



**NORTH
NORFOLK
DISTRICT
COUNCIL**

Norfolk Vanguard Offshore Wind Farm

**REPRESENTATIONS IN RESPECT OF LETTER
FROM SECRETARY OF STATE FOR
BUSINESS, ENERGY & INDUSTRIAL
STRATEGY DATED 06 DEC 2019**

NORTH NORFOLK DISTRICT COUNCIL
(INTERESTED PARTY REF: 20012882)

28 FEB 2020

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1. Introduction

- 1.1. These are North Norfolk District Council's written submissions following a request made by the Secretary of State for Business, Energy and Industrial Strategy dated 06 Dec 2019 for further observations. A copy of the letter is attached at **Appendix A** for completeness.
- 1.2. In relation to North Norfolk, requests for further observations were made by the Secretary of State regarding:
 - **Additions to Trenchless Crossings** (§20-21);
 - **Replacement Period in Landscaping Scheme** (§22-23)
 - **Non-Standard Construction Hours** (§26-27); and
 - **Control of Noise During Operational Use** (§28-29)
- 1.3. The response from NNDC in relation to these matters are set out below.

2. Additions to Trenchless Crossings (§20-21)

- 2.1. NNDC are grateful that the Secretary of State recognises the concerns of NNDC regarding proposals at Church Road, Colby. What is at stake here is avoiding disturbance of three out of six Important Hedgerows along this part of the route as well as the integrity of the tree lined road. The character of Colby Road would be permanently affected by the open cut trenching option proposed by the applicant with permanent easements preventing replacement trees being planted in the same or similar locations.
- 2.2. In relation to Norfolk Boreas, NNDC has considered the applicant's Clarification Note submission in relation to trenchless crossing at Church Lane, Colby [REP4-017] See **Appendix C**. NNDC notes the position of the applicant as set out across paragraphs 32 to 44 of this document. In the context of considering this

document, the ExA should be aware of the Important Hedgerows Plan prepared by the applicant for Norfolk Boreas [APP-018] (see **Appendix D**) where sheet 13 of 42 relates to the Colby Road area. This plan identifies six 'Important Hedgerows' affected by the project in this area alone.

- 2.3. Whilst NNDC consider that the applicant is perhaps seeking to overplay the negative HGV and construction traffic impact consequences associated with trenchless crossing compared against open cut trenching, it is nonetheless recognised by NNDC that there would be greater construction associated impacts for trenchless crossing. However, these construction related impacts would occur over a relatively short-term duration compared against the operational lifespan of the project and do have to be carefully weighed against the positive benefits of trenchless crossing including avoiding removal of sections of six Important Hedgerows and roadside trees which are an intrinsic landscape feature of the rural character of Colby Road.
- 2.4. In discussing this matter with the applicant, particularly with regard to alternative access points, NNDC has suggested consideration of an alternative vehicular access point to the north of the proposed cable corridor - see annotated plan of the proposal attached at **Appendix B** submitted to ExA for Norfolk Boreas at Deadline 5. This would be located at a point where there is an existing break in the tree line on the western side of Colby Road at the entrance to Hall Farm and Hall Farm Cottages. Existing access tracks could be partly used to form a new works access entrance with no loss of trees on this side of the road. On the eastern side of Colby Road, a new access could be created through the existing hedge. Whilst this may require removal of one or two semi-mature trees, the advantage of using this location is that replacement trees (and hedging) could be planted where gaps are created because the access would fall outside of the permanent easement area. These two accesses could allow new running track to be laid which will enable access to the trenchless crossing under Colby Road and thus negating the need to remove sections of three Important Hedgerows No.77, 78 and 79.

- 2.5. NNDC fully recognise that this alternative proposal carries additional considerations, namely those related to impacts to residents living nearby at Colby Hall Farm, Hall Farm, Hall Farm Cottages and Banningham Hall, amongst others who use the existing road network. These impacts have not been assessed by the applicant and fall outside the red line area of the DCO application.
- 2.6. Ultimately it is a matter of planning judgment for the ExA. The applicant is reluctant to consider alternatives beyond what they have considered within the ES, but this is not in itself justification for the existing option they are pursuing. Acknowledging that there will be some additional short term noise disturbance to neighbouring residents from the alternative proposed by NNDC, the benefits of saving the trees and Important Hedgerows are considered to more than outweigh any temporary harm to residential amenity, particularly in light of the opportunity afforded by this alternative for replacement tree and hedge planting.
- 2.7. NNDC consider that Norfolk Vanguard Requirement 16 (17) (Detailed design parameters onshore) should be amended to include passing under Church Lane, Colby via trenchless installation techniques.

3. Replacement Period in Landscaping Scheme (§22-23)

- 3.1. NNDC fully support the approach by the Secretary of State to clarify and secure an appropriate replacement period for landscaping associated with Norfolk Vanguard (and Norfolk Boreas). The position of NNDC throughout the examination of both Norfolk Vanguard and Norfolk Boreas in relation to the aftercare/replacement period has always been that this should be a 10-year period for all planting types within North Norfolk. This is based on evidence presented to the ExA for both NSIP schemes including Norfolk Vanguard Deadline 3 [REP3-055], Deadline 4 [REP4-068] and Deadline 6 [REP6-034].
- 3.2. Whilst the commitment from Vattenfall for a ten-year aftercare period for trees in North Norfolk is welcomed, at no time has NNDC sought to split out the replacement planting/aftercare periods for trees as opposed to hedges and shrubs. NNDC will continue to request a 10-year aftercare period for all tree, hedge and shrub planting within North Norfolk, which is supported by the evidence submitted by NNDC.
- 3.3. Whilst the evidence presented by NNDC related to trees; other shrubs and hedge plants within North Norfolk are also subject to the same challenging growing conditions and so should also be subject to a 10-year aftercare period so as to ensure all planting is able to properly establish.
- 3.4. NNDC notes that at paragraph 47 bullet point six of the Norfolk Vanguard Outline Landscape and Ecological Management Strategy [REP9-014] the applicant makes a commitment that:

