Norfolk Vanguard Offshore Wind Farm

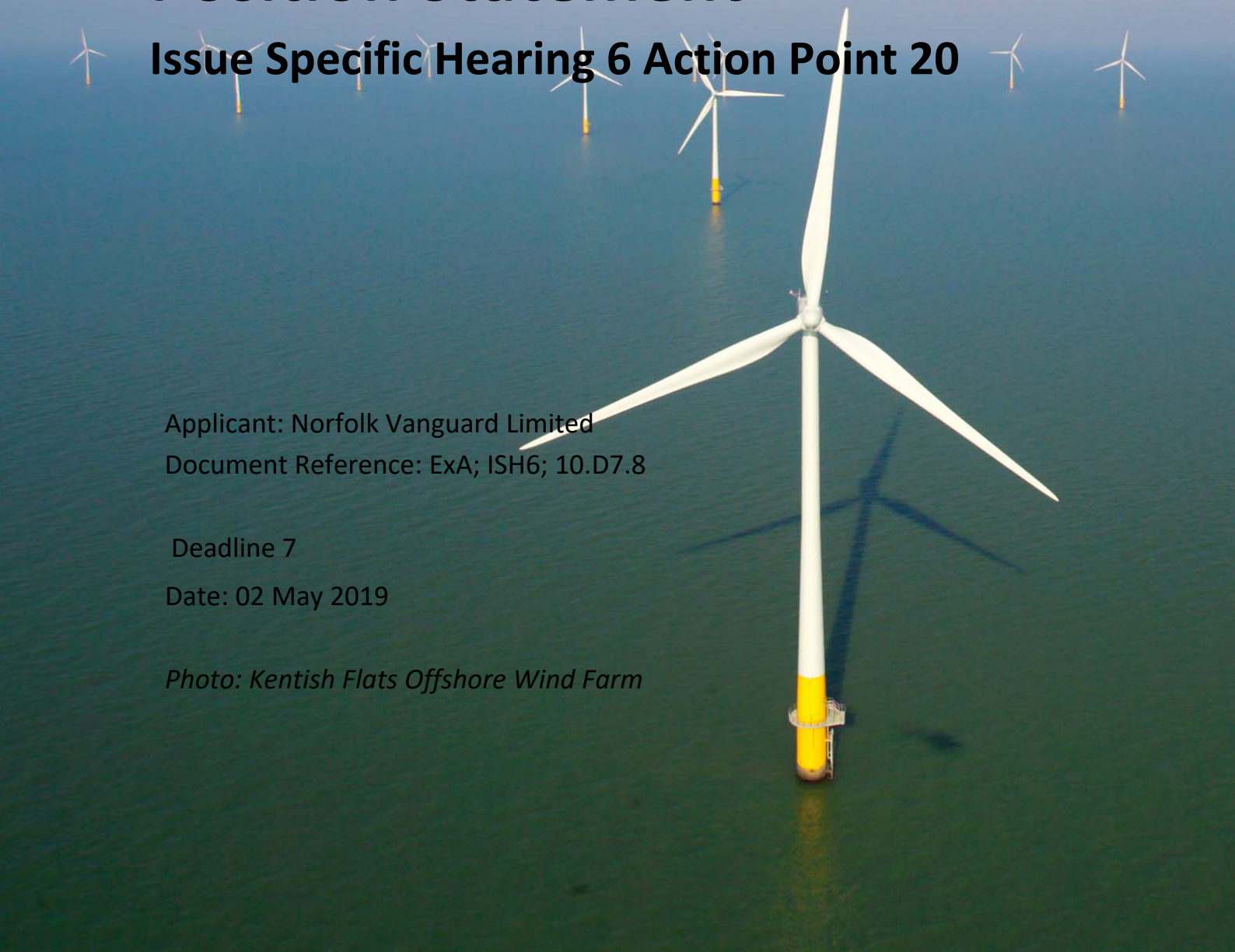
Norfolk Vanguard Ltd

North Norfolk District Council

Little London and Happisburgh

Position Statement

Issue Specific Hearing 6 Action Point 20



Applicant: Norfolk Vanguard Limited

Document Reference: ExA; ISH6; 10.D7.8

Deadline 7

Date: 02 May 2019

Photo: Kentish Flats Offshore Wind Farm

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1 Little London and Happisburgh

1.1 Introduction

1. During the Issue Specific Hearing on Environmental Matters (ISH6) on the 24 April 2019, the Examining Authority (ExA) requested a position statement from the Applicant in relation to information requested by North Norfolk District Council:

    - Impacts and mitigation at Little London; and
    - Noise mitigation at Happisburgh (both Action Point 20).

2. This requested information refers to three separate notes produced by the Applicant, which are included within this submission:

    - A note to clarity the traffic movements forecast for Little London Road, consolidating information from the following documents:
        - Environmental Statement (ES) Chapter 24 – Traffic and Transport;
        - DCO Document 8.8 – Outline Traffic Management Plan (OTMP); and
        - DCO Document 8.10 – Outline Access Management Plan (OAMP).
    - A note to clarity the approach to construction noise mitigation – summarising information presented within ES Chapter 25 noise and Vibration; and
    - Details of 24 hour working at the landfall (previously submitted to the examination on 19th February 2019 - ExA;AS_ISH1 Action;10.D3.7).

Note / Memo

HaskoningDHV UK Ltd.
Transport & Planning

To: North Norfolk District Council
From: Norfolk Vanguard Ltd
Date: 02 May 2019

Our reference: T&PPB4476N009D.1
Classification: Project related

Subject: Norfolk Vanguard, Little London Road (Link 69) Traffic Study

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1 Introduction

This note has been prepared on behalf of Norfolk Vanguard Ltd in relation to the Norfolk Vanguard Offshore Wind Farm Project ('the Project').

The purpose of this study is to provide clarity on the traffic movements forecast for Little London Road during the construction phase of the Project.

2 Methodology

This consolidates information from the following documents:

- Environmental Statement (ES) Chapter 24 – Traffic and Transport;
- DCO Document 8.8 – Outline Traffic Management Plan (OTMP); and
- DCO Document 8.10 – Outline Access Management Plan (OAMP).

3 Study Area

Figure 1 defines the area local to North Walsham and Little London Road and includes the following infrastructure components of the Project which serve the onshore cable route and are of particular relevance to Link 69:.

- Mobilisation Area 10 (MA10) – The MA is used as an access point to the running track for duct installation and to store equipment and provide welfare facilities.

- Trenchless Crossings (TC) 14 and 15 – Trenchless crossing methods are required where open trenching is not suitable due to the type of feature being crossed (Paston Way (TC14) and North Walsham and Dilham Canal (TC15)).

Link 69 is comprised of Little London Road, starting from the junction with the B1145 Lyngate Road to an access point (AC37) approximately 210m east. Little London Road continues for a further 740m east where it terminates at the junction with Bacton Road.

Link 69 is a narrow lane lined with no footway. The lane is lined with established hedgerows, walls and a number of private residential accesses.

3.1 Link Sensitivity

Within Chapter 24, Link 69 was assigned a High sensitivity value. Appendix 24.2 described further detail of the sensitivity rationale and this has been reproduced in **Table 3.1**.

Table 3.1 Link Sensitivity (part reproduced from Chapter 24 – Appendix 24.2)

Link	Section	Link Description	Sensitivity	Rationale
69	-	Little London Road	High	A local access road that links into Bacton Road. Narrow road with evidence of direct frontage development.

3.2 Traffic Flows

Table 3.2 summarises the total daily peak vehicle movements (i.e. arrivals and departures) of all materials, personnel and plant for Link 69. The table also provides a comparison of the peak daily construction flows with the forecast background daily traffic flows in 2022, identified in Chapter 24 as the approximate start of construction.

Table 3.2 Link 69 Forecast Background and Construction Traffic Flows (reproduced from Chapter 24 – Table 24.21

Link	Link Description	2022 Forecast Background Flows (24hr AADT*)		2022 Construction Vehicle Movements		Percentage Increase	
		All Vehicles	HGVs	All Vehicles	HGVs	All Vehicles	HGVs
69	Little London Road	549	22	260	240**	47.3%	1092.3%
*	Annual Average Daily Traffic						
**	Utilising 10t payload vehicles						
	Exceeds GEART (Rule 1 and Rule 2)[1] screening thresholds						

3.3 Potential Impacts

As a result of the screening process followed in Table 3.2 and the link sensitivity detailed in Table 3.1, link 69 is predicted to experience a high magnitude of change resulting in a Major Adverse Impact significance for both Pedestrian Severance and Amenity (without mitigation) and is shown in **Table 3.3.**

Table 3.3 Link 69 Magnitude and Impact Significance

Link	Link Description	Pedestrian Severance		Pedestrian Amenity	
		Magnitude	Impact significance	Magnitude	Impact significance
69	Little London Road	High	Major Adverse	High	Major Adverse

[1] Guidelines for the Environmental Assessment of Road Traffic Rule 1: Include highway links where traffics flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and Rule 2: Include any other specifically sensitive areas where traffic flows (or HGV component) are predicted to increase by 10% or more.

The remaining Sections of this note detail the construction programmes, traffic demand and resultant mitigation measures to address the forecast Major adverse impacts.

4 Construction Programme (Stage Definitions)

The OTMP outlines three discrete stages in the Project's onshore 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.

The interaction of these stages is described as follows:

Stage 1: Pre-construction works (2020-2021)

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; with the potential for access AC37 to be constructed during this phase to facilitate construction of TC14, TC15 and Cable Section 16a at Stage 2.

