Norfolk Vanguard Offshore Wind Farm

Consultation Report

Appendix 25.12 Traffic Outgoing Documents Post-S42

Applicant: Norfolk Vanguard Limited
Document Reference: 25.12
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Date: June 2018
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Author: Royal HaskoningDHV

Photo: Kentish Flats Offshore Wind Farm

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Note / Memo

HaskoningDHV UK Ltd.
Transport & Planning

To:	Norfolk Vanguard Ltd
From:	Royal HaskoningDHV
Date:	23 March 2018
Copy:	Norfolk Vanguard Ltd
Our reference:	T&PPB4476N002F2.0
Classification:	Project related

Subject: **Norfolk Vanguard Substation – A47 Substation Access Review**

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1 Introduction

This Technical Note (TN) has been prepared on behalf of Norfolk Vanguard Ltd in relation to the Norfolk Vanguard Offshore Windfarm Project ('the Norfolk Vanguard Project'). The note sets out a review of the Norfolk Vanguard Project onshore access options from the A47.

During the construction phase of the Norfolk Vanguard Project, Heavy Goods Vehicles (HGVs) and workforce traffic will require access to project infrastructure sites south of the A47, namely the:

- Onshore Project Substation;
- Mobilisation Area 1 (MA1); and
- National Grid Substation Extension (NGSE).

A subset of National Grid's construction traffic will need to access the field to the north of the A47 (where an electricity pylon is situated) to complete the Overhead Line Modification (OHLM) works.

Figure 01 details the project infrastructure sites and the associated access study area. The purpose of this note is to evaluate potential access options to inform the Norfolk Vanguard Project design.

1.1 Engagement

To facilitate stakeholder engagement a Transport Expert Topic Group (ETG) was established, consisting of transportation professionals from Norfolk County Council, Highways England and Norfolk Vanguard Ltd. The ETG raised a number of issues with respect to potential access off the A47 all of which have informed this technical note. **Table 1.1** details ETG and other relevant input.

Table 1.1: A47 Consultation Feedback

Consultee	Date	Comment
Highways England	27 February 2017: First Expert Topic Group Meeting	The proposed existing access off the A47 to substation site was presented. It was agreed that a review of the accident record would be undertaken if this facility was to be relied upon. Highways England explained that current policy does

		not prevent a new access from the A47 from being created, however, preference was for an existing access point to be utilised.
Highways England	7 March 2017: EIA Traffic & Transport Method Statement Response (Red:60506522/DN052.0002 BN01)	Impact on A47 at substation site near to Necton raised, requiring detailed analysis of traffic generation and a review of historic collisions.
Highways England and Norfolk county Council	17 July 2017: Second Expert Topic Group Meeting	Queries raised relating to the existing National Grid substation extension site access and potential for a new access north of the site. NCC noted a historic u-turn strategy at Dereham requiring HGV traffic to left turn into Substation Site.
Local Stakeholders	8 September 2017: Site visit with local stakeholders	Stakeholders voiced concerns in utilising a u-turn strategy at Dereham to negate the need for right turns into the substation site.
National Grid	Email correspondence	Liaison with National Grid to determine total quantity of vehicles required to access north of the A47.

2 Access Options

The accesses to be reviewed are detailed within **Table 2.1** together with the associated infrastructure sites served. The access locations are presented in **Figure 02**.

Table 2.1: Potential Accesses

Access ID	Access Description	Access to Infrastructure	Eastings	Northings
A	Existing Necton Electricity Substation access	NV onshore project substation NV MA1 NGSE	588435	310734
B	Existing Farm access	NV onshore project substation NV MA1	589285	311409
C	Existing Field and Residential Access	NG OHLM	588482	310789
D	Existing Field and Residential Access	NG OHLM	588882	311088
D1	Existing Field Access	NG OHLM	588668	310932

2.1 Access A – Existing Necton Electricity Substation Access

Access A was historically used by famers to access the field south of the A47. In 2014 the access was upgraded to accommodate construction vehicle access for the National Grid and Dudgeon Offshore Windfarm substations collectively known as the Necton Electricity Substation (NES). The upgrade

comprised a simple T junction with grasscrete ‘over-run’ for abnormal loads. Construction work for the NES was completed by early 2017.

At present the access is currently shared by local farmers accessing farmland and by operational and maintenance vehicles in servicing the NES.

2.2 Access B – Existing Farm Access

Access B is a field and farm access leading south east off the A47. It comprises of a loose gravel track allowing access to various farmland and farm buildings.

2.3 Access C – Existing Field and Residential Access

Access C is a metalled access with a short driveway leading to a gated residential property. At this point the access track turns north east and runs parallel to the A47 through a wooded area for approximately 230m before entering the field with the electricity pylon. This access was proposed by National Grid as their preferred access point.

2.4 Access D – Existing Residential and Field Access

Access D is a field access located on Moor Lane approximately 270m north west of its junction with the A47. The A47/Moor Lane junction is a metalled bellmouth junction leading to a single vehicle track. Moor Lane is used to access farmland, residential properties and a number of farm buildings. This access has been proposed as an alternative to Access C by National Grid.

2.5 Access D1 – Existing Field Access

Access D1 is an existing field access located on the northern verge of the A47 approximately 300 north east of the existing NES access. The access allows immediate access to the field with the electricity pylon. This access has been identified as an alternative to Access C during the course of this study.