‘Any tree or shrub planted as part of an approved Landscape Management Scheme that, within the first five years of the aftercare period (ten years for North Norfolk), is removed, dies or becomes, in the opinion of the relevant Local Authorities, seriously damaged or diseased, must be replaced in the first available planting season with a specimen of the same species and size as that originally planted, unless otherwise agreed in writing by the relevant Local Authorities’.

Whilst this commitment is welcomed, it is not backed up in the DCO. Requirement 19 (2) still refers to a five-year replacement planting period, at odds with the commitment for North Norfolk made in the OLEMS.

- 3.5. NNDC consider that Requirement 19 (2) should be amended to reflect the different replacement planting periods for North Norfolk and other LPA areas away from the coast. This could be achieved via amending 19 (2) and adding a new 19 (3) as suggested below:

19 (2) Any tree, **hedge** or shrub planted **within the District of North Norfolk** as part of an approved landscaping management scheme that, within a period of ~~five~~ **ten** years after planting, is removed, dies or becomes, in the opinion of the relevant planning authority, seriously damaged or diseased must be replaced in the first available planting season with a specimen of the same species and size as that originally planted unless a different species is otherwise **first** agreed in writing with the relevant planning authority.

19 (3) Any tree, **hedge** or shrub planted **outside the District of North Norfolk** as part of an approved landscaping management scheme that, within a period of five years after planting, is removed, dies or becomes, in the opinion of the relevant planning authority, seriously damaged or diseased must be replaced in the first available planting season with a specimen of the same species and size as that originally planted unless a different species is otherwise **first** agreed in writing with the relevant planning authority.

- 3.6. On 26 Feb 2020, the applicant shared with NNDC a draft copy of its proposed response to the Secretary of State in relation to Norfolk Vanguard. Within this draft letter, the applicant sets out agreement to extend the commitment within the OLEMS, to include replacement shrubs as well as trees, subject to landowner consent, for a period of ten years. Updated wording contained within Section 6.7.3 (Landscape Mitigation Post-Construction) of the Outline Landscape and

Ecological Management Strategy (OLEMS) was shared with NNDC which will be provided by the applicant to the Secretary of State.

- 3.7. In its draft response to Secretary of State letter (paragraphs 22-23) and its commitment to extend the ten-year replacement planting period for trees and shrubs, the applicant states:

‘It should be noted that the ten year period of aftercare for both trees and shrubs planted in North Norfolk's administrative area can only be agreed by the Applicant subject to landowner consent. The permanent rights that the Applicant can acquire over the land (Schedule 6 of the dDCO) do not extend to replacement planting outside of activities connected to cable maintenance. Therefore, where freehold land is not acquired (i.e. along the cable route), the Applicant will be reliant on temporary possession powers under Article 27 of the dDCO to maintain landscaping during the aftercare period. Article 27(12) of the dDCO limits the exercise of temporary powers in relation to any part of the authorised project to 5 years from the first export of electricity to the network. As such, the Applicant would not have rights or powers under the dDCO to maintain landscaping after the expiry of this 5 year period unless landowner consent is separately obtained. It is for this reason that the Applicant has only agreed to a 10 year period for North Norfolk's administrative area subject to landowner consent, and for this reason that this is appropriately secured in the OLEMS and not in the dDCO’.

- 3.8. NNDCs interpretation of the applicant's position highlighted above is that the applicant is happy with the principle of a ten-year replacement planting period (Trees and Shrubs) but this commitment cannot necessarily be realised because of constraints associated with DCO wording in Schedule 6 (relating to permanent rights) and reliance would instead be placed on temporary possession powers under Article 27 (temporary use of land for maintaining authorised project). The applicant refers to time limit restrictions imposed under Article (12) which would

limit maintenance to 'the period of 5 years beginning with the date on which the authorised project first exports electricity to the national electricity transmission network'. In effect the commitment made by the applicant to extend the ten-year replacement planting period for trees and shrubs cannot be fulfilled unless landowners are willing to agree to it. The Secretary of State is advised to consider very carefully the possible implications of the position set out by the applicant.

- 3.9. NNDC's position is that evidence has been produced to demonstrate why a ten-year replacement planting period is necessary for the District of North Norfolk and this requirement needs to be secured within the DCO. To not do so risks allowing the development to proceed with the real prospect of plant failures occurring after 5 years not being replaced to the detriment of the natural environment along the cable corridor within North Norfolk.
- 3.10. This raises the question as to whether the Secretary of State should be requesting the applicant to amend Schedule 6 and/or Article 27 to redefine the maintenance period taking account of the replacement planting commitment for North Norfolk. On the face of it this requires relatively simple re-drafting of Article 27 reflecting the two different maintenance periods, one within the District of North Norfolk for a period of 10 years and one outside the District of North Norfolk for a period of 5 years.
- 3.11. Amendments required to Schedule 6 may be more complex but can and should be explored further in order to ensure the DCO in its final form can deliver upon the commitments made by the applicant.
- 3.12. In respect of further changes to the DCO it is important that the DCO decision is clear with regards to what is covered within the replacement planting period. NNDC consider that the 10-year replacement period should be extended to apply to all planting types including trees, shrubs and hedgerows. NNDC would define tree, shrub and hedge as follows:
- A shrub would be defined as low to medium height vegetation of bushy form;

- A hedge is a line of shrubs managed as a hedgerow; and
- A tree is a tree unless it is a line of trees managed as a hedgerow

NNDC there would ask the Secretary of State to ensure changes are made to the DCO so that all tree, shrub and hedgerow planting within North Norfolk is subject to appropriate replacement planting periods.