Stage 2: Duct Installation works (2022 – 2023)

The onshore cable route has been separated into 20 cable route sections. Cable Section 16a would be accessed directly from AC37 on Link 69 via a running track (up to 6m wide). The running track would provide safe access for construction vehicles along the onshore cable route for duct installation works and to access TC14 and TC15 at the east and west of Cable Section 16a.

The access strategy for Stage 2 utilising Link 69 has been developed to accommodate access to TC14 TC15 and Cable Section 16a. Link 69 is assessed as unsuitable for conventional (20t payload) tipper trucks and therefore in order to safely traverse along the narrow lane, mitigation is proposed in the form of splitting HGV payload into smaller 10t vehicles at MA10.

HGVs would first access MA10 utilising conventional HGVs off the B1145 at AC38. At MA10 the loads destined for Link 69 would then be split into the smaller 10t vehicles for onward travel. The main function of MA10 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.

Stage 3: Cable pull, joint and commission (2024 – 2025)

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.

Further details of all three stages are contained within Chapter 5 Project Description of the ES.

5 Traffic Demand

Table 5.1 summarises the peak daily HGV movements to each of the identified accesses for Stage 2 and Stage 3 which are assigned to Link 69. For example, during Stage 2 at peak demand, 120 daily HGV movements would occur at AC38 (MA10), delivering plant and materials destined for AC37. As discussed earlier, the materials would be transferred into smaller 10t payload vehicles at MA10, in effect doubling the traffic demand to 240 HGV movements.

Table 5.1 HGV Movements Per Access

Access ID	Vehicle payload	Stage 2 - Access function	Stage 2 - Peak daily two-way HGV movements	Stage 3 - Access function	Stage 3 - Peak daily two-way HGV movements
AC38	20t	MA10 (transferring to smaller 10t vehicles)	120	Cable Section 14	30
AC37	10t	Cable Section 16a TC14(east) TC15(west)	240*	Cable Section 14	60
	*Utilising smaller 10t payload vehicles				

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).

5.1 Stage 2: Traffic Demand and Duration

The 240 HGV (10t payload) movements generated by AC37 represent the worst case scenario, where construction of all infrastructure components are undertaken concurrently and assigned to Link 69. **Table 5.2** breaks down the worst case scenario into the separate infrastructure components and their programmed date of works. A graphical representation of the construction programme with associated HGV movements is presented in **Appendix A**

Table 5.2 Link 69 Traffic Derivation

Infrastructure Component	ID	Indicative Programmed date of construction activity	Work Team	Peak daily construction vehicle deliveries	Peak daily construction vehicle movements	Indicative peak construction duration
Section 16a: MA10	1	24.03.2023 – 10.07.2023 (inc)	Duct Installation Team	48	96	9 consecutive weeks
TC 14 – Paston Way CWS (East)	2	27.06.2022 – 15.08.2022 (inc)	TC Gang 3*	72	144	2 weeks
TC 15 – North Walsham and Dilham Canal (West)	3	22.08.2022 – 10.10.2022 (inc)	TC Gang 3*	72	144	2 weeks
*TC gang 3 would only work on one TC at any one time during the construction programme.						

It can be noted from **Table 5.2** that the construction programme presented is sufficient to also allow sequential construction of the three components.

As identified within Chapter 24, a peak of 144 daily movements (only one TC could be worked on at any one time) would still represent an increase of 654% for HGVs; therefore further mitigation is considered.

As detailed in the construction programme (Appendix 24.7 of Chapter 24), Section 16a of the duct installation is predicted to last a total of 12 weeks during year 2 (2023). The greatest opportunity to reduce the effects of severance upon Link 69 would be to focus on elongating the currently defined construction programme.

For example, an increase in total construction programme from 12 weeks to 24 weeks would see a reduction from 96 peak daily movements to 48 peak daily movements.

There is an opportunity to further reduce the TC traffic demand by placing both TC 14 and TC 15 reception[2] sides to the area which Link 69 serves. This would reduce the 144 daily movements to 48 daily movements (25% of TC traffic demand).

[2] Each Trenchless Crossing requires a 'Launch' and 'Reception' pit. The launch side sites the drilling equipment, associated water requirements and the majority of material removal. The reception side requires less material removal and site equipment setup.

In summary, mitigation for Link 69 would be agreed as part of the final TMP and may comprise one or more of the following mitigation measures:

1. Extend construction programme for Section 16a of the duct installation;
2. Locate the reception sides of TC 14 and TC 15 to the area which Link 69 serves; and
3. Sequential planning of construction activities to reduce peak HGV demand.

Table 5.3 details the 'capped' HGV demand that the contractor would be required to adhere to.

Table 5.3 Resultant Link 69 Traffic Demand

Infrastructure Component	ID	Indicative Programmed date of construction activity	Work Team	Peak daily construction vehicle deliveries	Peak daily construction vehicle movements	Indicative peak construction duration
Section 16a: MA10	1	24.03.2023 – 10.07.2023 (inc)	Duct Installation Team	24**	48**	18 weeks
TC 14 – Paston Way CWS (East)	2	27.06.2022 – 15.08.2022 (inc)	TC Gang 3*	24**	48**	2 weeks
TC 15 – North Walsham and Dilham Canal (West)	3	22.08.2022 – 10.10.2022 (inc)	TC Gang 3*	24**	48**	2 weeks
* TC gang 3 would only work on one TC at any one time during the construction programme.						
** Utilising 10t payload vehicles						

As can be seen from **Table 5.3** and **Appendix A** the programme presents the following scenario peaks and averages predicted to occur on Link 69.

- Primary peak of 22 weeks at 48 daily movements
- Secondary peak of 6 weeks at 40 daily movements
- Then 12 weeks at 2 daily movements
- Average HGV demand of 33 daily movements for 40 week construction programme.

This mitigated traffic demand of 48 daily HGV (10t payload) movements reduces the magnitude of effect to low on a high value receptor resulting in a residual impact significance of 'marginally' moderate adverse. Applying the significance matrix in Chapter 24 this residual impact is classed as significant. However, it is proposed to supplement the mitigation measures with a local traffic management strategy as outlined below to further manage disruption and ensure any impacts are limited and temporary.

The traffic management strategy would in turn be supplemented by a local communication strategy to ensure stakeholders and the public were kept appraised of demands on the network and intensive delivery periods are timed to minimise disruption. This is secured within the OTMP..

6 Proposed Traffic Management Strategy

As discussed in **Section 3** Little London Road (Link 69) does not allow for full two-way HGV traffic along the entire length of the link, and further mitigation is required, which is outlined in the following sections.

6.1 HGV Deliveries to AC37 (Link 69)

1. Plant and material required for infrastructure components served by Link 69 would be delivered to MA10 (AC38) via typical HGV construction vehicles.
2. The materials will be stockpiled or directly transferred to smaller 10t payload vehicles to await further instructions.
3. Mobile traffic management would be utilised along the 210m of Link 69 and would comprise of a suitable marked pilot vehicle (with flashing ambers) with two-way radio communication with the MA10 co-ordinator. The pilot vehicle would exit MA10 (AC38) and travel to a designated layby west of access AC37 on Link 69.
4. All side accesses along Link 69 between the junction of the B1145 and AC37 would be temporarily closed via coning or vehicle marshals.
5. The pilot vehicle would then temporarily stop oncoming traffic and radio to MA10 Co-Ordinator to release the waiting 10t payload construction vehicles. The construction vehicles would exit MA10 and traverse in convoy onto Link 69 and into AC37 unopposed.
6. Up to three HGVs are proposed to be escorted in platoons to minimise delays to background traffic.

Appendix B graphically depicts the traffic management strategy for construction vehicle deliveries into AC37.

The distance a HGV convoy would be required to travel under pilot vehicle on Link 69 would be 313m. At a speed of 20km/hr, this would mean a delay to other vehicle users of up to 56 seconds for HGVs utilising AC37. A driver delay of 56 seconds is considered an acceptable delay.

6.2 HGV return movements to MA10 (AC38)

1. Once all construction vehicles have completed their deliveries they will wait further instructions by the MA10 co-ordinator.
2. Traffic Management Operatives would utilise Stop/Go boards on the B1145 to momentarily halt traffic either side of the junction with Little London Road.
3. The waiting HGVs at AC38 will be given the signal to proceed to the B1145. They will be led along Link 69 by the escort vehicle and would turn out of Little London Road unopposed. This strategy will mitigate the reduced visibility at this junction.
4. Once clear the Traffic Management Operatives would release the waiting public vehicles and the outgoing HGVs would then proceed into AC38 (MA10) under normal traffic conditions.
5. Up to three HGVs are proposed to be escorted in platoons to minimise delays to background traffic.

Appendix B graphically depicts the traffic management strategy for construction vehicle return to MA10 (AC37).

The distance a HGV convoy would be required to travel under pilot vehicle on Link 69 would be 210m. At a speed of 20km/hr, this would mean a delay to waiting vehicles on the B1145 of up to 38 seconds which would be considered an acceptable delay.

As detailed in **Table 5.3**, a peak daily total of 48 construction movements (2.5 arrivals and 2.5 departures per hour) would be required to be managed during Stage 2 of the project. Utilising the Platoon (up to 3 HGVs) method as detailed in Section 6.1 and 6.2 this would equate to 1 platoon arrival movement and 1 platoon departure per hour.