3 Baseline Situation

3.1 Highway Environment

The A47 trunk road is identified in the Norfolk County Council (NCC) Local Transport Plan (Norfolk County Council, 2011) as one of Norfolk’s key strategic connections and is part of the Strategic Road Network, managed by Highways England.

Within the A47 access study area, the A47 is a relatively straight single carriageway road of typical road width and alignment for a trunk road and is subject to the national speed limit with no street lights present. There is a slight hill with a gradient of approximately 3%. The crest of the hill is located approximately 200m to the northeast of the existing NES access.

The A47 is bounded to the north by established hedgerows, woodland and agricultural land. The existing NES and further agricultural land is located to the south of the A47 with a number of hedgerows that border along the extent of the southern A47 verge.

3.2 Background Traffic Data

Traffic flow data obtained from the Department of Transport confirms a 24 hour Annual Average Daily Flows (AADF) of 15,380 total vehicles including 1,546 HGV component.

Speed surveys were undertaken within the access study area during August and September 2017. The location of the surveys can be observed in **Figure 03,** the results of the speed surveys are detailed **Table 3.1**.

Table 3.1: Speed Survey Results

Speed Survey ID	Date	85th Percentile (mph) Northbound	85th Percentile (mph) Southbound
SS1	16.09.17 to 22.09.17	55.5	54.4
SS2	22.08.17 to 28.08.17	54.1	53.5

The results of the speed surveys indicate that vehicle speeds passing the proposed site access are below the posted 60mph speed limit with, a maximum 85th percentile of 55.5 mph recorded.

3.3 Personal Injury Collision (PIC) Data

To assess whether there are any inherent road safety issues within the access study area, detailed STATS19[1] data have been obtained from NCC for the five year period, 01.05.12 to 30.04.17. **Figure 03** details the location of the PICs within the access study area and **Appendix A** provides the STATS19 data.

A review of the STATS19 data has identified two collisions occurring on the A47 within the access study area. The first collision (PIC1) occurred north east of access A and C and involved a driver travelling eastbound who fell asleep at the wheel and veered into an oncoming car. The second collision (PIC2) involved a rear end shunt which occurred when vehicles travelling eastbound braked heavily in the vicinity of 'Spicers Corner' junction. Both collisions resulted in slight injuries.

From the analysis of PICs it is concluded that there is no inherent pattern of collisions identified. Furthermore, neither of the collisions involved HGV traffic and only one (PIC2) was located within 100m of a proposed access.

It should be noted the STATS19 data sourced covers the construction period for the Necton Electricity Substation.

[1] Accidents on the public highway that are reported to the police and which involve injury or death are recorded by the police on a STATS19 form. The form collects a wide variety of information about the accident (such as time, date, location, road conditions).

4 Norfolk Vanguard Traffic Demand

4.1 Vehicle Types

The vehicle types expected to access the Norfolk Vanguard infrastructure sites during construction will include:

- concrete trucks;
- tipper trucks;
- articulated low loader vehicles;
- cranes;
- Light Commercial Vehicles (LCVs);
- site plant; and
- Abnormal Indivisible Loads. (AILs).

Forecast vehicle trips during the project construction period have been extrapolated from the recently submitted Norfolk Vanguard Preliminary Environmental Information Report and are reproduced within **Table 4.1.**

Table 4.1 Norfolk Vanguard Traffic Demand

Norfolk Vanguard Work Activity	Daily Movements		Peak Hour Movements	
	LCVs	HGVs	LCVs	HGVs
Onshore Project Substation	40	58	20	6
National Grid Substation Extension*	40	26	20	3
MA 1 (Cable Route)	40	74	20	8
Totals	120	158	60	17
Total Vehicle Movements	278		77	

* A total of 200 HGVs and 40 LCV movements will be required to access north off the A47 (Access C/D) to complete the Overhead Line Modifications work. These movements would be conducted over two separate construction peaks lasting a week each and separated by a gap of four to six months.

5 Access Standards

The required standard for each access location has been evaluated against the criteria set out in the Design Manual for Roads and Bridges (Department for Transport, 1995). **Table 5.1** summarises.

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Table 5.1 DMRB Access Requirements

Access ID	Background AADT Flows		Forecast Daily Construction Flows		Existing Available Visibility (Compliant speed)			DMRB 'Right turn' Traffic Flow Criteria Met[1]	Does Existing Access meet DMRB standards?
	Tot Veh	HGV	Tot Veh	HGV	Left	Right	Vertical		
A	15,380	1,546	278	158	215m (60mph applicable)	215m (60mph applicable)	Yes	Yes – Right turn required	No
B					215m (60mph applicable)	150m (60mph applicable)	Yes	Yes – Right turn required	No
C			24	20	215m (60mph applicable)	215m (60mph applicable)	Yes	Yes – Right turn required	No
D					113m (60mph applicable)	215m (60mph applicable)	Yes	Yes – Right turn required	No
D1					215m (60mph applicable)	215m (60mph applicable)	No	Yes – Right turn required	No

[1]DMRB states that upgrading at existing simple junctions to provide a right turn should always be considered where the minor road flows exceed 500 vehicles 2-way AADT, a right turning accident problem is evident or where vehicles waiting on the major road to turn right inhibit the through flow and create a hazard. The key criteria stated in DMRB to provide a Ghost Island junction with a right turn facility includes the major road traffic flows exceeding13,000 vehicles per day.