4. Non-Standard Construction Hours (§26-27)

4.1. NNDC note the proposed amendments to Requirement 26 (4) as set out in paragraph 26 of the Secretary of State's letter:

*“Save for emergency works, the timing and duration **full details, including but not limited to type of activity, vehicle movements and type, timing and duration and any proposed mitigation**, of all essential construction activities under paragraph (2) and undertaken outside of the hours specified in paragraph (1) must be agreed with the relevant planning authority in writing in advance, and must be carried out within the agreed time.”*

4.2. NNDC consider that the proposed additions/changes are helpful and welcome such changes to be included within the final DCO.

5. Control of Noise During Operational Use (§28-29)

- 5.1. NNDC notes the matters raised across paragraphs 28-29 by the Secretary of State. Whilst the views of North Norfolk are requested, this matter relates to aspects of the development falling within the District of Breckland. NNDC would therefore not wish to comment on matters outside of its area of jurisdiction.
- 5.2. NNDC understands that the applicant has contacted Breckland Council for their comments.

28 FEBRUARY 2020

Appendix A – Secretary of State for Business, Energy and Industrial Strategy letter dated 06 Dec 2019



Department for
Business, Energy
& Industrial Strategy

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Email: beiseip@beis.gov.uk
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To:

Norfolk Vanguard Limited
Natural England
Marine Management Organisation
Norfolk County Council
Broadland District Council
North Norfolk District Council
Necton Parish Council

Your Ref:
Our Ref: EN010079

Date: 6 December 2019

Dear Sir or Madam,

Planning Act 2008 and The Infrastructure Planning (Examination Procedure) Rules 2010

Application by Norfolk Vanguard Limited (“the Applicant”) for an Order granting Development Consent for the proposed Norfolk Vanguard Offshore Wind Farm and associated offshore and onshore infrastructure (“the Norfolk Vanguard project”)

REQUEST FOR INFORMATION AND NOTIFICATION OF THE SECRETARY OF STATE’S DECISION TO SET A NEW DATE FOR DETERMINATION OF THE APPLICATION

1. Following the completion of the examination on 10 June 2019, the Examining Authority submitted a Report and Recommendation in respect of its findings and conclusions on the above application to the Secretary of State on 10 September 2019. In accordance with section 107 of the Planning Act 2008, the Secretary of State has three months to determine the application.
2. There are several issues on which the Secretary of State would be grateful if the parties identified in bold could provide any updates or information as appropriate. Additional comments from any interested parties on these points will also be considered. The issues are grouped by topic heading.

Request for information

Ornithology

3. In relation to in-combination impacts on the qualifying kittiwake feature of the Flamborough and Filey Coast Special Protection Area (“SPA”) and the qualifying lesser black-backed gull feature of the Alde-Ore Estuary SPA, the **Applicant**, in consultation with **Natural England** as necessary, is invited to provide information on any mitigation, not discussed during the Examination, which could lessen or avoid any adverse effects on the integrity of these sites.
4. In addition, or alternatively, **the Applicant**, in consultation with **Natural England** as necessary, is invited to provide evidence as to:
 - whether there are any feasible alternative solutions to the Norfolk Vanguard project which could avoid or lessen any adverse effects on the integrity of these sites;
 - any imperative reasons of overriding public interest for the Norfolk Vanguard project to proceed; and
 - any in-principle compensatory measures proposed to ensure that the overall coherence of the network of Natura 2000 sites is protected.
5. Compensatory measures should, if possible, be agreed by Natural England as at least sufficient, to offset the potential residual harm to the features of the Natura 2000 sites. In order that the Secretary of State can consider fully the application, the Applicant is requested to provide as much information as possible to explain the compensatory measures proposed and the feasibility of those measures. Details of the steps required to implement the compensation and proposed timescales to establish the compensatory measures should also be provided. Where disagreement remains between the parties on the assessment and quantification of an impact, compensation proposals should be provided for a range of scenarios.

Haisborough, Hammond and Winterton SAC

Site Integrity Plan

6. The Applicant has stated that up to 5% of the cable length within the Haisborough, Hammond and Winterton Special Area of Conservation (“SAC”) may require cable protection. Throughout the Examination, Natural England maintained a position that cable protection is not appropriate within the Haisborough, Hammond and Winterton Special Area of Conservation (“SAC”). The Secretary of State understands that both parties are agreed that a commitment by the Applicant to follow a Site Integrity Plan (“SIP”) approach would facilitate the identification of a final mitigation solution prior to construction. However, it is not clear whether any mitigations solutions currently exist. The **Applicant**, in consultation with the **Marine Management Organisation** and **Natural England** as necessary, is invited to provide information on the specific mitigation solutions that would address the potential effects of cable protection on the SAC features. In the absence of any identifiable mitigation measures, the **Applicant**, in consultation with **Natural England**, may wish to consider the provision of evidence as to:

- whether there are any feasible alternative solutions to the Norfolk Vanguard project which could avoid or lessen any adverse effects on the integrity of these sites;
- any imperative reasons of overriding public interest for the Norfolk Vanguard project to proceed; and
- any in-principle compensatory measures proposed to ensure that the overall coherence of the network of Natura 2000 sites is protected.

