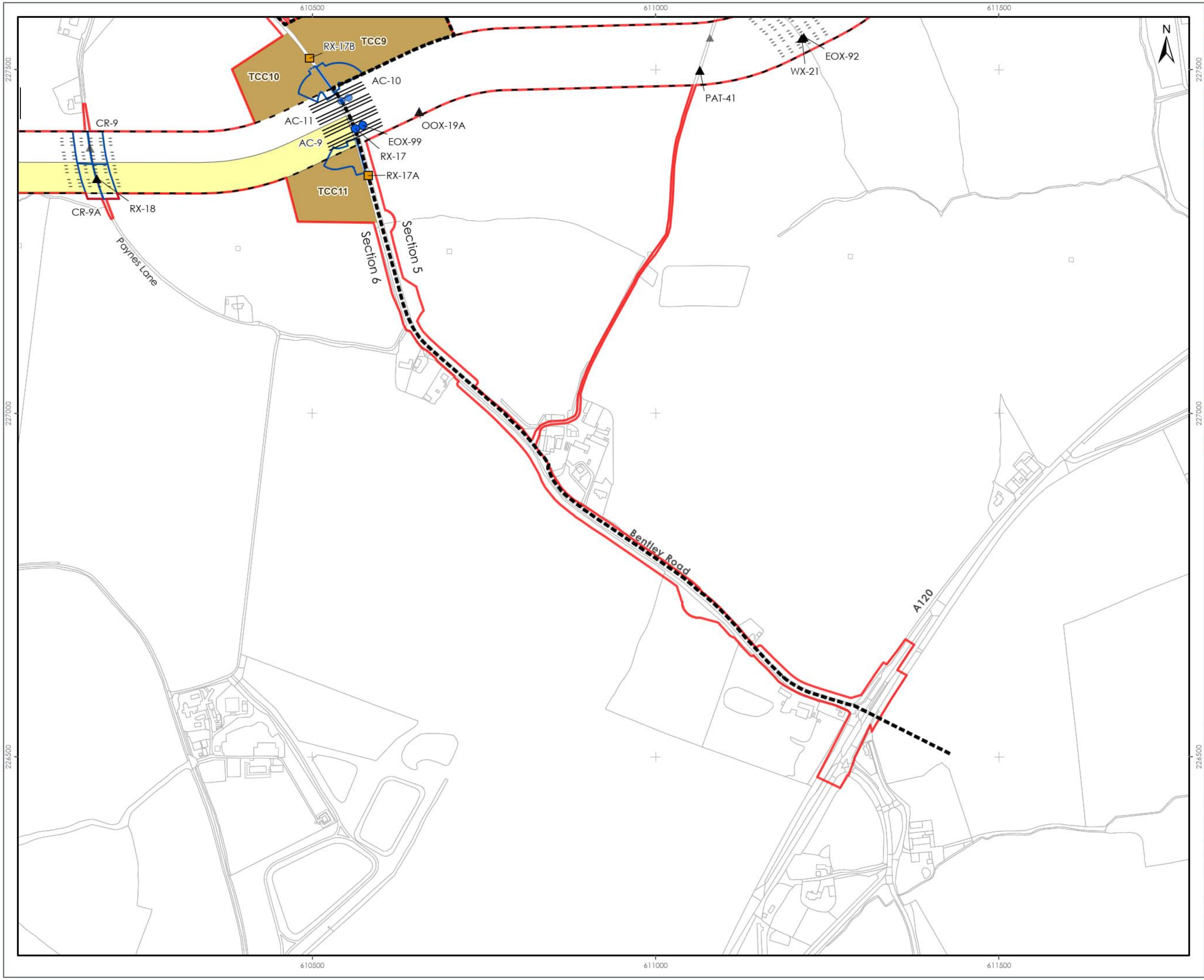
VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.7

Sheet No: 2 of 3

SCALE: 1:5,000 | PLOT SIZE: A3 | DATUM: OSGB 1936 | PROJECTION: British National Grid

FIVE ESTUARIES OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Substation Temporary Construction Haul Road
- Temporary Construction Compound
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ONSHORE EXPORT CABLE CORRIDOR SECTION 5

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
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3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.7

Sheet No: 3 of 3

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

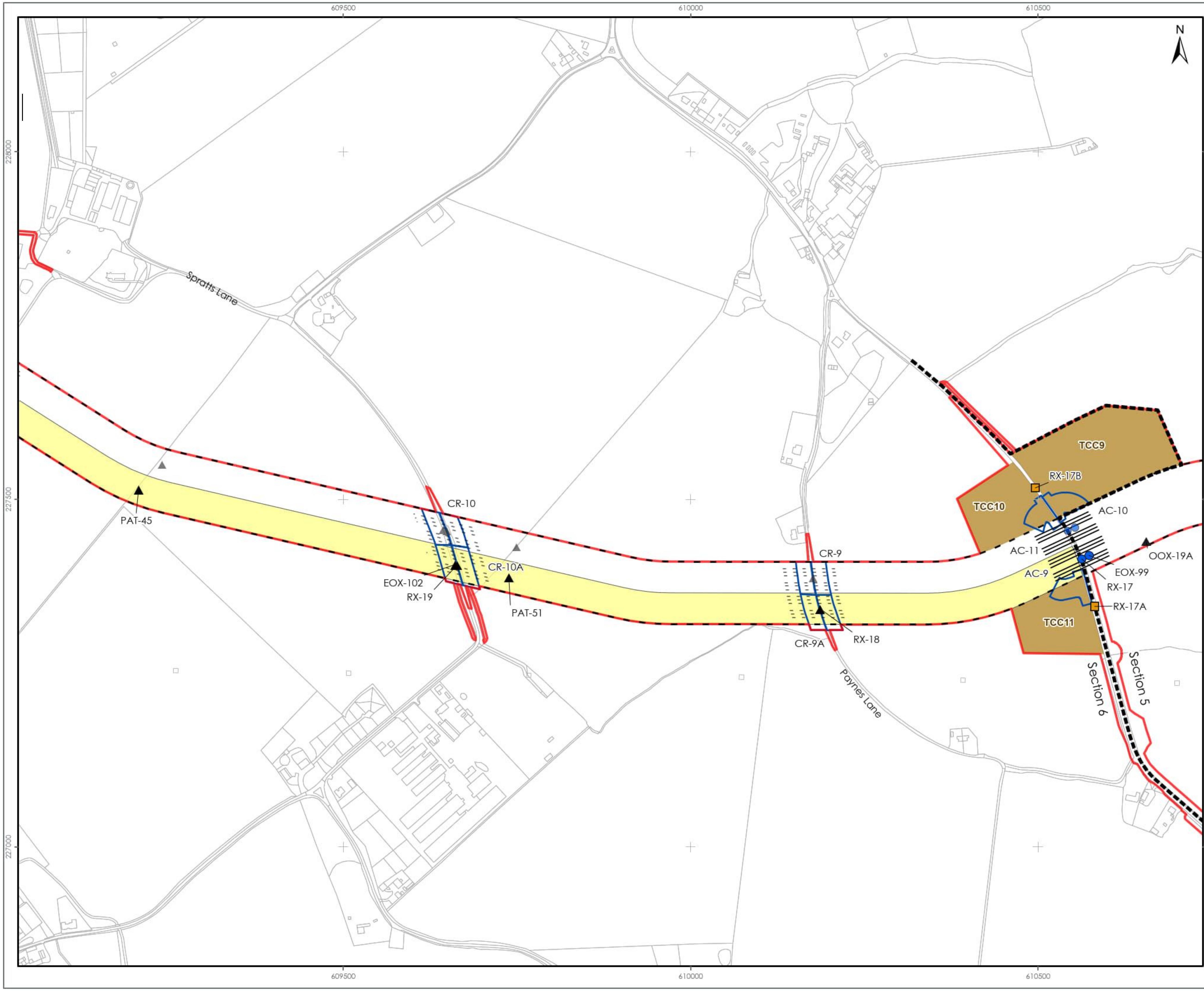
ROUTE SECTION 6

1.2.23 Section 6 extends from Bentley Road to the crossing of Ardleigh Road as shown on Figure 1.8 (split across two sheets to show detail). The onshore ECC continues westwards in this section through agricultural fields passing Payne's Lane, Spratts Lane and Barlon Road. The crossings of Bentley Road and Ardleigh Road will be by trenchless means.

1.2.24 A TCC (TCC no.10) has been identified to the west of Bentley Road servicing this section. As described above a further TCC (TCC no.9) is located to the east of Bentley Road and this will also support the cable construction operation along section 6 and 7.

1.2.25 This section of the onshore ECC will also be used during construction for access to the OnSS. A TCC (TCC no.11) has been identified to the west of Bentley Road, south of the Onshore ECC. This TCC is specifically designed to provide space for marshalling of construction traffic accessing or leaving the OnSS (see paragraphs 1.5.26 to 1.5.30) as this will be the point substation construction traffic leaves / enters the public highway.

1.2.26 Junction improvement works are proposed where Bentley Road meets the A120. With further widening of the public highway needed along Bentley Road to where it meets TCC no.11.



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Substation Temporary Construction Haul Road
- Temporary Construction Compound
- Access and Crossing Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

Data Source:

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
ONSHORE EXPORT CABLE CORRIDOR SECTION 6

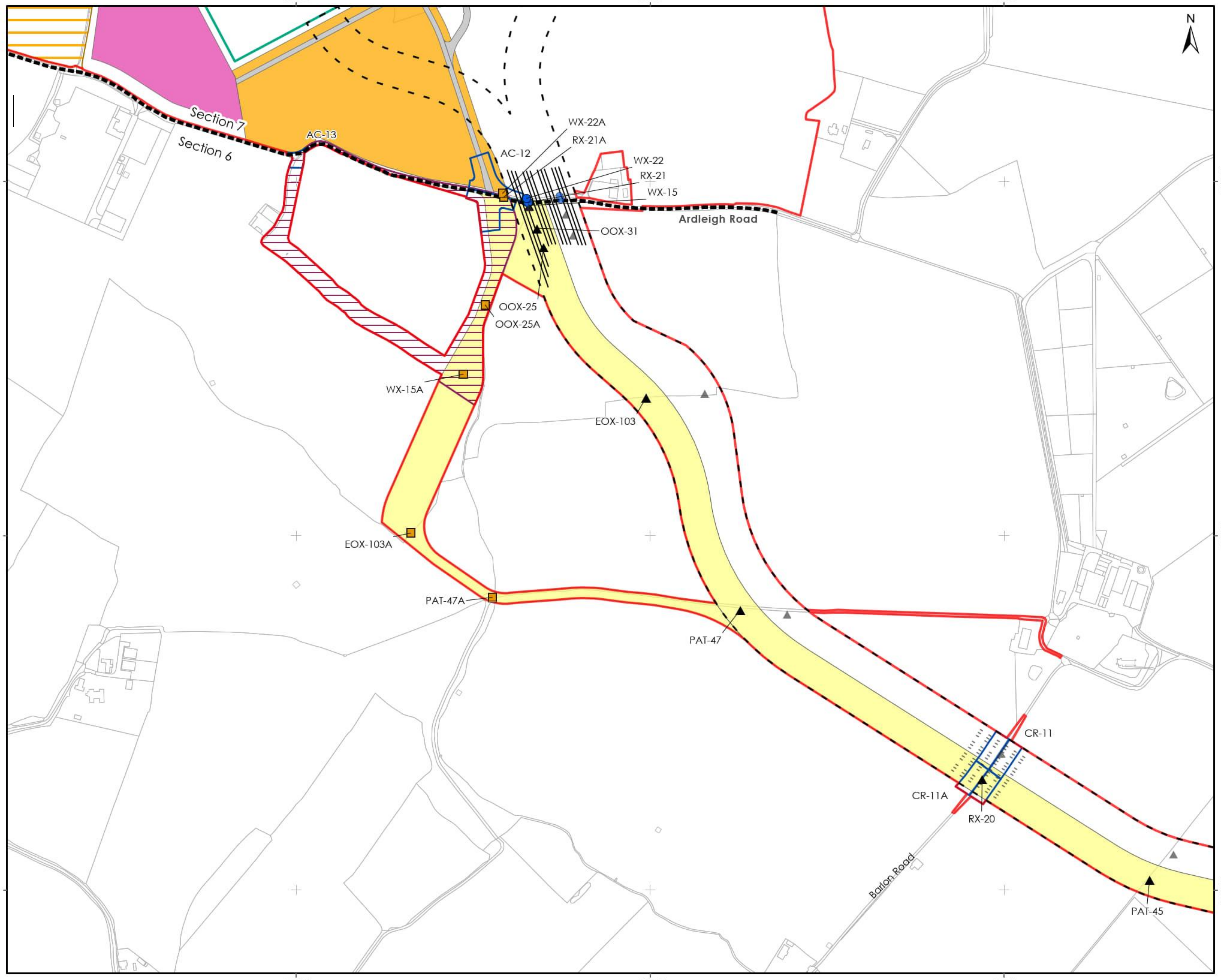
VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.8