Table 5.1 shows that all five accesses currently do not conform to the standards set out in the DMRB for right-turning traffic to be accommodated and each would require engineering to be fully compliant with standards.

6 Access Reviews and Proposals.

A review of each access has been undertaken with reference to the information set out in **Sections 2**, **3**, **4** and **5**. An assessment of each option has been undertaken using the following parameters:

- Highway Safety;
- Environment; and
- Infrastructure requirement.

6.1 Access A Review

It is noted that the existing access arrangement is below the standard of what would be required for a modern trunk road access serving traffic of significant volumes of (side-road) traffic. To counteract this, a traffic management strategy was employed during the construction of the NES which precluded vehicles from making a right turn in, or right turn out of the site. Recognising these issues, Highways England has directed the following criteria must be met for the existing access to be considered with minimal modifications:

1) A review of PICs to evidence no patterns (clusters) attributable to the access design. The PIC review must cover the duration of the construction of the existing Necton Substation.

2) A forecast traffic demand no higher for the NES construction phase than that of the existing Necton sub-station.

3) A commitment from Norfolk Vanguard Limited to employ a 'no right turn traffic management strategy'.

To assist with the review, Royal HaskoningDHV has obtained anecdotal evidence from the NES substation construction contractors, Wilding Construction Ltd (WCL). WCL were responsible for site management of all partners involved in the construction of the NES (Siemens, Statoil, Laing O'Rourke and National Grid).

Criterion 1

Construction for the NES commenced in 2014 and was completed by early 2017. Construction activity peaked during summer 2016. **Section 3.3** of this report contains a review of PIC data covering these periods and concludes there was no-inherent highway safety issue.

Criterion 2

Section 4 confirms a forecast traffic demand for the construction of Norfolk Vanguard of 278 daily movements, consisting of 158 HGV movements and 120 light vehicle movements.

WCL feedback indicates at the height of the Construction works for the NES a total of 400 operatives and approximately 230 cars were accessing the site every day along with an average of 25-30 deliveries of various vehicle sizes from concrete lorries to tipper trucks.

The total NES daily peak construction traffic movements equates to approximately 520 movements per day (noting the HGV component is 60 movements).

This anecdotal evidence indicates that the forecast traffic flows for the Norfolk Vanguard Project could comfortably meet Criterion 2 albeit a higher HGV demand is predicted [to that of the NES].

Should the forecast higher HGV component be of concern to Highways England, daily movements could be controlled to NES levels by a Construction Traffic Management Plan but this would potentially impact on construction duration.

Criterion 3

The NES traffic management strategy consisted of an enforced restriction on right turns in and out of the site. This required HGV arrivals from the east to travel eastbound on the A47 turning off at the A1075 junction at Dereham and then returning westbound back to the Substation access. This journey would entail a diversion route totalling 15.5 miles.

HGV departures to the east would travel westbound to the 'McDonalds' Norwich Road Roundabout before 'u' turning and returning eastbound. This journey would entail a diversion route totalling 5.5 miles.

Light vehicles were also subject to the enforced restriction but had the option of a shorter eastbound diversion by utilising the layby at Spicers Corner to make a right turn to return westbound.

Feedback from WCL indicates the strategy (backed up with reporting and enforcement) was adhered to by all contractors (sub-station, cabling and National Grid).

If the NES traffic management strategy was applied to the Norfolk Vanguard Project, based on current forecasts this would lead to 79 HGVs per day making the 15.5 mile diversion via Dereham - a total increase of 1224.5 miles per day. This is likely to manifest in increased tender prices due to larger fleet sizes and fuel costs.

A further consideration is traffic growth subsequent to the NES consent (2012). It is conceivable that the characteristic of the highway network has changed as the economy has rallied in the region.

Specific to the diversion route, it is notable from site visits that Dereham has significant traffic congestion which particular impacts on two signalised junctions located at Tavern Lane/ Yaxham Road and Yaxham Road/ Greens Road. If NES traffic management strategy was to be implemented in the modern era it is recommended that a full assessment of capacity, delay, noise and air quality is undertaken for the Dereham diversion route.

To alleviate the restrictions associated with utilising the existing junction arrangement a standard DMRB[2] compliant design has been considered at this location (notated as Access A1).

The following subsections review Access A and A1 in context with the adopted study parameters.

Highway Safety

From a highway safety perspective, Access A currently provides the requisite highway visibility of 215m for a 60mph road in both directions. Within the visibility envelope the highway has a straight horizontal alignment with a slight gradient which rises to the eastbound. DMRB Compliant vertical visibility is achievable for Access A.

Access A1 would also achieve all the highway safety parameters as detailed for Access A.

Environmental Impact (Access A)

No significant vegetation clearance is required to obtain visibility splays. As previously noted, there are indirect environmental impact concerns with respect to the diversion route through Dereham.

Environmental Impact (Access A1)

From an ecology perspective, approximately 772m^2 of vegetation would need to be removed to allow for widening of the A47 and additional visibility splay envelopes. The timescales would be dictated by seasonal constraints.

Infrastructure Requirements (Access A1 only)

The following infrastructure improvements would be required:

- Removal of the existing grasscrete.
- Widening of the A47 carriageway to include a right turn lane and ghost island facility.
- Removal of existing vegetation to allow for highway widening and visibility splays.
- Realignment and widening of existing access approach to cater for a 7.3m approach width allowing passing of two HGVs.
- Construction of new a new bellmouth with 15m corner radii (potentially wider for abnormal loads).

