

Norfolk Vanguard Offshore Wind Farm Outline Traffic Management Plan

Part 1 of 4

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Glossary

AADT	Annual Average Daily Traffic
AILs	Abnormal Indivisible Loads
AMP	Access Management Plan
DCO	Development Consent Order
EIA	Environment Impact Assessment
ES	Environmental Statement
ESDAL	Electronic Service Delivery for Abnormal Loads
ETG	Expert Topic Group
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HVDC	High Voltage Direct Current
MA	Mobilisation Area
NCC	Norfolk County Council
OAMP	Outline Access Management Plan
OTMP	Outline Traffic Management Plan
OTP	Outline Travel Plan
PEIR	Preliminary Environmental Information Report
SRN	Strategic Road Network
TC	Trenchless Crossing Point
TMP	Traffic Management Plan
WCS	Worst Case Scenario

Terminology

Cable Relay Station	Primarily comprised of an outdoor compound containing reactors (also called inductors, or coils) and switchgear to increase the power transfer capability of the cables under the HVAC technology scenario as considered in the PEIR. This is no longer required for the project as the HVDC technology has been selected.
Control Point	A location that provides the checks and controls for the movement of HGVs and employees.
Delivery	A delivery is the process of transporting goods from a source location to a predefined destination. A delivery will generate two vehicle movements (an arrival and departure)
Joining pit	Underground structures constructed at regular intervals along the cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	Where the offshore cables come ashore at Happisburgh South
Landfall compound	Compound at landfall within which HDD drilling would take place
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing low voltage electrical earthing links.
Mobilisation area	Areas approximately 100 x 100m used as access points to the running track for duct installation. Required to store equipment and provide welfare facilities. Located adjacent to the onshore cable route, accessible from local highways network and suitable for the delivery of heavy and oversized materials and equipment.
National Grid new / replacement overhead line	New overhead line towers to be installed at the Necton National Grid substation.

tower	
National Grid overhead line modifications	The works to be undertaken to complete the necessary modification to the existing 400kV overhead lines
National Grid substation extension	The permanent footprint of the National Grid substation extension
National Grid temporary works area	Land adjacent to the Necton National Grid substation which would be temporarily required during construction of the National Grid substation extension.
Necton National Grid substation	The existing 400kV substation at Necton, which will be the grid connection location for Norfolk Vanguard
Onshore 400kV cable route	Buried high-voltage cables linking the onshore project substation to the Necton National Grid substation
Onshore cable route	The 45m easement which will contain the buried export cables as well as the temporary running track, topsoil storage and excavated material during construction.
Onshore cables	The cables which take the electricity from landfall to the onshore project substation.
Onshore infrastructure	The combined name for all onshore infrastructure associated with the project from landfall to grid connection.
Onshore project area	All onshore electrical infrastructure (landfall; onshore cable route, accesses, trenchless crossing technique (e.g. Horizontal Directional Drilling (HDD)) zones and mobilisation areas; onshore project substation and extension to the Necton National Grid substation and overhead line modification)
Onshore project substation	A compound containing electrical equipment to enable connection to the National Grid. The substation will convert the exported power from HVDC to HVAC, to 400kV (grid voltage). This also contains equipment to help maintain stable grid voltage.
Running track	The track along the onshore cable route which the construction traffic would use to access workfronts.
The Applicant	Norfolk Vanguard Limited
The project	Norfolk Vanguard Offshore Wind Farm, including the onshore and offshore infrastructure.
Transition pit	Underground structures that house the joints between the offshore export cables and the onshore cables.
Trenchless crossing zone (e.g. HDD)	Temporary areas required for trenchless crossing works.
Vehicle movement	A single trip (i.e. either an arrival to, or departure from site) for the transfer of employees or goods.
Workfront	The 150m length of onshore cable route within which duct installation would occur

1 OUTLINE TRAFFIC MANAGEMENT PLAN

1.1 Introduction

1. This document forms part of the Development Consent Order (DCO) application for the onshore project area of the Norfolk Vanguard Offshore Wind Farm (herein 'the project').
2. A traffic and transport impact assessment has been undertaken for the project and is detailed in Chapter 24 Traffic and Transport of the Environmental Statement (ES).
3. In respect of traffic and transport, the certified plans referred to in the DCO are outlined below:
 - Outline Traffic Management Plan (OTMP) (document reference 8.8): The OTMP sets out the standards and procedures for managing the impact of Heavy Goods Vehicles (HGV) traffic during the onshore construction period, including localised road improvements necessary to facilitate the safe use of the existing road network;
 - Outline Travel Plan (OTP) (document reference 8.9): The OTP sets out how onshore construction employee traffic would be managed and controlled; and
 - Outline Access Management Plan (OAMP) (document reference 8.10): The OAMP sets out detail on the location, frontage, general layout, visibility and embedded mitigation measures for access for the onshore project substation, landfall and points of access to the onshore cable route. It presents the requirements and standards that will be incorporated into the final access design.
4. Final plans which accord with these outline documents must be submitted to and approved by the relevant local planning authority (in consultation with Norfolk County Council (NCC) and Highways England (HE)) prior to commencement of any relevant works, as per Requirements 21 and 22 of the Draft DCO.
5. The OTMP is complimented by the OAMP which details additional measures to facilitate vehicles (particularly HGVs) to safely access the main distributor highway network via the identified accesses and minor routes during the onshore construction period.
6. Following appointment of a contractor, the respective plan measures would be validated and optimised in consultation with Norfolk County Council (NCC) and Highways England (HE).
7. Norfolk Vanguard Limited is seeking consent for the following onshore elements of the project:

- Landfall;
 - Onshore cable route, access, trenchless crossing (e.g. Horizontal Directional Drilling (HDD)) zones and mobilisation areas;
 - Onshore project substation; and
 - Extension to the Necton National Grid substation and overhead line modifications.
8. The applicant is also developing Norfolk Boreas, a ‘sister project’ to Norfolk Vanguard. Norfolk Boreas would share a grid connection location and also much of the offshore and onshore cable corridors with Norfolk Vanguard. Therefore, in order to minimise impacts, Norfolk Vanguard Limited will include within its Development Consent Order (DCO) application some enabling works for the Norfolk Boreas project (subject to Norfolk Boreas DCO consent and Financial Investment Decision), these include:
- Installation of ducts to house the Norfolk Boreas export cables, along the entirety of the onshore cable route from the landward side of the landfall transition pit to the Norfolk Boreas’ onshore project substation; and
 - Modification of the existing overhead lines in the vicinity of the Necton National Grid substation for Norfolk Vanguard and Norfolk Boreas.

1.2 Purpose of the OTMP

9. The purpose of the OTMP is to capture and secure the mitigation principles that, for the construction phase of the onshore elements of the project, are to be included in the final Traffic Management Plan (TMP) to be submitted pursuant to the discharge of Requirement 21 of the Draft DCO.
10. During the operational phase, traffic movements would be limited to periodic maintenance at the substation and link boxes/test pits along the onshore cable route. Due to the limited nature of these operations, the OTMP does not consider operational traffic movements.

1.3 Consultation

11. Norfolk Vanguard Limited has undertaken pre-application consultation on the project in accordance with the requirements of the Planning Act 2008.
12. To date, consultation regarding traffic and transport has been conducted through transport specific Expert Topic Group (ETG) meetings in January 2016, July 2017 and January 2018 to review and agree methodologies for the assessments, the Scoping Report (Royal HaskoningDHV, 2016) and the Preliminary Environmental Information Report (PEIR) (Norfolk Vanguard Limited, 2017). The ETG included transportation professionals from NCC, HE and Norfolk Vanguard Limited. Whilst not a member of the Group, Suffolk County Council were kept informed of developments, noting that

the south east tip of the traffic and transport study area encompassed two roads within their administration area.

13. Further details of consultation undertaken to date is outlined within Chapter 24 Traffic and Transport of the ES.

1.4 Interactions with Other Projects

1.4.1 Hornsea Project Three

14. The Hornsea Project Three application for development consent was submitted in May 2018 setting out a proposal to develop an offshore wind farm located in the southern North Sea, with a total generating capacity of up to 2,400MW.
15. The outline Export Cable Route (ECR) of Hornsea Project Three will make landfall at a location between Sheringham and Cley next the Sea. From the landfall location, the ECR heads approximately 55km south to connect to the Norwich Main National Grid Substation. A high level construction programme indicates that onshore construction is currently planned to commence in 2021 and last for a period of six years. Hornsea Project Three's construction could coincide with Norfolk Vanguard's duct installation and onshore project substation construction works period should both projects proceed to construction on forecasted programmes.
16. This OTMP identifies the highway links that would be shared by both projects and sets out the measures and commitments to ensure the cumulative traffic impacts would be managed below significant (environmental impact) levels. This is in accordance with the updated Cumulative Impact Assessment (CIA) submitted by the Applicant at Deadline 5 (ExA; ISH1; 10.D5.1) which considers the final traffic numbers presented for Hornsea Project Three.
17. The respective Outline Code of Construction Practice (OCoCP) as submitted for both Norfolk Vanguard (document reference 8.1) and Hornsea Project Three both include commitments to developing project specific Communication Plans post-consent and include a framework to set out the key points of how communications will be delivered. In order to ensure communication between the respective projects, the Communication Plans will set out the process of continued engagement between Norfolk Vanguard, Hornsea Project Three and the Local Highway Authority. This will ensure that as construction programmes are refined post-consent this information is regularly shared between parties, particularly traffic demand on shared road links and that commitments to manage cumulative construction traffic demand are fully delivered; for example on a given road the two projects may have committed to programme works that ensure each scheme's peak traffic does not overlap.

1.4.2 Strategic Road Network

18. HE has proposed six improvement schemes for the A47 as part of the Road Investment Strategy (RIS) announced in 2014. Current timescales estimate that the DCO applications for these separate schemes will be submitted in either 2019 or 2020.
19. The schemes that could potentially impact on the project are:
 - A47 North Tuddenham to Easton dualling;
 - A47 / A11 Thickthorn Junction;
 - A47 Blofield to North Burlingham dualling;
 - A47 Third River Crossing (Great Yarmouth); and
 - A47 Great Yarmouth junction improvements.
20. These schemes are expected to start construction in 2021 and predicted to end in 2023. The peak construction activity for these schemes is expected to finish before the commencement of construction works for Norfolk Vanguard. Norfolk Vanguard is scheduled for construction between 2022 and 2023 and as such, any slippage in the programme for these separate schemes could potentially lead to cumulative impacts with Norfolk Vanguard's peak traffic.
21. At this stage, three of the identified schemes have announced their preferred scheme options and further consultation is ongoing. DCO applications for these schemes have not yet been submitted and therefore it is not possible to determine the scope and scale of the construction traffic demand associated with the RIS schemes at this stage.
22. To manage potential cumulative traffic impacts, it has been agreed with HE that the management of the potential cumulative impacts can be addressed in the final submitted Traffic Management Plan (post DCO determination) when there is greater certainty with regard to RIS scheme construction traffic data.
23. Norfolk Vanguard's commitment to engage with HE to establish opportunities to co-ordinate activities and avoid significant impacts resulting from cumulative peak traffic is captured in the OCoCP (document reference 8.01) through the development of a Communication Plan.

1.5 Project Description

24. A comprehensive project description of the onshore project area is contained within Chapter 5 Project Description of the ES.
25. The onshore cable route is approximately 60km in length and travels west from the landfall at Happisburgh South towards the northern edge of North Walsham before

bearing southwest to the onshore project substation near Necton as shown in Figure 1.

26. The onshore project substation at Necton will be constructed approximately 1km away from the Necton National Grid substation.
27. The onshore cable route would require trenches (within which ducts would be installed to house the cable circuits); a running track to deliver equipment to the installation site from mobilisation areas and separate storage areas for topsoil and subsoil.
28. The main installation method would be through the use of open cut trenching. High Density Polyethylene (HDPE) ducts would be installed within the trenches and the soil backfilled. Cables would then be pulled through the pre-laid ducts at a later stage in the programme.
29. The EIA assessment considered three discrete stages in the project's construction, namely:
 - Stage 1: Pre-construction works e.g. pre-construction surveys;
 - Stage 2: Duct installation works, landfall and onshore project substation primary works (including National Grid substation extension); and
 - Stage 3: Cable pull, joint and commission.
30. The project could be constructed in either two phases or one continuous construction phase (up to 1,800MW). For the purposes of the ES assessment a two phase approach was adopted.
31. Table 1.1 details an indicative construction phase programme for the project.

Table 1.1 Indicative project construction programme (HVDC Two Phase)

Activity	Year					
	2020	2021	2022	2023	2024	2025
Landfall						
Duct Installation						
Cable Pull, Joint and Commission						
<i>Phase 1¹</i>						
<i>Phase 2¹</i>						
Onshore cable route						
Pre-construction works						
Duct installation works						
Cable pull, joint and commission						

Activity	Year					
	2020	2021	2022	2023	2024	2025
<i>Phase 1¹</i>						
<i>Phase 2¹</i>						
Onshore project substation						
Pre-construction works						
Primary works						
Electrical plant installation and commission						
<i>Phase 1¹</i>						
<i>Phase 2¹</i>						

¹In the two phase option, cables are installed in two consecutive years to facilitate the commissioning of the offshore wind turbine planting.