6.3 Employee Demand

During Stage 2 construction, Chapter 24 detailed that 10 employees associated with the TC sites and 20 employees associated with Cable Section 16a would be required to travel directly to AC38. As a pre-requisite within Chapter 24 single occupancy vehicles were used to create the basis for a worst case assessment scenario. However, in reality this is not an acceptable logistics strategy and a number of potential traffic measures have been outlined within the Outline Travel Plan (DCO Document 8.9) to reduce impacts associated with employee travel such as crew vans and car share databases.

7 Conclusions

With the implementation of the measures outlined in Section 6 a short-term moderate adverse impact remains related to pedestrian severance and pedestrian amenity. The assessed residual impact is very localised (impacting a small number of dwellings) and is relatively short in duration (22 weeks at peak traffic). It is considered community engagement to establish clear lines of communication to the appointed contractor would serve to identify periods that are particularly sensitive to HGV movements which could further mitigate this impact.

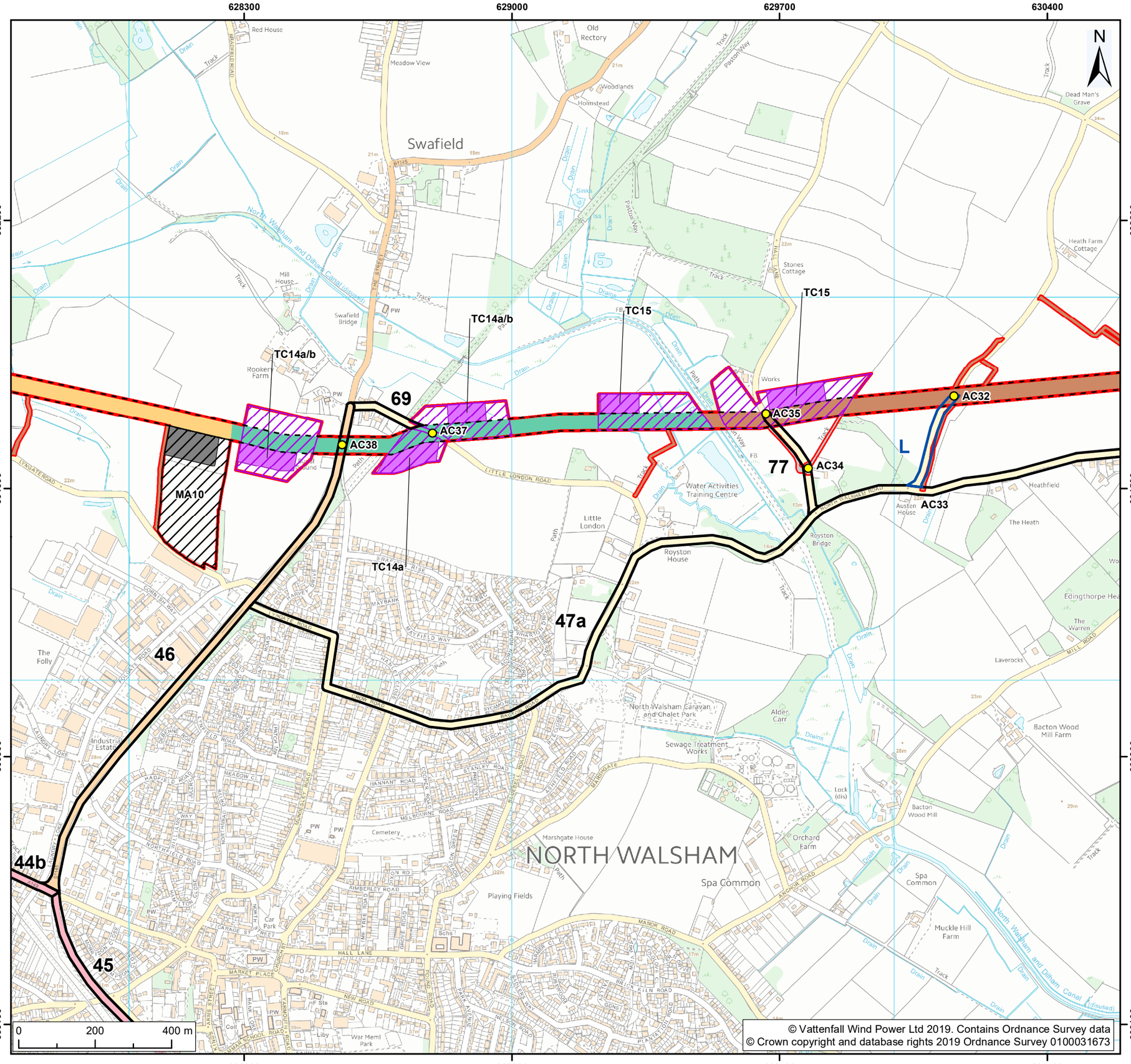
All work presented within this Technical Note has been collated from various source documents of the Norfolk Vanguard DCO application with the exception of Section 6. Section 6 – Proposed Traffic Management Strategy has provided further clarifications on the specific measures for Link 69 building on the proposed traffic management concepts provided within the DCO Document 8.10 - Outline Traffic Management Plan.

It is important to understand that this study is supplementary information and does not change the assessment presented in the ES.

8 References

Royal HaskoningDHV (July 2018) Norfolk Vanguard Offshore Wind Farm Environmental Statement. Chapter 24 Traffic and Transport

9 Figures



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
- Access point ID
- Major highway links
- Minor highway links

Stage 2 Cable Route Sections

- Section 15: MA10-W
- Section 16a: MA10-E
- Section 17a: MA10a-W

Project:	Report:
Norfolk Vanguard	Little London Road (Link 69) Traffic Study

Title: Link 69 Study Area

Figure: 1 | Drawing No: PB4476-008-006-022

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	30/04/2019	LB	RE	A3	1:10,000
01	29/04/2019	LB	RE	A3	1:10,000

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

VATTENFALL

Royal HaskoningDHV
Enhancing Society Together

Appendix A – Programme

Link 69 HGV Summary Table*

ID	Infrastructure Component	Norfolk Vanguard - Link 69	03/01/2022	10/01/2022	17/01/2022	24/01/2022	31/01/2022	07/02/2022	14/02/2022	21/02/2022	28/02/2022	07/03/2022	14/03/2022	21/03/2022	28/03/2022	04/04/2022	11/04/2022	18/04/2022	25/04/2022	02/05/2022	09/05/2022	16/05/2022	23/05/2022	30/05/2022	06/06/2022	13/06/2022	20/06/2022	27/06/2022	04/07/2022	11/07/2022	18/07/2022	25/07/2022	01/08/2022	08/08/2022	15/08/2022	22/08/2022	29/08/2022	05/09/2022	12/09/2022	19/09/2022	26/09/2022	03/10/2022	10/10/2022	17/10/2022	24/10/2022	31/10/2022	07/11/2022	14/11/2022	21/11/2022	28/11/2022	05/12/2022	12/12/2022	19/12/2022	26/12/2022
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1	Cable Route Section	Section 16a: MA10-E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Trenchless Crossings	TC 14 - Paston Way CWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	2	2	2	2	2	2	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Trenchless Crossings	TC 15 - N.Walsham and Dilham Canal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	2	2	2	2	2	2	48	0	0	0	0	0	0	0	0	0	0	0
	Total HGV movements		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	2	2	2	2	2	2	48	48	2	2	2	2	2	2	48	0	0	0	0	0	0	0	0	0	0	0
	Number of Norfolk Vanguard Infrastructure components active in each week		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0

ID	Infrastructure Component		02/01/2023	09/01/2023	16/01/2023	23/01/2023	30/01/2023	06/02/2023	13/02/2023	20/02/2023	27/02/2023	06/03/2023	13/03/2023	20/03/2023	27/03/2023	03/04/2023	10/04/2023	17/04/2023	24/04/2023	01/05/2023	08/05/2023	15/05/2023	22/05/2023	29/05/2023	05/06/2023	12/06/2023	19/06/2023	26/06/2023	03/07/2023	10/07/2023	17/07/2023	24/07/2023	31/07/2023	07/08/2023	14/08/2023	21/08/2023	28/08/2023	04/09/2023	11/09/2023	18/09/2023	25/09/2023	02/10/2023	09/10/2023	16/10/2023	23/10/2023	30/10/2023	06/11/2023	13/11/2023	20/11/2023	27/11/2023	04/12/2023	11/12/2023	18/12/2023	25/12/2023	Main Duct Installation Totals 03.01.2022 - 25.12.2023	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Totals	Max
1	Cable Route Section	Section 16a: MA10-E	0	0	0	0	0	0	0	0	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	40	40	40	40	40	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5520	48
2	Trenchless Crossings	TC 14 - Paston Way CWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	540	48
3	Trenchless Crossings	TC 15 - N.Walsham and Dilham Canal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	540	48
	Total HGV movements		0	0	0	0	0	0	0	0	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	40	40	40	40	40	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6600	48
	Number of Norfolk Vanguard Infrastructure components active in each week		0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	1

***HGV Contingencies applied within Summary Table**

Duct Installation	1.2
Trenchless Crossings	1.1
Cable Pull	1.2
A47 Highway Works	1.2
Onshore Project Substation	1.2
NGET Substation	1.2

HGV Key

- 22 weeks @ 48 daily movements — Peak HGV demand per activity
- 6 weeks at 40 daily movements — Secondary Peak HGV demand activity
- 12 weeks at 2 daily movements — Third Peak HGV demand activity
- Link 69 total duration = 40 weeks

