Norfolk Vanguard Offshore Wind Farm

Outline Traffic Management Plan

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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)
Jointing 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 tower	New overhead line towers to be installed at the Necton National Grid substation.
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

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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) (this document; 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 and Highways England) 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 measures outlined in the respective plans would be validated and optimised in consultation with Norfolk County Council and Highways England.

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 has included 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(a) 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 Norfolk County Council (NCC), Highways England (HE) and Norfolk Vanguard Limited. Whilst not a member of the ETG, 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 Project Description

14. A comprehensive project description of the onshore project area is contained within Chapter 5 Project Description of the ES.

15. 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 at Necton as shown in Figure 1.

16. The onshore project substation at Necton will be constructed approximately 1km away from the Necton National Grid substation.

17. 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.

18. 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 though the pre-laid ducts at a later stage in the programme.

19. 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.

20. The project could be constructed in either two phases or one continuous construction phase (up to 1,800MW). For the purposes of the ES, a two phase approach was assessed as the worst case scenario.

21. 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						
Phase 1						
Phase 2						
Onshore cable route						
Pre-construction works						
Duct installation works						
Cable pull, joint and commission						
Phase 1						
Phase 2						
Onshore project substation						
Pre-construction works						
Primary works						
Electrical plant installation and commission						
Phase 1						
Phase 2						

1.4.1 Stage 1: Pre-construction works

22. 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.

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

23. 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.

24. 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.

25. 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.

26. 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.

27. The running track would be up to 6m wide and may ultimately extend the full length of the onshore cable route crossing the public highway in a number of locations.

28. 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 technique[1] would be employed.

29. 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.

30. Figure 2 details the key components of the stage 2 construction phase.

1.4.3 Stage 3: Cable pull, joint and commission

31. 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.

32. 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.

33. 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

[1] Trenchless crossing techniques include HDD/Auger Bore/Micro Tunnel

where possible. In some locations, isolated sections of the running track would be left in place from the duct installation works or be re-instated to allow access to more remote joint locations. It is estimated that a running track would be required for 20% of the total onshore cable route length for the cable pull and jointing works.

34. 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.

35. 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 1.3).

1.5 Embedded Mitigation

36. 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.

37. Full details of the embedded mitigation can be found within Chapter 5 Project description of the ES.

38. 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	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; • Trunk Roads/Principal Roads including A47, A140, A149; • Mid-Norfolk Railway; and • Network Rail.	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.
Mobilisation Areas	Mobilisation areas would be located close to main A-roads	

Parameter	Embedded mitigation for traffic and transport	Notes
	minimising impacts upon local communities and utilising the most suitable roads. Mobilisation areas located away from population centres where practical to reduce impact on local communities and population centres.	
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	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. Consolidating HGVs at mobilisation areas to reduce vehicle movements along more sensitive local routes. Carefully selected delivery routes acknowledging the sensitive receptors within the traffic and transport study area Management measures to control timing of deliveries	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)

1.6 Environmental Impact Controls

1.6.1 General Principles

39. 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

40. The traffic and transport assessment is predicated on the final TMP being implemented as embedded mitigation (as required under DCO Schedule 1, Part 3,

Requirement 21) to manage the daily delivery profiles and control movements and routing.

41. 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).

1.6.2 HGV Demand

42. During the development of the EIA, HGV routes were carefully selected (in liaison with highway stakeholders) to minimise the potential for adverse environmental impacts.

43. The EIA sets out the forecast number of construction HGVs distributed across the traffic and transport study area (see Appendix 1 HGV Distribution). These HGV movements would be controlled by the contractor at point of destination on the onshore cable route by monitoring the number of deliveries.

44. The following Table 1.3 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 1.3 HGV movements per access

Access ID	Stage 2		Stage 3	
	Access function	Peak daily two-way HGV movements	Access function	Peak daily two-way HGV movements
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

Access ID	Stage 2		Stage 3	
	Access function	Peak daily two-way HGV movements	Access function	Peak daily two-way HGV movements
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
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

Access ID	Stage 2		Stage 3	
	Access function	Peak daily two-way HGV movements	Access function	Peak daily two-way HGV movements
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
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

Access ID	Stage 2		Stage 3	
	Access function	Peak daily two-way HGV movements	Access function	Peak daily two-way HGV movements
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
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

Access ID	Stage 2		Stage 3	
	Access function	Peak daily two-way HGV movements	Access function	Peak daily two-way HGV movements
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

45. 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.

46. 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.

1.6.3 Control of HGV Numbers

47. To ensure compliance with the assessed HGV movements, a booking system for deliveries will be established by the contractor.

48. The booking system will enable a daily profile of deliveries to be maintained within the assessment thresholds (Table 1.3) and allow the contractor to ensure that the required deliveries are regularly forecast and planned.

49. 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.

50. 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.

51. 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.

1.6.4 Delivery Route Compliance

52. 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.

1.6.5 Delivery Periods

53. The delivery of materials and plant would typically occur between 7am to 7pm Monday to Friday. Saturday working may be required at times (e.g. accelerated working following adverse weather) but would be subject to prior agreement with the relevant authorities.

54. Section 24.7 of Chapter 24 Traffic and Transport sets out that in order to avoid potentially significant impacts on Bloodslat Lane (link 47c) and B1159 Coast Road (link 49), HGV movements will be restricted during school drop off (8am to 9am) and pick up times (3pm to 4pm).

55. Table 1.4 sets out further measures to coordinate the timing of HGV deliveries to ensure highway network 'resilience' is maintained.

Table 1.4 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	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. 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

Potential Event	Mitigation Measures
	events.
Managing traffic demand during major incidents such as accidents on the highway.	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. 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.
Incidents involving HGV traffic blocking the highway, such as, breakdowns, accidents, etc.	The Contractor and their suppliers' fleets will have arrangements with recovery companies to allow breakdowns and accidents to be cleared as quickly as possible.
A47 Corridor improvement programme	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. It is therefore proposed that, should the two projects overlap, Norfolk Vanguard Limited and its Contractors would engage with Highways England to establish opportunities to co-ordinate activities and avoid peak traffic impacts.

1.6.6 Abnormal Loads

56. 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.

57. 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.

58. 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.

1.6.7 Road Safety

59. 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.

60. The site is located within the extent of Highways England'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.

61. 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.

62. 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 1.5). 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 1.5 Enhanced TMP measures

Enhanced TMP Measures
Driver training and toolbox talks
Driver information packs to include: • 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'
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)

63. 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.

64. 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'.

1.6.8 Other Measures

65. 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.

66. 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.

1.7 Traffic Management

67. 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.

1.7.1 General Principles - Managing HGV Demand

68. 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.

69. 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.

70. 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.

71. 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.

72. 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.

73. 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). Some localised carriageway widening may be required to ensure pilot vehicle control distances do not lead to excessive delays.

74. Table 1.6 details the locations where pilot vehicle traffic management would be employed noting that the maximum peak HGV demand would be <20 two-way HGV movements per hour, i.e. 10 arrivals and 10 departures.

75. The pilot vehicle routes would be appropriately signed to indicate to motorists the presence of mobile construction traffic and potential delays.

76. Suitable scale plans of pilot control routes with any proposed widening would be submitted with the final TMP pursuant to the discharge of Requirement 21 of the DCO.

Table 1.6 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
68	The Street / Heydon Road	1,000	96	10	35	~ 4
69	Little London Road	500	48**	5	30	~ 4
70	Plantation Road (230m south of North Walsham Road junction)	1,000	192	19	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 - Blickling	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						

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*
*	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.					

1.7.2 General Principles – Roadworks

77. Where the onshore cable route crosses roads, tracks and public rights of way, 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.

78. 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 21.

79. 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.

80. Following consultation with NCC, it has been raised that the traffic flows on the A1067 have increased significantly post the opening of the Norwich Northern Distributor Road and may be at such a level that standard traffic management methods are no longer suitable. Therefore, to inform the TMP submission, a survey of traffic flows will be undertaken during peak hours and an appropriate crossing method will be agreed with NCC.

1.7.3 Specific Traffic Management Mitigation

81. Chapter 24 Traffic and Transport ES identifies a number of highway routes (links) that the daily HGV traffic generation must be 'capped' to avoid significant amenity and severance impacts. Table 1.7 details the capped routes and the recommended maximum daily construction HGVs.

Table 1.7 Capped HGV routes

Link ID	Route	Max. Daily HGV movements
42	B1145: Reepham Road	72
47c	Bloodslat Lane – Broomholm	72
49	B1159 – Coast Road	72
69	Little London Road	48

82. The HGV demand on the capped routes is short-term (matter of weeks) and localised. It is considered relative minor revision to activity schedules and a refinement of the worst case construction parameters would achieve the required capped HGV flows. The TMP will contain full details of how these HGV caps would be achieved.

83. Specific to link 69, Little London Road, the proposed HGV cap must be achieved using smaller payload vehicles (~10tonne) to traverse the constrained highway corridor.

1.7.4 National Grid overhead line modifications

84. 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.

85. 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.

86. 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 construction 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).

87. 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 closer with the least disruption to the traveling public and local communities.

1.8 Highway Asset Management

88. 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.

89. 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 Monitoring and Enforcement

1.9.1 Introduction

90. 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.

91. The information will be made available upon request to the relevant Local Authority, in the form of a report validating the project HGV demand.

1.9.2 Local Community Liaison

92. 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.

93. A designated Norfolk Vanguard Limited local community liaison officer will respond to any public concerns, queries or complaints in a professional and diligent manner

as set out in a project community and public relations procedure which will be submitted for comment to the Local Authorities.

94. 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, as far as possible, an outline 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.

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

1.9.3 Co-ordination

96. 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.

1.9.4 Potential Plan Breaches

97. 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.

1.9.5 Corrective Process

98. 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.

99. 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.

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

1.10 Figures

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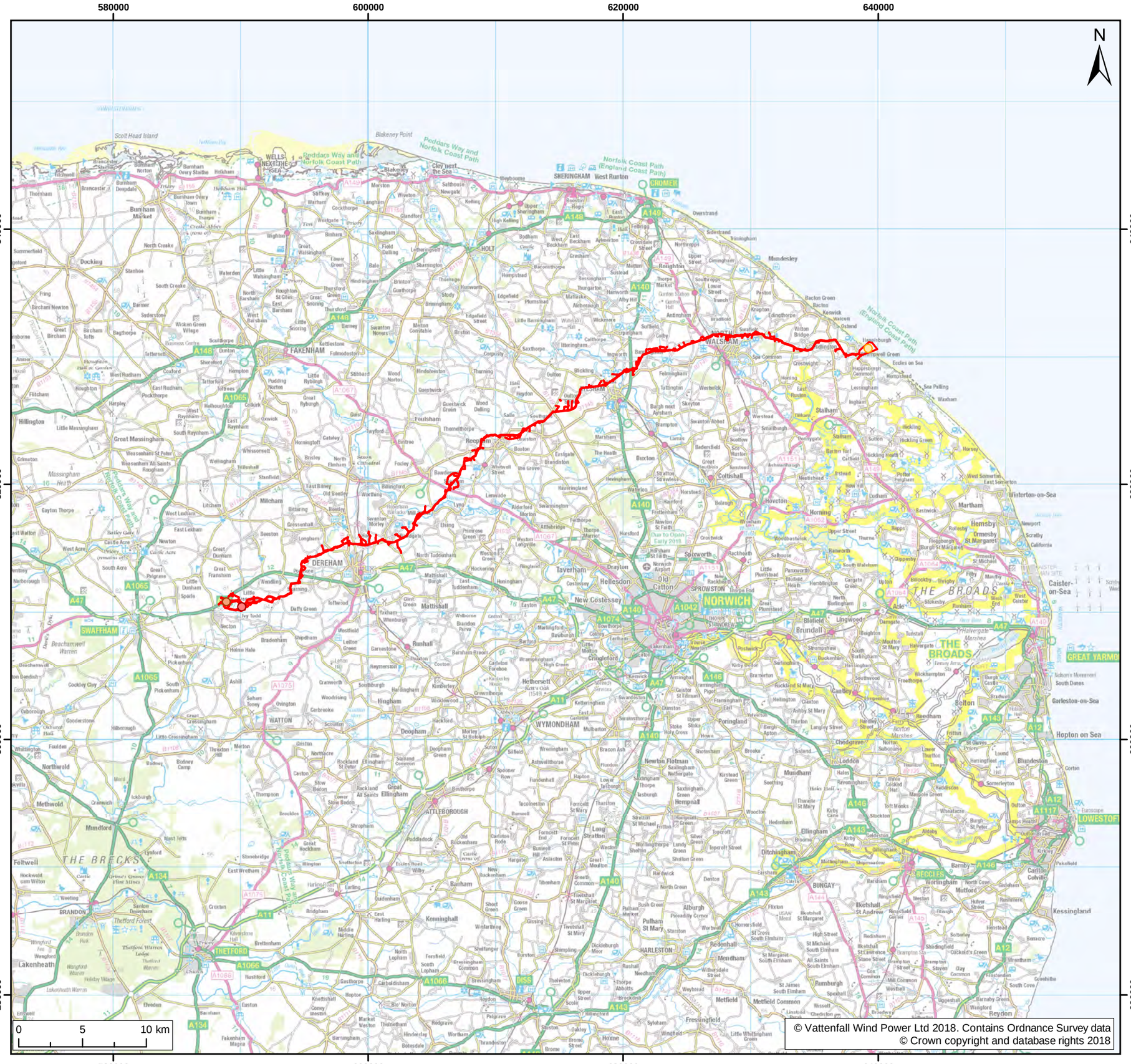

Legend:

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

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Project Study Area

Figure: 1 | Drawing No: PB4476-006-009-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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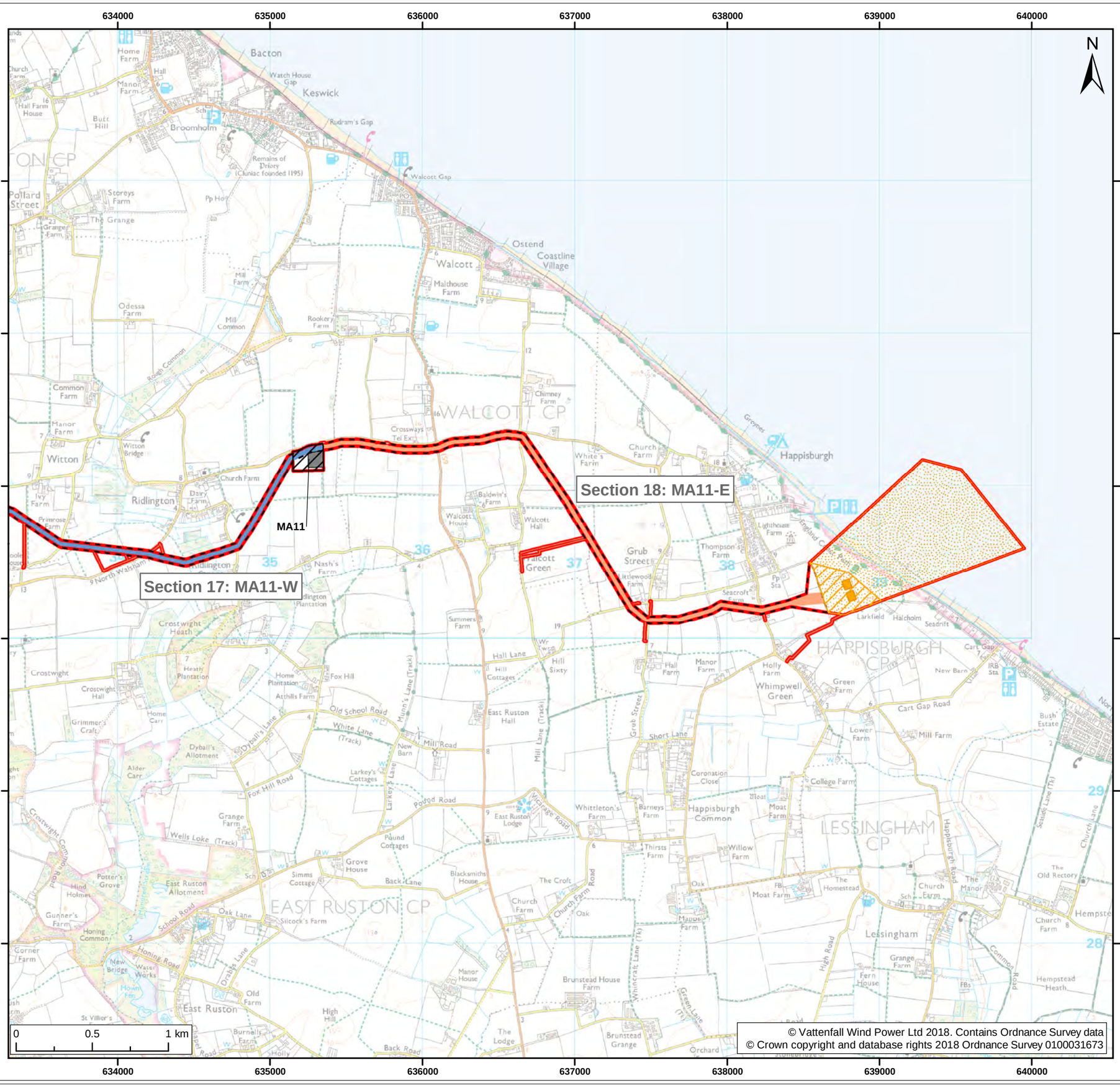

Legend:

- 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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components (map 1 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	08/06/2018	LB	RE	A3	1:25,000
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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333000 332000 331000 330000 329000 328000

N

Section 15: MA10-W

Section 16a: MA10-E

Section 17a: MA10a-W

Section 17: MA11-W

TC13 TC14a/b TC14a/b MA10 TC14a TC15 TC15 MA10a TC16 TC16

SWAFIELD CP TWALSHAM CP NORTH WALSHAM BACTON CP HONING CP

Bradfield Swafield Knapton Paston Green Edingthorpe Edingthorpe Green Witton Witton Heath Bengate Briggate White Horse Common

0 0.5 1 km

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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title: Onshore Cable Route Project Components (map 2 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	08/06/2018	LB	RE	A3	1:25,000
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Co-ordinate system: British National Grid **EPSG:** 27700

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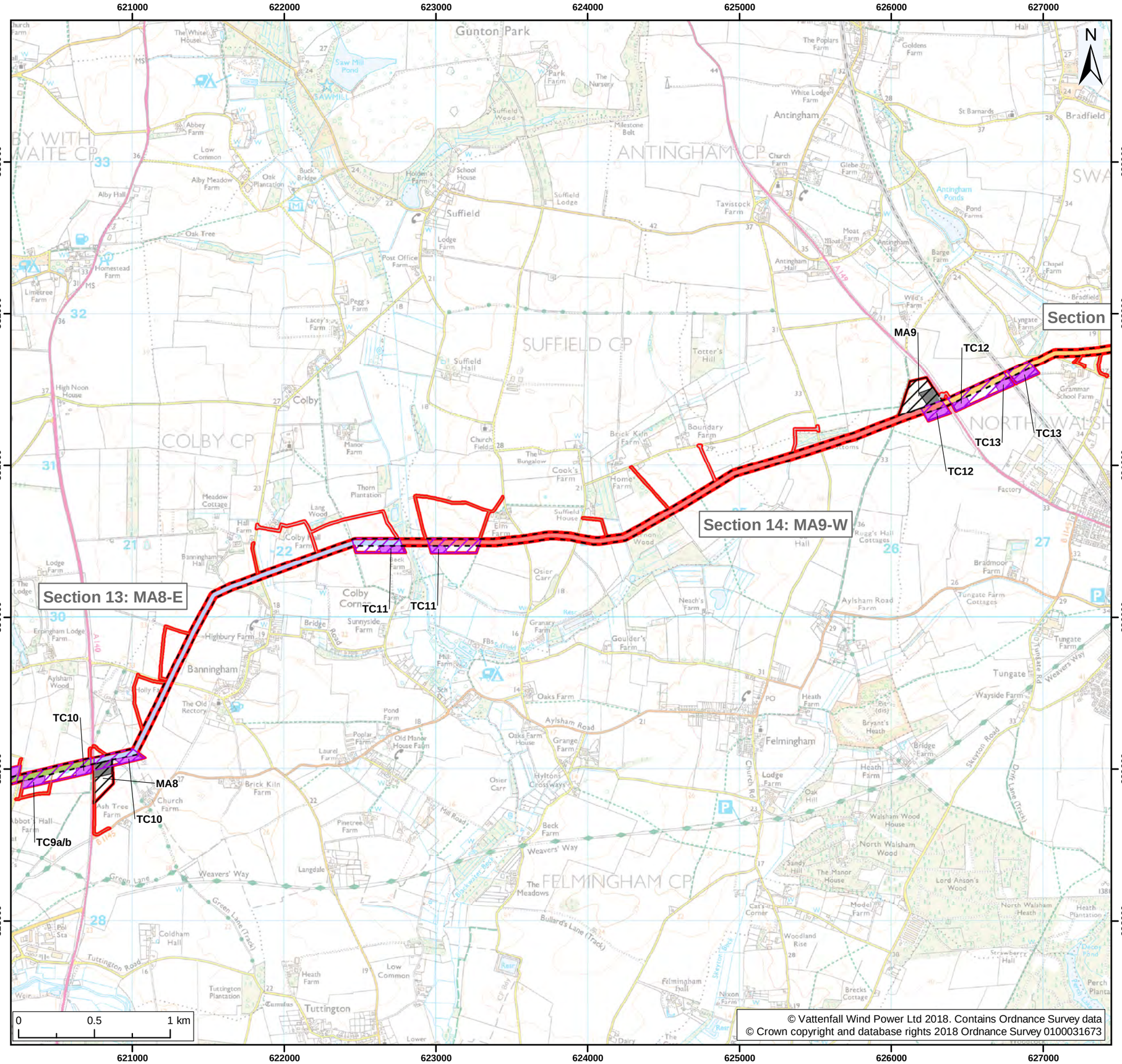

Legend:

- 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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components (map 3 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	08/06/2018	LB	RE	A3	1:25,000
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Co-ordinate system: British National Grid **EPSG:** 27700

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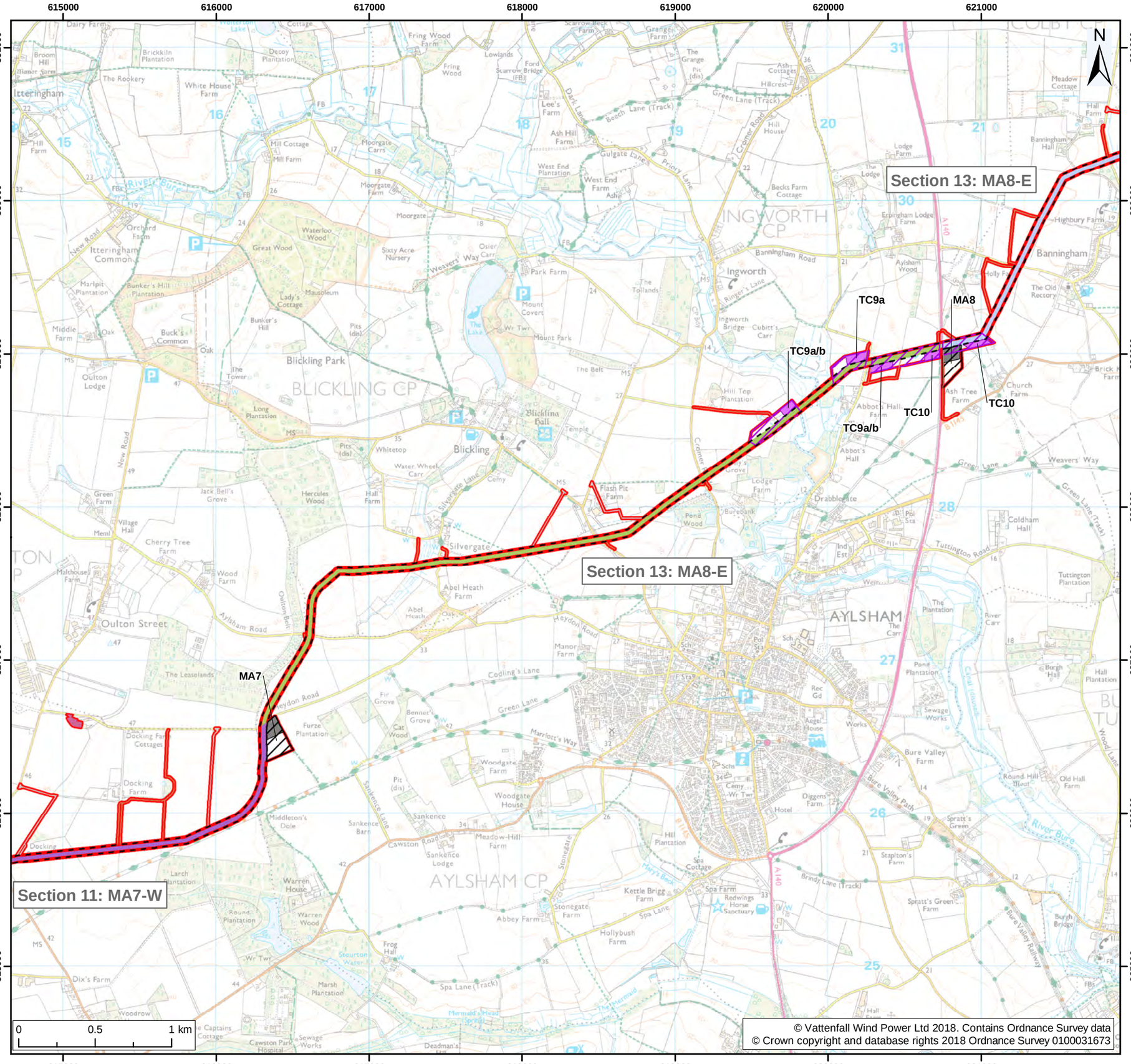