In addition, there will be increased costs related to traffic management to allow existing NES and farm traffic to continue to use the access.

[2] Design speed of 100km/h (60mph) including ghost island right turn facility with turning lane width of 3.5m and queuing storage length of 49.5m.

The widening of the A47 carriageway would occur within land under Norfolk Vanguard control or public highway and would require night time working over several weeks.

The design of the access should allow for infrequent AILs to be delivered to site without further widening or strengthening work to be completed outside of the upgraded access envelope.

6.2 Access B Review

The current Access B is approximately 16m north of the existing Spicers Corner junction with the A47 to the north. The layout of these junctions creates a left-right stagger which is not compliant with DMRB standards.

Based on the current baseflows and forecast Norfolk Vanguard project construction flows, Access B would require upgrading to a DMRB standard compliant access. A new access point would need to be created approximately 68m to the south west of the existing access to create a DMRB[3] compliant right-left stagger with a minimum 50m distance between both junction centrelines.

The following subsections review Access B in context with the adopted study parameters.

Highway Safety

From an existing highway perspective, there has been no collision patterns identified as described in Section 3.3. Access B would be standard compliant and meet all the required visibility splays for a 100kph design speed.

Environmental Impact

From an ecology perspective, the new access would require the removal of existing vegetation and the potential removal of a number of established trees. The vegetation clearance would encompass the whole of the visibility envelope and to the extents of the new access and A47 widening works this would comprise of approximately 750m^2 of land.

Infrastructure Requirements

The following infrastructure improvements would be required:

- Widening of the A47 carriageway to include a right turn lane and ghost island facility.
- Construction of a new access to incorporate a bellmouth with 15m corner radii and a 7.3m approach width allowing passing of two HGVs (potentially wider for abnormal loads).
- Additional internal track to tie back into the substation access track.

[3] Design speed of 100km/h (60mph) including ghost island right turn facility with turning lane width of 3.5m and queuing storage length of 49.5m.

The required visibility of 215m to the east would be achieved following relocation of the access 68m further south and the widening works on the southern verge of the land within Norfolk Vanguard control or public highway land.

The construction works would require night time working with substantial temporary traffic management required over several weeks.

The design of the access should allow for infrequent AILs to be delivered to site without further widening or strengthening work to be completed outside of the upgraded access envelope.

6.3 Access C and D Review

The following subsections review Accesses C, D and D1 in context with the adopted study parameters.

Highway Safety

From a highway safety perspective Access C could achieve the requisite 215m visibility splays with vegetation cutback in both directions. Access D would require the cutback/remove approximately 100m of established hedgerow to the east to be compliant. Both accesses are situated on relatively straight roads on a hill with approximately a 3% gradient.

Both Access C and Access D would introduce conflicts with either existing farm or residential traffic and neither the access track (Access C) or Moor Lane (Access D) would allow two way HGV traffic movements. At both access locations vehicles exiting the A47 may have to wait for traffic departing the access points onto the A47. This has the potential of causing vehicles to queue back from these pinch points causing an obstruction to the A47 flow of traffic.

Recognising these road safety concerns, a potential alternative access in this vicinity has been identified (notated as D1). Access D1 is an existing field access 334m northeast of Access D with direct access to the field with the electricity pylon. The access could be widened and two-way HGV movements would be possible with no sharing of road space with existing farm traffic or other public vehicles.

Horizontal visibility is good (215m) in both directions. Vertical visibility is compromised approaching the junction from both directions with a minimum vertical height achievable of 0.48m from the west and 0.33m from the east. These heights are based on the height above the carriageway an approaching motorist can view over the hill crest to the access from a stopping sight distance of 215m (100kph design speed). These measurements do not meet the required 0.26m minimum height detailed in the DMRB and therefore Access D1 would require a speed restriction to achieve the desired forward visibility.

Environmental Impact

From an ecology perspective, all the accesses would require the removal of existing vegetation and the potential removal of a number of established trees. The vegetation clearance would encompass the whole of the visibility envelope.

Infrastructure Requirements

There is minimal scope for junction widening at Access C and D to allow the safe two-way movements of construction HGVs. Access C is constrained by an immediate right hand bend, while Access D is constrained by private properties and a drainage ditch to the north of the access route.

Access D1 has greater scope for junction improvements and would require the following infrastructure improvements:

- Removal of existing vegetation to allow for visibility splays.
- Widening of existing access approach to cater for a 6m approach width allowing passing of two HGVs.
- Construction of new a new bellmouth with 10m corner radii.

Proposed Access Management Strategy

A total of 200 HGVs and 40 LCVs would be required to access the Electricity Pylon field to complete the OHLM works. The works would be subject to two construction peaks of between 1-4 weeks with a 4-6 month gap between each peak.

It is therefore considered that constructing a DMRB compliant right-turn access would be disproportional to the traffic demand. As an alternative, it is proposed to implement an Access Management Strategy for the duration of the OHLM works. The Access Management Strategy would eradicate right turn maneuverers on the A47 by enforcing left in, left out manoeuvres to minimise infrastructure provision. and would include options based on which substation access (A or B) is taken forward.