Link 69 Employee Summary Table

ID	Infrastructure Component		03/01/2022	10/01/2022	17/01/2022	24/01/2022	31/01/2022	07/02/2022	14/02/2022	21/02/2022	28/02/2022	07/03/2022	14/03/2022	21/03/2022	28/03/2022	04/04/2022	11/04/2022	18/04/2022	25/04/2022	02/05/2022	09/05/2022	16/05/2022	23/05/2022	30/05/2022	06/06/2022	13/06/2022	20/06/2022	27/06/2022	04/07/2022	11/07/2022	18/07/2022	25/07/2022	01/08/2022	08/08/2022	15/08/2022	22/08/2022	29/08/2022	05/09/2022	12/09/2022	19/09/2022	26/09/2022	03/10/2022	10/10/2022	17/10/2022	24/10/2022	31/10/2022	07/11/2022	14/11/2022	21/11/2022	28/11/2022	05/12/2022	12/12/2022	19/12/2022	26/12/2022
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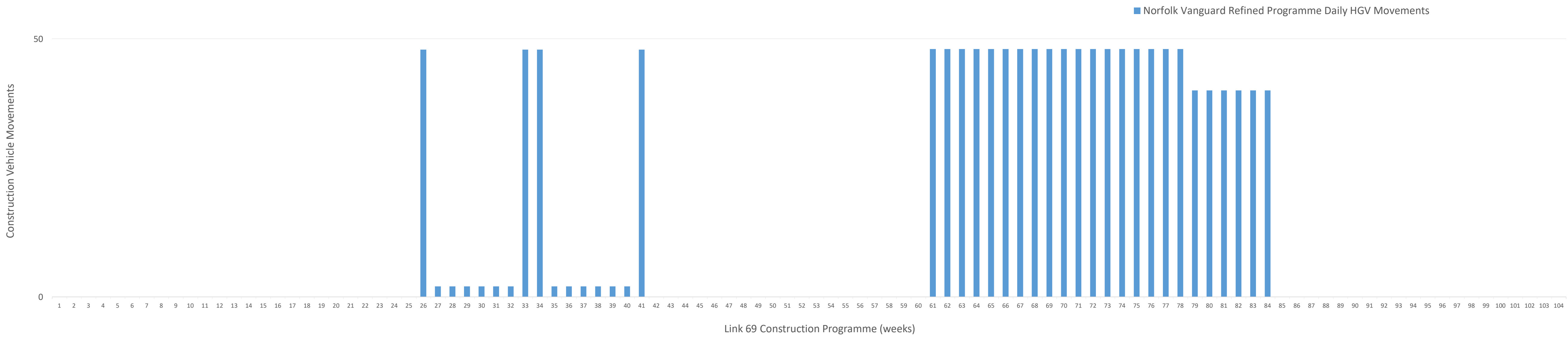
1	Cable Route Section	Section 16a: MA10-E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Trenchless Crossings (employees)	TC 14 - Paston Way CWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5	5	5	5	5	5	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Trenchless Crossings (employees)	TC 15 - N.Walsham and Dilham Canal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5	5	5	5	5	5	10	0	0	0	0	0	0	0	0	0	0	0
	Norfolk Vanguard total person trips (two-way)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5	5	5	5	5	5	10	10	5	5	5	5	5	5	10	0	0	0	0	0	0	0	0	0	0	0

ID	Infrastructure Component		02/01/2023	09/01/2023	16/01/2023	23/01/2023	30/01/2023	06/02/2023	13/02/2023	20/02/2023	27/02/2023	06/03/2023	13/03/2023	20/03/2023	27/03/2023	03/04/2023	10/04/2023	17/04/2023	24/04/2023	01/05/2023	08/05/2023	15/05/2023	22/05/2023	29/05/2023	05/06/2023	12/06/2023	19/06/2023	26/06/2023	03/07/2023	10/07/2023	17/07/2023	24/07/2023	31/07/2023	07/08/2023	14/08/2023	21/08/2023	28/08/2023	04/09/2023	11/09/2023	18/09/2023	25/09/2023	02/10/2023	09/10/2023	16/10/2023	23/10/2023	30/10/2023	06/11/2023	13/11/2023	20/11/2023	27/11/2023	04/12/2023	11/12/2023	18/12/2023	25/12/2023	Totals	Max
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52		
1	Cable Route Section	Section 16a: MA10-E	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2100	20
2	Trenchless Crossings (employees)	TC 14 - Paston Way CWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	10
3	Trenchless Crossings (employees)	TC 15 - N.Walsham and Dilham Canal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	10
	Norfolk Vanguard total person trips (two-way)		0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2600	20

Employee Key

- 20 weeks @ 20 daily movements — Peak employee demand per activity
- 10 weeks at 10 daily movements — Secondary Peak employee demand activity
- 10 weeks at 5 average daily movements — Third Peak employee demand activity
- Link 69 total duration = 40 weeks

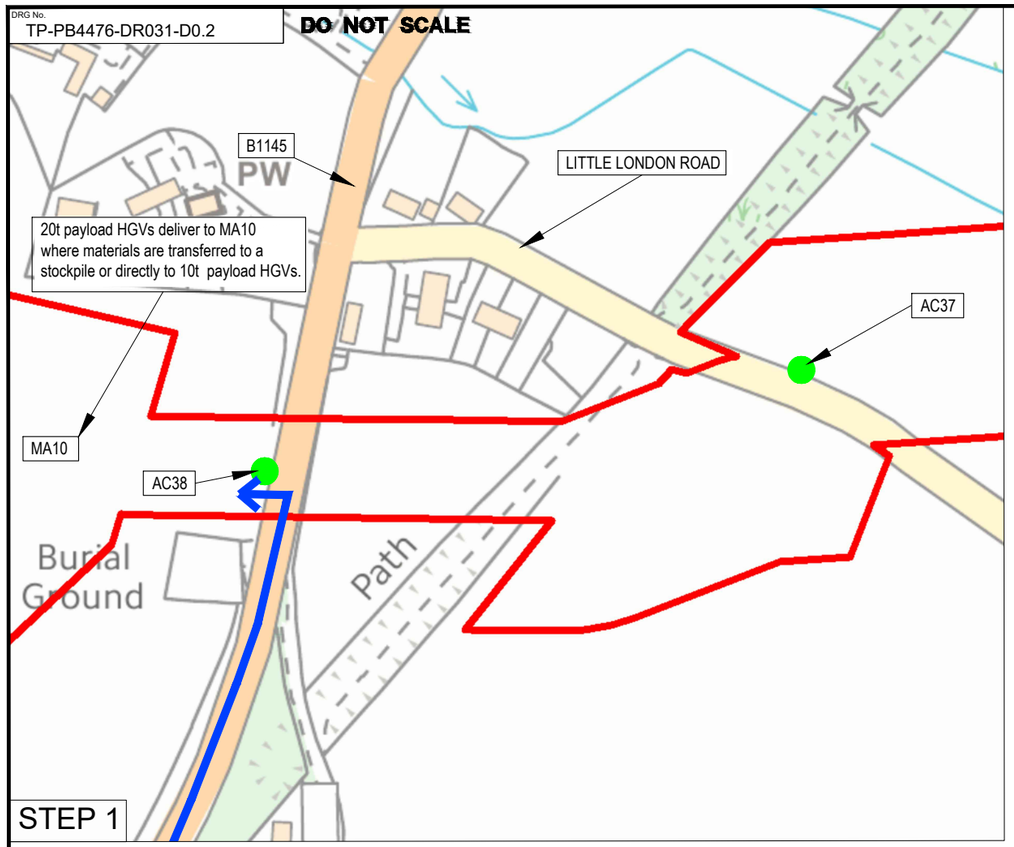
Link 69 - Weekly HGV Construction Programme



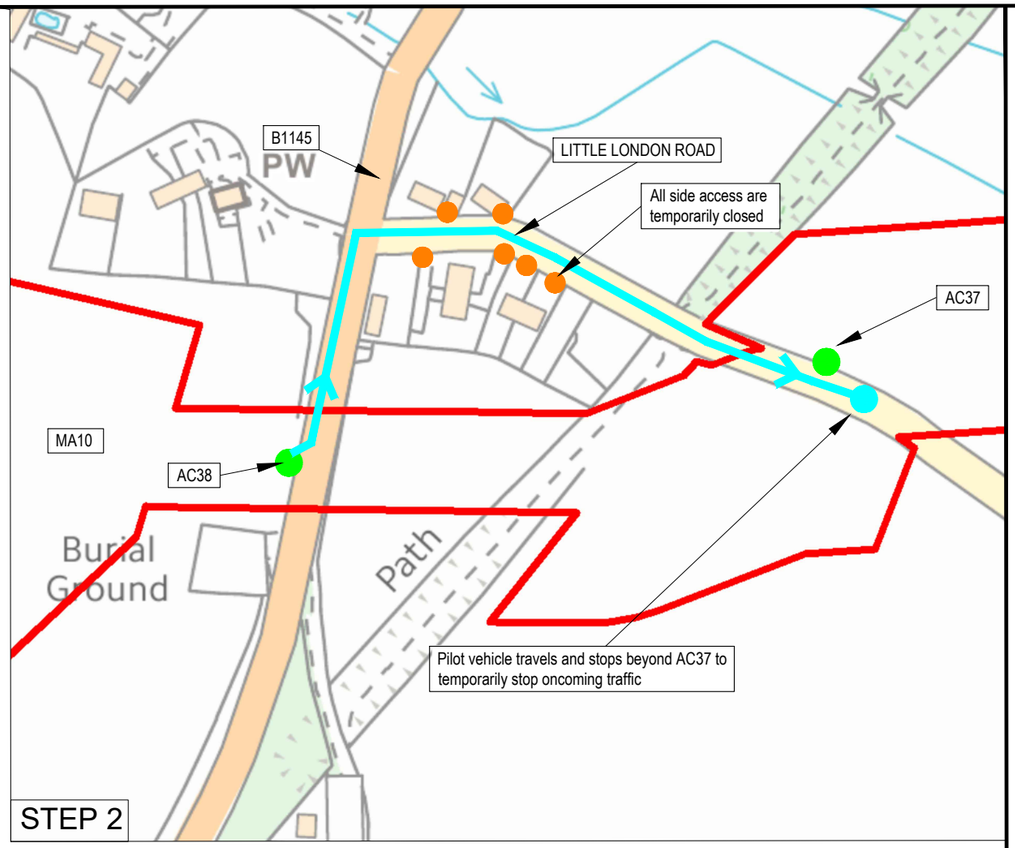
Appendix B – Traffic Management Concept Drawings