1.5.1 Stage 1: Pre-construction works

32. The pre-construction stage represents a number of activities with limited traffic demand (e.g. pre-construction surveys). Access to the onshore project area would be via existing tracks; however some new accesses may be constructed during this phase to facilitate construction at stage 2.

1.5.2 Stage 2: Duct installation works and onshore project substation primary works

33. The access strategy for stage 2 has been developed to accommodate the following requirements:

- Access to mobilisation areas (MA);
- Crossing of the highway by the project 'running track'; and
- Access to trenchless crossing locations.

34. The onshore duct installation and onshore project substation primary works are serviced by 14 mobilisation areas. The main function of the mobilisation areas is to provide a control point for HGVs delivering to the onshore cable route, as well as providing welfare facilities, parking for staff and storage areas for materials, plant and equipment.

35. The mobilisation areas are located in close proximity to A roads and B roads to concentrate traffic demand away from minor routes. They are located away from settlements to minimise disruption to local communities.

36. The onshore cable route has been separated into 20 cable route sections, which would be accessed from the mobilisation areas via a running track. The running track would provide safe access for construction vehicles along the onshore cable

route, from mobilisation areas to duct installation sites and would serve to significantly reduce the number of trips on the local highway network.

37. The running track would be up to 6m wide and may ultimately extend along the majority of the onshore cable route crossing the public highway in a number of locations.
38. There are a number of physical features which cannot be disturbed by trenching methods or the running track; examples of this include rivers and railway lines. To install the onshore cable route across such features a trenchless crossing technique¹ would be employed.
39. Each trenchless crossing location would require access to the 'drive' and 'reception' zone of the crossing. Access would be via the running track in the majority of cases, however some locations may be totally 'land locked' and therefore require direct access either via a private track from the public highway (referred to as a 'side access') or via a road crossing access direct into the cable route.
40. Figure 2 details the key components of the stage 2 construction phase.

1.5.3 Stage 3: Cable pull, joint and commission

41. Cables would be pulled through the installed ducts later in the construction programme in a phased approach. This approach would allow the main civil works to be completed in advance of cable delivery, preventing the requirement to reopen the land on a wholesale basis.
42. Cable pulling would not require the trenches to be re-opened. The cables would be pulled through the pre-installed ducts installed during the duct installation works at jointing pit locations located along the onshore cable route. The jointing pits and associated accesses would be constructed during the cable pull phase which would facilitate the cable pulling activities.
43. This would be achieved through access to the onshore cable route directly from the highway network (at running track crossing locations) or existing local access routes where possible. In some locations, isolated sections of the running track would be left in place from the duct installation works or be reinstalled to allow access to more remote joint locations. It is estimated that a running track would be required for up to 20% of the total onshore cable route length for the cable pull and jointing works.

¹ Trenchless crossing techniques include Horizontal Directional Drilling/Auger Bore/Micro Tunnel

44. The development of the access strategy for this stage has been informed by a reduced demand for materials and employees (relative to stage 2) leading to a substantial reduction in forecast traffic demand.
45. A review of over 200 access tracks, public highway roads and running track crossing points (from the previous construction stage) has been undertaken taking into account potential joint pit locations. This has narrowed down the potential access points to the 75 locations as presented in this plan (refer to Table 1.5).

1.6 Embedded Mitigation

46. Norfolk Vanguard Limited has committed to a number of techniques and engineering designs/modifications as part of the project, during the pre-application phase, in order to avoid a number of impacts or reduce impacts as far as possible. Embedding mitigation into the project design is a type of primary mitigation and is an inherent aspect of the EIA process.
47. Full details of the embedded mitigation can be found within Chapter 5 Project description of the ES.
48. Table 1.2 sets out the designed in (embedded) mitigation measures that have been applied to the traffic forecasts contained in this OTMP.

Table 1.2 Embedded mitigation

Parameter	Embedded mitigation for traffic and transport	Notes
Trenchless Crossings	<p>Commitment to trenchless crossing techniques at key sensitive environmental features, including but not limited to; waterways, protected wildlife sites, woodlands, long distance cycle route/footpaths, and major transport corridors to avoid significant environmental disturbance. These include avoiding specific features such as;</p> <ul style="list-style-type: none"> • Trunk Roads/Principal Roads including A47, A140, A149; • Mid-Norfolk Railway; and • Network Rail. 	<p>A commitment to a number of trenchless crossings at some sensitive locations has been a project commitment from the outset. However, in light of consultation received during PEIR Norfolk Vanguard Limited has committed to additional trenchless crossings as a direct response to stakeholder requests.</p>
Mobilisation Areas	<p>Mobilisation areas would be located close to main A-roads minimising impacts upon local communities and utilising the most suitable roads.</p> <p>Mobilisation areas located away from population centres where practical to reduce impact on local communities and population centres.</p>	

Parameter	Embedded mitigation for traffic and transport	Notes
Duct Installation	Suitable access points and identification of optimum routes for construction traffic to use. This minimises impacts on sensitive receptors	Details contained within the OAMP (document reference 8.10)
Cable Pull and Jointing Stage access	Suitable side accesses and road crossing locations reviewed from initial schedule of 200+ access points to 75 realistic potential access points to minimise local route impacts.	Details contained within in the OAMP (document reference 8.10)
HGV Vehicle Movement	<p>Construction of an (up to) 6m wide running track with an approximate length of 60km. This would reduce the number of access points required and HGV movements on the local road network.</p> <p>Consolidating HGVs at mobilisation areas to reduce vehicle movements along more sensitive local routes.</p> <p>Carefully selected delivery routes acknowledging the sensitive receptors within the traffic and transport study area</p> <p>Management measures to control timing of deliveries</p>	Details contained within the OTMP (document reference 8.8)
Employee Vehicle Movement	Consolidating onshore cable route section construction employee movements at mobilisation areas. Onward travel along the running track to place of work reducing vehicle movements along local routes.	Details contained in the OTP (document reference 8.9)

1.7 Environmental Impact Controls

1.7.1 General Principles

49. Chapter 24: Traffic and Transport of the ES, assesses the environmental impact of traffic on the routes within the traffic and transport study area across a range of effects, namely:
- Severance;
 - Pedestrian amenity;
 - Driver delay; and
 - Road Safety
50. The traffic and transport assessment is predicated on a TMP being implemented as embedded mitigation to manage the daily delivery profiles and control movements and routing.
51. In addition to the powers set out in the draft DCO, relevant powers under the Highways Act (1980), the Road Traffic Regulation Act (1984) and the New Roads and Street Works Act (1991) may also be relied upon to implement the final agreed TMP (e.g. to implement temporary speed limits).

1.7.2 HGV Demand

52. During the development of the EIA, HGV routes were carefully selected (in liaison with highway stakeholders) to minimise the potential for adverse environmental impacts.
53. The EIA sets out the forecast number of construction HGVs distributed across the traffic and transport study area (see Appendix 1 HGV Distribution). The daily HGV demand set out in Appendix 1 [to be updated for Deadline 8 once all capped traffic levels have been agreed with highway stakeholders] represents the maximum HGV level for the Project alone not to be exceeded by the appointed contractor.
54. Appendix 1 includes refinements to the numbers submitted in ES Chapter 24 Traffic and Transport (DCO document 6.2) based on the cumulative impact assessment and subsequent agreements with highway stakeholders. For clarity, these are identified in Table 1.3.

Table 1.3 Capped HGV routes Norfolk Vanguard in isolation

Link ID	Route	Max. Daily NV HGV movements	Notes
13b	A148	475	Refined primary peak
32	B1149 – Holt Road	184	Refined primary peak
34	B1145 – Cawston High St.	168	Refined primary peak
36	B1149 – Horsford Village	184	[To be confirmed for Deadline 8]
41	B1436 – Felbrigg Road	338	Refined primary peak

55. The maximum HGV movements will be controlled by the contractor at the point of destination on the onshore cable route by monitoring the number of deliveries. To facilitate this Table 1.4 provides a summary of the peak daily HGV movements to each of the accesses for Stage 2 and 3. Further details regarding these accesses are set out in the OAMP (document reference 8.8) and the Access to Works Plan (document reference 2.5).

Table 1.4 HGV movements per access [to be updated for Deadline 8]

Access ID	Stage 2	Peak daily two-way HGV movements	Stage 3	Peak daily two-way HGV movements
	Access function		Access function	
AC3	Landfall	61	Cable Section 16	31
AC5, AC10	Crossing only	-	Cable Section 16	31
AC12	Not required	-	Cable Section 16	31
AC13	MA11 (Cable section 17 & 18)	96	Cable Section 15 & 16	31
AC16	Crossing only	-	Cable Section 15	32
AC18	Crossing only	-	Cable Section 15	32
AC20	Not required	-	Cable Section 15	32
AC21, AC22	Crossing only	-	Cable Section 15	32
AC24	TC16(e)	72	Cable Section 14	38
AC25	MA10a Cable Section 17a TC16(w)	72	Cable Section 14	30
AC28, AC32	Crossing only	-	Cable Section 14	30
AC34	TC15(e)	72	Cable Section 14	30
AC35	TC15(e)	72	Cable Section 14	30
AC37	TC14(e), TC15(w)	48	Cable Section 14	30
AC38	MA10 (Cable Section 15 & 16a) TC13(e)	120	Cable Section 14	30
AC47	MA9 (Cable Section 14) TC12(e)(w), TC13(w)	120	Cable Section 13	30
AC49	Crossing only	-	Cable Section 13	36
AC50, AC51	Not required	-	Cable Section 13	36

Access ID	Stage 2		Stage 3	
	Access function	Peak daily two-way HGV movements	Access function	Peak daily two-way HGV movements
AC55	TC11€	72	Cable Section 12	31
AC57	TC11(w)	72	Cable Section 12	31
AC58	Crossing only	-	Cable Section 12	31
AC62	Crossing only	-	Cable Section 11	31
AC66	MA8 (Cable section 13) TC10(w)(e), TC9(w)	144	Cable Section 11	33
AC75	TC9(w)	72	Cable Section 11	36
AC77	Crossing only	-	Cable Section 10 & 11	35
AC78	Not required	-	Cable Section 10	31
AC84	MA7 (Cable Section 11 & 12)	96	Cable Section 10	35
AC85	Not required	-	Cable Section 10	35
AC88	Not required	-	Cable Section 9	35
AC89	Crossing only	-	Cable Section 9	29
AC91	Not required	-	Cable Section 9	29
AC92, AC96	Crossing only	-	Cable Section 9	29
AC102	MA7 (Cable section 9 & 10)	96	Cable Section 8	31
AC103	TC8(e)	72	Cable Section 8	31
AC105	Cable Section 9a TC7(e), TC8(w)	120	Cable Section 8	31
AC107	Crossing only	-	Cable Section 8	31
AC108	Not required	-	Cable Section 8	31

Access ID	Stage 2	Peak daily two-way HGV movements	Stage 3	Peak daily two-way HGV movements
	Access function		Access function	
AC110	Cable Section 8a TC7(w)	72	Cable Section 7	38
AC111	Cable Section 8a TC6(n)	72	Cable section 7	38
AC112	TC6(s)	72	Cable Section 7	38
AC121	MA 5b (Cable Section 8)	48	Cable Section 6	33
AC122	MA5a (Cable Section 7)	48	Cable Section 6	33
AC126	Crossing only	-	Cable Section 5	30
AC127	Cable Section 16a TC5(e)	72	Cable Section 5	30
AC128	Not required	-	Cable Section 5	30
AC131	TC5(w)	72	Cable Section 5	30
AC132	Not required	-	Cable Section 5	30
AC135	Not required	-	Cable Section 4	29
AC136	Crossing only	-	Cable Section 4	29
AC137	MA4 (Cable section 5 & 6)	96	Cable Section 4	29
AC138	Crossing only	-	Cable Section 4	29
AC142, AC143	Not required	-	Cable Section 4	29
AC144	TC4(w)(e)	96	Cable Section 4	29
AC145	Crossing only	-	Cable Section 4	29

Access ID	Stage 2	Peak daily two-way HGV movements	Stage 3	Peak daily two-way HGV movements
	Access function		Access function	
AC147	MA4 (Cable Section 3 & 4)	96	Cable Section 3	34
AC148	Not required	-	Cables Section 3	34
AC151	TC3b(e)	72	Cable Section 3	34
AC152	TC3b(w)	72	Cable Section 3	34
AC153	TC3a(w)	72	Cable Section 3	34
AC160	MA2 (Cable Section 2) TC1(n), TC2(n)(s)	144	Cable Section 2	34
AC161	TC1(s)	72	Cable Section 2	34
AC163	MA1b (Cable Section 1)	48	Cable Section 2	34
AC164, AC165	Crossing only	-	Cable Section 2	34
AC166	Not required	-	Cable Section 2	34
AC167	Not required	-	Cable Section 1	33
AC181	National Grid Substation Extension	68	Not required	-
AC182	National Grid Overhead Line Modifications	tbc	Not required	-
AC183	MA1a (Cable Section 0 & 1) Onshore project substation	150	Cable Section 1	33

56. The appointed contractor will be encouraged to validate the access figures based on a greater certainty on supply chain and programming. The number of movements per access may be subject to variance but at all times remaining within the total assessed levels defined on highways links (as set out in Chapter 24 Traffic and Transport of the ES) unless otherwise agreed by the relevant local authority in consultation with NCC and HE.
57. Any potential changes would be submitted to and approved by the relevant local authority, NCC and HE as part of the process of discharging Requirement 21.