All OHLM traffic would check in at the main NGSE works using Access A or A1. Traffic would then exit left out of Access A or A1 and perform a u-turn manoeuvre at the roundabout junction between the A47 and Norwich Road. A left turn in to either Access C, D or D1 could then be completed. This strategy would require an approximate 4.5mile diversion for a forecast 240 vehicles and could be enforced within the CTMP.

7 Summary and Conclusions

Table 7.1 provides a summary of the Norfolk Vanguard Project access review and applies a simple scoring system to differentiate between option.

Table 7.1. Access Scoring summary

Access Options	Highway Safety	Environmental Impacts	Infrastructure Requirements	Totals	Comments
A	2	2	5	9	- Requires u-turn traffic management strategy approval. - Potential capacity, delay, noise and air quality impacts within Dereham associated with diversion route.
A1	5	3	1	9	DMRB compliant access, significant engineering and environmental works required.

B	5	3	1	9	DMRB compliant access, significant engineering and environmental works required.
C	1	2	3	6	- Requires u-turn access management strategy approval. - Potential highway safety concern for A47 traffic associated with narrow access/egress.
D	1	2	4	7	- Requires u-turn access management strategy approval. - Potential highway safety concern for A47 traffic associated with narrow access/egress.
D1	4	2	3	9	- Requires u-turn access management strategy approval. - Requires a temporary speed limit for the duration of the OHLM works.
Highway safety scoring system used 1-5 (1 indicates low safety, 5 indicates high safety).					
Environmental impacts scoring system used 1-5 (1 indicates major impact, 5 indicates minimal impact).					
Infrastructure requirements scoring system used 1-5 (1 indicates greatest total cost, 5 indicates least total cost).					

For the project infrastructure sites south of the A47, Accesses A, A1 and B all score identical.

It is considered that the traffic management stipulations associated with Access A would have a significant impact on the efficient construction of the sub-station which in turn represents an economical risk. Access A1 and B have substantial infrastructure costs associated with implementing a standard compliant design.

Notwithstanding, based on the road safety and environmental impact assessment, there are no overriding reasons to reject any of these three access options. Furthermore, there are no overriding technical/policy constraints preventing both Access A/A1 and B being utilised, rather, there are potential road safety benefits in removing vehicle conflicts between Substation and NGES/OHLM works.

With regard to the OHLM works, Accesses C and D have constrained access/egress which give rise to safety concerns on the A47. Access D1 is the clear preferred option, but will require an approval of a temporary speed limit for the duration of the works.

APPENDICES

Royal HaskoningDHV
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APPENDIX A

STATS 19 Data

Royal HaskoningDHV
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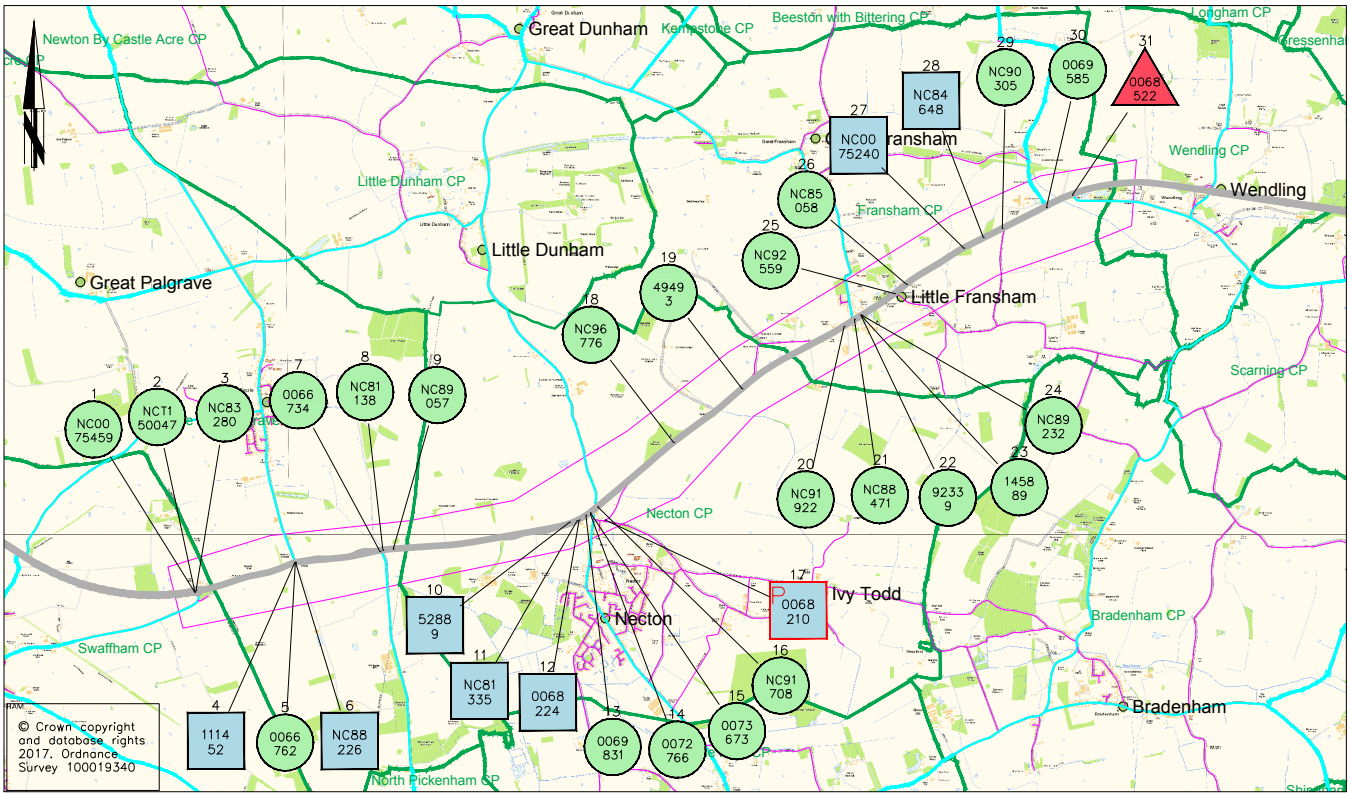
Five years to end April 2017