Sheet No: 1 of 2

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Trenchless Crossing Indicative Alignment - Non Comitted
- Substation Operational Boundary
- Substation Temporary Construction Compound
- Ardleigh Road Drainage Zone
- Indicative Substation Access and Drainage Zone
- Indicative Substation Access Route
- Substation Temporary Construction Haul Road
- Access and Crossing Zone
- National Grid East Anglia Connection Node (EACN) Substation Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
ONSHORE EXPORT CABLE CORRIDOR SECTION 6

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
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3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.8

Sheet No: 2 of 2

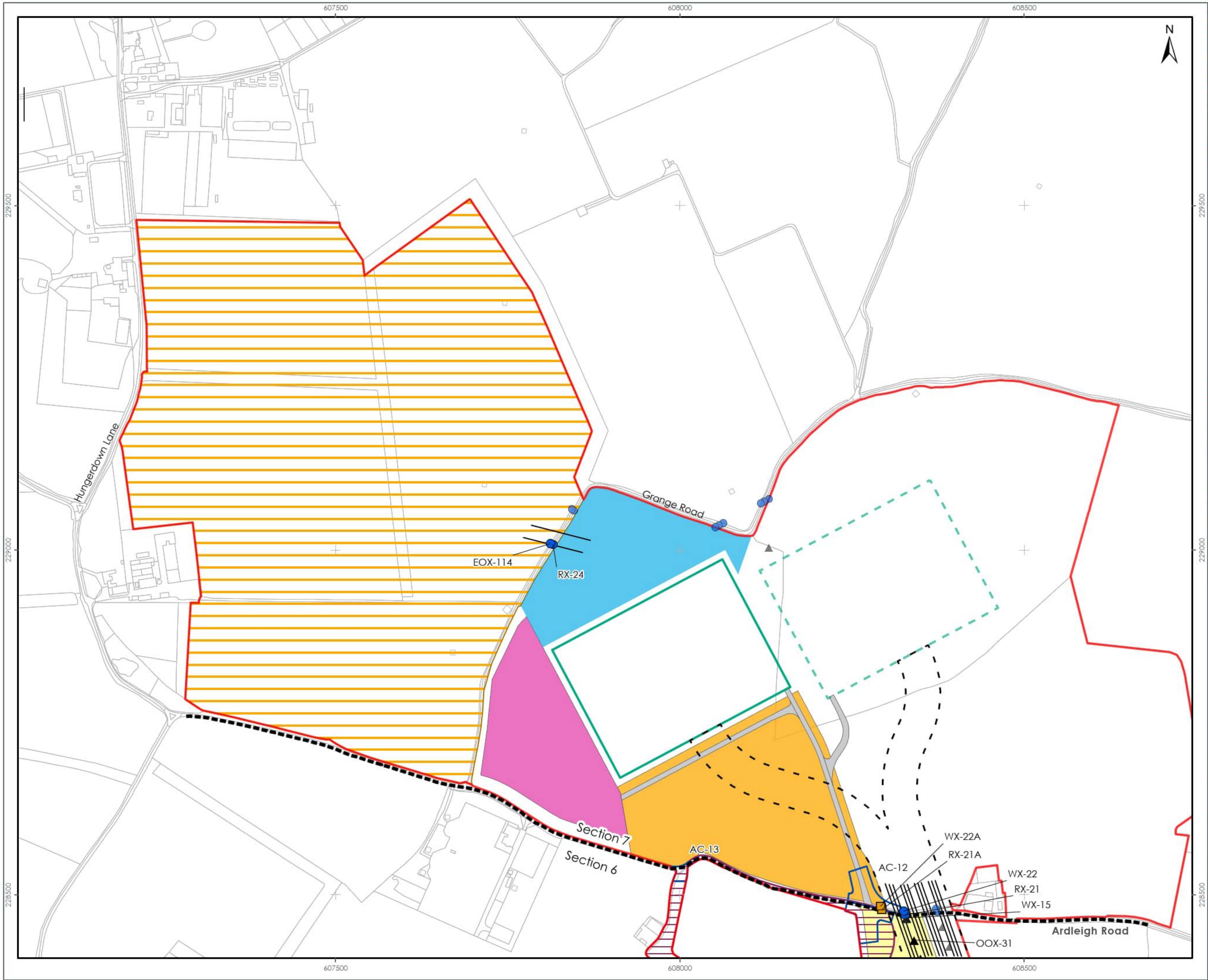
SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

ROUTE SECTION 7

1.2.27 Section 7 as shown in Figure 1.9 includes the OnSS. It extends north from the crossing of Ardleigh Road to the proposed location of the National Grid substation. This section of the onshore ECC will also be used during construction for access to the substation.

1.2.28 A short section of 400kV cable will connect the VE onshore substation with the National Grid EACN substation. The cable section will cross Grange Road, and a trenchless crossing is intended for this crossing. The full National Grid Substation Construction and Operation Zone has been included in the Order Limits as there is some uncertainty regarding the exact proposed location.



LEGEND

- Order Limits
- Onshore Export Cable Corridor Section Division
- Onshore Export Cable Corridor

Obstacle Crossing Register - Five Estuaries Circuits (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)

Obstacle Crossing Register - North Falls Ducts (Excluding Utilities Crossings)

- Committed Trenchless
- Haul Road Obstacles
- Trenched, Trenchless or Other (To be Determined at a Later Date)
- Trenchless Crossing Indicative Alignment
- Substation Operational Boundary
- Substation Temporary Construction Compound
- Ardleigh Road Drainage Zone
- Indicative Substation Access and Drainage Zone
- Indicative Substation Access Route
- Substation Temporary Construction Haul Road
- North Falls Indicative Substation Operational Boundary
- Access and Crossing Zone
- Indicative 400kV Underground Cable Zone
- National Grid East Anglia Connection Node (EACN) Substation Zone

Note.
Operation and Maintenance Access are included in the Onshore Order Limits.

0 100 200
Metres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE: ONSHORE EXPORT CABLE CORRIDOR SECTION 7

VER	DATE	REMARKS	Drawn	Checked
1	22/02/2024	ES Submission	JO	JRS
2	25/04/2024	Section 51 Advice	JO	JRS
3	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.9

Sheet No: 1 of 1

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:5,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES OFFSHORE WIND FARM

1.3 DESIGN ENVELOPE APPROACH

OVERVIEW

1.3.1 At this stage in the VE development process, decisions on exact locations of infrastructure and the precise technologies and construction methods employed are still being made.

1.3.2 As detailed within the Environmental Impact Assessment (EIA) methodology chapter (Volume 6, Part 1, Chapter 3: Environmental Impact Assessment Methodology), in some instances, the final design and or construction method cannot be defined at this stage. Where this is the case, a Maximum Design Scenario (MDS) has been adopted.

1.3.3 The project description is therefore indicative and the design envelope approach (often referred to as the 'Rochdale Envelope') has been used to provide certainty that the final project as built will not exceed the identified parameters, whilst providing the flexibility to accommodate further project refinement during the detailed design phase post-consent.

1.3.4 For onshore aspects, this flexibility is required for the number of export circuits, footprint requirements for the proposed Onshore Substation (OnSS), siting of onshore infrastructure and construction methods etc. This is to ensure that anticipated changes in available technologies between now and the detailed design phase can be accommodated within the design, whilst retaining an EIA that considers all options, with conclusions that are robust. It also provides greater flexibility to co-ordinate with the North Falls project, including allowing the installation of additional cable ducts.

1.3.5 The final project design will be influenced by ground and environmental conditions identified through detailed pre-construction surveys, project economics and the approach to procurement of resources.

1.3.6 This chapter sets out flexibility in the approach, which is encompassed within the overall design envelope.

RELATIONSHIP TO MAXIMUM DESIGN SCENARIO

1.3.7 The full onshore design envelope for VE is included in this Chapter. However, it is important to note that individual impact assessments do not consider all options. Instead, for each impact, the assessment is based on the scenario which results in the greatest potential for change, sometimes referred to as the 'worst-case' scenario. In the context of VE, this is referred to as the Maximum Design Scenario (MDS) approach.

1.3.8 The rationale for this approach is to ensure that the MDS for each impact is robustly considered, and therefore any other scenario as built would not result in impacts of greater significance of effect than those assessed in the EIA, whilst reducing the volume of assessment documentation required and avoiding dilution of outcomes in the interests of proportionality. The concept of proportionality is key in ensuring that the Environmental Statement (ES) is maintained at an accessible level for technical and non-technical stakeholders and aligns with industry best practice as advised by the Institute of Environmental Management & Assessment (IEMA) Delivering Proportionate EIA guidance (IEMA, 2017).

1.3.9 To avoid excessive conservatism in the EIA, the parameters assessed throughout the EIA are not necessarily a combination of the MDS for each component, hence the MDS is chosen on an impact-receptor basis, on a range of eventual build-out scenarios. The details of the MDS for each impact assessed are described in detail within the topic-specific chapters of the ES.

1.3.10 Therefore, confidence can be had that resulting environmental effects will not exceed the worst-case assumptions of the EIA. Further detail on the MDS approach, particularly how this relates to the various construction scenarios, is included in Volume 6, Part 1, Chapter 3: Environmental Impact Assessment Methodology.

1.4 ONSHORE CABLE ROUTE

1.4.1 For the basis of assessment presented in the ES, Scenario 1 is assumed as the MDS for VE. The onshore ECC will be approximately 60 m wide where open trenching will be used (38m for scenario 2 and 3). Where trenchless techniques such as HDD are used along the ECC, the width will need to increase to approximately 90 m (45m for scenario 2 and 3), but slightly wider widths are required at the major more complex crossings such as the railway and Tendring Brook (up to 140 m). In general, a 90m wide ECC has been defined which for the open trench sections gives some flexibility for micro-routing for archaeology or other ecological features found during pre-construction surveys. In route section 6 and 7 the onshore ECC is slightly wider (72m for scenario 1 and approximately 50m for scenario 2 and 3) as a dedicated haul road is incorporated to allow for construction traffic access to the onshore substation.

1.4.2 At hedgerow crossings the width of the hedgerow removed will be minimised. For hedgerows where open trench crossing is used, stockpiles will not be continued through the hedgerow, meaning the expected width of hedgerow removed would be approximately 30m (approximately 20m for scenario 2 and 3), including up to 10m width of haul road. For hedgerows where trenchless crossings, such as HDD is used, the haul road may need to pass through the hedgerow, which would mean a hedgerow width of approximately 10m would be removed. The haul road would also seek to target existing gaps, where practical, and a number of off route haul roads have been included in the design to facilitate this. Any hedgerow sections removed as part of the ECC construction will be replanted as part of the reinstatement works. Further details on the approach reinstatement are included in the outline Landscape and Ecology Management Plan (Volume 9, Report 22),

1.4.3 The full description of Landfall works and the associated parameters are included in the Offshore Project Description (Volume 6, Part 3, Chapter 1 Offshore Project Description). There is an overlap in the offshore and onshore study area at the intertidal area of the Landfall. Traffic associated with the landfall works is described within this chapter.