DRG No.
TP-PB4476-DR031-D0.2

DO NOT SCALE



STEP 1



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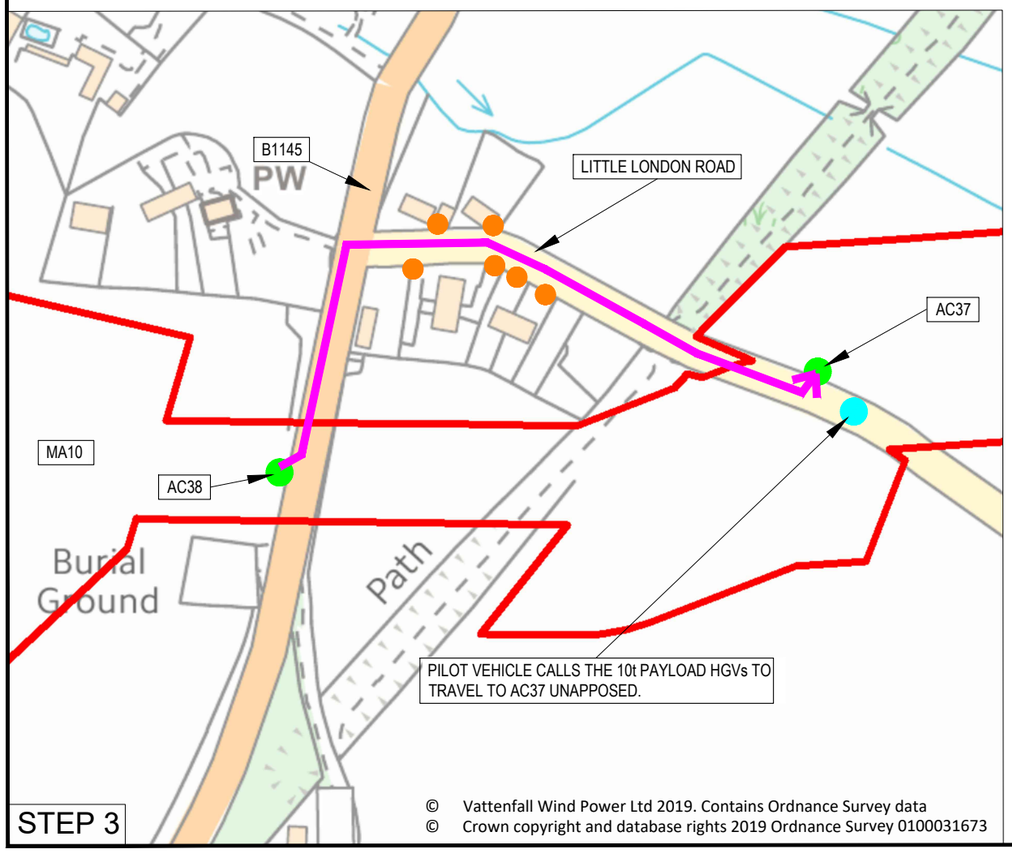
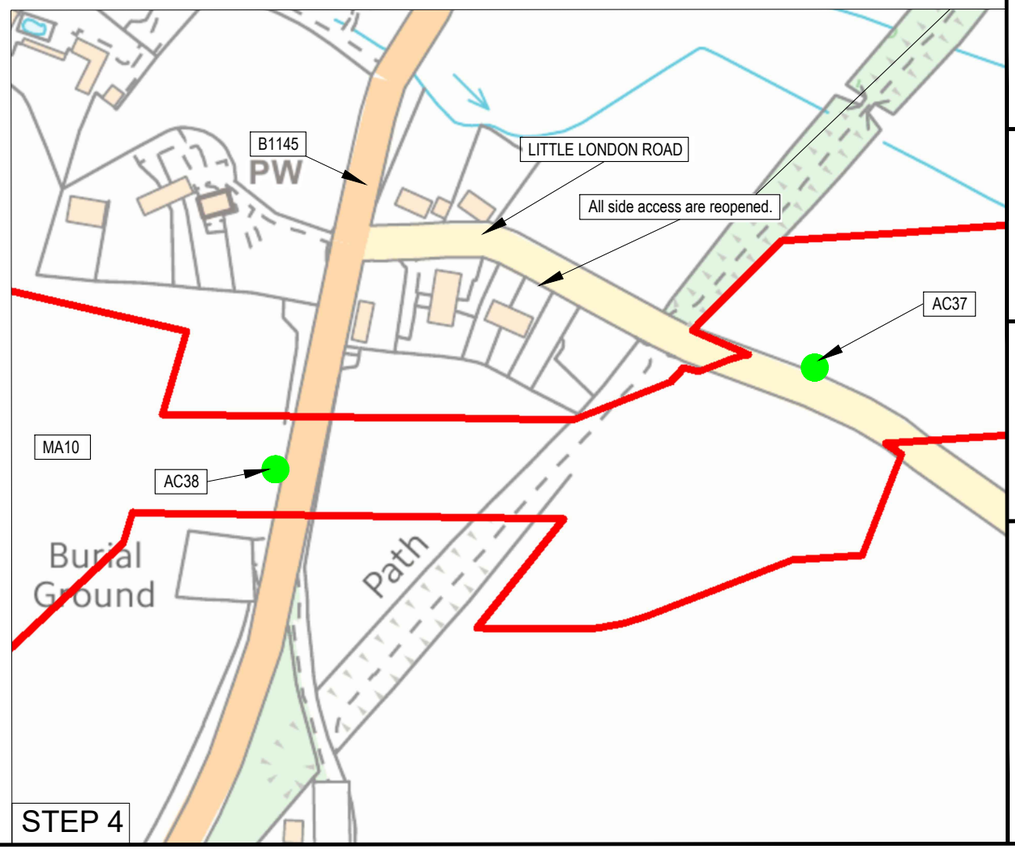


STEP 3



STEP 4

KEY

- DCO ORDER LIMITS
- ACCESS LOCATION
- PILOT VEHICLE
- PILOT VEHICLE ROUTE
- 20t PAYLOAD VEHICLE ROUTE
- 10t PAYLOAD VEHICLE ROUTE
- SIDE ACCESS LOCATIONS