Reference Number	1 NC00 75459	2 NCT1 50047	3 NC83 280	4 1114 52	5 0066 762	5a 0066 762	6 NC88 226	7 0066 734	8 NC81 138	9 NC89 057	10 5288 9	11 NC81 335	12 0068 224	13 0069 831	14 0072 766	15 0073 673
Date / Day	Fr 01	We 11	Mo 25	Fr 30	Fr 10		Th 19	Fr 03	Mo 09	Sa 21	We 09	Mo 23	Th 29	Mo 04	Su 14	Tu 20
Month	Nov	Mar	Aug	Sep	Aug		Feb	Aug	Jun	Mar	Mar	Jun	Nov	Mar	Jul	Aug
Year	2013	2015	2014	2016	2012		2015	2012	2014	2015	2016	2014	2012	2013	2013	2013
Time	1300	0845	1500	1733	0640		1115	1445	0845	1303	0638	2207	0920	1040	1915	1139
Severity	Sl	Sl	Sl	Se	Sl		Se	Sl	Sl	Sl	Se	Se	Se	Sl	Sl	Sl
Dark / Lit																
Weather Conditions																
Road Surface																
Special Conditions																
Carriageway Hazards																
Vehicle Manoeuvres																
Vehicle 1	32	58	62	20	50	43	28	77	41	19	50	24	19	62	18	77
Vehicle 2	47	34		49	58		67	39	57	50	30		84	35	56	20
Vehicle 3	77	49			55				53	48						
Vehicle 4					57											
Casualty / age	3	58	62	49	58 55		28 67	39 15	41 57	19 19 48 14 16	50	24	79	35 0	56	20

Reference Number	16 NC91 708	17 0068 210	18 NC96 776	19 4949 3	20 NC91 922	21 NC88 471	22 9233 9	23 1458 89	24 NC89 232	25 NC92 559	26 NC85 058	27 NC00 75240	28 NC84 648	29 NC90 305	30 0069 585	31 0068 522
Date / Day	Fr 03	Tu 04	Tu 08	Su 07	Sa 11	We 04	We 06	Tu 29	Fr 27	We 05	Su 26	Th 24	Tu 14	Mo 11	Th 14	Mo 24
Month	Jul	Dec	Dec	Feb	Jul	Mar	Jul	Nov	Mar	Aug	Oct	Oct	Oct	May	Feb	Dec
Year	2015	2012	2015	2016	2015	2015	2016	2016	2015	2015	2014	2013	2014	2015	2013	2012
Time	1514	1630	0856	1100	1600	1640	0745	0815	0750	1322	1235	2250	0640	1717	1010	1430
Severity	Sl	Se	Sl	Sl	Sl	Sl	Sl	Sl	Sl	Sl	Sl	Se	Se	Sl	Sl	Fa
Dark / Lit																
Weather Conditions																
Road Surface																
Special Conditions																
Carriageway Hazards																
Vehicle Manoeuvres																
Vehicle 1	39	47	25	77	57	64	49	17	29	62	73	17	31	55	54	77
Vehicle 2	42		21	60	62		47	35	29	43	52	32	77	42	22	69
Vehicle 3								43	43					63		
Vehicle 4																
Casualty / age	39 42	16	21	59	62 60 60 60	64	49 47	35	29	62	52 11 17 40	17	31	42	22	77 76 69

Full Details Report Summary -

Accidents Found Date Range: 03/08/2012 - 29/11/2016
Grid Coordinate Range: 584290, 309490 - 592050, 313000
Accident Date BETWEEN '01-May-2012' AND '30-Apr-2017'

Accident Severity

	2012	2013	2014	2015	2016	Total
Fatal	**1**	**0**	**0**	**0**	**0**	**1**
Serious	**2**	**1**	**2**	**1**	**2**	**8**
Slight	**2**	**5**	**3**	**9**	**3**	**22**
Total	**5**	**6**	**5**	**10**	**5**	**31**

Casualty Severity

	2012	2013	2014	2015	2016	Total
Fatal	**3**	**0**	**0**	**0**	**0**	**3**
Serious	**2**	**1**	**2**	**1**	**2**	**8**
Slight	**4**	**6**	**7**	**18**	**4**	**39**
Total	**9**	**7**	**9**	**19**	**6**	**50**

Casualty KSI

	2012	2013	2014	2015	2016	Total
Adult KSI	**5**	**1**	**2**	**1**	**2**	**11**
Slight	**4**	**6**	**7**	**18**	**4**	**39**
Total	**9**	**7**	**9**	**19**	**6**	**50**