1.4.4 The MDS associated with the onshore export cable is described in Table 1.2 below.

Table 1.2: Onshore export cable MDS

Onshore Cable Route	Max Design Scenario
Length	Up to 24.5 km
Max number of Export circuits	2 (with ducting for additional 2 circuits)
Number of power cables per circuit	3
Max number of comms cables per circuits	3
Max number of earth cables per circuit	1
Width of open trenched sections	Up to 60 m (38m for Scenario 2 and 3) which includes 10 m haul road swathe
Width of complex trenchless crossings	Up to 140 m
HVAC cable technology	XLPE insultation
Max export cable voltage	400 kV
Approximate max external cable diameter	150 mm
Bedding Material	CBS
No. of ducts required per circuit	Up to 7 (three power and four for telecomms/earthing)
Anticipated Construction period	18–27-month period.

CABLE INSTALLATION

1.4.5 Site enabling works will start the construction within each Route Section. These works are likely to include:

- Temporary fencing;
- Upgrade of existing, or installation of new, access from the public highways, only where required;
- Archaeological and ecological survey / mitigation works as necessary;
- Utility diversions and installation of temporary site drainage where required;
- Vegetation clearance; and
- Establishment of TCC site compounds, which could include site offices, welfare facilities, security, wheel wash, lighting and signage.

1.4.6 Main construction activities for each section of the onshore ECC may include:

- Topsoil removal (to edge of working area);
- Temporary haul road installation along all sections of the route;
- Trenchless duct installation beneath obstacles (such as major roads, railways, rivers and ecological features);
- Installation of header or interceptor drains at cable corridor boundaries;

- Trench excavation (typically up to four trenches for scenario 1; or up to 2 trenches for scenario 2 and 3);
- Duct and tile installation (this may be by hand or using a specialist ducting trailer / machine);
- Trench backfilling;
- Existing field drainage repairs (where disruption occurs); and
- Jointing pit installation (including French drains to prevent water pooling above jointing pit).

1.4.7 Once the ducts are installed cable installation will commence for the two VE circuits which includes:

- Cable installation (pulled through ducts from each joint pit);
- Cable jointing; and
- Cable testing and commissioning.

1.4.8 The main cable installation method will be through the use of open-cut trenching with High Density Polyethylene (HDPE) ducts installed, the trench backfilled and cables pulled through the pre-laid ducts.

1.4.9 The cable circuits will be installed within an onshore ECC generally up to 60 m wide (38 m for scenario 2 and 3) during the construction phase. In some places it could be wider as described in 1.4.1. This corridor includes space to store topsoil, subsoil and a temporary haul road, as well as any equipment required for that section of work during construction and to accommodate any Public Right of Way (PRoW) diversions required during the construction phase. An indicative cross section is shown in Figure 1.10.

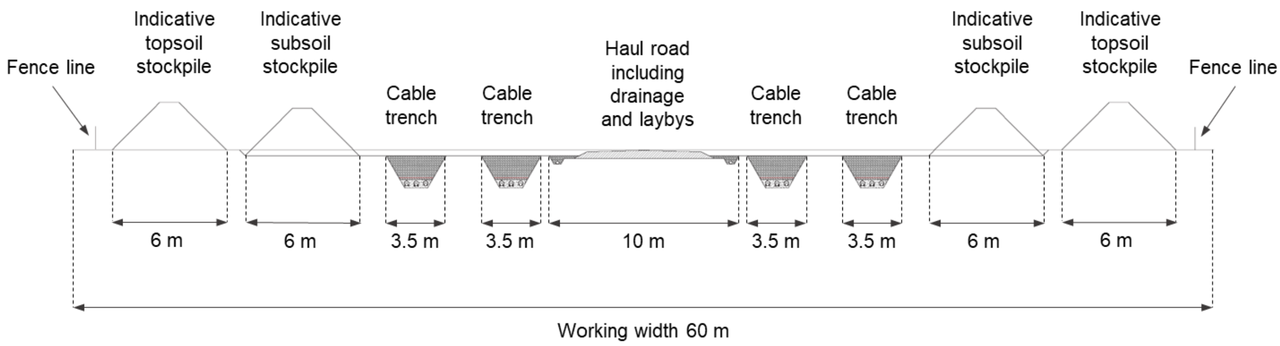


Figure 1.10: Indicative cross section through onshore ECC (Scenario 1)

1.4.10 In some areas reinstatement can occur as soon as the cable ducts are installed. Reinstatement activities are expected to consist of:

- Removal of haul road;
- Jointing pit ground re-instatement;
- Replacement of topsoil;
- Landscaping and hedge re-planting, where appropriate; and
- Demobilisation and fence removal.

1.4.11 The typical width for the export cable corridor would be up to 60 m for open trenching (38m for scenario 2 and 3), although in places there may be exceptions to avoid repeated necking in and out of the corridor either side of HDDs.

1.4.12 It is assumed that many of these crossings will use HDD as that provides a reasonable worst case for assessment, however the precise crossing methodology will be determined as part of detailed design. At trenchless crossings HDD compounds / HDD swathes are anticipated to be slightly wider than the standard open trench corridor with a typical width of 90m (45m for scenario 2 and 3) for simpler crossings and up to approximately 140 m (70m for scenario 2 and 3) for the major crossings. The width set out above allows for deviation of the drills and for a spare drill alignment should this be required.

1.4.13 The cables are typically installed in a flat (cables laid adjacently and horizontally) formation as seen in Figure 1.11 Indicative cross section of a direct burial trench, or a trefoil formation (cables bunded together in a triangular shape), depending on detailed cable system design, with separation between circuits to ensure thermal separation.

1.4.14 The cable trenches will be excavated, typically utilising tracked excavators. The excavated subsoil will be stored separately from the topsoil, with the profile of the soil maintained during the storage process, in accordance with best practice. Soil may be stored immediately adjacent to the trench or stored elsewhere within the Order Limits at temporary construction and laydown areas. The nominal width of topsoil affected is up to 60 m for open trenched sections (38m for scenario 2 and 3).

1.4.15 The removal (or height reduction) of trees, hedgerows and ground vegetation will be kept to a minimum but where necessary will be completed in accordance with the prevailing best practice and controlled by the Code of Construction Practice (CoCP) and the Landscape Ecological Management Plan (LEMP), both of which will be secured within the DCO.

1.4.16 Drainage measures will be incorporated into the works design, the principles of these are set out in the CoCP (forming part of the DCO) to minimise water within the trench and ensure ongoing drainage of surrounding land. Where water enters the trenches during installation, this will be pumped via settling tanks or ponds to remove sediment, before being discharged into local ditches or drains via temporary interceptor drains.

1.4.17 The base of the trench will be prepared by laying a base fill material of Cement Bound Sand (CBS). A duct for each cable and separate ducts for a fibre optic bundle will be laid on the base fill material and surrounded with further CBS material before being backfilled with stored subsoil. The soil will be reinstated with a warning tape buried approximately 100 mm above the polyethylene protection tiles to indicate the presence. The stored topsoil will be replaced upon the backfilled subsoil to reinstate the trench.

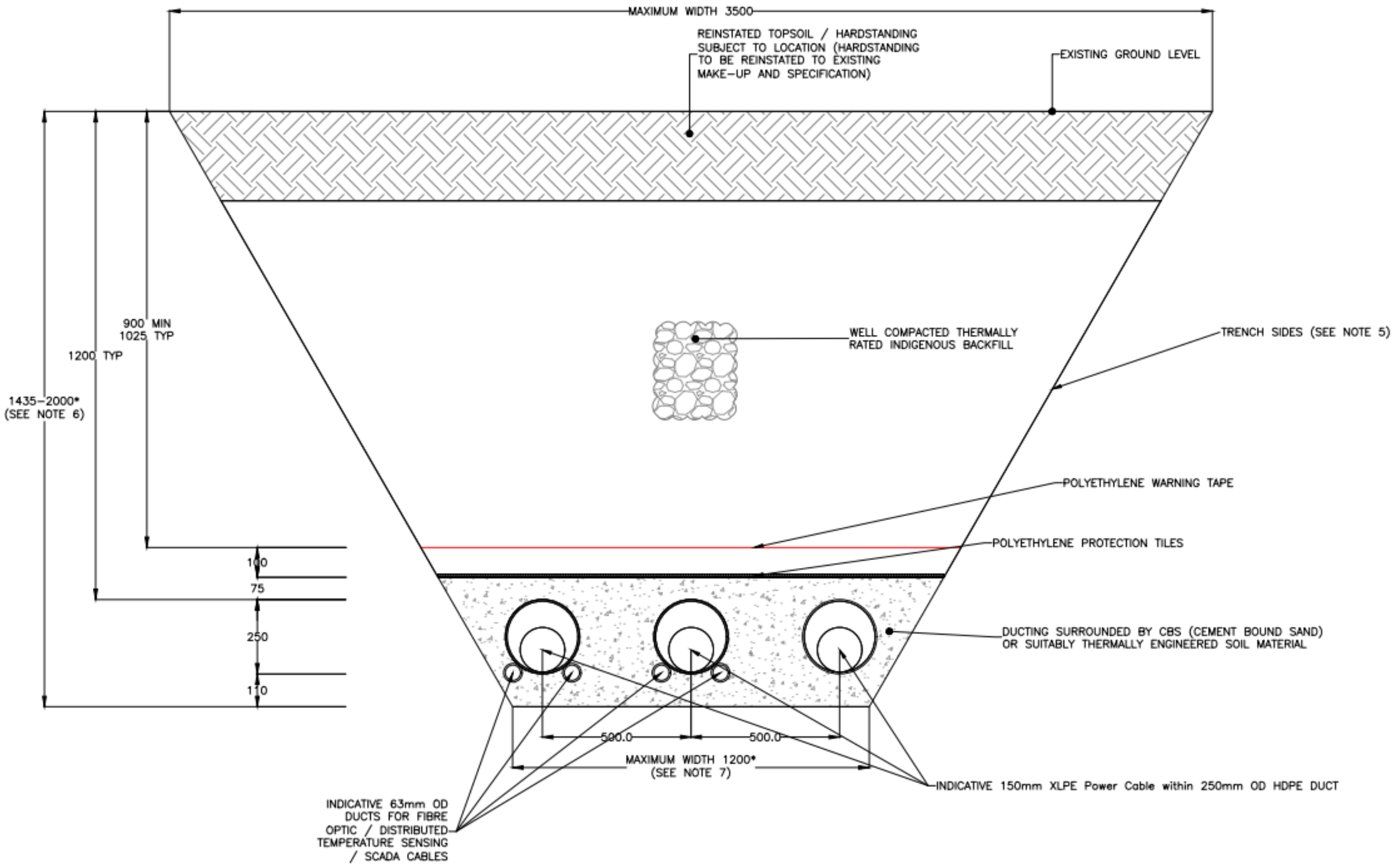


Figure 1.11: Indicative cross section of a direct burial trench

1.4.18 For the two VE circuits, cables will be pulled and installed through the buried ducts and will not require the trenches to be reopened, however access to and from the jointing pits will be required to facilitate the works.

1.4.19 Cable drums will be delivered by Heavy Goods Vehicles (HGV) to the cable route TCC's for storage where necessary, then transported to the joint pit locations. The cable drum will be located adjacent to the joint pit on a temporary hard standing. A winch will be attached to the cable with a pilot wire, and the cable will be pulled off the drum through the buried ducts.

1.4.20 Figure 1.12 shows an example of a cable drum delivery to cable storage area.

Figure 1.12: Example of a cable drum delivery to cable storage area

1.4.21 Cranes will be used to transfer the cable drums from the delivery lorries either directly to the cable vehicles or to a storage point until they are required.

1.4.22 The MDS associated with the installation of the onshore export cable are described in Table 1.3: Onshore export cable construction MDS below.