1.7.3 Cumulative HGV restrictions

58. A number of highway links have been identified as being shared with Hornsea Project Three. Five shared links have been identified as requiring the cumulative peak traffic demand to be managed to ensure that significant impacts are not realised. The preferred method for managing cumulative traffic is to work with Hornsea Project Three to ensure that respective project peak HGV demand does not overlap (see Section 1.4). If that is not possible, a cap will be applied to Norfolk Vanguard HGV demand (achieved through a minor programme extension) to ensure that cumulative traffic with Hornsea Project Three remains below the threshold that would constitute a significant impact.
59. Table 1.5 details the routes with capped maximum daily construction HGVs when considered cumulatively with Hornsea Project Three.

Table 1.5 Capped HGV routes Norfolk Vanguard Cumulatively with Hornsea Project Three

Link ID	Route	Cumulative			Notes
		Max. Daily NV HGV movements	Max. Daily HP3 HGV movements	Total Max. Daily cumulative HGV movements	
13b	A148	414	156	570	-
32	B1149	140	153	293	-
34	B1145: Cawston High St.	144	127	271	-
36	B1149 – Horsford Village	184	187	371	[To be confirmed for Deadline 8]
41	B1436 – Felbrigg Road	338	149	473	A further cap (down to 128 daily HGV movements for Norfolk Vanguard) will apply during the six week school summer holidays

1.7.4 Control of HGV Numbers

60. To ensure compliance with the assessed HGV movements a booking system for deliveries will be established by the contractor.
61. The booking system will enable a daily profile of deliveries to be maintained within the assessment thresholds (Table 1.5) and allow the contractor to ensure that the required deliveries are regularly forecast and planned.

62. HGVs will be refused access and turned away if they arrive outside of their allocated time slot; a small number of daily slots will be reserved to accommodate any unplanned deliveries.
63. To ensure that compliance with the assessed HGV movements does not impact upon progress, the contractor will where possible plan for maintaining stockpiles of critical path items such as aggregate. These stockpiles will facilitate advanced planning of deliveries, maximise payloads, and enable a smooth import profile to be maintained.
64. The contractor will be required to keep an up to date record of deliveries and exports from the project, this will take the form of delivery receipts. This information will be retained to be provided to the relevant local authority, NCC and HE upon request.

1.7.5 Delivery Route Compliance

65. Figure 3 details the HGV delivery routes for the project. To ensure compliance with the agreed delivery routes, the following measures are proposed:
 - An information pack will be distributed to all individuals involved in the transport of materials and will include key information on delivery routes. The pack will be provided in a convenient format and size so it can be stored in a truck cab;
 - Appropriate traffic signage would be installed to direct suppliers and contractor’s vehicles along appropriate delivery routes;
 - Information signs will also be erected which will include a telephone number for the public to report concerns; and
 - Supply chain vehicles will display a unique identifier in the cab of the vehicle.

1.7.6 Delivery Periods

66. The delivery of materials and plant would occur between 7am to 7pm Monday to Friday and Saturday 7am to 1pm, however, further restrictions to HGV movements have been identified for a number of links.

Table 1.6 Delivery period restrictions summary

Link Id	Route	Delivery Period Restrictions
6	A47	8am to 9am 5pm to 6pm
9	A47	8am to 9am 5pm to 6pm
32	B1149 Edgefield	7:30am to 9am
34	B1145 Cawston	7:30 am to 9am 3pm to 4pm
36	B1149 – Holt Road	8am to 9am 3pm to 4pm

Link Id	Route	Delivery Period Restrictions
47c	North Walsham Road - Edingthorpe Green	8am to 9am 3pm to 4pm
49	B1159	8am to 9am 3pm to 4pm
53	A149	8am to 9am 5pm to 6pm
68	The Street – Oulton.	7:30am to 9am

67. The final TMP will include advice to drivers of approved lorry parks, motorway services or other designated parking areas between the source of the delivery and the site compound. This will assist drivers when they may be running early / late in relation to set delivery timeslots to avoid instances where drivers arrive outside of their timeslot and attempt to wait nearby.
68. Table 1.7 sets out further measures to coordinate the timing of HGV deliveries to ensure highway network ‘resilience’ is maintained.

Table 1.7 Summary of delivery management measures

Potential Event	Mitigation Measures
Managing traffic demand during major events on the highway (e.g. bike races, parades, etc.) and around public holidays	<p>The Contractor will ensure that a stockpile of materials is maintained to allow HGV movements to be reduced during planned major events whilst not impacting upon the construction programme.</p> <p>The Contractor will also work closely with the local liaisons groups to identify the dates of local planned events, (e.g. harvests) that could impact upon the project and seek to effectively manage deliveries during these events.</p> <p>Special provisions will be made in the Communications Plan for events relating to the Blickling Estate (Link 75).</p>
Managing traffic demand during major incidents such as accidents on the highway.	<p>The Contractor will monitor traffic conditions. Should the Contractor be notified of an incident then the Contractor will liaise directly with suppliers to suspend HGV deliveries along affected routes.</p> <p>If the obstruction is likely to be longer term, in the first instance the programme would be reviewed to ascertain if resource could be diverted to an alternative onshore cable route section. Failing that, the Contractor would liaise with NCC and other relevant authorities to identify and assess alternative temporary access arrangements.</p>
Incidents involving HGV traffic blocking the highway, such as, breakdowns, accidents, etc.	<p>The Contractor and their suppliers’ fleets will have arrangements with recovery companies to allow breakdowns and accidents to be cleared as quickly as possible.</p>
A47 Corridor improvement programme	<p>The current programme of construction works for the A47 Corridor improvement is programmed for commencement of construction in 2020 and completion by 2022. The works are likely to finish before the main construction works of the project commence, however this does not allow for slippage in the programme.</p> <p>It is therefore proposed that, should the two projects overlap, Norfolk Vanguard Limited and its Contractors would engage with HE to establish opportunities to co-ordinate activities and avoid peak traffic impacts.</p>

1.7.7 Abnormal Loads

69. The importing of large Abnormal Indivisible Loads (AILs) may lead to delays on the highway network. The construction of the onshore project substation is likely to require the delivery of up to eight supergrid Transformers to the onshore project substation near Necton. Appendix 2 contains an AIL report which sets out the type of management measures which could be employed to minimise disruption to traffic during AIL delivery.
70. The movement of Abnormal Loads is outside of the restrictions (routes, times) contained within this OTMP and will be subject to separate agreement with the relevant highway authorities and police through the Electronic Service Delivery for Abnormal Loads (ESDAL) system.
71. The Contractor will notify stakeholders through ESDAL and agree appropriate timings and AIL routes (with the relevant highway authorities and police) appropriate to the type of load.

1.7.8 Road Safety

72. The EIA identified that the pattern of collisions at the priority junction of the A47 with Lingwood Lane and the staggered priority junction with the B1140 north and south could be exacerbated by the projects traffic demand.
73. The site is located within the extent of HE's Blofield to North Burlingham A47 corridor improvement scheme. The scheme is scheduled for completion prior to the commencement of the project and would be appropriate to mitigate the project's traffic demand.
74. In the event that the corridor improvements have not been completed prior to the commencement of the project then the contractor would be required to install a 'Queuing Ahead' sign. This sign would provide advance warning of potential queuing at the staggered B1140 junction reducing the potential for rear end shunts.
75. HE requested variable messaging signs in response to the sensitive junction assessment provided in Chapter 24 of the ES. The variable messaging signs would be provided on Link 6, with the objective of alerting westbound drivers on the A47 of the risk of excessive queues at this junction whilst they are still on the Acle Straight.
76. To further address road safety, it is proposed that a series of 'enhanced' mitigation measures are provided within the finalised TMP (as outlined in Table 1.8). The measures detailed are additional to those contained in a 'typical' TMP and are included to minimise impacts and enable construction vehicle drivers to understand the policies, procedures and regulations proposed for the safe and efficient movement of plant, materials and employees.

Table 1.8 Enhanced TMP measures

Enhanced TMP Measures
Driver training and toolbox talks
Driver information packs to include: <ul style="list-style-type: none"> • Delivery timing constraints (e.g. school arrival/departure times); • HGV delivery routes; • Diversion routes; and • Identify safe areas to pull over to reduce the effect of slow moving platoons of vehicles.
Safety Awareness – Educate drivers to report ‘near misses’
Day time parking controls and stewardship (where a need is identified)
Engagement structure – to provide clear governance and reporting (stakeholders) structure
Monitoring and Reporting – To monitor traffic flows at mobilisation areas and the onshore project substation
Contact information at all roadwork sites and robust complaint response standards (as soon as practicable)

77. The measures are designed to familiarise drivers with the identified sensitivities within the traffic and transport study area delivery routes. The ‘enhanced’ measures will help to mitigate the effects of pedestrian severance and amenity (and associated fear and intimidation factors) and are expected to reduce the potential for significant road safety impacts associated with the increase of HGV movements within the area.
78. An induction for contractor HGV drivers will also help to establish a clear set of responsibilities that drivers will be required to follow including:
- Timings, pre-booked slots;
 - Clarification of approved HGV routes;
 - Awareness of highway safety concerns;
 - Adherence to speed limits;
 - Instructions on when to pull over safely to alleviate platoons;
 - Safe driving techniques for over-taking manoeuvres; and
 - Details of reporting accidents and ‘near misses’.

1.7.9 Other Measures

79. To prevent dust and dirt being tracked on to the highway the following measures will be adopted:
- Accesses will be metalled surface within the adopted highway boundary;
 - Road sweepers will be used to regularly sweep the highway as required; and
 - Wheel washing facilities will be provided as required and dependant on weather conditions.
80. To avoid the need for parking or waiting on the highway, appropriate loading/unloading and parking areas for construction vehicles will be designated. The pre-booking of deliveries will assist the Contractor to allocate sufficient space to accommodate the planned number of deliveries.

1.8 Highway Asset Management

81. A highway condition survey would be undertaken by the contractor before the commencement of construction and after the substantial completion of construction works. Any damage to the existing road network or public highway as a consequence of the construction activities, will be made good to the reasonable satisfaction of NCC .
82. The survey would most likely comprise of a Coarse Visual Inspection survey (in accordance with the UK Pavement Management System standard) of all Minor Local Routes. The exact extent and specification of surveys required would be agreed with NCC prior to commencement.

1.9 Traffic Management

83. This section sets out the processes for managing the interaction between construction traffic and existing highway users. Figure 4 and Figure 5 detail the highway links referred to in this section.

1.9.1 General Principles - Managing HGV Demand

84. To ensure that the identified road links are suitable to accommodate the forecast HGV demand a detailed review of the highway geometry has been undertaken. This review has provided an initial assessment to identify those routes that allow two-way HGV traffic.
85. The routes that do not allow two-way HGV traffic require mitigation to ensure that the project's traffic demand would not have an adverse impact upon the free flow of traffic.
86. The guiding principle in developing the route mitigation strategy is to minimise impact on the surrounding environment. Recognising the temporary nature of the onshore project construction period, opportunities will be sought to pursue management measures in preference to 'hard engineering' solutions only, such as road widening.
87. To reduce the requirement for hard engineering, mobile traffic management is proposed to control low HGV demand on lightly trafficked narrow roads. The use of mobile traffic management would avoid the need for temporary road closures or road widening which could introduce delays and in many areas would require a full road closure to implement.
88. It is envisaged that mobile traffic management would comprise of a suitably marked pilot vehicle (with flashing ambers) with two-way radio communication with the HGV driver. The pilot vehicle would exit the access and travel to a designated

layby/passing place. The pilot vehicle would then temporarily stop oncoming traffic and radio to the HGV driver to exit the site and traverse to the designated passing place. Appendix 3 visually depicts this traffic measure.

89. The desirable distance a HGV would be allowed to travel under pilot vehicle control would be 1km, this is based on a HGV travelling at 20km per hour for a period of three minutes (deemed an acceptable duration for other road users to be held up). To keep the pilot vehicle control distance to a minimum it may be necessary to construct temporary passing bays in the highway verge to 'hold' HGVs prior to being called.
90. Table 1.9 details the locations where pilot vehicle traffic management would be employed noting that the maximum peak HGV demand would be <14 two-way HGV movements per hour, i.e. 7 arrivals and 7 departures. Where possible HGVs would be escorted in convoy to minimise delays to the travelling public.
91. During Stage 2, links would typically experience hourly flows of 7 movements. Links would typically experience 4 movements or less during Stage 3.
92. The pilot vehicle routes would be appropriately signed to indicate to motorists the presence of mobile construction traffic and potential delays.
93. Suitable scale plans of pilot control routes with any proposed widening would be submitted with the final TMP pursuant to the discharge of Requirement 20 of the DCO.