Legend:

- 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
- 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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components (map 4 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	08/06/2018	LB	RE	A3	1:25,000
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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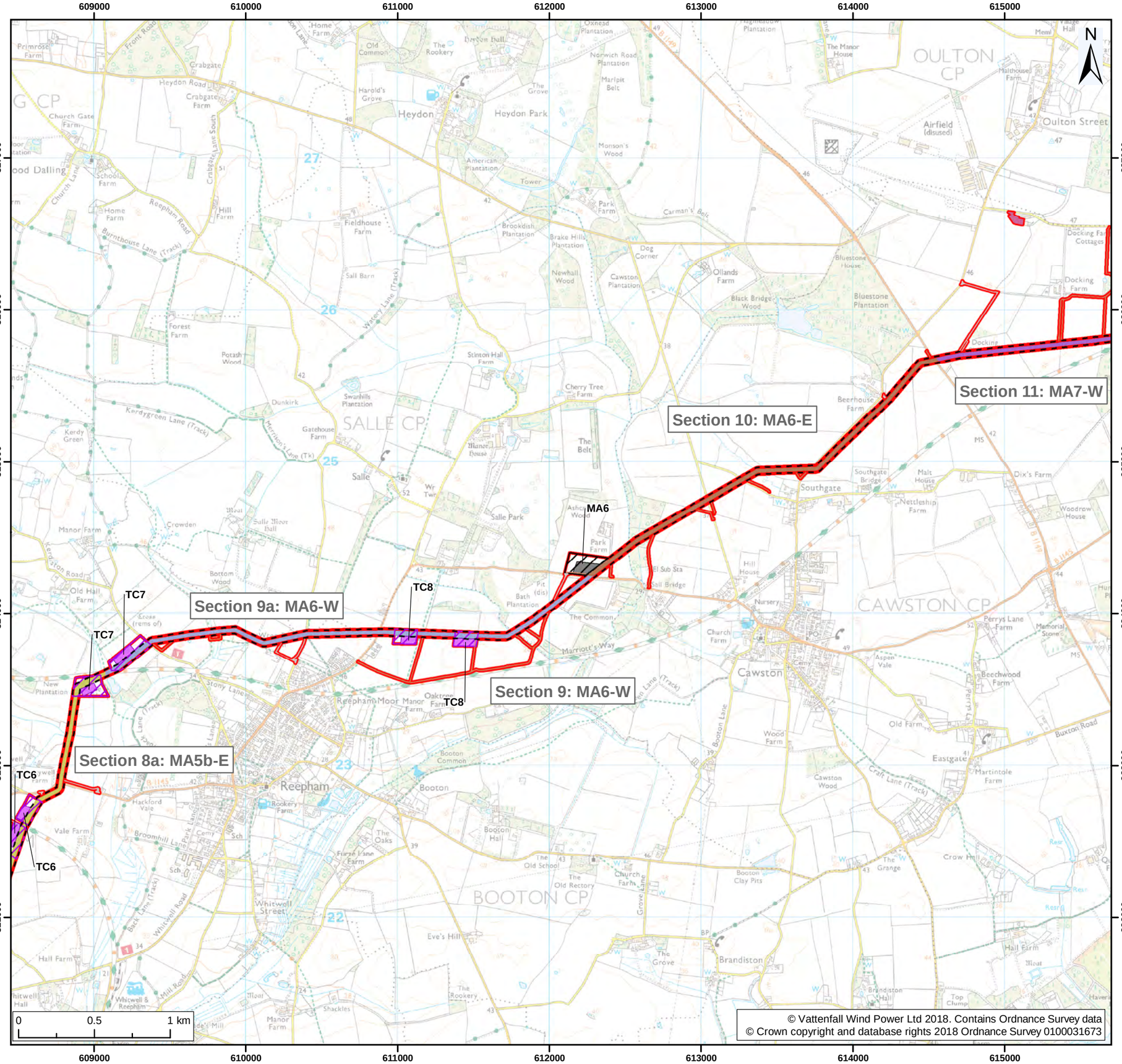

Legend:

- 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
- 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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components (map 5 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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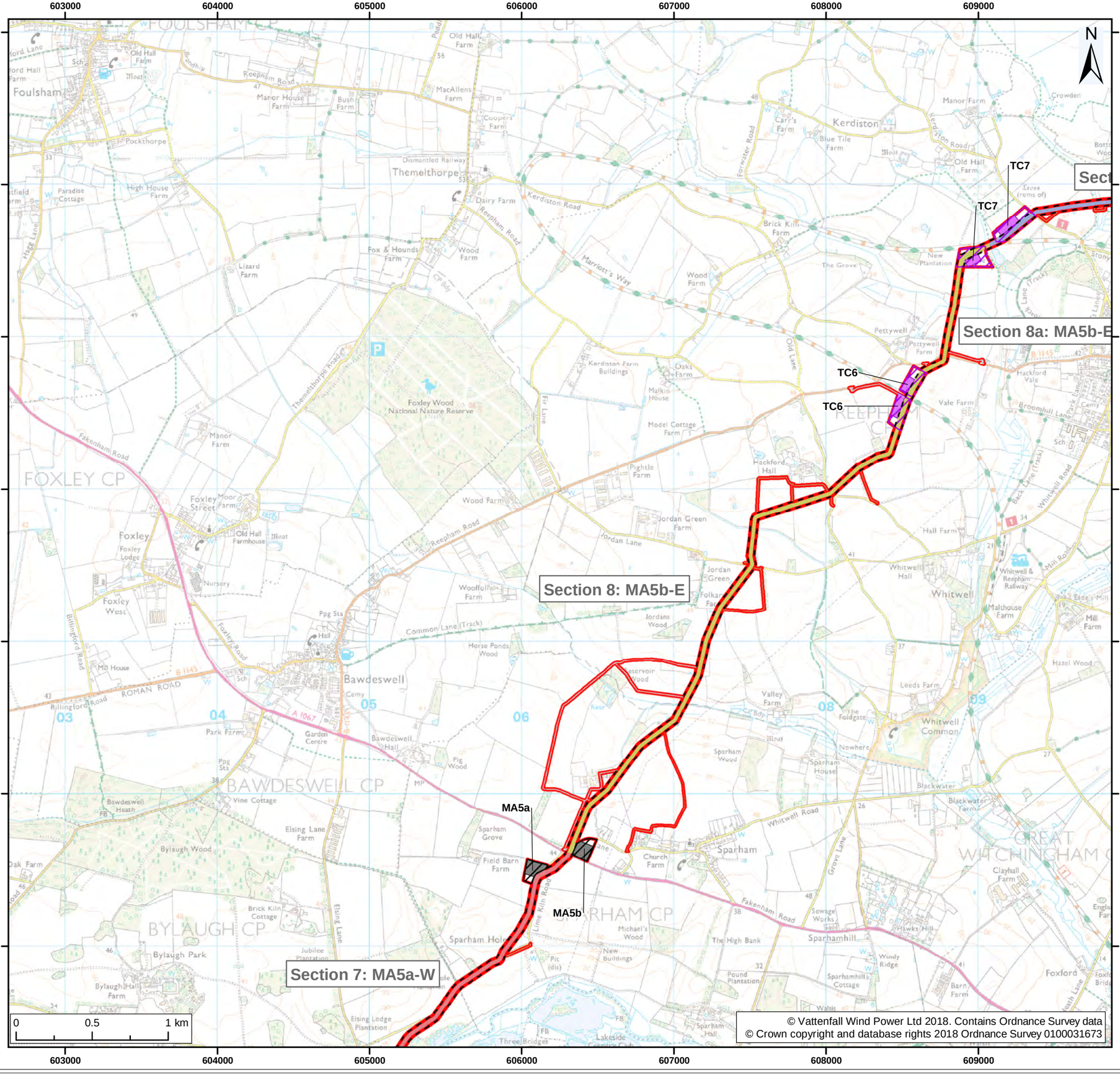

Legend:

- 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 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)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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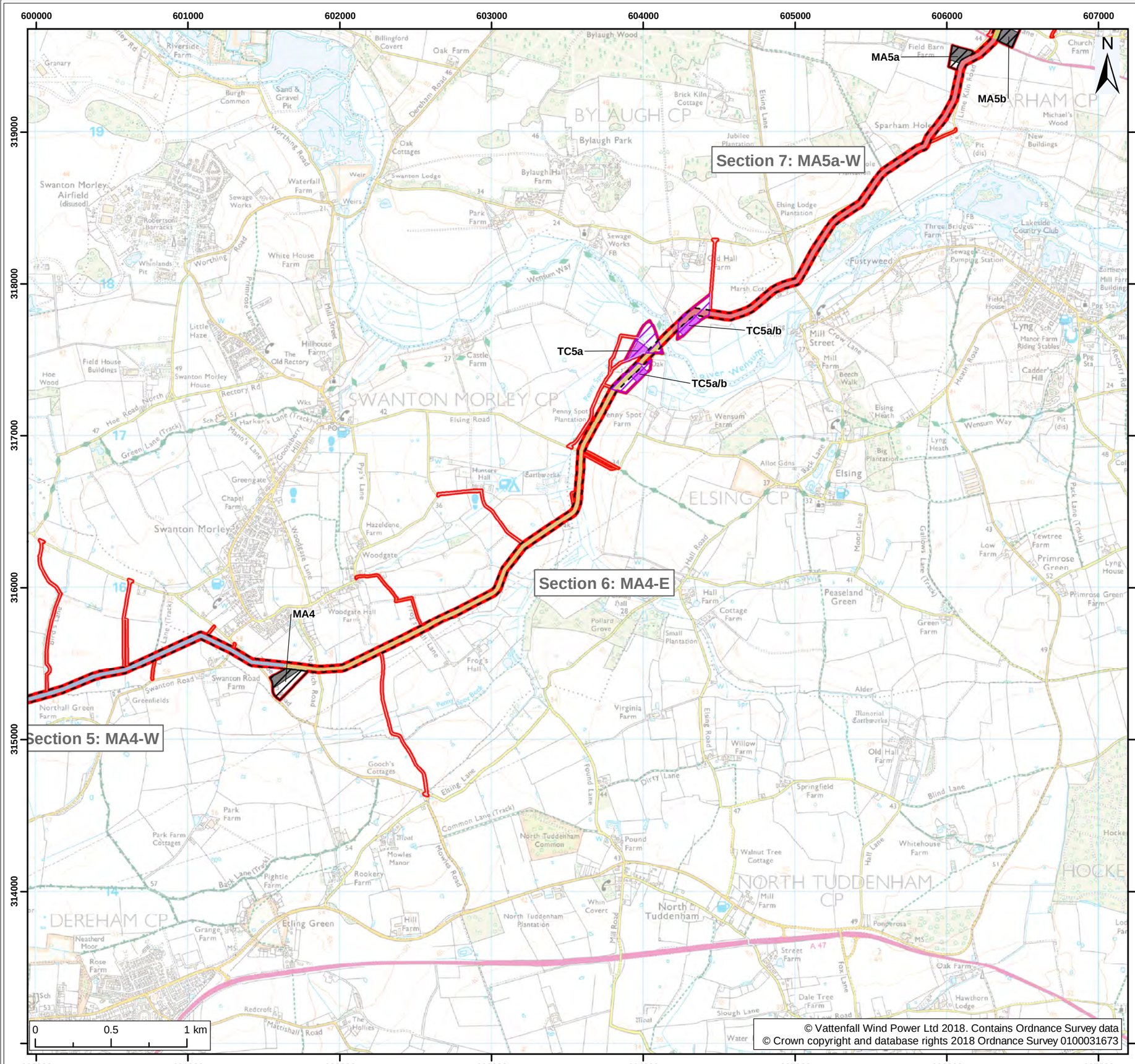

Legend:

- 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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components (map 7 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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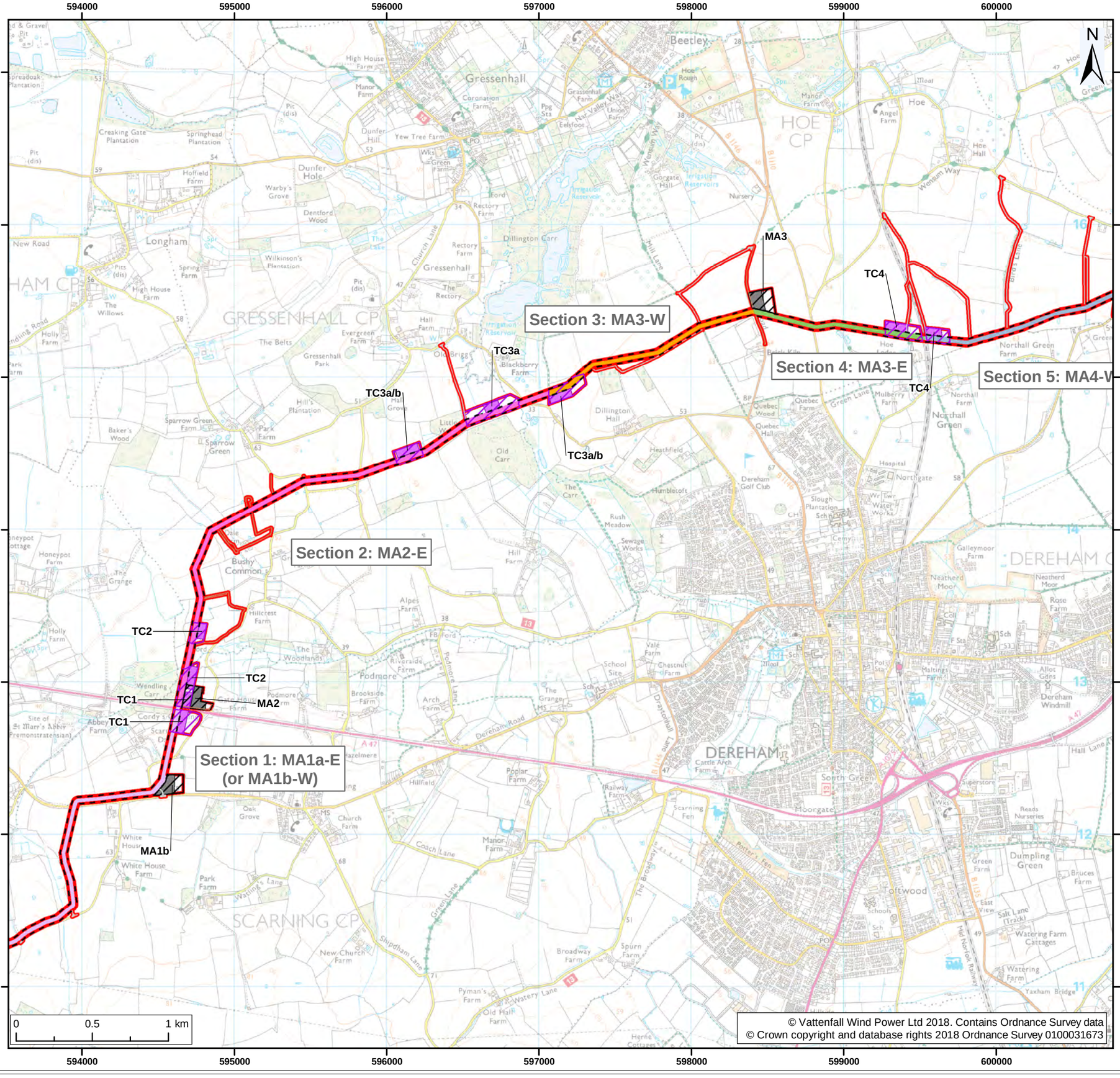

Legend:

- 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:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title:

Onshore Cable Route Project Components (map 8 of 9)

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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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588000 589000 590000 591000 592000 593000 594000

314000 313000 312000 311000 310000 309000 308000

N

MA1a

Section 1: MA1a-E (or MA1b-W)

Section 0: MA1a-W

0 0.5 1 km

Legend:

- Norfolk Vanguard onshore red line boundary
- Onshore cable route
- Onshore cable route
- Onshore 400kv cable route
- Mobilisation zone
- Indicative mobilisation area compound
- Access
- Permanent access
- Construction access
- Operation access
- Onshore project substation
- 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

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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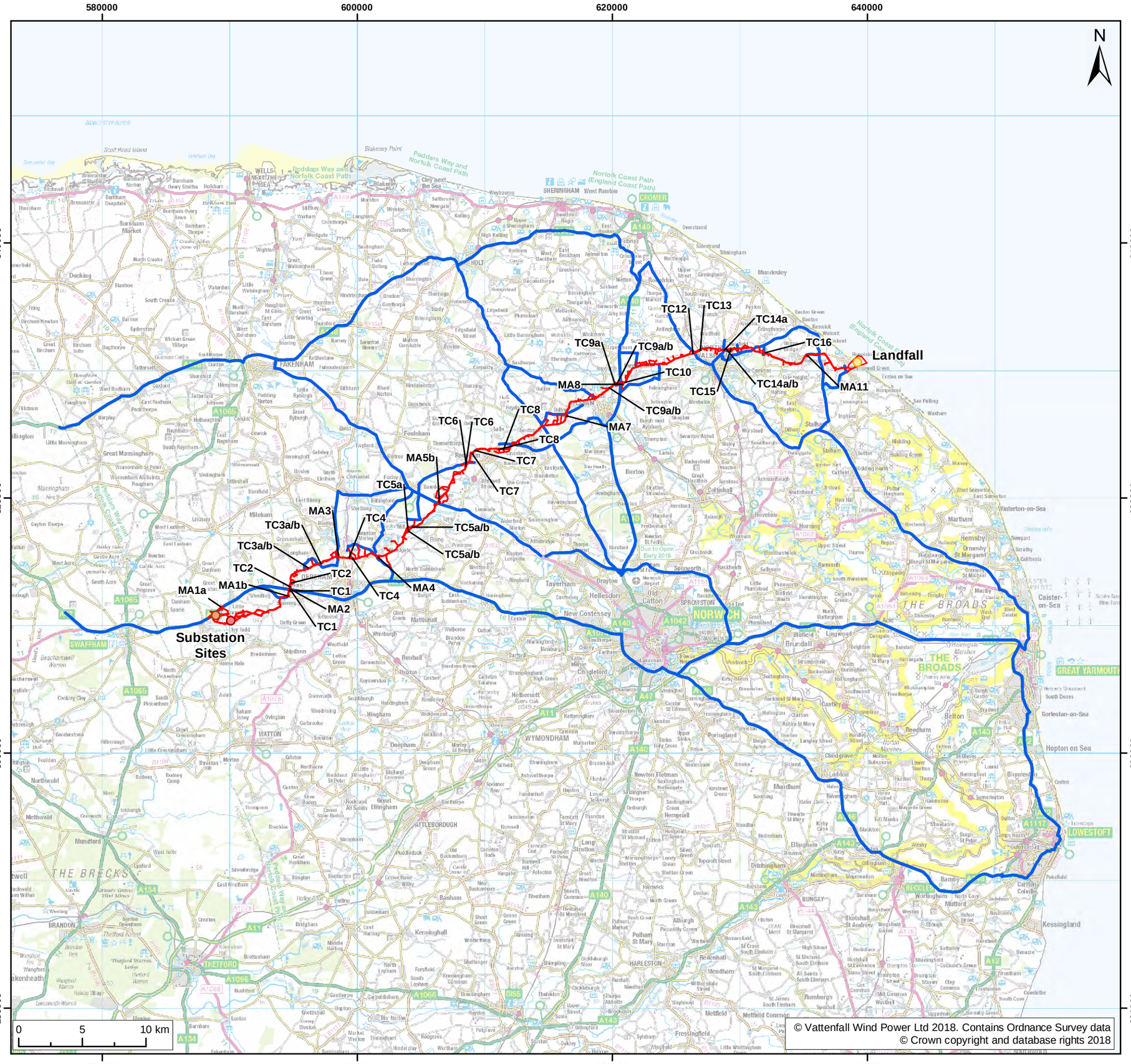

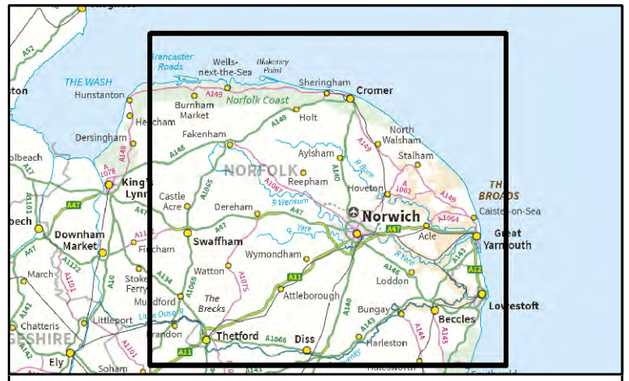

Legend:

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

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title: HGV Delivery Routes

Figure: 3 | Drawing No: PB4476-006-009-003

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	04/06/2018	LB	RE	A3	1:300,000

Co-ordinate system: British National Grid **EPSG:** 27700

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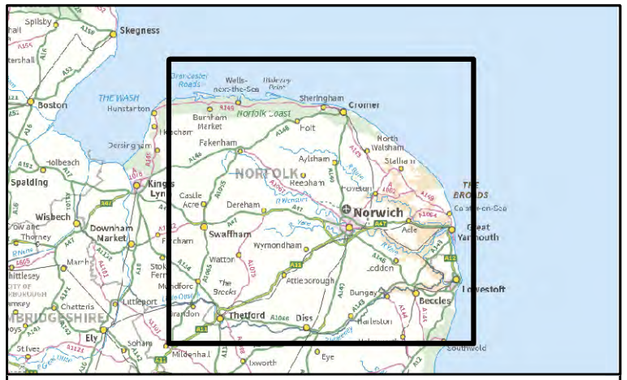


Legend:

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

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title: Highway Links (Stage 2)

Figure: 4 | Drawing No: PB4476-006-009-002

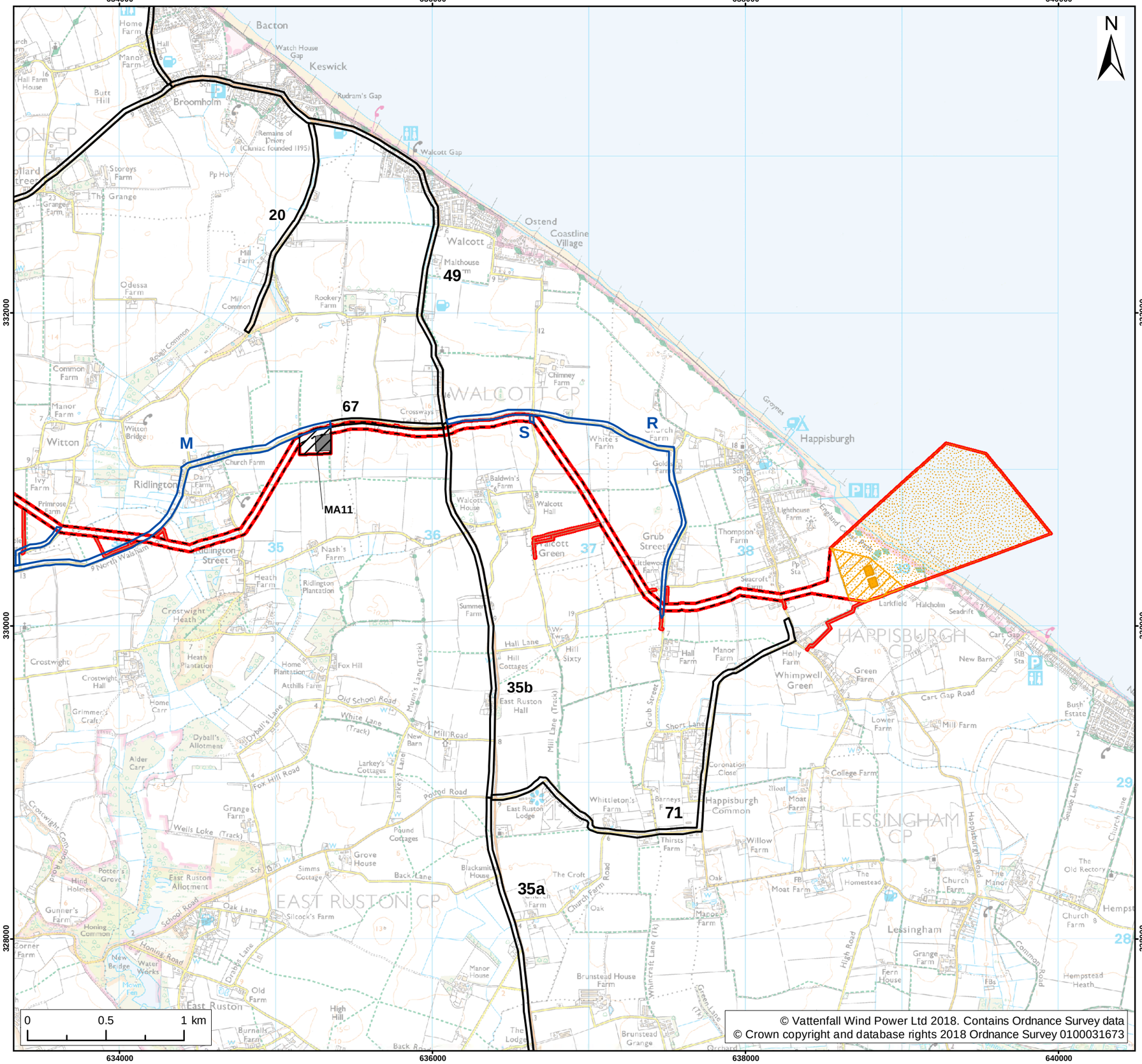
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	04/06/2018	LB	RE	A3	1:300,000