Table 1.3: Onshore export cable construction MDS

Onshore Cable Route	Max Design Scenario
Maximum Depth of Burial (DOB) and Depth of Excavation (DOE) (excluding obstacle crossing points inc. utility crossings subject to depth of service line and clearance)	1.64 (DOB) 2.00 (DOE)
Minimum Soil Cover	0.9m (above warning tape)[1]
Open trench cable corridor construction swathe	Up to 60 m (38m for scenario 2 and 3)
Max no. of trenches for all cables / ducts – normal construction	4 (2 for scenario 2 and 3)[2]
Indicative open trench dimensions [per trench]	3.5 m wide at surface
Typical Joint Pit dimensions	15 x 4 m
Number of HDDs bores per crossing	Up to 12 (6 for scenario 2 and 3)
Indicative HDD / trenchless drives max depth (m below ground level)	Up to 20 m
Maximum width of working corridor at trenchless crossings	Up to 90 m for standard trenchless crossings, up to 140 m at complex trenchless locations
Typical HDD compound dimensions	**Scenario 1:** Typically 90 m x 50 m but longer HDDs up to 130 m x 50 m **Scenario 2 and 3:** Typically 50 m x 40 m but longer HDDs up to 50 m x 80 m
Haul road	Up to 6 m wide (10 m including verges and drainage)

[1] Typically this minimum soil cover will result in a DoB of at least 1.05m

[2] In specific instances where the phases / cables cores are separated up to 12 trenches (6 for scenarios 2 and 3) may be required. This may be required where HDDs are used with one core per bore and the phases need to be brought back together either side of the HDD to continue in a single trench. This would only be in local areas next to HDDs/trenchless crossings.

JOINT PITS

1.4.23 Joint pits will be required along the cable route to allow cable pulling and jointing of two sections of cable. One joint pit will be required approximately every 500 m of cable (to be determined by detailed design), resulting in a maximum of 196 (98 for Scenario 2 and 3) joint pits (this is 49 per circuit with ducting for a maximum of four circuits in the MDS), in addition to the TJBs at Landfall and cable termination at the OnSS. The joint pits will be of a similar design and installed in a similar approach to the TJBs and will have a maximum footprint of 60 m^2 (indicatively up to 15 m long by 4 m wide by 1 m deep). While crossing agricultural land the highest point in the pit – including the cable circuit and associated protection – will be at a minimum depth of 900 mm below the top of the subsoil layer. In some areas the joint pits could be deeper, for example where there is extensive field drainage.

1.4.24 The jointing pits will require separate, smaller cable-testing chambers (known as link boxes) to allow for fault testing and to accommodate earth bonding and fibre optic splicing. These will typically consist of concrete or glass reinforced plastic (GRP) chambers, and where access is needed may have a manhole(s) set in a concrete plinth at ground level. The manhole covers will either be heavy duty to provide agricultural vehicle load-bearing capabilities or lightweight construction allowing access to personnel without need for additional lifting machinery. A maximum footprint of link box chambers of 10m^2 per joint pit is considered. Manhole covers where used would typically have a size of around 2 x 2m. Figure 1.13 shows a typical jointing pit under construction.

A. 

B. 

Figure 1.13 A: A typical jointing pit under construction. B. typical link box cover once backfilled (image courtesy of RWE Renewables)

CROSSING TECHNIQUES

1.4.25 Volume 6, Part 6, Annex 1.1: Obstacle Crossings Register comprises a table noting the identified obstacles on the cable route that will be crossed by the onshore ECC. The list of obstacles where HDD (or other trenchless techniques) will be used to cross them is not exhaustive. The most suitable method for crossing obstructions will be determined during the construction stage of the project which may identify additional trenchless crossings.

TRENCHLESS

1.4.26 HDD (or other trenchless crossing techniques) will be used at a number of locations as an alternative methodology to open-cut trenching to cross significant environmental and physical features such as main rivers, major drains, roads, and railways. When using a trenchless technique, the ducts require greater spacing, a width of up to 90m for the corridor is generally required where standard trenchless techniques are used. A wider corridor has been allowed for at more complex crossing points (Landfall, the railway and Swan Road / Thorpe Road junction) Figure 1.14 depicts a typical HDD layout.

1.4.27 The HDD process involves drilling under the feature being avoided. Typically a drilling head is used to drill a pilot hole along a predetermined alignment, before this pilot hole is widened using larger drilling heads to the required bore size. Bentonite pumped to the drilling head is used to stabilize the hole and ensure it doesn’t collapse.

1.4.28 Alternative trenchless crossing methodologies that may be considered where appropriate include pipe jacking, direct pipe or auger boring. For assessment purposes, it is considered the plant and equipment identified for HDD would be representative of that required for other techniques, in terms of maximum numbers of equipment on site and the potential environmental impacts.

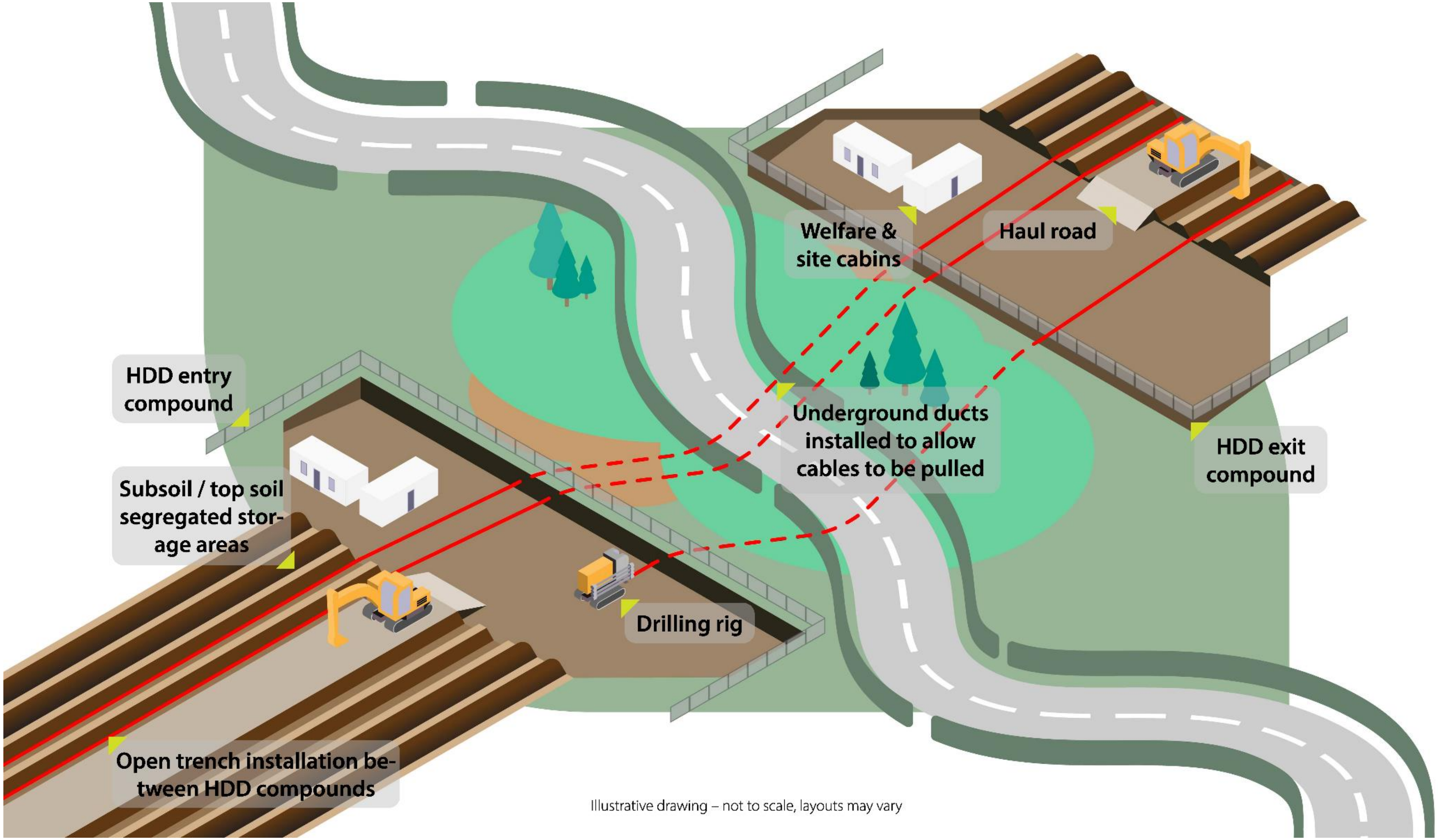


Figure 1.14 Typical HDD Layout

1.4.29 A number of minor obstacles are identified in the Obstacle Crossings Register (Volume 6, Part 6, Annex 1.1) as being crossed by trenchless techniques as they are adjacent to a major feature, such as a small ditch next to a main road and as a result will be crossed together as a group of obstacles. In addition, trenchless crossings are selected for some minor roads, as a result of sensitive hedgerow habitats either side, and the fact that trenchless crossing techniques, such as HDD minimises the impact on these (although haul road crossing / access is typically still needed).

1.4.30 Drilling compounds or launch and receptor pits (dependent on the technique chosen) will be set up within the cable corridor at suitable locations adjacent to each obstacle, or group of obstacles, to be crossed. The distance that each compound will be from the obstacles will be determined during the construction stage of the project and will depend on factors such as the length of the crossing, the height differential of the land either side of the obstacles, depth of the obstacle to be cleared, and the local ground conditions.

1.4.31 As the length of each crossing will not be finalised and known until the construction phase, the duration for each trenchless duct installation is not currently known.

TRAFFIC AND ACCESS

HAUL ROAD

1.4.32 A temporary haul road will be established along the onshore ECC to provide safe access for construction vehicles; from TCCs to cable installation sites and to reduce impact on the surrounding road network. The temporary haul road could be up to 6 m wide (up to 10 m wide, including verges and drainage channels) and extend along the onshore ECC, obstacles such as the railway and the A120 provide natural breaks in the haul road, meaning it will not be continuous.

1.4.33 Depending upon ground conditions, it may not be necessary to undertake works to construct the fully designed haul road. Where the ground is sufficiently firm it may be acceptable to use significantly less granular sub-base material, or trackway this is to be confirmed once further information is available as part of the post consent detailed design process.

1.4.34 Following topsoil stripping, the temporary haul road will be formed of protective matting, temporary metal road or permeable hardcore aggregate dependent on the ground conditions, vehicle requirements and any necessary protection for underground services. The haul road will remain in place for access to the joint pits until cable jointing and testing is complete, where upon it can be removed and the topsoil reinstated.

1.4.35 Consideration will also be given to alternatives such as a specialist track-way if appropriate before construction. The final decision will depend upon ground conditions and the contractor’s preferred construction strategy and will not be confirmed until the detailed design stage.

TRAFFIC ESTIMATES

1.4.36 Summary traffic generation estimates for the different scenarios are provided in Table 1.4 with further information on traffic generation estimates provided within Volume 6, Part 3, Chapter 8: Traffic and Transport.

Table 1.4: Minimum, maximum and average daily traffic generation (two way movement) estimates for cable installation (Scenario 1)[3]

Route Section	Total vehicles			HGVs			Employee vehicles (car occupancy 1.5)		
	Min	Max	Av.	Min	Max	Av.	Min	Max	Av.
Section 1 (incl. Landfall HDD compound)	77	242	153	38	106	71	35	145	82
Section 2	0	103	61	0	33	22	0	77	38
Section 3	85	175	134	25	87	62	34	109	72
Section 4a	14	87	57	3	39	21	11	59	36
Section 4b	68	146	112	16	72	50	34	84	61
Section 5	43	128	88	28	57	38	11	83	49
Section 6/7	75	160	107	16	91	50	34	81	57
400kV works	0	86	23	0	42	9	0	55	14
Beach access to support landfall works	0	92	12	0	39	5	0	53	9

[3] Traffic estimates are based on an 18 month construction period, which is expected to produce the highest peaks. Minimum values of zero indicate that for that section, works are not expected to occur for the full 18 months, and for some months no or very limited activity is expected. This would typically occur for the shorter sections.