Table 1.9 Proposed traffic management measures

Link ID	Route	AADT Base Flows	Stage 2 HGV movements (two-way)		Stage 3 HGV movements (two-way)	
			Max. Daily	Hourly peak*	Max. Daily	Hourly peak*
42	B1145: Reepham Road	2,265	72**	8	38	~ 4
67	Happisburgh Road	1,000	96	10	31	~ 4
68	The Street / Heydon Road	1,000	96	10	35	~ 4
69	Little London Road	500	48**	5	60	~ 4
70	Plantation Road (230m south of North Walsham Road junction)	1,000	72**	8	31	~ 4
71	Vicarage Road / Whimpwell Street	2,000	61	6	31	~ 4
72	Dereham Road / Longham Road - Dillington	1,000	144	14	34	~ 4
73	Hoe Road South	800	144	14	29	~ 3
74	Mill Street, Elsing Road – Swanton Morley	800	72	7	30	~ 4
75	B1354 - Blicling	2,000	72	7	36	~ 4
76	High Noon Road / Church Road	500	72	7	31	~ 4
77	Hall Lane – North Walsham	500	72	7	30	~ 4
78	Bylaugh	500	72	7	30	~ 4
79	B1145 / Suffield Road***	2,000	72	7	31	~ 4

A to V	Local Access routes	Varies	n/a	n/a	29 - 38	~ 4
Notes						
*	Daily HGV flows divided by 10					
**	Proposed mitigation flows identified in the ES					
***	Localised widening may be required at the junction between the A140/B1145 to accommodate the largest HGVs.					

1.9.2 General Principles – Roadworks

94. Where the onshore cable route crosses roads, tracks and public rights of way, via ‘open cut’ methods traffic management would be employed to allow construction activities to continue safely within the road. Where appropriate, single lane operation of roads would be utilised during installation, typically with signal controls to allow movements to continue. Where the normal width of the road is less than 7.2m kerb to kerb (typical width for two way traffic) then it may not be possible to undertake works in the road and maintain a single lane open for traffic. In these cases alternative methods such as temporary road closure or diversion could be required.
95. Temporary closures or diversions would be in place for the period of time required for the duct installation (e.g. approximately one week with a maximum worst case of two weeks). To minimise the impact of closures or diversions, night working could be employed. The detailed installation method for each crossing utilising traffic management would be set out in the TMP and agreed with the relevant local authority and the NCC/HE pursuant to the discharge of Requirement 20.
96. It should be noted that trenchless crossing methods have been agreed for the following roads where standard traffic management techniques are not deemed to be suitable:
- A47;
 - A140; and
 - A149.

1.9.3 Highway Mitigation Schemes

1.9.3.1 Link 34 - Cawston

97. Link 34 will require a range of additional traffic management (in addition to enhanced TMP measures) to mitigate the effects on pedestrian amenity including timing deliveries to avoid school pick up and drop off times during term time, enhanced pedestrian facilities, managed parking and road safety measures.
98. The total package of mitigation for Link 34 would consist of:

- Enhanced traffic management plan measures (including the prohibition of deliveries during term time school pick up and drop off times).
- Managed cumulative traffic demand to no greater than 271 daily HGV movements; and
- Commitment to deliver a scheme of highway mitigation to include enhanced pedestrian facilities, managed parking and road safety measures (to be captured in an update to the final TMP and agreed with NCC)

99. Hornsea Project Three are currently in discussions with NCC regarding a scheme of highway mitigation that would deliver the measures outlined above, i.e. enhanced pedestrian facilities, managed parking and road safety measures.
100. Norfolk Vanguard is continuing to engage with Hornsea Project Three and NCC to further understand the details of this highway mitigation scheme for cumulative construction traffic with a view to adopting those measures if appropriate. The adopted scheme would be sufficient to mitigate impacts for Norfolk Vanguard alone, Hornsea Project Three alone or for both projects together. The first project to proceed to construction would deliver the full scheme of mitigation and the second project would be responsible for removing the measures once both project's construction phases are complete [To be updated for Deadline 8]

1.9.3.2 Link 68 – The Street, Oulton

101. Link 68 serves Hornsea Project Three's main construction compound at Oulton Airfield and Norfolk Vanguard Mobilisation Area 7 (west and east) during the Stage 2 duct installation period and access points AC84, AC85 and AC88 during the Stage 3 cable pull stage.
102. There has been extensive consultation between Hornsea Project Three and NCC with regards to a highways mitigation scheme to address cumulative impacts. NCC has confirmed a preferred scheme option, which is summarised in Table 1.10.

Table 1.10 The Street, Oulton proposed highway mitigation scheme

Components
Improvement of existing bellmouth junction between The Street and the B1149 (Holt Road).
Up to 8 passing places along The Street for HGV opposing traffic (using Grasscrete paving) resulting in an overall carriageway width of 6.0m.
Widening of The Street near Dorking farm access (using full carriageway construction).
Trimming, but no removal, of vegetation and trees along The Street.
A means of priority work for southbound vehicles in the vicinity of The Old Railway Gatehouse with a view to minimising the potential for two opposing HGVs to pass by this property simultaneously while also serving as a means of speed attenuation and mitigation to improve noise and vibration risk.

Components
Temporary lowering of the existing 60mph speed limit to 30mph from the B1149 junction to the Hornsea Three main construction compound access.
Temporary signage along the B1145 and The Street as agreed with the Highway Authority to provide driver awareness and enforcement.
Regrading of existing road hump on The Street in the vicinity of the Old Railway Gatehouse to minimise noise and vibration impacts on the Old Railway Gatehouse.
Filter trench drainage of The Street along the regrading of the existing road hump.

103. In addition to the above, Norfolk Vanguard has committed to not routing HGV construction traffic along Oulton Street north of the junction between The Street and Heydon Road.
104. Norfolk Vanguard is committed to adopting the preferred mitigation scheme option if appropriate for Norfolk Vanguard in isolation to ameliorate the potential traffic impacts. In effect this scheme of mitigation, on the shared part of Link 68, would be sufficient to mitigate impacts for Norfolk Vanguard alone, Hornsea Project Three alone or for both projects together. The first project to proceed to construction would deliver the full scheme of mitigation and the second project would be responsible for removing the measures once both project's construction phases are complete.

1.10 Mitigation Summary

105. Table 1.11 details the link specific traffic management measures required for Norfolk Vanguard. Cumulative management measures are also presented for Norfolk Vanguard and Hornsea Project Three in combination.

Table 1.11 Specific traffic management measures summary [to be updated for Deadline 8]

Link	Link description	Norfolk Vanguard Mitigation measures In isolation	Norfolk Vanguard Mitigation measures Cumulatively
6	A47	HGV Delivery Restrictions (8am to 9am and 5pm to 6pm)	HGV Delivery Restrictions (8am to 9am and 5pm to 6pm)
9	A47	HGV Delivery Restrictions (8am to 9am and 5pm to 6pm)	HGV Delivery Restrictions (8am to 9am and 5pm to 6pm)
13b	A148	Managed Traffic Demand (Table 1.3).	Managed Traffic Demand (Table 1.4). Enhanced TMP measures.

Link	Link description	Norfolk Vanguard Mitigation measures In isolation	Norfolk Vanguard Mitigation measures Cumulatively
17	B1145 - Billingford Road	Enhanced TMP measures.	n/a
21	B1147 – Etling Green	Enhanced TMP measures.	n/a
22	B1147 – Dereham Road	Enhanced TMP measures.	n/a
32	B1149 - Edgefield	HGV Delivery Restrictions (7:30am to 9am).	Managed Traffic Demand (Table 1.4). Enhanced TMP measures HGV Delivery Restrictions (7:30am to 9am)
34	B1145 – west of Cawston	Managed Traffic Demand (Table 1.3). Enhanced TMP measures. HGV Delivery Restrictions (7:30am to 9am and 3pm to 4pm). Highway Mitigation Scheme (undertaken by Norfolk Vanguard).	Managed Traffic Demand (Table 1.4). Enhanced TMP measures. HGV Delivery Restrictions (7:30am to 9am and 3pm to 4pm). Highway Mitigation Scheme (undertaken by Norfolk Vanguard/ Hornsea P3).
35a	B1159	Enhanced TMP measures.	n/a
35b	B1159	Enhanced TMP measures.	n/a
36	B1149 – Holt Road	Enhanced TMP measures. HGV Delivery Restrictions (8am to 9am and 3pm to 4pm).	Managed Traffic Demand (Table 1.4). Enhanced TMP measures. HGV Delivery Restrictions (8am to 9am and 3pm to 4pm).
41	B1436 - Felbrigg	Managed Traffic Demand (Table 1.3). Enhanced TMP measures.	Managed Traffic Demand (Table 1.4). Enhanced TMP measures.

Link	Link description	Norfolk Vanguard Mitigation measures In isolation	Norfolk Vanguard Mitigation measures Cumulatively
42	B1145: Reepham Road	Mobile Traffic Management. Enhanced TMP measures. Managed Traffic Demand as identified in ES Chapter 24 and to include: - No concurrent Infrastructure components construction. - Extend TC 6 peak construction period.	n/a
47c	North Walsham Road - Edingthorpe Green	Enhanced TMP measures. HGV Delivery Restrictions (8am to 9am and 3pm to 4pm). Managed Traffic Demand as identified in ES Chapter 24 and to include: - No concurrent Infrastructure components construction. - Extend TC 16 peak construction period.	n/a
49	B1159	HGV Delivery Restrictions (8am to 9am and 3pm to 4pm). Managed Traffic Demand as identified in ES Chapter 24 and to include: - No concurrent Infrastructure components construction. - Extend TC 16 peak construction period.	n/a
53	A149	HGV Delivery Restrictions (8am to 9am and 5pm to 6pm)	n/a
67	North Walsham Road / Happisburgh Road	Mobile Traffic Management.	n/a
68	The Street / Heydon Road	Highway Mitigation Scheme (undertaken by Norfolk Vanguard). HGV Delivery Restrictions (7:30am to 9am)	Managed Traffic Demand. Highway Mitigation Scheme (undertaken by Norfolk Vanguard/ Hornsea P3). HGV Delivery Restrictions (7:30am to 9am)

Link	Link description	Norfolk Vanguard Mitigation measures In isolation	Norfolk Vanguard Mitigation measures Cumulatively
69	Little London Road	Mobile Traffic Management. Enhanced TMP measures. Managed Traffic Demand as identified in ES Chapter 24 and to include: - No concurrent Infrastructure component construction. - Increase construction programme for Route Section 16a of duct installation. - Locate reception sides of TCs to area served by Link 69. - Splitting HGV payloads into smaller 10t vehicles.	n/a
70	Plantation Road (230m south of North Walsham Road junction)	Mobile Traffic Management.	n/a
71	Vicarage Road / Whimpwell Street	Mobile Traffic Management.	n/a
72	Dereham Road / Longham Road - Dillington	Mobile Traffic Management. Enhanced TMP measures.	n/a
73	Hoe Road South	Mobile Traffic Management.	n/a
74	Mill Street, Elsing Road – Swanton Morley	Mobile Traffic Management.	n/a
75	B1354 - Blickling	Mobile Traffic Management.	n/a
76	High Noon Road / Church Road	Mobile Traffic Management.	n/a
77	Hall Lane – North Walsham	Mobile Traffic Management. Managed Traffic Demand.	n/a
78	Bylaugh	Mobile Traffic Management.	n/a
79	B1145 / Suffield Road	Mobile Traffic Management. Potential localised highway widening.	n/a

Link	Link description	Norfolk Vanguard Mitigation measures In isolation	Norfolk Vanguard Mitigation measures Cumulatively
A	Dale Road	Not to be used.	n/a
B	Bradenham Lane	Enhanced TMP measures. Mobile Traffic Management.	n/a
C to F	Local routes	Mobile Traffic Management.	n/a
G	B1145 - Cawston road	Enhanced TMP measures. Mobile Traffic Management.	n/a
H	Wood Dalling Road	Enhanced TMP measures. Mobile Traffic Management.	n/a
I to L	Local routes	Mobile Traffic Management.	n/a
M	North Walsham Road / Happisburgh Road	Enhanced TMP measures. Mobile Traffic Management.	n/a
N to V	Local Access routes	Mobile Traffic Management.	n/a

1.11 A47 Access and Associated Traffic Management Measures

106. A traffic management strategy has been developed for each of the accesses required off the A47 to various infrastructure sites, the final details of which are being discussed with HE and will be included in the final TMP. Details and the locations of all accesses are set out within the Outline Access Management Plan (document reference 8.10).

1.11.1 Access AC160

107. Access AC160 will be required for the following Norfolk Vanguard Stages:

- Stage 2 to access MA2-E, TC1 (north) and TC2.
- Stage 3 for any potential jointing bay locations.

108. Access AC160 will be upgraded to a DMRB compliant rural simple junction with a 'no right turn' traffic management plan.

109. The 'no right turn' traffic management plan for AC160 at the A47/Bushy Common Road, will utilise a left turn in / left turn out only. This will require any potential right turning construction vehicles either entering or exiting the junction to divert and perform the following 'u-turn' manoeuvres:

1. Westbound traffic to utilise the 'McDonalds Roundabout' located on the A47 / Norwich Road roundabout junction approximately 7.1 miles west of AC160 near Swaffham. Figure 6 shows the construction vehicle diversion route [to be provided at Deadline 8].
2. Eastbound traffic to utilise the eastbound offramp off the A47 (approximately 2.9 miles west of AC160) and turning right onto Tavern Lane. At the traffic signal-controlled junction with the A1075 (Yaxham Road) at Dereham, construction vehicles would turn right and proceed south east under the A47 taking the westbound onramp back onto the A47. Figure 7 shows the construction vehicle diversion route [to be provided at Deadline 8].