Particle Size Condition

7. At deadlines 8 and 9 of the Examination, Natural England advised the Examining Authority that changes to sediment distribution and composition can be minimised by securing the Applicant's commitment to ensure particle size of the deposited material matches the disposal site. In view of Natural England's advice, the Secretary of State invites comments from **Natural England, the Marine Management Organisation** and the **Applicant** on the inclusion of the following subsection (g) within Condition 3(1) of Schedules 11 and 12 of the DCO (Applicant's preferred DCO submitted at Deadline 9):

"Taken together with works authorised and proposed to be constructed pursuant to licences 1 and 2 (transmission)— disposal activities within the Haisborough, Hammond and Winterton Special Area of Conservation Site must not take place until the Marine Management Organisation has confirmed that the particle size composition of the disposal material is within 95% similarity to the particle size composition of the seabed at the disposal location."

Marine Mammals

Vibro Piling and 'blue hammer'

8. At the second Issue Specific Hearing and the subsequent written summary the Applicant provided details of other construction techniques that were being trialled including vibro-piling and the 'blue hammer' that are construction techniques which use vibration and hydro power respectively.
9. In view of possible use of vibro piling and 'blue hammer' construction techniques, the **Applicant**, in consultation with **Natural England** as necessary, is invited to provide information on the likely noise levels associated with these techniques. In addition, the Secretary of State invites comments from **Natural England, the Marine Management Organisation** and the **Applicant** on the inclusion of the following amended conditions in the DCO (Applicant's preferred DCO submitted at Deadline 9):
 - **Condition 14(1)(f) of Schedules 9 and 10, and Condition 9(1)(f) of Schedules 11 and 12.** *In the event that piled foundations or any other construction method that may have an impact on marine mammals, such as vibro-piling or 'blue hammer', are proposed to be used, a marine mammal mitigation protocol, in accordance with the draft marine mammal mitigation protocol, the intention of which is to prevent injury to marine mammals and following current best practice as advised by the relevant statutory nature conservation bodies.*

- **Condition 14(1)(m) of Schedules 9 and 10, and Condition 9(1)(l) of Schedules 11 and 12.** *In the event that piled foundations or any other construction method that may have an impact on marine mammals, such as vibro-piling or ‘blue hammer’, are proposed to be used, a site integrity plan which accords with the principles set out in the in principle Norfolk Vanguard Southern North Sea Special Area of Conservation Site Integrity Plan, and which the MMO is satisfied would provide such mitigation as is necessary to avoid adversely affecting the integrity (within the meaning of the 2017 Regulations) of a relevant site, to the extent that harbour porpoise area protected feature of that site.*

Water Quality

10. The Applicant’s Information for the Habitats Regulations Assessment document assesses the effect of changes to water quality on harbour porpoise from the Project alone, but it is noted that an assessment of this effect in-combination with other plans and projects has not been provided. The **Applicant**, in consultation with **Natural England** as necessary, is invited to provide information on this matter to inform the Secretary of State’s HRA.

Traffic Movements at Cawston

11. The Secretary of State is aware of concerns raised by local residents in respect of potential HGV movements along the B1145 (‘link 34’ in the Applicant’s Environmental Statement) road through Cawston both in relation to traffic movements potentially generated by the Norfolk Vanguard project on its own, but also in combination with traffic that might be generated by the proposed Hornsea Project Three Offshore Wind Farm (“H3”).
12. The Secretary of State notes that the Applicant submitted a revised Outline Traffic Management Plan at Deadline 8 of the Examination (Revision 3 of 30 May 2019) which included proposed measures for mitigating impacts from HGVs on Cawston (see link below).

<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003034-8.8%20Outline%20Traffic%20Management%20Plan.pdf>

13. The Secretary of State is aware that the Applicant submitted a “position statement” to the Norfolk Vanguard Examination at Deadline 9 which set out the respective positions of the Norfolk County Council and the Applicant with regard to “Unresolved Traffic Matters”. The position statement covered three topics: “Requested trenchless crossing of the B1149”; “Norfolk County Council – Link 34, B1145 Cawston – Highway Mitigation Measures”; and “The Street, Oulton – Highway Mitigation Measures” (see below).

[https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003194-ExA;%20AS;%2010.D9.7%20Norfolk%20County%20Council%20Unresolved%20Traffic%20Matters%20Position%20Statement%20\(002\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003194-ExA;%20AS;%2010.D9.7%20Norfolk%20County%20Council%20Unresolved%20Traffic%20Matters%20Position%20Statement%20(002).pdf)

14. The Secretary of State also notes that in the Statement of Common Ground between the Applicant and Norfolk County Council (submitted for Deadline 9), the Council states that its position on the B1145 Cawston – Highway Mitigation Measures, is that it *“believes a suitable access strategy can be produced that mitigates impact however..... the intervention scheme drawings and proposal before us are very much “work in progress”. In short, the scheme needs several changes, but we anticipate they will be amendments rather than a complete re-think”* (see below). This statement is also set out in the position statement mentioned above.