Table 1.5: Minimum, maximum and average daily traffic generation (two way movement) estimates for cable installation (Scenarios 2 and 3) [4]

Route Section	Total vehicles			HGVs			Employee vehicles (car occupancy 1.5)		
	Min	Max	Av.	Min	Max	Av.	Min	Max	Av.
Section 1 (incl. Landfall HDD compound)	67	150	117	28	69	50	35	101	67
Section 2	0	80	47	0	33	15	0	56	33
Section 3	63	151	98	25	65	43	34	97	56
Section 4a	0	92	43	0	41	14	0	59	28
Section 4b	44	131	83	10	59	35	34	90	48
Section 5	0	114	66	0	58	26	0	71	40
Section 6 and 7 (combined)	37	141	91	3	90	41	24	78	50
400kV works	0	74	18	0	18	5	0	56	13
Beach access to support landfall works	0	92	12	0	39	5	0	53	9

[4] See preceding footnote

TEMPORARY CONSTRUCTION COMPOUNDS

1.4.37 TCCs will be required along the onshore ECC for the duration of the enabling and installation works. The compounds will provide secure, fenced and potentially lit, storage locations for heavy duty plant equipment, local site management offices, welfare, local first aid points, refuelling stations, and control of substances hazardous to health (CoSHH) storage as well as providing space for storage of cables, optical fibres, ducts and other supplies required to complete the installation works. At the larger TCCs, CBS or concrete batching plants may be established to support the works along the cable route, depending on the delivery logistics strategy. If used, such temporary batching plants would consist of material storage bins, conveyor systems and silos (typically up to approximately 17m in height). Cranes will be used during establishment and decommissioning of each TCC. Water, sewage, and electricity services will also be required at these sites.

1.4.38 Temporary site drainage will be installed during construction at each TCC, with the routing and discharging of water undertaken in accordance with principles set out in the CoCP.

1.4.39 TCCs will have sufficient space to ensure no vehicles are parked on the public highway.

1.4.40 Scenario 1 includes the establishment of TCCs sufficient to enable the construction of both the VE and North Falls projects. It is envisaged that in this scenario certain areas of the TCCs would be specific to each project (e.g. for cable storage), and certain areas would be utilized by both projects. In scenario 2 and 3 a smaller number of TCCs or smaller areas in each TCC zone would be required.

1.4.41 The MDS associated with the TCCs are described in Table 1.6.

Table 1.6: Onshore TCC MDS

Onshore Cable Route	Max Design Scenario
Indicative no. of TCCs	Up to 12 comprising: **For Scenario 1:** 7 main / larger TCCs; 3 minor TCCs; 1 minor sized TCC for marshalling of substation traffic; and 1 minor beach access compound **For Scenario 2 and 3:** 4 main / larger TCCs; 5 minor TCCs; 1 minor sized TCC for marshalling of substation traffic; and 1 minor beach access compound
Indicative cable construction compound TCC area	Main TCCs: Up to 22,500m2 (e.g. dimensions 150m x 150m) Minor TCCs: Up to 10,000m2 (e.g. dimensions 100m x 100m) For Scenario 1 larger areas for TCCs 4 and 6 (up to 45,000 m^2) are considered. TCC 6 adjacent to the A120 is envisaged to be used as a primary TCC / site offices location. TCC 4 serves a relatively longer section of route.

1.4.42 The potential TCCs associated with each route section of the ECC are outlined in section 1.2 and shown on Figure 1.3 to Figure 1.8.

SITE ACCESS AND CROSSING POINTS

1.4.43 Traffic will only be able to enter the onshore ECC from the highway at agreed access points, thus minimising the impact on the local minor road network.

1.4.44 Where the ECC crosses the local road network and haul route access over that road is appropriate, construction vehicles will need to cross the existing road to continue along the ECC. As noted above, construction traffic coming from the highway network will not be permitted to access the ECC from the public highway at these crossings points, unless defined as an access point, and will be limited to directly crossing from one side of the road to the other to continue along the haul road.

1.4.45 The temporary works required at each of these crossing points will therefore be significantly less than that required at TCC entrances, where traffic will be entering and exiting the public road network. Priority will be given to existing traffic on the local roads and, where necessary, the traffic entrance onto the roads will be managed. Barriers will be used, and access will be controlled, to prevent members of the public accessing the construction works.

1.4.46 Proposed temporary construction access locations will mostly be via the TCCs, and most construction traffic will enter the site through the TCCs. The precise access locations will be determined and finalised post consent and as part of detailed design. Table 1.7 below shows the construction access locations/TCCs.

Table 1.7: Construction access locations/TCCs

Access/TCC	Highway link	Details
AC-0	Holland Haven Country Park car park access road	For access to the beach for personnel to monitor HDD (or other trenchless technique) progress.
AC-1/TCC 1	B1032 Clacton Road	For access to Onshore ECC Route Section 1, between landfall and the Great Eastern Mainline Spur
AC-2/TCC 2	B1032 Clacton Road	For access to Onshore ECC Route Section 1, between landfall and the Great Eastern Mainline Spur
AC-3A/TCC 3	B1033 Thorpe Road	For access to Onshore ECC Route Section 2 between the Great Eastern Mainline Spur and the B1033 Thorpe Road
AC-3B	B1033 Thorpe Road	For access to Onshore ECC Route Section 3 between the B1033 Thorpe Road and the B1035 Tendring Road
AC-4/ TCC 4	B1035	For access to Onshore ECC Route Section 3 between the B1033 Thorpe Road and the B1035 Tendring Road
AC-5/TCC 5	B1035 Thorpe Road	For access to Onshore ECC Route Section 4a between B1035 Tendring Road and Tendring Brook
AC-6/TCC 6	B1035 south of A120	For access to Onshore ECC Route Section 4b between the A120 and Tendring Brook
AC-7/TCC 6	B1035 south of A120	For access to Onshore ECC Route Section 4b between the A120 and Tendring Brook
AC-8A/TCC 7	B1035 Clacton Road	For access to Onshore ECC Route Section 5 between the B1035 Clacton Road and the A120
AC-8B/TCC 8	B1035 Clacton Road	For access to Onshore ECC Route Section 5 between the B1035 Clacton Road and Bentley Road
AC-9/TCC 9	Bentley Road	For access to Onshore ECC Route Section 5 between the B1035 Clacton Road and Bentley Road
AC-10/TCC 9	Bentley Road	For access to Onshore ECC Route Section 6/7, the OnSS and 400kV route
AC-11/TCC 9	Bentley Road	For access to Onshore ECC Route Section 6/7, the OnSS and 400kV route
AC-12/12A/ OnSS TCC	Ardleigh Road	Could be used during periods of construction works set up or close down and access to EACN Substation Compound and 400kV connection works.
AC-13	Ardleigh Road	For access to the Ardleigh Road Drainage Zone

POST INSTALLATION ACTIVITIES

1.4.47 Following the installation of all cables and joint pits in a section, the construction working width will be cleared and reinstated. This reinstatement will include replanting of hedgerows, replacement of fences, removal of temporary land drains and reinstatement of permanent land drains. Hedgerows will be replaced, but deep rooted trees cannot be planted on top of any sections of underground cable that have been installed. However, there will be replacement tree planting within the project Order Limits. Further detail is included in Outline Landscape Ecology Management Plan (Volume 9, Report 22), which accompanies the DCO application.

1.4.48 Standard practice will be for areas of temporary land take to be restored to agriculture, or other original use where practicable. Figure 1.15 shows an example of an area of cable corridor during restoration.

Figure 1.15: Cable corridor during restoration example (RWE renewables UK Ltd)

ESTIMATED WASTE AND MATERIALS FOR ONSHORE ECC

1.4.49 Table 1.8 provides an estimate of the materials used in construction of the onshore ECC.

Table 1.8: Estimate of materials used in construction of the onshore ECC (Scenario 1)

Imported Materials / Permanent Equipment	Units	Indicative Maximum Value
MOT Type 1	Tonnes	387,789
Asphalt	Tonnes	12,861
HB2 External Radii Kerbs	No.	319
HB2 Straight Kerbs	No.	0
Concrete	m^3	3,957
Crusher Run Stone	Tonnes	0
20/40mm Drainage Stone	Tonnes	33,538
Length of perforated pipe	m	62,107
Geogrid	m^2	697,710
Geotextile	m^2	697,710
Fencing (including required posts)	m	63,403
Heras fencing panels	No.	7,072
Length of Onshore Export Cable (single core length)	m	131,361
Length of Onshore Fibre Cable	m	133,361
Length of Onshore Earth Cable	m	43,787
Trench Tiles / cable protective covers	No.	310,077
Cement Bound Sand (CBS)	Tonnes	57,472
Selected Sand	Tonnes	8,934
Length of 250mm duct	m	212,256
Length of 62mm duct / pipe	m	287,008
Length of ducting for install in onshore HDD bores for cable circuits	m	50,466
Length of ducting for install in onshore HDD bores for FO and DTS	m	33,644
Bentonite	kg	1,013,427
Water	m^3	25,408

Imported Materials / Permanent Equipment	Units	Indicative Maximum Value
Steel Reinforcement	Tonnes	248
Link box lids	No.	384
Cable Joint Kits	No.	576
Transition bay pre-cast concrete slabs	No.	152
Length of 120mm duct	m	2,000
Length of 11kv Auxiliary Cable	m	2,000
Number of CG3 cable marker blocks	m	443

1.4.50 Table 1.9 provides an estimate of the waste generated from construction of the onshore ECC.

Table 1.9: Estimate of waste generated from construction of the onshore ECC (Scenario 1)

Waste Material Type	Units	Indicative Maximum Value
MOT Type 1	Tonnes	387,789
Asphalt	Tonnes	12,861
HB2 External Radii Kerbs	No.	319
HB2 Straight Kerbs	No.	0
Concrete	m^3	145
Crusher Run Stone	Tonnes	0
20/40mm Drainage Stone	Tonnes	33,538
Length of perforated pipe	m	62,107
Geogrid	m^2	697,710
Geotextile	m^2	697,710
Heras fencing panels	No.	7,072
Native Soil	Tonnes	134,084
Topsoil	Tonnes	766
Drill Fluid Removal	m^3	8,847
Fencing (including required posts)	m	63,403

1.5 ONSHORE SUBSTATION

1.5.1 One OnSS will be required for VE which will be sited north of the A120 to the west of Little Bromley, this area has been chosen to facilitate connection to the National Grid EACN substation (subject to a separate DCO application). The proposed substation is within the Substation Search Area (SSA) West identified and included within the PEIR. Following PEIR a co-located arrangement has been developed with North Falls, which has both the VE and North Falls substations located next to each other just north of Ardleigh Road.

1.5.2 The main elements of the OnSS are defined as follows:

- **Onshore Substation Works Area** is the wider area within which all the OnSS works will take place. Within the area are specific footprints or zones for the various infrastructure elements these include:
  - **Onshore substation compound (OnSS)** The area in which the OnSS footprint will be located. The footprint assessed allows for either Air-Insulated Switchgear (AIS) or Gas-Insulated Switchgear (GIS) technology.
  - **Onshore substation construction zone (OnSS construction zone**) The area in which the OnSS Temporary Construction Compound (TCC) would be located.
  - **Onshore substation access and drainage zone (OnSS access zone)** The area which will contain the final OnSS access route(s) (both construction and operational) north of Ardleigh Road.
  - **Onshore substation planting zone (OnSS Planting zone)** Within this area only screening planting, drainage and other ecological mitigations for the project will be undertaken.
- **Onshore substation access route** The route includes permanent road improvements to the A120/Bentley Road junction and widening to the Bentley Road highway, along with a new temporary haul road running within the ECC for substation construction traffic from Bentley Road to Ardleigh Road.