1.11.2 Access AC161 (TC1 (south))

110. Access AC161 will be required for the following Norfolk Vanguard Stages:
 - Stage 2 to access MA1b and TC1 (south).
 - Stage 3 for any potential jointing bay locations.
111. Vehicle demand associated with the TC1 southern compound off the A47 / Dale Road / Bushy Common Road staggered junction is to be diverted to the MA1b compound (AC163) access on Dereham Road (Link 66). Once construction vehicles have arrived at MA1b, they would travel 450m north along the running track to the TC1 southern compound.
112. Access AC161 off Dale Road is not to be used to access TC1 southern compound.
113. The proposed diversion route is shown in Figure 8 [to be provided at Deadline 8].

1.11.3 Access AC181 and AC182 (National Grid works)

114. Access AC181 will be required for the following Norfolk Vanguard Stages:
 - Stage 2 for construction of the National Grid Substation Extension.
115. Access AC182 will be required for the following Norfolk Vanguard Stages:
 - Stage 2 for construction of the overhead line modification works (see Section 1.10.5 for details).
116. Both Accesses AC 181 and AC182 will be DMRB compliant rural simple junctions with a 'no right turn' temporary traffic management strategy. The temporary traffic management strategy proposed for Access AC181 and Access AC182 will be to utilise a left turn in / left turn out only. This will require any potential right turning construction vehicles to divert and perform the following 'u-turn' manoeuvres:

1. Westbound traffic to utilise the ‘McDonalds Roundabout’ located on the A47 / Norwich Road roundabout junction approximately 2.8 miles west of Access AC181 near Swaffham. Figure 9 graphically depicts the construction vehicle diversion route [to be provided at Deadline 8].
 2. Eastbound traffic to utilise the eastbound offramp off the A47 (approximately 7.4 miles west of AC181) and turning right onto Tavern Lane. At the traffic signal-controlled junction with the A1075 (Yaxham Road) at Dereham, construction vehicles would turn right and proceed south east under the A47 taking the westbound onramp back onto the A47. Figure 10 graphically depicts the construction vehicle diversion route [to be provided at Deadline 8].
117. It is not possible to provide two-way HGV entry/exit at Access AC182 due to land constraints and therefore further traffic management measures are required to ensure two HGVs do not meet in the ‘bell mouth’ and obstruct the flow of traffic on the A47. All site bound HGVs destined for Access AC182 will temporarily park at a segregated layby approximately two miles west of the site. From here, the drivers will communicate with a designated contact at the site to ascertain that no HGVs are leaving the site. Once, confirmed the driver will continue their journey and enter access AC182 unopposed. The location of the layby is detailed in Figure 9 [to be provided at Deadline 8].

1.11.4 Access AC183 (Onshore project substation, MA1a-West and MA1a-East)

118. A DMRB compliant right turn ghost island junction – all movements permitted. No temporary traffic management (including diversion manoeuvres) is required to support the access strategy for this location.
119. Full details of each of the required A47 access designs are detailed in the OAMP (DCO Document 8.10) and secured through DCO Requirement 21.

1.11.5 National Grid overhead line modifications

120. The Necton National Grid substation would need to accommodate circuit breakers and associated busbar (metal bar that conducts electricity within a substation) structures which allow connection onto the existing 400kV overhead line for generation to be transmitted onto the wider National Grid system. In addition to the Necton National Grid substation itself, modifications to the existing overhead line structures adjacent to the substation would be required.
121. Two new overhead line towers will be required to accommodate Norfolk Vanguard and Norfolk Boreas in close proximity to the existing corner tower (to the north east of the existing Necton National Grid substation) with a maximum height of 55m. The

existing corner tower will be demolished such that the net new number of towers is one.

122. To facilitate the connection to the wider national grid system it will be necessary to oversail the A47. To undertake this operation safely, it will be necessary to construct two scaffold towers adjacent to the carriageway and erect netting. Whilst the scaffold towers can be constructed with limited disturbance to the free flow of traffic, the netting must be installed during a temporary full road closure (for a matter of hours).
123. Norfolk Vanguard Ltd and National Grid are committed to work with the HE to agree appropriate timings, diversions and consultation strategy to implement the road closure with the least disruption to the traveling public and local communities.

1.12 Monitoring and Enforcement

1.12.1 Introduction

124. The HGV movements associated with the works will be continuously monitored through the use of the Booking System. As part of this monitoring process, the contractor would be required to keep an up to date record of deliveries and exports associated with the works.
125. The information will be made available upon request to the relevant Local Authority, in the form of a report validating the project HGV demand.

1.12.2 Local Community Liaison

126. Norfolk Vanguard Limited will ensure effective and open communication with local residents and businesses that may be affected by noise or other amenity aspects caused by the construction works. Communications will be co-ordinated on site by a designated member of the construction management team. A proactive public relations campaign will be maintained, keeping local residents informed of the type and timing of works involved, the transport routes associated with the works, the hours of likely construction traffic movements and key traffic management measures that would be provided. A combination of communication mechanisms such as posters and parish meetings will be employed to keep local residents informed.
127. A designated Norfolk Vanguard Limited local community liaison officer will be appointed to respond to any public concerns, queries or complaints in a professional and diligent manner as set out by a project community and public relations procedure which will be submitted for comment to the Local Authorities.
128. Parish Councils in the relevant area will be contacted (in writing) in advance of the proposed works and ahead of key milestones. This information will include a

timetable of works, a schedule of working hours, the extent of the works, and a contact name, address and telephone number in case of complaint or query.

Enquiries will be dealt with in an expedient and courteous manner. Any complaints will be logged, investigated and, where appropriate, rectifying action will be taken.

129. The above will be captured in a communications plan as part of the final CoCP (DCO Requirement 20).

1.12.3 Co-ordination

130. The contractor will establish the role of a Traffic Management Plan Coordinator (TMPCo). Their key responsibilities include:

- Managing the implementation of the plan;
- Reporting monitoring to Norfolk Vanguard Limited and relevant stakeholders (i.e. local authorities, NCC and HE);
- Inputting into and attending community liaison as required by Norfolk Vanguard Limited;
- Providing details of any complaint investigations to Norfolk Vanguard community liaison;
- First point of contact for construction workers and sub-contractors.

1.12.4 Potential Plan Breaches

131. To ensure that the OTMP can be effectively enforced, it is important to define what would constitute a breach. The following non compliances of the OTMP would constitute a breach whereby corrective measures would be required:

- 1) Failure to implement or use the agreed traffic management measure;
- 2) Failure to follow the agreed delivery routes;
- 3) Failure of the HGV to display its unique identifier;
- 5) Dangerous driving; and
- 7) Failure to record deliveries and departures for plant and materials within the booking system.

1.12.5 Corrective Process

132. On receipt of a report of a potential breach, Norfolk Vanguard Limited would investigate the circumstances and compile a report to the relevant authorities as soon as practicable. The report would outline the outcome of the investigation and what corrective action (if necessary) had been implemented.

133. If the breach is found to be material, Norfolk Vanguard Limited would take appropriate action within the jurisdiction of the contract and report back to the relevant local authority and the highway authority.

134. Individual employee breaches would be addressed through UK employment law whereby the process outlined above would form the basis for disciplinary proceedings.

2 FIGURES

Figure 1 Project Study Area

Figure 2 Onshore Cable Route Project Components

Figure 3 HGV Delivery Routes

Figure 4 Highway Links (Stage 2)

Figure 5 Highway Links (Stage 3)

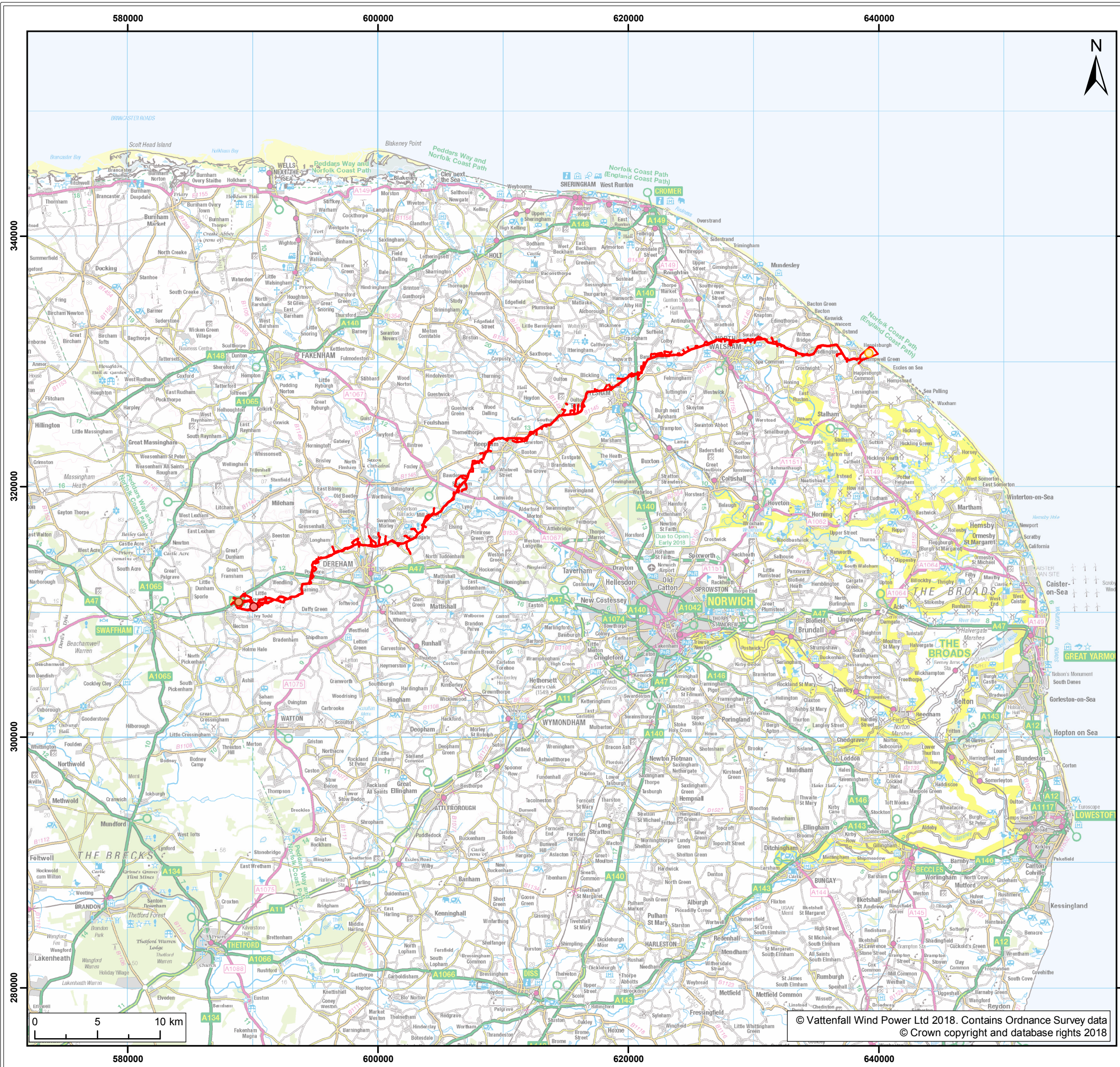
Figure 6 Diversion utilising the 'McDonald's Roundabout' u-turn route (AC159) [**to be provided at Deadline 8**]

Figure 7 Diversion utilising Dereham u-turn route (AC159) [**to be provided at Deadline 8**]

Figure 8 Construction Vehicle Access route to TC1 south (AC162) [**to be provided at Deadline 8**]

Figure 9 Diversion utilising the 'McDonald's Roundabout' u-turn route (AC178 & AC179) [**to be provided at Deadline 8**]

Figure 10 Diversion utilising Dereham u-turn route (AC178 & AC179) [**to be provided at Deadline 8**]



- Legend:
- Norfolk Vanguard onshore red line boundary
 - Landfall zone location
 - Onshore project substation location
 - National Grid substation extension location

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan
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Title: Project Study Area