[https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003193-Rep3%20-SOCG%20-15.1%20Norfolk%20Vanguard%20SoCG%20-%20NCC%20\(002\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003193-Rep3%20-SOCG%20-15.1%20Norfolk%20Vanguard%20SoCG%20-%20NCC%20(002).pdf)

15. The Secretary of State notes from the above submissions that the Applicant and Norfolk County Council believe there is a reasonable expectation that an appropriate mitigation scheme could be brought forward for traffic movements at Cawston. However, the Secretary of State considers that it is not apparent from exchanges during Examination that these will be sufficient to offset any potential harm from in-combination traffic effects arising from the proposed Norfolk Vanguard project and H3 in the event that both were granted development consent.
16. The Secretary of State is considering whether it would be necessary to introduce an amendment to Requirement 21 of the last version of the ExA’s DCO (submitted at Deadline 9) to provide additional mitigation for cumulative impacts that might arise in the event that both the Norfolk Vanguard project and H3 developments are granted consent. The Secretary of State would be grateful for comments from the **Applicant, Norfolk County Council** and **Broadlands District Council** on the possible incorporation of the following wording into any development consent order that might be made in respect of the Norfolk Vanguard offshore wind farm:

“In circumstances where the Hornsea Project 3 DCO is made and development of the Hornsea Project 3 commences, and notwithstanding the requirement of sub-paragraph (a) of paragraph (1) above, the traffic management plan shall include, in respect of Link 34 as referred to in the Environmental Statement, revised details of a scheme of traffic mitigation which shall be submitted to, and approved in writing by, the relevant planning authority, in consultation with the highway authority.”

Appearance of Electrical Equipment

17. The Secretary of State notes some discussion during the Examination about mitigation for the potential visual impacts of certain onshore works proposed as part of the Norfolk Vanguard project. In particular, there was discussion about design mitigation for the proposed extension of the National Grid substation at Necton (Work 10A). The Secretary of State notes that work 10A is not specifically covered in the mitigation provisions of the Applicant’s proposed DCO as submitted at Deadline 9 of the Examination.

18. The Secretary of State is considering whether to amend Requirement 16(9) of the Applicant's proposed DCO in the following terms:

"The external electrical equipment comprised in Work No. 10A (the external appearance of which shall have been approved in writing by the relevant planning authority prior to commencement of its construction) must not exceed a height of 15 metres above existing ground level."

19. The Secretary of State asks the **Applicant, Norfolk County Council** and **Necton Parish Council** for their views on the proposed amendment.

Additions to Trenchless Crossings

20. The Secretary of State is aware that there was consideration during the Examination of the extent of the requirements for trenchless crossing to be utilised in a number of locations along the onshore export cable route. In particular, the Secretary of State notes that at the end of the Examination, there was disagreement between the Applicant and North Norfolk District Councils and Norfolk County Council about whether two particular sections of the local road network – along the B1149 and on Colby Road (Church Road), north of Banningham – should be added to the list of trenchless crossings as set out in Requirement 16 of the Applicant's proposed development consent order as submitted to the Examination for Deadline 9.

21. The Secretary of State would be grateful for the views of the **Applicant, Norfolk County Council** and **North Norfolk District Council** on this proposal.

Replacement Period in Landscaping Scheme

22. The Secretary of State notes discussion during the Examination about the duration of any planting period, with ten year and five-year periods being proposed by North Norfolk District Council and the Applicant respectively. While it appears from the Statement of Common Ground prepared by North Norfolk District Council and the Applicant that there was agreement on a ten year planting period, the Secretary of State notes that Requirement 19(2) of the proposed DCO submitted by the Applicant for Deadline 9 of the Examination sets a five year period for remedial planting.

23. The Secretary of State would be grateful for comments from **North Norfolk District Council** and the **Applicant** on whether the ten-year period is agreed as a provision in any DCO that might be made by the Secretary of State.

Timing of Traffic Management Measures

24. The Secretary of State notes the importance of the consideration of traffic and transport issues during the Examination of the Application. The Secretary of State is, therefore, considering amending Requirement 21(2) of the development consent order submitted by the Applicant for Deadline 9 of the Examination, as follows:

“The plans approved under paragraph (1) must be implemented ~~upon~~ prior to commencement of the relevant stage of the onshore transmission works.”

25. The Secretary of State would be grateful for comments from the **Applicant, Broadlands District Council and Norfolk County Council** on the proposed revision.

Non-standard Construction Hours

26. The Secretary of State notes that there was consideration during the Examination of how mitigation for impacts arising from non-standard construction hours might be given effect. The Secretary of State notes the provision made by the Applicant in its proposed DCO submitted at Deadline 9 for such mitigation. However, the Secretary of State considers that the following amendment should be made to the proposed DCO in the following terms:

“Save for emergency works, ~~the timing and duration~~ full details, including but not limited to type of activity, vehicle movements and type, timing and duration and any proposed mitigation, of all essential construction activities under paragraph (2) and undertaken outside of the hours specified in paragraph (1) must be agreed with the relevant planning authority in writing in advance, and must be carried out within the agreed time.”

27. The Secretary of State would be grateful for comments from the **Applicant and North Norfolk District Council** on the proposed amended wording.