Royal HaskoningDHV
Enhancing Society Together

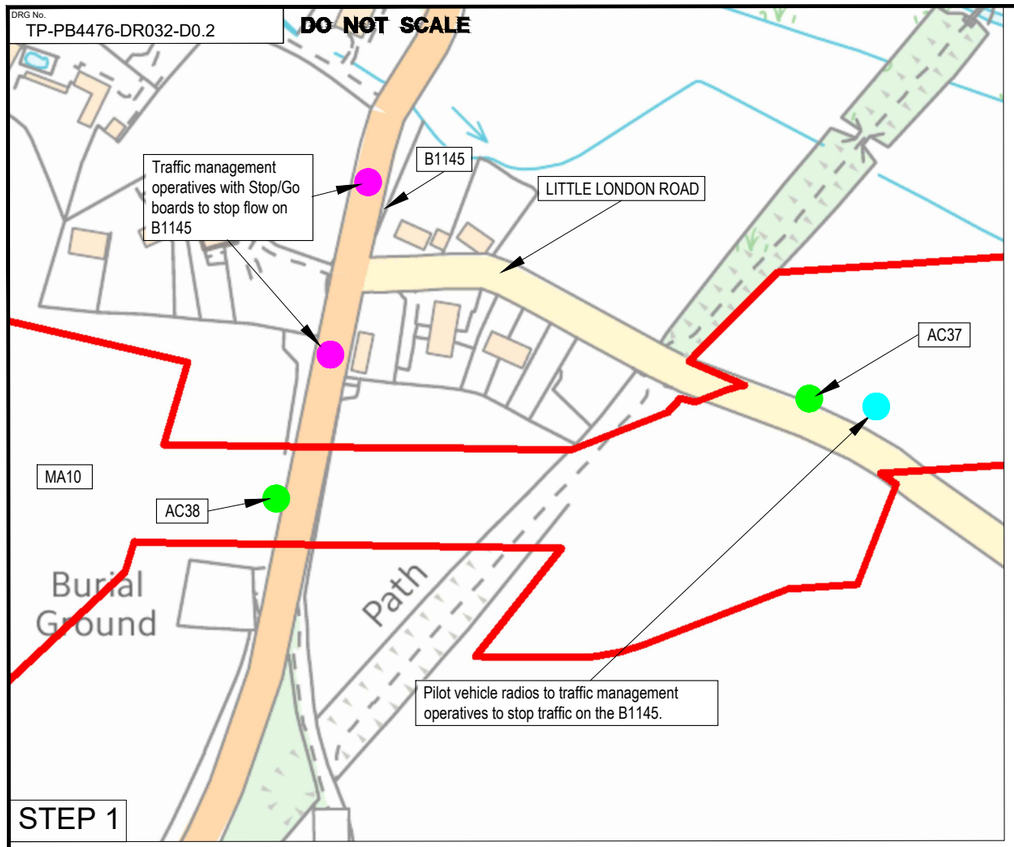
NORFOLK VANGUARD

LITTLE LONDON LANE (LINK 69)
PROPOSED MANAGED
AC37 ACCESS STRATEGY

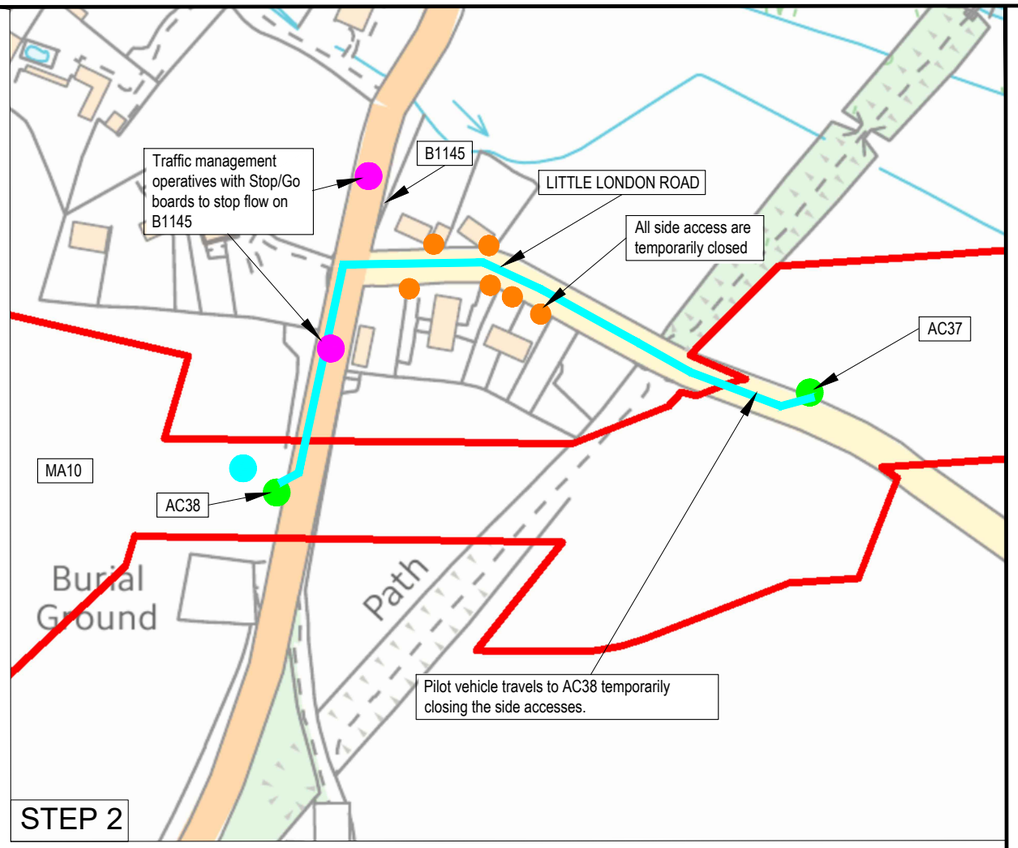
TP-PB4476-DR031-D0.2

DRG No.
TP-PB4476-DR032-D0.2

DO NOT SCALE



STEP 1



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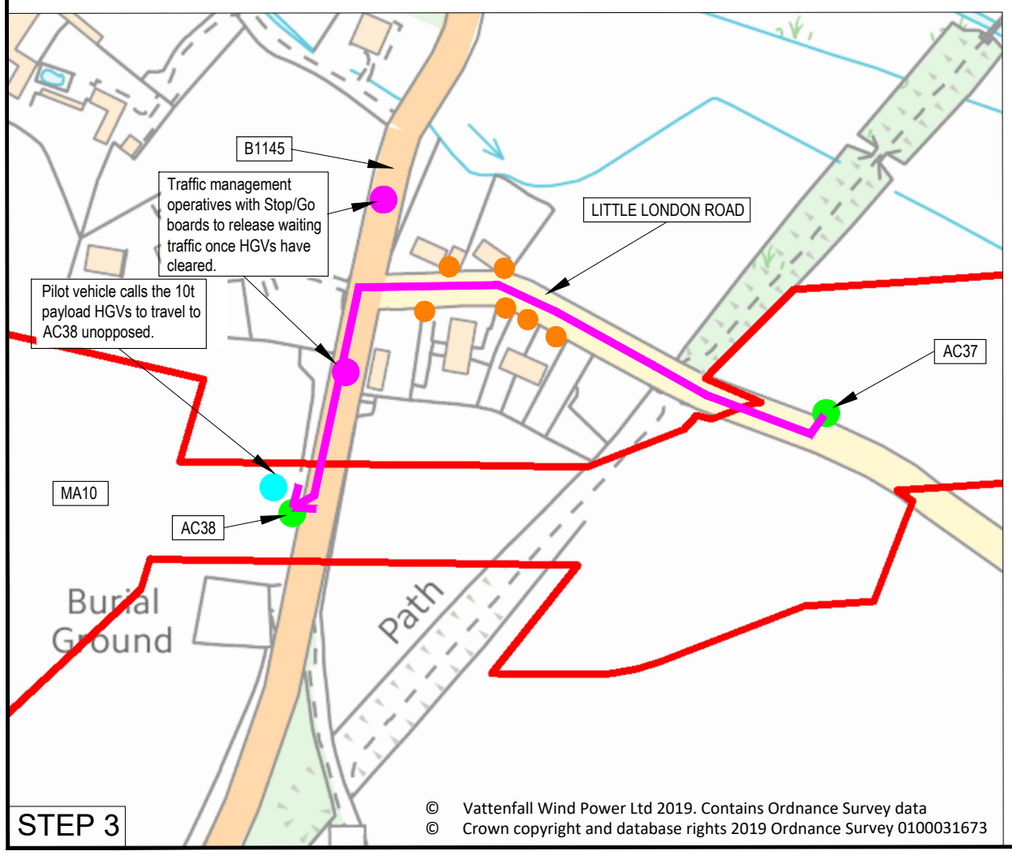
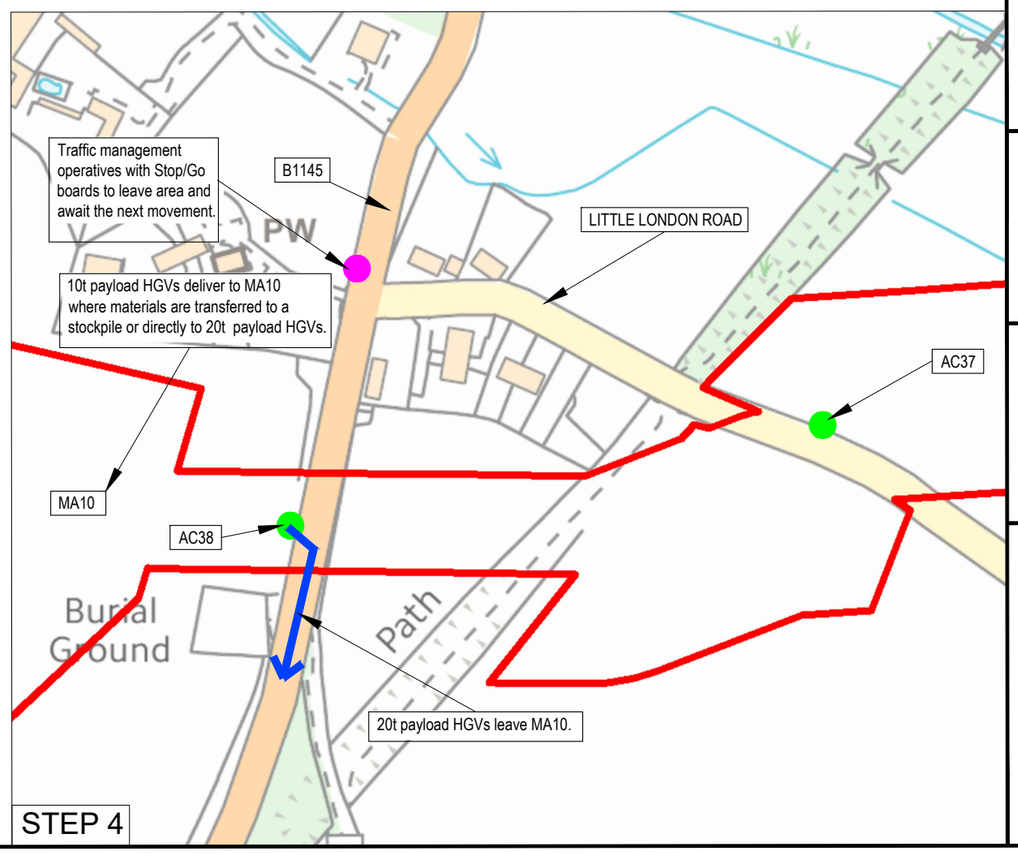


STEP 3



STEP 4

KEY

- DCO ORDER LIMITS
- ACCESS LOCATION
- PILOT VEHICLE
- PILOT VEHICLE ROUTE
- 20t PAYLOAD VEHICLE ROUTE
- 10t PAYLOAD VEHICLE ROUTE
- SIDE ACCESS LOCATIONS
- TRAFFIC MANAGEMENT OPERATIVES

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NORFOLK VANGUARD

LITTLE LONDON LANE (LINK 69)
PROPOSED MANAGED
AC38 ACCESS STRATEGY

TP-PB4476-DR032-D0.2

Clarification Note: Norfolk Vanguard
Construction noise mitigation (fencing)

HaskoningDHV UK Ltd.