Co-ordinate system: British National Grid **EPSG:** 27700

VATTENFALL

Royal HaskoningDHV
Enhancing Society Together

0 5 10 km



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

Highway links

- Major highway links
- Minor highway links

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 1 of 9)

Figure: 5 | Drawing No: PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate System: British National Grid **EPSG:** 27700

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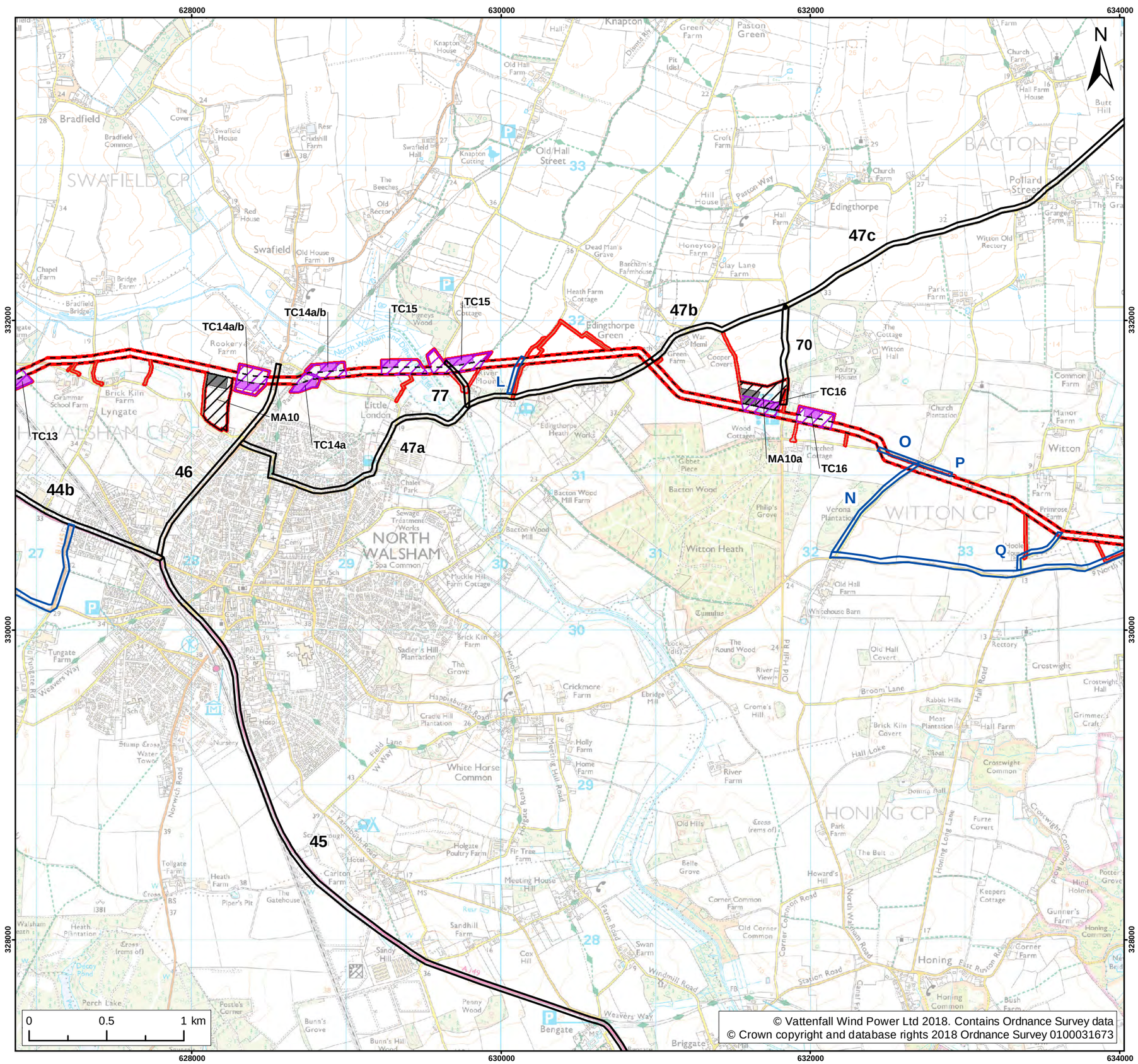

Legend:

- 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

Highway links

- Major highway links
- Minor highway links

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 2 of 9)

Figure: 5 | Drawing No: PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate System: British National Grid **EPSG:** 27700

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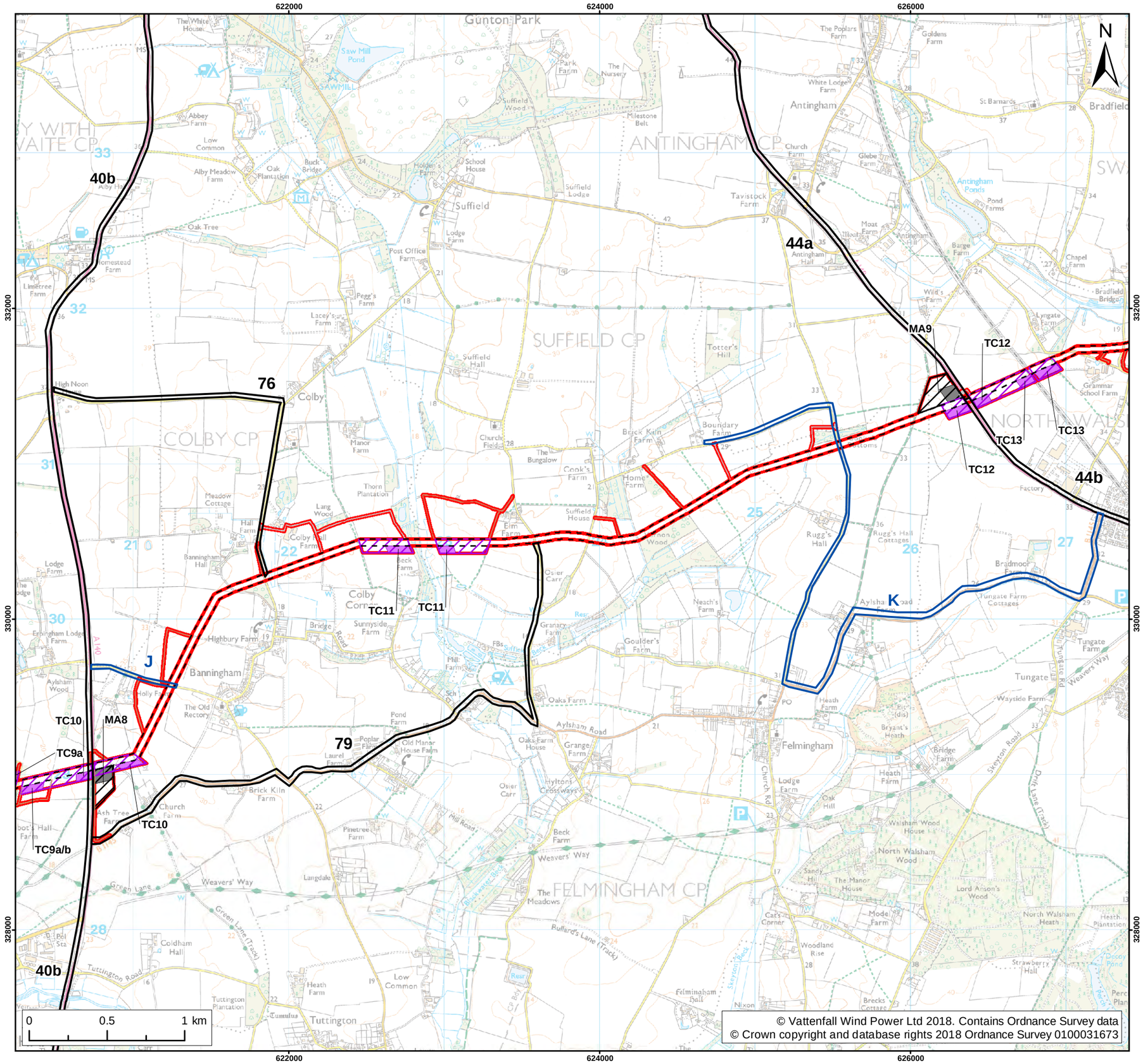

Legend:

- 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

Highway links

- Major highway links
- Minor highway links

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 3 of 9)

Figure:	Drawing No:
5	PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate System: British National Grid **EPSG:** 27700

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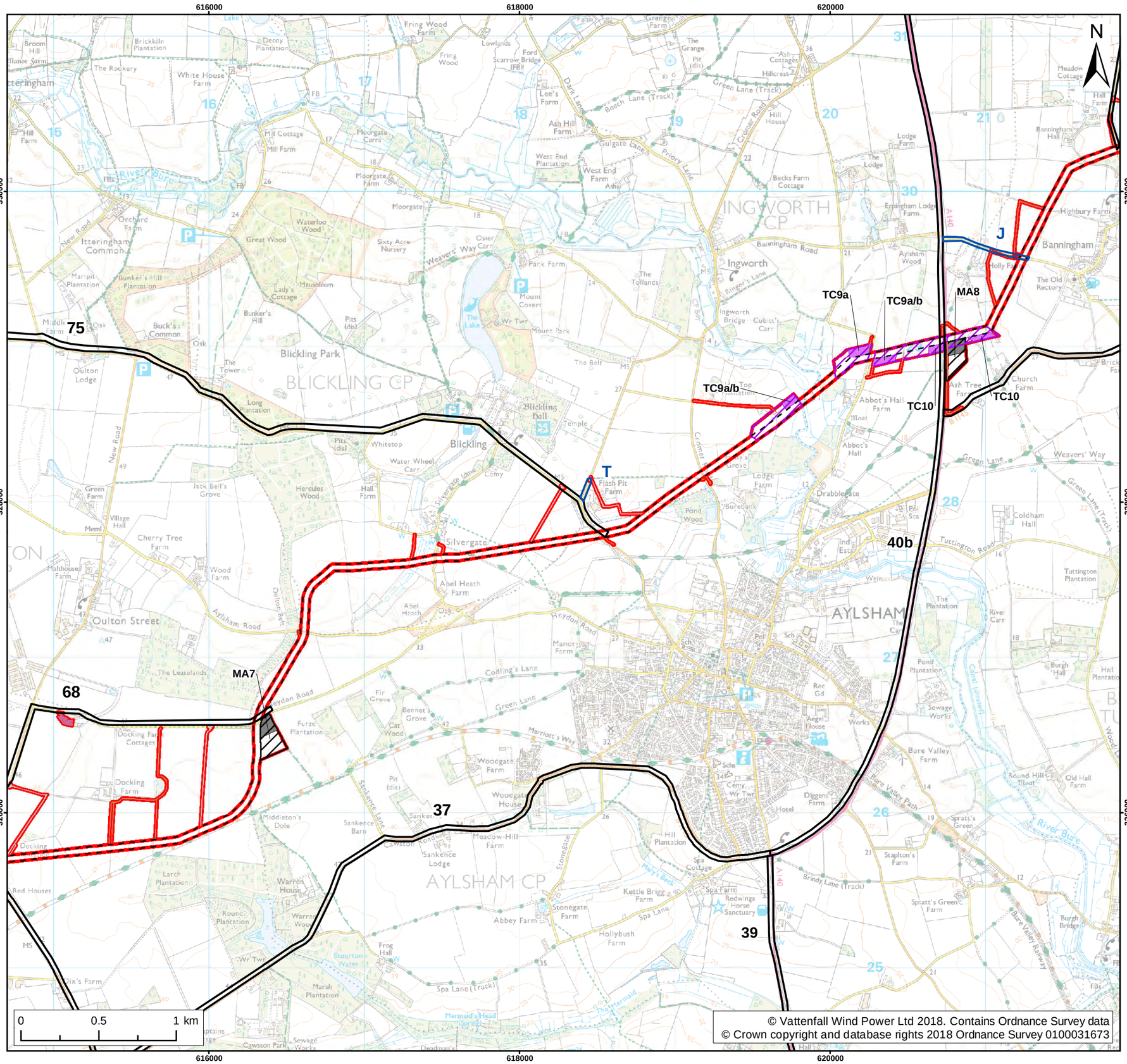

Legend:

- 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
- Cable logistics area

Access

- Construction access
- Operation access

Highway links

- Major highway links
- Minor highway links

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 4 of 9)

Figure: 5 | Drawing No: PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate System: British National Grid **EPSG:** 27700

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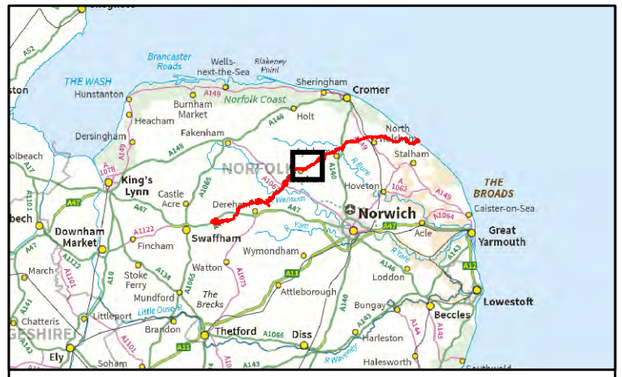
610000 612000 614000

326000 324000 322000

N

0 0.5 1 km



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

Highway links

- Major highway links
- Minor highway links

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 5 of 9)

Figure:	Drawing No:
5	PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate System: British National Grid **EPSG:** 27700

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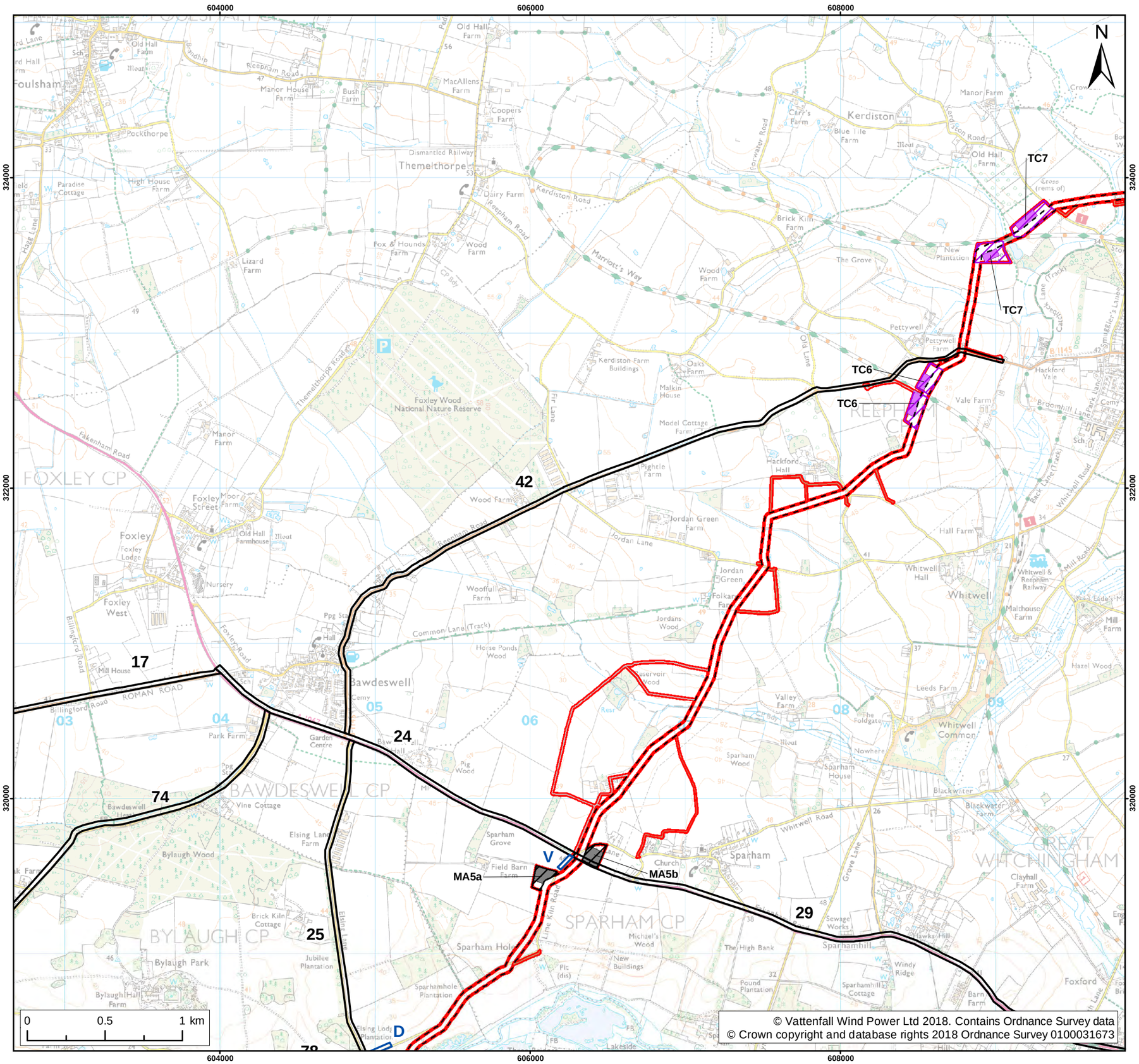

Legend:

- 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

Highway links

- Major highway links
- Minor highway links

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 6 of 9)

Figure:	Drawing No:				
5	PB4476-006-009-005				
Revision:	**Date:**	**Drawn:**	**Checked:**	**Size:**	**Scale:**
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate System: British National Grid **EPSG:** 27700

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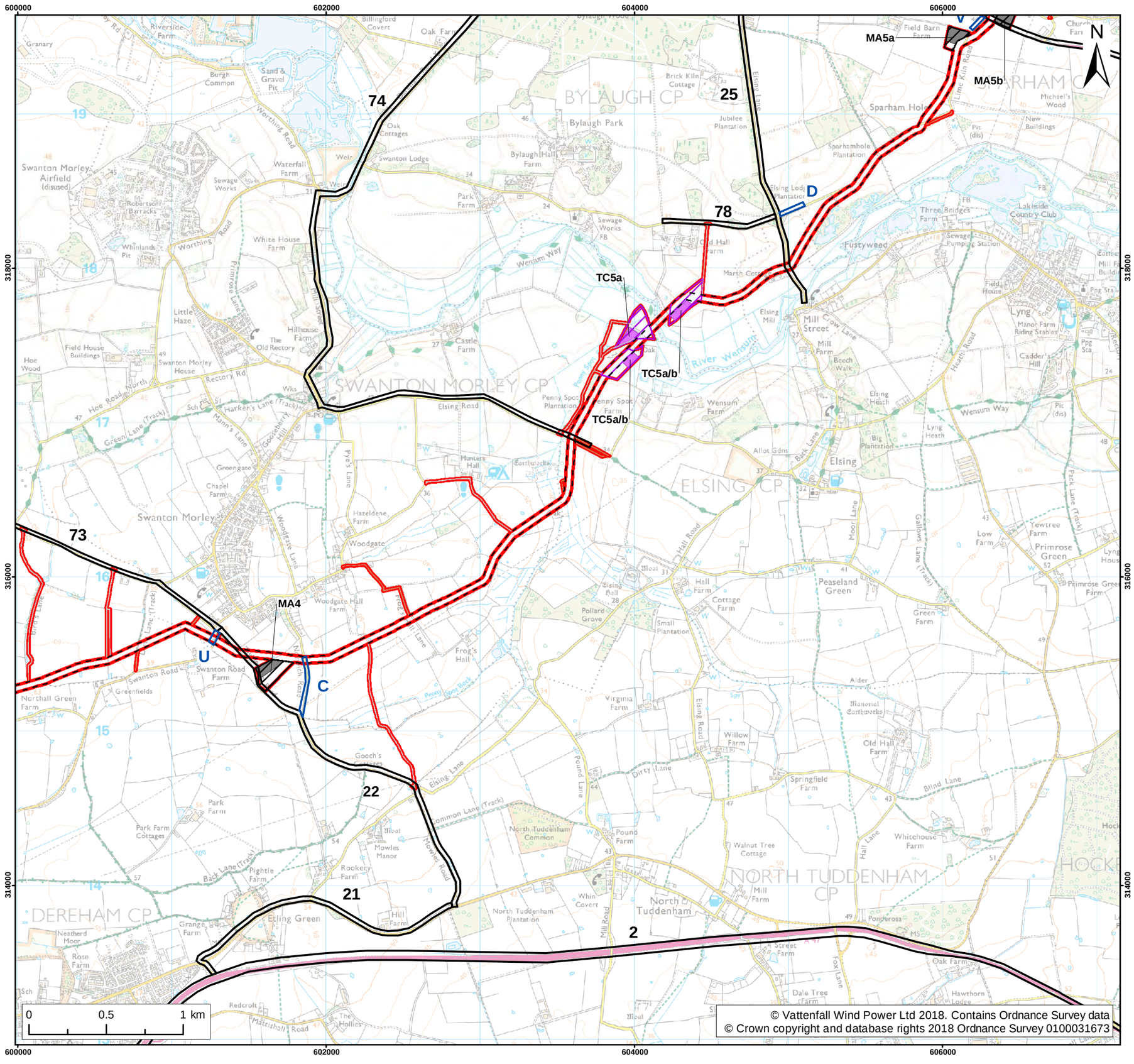

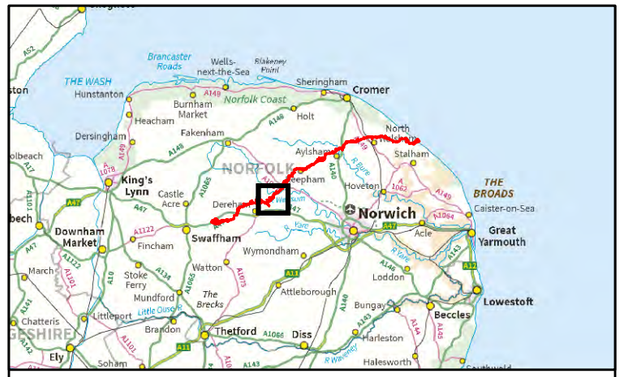

Legend:

- 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

Highway links

- Major highway links
- Minor highway links

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 7 of 9)

Figure:	Drawing No:
5	PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate System: British National Grid **EPSG:** 27700

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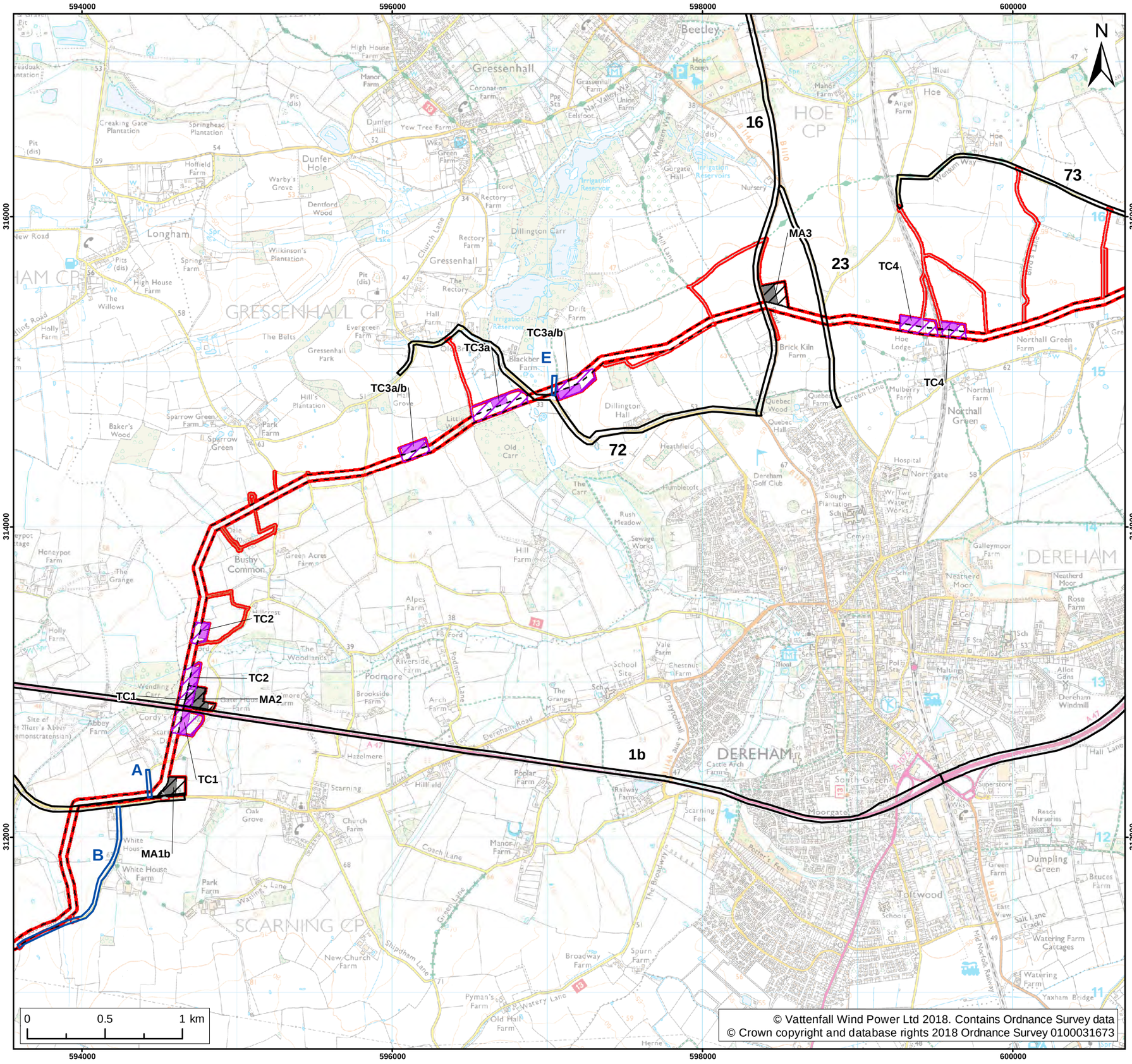