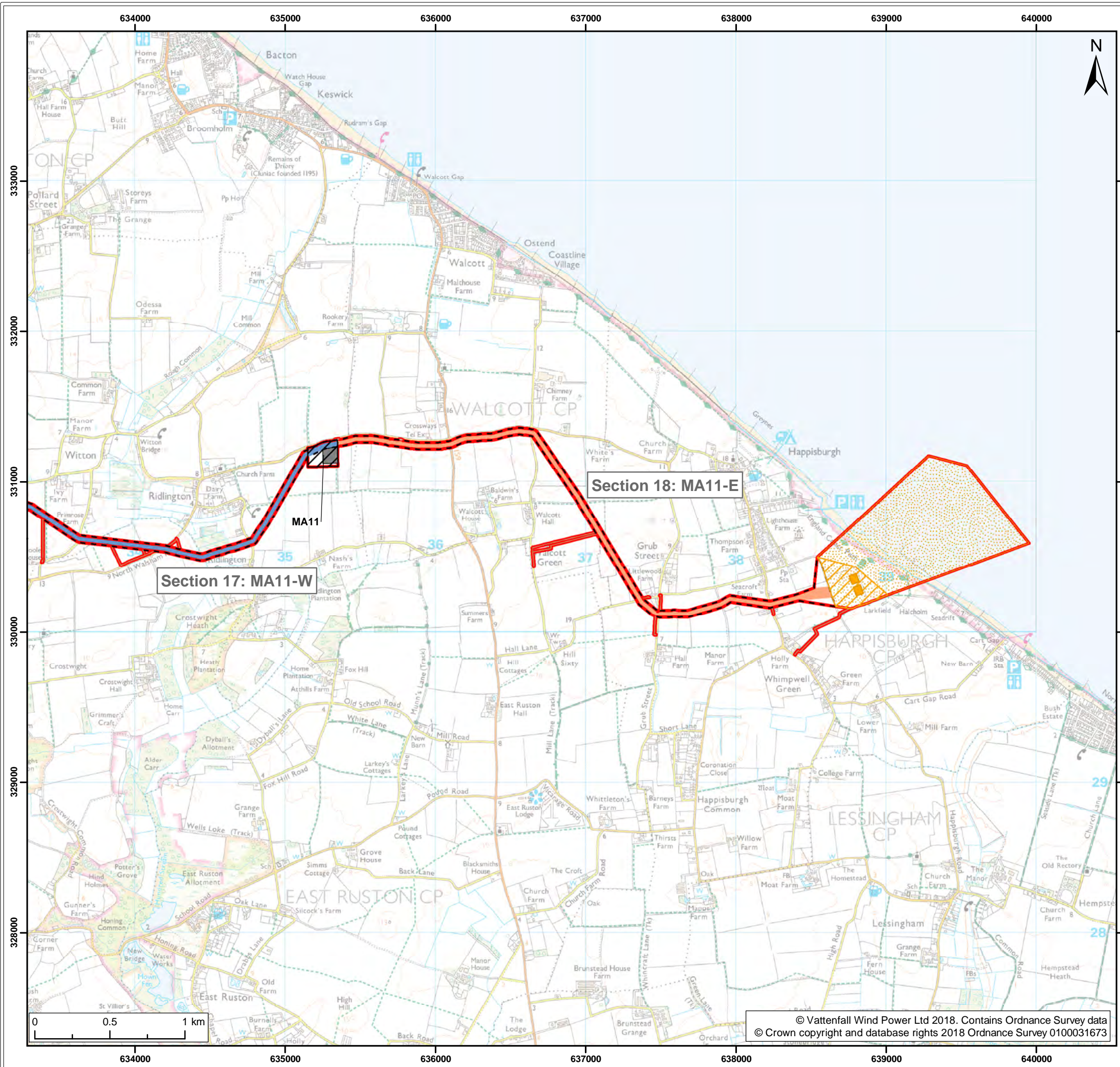
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Co-ordinate system: British National Grid EPSG: 27700

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- Legend:
- Norfolk Vanguard onshore red line boundary
 - Landfall**
 - Landfall zone
 - Landfall compound zone
 - Indicative landfall compound
 - Onshore cable route**
 - Onshore cable route
 - Mobilisation zone
 - Indicative mobilisation area compound
 - Access**
 - Construction access
 - Operation access
 - Cable Route Sections**
 - Section 17: MA11-W
 - Section 18: MA11-E

MA = Mobilisation Area	
Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

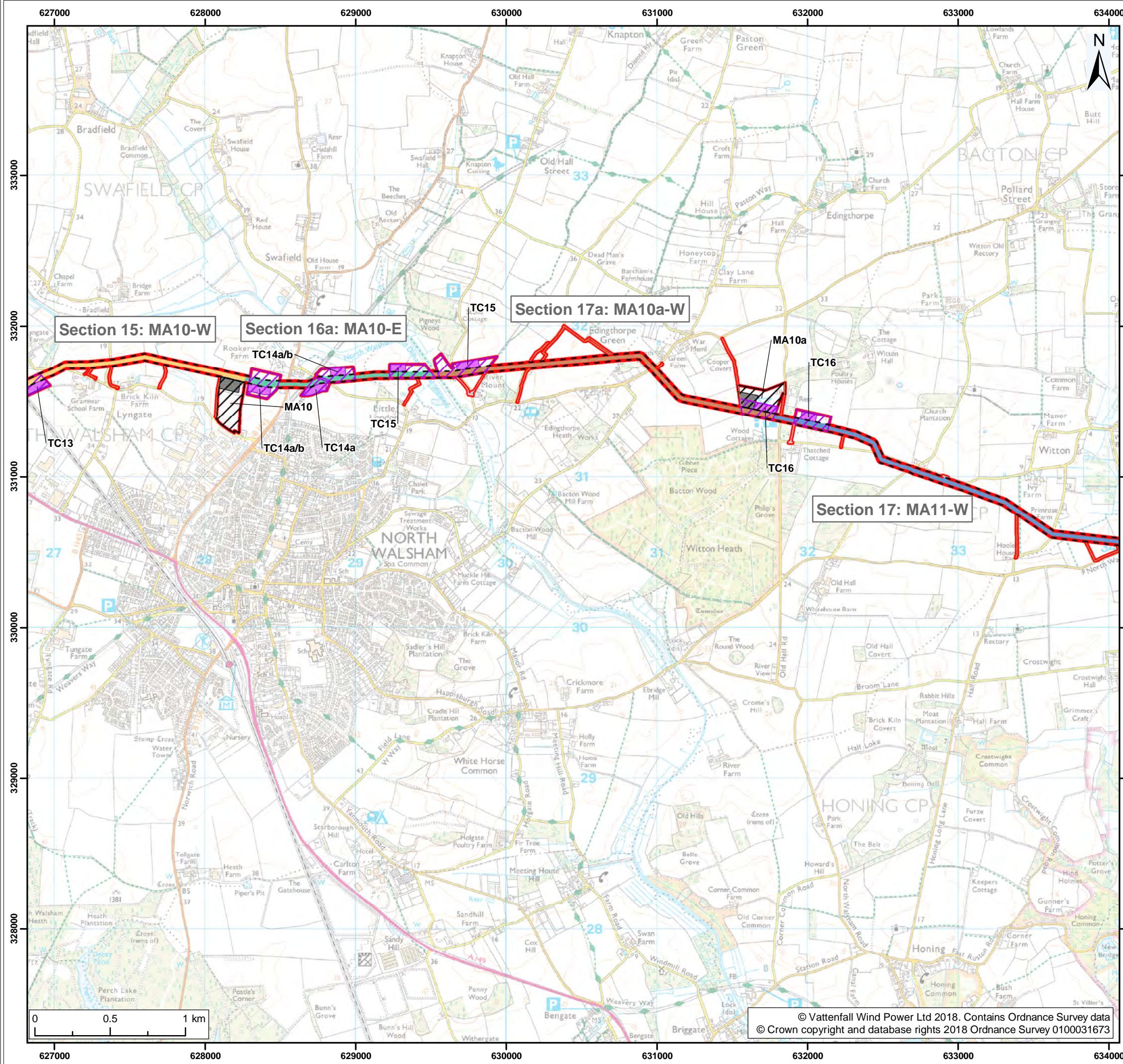
Title:
Onshore Cable Route Project Components
(map 1 of 9)

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01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate system: British National Grid EPSG: 27700



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- Legend:**
- Norfolk Vanguard onshore red line boundary
 - Onshore cable route**
 - Onshore cable route
 - Trenchless crossing zone (e.g. HDD)
 - Indicative trenchless crossing compound
 - Mobilisation zone
 - Indicative mobilisation area compound
 - Access**
 - Construction access
 - Operation access
 - Cable Route Sections**
 - Section 15: MA10-W
 - Section 16a: MA10-E
 - Section 17: MA11-W
 - Section 17a: MA10a-W

MA = Mobilisation Area	
Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

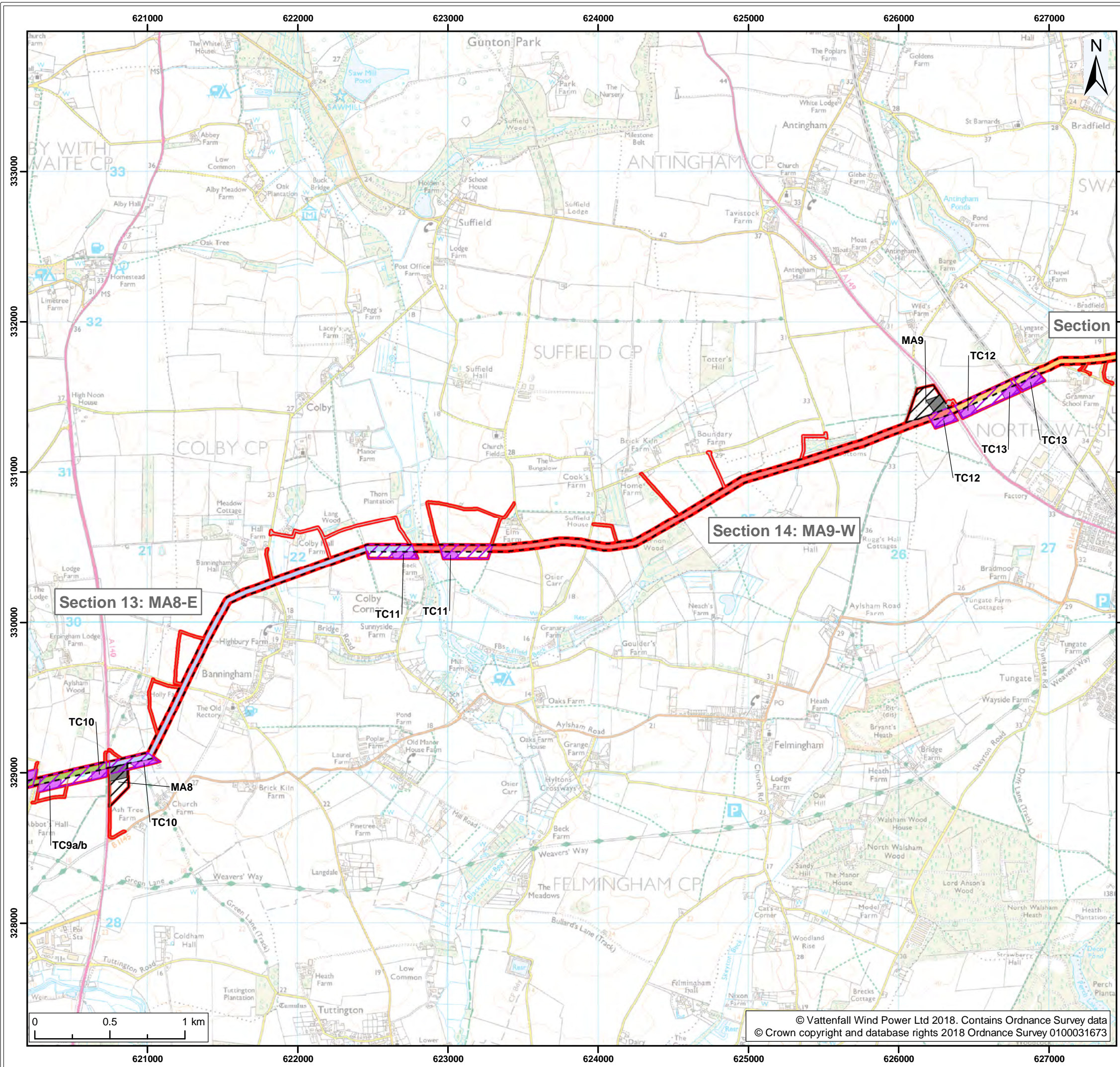
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Co-ordinate system: British National Grid EPSG: 27700



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- Legend:
- Norfolk Vanguard onshore red line boundary
 - Onshore cable route**
 - Onshore cable route
 - Trenchless crossing zone (e.g. HDD)
 - Indicative trenchless crossing compound
 - Mobilisation zone
 - Indicative mobilisation area compound
 - Access**
 - Construction access
 - Operation access
 - Cable Route Sections**
 - Section 12: MA7-E
 - Section 13: MA8-E
 - Section 14: MA9-W
 - Section 15: MA10-W