1 Construction Noise Impact Assessment

1.1 Background

1. Construction noise impacts are assessed in Environmental Statement (ES) Chapter 25 Noise and Vibration and Appendix 25.2 Construction Phase Assessment. The assessment is based on representative noise sensitive receptors (NSRs) at the landfall (four in total) and receptors identified along the cable route (33 in total) as well as assessing potential noise increases along all the required road links (vehicle noise emissions).

2. The following sections repeat the mitigation measures that are described within Chapter 25.

2 Standard Mitigation

3. Standard construction noise mitigation practices and good practice construction management will be adopted throughout the construction phase. These will be captured within a Construction Noise Management Plan (CNMP) within the CoCP (DCO requirement 20). A summary of the measures is set out in the following sections.

2.1 Best Practical Means

4. The Control of Pollution Act and BS 5228[1] define a set of Best Practice working methods and mitigation measures, referred to as Best Practical Means (BPM). Examples of these measures include:

- Where possible, locating temporary plant so that it is screened from receptors by on-site structures, such as site cabins;
- Using modern, quiet equipment and ensuring such equipment is properly maintained and operated by trained staff;
- Applying enclosures to particularly noisy equipment where possible;

[1] British Standards Institution, 2014 [BS] 5228-1:2009+A1:2014 “Code of practice for noise and vibration control on construction and open sites – Part 1: Noise”.

- Ensuring that mobile plant is well maintained such that loose body fittings or exhausts do not rattle or vibrate;
- Ensuring plant machinery is turned off when not in use;
- Providing local residents with 24-hour contact details for a site representative in the event that disturbance due to noise from the construction works is perceived; and
- Establishing a community engagement process including informing local residents about the construction works, detailing the timing and duration of any particularly noisy elements, and providing a contact telephone number to them.

2.2 Training of construction staff

5. The site induction programme and site rules will include good working practice instructions for site staff, managers, visitors and contractors to help minimise noise whilst working on the site.

6. Good working practice guidelines/instructions could include, but not be limited to, the following points:

- Avoiding unnecessary revving of engines;
- Plant used intermittently should be shut-down between operational periods, where possible;
- Avoiding reversing wherever possible;
- Reporting any defective equipment/plant as soon as possible so that corrective maintenance can be undertaken; and
- Handling material in a manner that minimises noise.

2.3 Maintenance of construction plant

7. Maintenance of temporary plant will be carried out routinely and in accordance with the manufacturers' guidance.

8. A regular inspection of all plant and equipment should be undertaken to ensure that:

- All plant is in a good state of repair and fully functional;
- Any plant found to be requiring interim maintenance has been identified and taken out of use;
- Acoustic enclosures fitted to plant are in a good state of repair;
- Doors and covers to such enclosures remain closed during operation; and
- Any repairs are being undertaken by a fully qualified maintenance engineer.

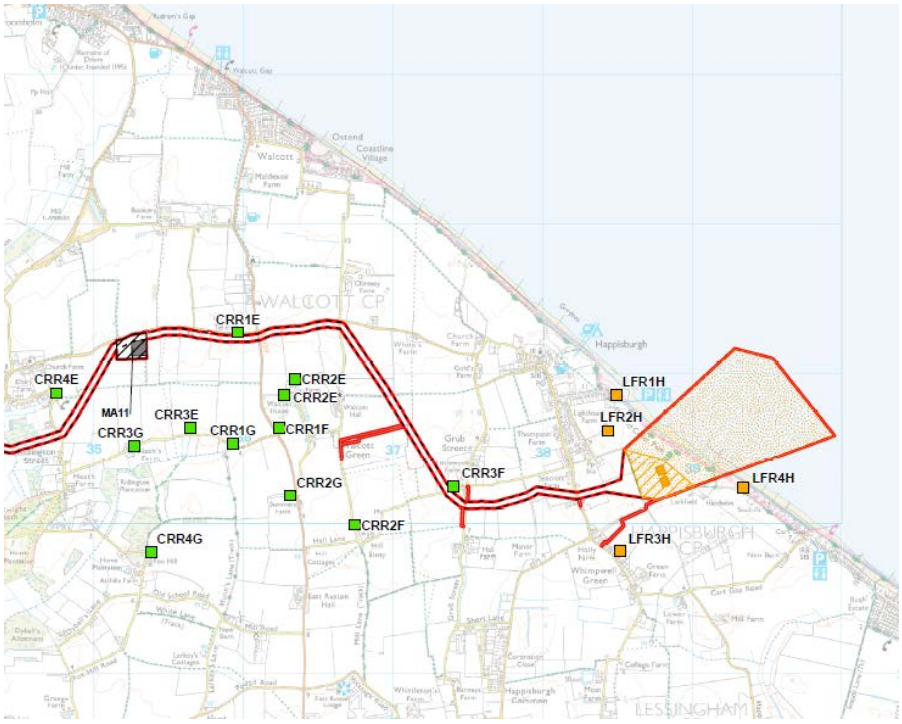
2.4 Standard mitigation summary

9. Whilst the effect of adopting these best practice methods cannot be precisely quantified, it is possible that these methods would reduce noise levels by between 5 - 10dB(A). In order to provide a conservative approach, the construction phase assessment assumed a 5dB(A) reduction for incorporating these standard mitigation measures.

10. During the daytime period, modelled construction noise levels (including standard mitigation) predicted impacts at only two onshore NSRs along the onshore cable route within North Norfolk District – CRR1E and CRR3F. The modelled exceedances of the daytime construction noise threshold (65dB) were calculated at +2.2dB and +9.8dB.

11. Potential construction noise impacts were also predicted at the landfall in the event of night time working[2]. The modelled exceedance of the night time working noise threshold (45dB) was +5.5dB at one landfall NSR – LFR2H.

12. The locations of these NSRs are shown on the extract of ES Figure 25.2 below.



[2] Refer to separate note on the potential for 24 hour working at the landfall submitted to the examination on 19 February 2019 - ExA;AS(ISH1 Action);10.D3.7.

3 Enhanced Mitigation

13. In order to ensure that impacts that remain following the application of standard mitigation are reduced to non-significant more site specific solutions such as increased separation distance of noisy plant, the use of temporary noise barriers and temporary spoil bunds will be applied.

3.1 Construction plant mitigation

14. Bulldozers, dump trucks and tracked excavators have been identified as the noisiest sources at receptor locations within the onshore cable route where significant impacts have been predicted.

15. Careful scrutiny of plant selection at procurement stage will ensure that the associated noise impact of the aforementioned plant is reduced as much as reasonably possible.

16. Initial calculations determined that with application of standard mitigation measures and an increased separation distance would ensure that the BS 5228 daytime construction noise thresholds are not exceeded at all receptors along the cable route.

3.2 Localised screening/temporary noise barriers

17. The exact specification of any noise barriers that may be required to mitigate these construction phases effects will be determined during detailed design. A CNMP will be produced for each stage of the works which will include further detail on the actual plant and equipment as well as the confirmed working methods. Where construction noise impacts remain, noise barriers will be introduced with the appropriate specification for the location and noise reduction required.

18. As an example of the relative effectiveness of applying a temporary localised noise barrier BS 5228 states:

- *"as a working approximation, if there is a barrier or other topographic feature between the source and the receiving position, assume an approximate attenuation of 5 dB when the top of the plant is just visible to the receiver over the noise barrier, and of 10 dB when the noise screen completely hides the sources from the receiver. High topographical features and specifically designed and positioned noise barriers could provide greater attenuation."*

3.3 Residual impacts

19. The modelled residual magnitude of effect after enhanced mitigation measures are is negligible at all affected NSRs, representing a **negligible** residual impact related to construction noise.