Control of Noise During Operational Phase

28. The Secretary of State notes the concerns expressed during the Examination of the Application about noise impacts at the proposed substation for the project both during the operation and maintenance of the infrastructure. The Secretary of State is considering whether an amendment to proposed DCO submitted by the Applicant at Deadline 9 of the Examination should be made to cover an event where agreed noise levels have been breached. The Secretary of State’s proposed amendments are as follows:

“Control of noise during operational phase and during maintenance

1.—(1) The noise rating level for the use of Work No. 8A and during maintenance must not exceed 35dB L_{Aeq} (5 minutes) at any time at a free field location immediately adjacent to any noise sensitive location.

(2) The noise rating level for the use of Work No. 8A and during maintenance must not exceed 32 dB L_{Leq} (15 minutes) in the 100Hz third octave band at any time at a free field location immediately adjacent to any noise sensitive location.

(3) Work No. 8A must not commence operation until a scheme for monitoring compliance with the noise rating levels set out in paragraphs (1) and (2) above has been submitted to and approved by the relevant planning authority. The scheme must include identification of suitable monitoring locations (and alternative surrogate locations if appropriate) and times when the monitoring is to take place to demonstrate that the noise

levels have been achieved after both initial commencement of operations and six months after Work No. 8A is at full operational capacity. *Such measurements shall be submitted to the relevant planning authority no later than 28 days following completion to confirm the rating level of operational noise emissions do not exceed the levels specified in subparagraphs (1) and (2), including details of any remedial works and a programme of implementation should the emissions exceed the stated levels.*

(4) *The monitoring scheme must be implemented as approved."*

29. The Secretary of State would be grateful, for the views of the **Applicant, Norfolk County Council** and **North Norfolk District Council** on the proposed changes to the development consent order.

Part 4 Condition 9(12) of Schedules 9 and 10, and Condition 4(12) of Schedules 11 and 12 – notice of cable exposure

30. The Secretary of State notes that during the Examination there was a disagreement between the MMO and the Maritime and Coastguard Agency on the one side and the Applicant on the other about the timescale within which notification of damage to buried cables offshore should be provided by the Applicant.

31. The Secretary of State is considering whether to amend the Applicant's proposed DCO submitted at Deadline 9 in the following way:

"Delete 'five days' and replace with 'three days'."

32. The Secretary of State would be grateful for comments from the **Applicant**, the **Marine Management Organisation** and the **Maritime and Coastguard Agency** on the proposed change.

Conditions 14(1) and 9(1) of Schedules 9 and 10, and Condition 9(1) of Schedules 11 and 12 – lighting and marking plan and operation and maintenance programme

33. The Secretary of State notes that during the Examination there was a disagreement between the Maritime and Coastguard Agency and the Applicant about when a Lighting and Marking Plan and an Operation and Maintenance Programme should be submitted by the Applicant to the Maritime and Coastguard Agency. The Secretary of State would be grateful for comments from the **Applicant** and the **Maritime and Coastguard Agency** on the following amendment to the Applicant's proposed DCO submitted at Deadline 9:

Add: "(n) a lighting and marking plan." and "(o) an operation and maintenance programme."

The deadline for responses is 23.59 on Friday, 28 February 2020.

34. Responses on the information requested above should be submitted by email to: NorfolkVanguard@planninginspectorate.gov.uk.

35. Please also send any hard copy response to the Norfolk Vanguard Offshore Wind Farm Team, Secretary of State for Business, Energy and Industrial Strategy, c/o the Planning Inspectorate, 3D Eagle Wing, Temple Quay House, Temple Quay, Bristol, BS1 6PN. If you will have difficulty in submitting a response by the consultation deadline, please inform the Project Team as soon as possible. An explanation of the reasons for this should also be provided.

36. Responses will be published on the Norfolk Vanguard Offshore Wind Farm project page of the National Infrastructure Planning website as soon as possible after 28 February 2020:

<https://infrastructure.planninginspectorate.gov.uk/projects/eastern/norfolk-vanguard/> .

37. Comments will then be invited from interested parties within a further 28 days on the above matters only (if appropriate). The Secretary of State will then consider the responses and information received in reaching a decision on the Application.

New Deadline

38. In order to allow time for the steps above to be taken, the Secretary of State will be setting a new deadline for a decision on the Application. A statement confirming the new deadline for a decision will be made to the House of Commons and the House of Lords in accordance with section 107(7) of the Planning Act 2008 as soon as possible once Parliament is in session.