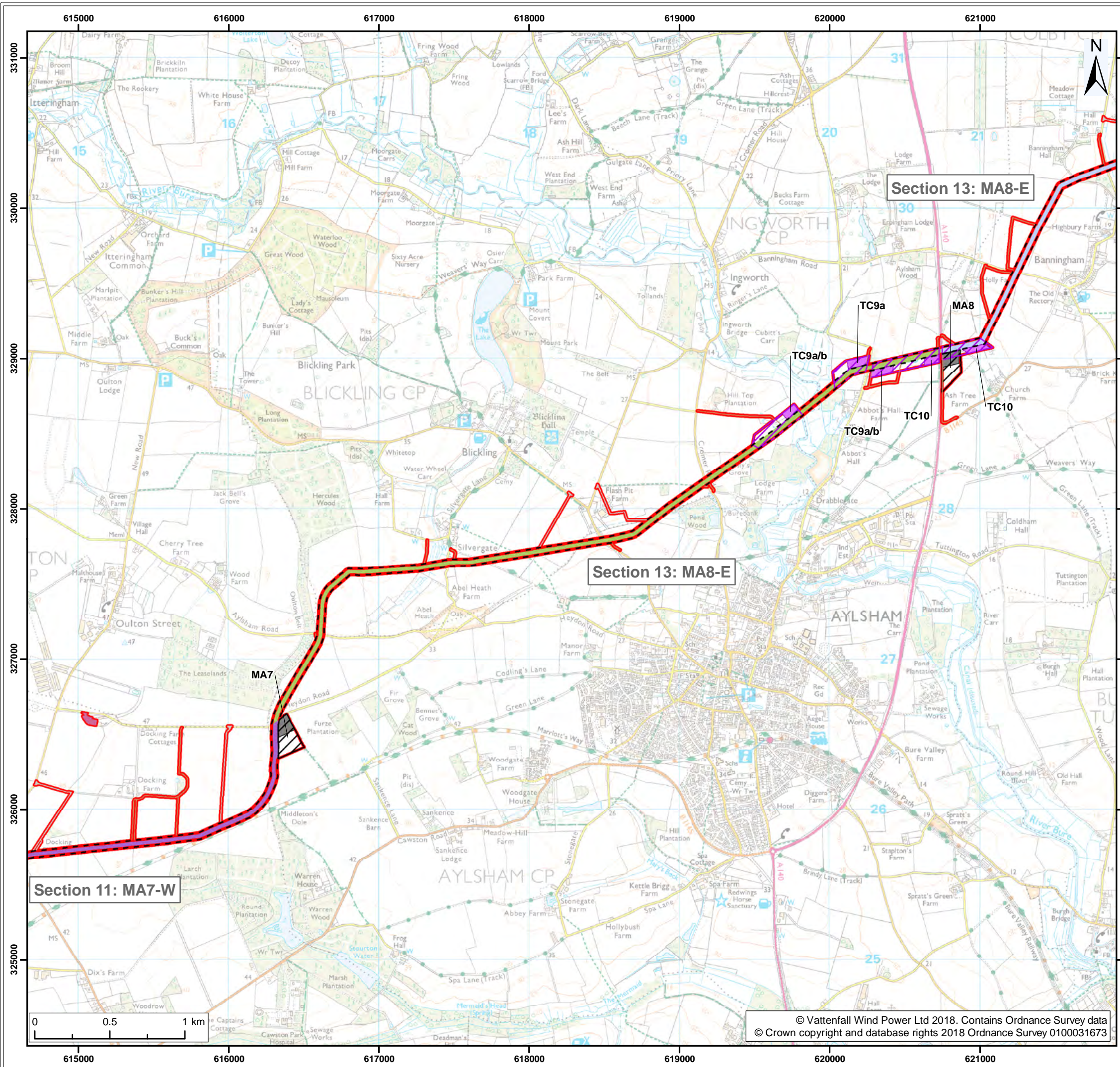
MA = Mobilisation Area	
Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title:
Onshore Cable Route Project Components
(map 3 of 9)

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Co-ordinate system: British National Grid EPSG: 27700





- Legend:
- Norfolk Vanguard onshore red line boundary
 - Onshore cable route**
 - Onshore cable route
 - Trenchless crossing zone (e.g. HDD)
 - Indicative trenchless crossing compound
 - Mobilisation zone
 - Indicative mobilisation area compound
 - Cable logistics area
 - Access**
 - Construction access
 - Operation access
 - Cable Route Sections**
 - Section 11: MA7-W
 - Section 12: MA7-E
 - Section 13: MA8-E

MA = Mobilisation Area	
Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

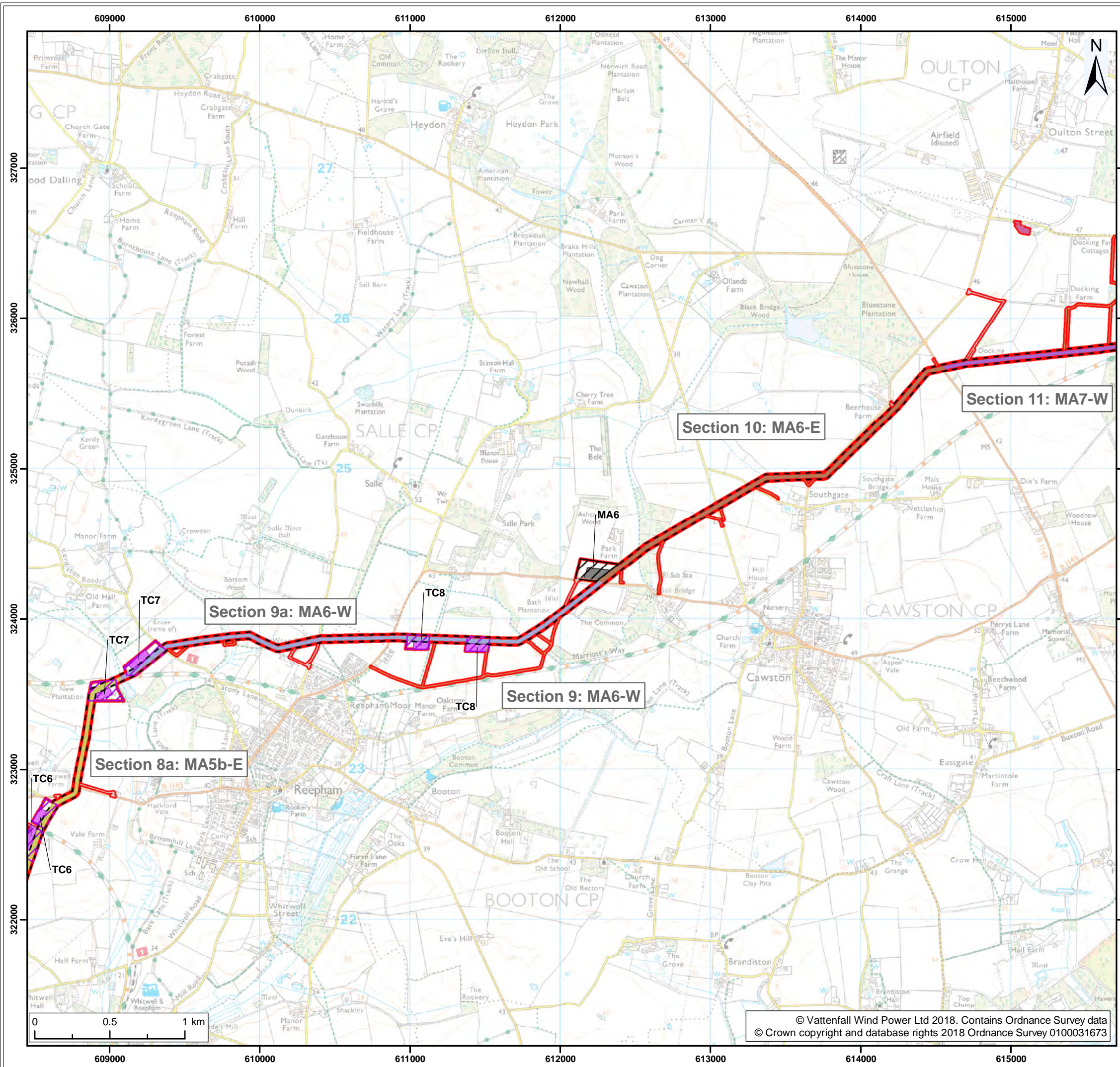
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(map 4 of 9)

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- Legend:
- Norfolk Vanguard onshore red line boundary
 - Onshore cable route**
 - Onshore cable route
 - Trenchless crossing zone (e.g. HDD)
 - Indicative trenchless crossing compound
 - Mobilisation zone
 - Indicative mobilisation area compound
 - Cable logistics area
 - Access**
 - Construction access
 - Operation access
 - Cable Route Sections**
 - Section 8a: MA5b-E
 - Section 9a: MA6-W
 - Section 10: MA6-E
 - Section 11: MA7-W

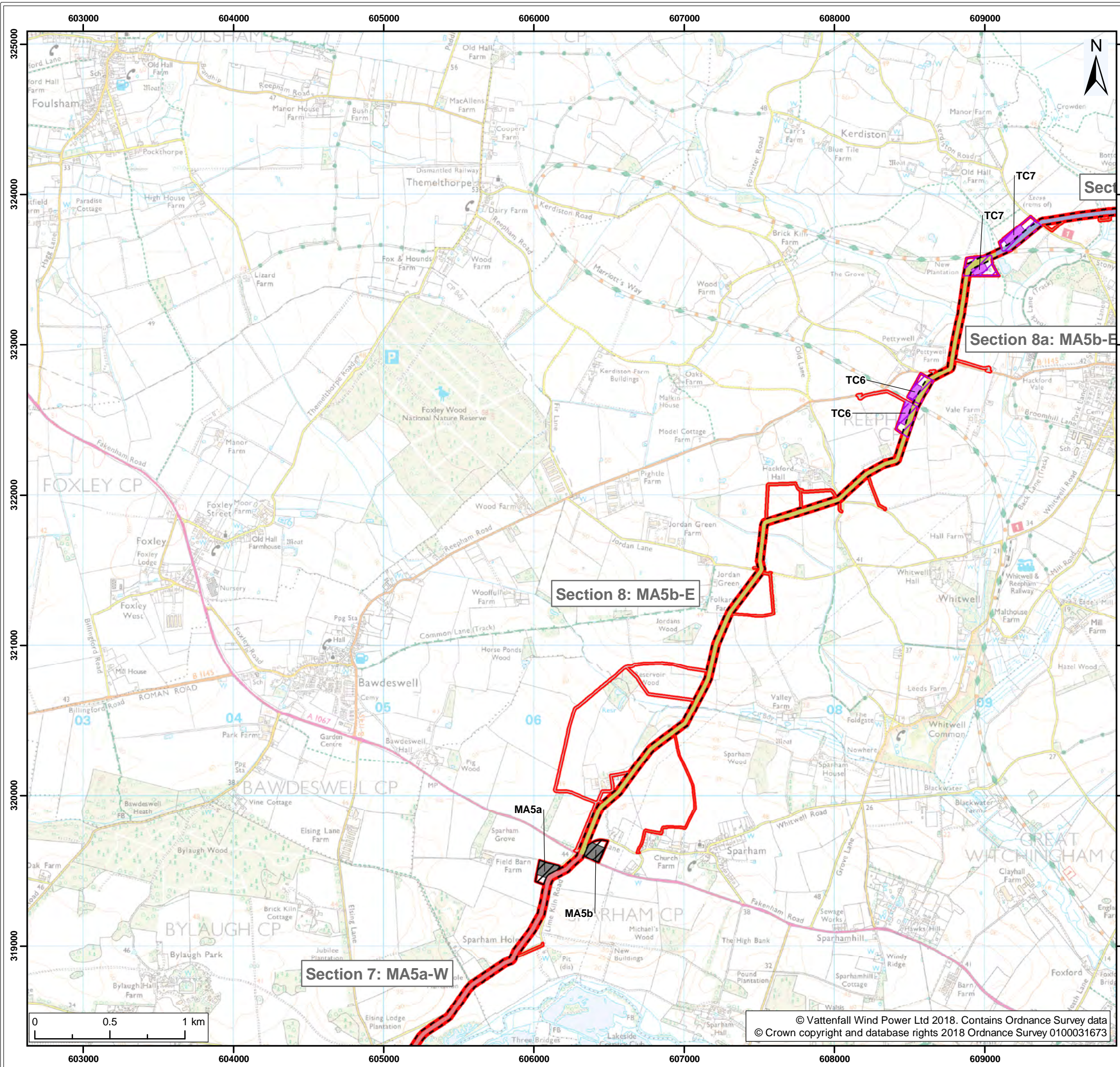
MA = Mobilisation Area	
Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title:
Onshore Cable Route Project Components
(map 5 of 9)

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Co-ordinate system: British National Grid EPSG: 27700





Legend:

- Norfolk Vanguard onshore red line boundary
- Onshore cable route**
- Onshore cable route
- Trenchless crossing zone (e.g. HDD)
- Indicative trenchless crossing compound
- Mobilisation zone
- Indicative mobilisation area compound
- Access**
- Construction access
- Operation access
- Cable Route Sections**
- Section 7: MA5a-W
- Section 8a: MA5b-E
- Section 9a: MA6-W