Legend:

- 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

Highway links

- Major highway links
- Minor highway links

Project: Norfolk Vanguard	Report: Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 8 of 9)

Figure: 5 | Drawing No: PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate System: British National Grid **EPSG:** 27700

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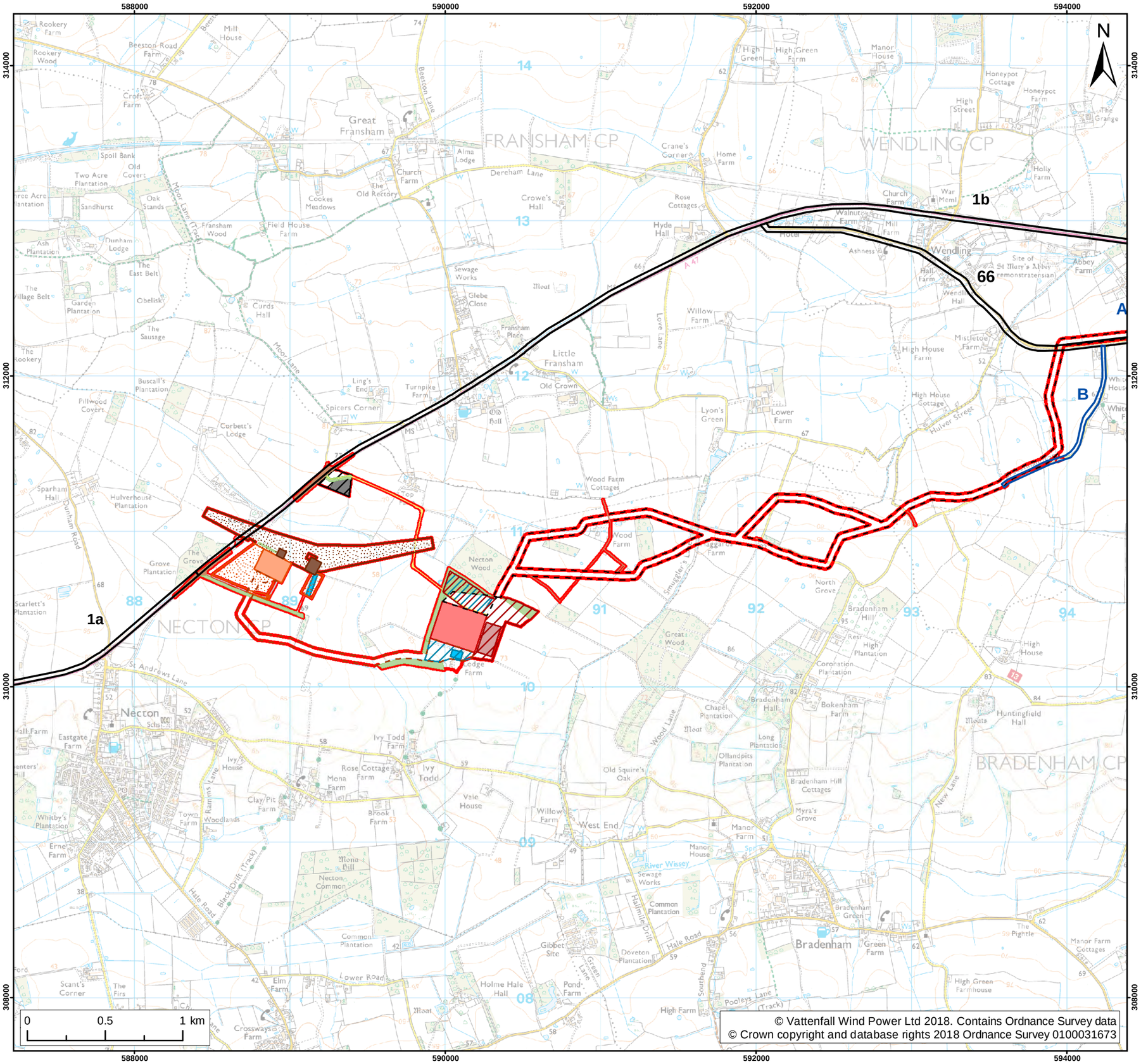

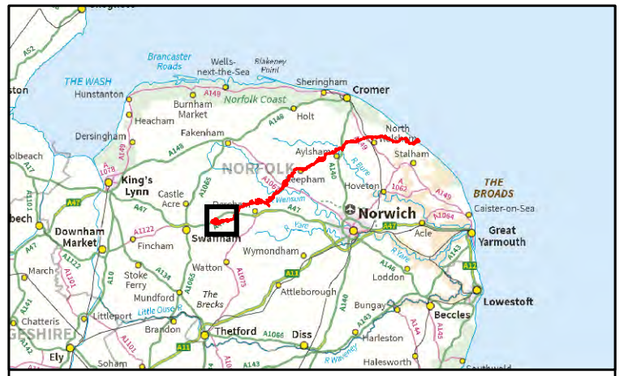

Legend:

- Norfolk Vanguard onshore red line boundary

Onshore cable route
- Onshore cable route
- Onshore 400kv cable route
- Mobilisation zone
- Indicative mobilisation area compound

Access
- Permanent access
- Construction access
- Operation access

Onshore project substation
- 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

Highway links
- Major highway links
- Minor highway links

Project:	Report:
Norfolk Vanguard	Outline Traffic Management Plan

Title: Highway Links (Stage 3) (map 9 of 9)

Figure: 5 | Drawing No: PB4476-006-009-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	04/06/2018	LB	RE	A3	1:25,000

Co-ordinate System: British National Grid **EPSG:** 27700

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1.11 Appendix 1: HGV DISTRIBUTION

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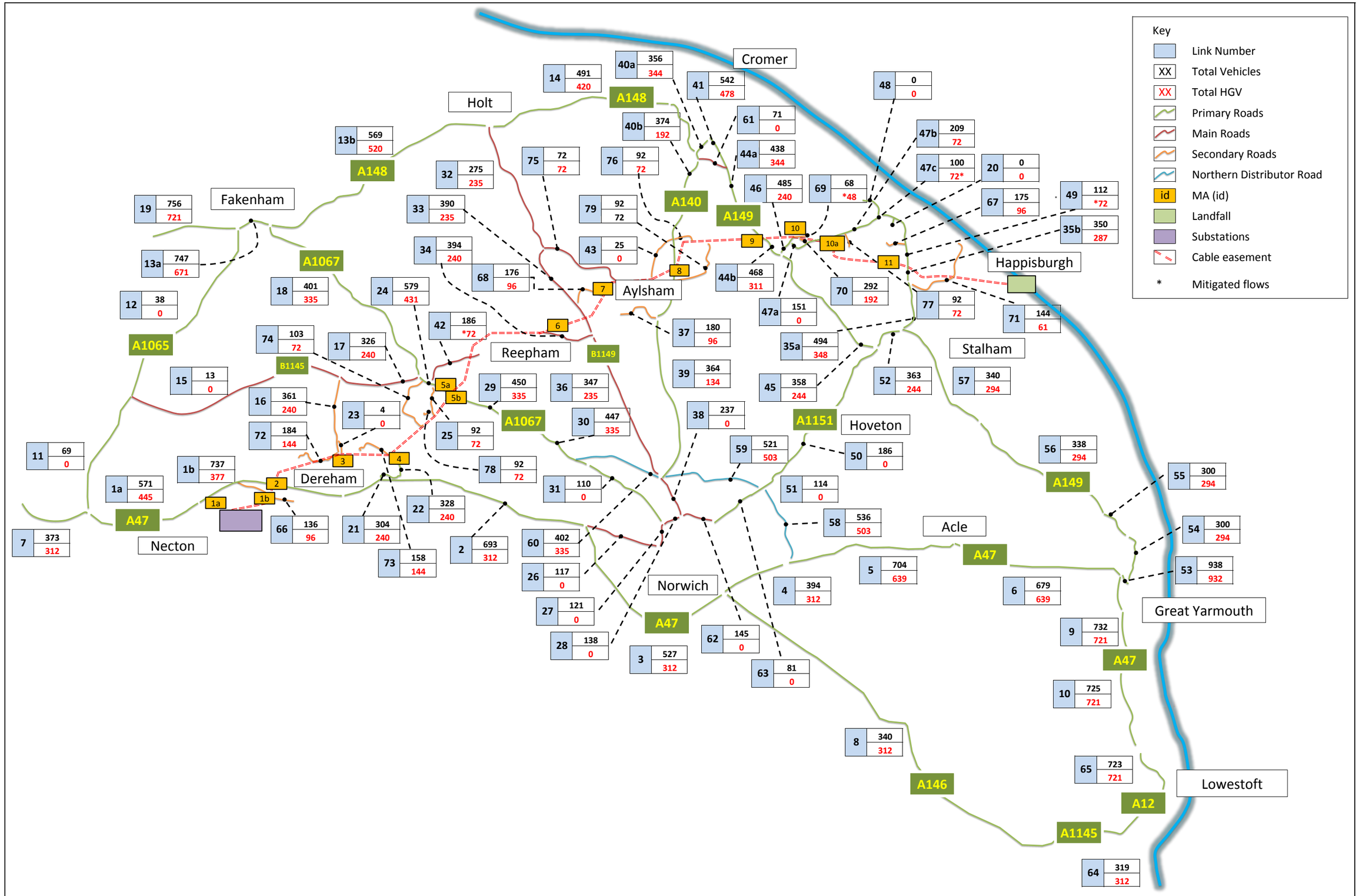

	Project Title Norfolk Vanguard Offshore Wind Farm	**Appendix Title** 2022 Development Flow Network Diagram	**Appendix No** 1
	Job Number PB4476 - DCO Document 8.8 - Traffic Management Plan	**Date** Jul-18	

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1.12 Appendix 2: ROUTE ACCESS STUDY

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EXPERTS IN MOTION

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EXPERTS IN MOTION

Route Access Survey – Revision 2
314597

Norfolk Vanguard
Off A47 near Necton, Norfolk

Royal HaskoningDHV

Report Produced: March 2018

Royal HaskoningDHV

Contents

Report Details

Report for
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Royal HaskoningDHV
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Peterborough
PE3 8DW

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Steven Mangham

Approved by
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Document Revisions

No	Date	Details
1	25/04/2018	Route B removed from report
2	25/04/2018	Updated to Client Comments

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Collett & Sons Ltd established in Halifax over 45 years ago specialise in the multimodal logistics throughout the UK, Europe and Worldwide.

Our Company owns a modern fleet of over 60 vehicles and over 100 trailers, operating from 3 depots located in Halifax, Goole and Grangemouth.

The depots situated in Google and Grangemouth offer strategically located sites suitable to provide central hubs for the distribution of abnormal load components throughout the UK. Each facility is complete with up to 110 tonnes lifting capacity in order to be able to handle different abnormal load types. As logistical partners to the Wind Energy Industry, the company is able to offer the complete transport solution from point of manufacture through to job site.

Collett & Sons Limited operate an in-house consultancy that deals with transport feasibility, route and site access surveys, Swept Path Analysis, Traffic Management Plans, Test Drives and Environment Statements.

In addition to consulting services, Collett & Sons Limited delivers the following services;

Marine
Port Operation
Heavy Lift Storage
Heavy Transport
Project Management
Freight Forwarding
Heavy Lift
General Haulage
Warehousing
Test Station (DVSA-authorised)
SHEQ Training

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1 Executive Summary

1.1. One route has been assessed for the transportation of a 200Te Transformer from the Kings Lynn Port to proposed Norfolk Vanguard Site. The Route has been detailed along the A47 to site.

1.2. The start location within the Port of Kings Lynn has been chosen due to previous information regarding the heavy load quay within the dock.

Third party land

1.3. No third party land has been identified by the assessment.

Road widening

1.4. No road widening has been identified by the assessment.

Modifications to street furniture

1.5. Street furniture removal will be required at a number of locations along the route and have been detailed where required.

Manual Steering

1.6. Due to the vehicle configuration, manual steering will be utilised at numerous locations along the routes including roundabouts.

Vertical Alignment

1.7. There is an overhead bridge along Route A on the A47. Clarification of the bridge clearance height has been sought from the relevant authorities and the response has indicated a clearance of 5.18m critical. Additional clearance checks to be undertaken prior to any movements.

Structural Assessment

1.8. The relevant authorities who own or manage the structures on the route have been consulted regarding any potential issues along the proposed route. No negative responses have been received at time of issue although Kier Group, who manages the A47, would not comment without a formal BE16 being applied for.

Other areas of note

1.9. There are numerous overhead cables along both routes. Once the final loaded configuration and dimensions are finalised, the utilities services should be contacted regarding their cable heights. It may be that some cables will have to be removed or a specialist team join the delivery convoy to raise the cables, where required.

1.10. Tree pruning will be required along the route to ensure a suitable clearance is available for the load.

2. Introduction

2.1 Collett & Sons Ltd. were commissioned by Royal Haskoning DHV (RHDHV) to undertake an abnormal loads route access study to assess the transportation of a 200Te Transformer to the Norfolk Vanguard Site, off A47 near Necton, Norfolk (the site).

2.2 The site is located off the A47 near Necton, Norfolk. The purpose of this report is to detail access to the entrance of Norfolk Vanguard site from Kings Lynn Harbour.

Methodology

2.3 An initial desk based study was undertaken to identify possible loading configurations for the component (details confirmed by RHDHV).

2.4 The route surveyed in this report has been identified by Collett.

2.5 A site visit was then carried out to determine the feasibility of the identified routes and pinch points.

2.6 Following the site visit, Swept Path Analysis (SPA) was then carried out at the identified pinch points. The SPA's are detailed in this report, and indicate any areas of road widening or land take that are required.

2.7 All drawings are produced using Ordnance Survey 'OS MasterMap' mapping data, unless stated otherwise. Street furniture is not included on OS MasterMap data; this is plotted by taking measurements on site with a tape. Actual road widths are also checked and adjusted on the map data accordingly. Where adjustments to the OS MasterMap data have been made this is indicated as 'adjusted' on the drawing.

2.8 The analysis is based on the most onerous components when loaded on delivery vehicles.

2.9 The trailers used to transport the component modular. Manual Steering indicates that the steering of the axles is controlled by an operative using an override devise. Manual Steering can be used to achieve alternative swept areas where appropriate.

2.10 Upon selection of the route, the relevant authorities were contacted with regard to the structural suitability of the delivery route for the heaviest loaded vehicle.

2.11 Details pertaining to the highway boundary have not been obtained from the County Council, thus in order to determine the impact on third party land it has been assumed that fence lines, walls and hedgerows define this boundary.

2.12 In addition, the report is supplemented by photographic evidence, map referencing and CAD drawings of the 'pinch points' for the proposed routes.

3. Components

3.1. RHDHV have requested that the assessment on which this report is compiled be based on the delivery of a 200Te Transformer.

3.2. The transformer specification was supplied by RHDHV.

4. Abnormal Indivisible Load Profiles

4.1. The abnormal loads are assessed based on weight, length, width and height and loaded to the most appropriate vehicle, the weights and dimensions of these are detailed below. The loading diagrams are detailed in APPENDIX 1.

4.2.	314597-A
200te Transformer	
	Loaded vehicle dimensions
Overall vehicle Length	66.06m
Rigid Length	27.04m
Width	4.929m
Height	5.10
G.V.W excluding tractor units	332.86Te

5. Requirements for the movement of Abnormal Indivisible Loads

5.1. An abnormal load is defined as below (including the actions required for permitting and notice).

Weight

5.2. Gross weight or axle weights exceeding C & U or Authorised Weight limits up to 80,000kgs (78.74 tons).

5.3. ***Action required:*** 2 clear days' notice with indemnity to Highway and Bridge Authorities.

5.4. Gross weight (of vehicle carrying the load) exceeding 80,000kgs (78.74tons) up to 150,000kgs (147.63tons).

5.5. ***Action required:*** 2 clear days' notice to Police and 5 clear days' notice with indemnity to Highway and Bridge Authorities.

5.6. Gross weight (of vehicle carrying the load) exceeding 150,000kgs (147.63tons).

5.7. ***Action required:*** HA Special Order (form BE16), up to 8 weeks approval time, plus 5 clear days' notice to Police and 5 clear days' notice with indemnity to Highway and Bridge Authorities.

Width

5.8. Width exceeding 2.9 metres (for C & U loads) 3.0 metres (9' 10") up to 5.0 metres (16' 5") for other loads

5.9. ***Action required:*** 2 clear days' notice to the Police.

5.10. Width exceeding 5.0 metres (16' 5") up to 6.1metres (20')

5.11. ***Action required:*** HA form VR1 plus 2 clear days' notice to Police.

5.12. Width exceeding 6.1 metres (20')

5.13. ***Action required:*** HA Special Order (form BE16), up to 8 weeks approval time, plus 5 clear days' notice to Police and 5 clear days' notice with indemnity to Highway and Bridge Authorities.

Length

5.14. When exceeding 18.65 metres (61' 2") up to 30 metres (98' 5") rigid length - (Vehicle or train of vehicles)

5.15. ***Action required***: 2 clear days' notice to the Police.

5.16. Vehicle combination exceeding 25.9 metres (85').

5.17. ***Action required:*** 2 clear days' notice to the Police.

5.18. When exceeding 30.0 metres (98' 5") rigid length.

5.19. ***Action required:*** HA Special Order (form BE 16), up to 8 weeks approval time, plus 5 clear days' notice to Police and 5 clear days' notice with indemnity to Highway and Bridge Authorities.

Bridge Height

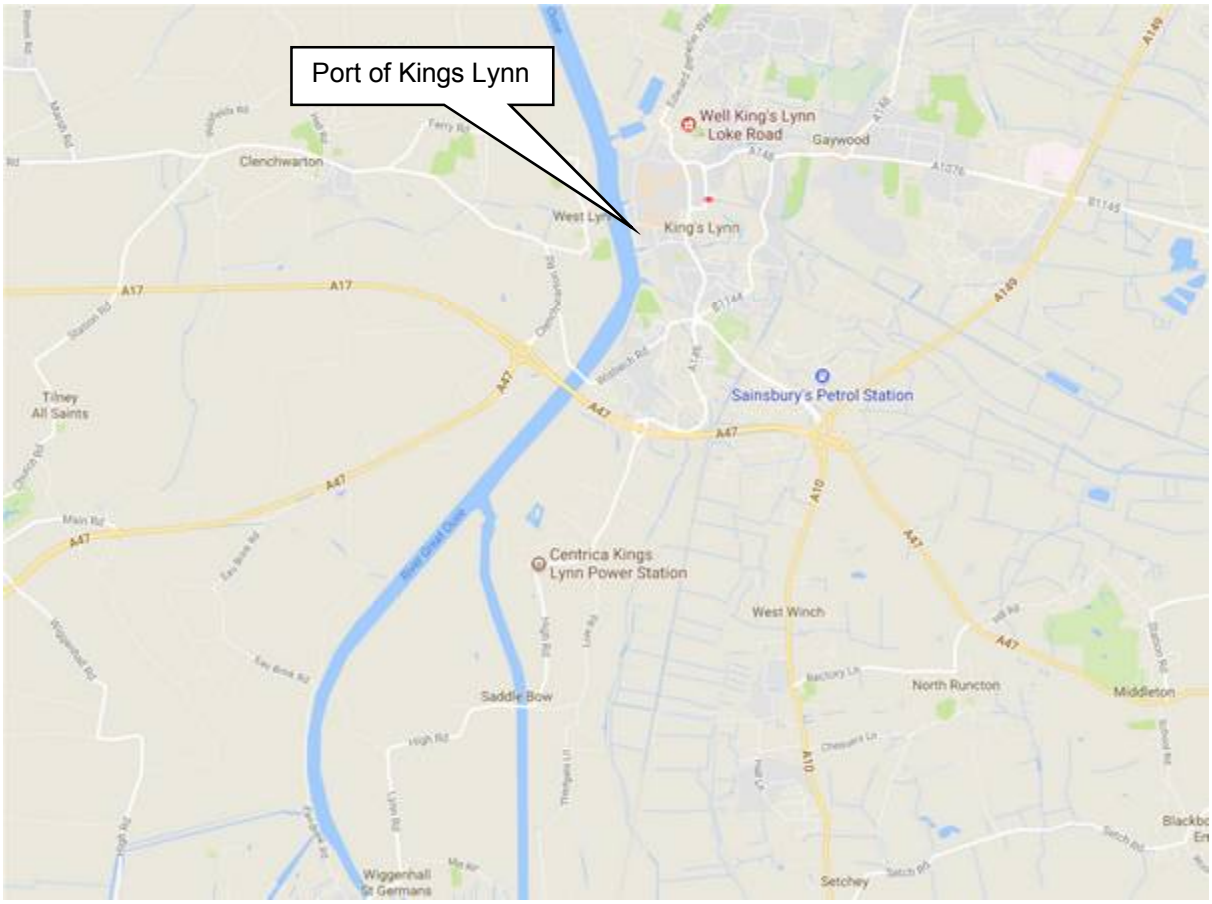
5.20. Any low bridges along the route that have a clearance less than 5.0m will be signed as a low bridge. This threshold could create difficulties in the passage of over-height or near over-height vehicles.

Abnormal Load Requirements

5.21. For the specified abnormal load, the following actions will be required for the delivery vehicle.

5.22.	**314597-A**	**Action Required**
	200te Transformer	HA Special Order (form BE16), up to 8 weeks approval time, plus 5 clear days notice to Police and 5 clear days notice with indemnity to Highways and Bridge Authorities.

6. Port Information



Kings Lynn

6.1. The Port of King's Lynn is located on the Wash on the UK's east coast. Trunk roads connect the port to Cambridge, where the M11 leads down to the M25 and east to Leicester and the M1.

Table of normal acceptance dimensions of vessels

			Normal acceptance dimensions of vessels			
Dock, Jetty or quay	**Quay Length**	**Depth of water**	**Length**	**Beam**	**Draught**	**Approx. dwt**
Alexandra Dock	350m	5.3m	119m	13.85m	5.5m	4,000
Bentinck Dock	800m	5.3m	119m	13.85	5.5m	4,000
Riverside Quay	220m	Tidal	140m	20.0m	6.0m	5,500

Alexandra Dock

7. Responses from Statutory Consultees (Structures Suitability)

7.1. The loading information for this transformer configuration has been sent to the relevant authorities to ascertain if there are any issues with weights and structures within the areas of the Authorities jurisdiction – Details of the authorities can be found below.

7.2. For the purposes of the responses below, the routes referred to are as follows

Route:
• Exit Kings Lynn Harbour onto Edward Benefer Way, • Continue on Edward Benerfer Way to merge onto Grimston Road A148. • Continue on A148 to roundabout junction with A149 Queen Elizabeth Way, • At roundabout turn right onto A149 Queen Elizabeth Way, • Continue on A149 through 2 roundabouts to roundabout junction with A47, • At roundabout turn left onto A47, • At roundabout turn left onto A47, • At roundabout, continue on A47, • At roundabout continue on A47, Continue on A47 to proposed site entrance on the right hand side at approx. OS Grid refs: TF 89245 11382.

7.3. The following summarises the correspondence between the relevant authorities. The detailed responses can be viewed in APPENDIX 3.

County Council Highways	**Issues?**	**Contact Name**	**Email Address**	**Phone Number**
Norfolk Council	No	Mark North	Pandt.bridges@norfolk.gov.uk	01603 223804
Area 6	No Comment	John Hughes	John.Hughes@kier.co.uk	01223 255255
Network Rail	No	Katie Nicholson	Katie.Nicholson@networkrail.co.uk	01908 783 140
Historic Railways Estate	No	Tania Howell	Tania.Howell@jacobs.com	0118 946 8911
Canal and river trust	Not responded	N/A	abnormal.loads@canalrivertrust.org.uk	0113 2005759

Summary of Structural Issues

7.4. At the time of issue, Canal and River Trust have yet to respond and Area 6 could not comment without a formal BE16 application. Responses from the other authorities in the table above have not highlighted any structural issues.

8. Route Assessment

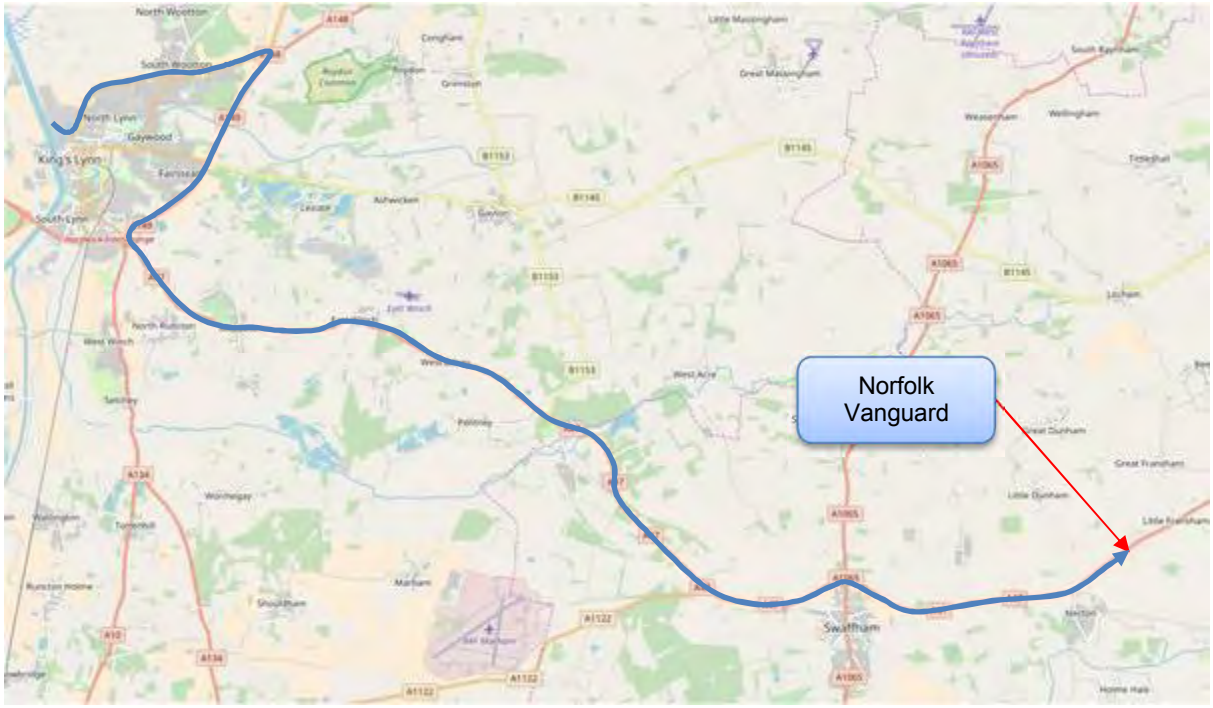
8.1. This section of the report illustrates in detail the pinch points and routes for the delivery of all abnormal load components from Kings Lynn Harbour to Norfolk Vanguard.