1.5.3 The OnSS is adjacent to the proposed North Falls project substation and the proposed National Grid East Anglia Connection Node (EACN) substation area, both of which are in the DCO pre-application phases. This has the potential for an increase in localised effects, but also provide greater opportunities for co-ordination on items such as site access and mitigation planting. VE will continue engagement with the neighbouring projects on coordination.

1.5.4 An indicative planting plan has been prepared, see Volume 9, Report 22: Outline Landscape and Ecological Management Plan (OLEMP), which shows landscape and ecological mitigation, compensations and/or enhancement planting around the OnSS. This is subject to further detailed design and an updated LEMP will be produced in advance of construction. This incorporates woodland, hedgerow and grassland planting, as well as indicative earthworks and drainage, described in more detail in the OLEMP and at paragraphs 11.5.25 to 1.5.27 below.

1.5.5 The OnSS will contain a number of elements including switchgear, busbars, transformers, capacitors, reactors, reactive power compensation equipment, grid stability equipment, filters, cooling equipment, control and welfare buildings, lightning protection rods (if required) and internal road access. A security fence will surround the OnSS compound, with full design details provided at detailed design

1.5.6 The OnSS will use either AIS or GIS. The choice of switchgear affects both the total land area required and the size and type of buildings which will be needed. GIS substations are generally smaller than their AIS counterparts, typically taking up an approximately 25- 35% smaller footprint than an equivalent AIS substation, although they are likely to require a greater number of taller buildings. GIS substations typically require less maintenance as the interior elements are sealed and insulated. GIS systems do, however, have a higher upfront cost, but may have a lower lifetime cost than equivalent AIS systems. The choice of AIS or GIS will be part of the detailed design process and a decision will be made post-consent prior to construction commencing.

1.5.7 Figure 1.16 and Figure 1.17 provide indicative substations views for AIS and GIS technologies.

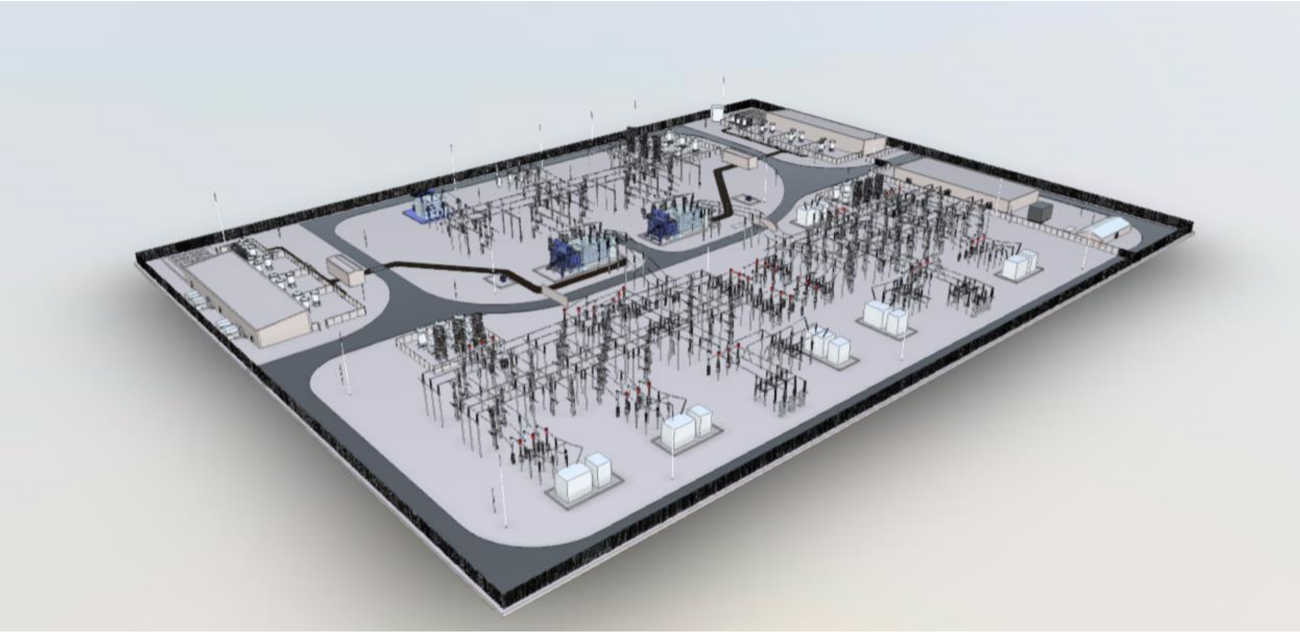


Figure 1.16: Indicative view of an AIS Substation

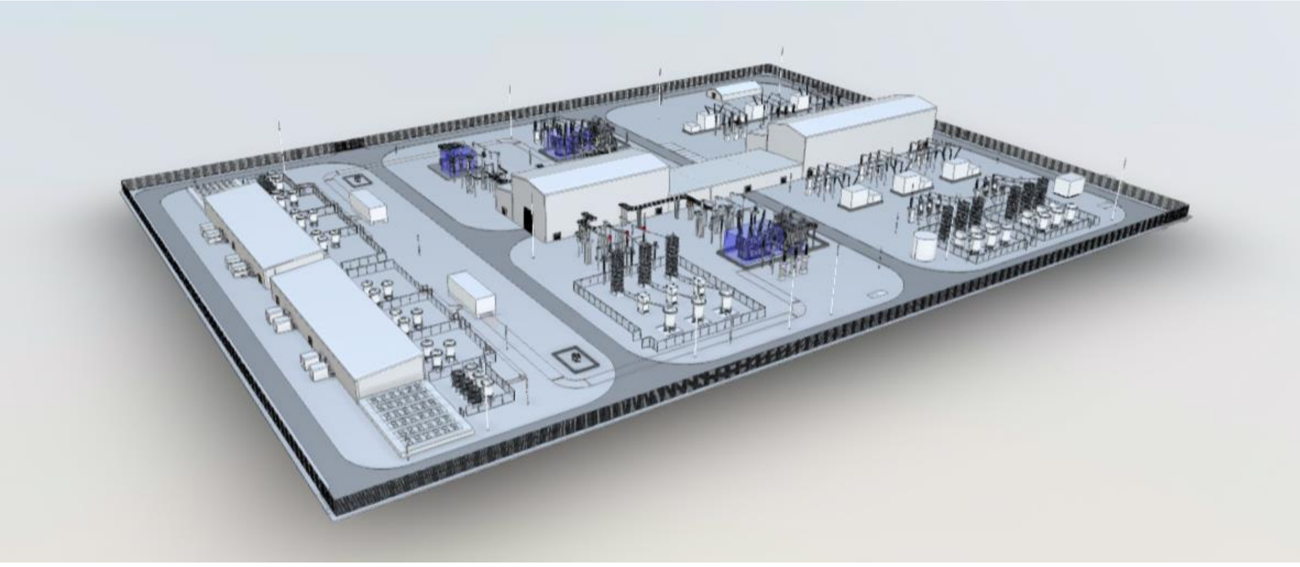


Figure 1.17: Indicative view of a GIS Substation

1.5.8 The largest structure within the OnSS will be the OnSS building, with a maximum height of 15 m above existing ground level (assuming a GIS design). All other equipment (e.g., transformers, switchgear) is designed not to exceed a height of 15 m above existing ground level with the exception of slender lightning masts which would be up to 18 m in height. While there would be lighting associated with the OnSS during the operational phase, this would be limited in extent and usage.

1.5.9 The total land requirement for the OnSS (assuming AIS layout) to the perimeter fence is 58,800 m^2, as well as additional land required for the TCC, roads, drainage and cut/fill.

1.5.10 The drainage design will consist of swales and / or attenuation ponds. Filter drains will collect runoff from the internal access roads within the substation site and convey runoff to swales and / or attenuation ponds. Outfall locations are proposed to the unnamed ordinary watercourse located south of Ardleigh Road and to the unnamed drainage ditch north of Ardleigh Road. An outline operational drainage strategy is included in the Substation Design Principles Document (Application Document 9.4)

1.5.11 There are proposed onsite welfare facilities for the substation which would be associated with infrequent usage. A septic tank is therefore proposed for the substation site.

1.5.12 The MDS associated with the OnSS are described in Table 1.10.

Table 1.10: Substation site MDS

Substation	Max Design Scenario
Indicative dimensions of AIS site	280 m x 210 m
Max area of AIS site	58,800 m²
Indicative dimensions of GIS site	250 m x 180 m
Max area of GIS site	45,000 m²
Indicative number of buildings	6
Indicative building dimensions	1 x 400 kV GIS building: 40 x 28 x 15 m high (only required for GIS substation, not for AIS) 1 x 275 kV GIS building: 60 x 27 x 15 m high (only required for GIS substation, not for AIS) 2 x STATCOM (Control & Valve) buildings: 55 x 15 x 7 m 1 x Control building (possibly several adjacent containerised buildings): 50 x 20 x 5 m 1 x Storage/Amenity building: 20 x 9 x 4 m
Max external equipment height	15 m
Max area of TCC	37,500 m²

ONSHORE SUBSTATION TEMPORARY CONSTRUCTION COMPOUND (OnSS TCC)

1.5.13 During construction of the OnSS, a TCC will be established to support the works. The area will be formed of hard standing with appropriate access to allow the delivery and storage of large and heavy materials and assets, such as power transformers.

1.5.14 The area will be approximately 37,500 m^2 and will accommodate construction management offices, welfare facilities, car parking, workshops and storage areas. A cement bound sand or concrete batching plant may be established to support the works, depending on the delivery logistics strategy. If used, such a temporary batching plant would consist of material storage bins, conveyor systems and silos (typically up to approximately 17m in height). Water, sewerage and electricity services will be required at the site and supplied either via mains connection or mobile supplies such as bowsers, septic tanks and generators. This area may also support the ECC works in the immediate area.

1.5.15 The OnSS TCC will not necessarily be a regular shape and may be split between several smaller areas to avoid constraints such as utilities or ecology receptors.

1.5.16 The OnSS TCC is expected to be sited immediately to the west of the OnSS, its location has considered avoidance of existing utilities, ponds, watercourses, hedgerows and other known infrastructure/ constraints, where practicable, to minimise potential impacts.

SUBSTATION CONSTRUCTION METHODS

1.5.17 The main OnSS construction works are anticipated to take place over an approximately 24-month period. Preliminary / enabling works, such as the improvement works to Bentley Road, may extend this period.

1.5.18 Site enabling works for the OnSS include site initial site clearance. The Order Limits and MDS has allowed for some site clearance works for the North Falls adjacent substation to be conducted where needed to allow coordination of access, screening and drainage arrangements. The soil will be stripped and graded as required with material being reused on site where possible. Further information on soil management is in Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use. Any excess material will be disposed of at a licenced disposal site. Excavations and laying of foundations, trenches and drainage will commence after grading is complete.

1.5.19 Upon completion of the enabling works and installation of drainage and foundations, the substation platform will be finalised with a layer of stone combined with concrete pour. The exact thickness of the platform will be determined at detailed design stage following the ground investigation.

1.5.20 Foundations for the OnSS may require piling, however, confirmation of the foundation design, including the type and amount of piling is dependent on the ground investigations. For the purpose of the assessment a worst case piled foundation has been assumed.

1.5.21 Specialist electrical equipment will be delivered to site, installed and commissioned. Due to the size and weight of the transformers' tanks, these deliveries will be classed as Abnormal Indivisible Loads (AILs). Such loads may require specialist delivery methods to be employed and, when on site, offloaded and skidded into position with the use of a mobile gantry crane.

1.5.22 Temporary perimeter fencing will enclose the OnSS for the duration of the construction period, and then during operation a permanent 2.4m high fence will be installed once construction works are complete.