1.3 Accident Reference:NC96776 Slight NECTON, A47 APPROX 450MTRS SOUTH WEST OF MOOR LANE Accident 18 of 31

1.7 Date & 1.9 Time.....Tuesday 08/12/2015 08:56
1.11 Grid co-ordinates.....588525/310812
1.10 Local Authority.....Breckland
1.12/1.13 1st road identity..A47
1.18/1.19 2nd road identity..
1.22 Weather.....Rain
1.21 Light conditions.....Daylight
1.20a Crossing(human).....No Human control within 50m
1.20b Crossing(physical).....No crossing facility within 5
1.15 Speed limit.....60 Mph
1.14 Road type.....Single c'way
1.16 Junction detail.....Not at or within 20m of junction
1.17 Junction control.....
1.24 Special conditions...None
1.25 Carriageway hazards..None
1.5 Number of vehicles...2
1.6 Number of casualties.1
1.23 Surface.....Wet

Did a police officer attend?
Yes

Accident Description
V1 ON A47 HEADED TOWARDS NORWICH WHEN DRIVER OF V1 FELL ASLEEP AT WHEEL DRIFTED ACROSS C/WAY AND HIT V2 IN OPPOSITE DIRECTION

2 Vehicles

2.4 Veh ref no.....1
2.17 Other vehicle.....0
2.5 Vehicle class.....Car
2.10 Junction location...Not at junction
2.9 Restricted location.On main carriageway
2.8 Movement from/to....South west North east
2.7 Manoeuvres.....Going ahead other
2.11 Skidding.....No
2.13 Left c'way.....Left c'way Offside
2.6 Towing.....No
2.28 Foreign vehicle.....Not foreign
2.16 First impact.....Offside
2.12 Hit object in c'way..None
2.14 Hit object off c'way.None
2.18 Parts damaged..... / /
2.21 Driver gender.....Male
2.22 Driver age.....25
2.24 Hit and Run.....No
2.23 Breath test.....Negative
2.29 Journey purpose.....Commuting to/from work

2.4 Veh ref no.....2
2.17 Other vehicle.....0
2.5 Vehicle class.....Car
2.10 Junction location...Not at junction
2.9 Restricted location.On main carriageway
2.8 Movement from/to....North east South west
2.7 Manoeuvres.....Going ahead other
2.11 Skidding.....No
2.13 Left c'way.....Did not leave c'way
2.6 Towing.....No
2.28 Foreign vehicle.....Not foreign
2.16 First impact.....Offside
2.12 Hit object in c'way..None
2.14 Hit object off c'way.None
2.18 Parts damaged..... / /
2.21 Driver gender.....Male
2.22 Driver age.....21
2.24 Hit and Run.....No
2.23 Breath test.....Negative
2.29 Journey purpose.....Commuting to/from work

1 Casualty

3.5 Cas ref no.....1
3.6 Casualty class.....Driver or Rider
3.7 Gender.....Male
3.8 Age.....21
3.9 Severity.....Slight
3.4 Vehicle no.....2
3.12 Ped Direction.....Not a pedestrian
3.15 Car passenger.....No
3.16 PSV passenger.....No
3.14 Seat belt usage.....Worn but not independently confirmed
3.17 School pupil.....Other
(3.19 School .....)
3.10 Pedestrian location..Not a pedestrian
3.11 Pedestrian movement..Not a pedestrian
3.19 Roadworker injured...No

1.3 Accident Reference:49493 Slight A47 Accident 19 of 31

1.7 Date & 1.9 Time.....Sunday 07/02/2016 11:00
1.11 Grid co-ordinates.....589129/311289
1.10 Local Authority.....King's Lynn and West Norfolk
1.12/1.13 1st road identity..A47
1.18/1.19 2nd road identity..
1.22 Weather.....Unknown
1.21 Light conditions.....Daylight
1.20a Crossing(human).....No Human control within 50m
1.20b Crossing(physical).....No crossing facility within 5
1.15 Speed limit.....60 Mph
1.14 Road type.....Single c'way
1.16 Junction detail.....Not at or within 20m of junction
1.17 Junction control.....
1.24 Special conditions...None
1.25 Carriageway hazards..None
1.5 Number of vehicles...2
1.6 Number of casualties.1
1.23 Surface.....Dry

Did a police officer attend?

No - reported over the counter

Accident Description

VEH2 IN A LINE OF TRAFFIC ON THE A47 TRAVELLING TOWARDS FRANSHAM. THE LINE OF TRAFFIC BRAKED HEAVILY AS DID VEH2, BUT VEH1 COLLIDED WITH THE REAR OF VEH2 CAUSING WHIPLASH INJURIES TO THE PASSANGER IN THE FRONT OF VEH2.

2 Vehicles

2.4 Veh ref no.....1
2.17 Other vehicle.....0
2.5 Vehicle class.....Car
2.10 Junction location...Not at junction
2.9 Restricted location.On main carriageway
2.8 Movement from/to....East West
2.7 Manoeuvres.....Going ahead other
2.11 Skidding.....No
2.13 Left c'way.....Did not leave c'way
2.6 Towing.....No
2.28 Foreign vehicle.....Not foreign
2.16 First impact.....Front
2.12 Hit object in c'way..None
2.14 Hit object off c'way.None
2.18 Parts damaged..... / /
2.21 Driver gender.....Male
2.22 Driver age.....-1
2.24 Hit and Run.....No
2.23 Breath test.....Not contacted
2.29 Journey purpose.....Unknown