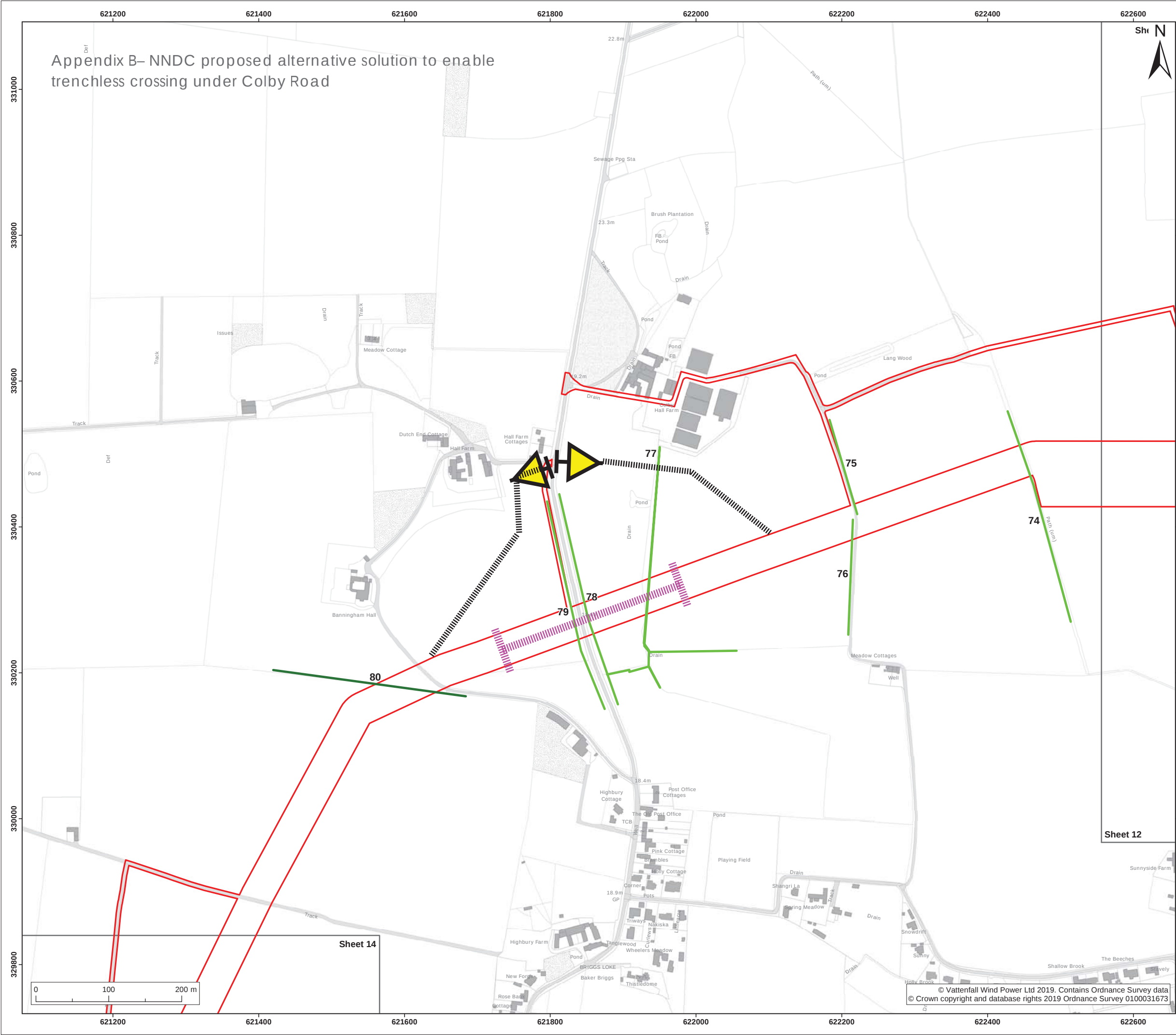
39. This letter is without prejudice to the Secretary of State's decision whether or not to grant development consent for the Norfolk Vanguard project, and nothing in this letter is to be taken to imply what the eventual decision might be or what final conclusions the Secretary of State may reach on any particular issue which is relevant to the determination of the application.

Yours faithfully

Gareth Leigh

Gareth Leigh
Head of Energy Infrastructure Planning

Appendix B – NNDC proposed alternative solution to enable trenchless crossing under Colby Road



- Legend:
- Order limits
 - Sheet boundary
 - Important hedgerow
 - Hedgerow
- Proposed Vehicular Access point
- New running track
- Area for trenchless crossing

Project:	Report:
Norfolk Boreas Offshore Wind Farm	Development Consent Order

Title:
2.11 Important hedgerows plan (sheet 13 of 42)

Doc Ref:	APFP Ref:	Drawing No:			
2.11	5(2)(0)	PB5640-007-000-025			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
05	29/04/2019	LB	CD	A1	1:2,500
04	04/03/2019	JT	CD	A1	1:2,500

Co-ordinate system: British National Grid EPSG: 27700



**Appendix C – Norfolk Boreas [REP4-017] – Norfolk Boreas
Limited Deadline 4 Submission - Clarification Note - Trenchless
Crossings B1149 and Church Road, Colby**

Norfolk Boreas Offshore Wind Farm Clarification Note Trenchless Crossings B1149 and Church Road, Colby

Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-3.D4.V1
Deadline 4

Date: January 2020
Revision: Version 1
Author: Royal HaskoningDHV

Photo: Ormonde Offshore Wind Farm

Date	Issue No.	Remarks / Reason for Issue	Author	Checked	Approved
28/01/2020	01D	First draft for Internal Review	AH/RE/AR	CD/VR	JL
30/01/2020	01F	Final for Deadline 4 submission	AH/RE/AR	CD	JL



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Appendix 4	Church Road, Colby Access Layout
Appendix 5	Church Road, Colby Access Aerial Image

Glossary of Acronyms

AAWT	Annual Average Weekly Traffic
ATC	Automatic Traffic Count
dDCO	Draft Development Consent Order
DMRB	Design Manual for Roads and Bridges
ES	Environmental Statement
HGV	Heavy Goods Vehicle
LWA db(A)	A-weighted sound power level in decibels
M	Metres
Mph	Miles per hour
NPL	Norfolk Partnership Laboratory
OLEMS	Outline Landscape and Ecological Management Strategy
TC	Trenchless Crossing Point
TEMPro	Trip End Model Presentation Programme

1 Introduction

- Following Issue Specific Hearing 3 on Onshore Effects including the draft Development Consent Order held on Tuesday 21st January 2020, an action was identified by the Examining Authority for the Applicant to produce a Clarification Note to set out the reasons for and against trenchless crossings at B1149 and at Church Road, Colby, to include plans to an appropriate scale. This clarification note has been produced to address the request from the Examining Authority.