SEQUENCE OF CONSTRUCTION ACTIVITIES AT THE SUBSTATION

1.5.23 The likely sequence of activities at the OnSS are:

- Detailed site investigation works, pre-construction archaeological and ecological surveys and mitigation;
- Site enabling works at the start of the construction will include the following:
  - The construction of temporary accesses and any local road improvements, including marshalling TCC's;
  - Site clearance,
  - Site mobilisation, temporary security fencing and the establishment of the OnSS TCC;
  - Ground works including cable ducting and new site drainage; and

- Reprofiling (ground raising), establishment of the stoned site platform.

1.5.24 Installation of the OnSS including:

- Permanent security fencing and operational access road
- Construction of buildings (e.g. control and welfare) and other structures;
- Installation of electrical equipment such as switchgear, busbars, capacitors, reactors, reactive power compensation equipment, filters and cooling equipment;
- Commissioning of the electrical equipment; and
- Demobilisation, removal of the TCC and;
- Landscaping.

SUBSTATION LANDSCAPING, SCREENING AND PLANTING

1.5.25 Mitigation planting will include both onsite and offsite planting with the intention of forming enclosure and screening around the OnSS. The indicative layout for planting is based on the larger AIS footprint and is also applicable to the smaller GIS footprint. The layout has been designed to include enclosure and screening around the co-located North Falls project substation.

1.5.26 Mitigation planting comprises belts of woodland planting with faster growing species for screening and slower growing species to create a longer term woodland framework. Landscape plans have been collaboratively developed with a joint focus on delivering biodiversity and green infrastructure benefits, as well as achieving sustainable drainage system. Opportunities for advanced planting will be implemented where practicable, for example around the eastern and southern parts of the site.

1.5.27 There are no Public Rights of Way (PRoWs) that cross the OnSS site. There are PRoW / bridleways following Barn Lane to the north-east of the OnSS site and joining Ardleigh Road immediately south of the OnSS site that will remain unaffected.

SUBSTATION CONSTRUCTION TRAFFIC

1.5.28 Summary traffic generation estimates (two-way traffic) for the OnSS construction are provided in Table 1.11 with further information on traffic generation estimates for each parameter provided within the Traffic and Transport Chapter (Volume 6, Part 3, Chapter 8).

1.5.29 HGV construction traffic will access the substation from the A120, travelling north up Bentley Road towards the cable corridor, before turning west onto a temporary substation access haul road running alongside the Onshore ECC. This temporary haul road will be constructed as enabling works and is expected to also be used by construction traffic associated with the North Falls and EACN substations.

1.5.30 Prior to substation construction, enabling works to Bentley Road will be needed. These will consist of widening of Bentley Road to between 6m and 6.75m and improvement of the Bentley Road / A120 junction. Depending on surveys and further engagement a temporary footpath / cycle way / bridleway (a non-motorised user path) may be included within the design, and space for this has been allowed for within the Order Limits. It is expected that the temporary non-motorised user path would be set back from the road to minimise impact on trees and hedgerows.

1.5.31 A TCC area where the Onshore ECC crosses Bentley Road has been allowed for which will act as a marshalling area for construction traffic accessing or leaving the temporary haul road along the Onshore ECC.

1.5.32 It is anticipated that National Grid will construct a new permanent private access road suitable for AIL movements to the proposed EACN 400kV substation. This new private access road is expected to be consented and owned by National Grid. The exact alignment of this is to be confirmed. Dependant on its location, personnel and AIL loads accessing the VE substation during the construction phase may, in addition to the public highway, utilise this new private National Grid route if it is available. Alternatively, they will use the temporary haul road along the Onshore ECC.

1.5.33 In the very rare event that AIL access is needed to the substation during operation (not planned), the National Grid private access road will, in addition to the public highway, be utilised, or if that is not available the substation temporary haul road will be reinstated.

Table 1.11: Minimum, maximum and average daily two-way traffic generation estimates for OnSS construction[5]

	Total vehicles			HGVs			Employee vehicles (car occupancy 1.5)		
	Min	Max	Av.	Min	Max	Av.	Min	Max	Av.
Bentley Road widening and improvements works	32	96	60	4	20	13	28	76	47
Substation Construction inc.	37	334	166	9	133	58	27	201	108

[5] Traffic estimates are conservatively based on an 19 month construction period, which is expected to produce the highest peaks.

1.5.34 Abnormal load deliveries during construction are anticipated to comprise approximately 4 two-way movements for transformers on 24 axle frame trailers or similar and approximately 14 - 20 two-way movements of oversized indivisible plant.

ESTIMATED WASTE AND MATERIALS FOR OnSS

1.5.35 Table 1.12 provides an estimate of the materials used in the construction of the OnSS. Table 1.13 provides an estimate of the materials used for the widening works required to Bentley Road.

Table 1.12 Estimate of materials used in construction of the OnSS

Parameter	Base Value
Concrete (m^3)	7,958
Imported Engineered Fill (m^3)[1]	84,733 (99,543)
Fencing (m)	1,030
Reinforcement (tonnes)	728
Chippings (m^3)	5,508
Drainage (m)[1]	2,282 (5,000)
Structural Steel (tonnes)	508
Cladding (m^2)	5,700
Bituminous road (m^3)[1]	7,187(14,998)

[1] values in brackets include temporary haul road from Bentley Road to Ardleigh Road

Table 1.13 Estimate of materials used in completion of Bentley Road Widening including the NMU path

Parameter	Base Value
Proprietary SMA (Stone Mastic Asphalt) (m^3)	293
Asphalt Concrete (various grades) (m^3)	1,016
Type 1 Granular Fill (m^3)	2,648

1.5.36 Table 1.14 provides an estimate of waste generated from the construction of the OnSS. Table 1.15 provides an estimate of the waste generated from the widening works required to Bentley Road.

Table 1.14: Estimate of waste generated from construction of the OnSS

Parameter	Base Value	Classification	Waste Management Option
Vegetation (m^3)	20	Non-hazardous	Exemption on site or disposal for controlled plants
Soil and stones (m^3)	18,980 (Substation Topsoil) 11,605 (Construction compound topsoil) 1,415 (unusable earthworks cut)	Non-hazardous	Reuse on site where possible
Hardstanding, road surfaces (m^3)	3,750 (15,685)[1] (Bituminous surface from Construction Compound) 1,935~~,085~~ (Temporary Access Road)	Non-hazardous	Recycling
Mixed construction waste (m^3)	150	Non-hazardous	Disposal
Wood (m^3)	3000	Non-hazardous	Segregation and recycling or recovery
Metal (m^3)	100	Non-hazardous	Segregation and recycling
Hard core (m^3)	1000	Non-hazardous	Reuse on site
Mixed Packaging (m^3)	120	Non-hazardous	Segregation and re-use or recycling

Parameter	Base Value	Classification	Waste Management Option
Contaminated packaging (m^3)	10	Hazardous	Treatment and disposal
Office general waste (m^3)	20	Non-hazardous	Treatment
Office paper (m^3)	3	Non-hazardous	Recycling
Canteen waste (m^3)	15	Non-hazardous	Composting and treatment
Waste hydraulic oil (m^3)	5	Hazardous	Disposal
Wiping cloths (m^3)	2	Non-hazardous	Disposal

[1] values in brackets include temporary haul road from Bentley Road to Ardleigh Road

Table 1.15: Estimate of waste generated from completion of Bentley Road widening

Parameter	Base Value	Classification	Waste Management Option
Existing road waste (m^3)	201	Non-hazardous	Recycling
Topsoil / Subsoil (m^3)	3.357	Non-hazardous	Re-use on site where possible

1.6 EAST ANGLIA CONNECTION NODE SUBSTATION AND CONNECTION TO NATIONAL GRID

1.6.1 The 400 kV onshore ECC connection will be underground circuit(s) running from the proposed VE OnSS to the proposed National Grid EACN 400kV Substation. The 400kV section is relatively short with a length of approximately 500m.

1.6.2 The proposed National Grid EACN 400kV Substation facilitates the connection of the offshore generation to the main National Electricity Transmission System and will include HV transformers, reactors and other typical HV Plant and equipment.

1.6.3 The EACN Substation construction works will be consented separately by National Grid as part of their DCO for the Norwich – Tilbury project.

1.6.4 The following is expected to be part of the new National Grid EACN Substation construction works and consented by National Grid separately:

- Construction of a 400kV substation including but not limited to the construction of the main compound, access roads, cable troughs, buildings, HV electrical primary plant / switchgear and including all associated civils works; and
- Provision of a construction access suitable for HGVs to enter the EACN substation construction site and a temporary construction / welfare compound that can be used by the Contractor undertaking the cable connection works to connect the new VE OnSS to the new National Grid substation.

GRID CONNECTION POINT

1.6.5 The VE DCO application will include works for the cable connection between the new VE OnSS to the National Grid substation and some specific works to facilitate the connection within the National Grid substation as follows:

- Installation of switchgear bays in the National Grid EACN substation;
- Installation of troughs / ducts to facilitate the 400kV circuits, Protection & Control cables from the VE onshore substation into the switchgear bays.
- Installation and termination of the 400kV circuits and Protection & Control cables between the VE substation and the switchgear in the National Grid EACN substation;
- Installation of protection and control equipment (if required) within the National Grid relay building; and
- Temporary infrastructure such as haul roads and construction compounds to facilitate access, egress, laydown, storage and welfare containers which would be placed within close proximity of the work area.

1.6.6 The configuration of the VE switchgear within the footprint of the National Grid EACN substation will depend on a number of factors including the detailed design of the equipment required and the final layout of the proposed National Grid EACN Substation.

1.6.7 Access to the EACN substation is expected to generally be via the access routes to the VE substation, with traffic between the VE substation and EACN substation using Ardleigh Road / Grange Road / Little Bromley Road (depending on the NG construction access location) and the NG construction access point.

STATUS OF NATIONAL GRID PROPOSALS

1.6.8 National Grid have identified a EACN construction and operational zone within which they anticipate their EACN substation will be located. This is the orange hatched highlighted area illustrated on Figure 1.8~~Figure 1.8~~. At this stage NGET have not confirmed the exact location of the EACN substation within this area. NGET have provided outline parameters for the EACN substation.

1.6.9 The whole EACN construction and operational zone has therefore been included within the VE Order Limits to ensure that the works required to connect the new VE OnSS to the National Grid EACN substation (as set out above) are encapsulated and appropriately assessed.

1.6.10 Given the current status of the National Grid EACN substation proposals, it has only been practicable to consider any likely significant effects relating to the works between the VE OnSS and the National Grid EACN substation at a high level in the ES. These cumulative assessments are based on publicly available data, initial high-level discussions with the National Grid project team and expert judgment from analogous projects.

1.7 CONSTRUCTION HOURS

1.7.1 Core working hours for construction of the onshore components will be 07:00 – 19:00 Monday to Saturday, further information is included in the CoCP.

1.7.2 No activity where noise is audible beyond the project boundary will take place outside of these hours including Sundays, public holidays, or bank holidays apart from under the following circumstances:

- where continuous periods of construction work are required, such as concrete pouring or directional drilling.
- for the delivery of abnormal loads to the connection works, which may cause congestion on the local road network, where the relevant highway authority has been notified prior to such works 72 hours in advance;
- where works are being carried out in the marine environment and may be tidally restricted; and
- as otherwise agreed in writing with the local planning authority.

1.7.3 HDD (or other trenchless crossing techniques) at the landfall and other major crossing points may require works to take place for continuous periods. This has been assessed in Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration.

1.8 CONSTRUCTION PLANT AND EQUIPMENT

1.8.1 The types of construction plant and equipment that could be used during the onshore construction of VE are listed below. This list is not an exhaustive list of equipment, but an indication of the types of plant and equipment that could be used during standard construction:

- Vibrating compactor;
- Roller;
- Mobile concrete or cement bound sand batching plant
- Concrete mixer;
- Cable-pulling winch;
- Angle grinder;
- Pneumatic breaker;
- Dump truck;

- Telehandler
- Dozer
- Tracked excavator; and
- Mobile cranes
- Directional drilling rig, and ancillary equipment e.g. settlement tanks and pumps
- Mobile generators

1.9 OPERATION AND MAINTENANCE

1.9.1 For the purposes of assessment, the operational lifetime of the project is assumed to be up to 40 years.

1.9.2 Onshore operation and maintenance activities can be categorised as preventative and corrective. Preventative maintenance is according to scheduled services whereas corrective maintenance covers unexpected repairs, component replacements, retrofit campaigns and breakdowns.