8.2. *Route*

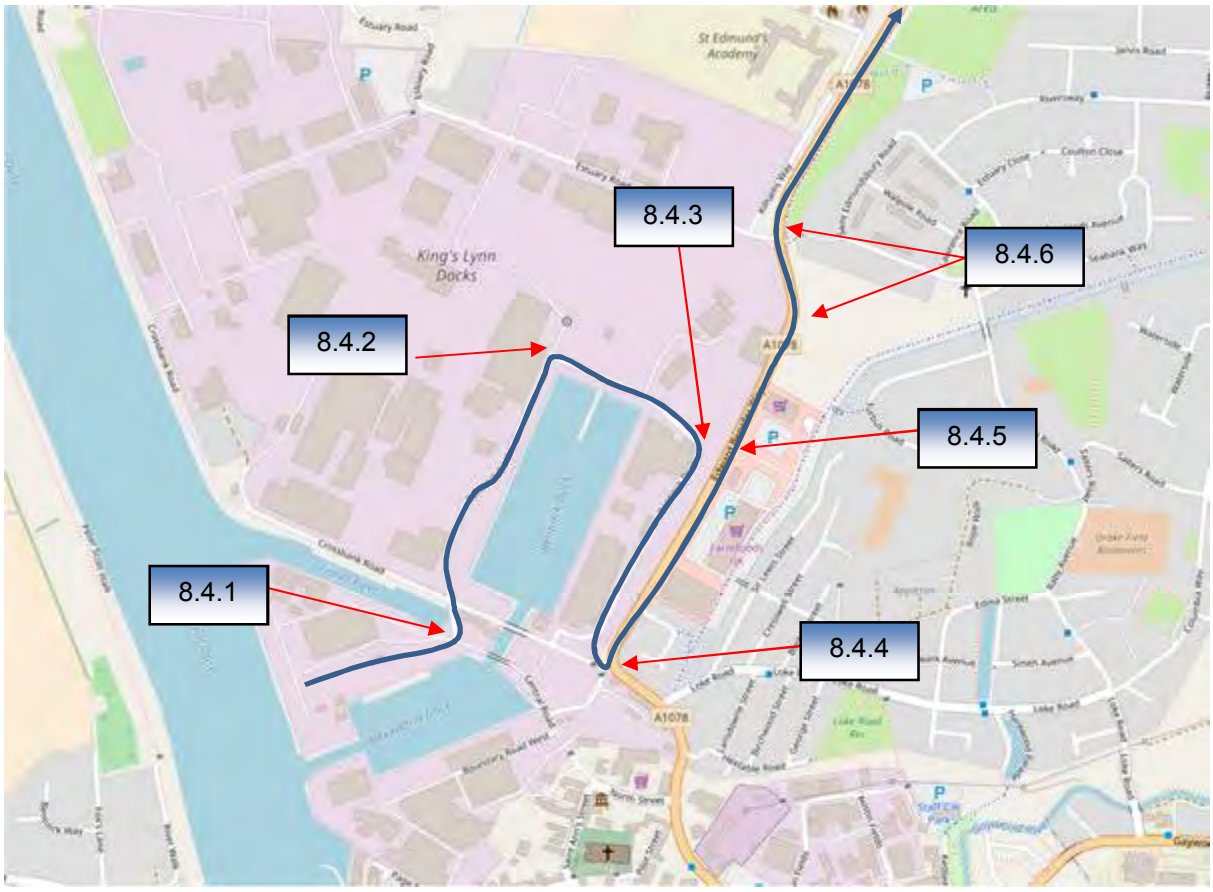
Start Location	Kings Lynn Harbour	Distance of Route	Km	Miles
Via:	A149/A47		34.1	21.2

- Exit Kings Lynn Harbour onto Edward Benefer Way,
- Continue on Edward Benerfer Way to merge onto Grimston Road A148.
- Continue on A148 to roundabout junction with A149 Queen Elizabeth Way,
- At roundabout turn right onto A149 Queen Elizabeth Way,
- Continue on A149 through 2 roundabouts to roundabout junction with A47,
- At roundabout turn left onto A47,
- At roundabout, turn left onto A47,
- At roundabout, continue on A47,
- At roundabout, continue on A47,
- Continue on A47 to site entrance on the right hand side at approx. OS Grid ref: TF 89275 11404.

8.3. Map Overview



8.4. *Map Extract*



KEY – Colour coding of modification requirements					
	Indicates major modifications are required i.e. Road widening, street furniture etc.		Indicates manoeuvre or minor modifications i.e. contraflow manoeuvre.		No modifications required.

8.4.1.1. – Aerial View of Location

8.4.1.2. – View prior to junction

8.4.1.3. – View at crossing

8.4.1.4. – View after crossing

Description:	From the Heavy Lift Quay turn left within the dock to avoid the bridges.		
Distance from previous Pinch Point	N/A	Distance to following Pinch Point	0.25km

	Modification required	Reason for Modification	Additional Information:
	Manual steering required	To assist navigation	Loaded vehicle will navigate this location without any issues.

Item No:	Title	OS Grid Ref:	TF 61628 20743
8.4.1	Exit form he Quay	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.4.2.1. – Aerial View of Location

8.4.2.2. – View prior to bend

8.4.2.3. – View at crossing

8.4.2.4. – Reverse view of bend

Description:	Continue through the port to 90° right hand bend.

Distance from previous Pinch Point	0.25km	Distance to following Pinch Point	0.05km

	Modification required	Reason for Modification	Additional Information:
	Street furniture/Manual steering	To provide clear envelope	Street furniture to be cleared on inside of bend to allow navigation.

Item No:	Title	OS Grid Ref:	TF 61756 21132
8.4.2	90° Right hand bend within the port	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.4.3.1. – Aerial View of Location

8.4.3.2. – View prior to bend

8.4.3.3. – View after bend

Description:	Continue through the port to 90 right hand bend.

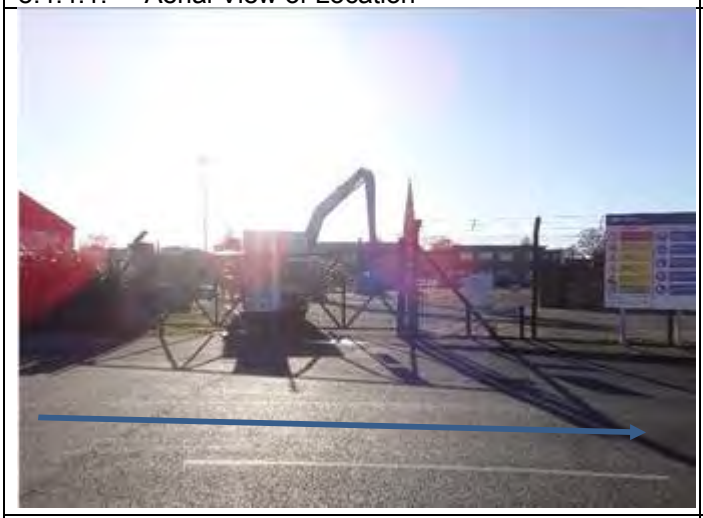
Distance from previous Pinch Point	0.5km	Distance to following Pinch Point	0.25km

	Modification required	Reason for Modification	Additional Information:
	Street furniture/Manual steering	To provide clear envelope	Area around bend required to be cleared.

Item No:	Title	OS Grid Ref:	TF 61962 21018
8.4.3	Right hand bend within the port	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.4.4.1. – Aerial View of Location

8.4.4.2. – Port Exit



8.4.4.3. – Reverse back past Gatehouse

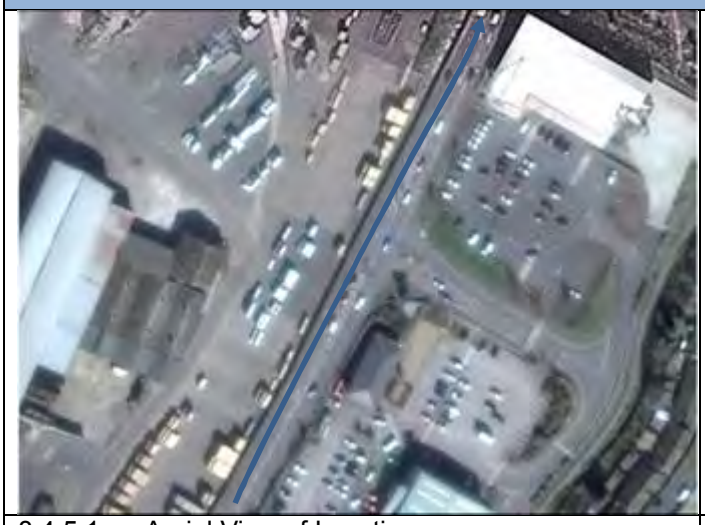
8.4.4.4. – Left turn onto Edward Benefer Way

Description:	Continue to port exit to junction with Edwards Benefer Way. At junction preform a 3 point turning manoeuvre to travel north on Edwards Benefer Way.

Distance from previous Pinch Point	0.25km	Distance to following Pinch Point	0.35km

	Modification required	Reason for Modification	Additional Information:
	Reverse manoeuvre and manual steering required	To exit the port	Loaded vehicle to turn left out of exit gate, reverse back past gate house and then turn left onto Edwards Benefer Way.

Item No:	Title	OS Grid Ref:	TF 61842 20712
8.4.4	Port exit	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-100A1.1



8.4.5.1. – Aerial View of Location

8.4.5.2. – View of splitter island

8.4.5.3. – View on junction

8.4.5.4. – View on junction

Description:	Continue on Edwards Benefer Way through junction with St Nicholas Retailer Park. At junction continue on Edwards Benefer Way

Distance from previous Pinch Point	0.35km	Distance to following Pinch Point	0.30km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at this location	Loaded vehicle will navigate past these splitter islands without any issues.

Item No:	Title	OS Grid Ref:	TF 62008 21014
8.4.5	Edwards Benefer Way junction with Retail Park	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.4.6.1. – Aerial View of Location

8.4.6.2. – View on left hand bend

8.4.6.3. – View on junction

8.4.6.4. – View on junction

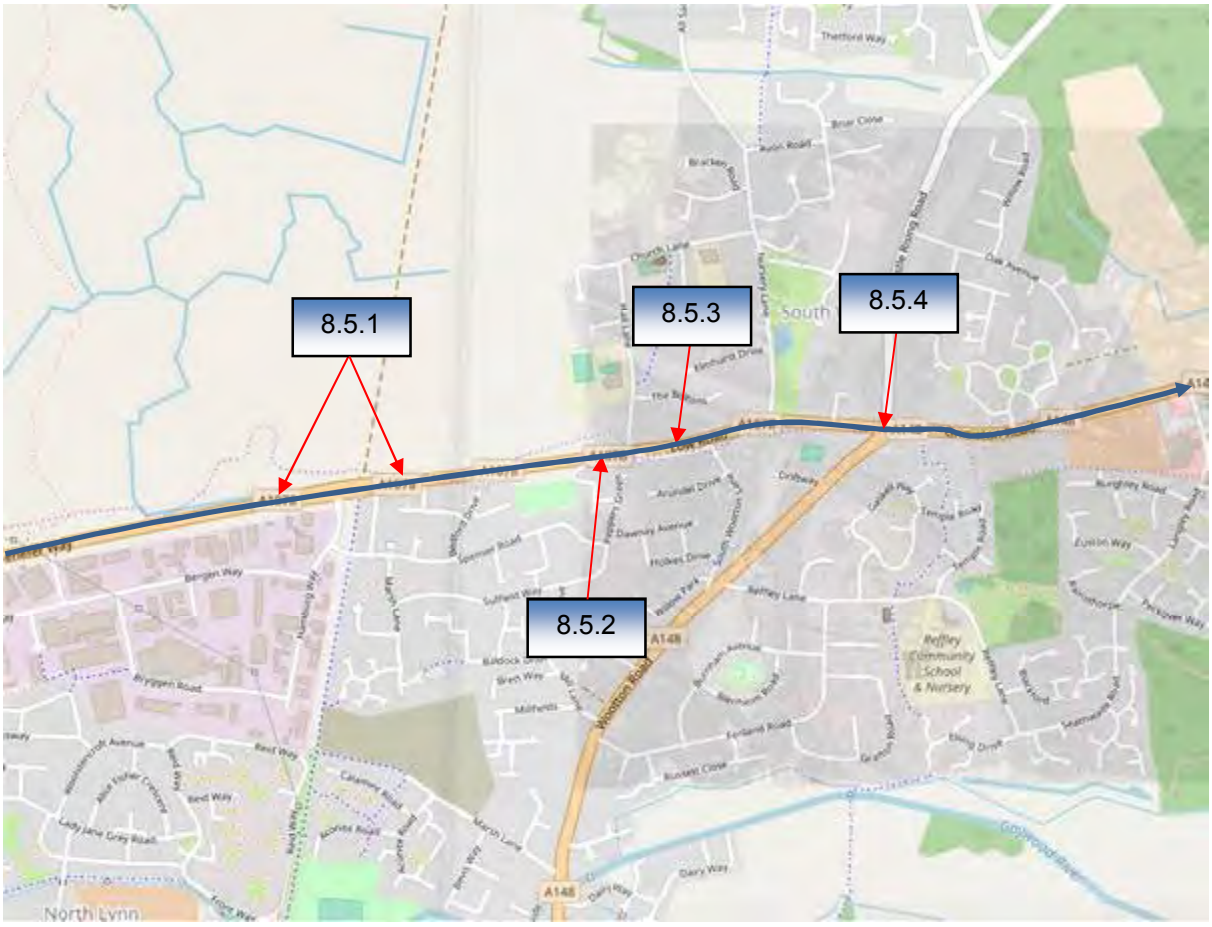
Description:	Continue on Edwards Benefer Way through junction with Estuary Road. At junction continue on Edwards Benefer Way.

Distance from previous Pinch Point	0.30km	Distance to following Pinch Point	1.50km

	Modification required	Reason for Modification	Additional Information:
	Modifications to street furniture required	To provide clear envelope	All street furniture on splitter islands to be removed.

Item No:	Title	OS Grid Ref:	TF 62054 21308
8.4.5	Edwards Benefer Way junction with Estuary Road	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.5. **Map Extract**



8.5.1.1. – Aerial View of Location

8.5.1.2. – View on left hand bend

8.5.1.3. – View on junction

8.5.1.4. – View on junction

Description:	Continue on Edwards Benefer Way through junction with Hamburg way. At junction continue on Edwards Benefer Way.

Distance from previous Pinch Point	1.50km	Distance to following Pinch Point	0.40km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	Loaded vehicle will navigate this location without any issues.

Item No:	Title	OS Grid Ref:	TF 63321 22213
8.5.1	Splitter islands at junction of Hamburg Way	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.5.2.1. – Aerial View of Location

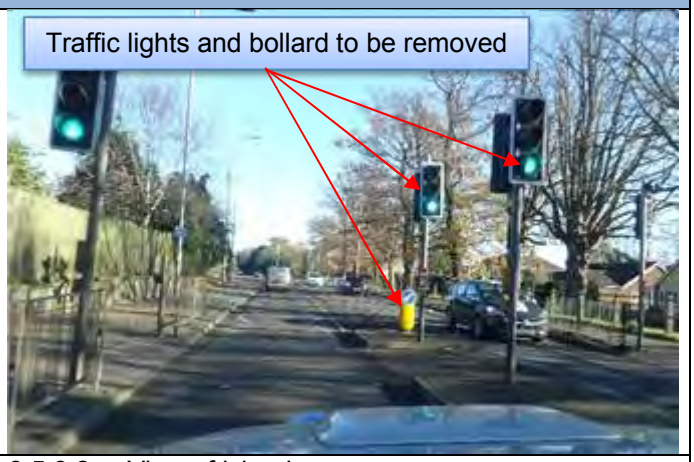
8.5.2.2. – View of island

Description:	Continue on Edwards Benefer Way.		
Distance from previous Pinch Point	0.40km	Distance to following Pinch Point	0.19km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	Loaded vehicle will navigate this location without any issues.

Item No:	Title	OS Grid Ref:	TF 63954 22324
8.5.2	Splitter islands at junction of Hall Way	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.5.3.1. – Aerial View of Location

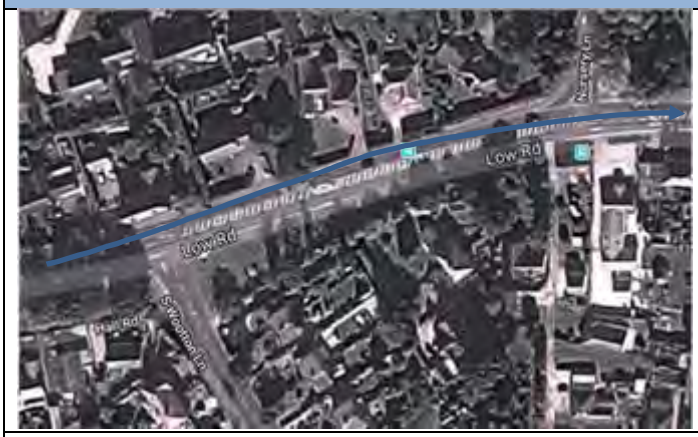


8.5.3.2. – View of island

Description:	Continue on Edwards Benefer Way.		
Distance from previous Pinch Point	0.19km	Distance to following Pinch Point	0.19km

	Modification required	Reason for Modification	Additional Information:
	Modifications to street furniture required	To provide clear envelope	Splitter island to be cleared of street furniture.

Item No:	Title	OS Grid Ref:	TF 64045 22334
8.5.3	Splitter islands after junction of Hall Way	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

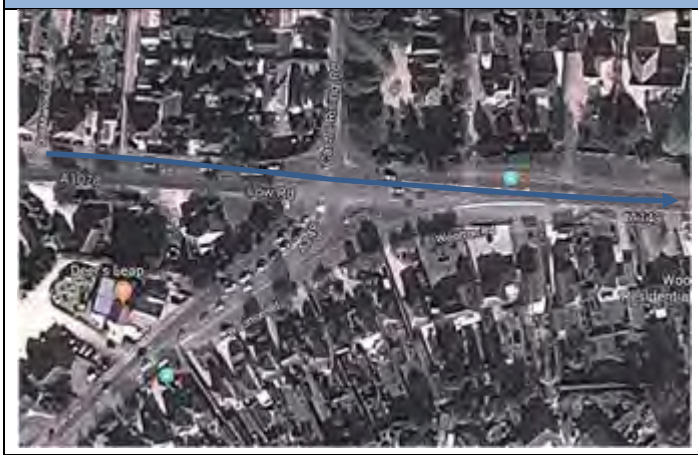


8.5.4.1. – Aerial View of Location	8.5.4.2. – View of island 3

Description:	Continue on Edwards Benefer Way.		
Distance from previous Pinch Point	0.19km	Distance to following Pinch Point	0.35km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	Loaded vehicle will navigate this location without any issues.

Item No:	Title	OS Grid Ref:	TF 64342 22397
8.5.4	Splitter island at junction of Nursery Way	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A



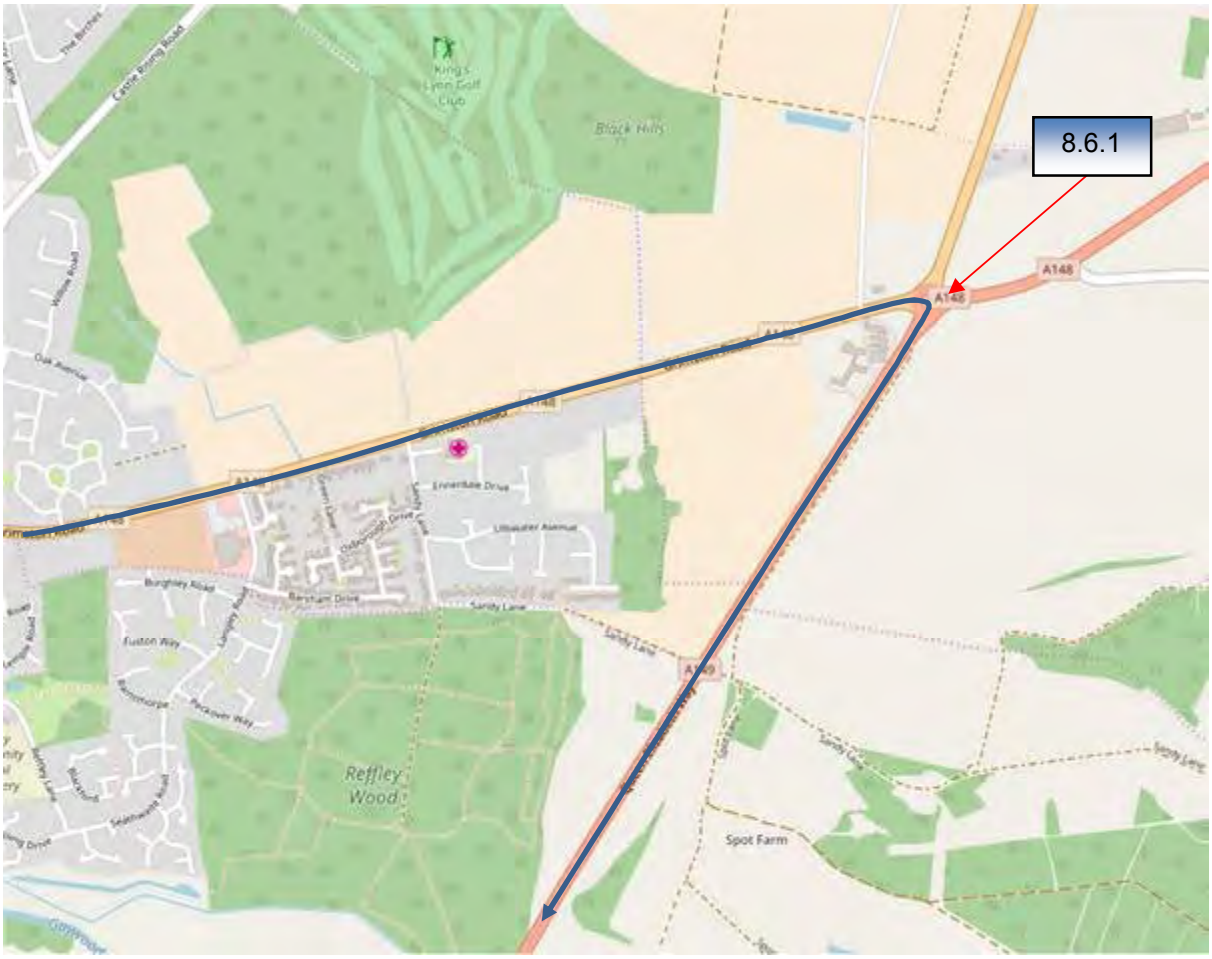
8.5.5.1. – Aerial View of Location	8.5.5.2. – View of island

Description:	Continue on Edwards Benefer Way to junction with A148. At junction continue onto A148.		
Distance from previous Pinch Point	0.35km	Distance to following Pinch Point	2.30km

Load:	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	Loaded vehicle will navigate this location without any issues.

Item No:	Title	OS Grid Ref:	TF 66758 22973
8.5.5	Splitter islands at junction of A148	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.6. **Map Extract**



8.6.1.1. – Aerial View of Location

8.6.1.2. – View on prior to roundabout

8.6.1.3. – View on roundabout

8.6.1.4. – View on junction

Description:	Continue on A148 to roundabout junction with A149. At roundabout turn right onto A149.

Distance from previous Pinch Point	2.30km	Distance to following Pinch Point	3.00km

Load:	Modification required	Reason for Modification	Additional Information:
	Contraflow manoeuvre required	To allow navigation	A contra flow manoeuvre is required at this roundabout in order to navigate this roundabout.

Item No:	Title		
8.6.1	A148 roundabout junction with A149	OS Grid Ref:	TF 66767 22985
		Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-120A1.1

8.7. **Map Extract**

8.7.1.1. – Aerial View of Location

8.7.1.2. – View on prior to roundabout

8.7.1.3. – View on roundabout

8.7.1.4. – View of exit of roundabout

Description:	Continue on A149 to roundabout junction with A1076. At roundabout continue on A149.

Distance from previous Pinch Point	3.00km	Distance to following Pinch Point	2.00km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	No issues at this roundabout.