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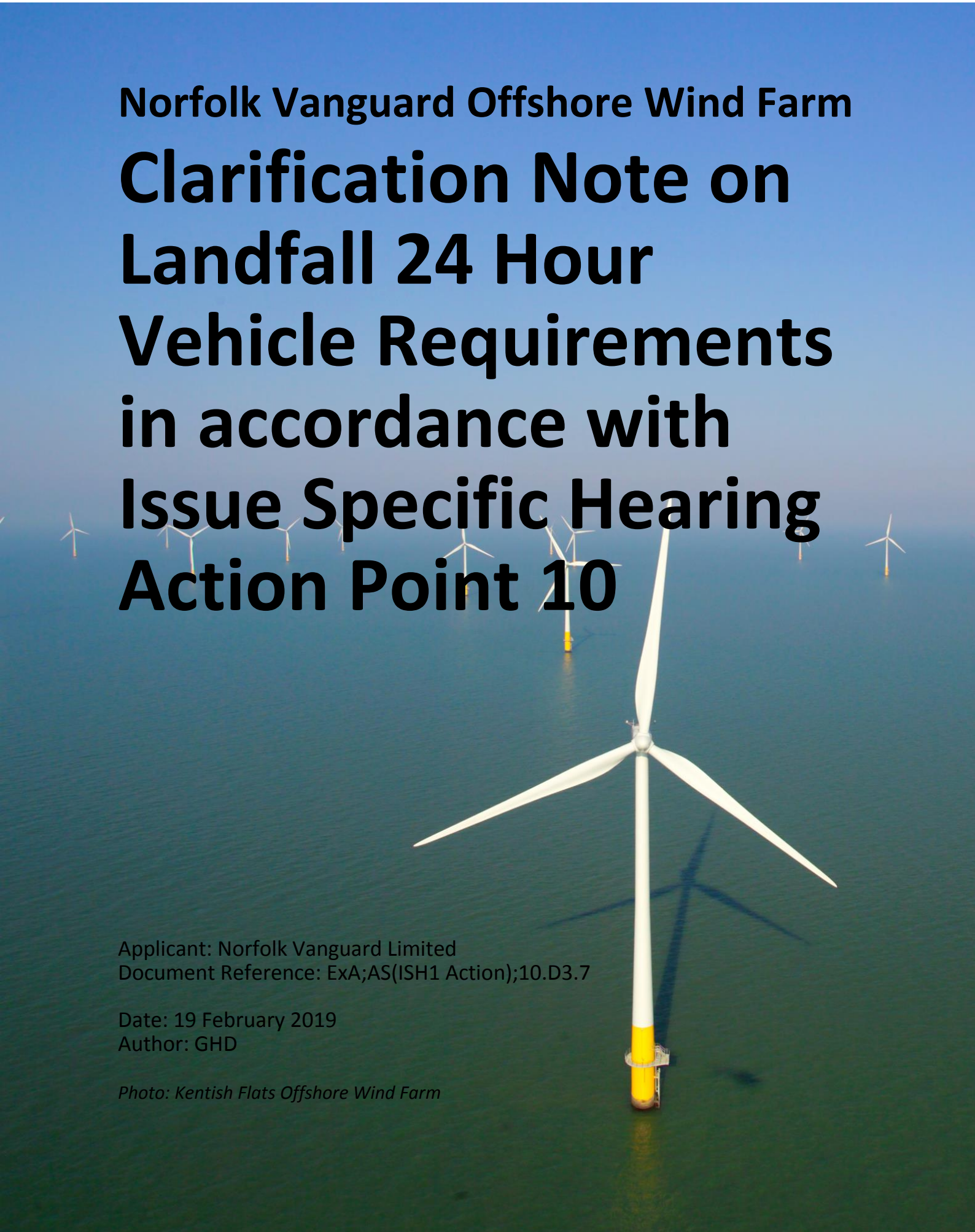
VATTENFALL

Norfolk Vanguard Offshore Wind Farm

Clarification Note on Landfall 24 Hour Vehicle Requirements in accordance with Issue Specific Hearing Action Point 10



Applicant: Norfolk Vanguard Limited
Document Reference: ExA;AS(ISH1 Action);10.D3.7

Date: 19 February 2019
Author: GHD

Photo: Kentish Flats Offshore Wind Farm

Date	Issue No.	Remarks / Reason for Issue	Author	Checked	Approved
19/2/2019	01	Final version for submission	AH	RS	RS

Table of Contents

1 CLARIFICATION NOTE ON LANDFALL 24 HOUR VEHICLE REQUIREMENTS IN ACCORDANCE WITH ISSUE SPECIFIC HEARING ACTION POINT 10

1.1 Purpose of Clarification Note

1. This clarification note has been produced by the Applicant in response to Action Point 10 from Issue Specific Hearing 1 to outline some indicative examples of when 24 hour working may be needed at the landfall for Norfolk Vanguard and the potential implications this has on traffic movements. Any 24 hour working will be agreed with the relevant planning authority in advance of construction in accordance with Requirement 26 of the draft Development Consent Order (DCO). The Applicant refers to Appendix 24.7 of the Environmental Statement (ES) with respect to the indicative construction programme at the landfall and associated daily Heavy Goods Vehicle (HGV) delivery and daily personnel requirements.

2. It should be noted that for the purposes of the traffic assessment within Chapter 24 Traffic and Transport of the ES, a 20% contingency and rounding up to the nearest whole HGV delivery is included to provide the worst case scenario. The figures presented within this note are those used within the traffic assessment (i.e. including the 20% contingency), which explains the inconsistency between the figures presented in this note and those shown in Appendix 24.7 of the ES.

3. The Applicant also refers to Chapter 5 of the ES for general construction details associated with the landfall works. The DCO requirements associated with these works are secured primarily in Requirement 20 (Code of Construction Practice), Requirement 21 (Traffic) and Requirement 26 (Construction hours).

1.2 Landfall construction and associated traffic requirements

4. Landfall construction and related traffic requirements for Norfolk Vanguard can be subdivided into three distinct phases: site mobilisation, site demobilisation, and the drilling phase between site mobilisation and site demobilisation activities. During these phases, there are different requirements for materials, personnel and working hours, which are noted below.

5. In the event that 24 hour working, seven days a week is agreed, the landfall programme would be reduced from 20 weeks to 14 weeks. The first and last week of the programme covers site mobilisation and site demobilisation, such that the drilling phase would be for 18 weeks or (in the event of 24 hour, seven days a week working) 12 weeks of these respective programmes. The benefits of 24 hour working are a reduced construction programme and reduced risk of drill failure by maintaining drilling pressures throughout the drilling process until the duct is installed.

1.2.1 Site mobilisation

6. Site mobilisation occurs in the first week of the landfall construction process. During this time the landfall compound is established and includes activities as detailed in paragraph 289 of ES Chapter 5 Project Description such as stripping of topsoil, laying of protective matting/hardstanding, fencing and delivery of plant and welfare facilities. These works are covered under Work No. 4C of the draft DCO.

7. During this one-week period, the average traffic demand would be 30 HGV deliveries per day and 20 personnel vehicles per day (assumed to be one vehicle (car or van) per worker). These deliveries are to bring the plant, welfare facilities, geotextiles, stone (aggregate), fencing and associated materials to establish the landfall compound. All works at the landfall compound during site mobilisation, including associated traffic demand, would be conducted during normal construction hours as secured in Requirement 26(1) of the draft DCO.

1.2.2 Drilling

8. Once the mobilisation site is established and drilling activities have begun, as detailed in paragraph 290 of ES Chapter 5, it may be necessary to continue the drilling operation on a 24-hour basis to minimise the risk of a failure prior to the duct being installed by maintaining continuous drilling pressures. During this drilling period of 12 weeks (assuming 24 hour working), the average HGV deliveries per day is 4 and the average daily number of personnel required for the works is 10 (assumed to be one vehicle (car or van) per worker).

9. The 4 HGV deliveries per day are associated with the collection of drill arisings. It will be possible to store a small amount of these arisings temporarily, such that collections could be made during normal daytime construction hours, i.e. between 07.00 to 19.00 Monday to Friday and 07.00 to 13:00 hours on Saturday (Requirement 26(1) of the draft DCO). However, the storage space within the landfall compound will not be sufficient to store arisings over the Saturday afternoon and Sunday period. Therefore, should extended working hours be agreed at the landfall, it would be on the basis of (on average) 4 HGV deliveries per day between 7am to 7pm Monday to Sunday inclusive, unless otherwise agreed with the relevant planning authority.

10. The average daily personnel requirements for 24-hour working may be achieved with two 12 hour shift patterns which would allow for changes of personnel at 7am and at 7pm. However, in the worst case scenario, three 8 hour shifts may be necessary which would require a single shift change outside of the 7am to 7pm period.

11. In the event that 24 hour working was employed for the drilling phase, the vehicles accessing the landfall compound outside of the 7am to 7pm period would be up to 10 personnel vehicles (cars/vans) for 12 weeks.

12. In the event that 24 hour working was not employed for the drilling phase, all works and all vehicle deliveries at the landfall compound would take place within normal construction hours as secured in Requirement 26(1) of the draft DCO for a period of 18 weeks.

1.2.3 Site demobilisation

13. Site demobilisation occurs in the last week of the landfall construction process. During this time plant is removed and the land reinstated as detailed in paragraph 291 of ES Chapter 5. During this one-week period, the average traffic demand would be 30 HGV deliveries per day and 20 personnel vehicles per day (based on one vehicle (car/van) per worker). These deliveries are to remove the plant, welfare facilities, geotextiles, stone (aggregate), fencing and associated materials to demobilise the landfall compound. All works, including associated traffic deliveries at the landfall compound during this period, would be conducted during normal construction hours as secured in Requirement 26(1) of the draft DCO.

1.3 Parking

14. All parking will be within the landfall compound. With reference to Section 2.5.2 of the Outline Code of Construction Practice (document reference 8.01), the Applicant has agreed to not use the public beach car park at Happisburgh South.

1.4 Environmental Statement

15. All works within the landfall compound have been assessed for 24-hour, seven days a week operation within the ES.

1.5 Summary

16. Should extended working hours (24 hour, seven days a week) be agreed with the relevant planning authority in advance of construction for the landfall works, it is anticipated that no HGV deliveries would access the landfall compound outside of the 7am to 7pm period (Monday to Sunday). The average number of daily HGV deliveries associated with the landfall drilling works would be 4 and would all occur between 7am to 7pm.

17. There may be a requirement for a single daily personnel change outside of the 7am to 7pm period during the 12 week drilling phase, however this would be a daily

average of 10 personnel vehicles (cars/vans) arriving and departing site, and all parking will be within the landfall compound.

18. All works within the landfall compound have been fully assessed for 24 hour, seven days a week operation within the ES. All construction works undertaken outside of the normal construction hours must be agreed with the relevant planning authority in writing in advance, and must be carried out within the agreed time, as secured in Requirement 26(3) of the draft DCO.