1.9.3 Onshore, the O&M requirements will be largely preventative, accompanied by infrequent on-site inspections of the onshore transmission infrastructure. However, the onshore infrastructure will be consistently monitored remotely, and there may be O&M staff visiting the OnSS to undertake works on a regular basis (expected to be once per week), O&M access routes are shown in Figure 1.18.

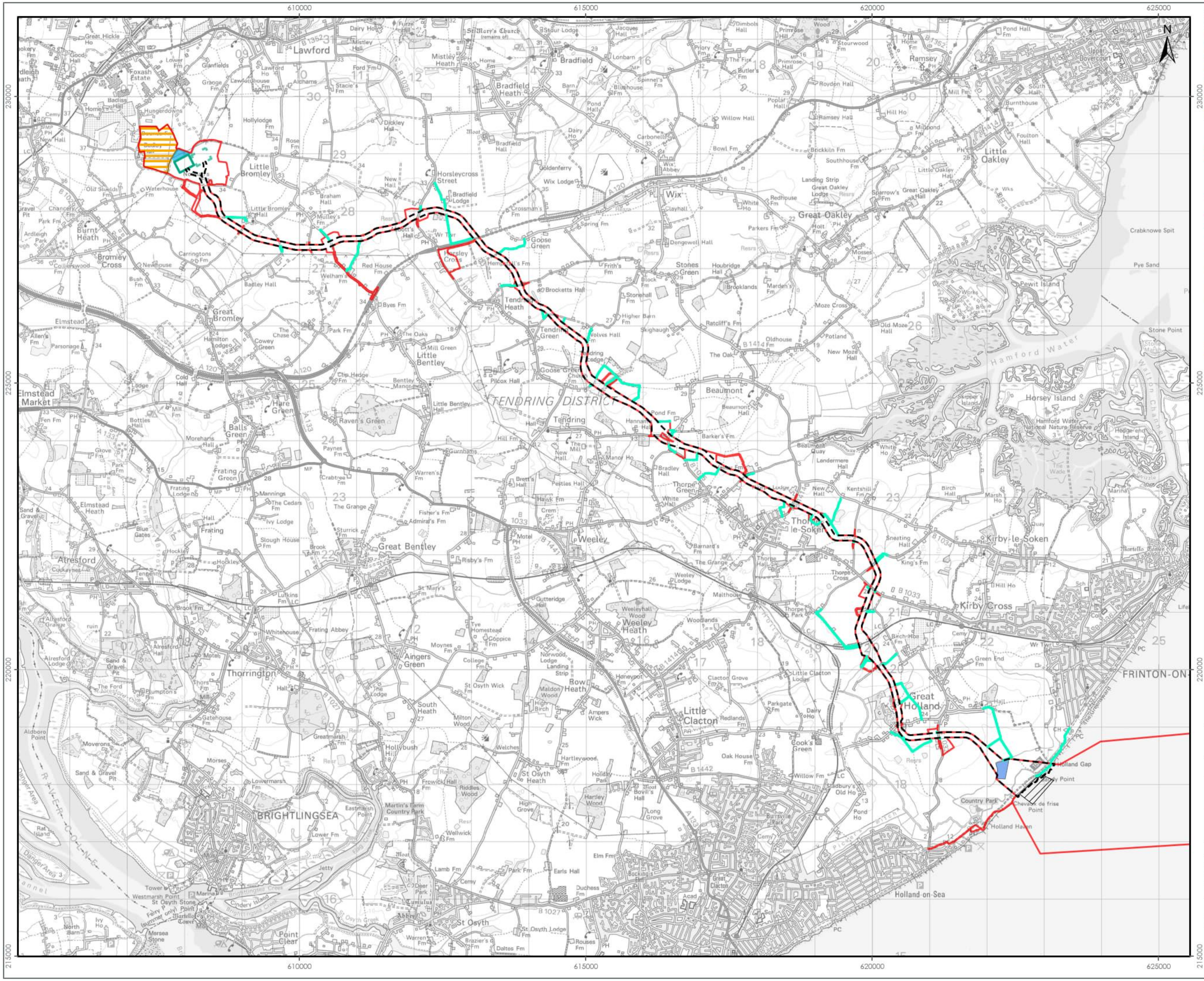
1.9.4 The OnSS will not be manned, and lighting will only be required during O&M activities. Low level movement detecting security lighting may be utilised for health and safety purposes.

1.9.5 Link boxes will need to be serviced approximately once a year to ensure correct operation. Occasional access may also be required to the cable in the event of a fault and for repair purposes.

1.9.6 As the haul road will not be in place during the operational phase, VE will seek to agree appropriate access routes with the relevant landowner, as required. Operational access routes that follow existing tracks have been included within the Order Limits.

1.9.7 Planned maintenance associated with the onshore ECC would involve approximately one visit to each cable joint pit per year by two maintenance personnel.

1.9.8 Unplanned maintenance may involve the repair of onshore cable faults. This is extremely rare (indicatively one to two events per lifetime). Typically, this involves excavating the two adjacent pits, pulling the cable back through the ducting and pulling a new cable through. Alternatively, the area of the fault may be excavated (with an additional up to 40 m in both directions) and two new joints installed within this area. Methods for excavation and reburial will be similar to the original installation.



LEGEND

- Order Limits
- Onshore Export Cable Corridor
- Substation Operational Boundary
- North Falls Indicative Substation Operational Boundary
- Indicative 400kV Underground Cable Zone
- Landfall Compound Zone
- Landfall Exit Pit Sheet Piling Zone
- National Grid East Anglia Connection Node (EACN) Substation Zone
- Operations and Maintenance Access Route

0 0.5 1 2
Kilometres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

OPERATIONS AND MAINTENANCE EXPORT CABLE ACCESS ROUTES

VER	DATE	REMARKS	Drawn	Checked
1	13/02/2024	ES Submission	JO	JRS
2	01/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1.18

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:60,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES OFFSHORE WIND FARM

1.10 DECOMMISSIONING

1.10.1 No decision has yet been made regarding the final approach to decommissioning for the Project as it is recognised that industry best practice, rules and legislation change over time. The detail and scope of decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator with decommissioning plan provided.

1.10.2 Closer to the time of decommissioning, it may be decided that removal of infrastructure, such as the cable circuits, would lead to a greater environmental impact than leaving some components in situ. In this case it may be proposed that cable ducts and Landfall infrastructure are to remain in situ where appropriate and any requirements for decommissioning at the OnSS will follow the appropriate regulatory regime.

1.10.3 An onshore decommissioning plan, including a revised CoCP would be required to be submitted prior to decommissioning and is secured in the DCO. The activities and methodology for decommissioning are likely to include:

- Dismantling and removal of electrical equipment;
- Removal of cabling, and where required leaving in situ as with the ducting;
- Removal and demolition of buildings, fences, and services equipment; and
- Reinstatement and landscaping works.

1.10.4 The decommissioning plan will follow the appropriate regulatory regime at the time.

1.11 PROJECT PROGRAMME

OVERVIEW

1.11.1 Five Estuaries Offshore Windfarm Limited (VE OWFL) is seeking approval of its application for Development Consent by Q3 2025. This will support the project in meeting UK Government renewable energy targets. The aim is for VE to start generating in 2030, with all construction and commissioning works anticipated to be completed by 2031.

1.11.2 The construction programme for VE is dependent on a number of factors which may be subject to change, including:

- Grid connection and proposed substation construction dates specified in agreements with the National Grid;
- The date that the necessary consents are granted;
- Should it be required, obtaining a Contract for Difference (CfD) from the UK Government within the anticipated programme; and
- The availability and lead in times associated with procurement and installation of project components.

ONSHORE PROGRAMME

1.11.3 Onshore preliminary works are anticipated to commence in 2027. VE is anticipated to start generating in 2030, with the onshore works expected to be complete by this time with minor reinstatement works ongoing.

1.11.4 Figure 1.19Figure 1.19 provides indicative durations and windows for each activity across the proposed project, and the order in which they may occur in the construction campaign. The overall full construction and commissioning for the project would be expected to take around 5 years to fully complete.

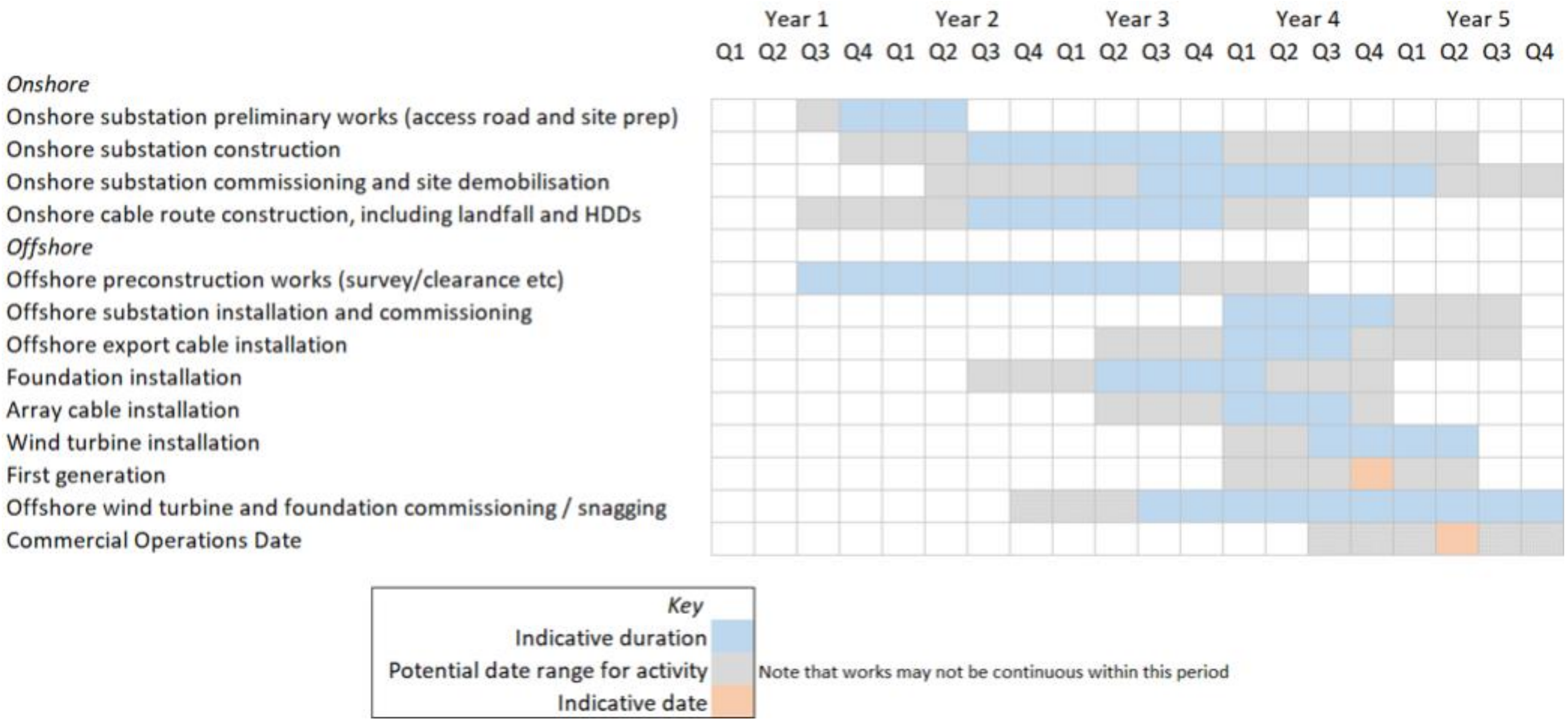


Figure 1.19: Indicative construction programme

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