Item No:	Title	OS Grid Ref:	TF 65346 20197
8.7.1	A149 roundabout junction with A1076	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-130A1.1

8.7.2.1. – Aerial View of Location

8.7.2.2. – View of entrance to roundabout

8.7.2.3. – View on roundabout

8.7.2.4. – View of exit of roundabout

Description:	Continue on A149 to roundabout junction with Sainsbury's. At roundabout continue on A149.

Distance from previous Pinch Point	2.00km	Distance to following Pinch Point	1.00km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	No issues at this roundabout.

Item No:	Title		
8.7.2	A149 roundabout junction with Sainsbury's.	OS Grid Ref:	TF 63970 18745
		Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-140A1.1

8.7.3.1. – Aerial View of Location

8.7.3.2. – View of entrance to roundabout

8.7.3.3. – View on exit of roundabout

8.7.3.4. – View after roundabout exit

Description:	Continue on A149 to roundabout junction with A47. At roundabout turn right onto A47.

Distance from previous Pinch Point	1.00km	Distance to following Pinch Point	0.90km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	No issues at this roundabout.

Item No:	Title	OS Grid Ref:	TF 63297 18102
8.7.3	A149 roundabout junction with A47	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-150A1.1

8.7.3.1. – Aerial View of Location

8.7.3.2. – View of entrance to roundabout

8.7.3.3. – View on roundabout

8.7.3.4. – View of exit of roundabout

Description:	Continue on A47 to roundabout junction with A47. At roundabout turn left onto A47.

Distance from previous Pinch Point	0.90km	Distance to following Pinch Point	18.30km

Load:	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	No issues at this roundabout.

Item No:	Title		
8.7.4	A47 roundabout	OS Grid Ref:	TF 63500 18057
		Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-160A1.1

8.8. **Map Extract**

8.8.1.1. – Aerial View of Location

8.8.1.2. – View of entrance to roundabout

8.8.1.3. – View on roundabout

8.8.1.4. – View of exit of roundabout

Description:	Continue on A47 to roundabout junction with A1122. At roundabout, continue straight on A47.

Distance from previous Pinch Point	18.30km	Distance to following Pinch Point	3.00km

Load:	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at location	No issues at this roundabout.

Item No:	Title	OS Grid Ref:	TF 78322 09905
8.8.1	A47/A1122 roundabout	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-170A1.1

	
8.8.2.1. – Aerial View of Location	8.8.2.2. – Reverse view of bend

Description:	Continue on A47 to overhead bridge.		
Distance from previous Pinch Point	3.00km	Distance to following Pinch Point	3.40km

	Modification required	Reason for Modification	Additional Information:
	No modification required	No issues at location	Clarification of the bridge clearance height was sought from the relevant authorities. Response has highlighted a clearance height of 5.2m although this should be reassessed prior to any delvieries being undertaken.

Item No:	Title		
8.8.2	Overhead bridge on A47	OS Grid Ref:	TF 81184 09866
		Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.8.3.1. – Aerial View of Location

8.8.3.2. – View of entrance to roundabout

8.8.3.3. – View on roundabout

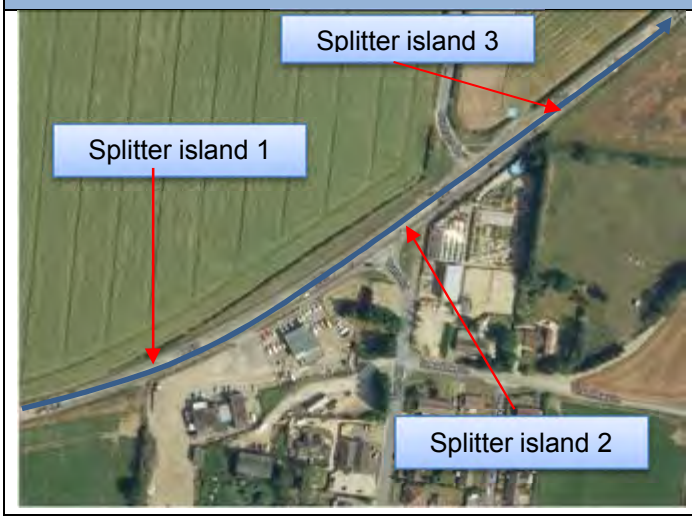
8.8.3.4. – View of exit of roundabout

Description:	Continue on A47 to roundabout at junction with Norwich Road. At roundabout, continue straight on A47.

Distance from previous Pinch Point	3.40km	Distance to following Pinch Point	3.40km

	Modification required	Reason for Modification	Additional Information:
	Modifications to street furniture, tree pruning and manual steering required.	To allow navigation	Street furniture on central island of roundabout to be removed due to oversail of loaded vehicle. Tree on central island to be pruned.

Item No:	Title	OS Grid Ref:	TF 84328 09486
8.8.3	Roundabout prior to site	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-180A1.1



8.8.4.1. – Aerial View of Location

8.8.4.2. – Splitter Island 1

8.8.4.3. – Splitter Island 2

8.8.4.4. – Splitter Island 3

Description:	Continue on A47 through Necton.

Distance from previous Pinch Point	3.40km	Distance to following Pinch Point	2.10km

	Modification required	Reason for Modification	Additional Information:
	No modifications required	No issues at this location	Loaded vehicle will navigate past these splitter islands without any issues.

Item No:	Title	OS Grid Ref:	TF 87765 10171
8.8.4	Splitter islands in Necton	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	N/A

8.8.5.1. – Aerial View of Location

8.8.5.2. – View of entrance to roundabout

8.8.5.3. – View on roundabout

Description:	Continue on A47 to proposed site entrance.

Distance from previous Pinch Point	2.10km	Distance to following Pinch Point	N/A

	Modification required	Reason for Modification	Additional Information:
	New site entrance to be constructed	To allow access into site	Swept Path Analysis has been undertaken on the proposed site entrance design and showed that the loaded vehicle could access the site based on that design.

Item No:	Title	OS Grid Ref:	TF 89255 11397
8.8.5	Proposed site entrance location	Customer	RHDHV
		Project	Norfolk Vanguard
		Drawing Nos	314597-190A1.1

9. Recommendations

9.1. If suitable agreements and necessary amendments to the route can be made with both the highway authorities and land owners then this route is recommended for the delivery of all the components.

9.2. These recommendations are made from a purely transport orientated view, and do not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive. It is recommended to have adequate warning signs implemented to warn other road users at critical points along the route.

9.3. All hedges, shrubs, bushes, trees and overhanging branches along the nominated routes must be trimmed to allow a minimum envelope on the road of 7.5m wide by 7.5m high for load A and for load B they should be 6.0m by 6.0m.

9.4. All street furniture, signage etc. along the nominated route must be removed to allow a minimum envelope on the road of 7.5m by 7.5m high for load A and for load B they should be 6.0m by 6.0m. Other specific street furniture has been nominated in this report to facilitate ‘over-sailed’ and ‘swept’ areas.

10. Important notes

10.1. The loaded configuration is based on a generic load size identified by Royal Haskoning DHV. No technical drawings were received of the Transformer and it is possible that the load cannot be loaded in the configuration identified in this report. If this is the case, it may result in different loaded dimensions and as a result, the route becoming unsuitable.

10.2. Police escort or Pilot car will be required for all component trailers to negotiate the route, in order to assist with traffic control and control oncoming traffic flow.

10.3. The information contained in this report is privileged and confidential and is for the exclusive use of the client nominated herein.

10.4. All access diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying the components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.

10.5. Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.

10.6. All drawings produced of swept path diagrams are illustrated by using the automatic steering principle for the steerable trailers, unless otherwise stated. However, all steerable trailers have a manual override system that if used will alter the path of the trailer.

10.7. All drawings are produced using Ordnance Survey 'OS MasterMap' mapping data, unless stated otherwise. Street furniture is not included on OS MasterMap data, this is plotted by taking measurements on site with a tape, actual road widths are also checked and adjusted on the map data accordingly. Where adjustments to the OS MasterMap data have been made this is indicated as 'adjusted' on the drawing.

10.8. All route assessment, proposed land-take and removal/re-instatement of nominated street furniture is deemed accurate by Collett & Sons Ltd at the date that this report is created. We cannot be held responsible for the development of future road schemes or alterations to the routes surveyed that may leave this report inaccurate.

11. List of Drawing Numbers

11.1. Transformer

Drawing No	Title
314597-100A1.1	Exit from Kings Lyn port
314597-120A1.1	A148 roundabout junction with A149
314597-130A1.1	A149 roundabout junction with A1076
314597-140A1.1	A149 roundabout junction with Sainsbury's
314597-150A1.1	A149 roundabout junction with A47
314597-160A1.1	A47 Roundabout
314597-170A1.1	A47/A1122 Roundabout
314597-180A1.1	A47/Norwich Road Roundabout
314597-190A1.1	Proposed site entrance off A47

APPENDIX 1 - ELEVATION DRAWINGS OF SWEPT PATH MODELS

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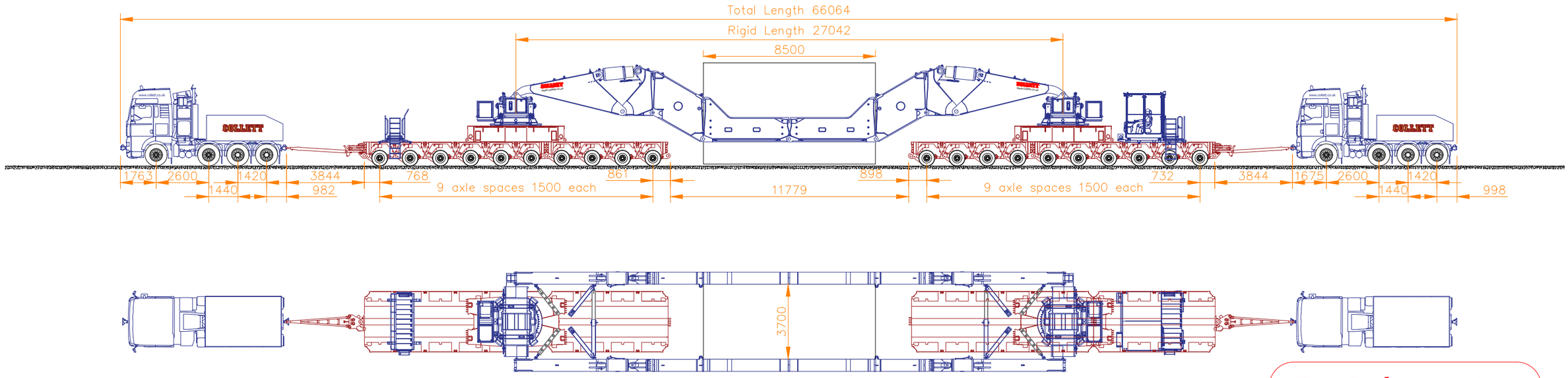
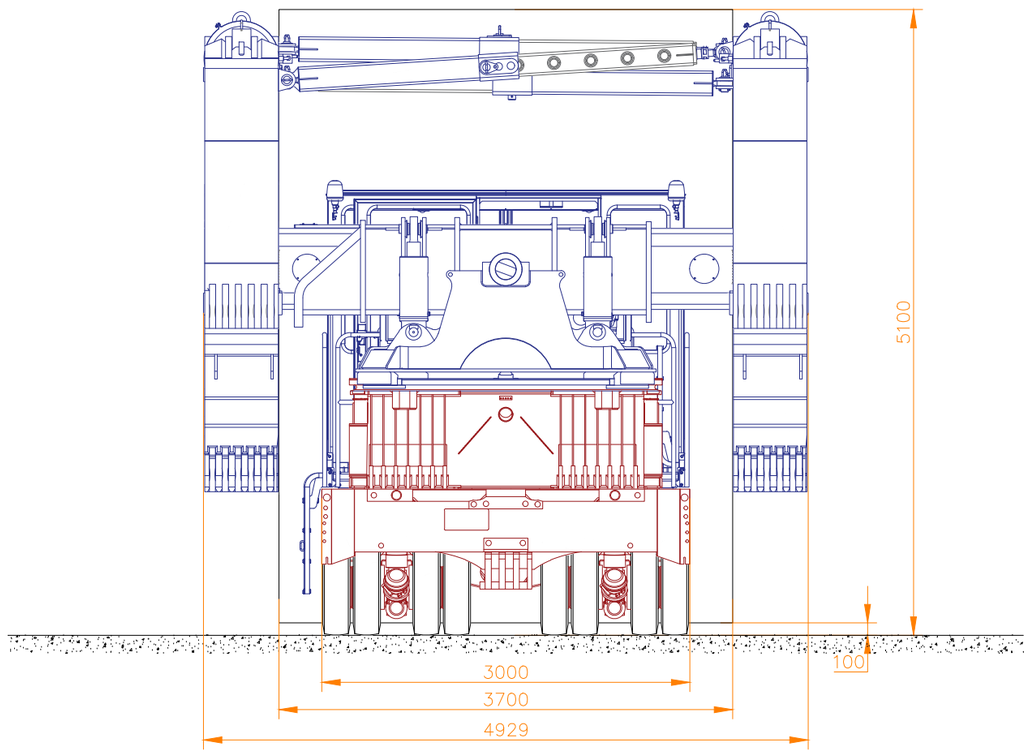
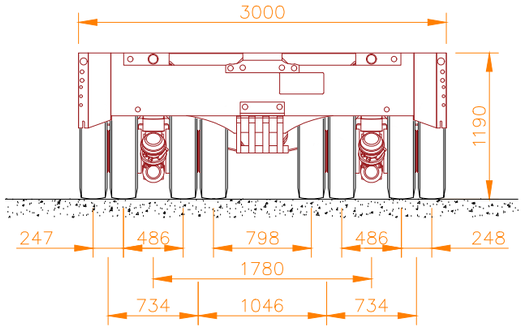
PLAN & SIDE ELEVATION VIEW. SCALE 1:200



END ELEVATION VIEW. SCALE 1:50



TRAILER END ELEVATION VIEW. SCALE 1:50



For Information

1.	THIS DRAWING IS PRELIMINARY AND IS RELEASED FOR INFORMATION ONLY.
2.	ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE STATED.
3.	ALL WEIGHTS ARE IN METRIC TONNES (t) UNLESS OTHERWISE STATED.
4.	THE CLIENT IS RESPONSIBLE FOR THE PREPARATION OF THE TRANSPORT AREAS TO ENSURE THAT IT IS CAPABLE OF ACCOMMODATING THE LOADS GENERATED BY THE TRAILERS DURING ALL TRANSPORT / LOADING AND UNLOADING OPERATIONS. GROUND TO BE SUITABLY COMPACTED AND LEVELLED FOR A SAFE AND CONVENIENT TRANSPORT OPERATION.
5.	THE CLIENT IS RESPONSIBLE FOR THE STRUCTURAL INTEGRITY OF THE LOAD TRANSPORTED.
6.	THE CLIENT IS TO IDENTIFY AND CONFIRM THE SUITABILITY OF THE SUPPORT POINTS ON THE LOAD TO BE UTILISED DURING TRANSPORT. IT IS ASSUMED THE TRANSFORMER WILL BE FITTED WITH TRANSPORT BRACKETS.
7.	SECURE CARGO ONTO THE TRAILER USING LASHING MATERIAL TO PREVENT SLIDING AND/OR TIPPING OF THE LOAD. ALL STRAPS AND CHAINS TO BE TIGHTENED WITH RATCHET BINDERS. ANTI SLIP RUBBER MATTING TO BE USED BETWEEN THE TRAILER AND THE BASE OF THE LOAD INCLUDING ALL STEEL CONTACT AREAS TO PROMOTE FRICTION.
8.	ALL EQUIPMENT IS SUPPLIED IN ACCORDANCE WITH COLLETT & SONS LIMITED TERMS AND CONDITIONS, AND THE RELEVANT R.H.A. 2009 TERMS AND CONDITIONS.
9.	WITHOUT AUTHORISED SIGNATURES THIS DOCUMENT IS UNCONTROLLED, NOT BINDING AND FOR INDICATIVE PURPOSES ONLY.

Weights Table		
Type	Description	Weight
Type of Trailer	20 Axle Girder Bridge Combination	132.860 t
Type of Load	Transformer	200.000 t
	Total loaded weight excluding tractor units	332.860 t
	Load per axle line on trailer (equivalent to 2 file)	16.643 t
	Load per axle per file	8.322 t
	Load per wheel	2.080 t
Abnormal Load Classification: Special Order (BE16)		

Rev:	Drawn by:	Date:	Checked by:	Date:
00	A.Abdallah	19/03/2018	S.Mangham	19/03/2018

Description: First Issue

Client: Royal Haskoning DHV

Project: Norfolk Vanguard

Title: 200 ton Transformer Transport Arrangement

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Paper Size:	Scale:	Project No:	Drawing No:	Sheet No:
A3	As Noted	314597	COL-D-314597-1-1	1 of 1

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APPENDIX 2 – SWEPT PATH ANALYSIS

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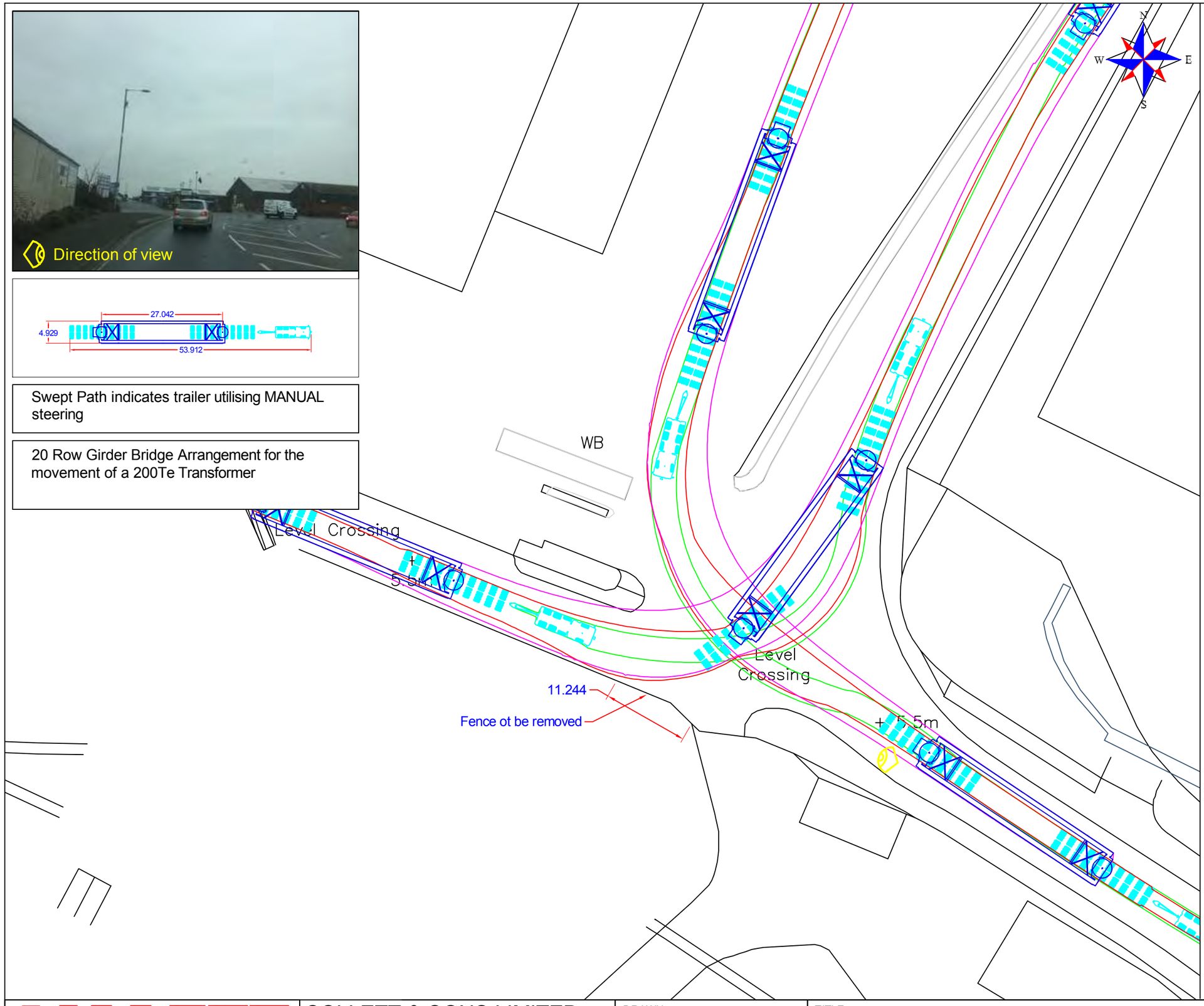
Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Exit Kings Lynn port onto Edward Benefer Way.

Caution

- A reverse manoeuvre is required when exiting the port in order to avoid modifications.
- Vehicle to turn left onto Edward Benefer towards town centre then reverse back into Port Entrance.
- Vehicle will then turn left onto Edward Benefer Way..

UK Grid Reference: TF 61846 20715

- The swept path analysis provided is produced from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive.
- The drawing has been produced from data created by Collett. A site visit has **not** been conducted to verify road widths or the presence of street furniture.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
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- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

COLLETT
EXPERTS IN MOTION

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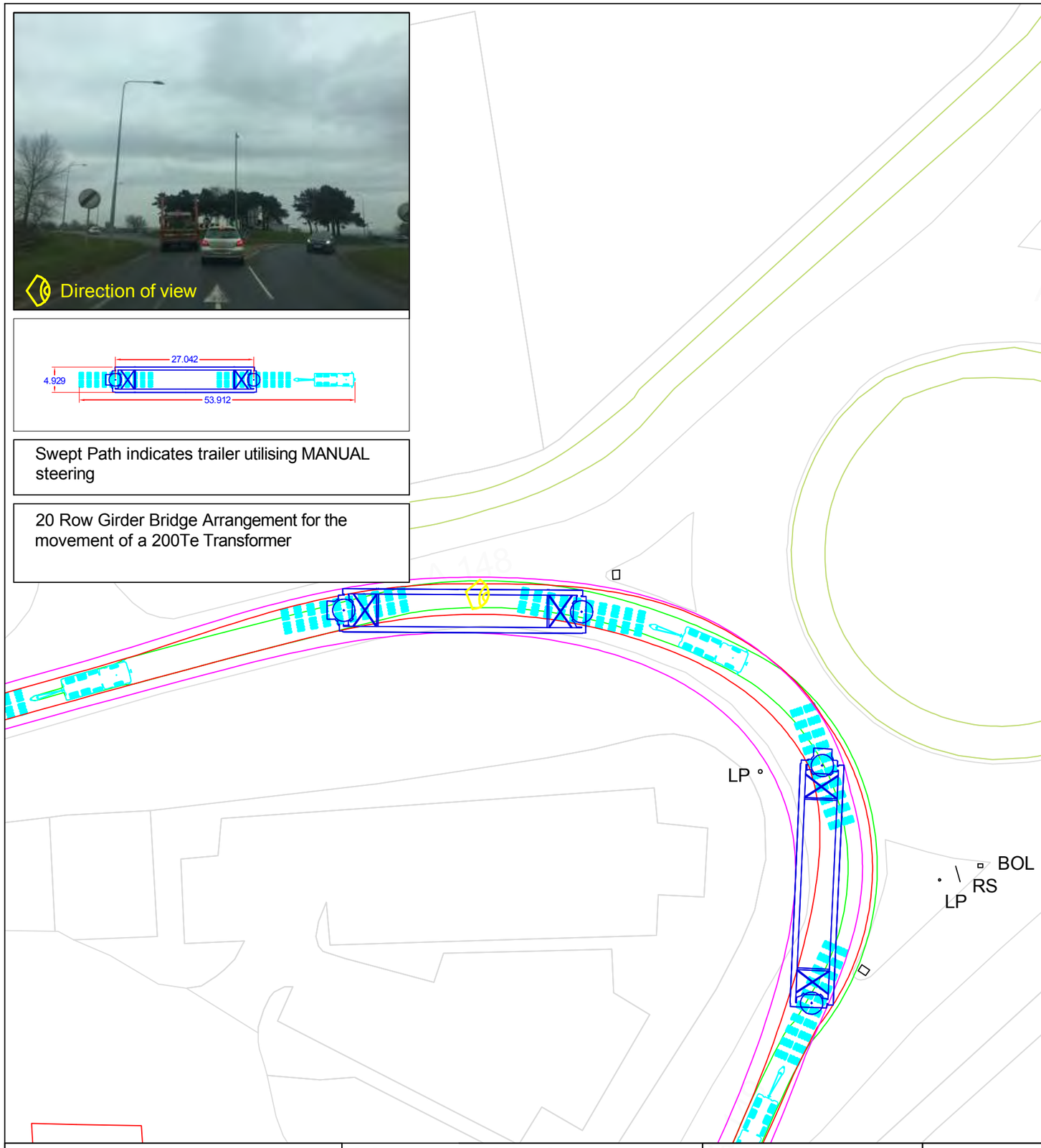
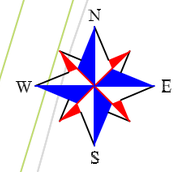
DRAWN S.MANGHAM	TITLE EXIT KINGS LYNN PORT ONTO EDWARD BENEFER WAY		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500 / SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-100A1.1

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer





Continue on A148 to roundabout junction with A149 Queen Elizabeth Way,

Caution

- Loaded vehicle will navigate this roundabout utilising a contraflow manoeuvre.