MA = Mobilisation Area

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

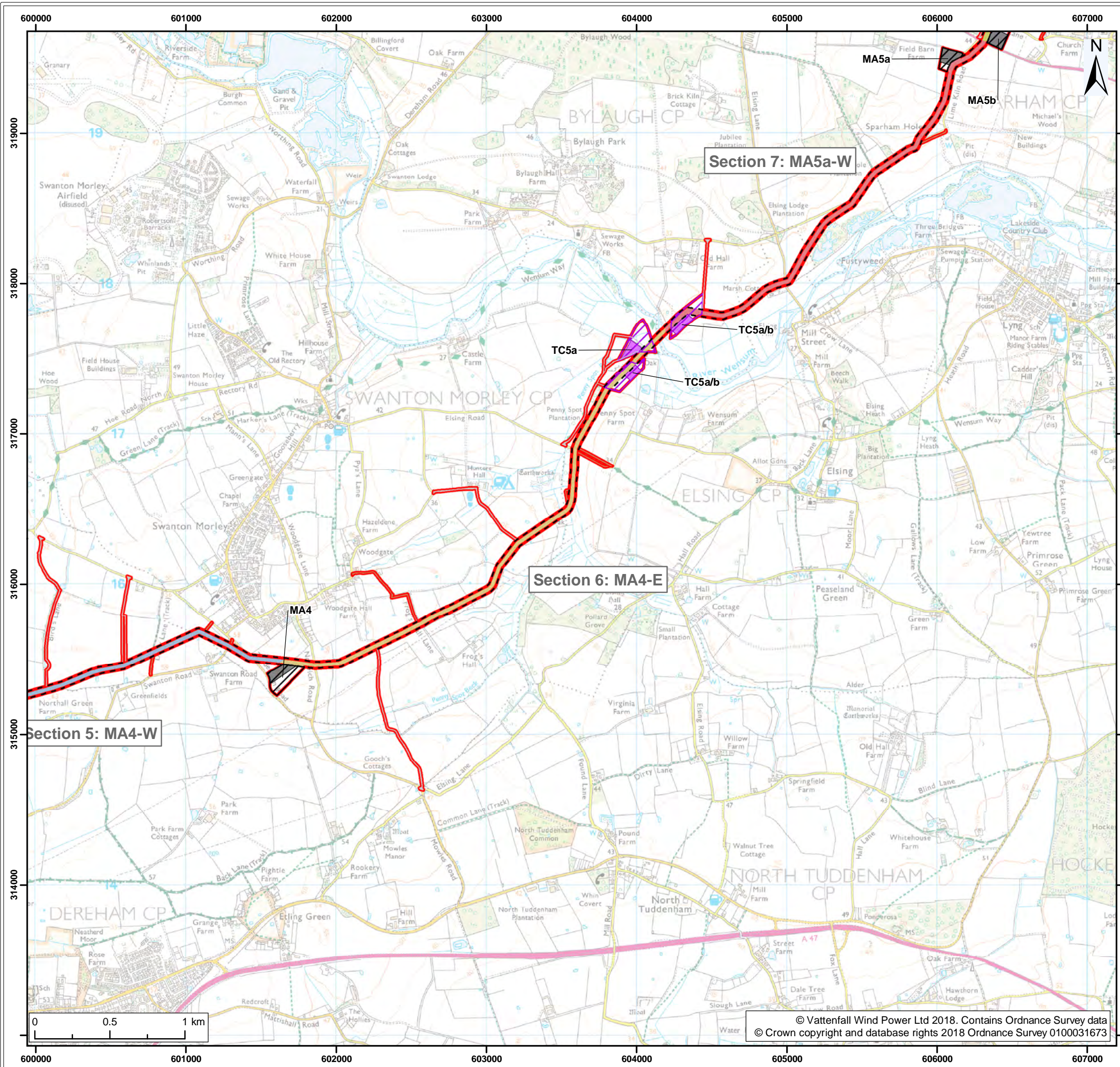
Onshore Cable Route Project Components
(map 6 of 9)

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Co-ordinate system: British National Grid EPSG: 27700

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- Legend:
- Norfolk Vanguard onshore red line boundary
 - Onshore cable route**
 - Onshore cable route
 - Trenchless crossing zone (e.g. HDD)
 - Indicative trenchless crossing compound
 - Mobilisation zone
 - Indicative mobilisation area compound
 - Access**
 - Construction access
 - Operation access
 - Cable Route Sections**
 - Section 5: MA4-W
 - Section 6: MA4-E
 - Section 7: MA5a-W
 - Section 8a: MA5b-E

MA = Mobilisation Area	
Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title:
Onshore Cable Route Project Components
(map 7 of 9)

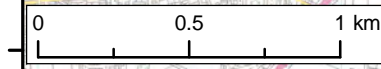
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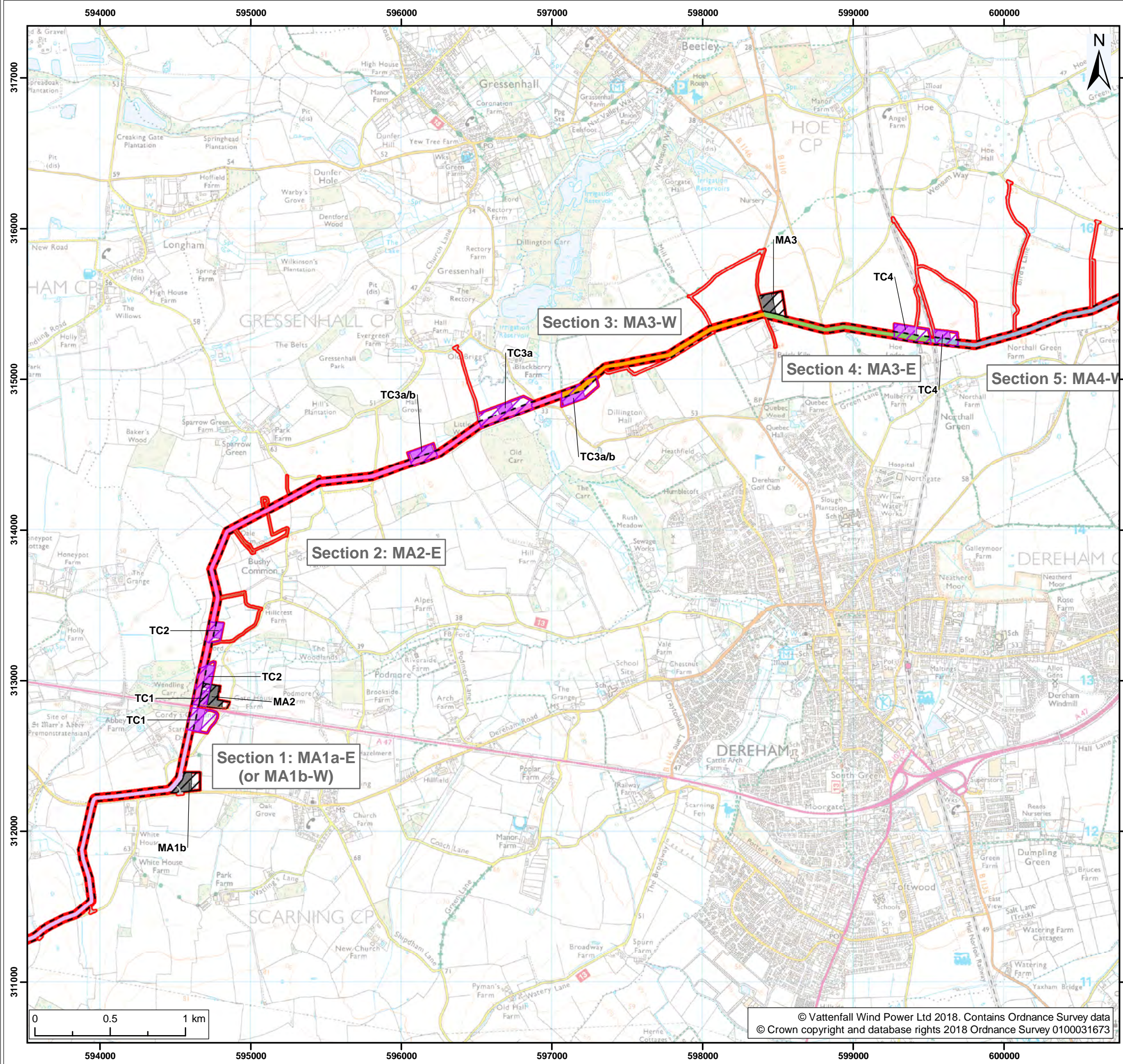
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Legend:

- Norfolk Vanguard onshore red line boundary
- Onshore cable route**
- Onshore cable route
- Trenchless crossing zone (e.g. HDD)
- Indicative trenchless crossing compound
- Mobilisation zone
- Indicative mobilisation area compound

Access

- Construction access
- Operation access

Cable Route Sections

- Section 1: MA1a-E (or MA1b-W)
- Section 2: MA2-E
- Section 3: MA3-W
- Section 4: MA3-E
- Section 5: MA4-W

MA = Mobilisation Area

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan
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Title:
Onshore Cable Route Project Components
(map 8 of 9)

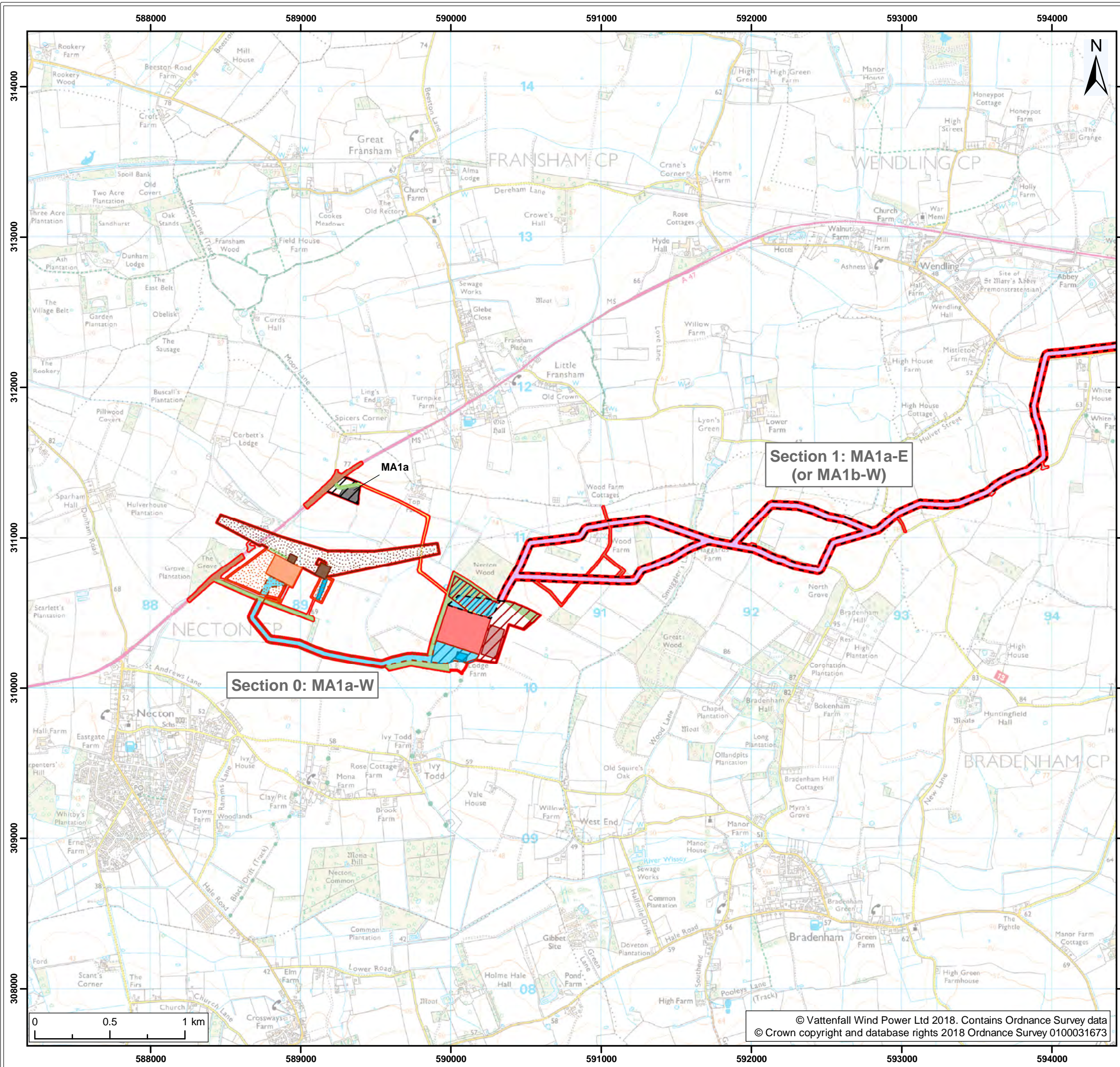
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Legend:

- Norfolk Vanguard onshore red line boundary
- Onshore cable route
- Onshore 400kv cable route
- Mobilisation zone
- Indicative mobilisation area compound
- Permanent access
- Construction access
- Operation access
- Onshore project substation
- Onshore project substation temporary construction compound zone
- Indicative onshore project substation temporary construction compound
- National Grid**
- National Grid substation extension
- National Grid new / replacement overhead line tower
- National Grid temporary works
- Overhead line temporary works
- Mitigation areas**
- Attenuation pond zone
- Indicative attenuation pond
- Indicative mitigation planting
- Cable Route Sections**
- Section 0: MA1a-W
- Section 1: MA1a-E (or MA1b-W)

MA = Mobilisation Area

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components
(map 9 of 9)

Figure: 2	Drawing No: PB4476-006-009-002				
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