2.4 Veh ref no.....2
2.17 Other vehicle.....0
2.5 Vehicle class.....Car
2.10 Junction location...Not at junction
2.9 Restricted location.On main carriageway
2.8 Movement from/to....East West
2.7 Manoeuvres.....Going ahead other
2.11 Skidding.....No
2.13 Left c'way.....Did not leave c'way
2.6 Towing.....No
2.28 Foreign vehicle.....Not foreign
2.16 First impact.....Back
2.12 Hit object in c'way..None
2.14 Hit object off c'way.None
2.18 Parts damaged..... / /
2.21 Driver gender.....Not known
2.22 Driver age.....60
2.24 Hit and Run.....No
2.23 Breath test.....Not contacted
2.29 Journey purpose.....Unknown

1 Casualty

3.5 Cas ref no.....1
3.6 Casualty class.....Passenger
3.7 Gender.....Female
3.8 Age.....59
3.9 Severity.....Slight
3.4 Vehicle no.....2
3.12 Ped Direction.....Not a pedestrian
3.15 Car passenger.....Front
3.16 PSV passenger.....No
3.14 Seat belt usage.....Unknown
3.13 School pupil.....Other
(3.19 School .....)
3.10 Pedestrian location..Not a pedestrian
3.11 Pedestrian movement..Not a pedestrian
3.19 Roadworker injured...No

FIGURES

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FIGURE 1

Site Location

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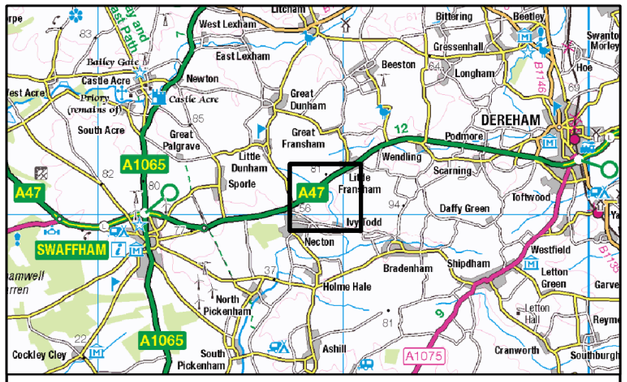
588000 589000 590000

312000 311000 310000



Legend:

- Proposed Norfolk Vanguard onshore project substation
- Red Line Boundary
- A47 Access Study Area

Note:
PMAI to be located within Red Line Boundary
at a location to be determined

Project:	Report:
Norfolk Vanguard	A47 Access Review

Title:

Site Location Plan

Figure: 1 Drawing No: PB4476-003-00X-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/01/2018	GC	RE	A3	1:10,000

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

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FIGURE 2

Access Options

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588000 589000 590000

312000 311000 310000

N

B

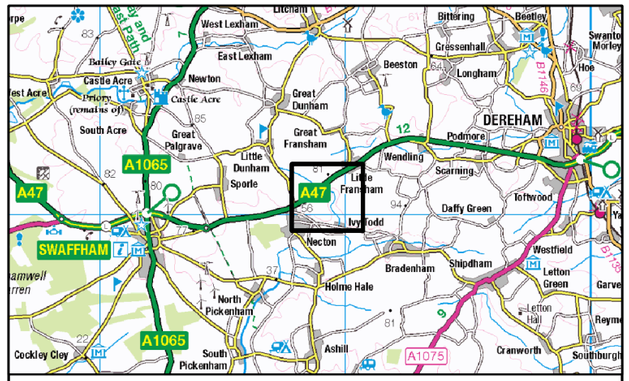
D

D1

C

A

0 200 400 Meters



Legend:

- Proposed Norfolk Vanguard onshore project substation
- Access Point ID
- Access Options for National Grid Overhead Line Modification Works
- Access Options for Norfolk Vanguard Onshore Project Substation and National Grids Substation Extension

Project:	Report:
Norfolk Vanguard	A47 Access Review

Title: Access Options

Figure: 2 | Drawing No: PB4476-003-00X-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/01/2018	GC	RE	A3	1:10,000

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

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FIGURE 3

Speed Survey and Personal Injury Collision Locations

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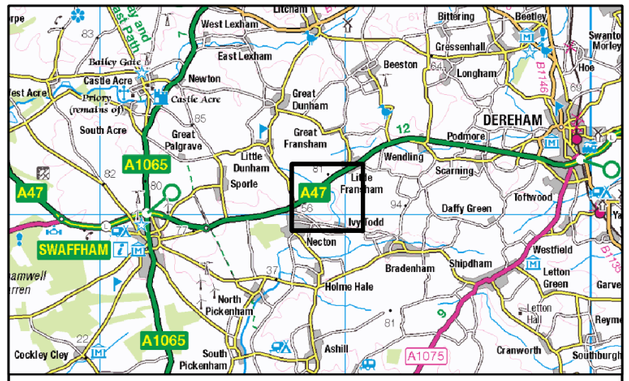
588000 589000 590000

312000 311000 310000

N

A
SS 1
C
PIC 1
D1
D
PIC 2
B
SS 2

0 200 400 Meters



Legend:

- Proposed Norfolk Vanguard onshore project substation
- A47 Access Study
- Access Point ID
- Injury Collision Location
- Speed Survey Locations

Project:	Report:
Norfolk Vanguard	A47 Access Review

Title:

Speed Survey and Personal Injury Collision Locations

Figure:	Drawing No:
1	PB4476-003-00X-003

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

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