UK Grid Reference: TF 66754 22967

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Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

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Area within green outline will be oversailed by trailer body

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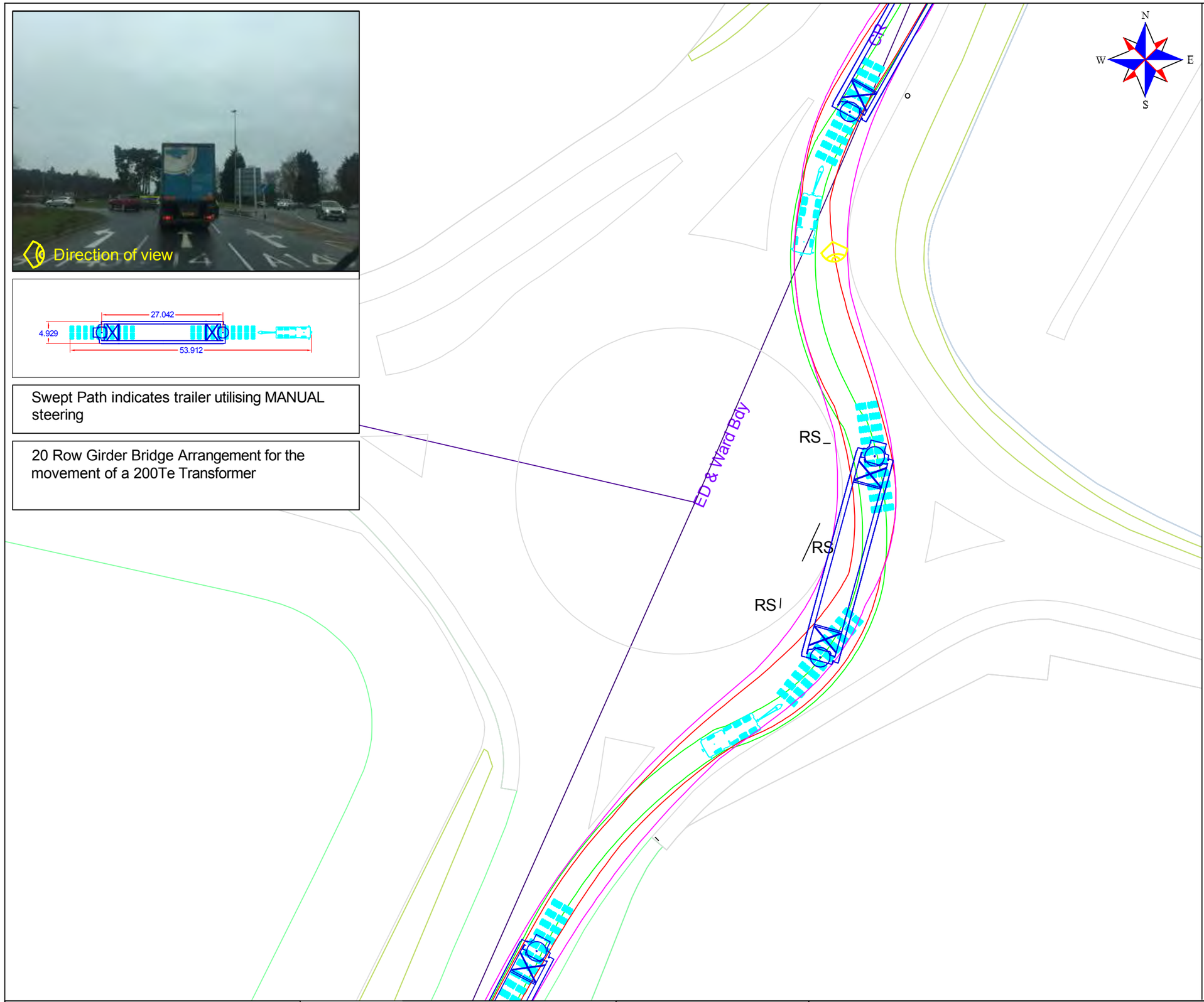
DRAWN S.MANGHAM	TITLE A148 ROUNDBAOUT JUNCTION WITH A149		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500 SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-120A1.1

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Continue on A149 to roundabout to at junction with A1076.
At roundabout continue on A149.

Caution

- Loaded vehicle will navigate this roundabout utilising manual steering.

UK Grid Reference: TF 65339 20203

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- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

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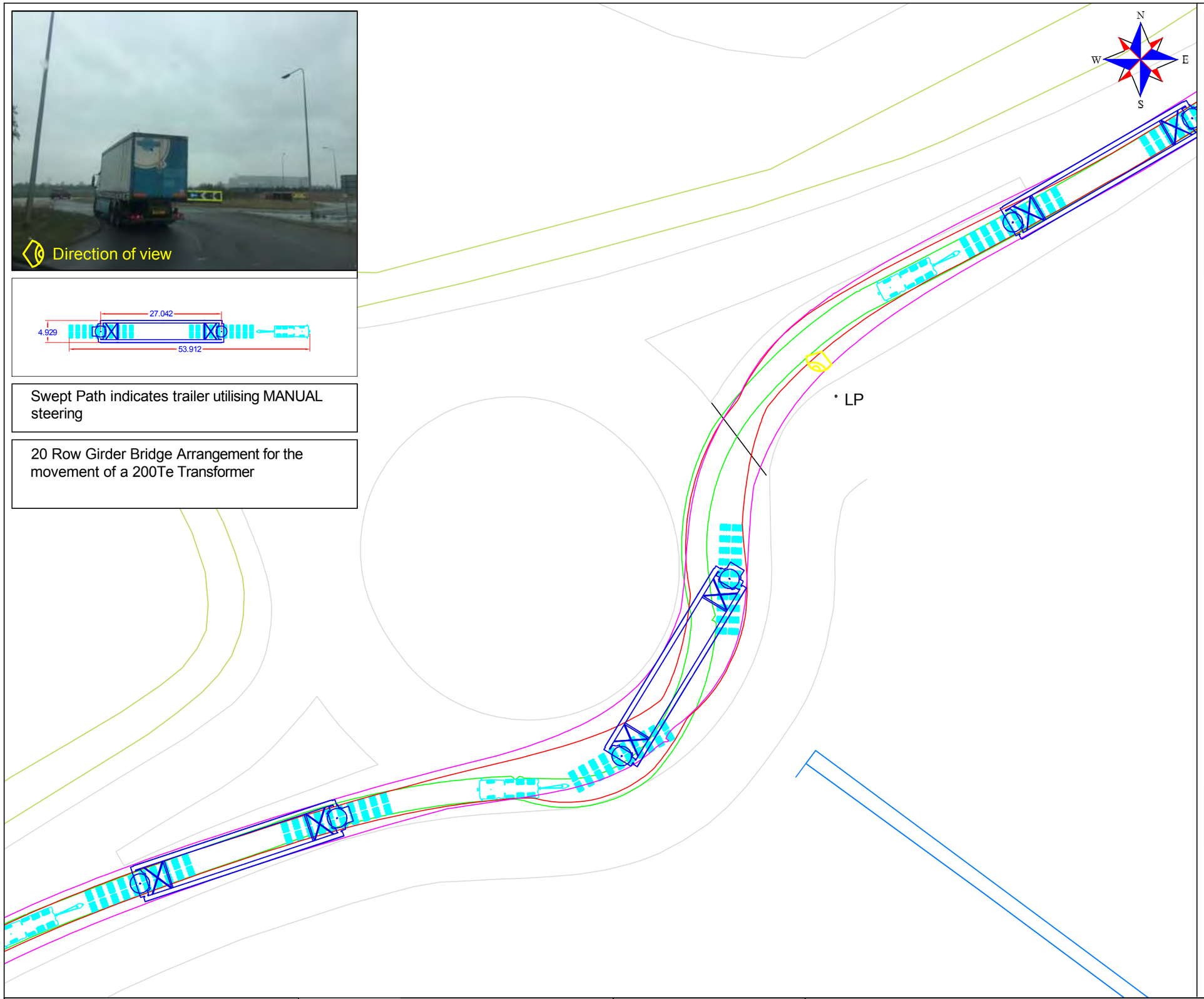
DRAWN S.MANGHAM	TITLE A149 ROUNDABOUT JUNCTION WITH B1145		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500 SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-130A1.1

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Continue on A149 to roundabout to at junction with Sainburys.
At roundabout continue on A149.

Caution

- Loaded vehicle will navigate this roundabout utilising manual steering.

UK Grid Reference: TF 63957 18715

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Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

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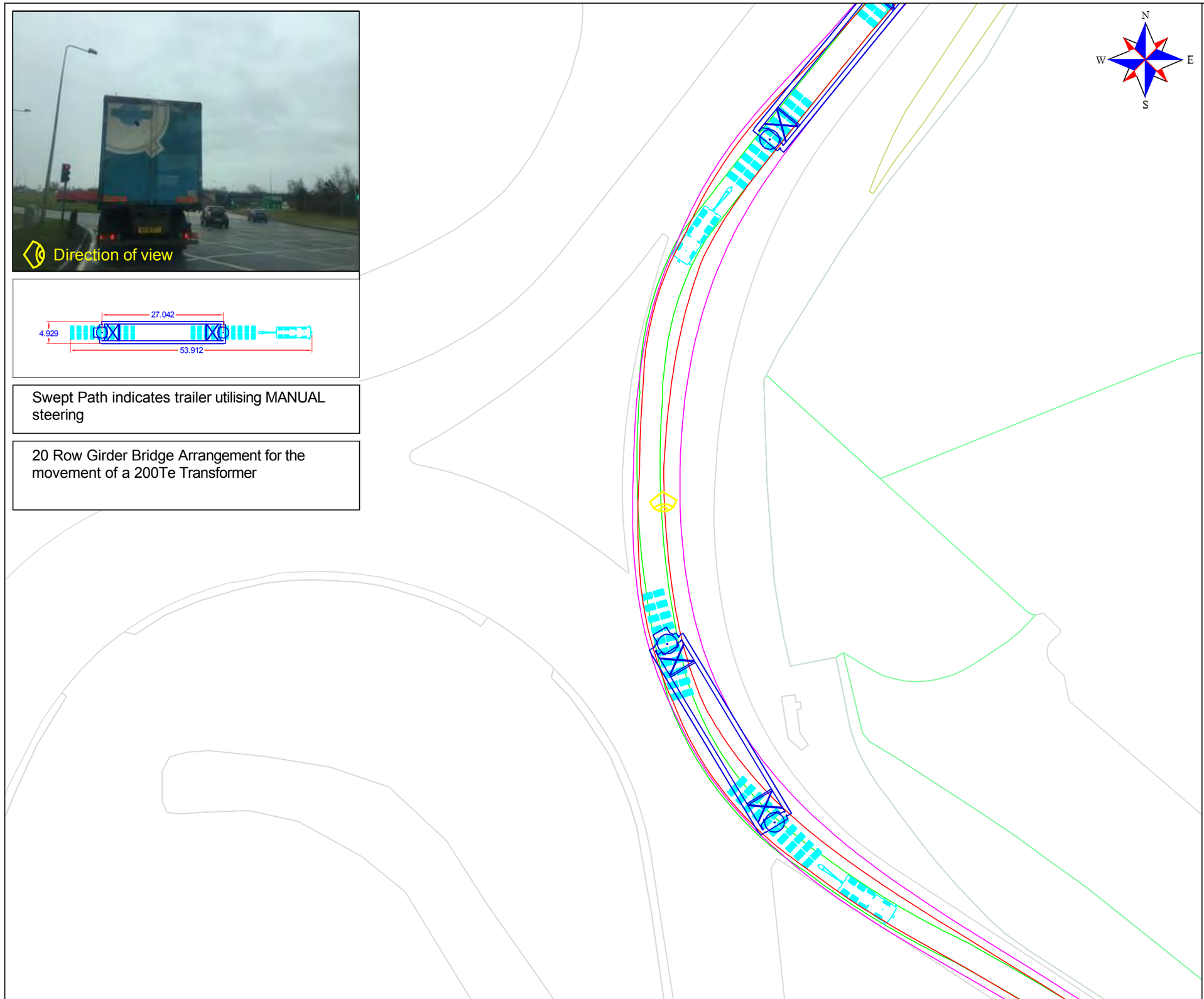
DRAWN S.MANGHAM	TITLE A149 ROUNDABOUT JUNCTION WITH SAINBURYS		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-140A1.1

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Continue on A149 to roundabout junction with A47,
At junction turn right onto A47

Caution

- Loaded vehicle will navigate this roundabout utilising manual steering.

UK Grid Reference: TF 63240 18156

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- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

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DRAWN	S.MANGHAM	TITLE	A149/A47 ROUNDABOUT JUNCTION
DATE	20/03/2018	MAPPING	ORDNANCE SURVEY Not Adjusted
CUSTOMER	ROYAL HASKONING DHV		
SCALE	1:500	SIZE	A3
PINCH POINT IDENTIFIED BY	COLLETT	SITE	NORFOLK VANGUARD
DWG. NO	314597-150A1.1		

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer

Continue on A47 to roundabout.
At roundabout, turn left onto A47.

****Caution****

- Loaded vehicle will navigate this roundabout utilising manual steering.

UK Grid Reference: TF 63500 18063

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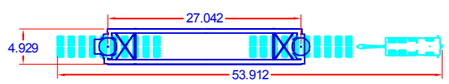
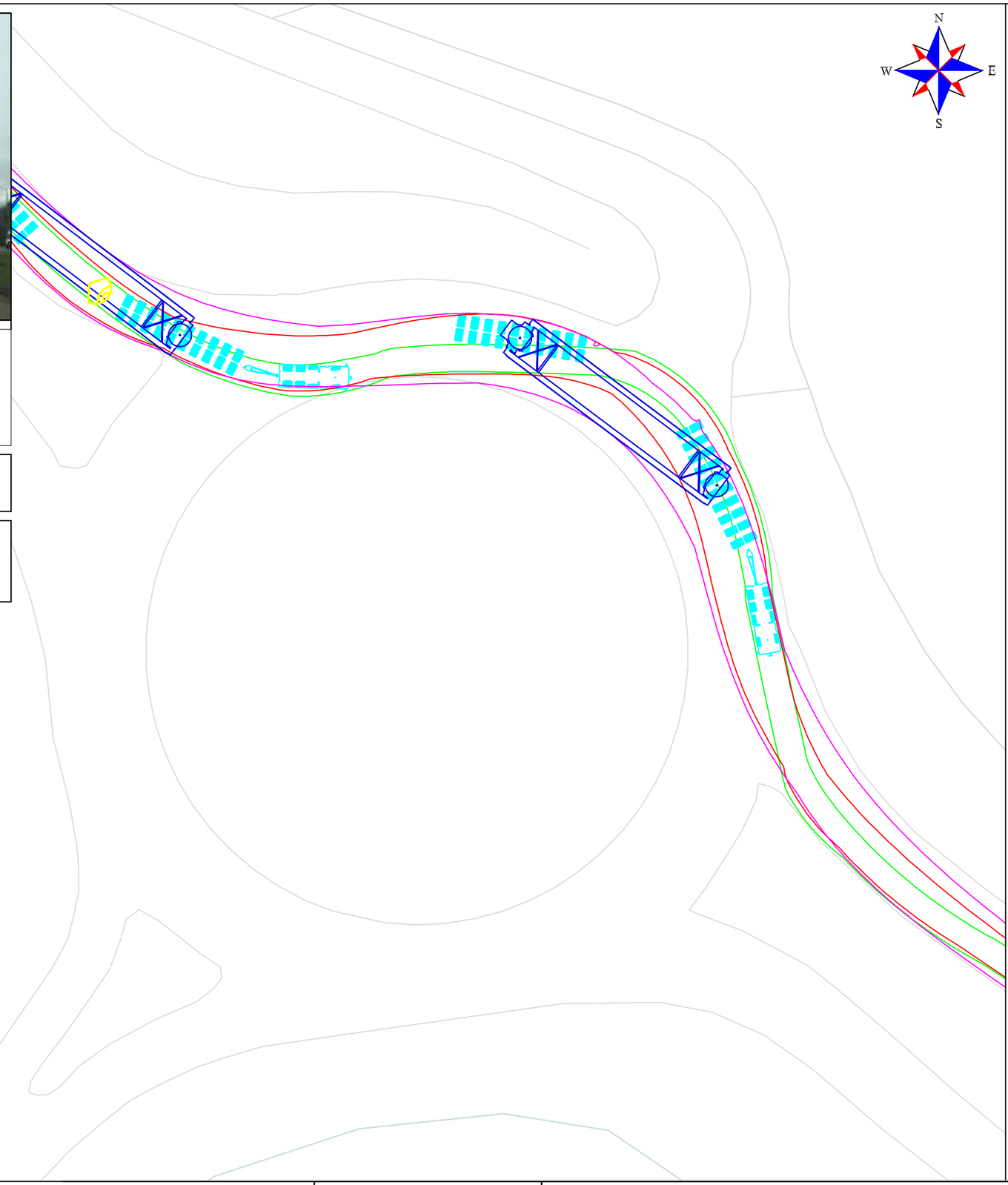
DRAWN S.MANGHAM	TITLE A47 ROUNDABOUT		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500 SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-160A1.1



Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Continue on A47 to roundabout at junction with A1122.
At roundabout, continue on A47.

****Caution****

- Loaded vehicle will navigate this roundabout utilising manual steering.

UK Grid Reference: TF 78318 09912

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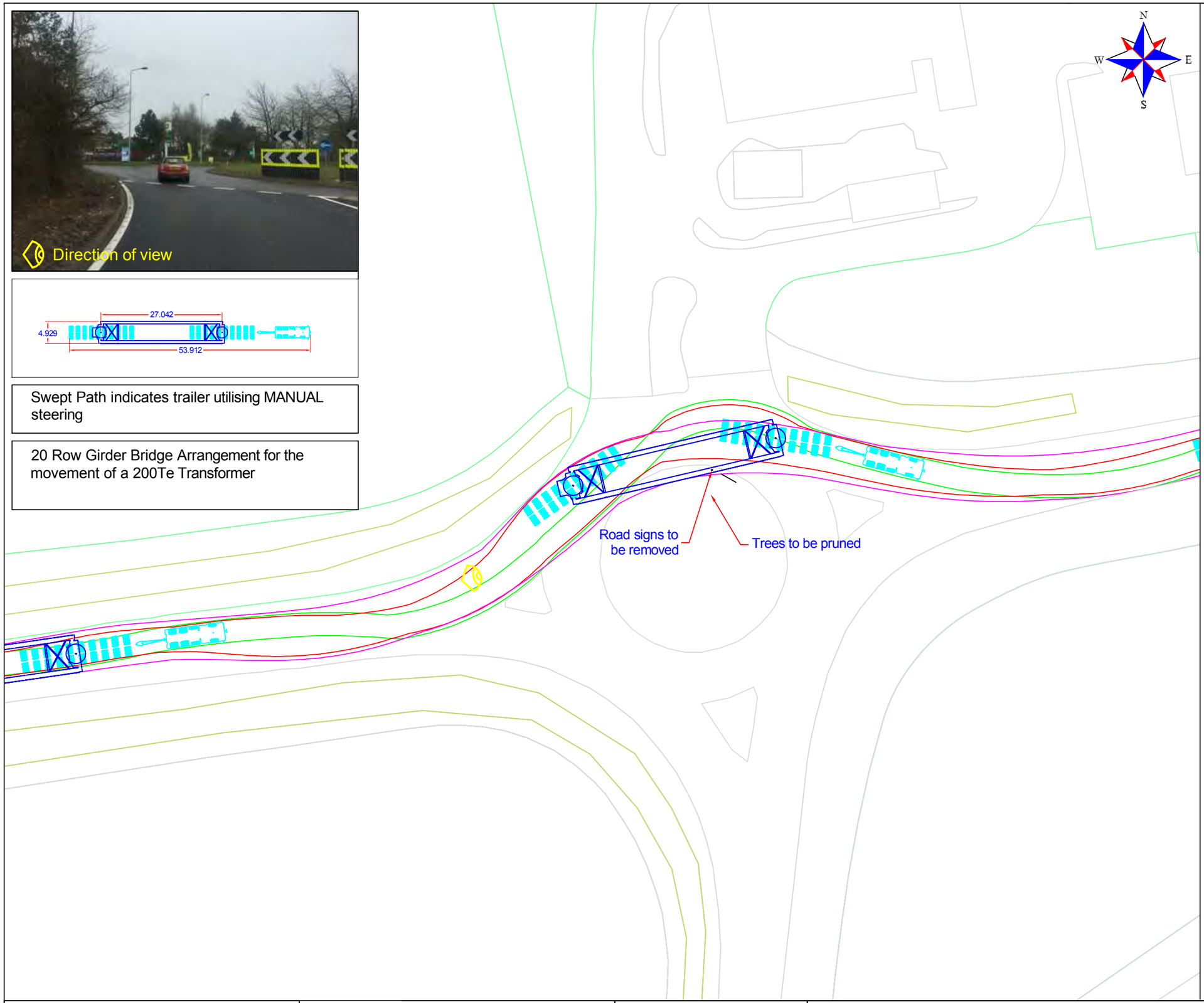
DRAWN S.MANGHAM	TITLE A47/A1122 ROUNDABOUT		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-170A1.1

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Continue on A47 to roundabout with Norwich Road.
At roundabout, continue on A47.

****Caution****

- Road signs on central island of the roundabout to be removed.
- Trees on roundabout to be pruned.
- Girder Bridge to be raised to clear central island.

UK Grid Reference: TF 84305 09509

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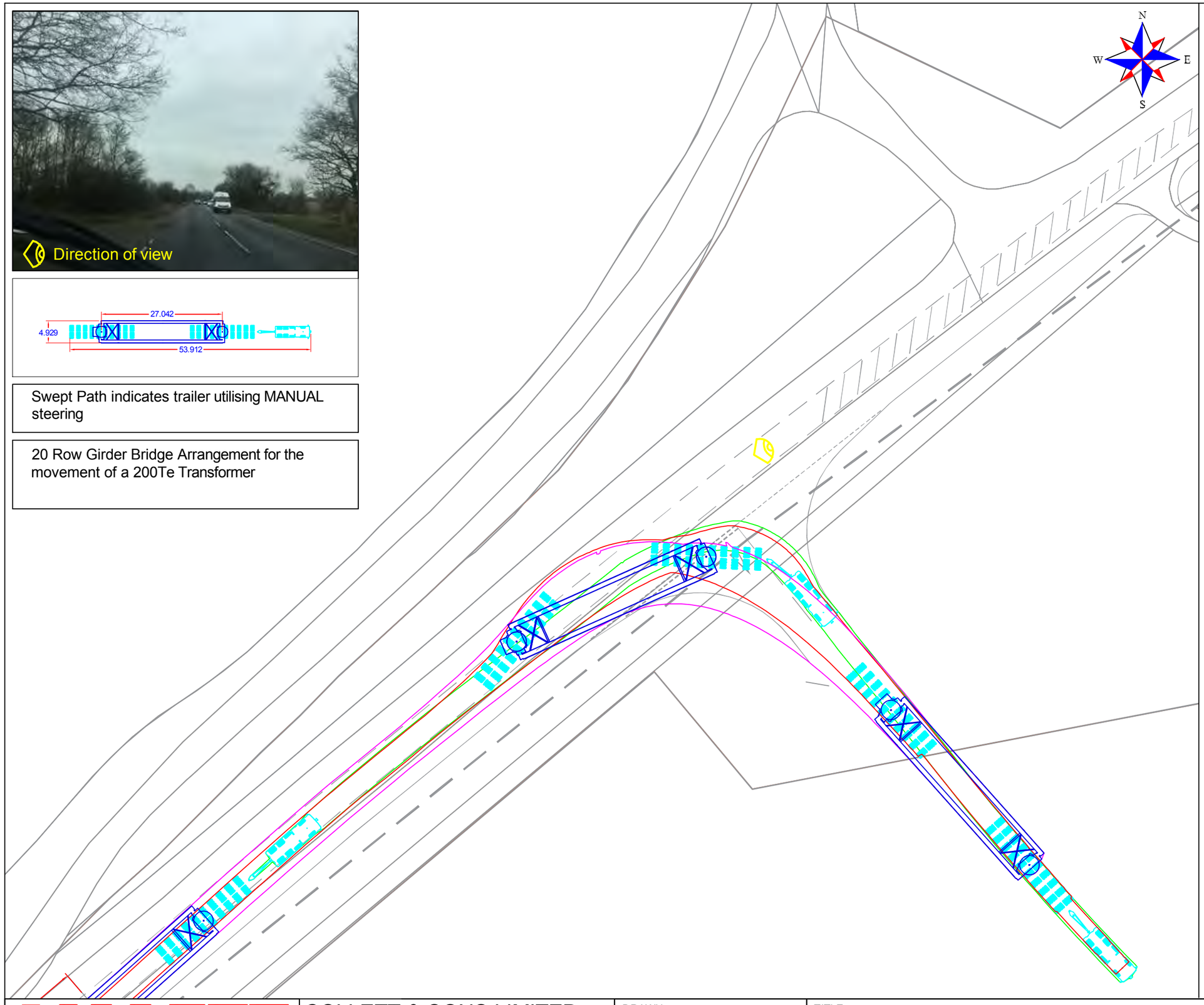
DRAWN S.MANGHAM	TITLE A47/NORWICH ROAD ROUNDABOUT		
DATE 20/03/2018	MAPPING ORDNANCE SURVEY Not Adjusted	CUSTOMER ROYAL HASKONING DHV	
SCALE 1:500 SIZE A3	PINCH POINT IDENTIFIED BY COLLETT	SITE NORFOLK VANGUARD	DWG. NO 314597-180A1.1

Swept Path indicates trailer utilising MANUAL steering

20 Row Girder Bridge Arrangement for the movement of a 200Te Transformer



Continue on A47 to proposed site entrance.

Caution

- Proposed junction alignment can be navigated utilising manual steering.

UK Grid Reference: TF 89245 11382

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- Police escorts and permits will be required for the movement of all of the components. Form 'BE16' permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Highway Agency (HA). Therefore, approval of these 'permits for movements' by the HA are a major consideration before the physical capability to deliver these components are undertaken.
- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
- The information is privileged and confidential and is for the exclusive use of the nominated client.
- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

COLLETT
EXPERTS IN MOTION

COLLETT & SONS LIMITED
Victoria Terminal TEL: +44(0)8456 255288
Albert Road FAX: +44(0)8456 255244
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN	S.MANGHAM	TITLE	PROPOSED SITE ENTRANCE OFF A47		
DATE	20/03/2018	MAPPING	PROVIDED BY CLIENT	CUSTOMER	ROYAL HASKONING DHV
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY	COLLETT	SITE	NORFOLK VANGUARD
				DWG. NO	314597-190A1.1

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APPENDIX 3 - COUNCIL CORRESPONDENCE AND COMMENTS

COLLETT
EXPERTS IN MOTION

Victoria Terminal
Albert Road
HALIFAX
West Yorkshire
HX2 0DF

Mistral Point
AW Nielsen Road
GOOLE
East Yorkshire
DN14 6UE

Baltic House
Central Dock Road
GRANGEMOUTH
Central Scotland
FK3 8TY

Tel. +44 (0) 8456 255 233
Fax +44 (0) 8456 255 244
Email info@collett.co.uk
www.collett.co.uk

Our Ref:	314597	**Date:**	10th March 2018

Application for 'Confirmation of suitable route' for Norfolk Vanguard.

To Whom it May Concern,

I am currently carrying out a survey to a site called 'Norfolk Vanguard', off A47 near Necton.

Could you please **confirm in writing** that the **route** detailed below and all structures that are involved in your area on this route are suitable in terms of axle loadings, spacing and Gross vehicle weights, in connection with the loaded vehicle specifications below.

Route:

- Exit Kings Lynn Harbour onto Edward Benefer Way,
- Continue on Edward Benerfer Way to merge onto Grimston Road A148.
- Continue on A148 to roundabout junction with A149 Queen Elizabeth Way,
- At roundabout turn right onto A149 Queen Elizabeth Way,
- Continue on A149 through 2 roundabouts to roundabout junction with A47,
- At roundabout turn left onto A47,
- At roundabout turn left onto A47,
- At roundabout, continue on A47,
- At roundabout continue on A47,
- Continue on A47 to proposed site entrance on the right hand side at approx. OS Grid refs: TF 89245 11382.

Load A: Girder Bridge Only								
Rigid Length	27.042	Overall Length	49.70	Overall Width	7.39	Overall Height	4.929	Gross Vehicle Weight	332.86Te

-

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Number of wheels per axle	8	8	8	8	8	8	8	8	8	8	8	8	8
Axle Weight (Te.)	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64
Axle Spacing		1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	11.78	1.50	1.50	1.50

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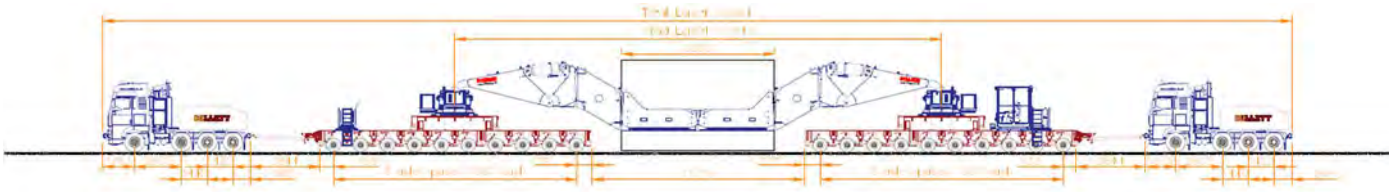
www.collett.co.uk

14	15	16	17	18	19	20
8	8	8	8	8	8	8
16.64	16.64	16.64	16.64	16.64	16.64	16.64
	1.50	1.50	1.50	1.50	1.50	1.50



Should there be any problem with any part of the route detailed, I would appreciate your immediate response.

Your urgent response would be greatly appreciated.
Many thanks & best regards

Steven Mangham

COLLETT & SONS LTD

Victoria Terminal
Albert Road
HALIFAX
West Yorkshire
HX2 0DF

Mistral Point
AW Nielsen Road
GOOLE
East Yorkshire
DN14 6UE

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Email info@collett.co.uk

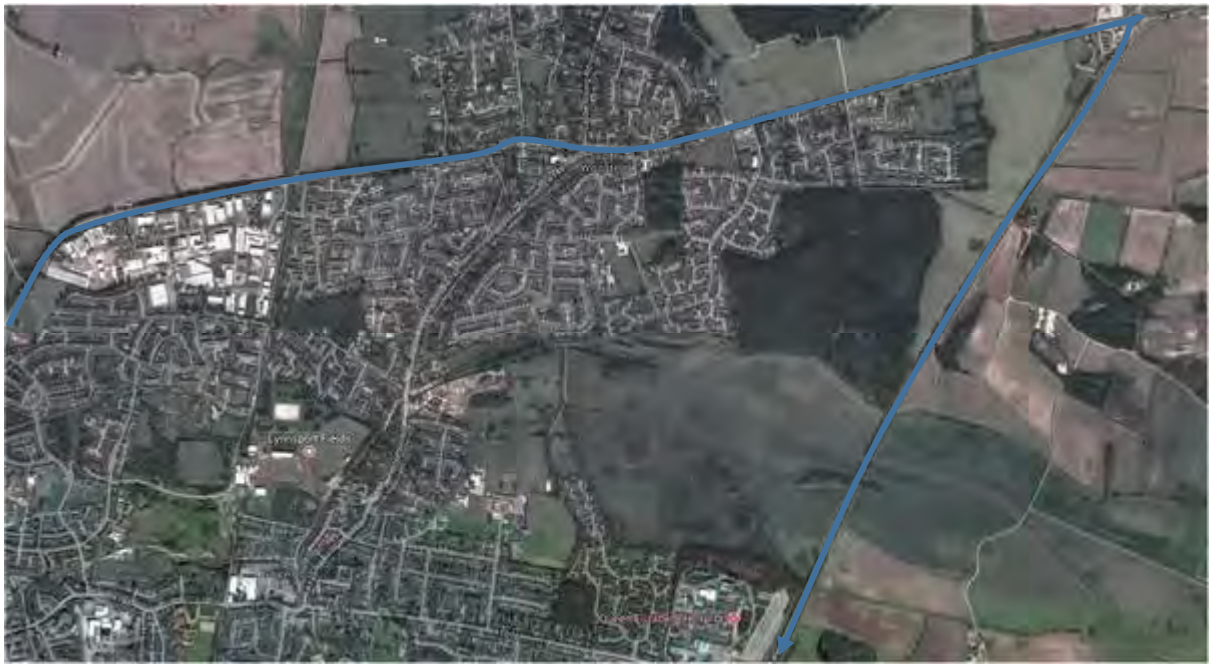
www.collett.co.uk

Map of Routes

Route A

Exit from Kings Lynn Harbour on Edward Benefer Way.

Continue on Edward Benefer Way to merge on Grimston Road A148.



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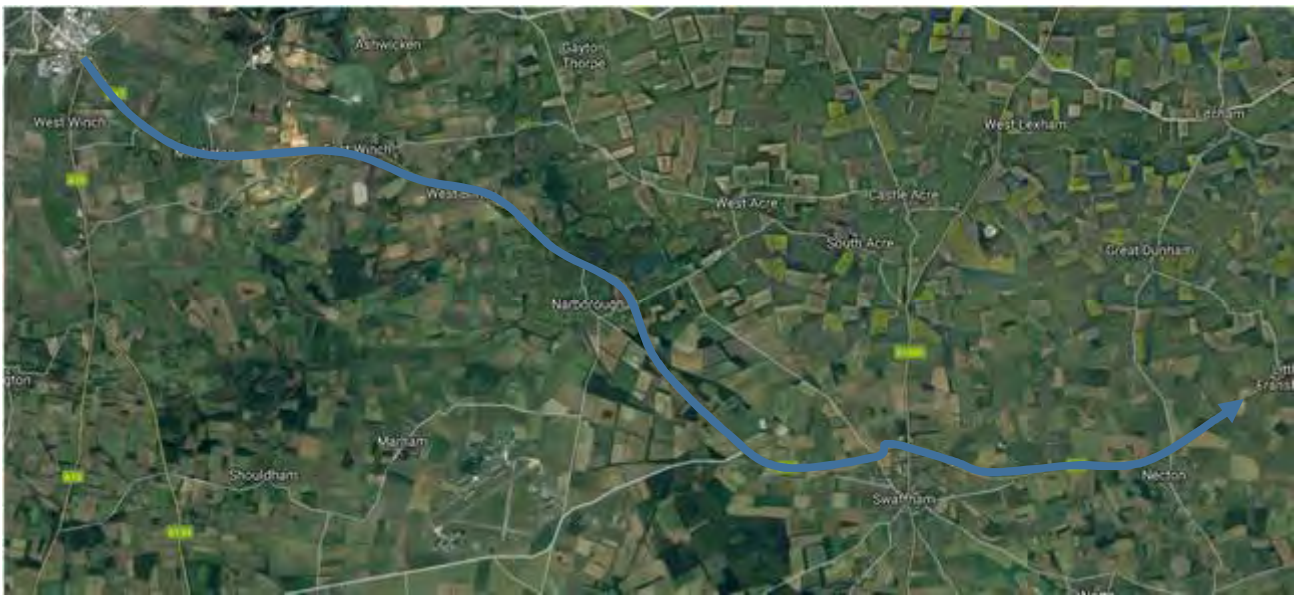
Continue on A148 to roundabout jucntion with A47.

Continue on A47 to Site



Steven Mangham

From: Howell, Tania <Tania.Howell@jacobs.com>
Sent: 21 March 2018 08:19
To: Steven Mangham
Subject: RE: Confirmation of Suitable Route - 314597

Good morning Steven,

Thank you for your enquiry.
I can confirm that neither of the route options will affect any Historic Railways Estate structures.

Regards
Tania

Tania Howell
Abnormal Loads Officer
Jacobs
DDI: 0118 946 8911

If your mail concerns abnormal load movements, please reply to RSGBRB@jacobs.com

---

From: Steven Mangham [mailto:Steven.Mangham@collett.co.uk]
Sent: 20 March 2018 16:54
To: abloads.area6@kier.co.uk; roadspace.area6@kier.co.uk; abnormalloads@norfolk.gov.uk; Abnormal Loads Contact (AbnormalLoadsContact@networkrail.co.uk) <AbnormalLoadsContact@networkrail.co.uk>; abnormal.loads@canalrivertrust.org.uk; RSGBRB@jacobs.com
Subject: [EXTERNAL] Confirmation of Suitable Route - 314597

Good Afternoon,

To Whom It May Concern:

Please find attached a Confirmation of Suitable Route request for Norfolk Vanguard.

Please note that, at present, we do not require a permit to move. This request is for information purposes only to ensure that the route is suitable to accept the axles loads proposed and to identify any potential structure issues there may be on the identified route.

If you could response in writing to steven.mangham@collett.co.uk that would be much appreciated.

Kind Regards,

Steven Mangham
Consulting Team Manager/Renewables Project Manager

Collett & Sons Ltd | Victoria Terminal | Albert Road | Halifax | HX2 0DF | UK
Tel: +44 (0)8456 255288 | Fax: +44 (0)8456 255244 | Mob: +44 (0)7852 040509
Email: steven.mangham@collett.co.uk | Web: www.collett.co.uk

Jacobs U.K. Limited
1180 Eskdale Road, Winnersh, Wokingham RG41 5TU
Registered in England and Wales under number 2594504

Steven Mangham

From: Administrator
Sent: 26 March 2018 12:11
To: Steven Mangham
Subject: FW: 2018-03-23 00-00 Confirmation_of_suitable_route_314597
Attachments: 2018-03-23 00-00 Confirmation_of_suitable_route_314597.pdf; 2018-03-23 00-00 Confirmation_of_suitable_route_314597.xlsx

Michael Collett
Director

Collett & Sons Ltd | Victoria Terminal | Albert Road | Halifax | HX2 0DF | UK
Tel: +44 (0)8456 255233 | Fax: +44 (0)8456 255244 | mob: 07917 136146

From: Hughes, John [mailto:John.Hughes@kier.co.uk]
Sent: 26 March 2018 11:59
To: info at collett
Cc: Nick Hyde (Nicolas.hyde@highwaysengland.co.uk); Chimwemwe Banda
Subject: 2018-03-23 00-00 Confirmation_of_suitable_route_314597

Steven Mangham
Proposals such as in the attached have to be dealt with by due process.
If you have not already done so you must submit a Special Order Notification to:-

> Abnormal Loads
> Highways England | The Cube | 199 Wharfside Street | Birmingham | B1 1RN
> **Tel**: 0300 470 3102
> **Abnormal Loads Team Tel:** 0300 470 3004
> Web: http://www.highways.gov.uk

I believe that this is done via ESDAL.

There are potentially twenty structures belonging to Highways England that may be affected by your proposal, though I note that you are avoiding some of the larger span structures in your attached proposal.

The structures potentially affected by your proposal are listed in the attached excel spreadsheet.
We at Kier are unable to process your proposal further without a notification and Special Order reference from Highways England.

Regards

John Hughes Bsc. C.Eng MICE

Project Manager Structures
Abnormal Loads Coordinator Highways England Areas 6 and 8

Kier Services I **Highways** I Sandy Highways Depot, Beamish Close, Sandy **SG19 1SD**
T: I 01223 255255 I E: john.hughes@kier.co.uk
Web www.kier.co.uk

Steven Mangham

From: Nicholson Katie <Katie.Nicholson@networkrail.co.uk> on behalf of Network Rail Abnormal Loads <NetworkRailAbnormalLoads@networkrail.co.uk>
Sent: 23 March 2018 13:20
To: Steven Mangham
Subject: QID 615 RE: Confirmation of Suitable Route - 314597

Hi Steven,

Your proposed movement does not affect any Network Rail owned road over rail bridges or tunnels therefore we have no objection to your proposed routes.

Please note we only check the load carrying capacity of Network Rail owned road over rail bridges affected we do not check anything else including:

- Load carrying capacity of level crossings
- Clearance to bridge parapets
- Clearance under a rail bridge
- Clearance to overhead wires at level crossings

Many Thanks

Katie Nicholson
Abnormal Loads Assistant
Abnormal Loads Help Desk: 01908 783 140

NetworkRail Route Services

Abnormal Loads | National Records Group | Route Services
The Quadrant | Elder Gate | Milton Keynes | MK9 1EN
D 01908 783 140 | **E** Katie.Nicholson@networkrail.co.uk **W** Network Rail Abnormal Loads

---

From: Steven Mangham [mailto:Steven.Mangham@collett.co.uk]
Sent: 20 March 2018 16:53
To: abloads.area6@kier.co.uk; roadspace.area6@kier.co.uk; abnormalloads@norfolk.gov.uk; Network Rail Abnormal Loads; abnormal.loads@canalrivertrust.org.uk; rsgbrb@jacobs.com
Subject: Confirmation of Suitable Route - 314597

Good Afternoon,

To Whom It May Concern:

Please find attached a Confirmation of Suitable Route request for Norfolk Vanguard.

Please note that, at present, we do not require a permit to move. This request is for information purposes only to ensure that the route is suitable to accept the axles loads proposed and to identify any potential structure issues there may be on the identified route.

If you could response in writing to steven.mangham@collett.co.uk that would be much appreciated.

Kind Regards,

Steven Mangham
Consulting Team Manager/Renewables Project Manager

Collett & Sons Ltd | Victoria Terminal | Albert Road | Halifax | HX2 0DF | UK
Tel: +44 (0)8456 255288 | Fax: +44 (0)8456 255244 | Mob: +44 (0)7852 040509
Email: steven.mangham@collett.co.uk | Web: www.collett.co.uk

Steven Mangham

From: ETD Bridges <pandt.bridges@norfolk.gov.uk>
Sent: 21 March 2018 12:15
To: Steven Mangham
Subject: RE: MOVING - NO DATE FW: Confirmation of Suitable Route - 314597 ABNORMAL LOAD

Hi Steven

I have checked the routes and do not see any problems with the proposed vehicle/axle loads travelling over the NCC owned structures on the route. NCC are not responsible for the structures on the A47 and you will need to contact Highways England for them to comment on the suitability of that part of the route.

Regards

Mark

Mark North
Bridge Network Engineer
Highways & Transport
Community and Environmental Services

Direct Dial Telephone No: 01603 223804
Direct Fax No: 01603 223305
E-mail: mark.north@norfolk.gov.uk

Norfolk County Council
General enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk

From: Abnormal Loads
Sent: 21 March 2018 08:56
To: ETD Bridges <pandt.bridges@norfolk.gov.uk>
Subject: MOVING - NO DATE FW: Confirmation of Suitable Route - 314597 ABNORMAL LOAD

From: Steven Mangham [mailto:Steven.Mangham@collett.co.uk]
Sent: 20 March 2018 16:53
To: abloads.area6@kier.co.uk; roadspace.area6@kier.co.uk; Abnormal Loads <abnormalloads@norfolk.gov.uk>; Abnormal Loads Contact (AbnormalLoadsContact@networkrail.co.uk) <AbnormalLoadsContact@networkrail.co.uk>; abnormal.loads@canalrivertrust.org.uk; rsgbrb@jacobs.com
Subject: Confirmation of Suitable Route - 314597

Good Afternoon,

To Whom It May Concern:

Please find attached a Confirmation of Suitable Route request for Norfolk Vanguard.

Please note that, at present, we do not require a permit to move. This request is for information purposes only to ensure that the route is suitable to accept the axles loads proposed and to identify any potential structure issues there may be on the identified route.

If you could response in writing to steven.mangham@collett.co.uk that would be much appreciated.

Kind Regards,

Steven Mangham
Consulting Team Manager/Renewables Project Manager

Collett & Sons Ltd | Victoria Terminal | Albert Road | Halifax | HX2 0DF | UK
Tel: +44 (0)8456 255288 | Fax: +44 (0)8456 255244 | Mob: +44 (0)7852 040509
Email: steven.mangham@collett.co.uk | Web: www.collett.co.uk

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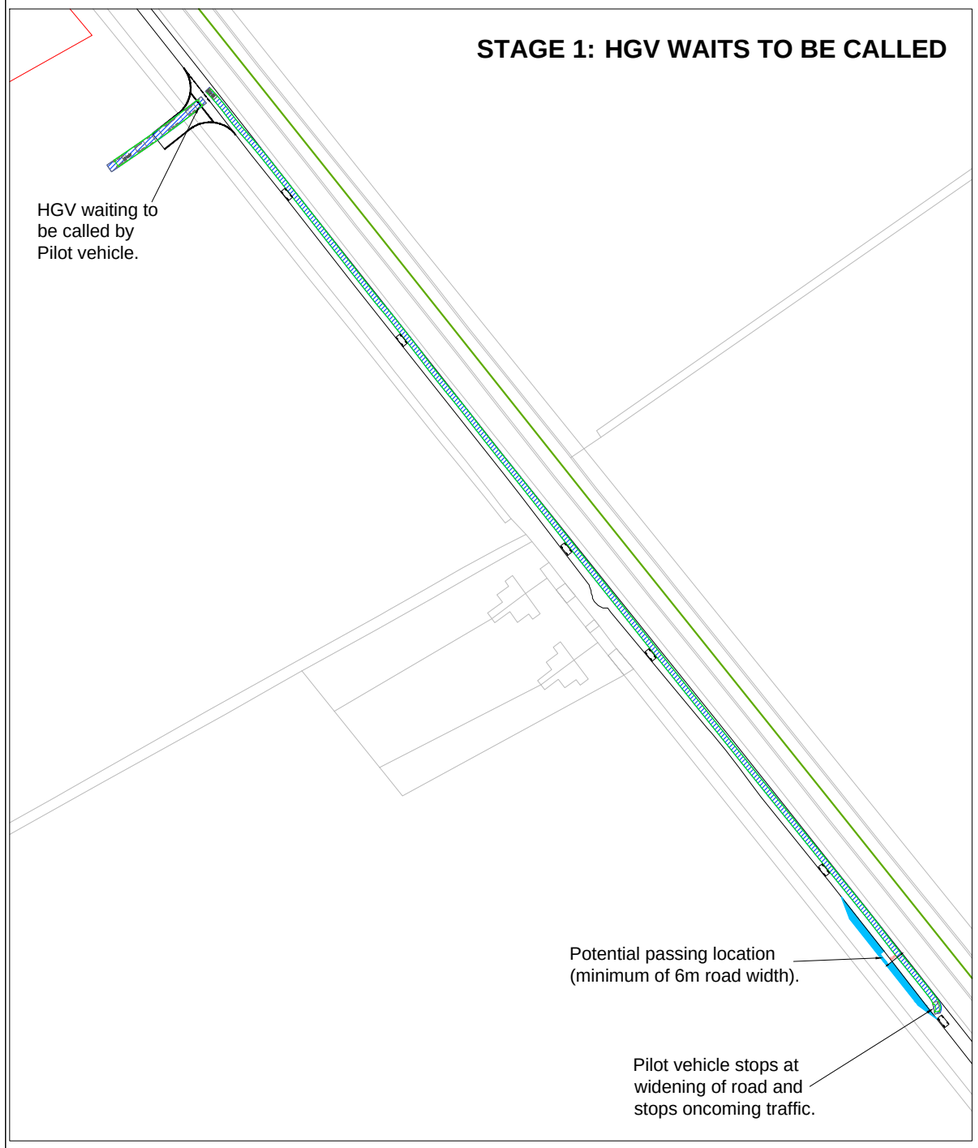
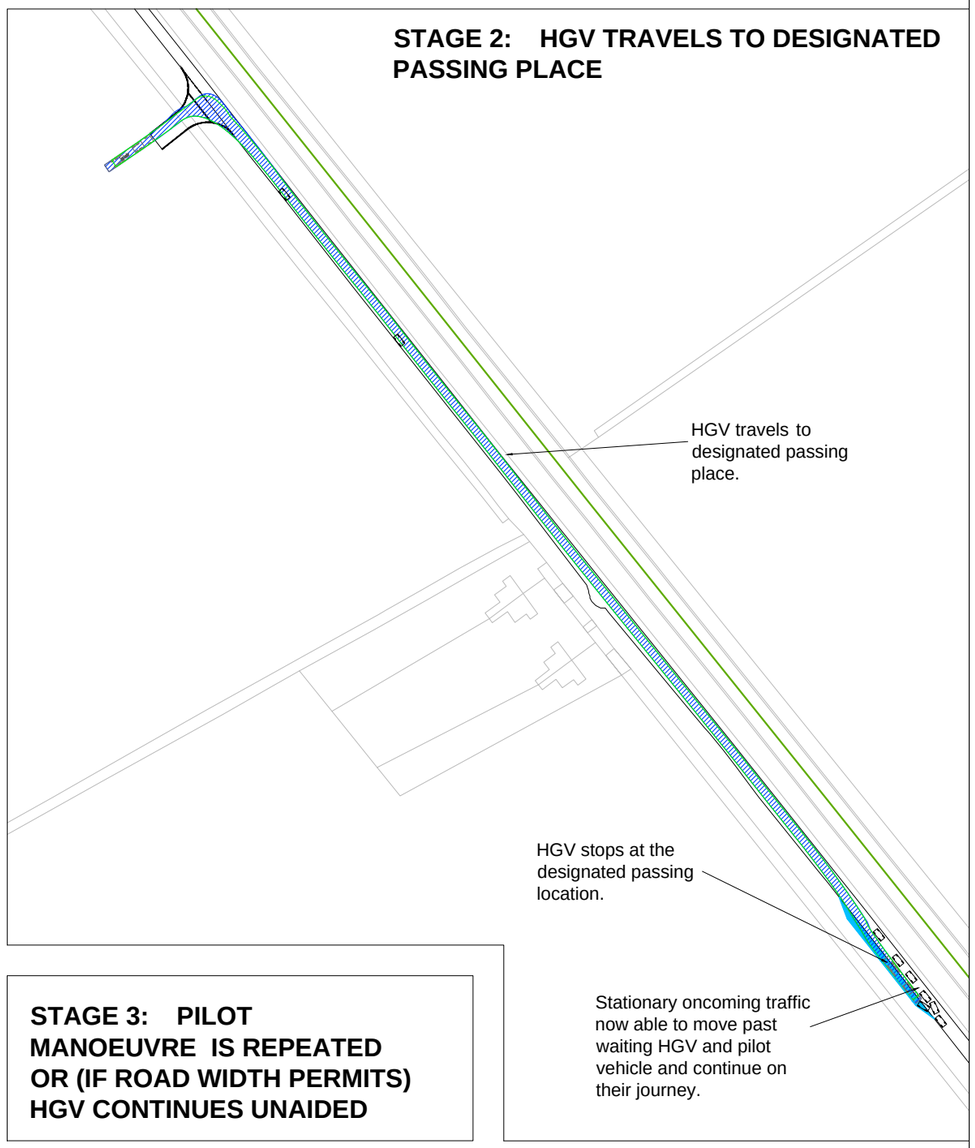
1.13 Appendix 3: PILOT VEHICLE CONCEPT

STAGE 1: HGV WAITS TO BE CALLED



STAGE 2: HGV TRAVELS TO DESIGNATED PASSING PLACE



STAGE 3: PILOT MANOEUVRE IS REPEATED OR (IF ROAD WIDTH PERMITS) HGV CONTINUES UNAIDED

Legend

PROJECT:	**TITLE:**
NORFOLK VANGUARD OFFSHORE WIND FARM	**PILOT VEHICLE WITH PASSING PLACES**

Rev	Date	By	Comment		
				Drg No	TP-PB47476-DR011
				Rev	D0.1
				Date	02.05.18
				Layout	LAYOUT

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