2 Comparison of open cut trenching and trenchless crossing of highways

- Open cut trenching and trenchless crossing duct installation methods for the crossing of highways are detailed within Section 5.7.2.3.3 and Section 5.7.2.4 of Environmental Statement Chapter 5 Project Description [APP-218] respectively.
- Crossing of highways for duct installation is required only in Scenario 2.
- A comparison of open cut trenching and trenchless crossing methods is provided in Table 2.1 based on a range of parameters and with reference to the application documents.

Table 2.1 Comparison of open cut trench and trenchless crossing methods

Parameter	Open Cut Trench Crossing	Trenchless Crossing
Impacts to road users	Temporary (typically less than 1 week) impacts to road users which may include traffic management measures such as single lane closure or road closure or diversion.	No direct impacts to road users
Working hours	Consented construction hours: 07.00 – 19.00 Monday to Friday 07.00 – 13.00 Saturday No work on Sundays or public holidays. As set out in Requirement 26.	Consented construction hours: 07.00 – 19.00 Monday to Friday 07.00 – 13.00 Saturday Trenchless crossings may require works to extend outside of the consented hours (for technical reasons following commencement of drilling), i.e. works may extend into the evening or night time. Should works be required to extend beyond the consented hours then prior approval would be required from the relevant planning authority as set out in Requirement 26.
Works footprint	No additional land requirements. All works are conducted within the cable route working width using the same or similar equipment and contractors as open cut trenching in agricultural land.	Additional temporary land requirements for laydown areas and facilities associated with additional trenchless crossing equipment and contractors, up to: 5,000m ² drill reception site 7,500m ² drill launch site
Timescale	Typically less than 1 week to conduct the crossing, likely to be completed in days.	Up to 6 weeks to conduct the crossing, allowing for setup of temporary areas and additional equipment, period of drilling and subsequent demobilisation and removal of equipment and materials.

Parameter	Open Cut Trench Crossing	Trenchless Crossing																																																																								
Materials and Transport	Negligible additional materials required to be delivered compared to open cut trenching in agricultural land, with exception to some minor traffic management and resurfacing materials, however this is offset by no running track material requirements. With reference to Appendix 24.20 [APP-635], approximately 8 HGV deliveries per notional 15m highways open cut trenched crossing.	Significant additional materials and associated traffic movements to establish and remove additional temporary works areas and drilling equipment to the location. With reference to Appendix 24.20 [APP-635], worst case additional deliveries of 450 HGVs per trenchless crossing.																																																																								
Equipment / plant and associated noise levels	Negligible additional equipment for open cut trench crossing compared to open cut trenching in agricultural land. Noise levels provided for associated equipment. Duct installation (daytime) <table> <tr> <th>Name</th><th>LwA dB(A)*</th><th>On time Correction**</th></tr> <tr> <td>Bulldozer</td><td>108</td><td>75%</td></tr> <tr> <td>Dump Truck</td><td>107</td><td>75%</td></tr> <tr> <td>Tracked Excavator</td><td>107</td><td>75%</td></tr> <tr> <td>Generator</td><td>105</td><td>100%</td></tr> <tr> <td>Water Pump</td><td>93</td><td>75%</td></tr> <tr> <td>Dump Truck</td><td>115</td><td>15km/h</td></tr> <tr> <td>Lorry</td><td>108</td><td>15km/h</td></tr> </table> Evening / night-time activities None	Name	LwA dB(A)*	On time Correction**	Bulldozer	108	75%	Dump Truck	107	75%	Tracked Excavator	107	75%	Generator	105	100%	Water Pump	93	75%	Dump Truck	115	15km/h	Lorry	108	15km/h	Additional equipment for trenchless crossings required with associated noise. Noise levels provided for associated equipment. Trenchless crossing (daytime) <table> <tr> <th>Name</th><th>LwA dB(A)*</th><th>On time Correction**</th></tr> <tr> <td>Tracked Excavator</td><td>107</td><td>50%</td></tr> <tr> <td>Backhoe Loader</td><td>96</td><td>50%</td></tr> <tr> <td>Bulldozer</td><td>108</td><td>50%</td></tr> <tr> <td>Dumper</td><td>101</td><td>50%</td></tr> <tr> <td>Mobile Crane</td><td>106</td><td>25%</td></tr> <tr> <td>Cement Mixer</td><td>103</td><td>25%</td></tr> <tr> <td>Concrete Pump</td><td>108</td><td>25%</td></tr> <tr> <td>Piling</td><td>118</td><td>10%</td></tr> <tr> <td>Drilling Rig</td><td>105</td><td>75%</td></tr> <tr> <td>Water Pump</td><td>93</td><td>75%</td></tr> <tr> <td>Generator</td><td>105</td><td>100%</td></tr> </table> Trenchless crossing (evening / night-time) <table> <tr> <th>Name</th><th>LwA dB(A)*</th><th>On time Correction**</th></tr> <tr> <td>Backhoe Loader</td><td>96</td><td>50%</td></tr> <tr> <td>Dumper</td><td>101</td><td>50%</td></tr> <tr> <td>Drilling Rig</td><td>105</td><td>75%</td></tr> </table>	Name	LwA dB(A)*	On time Correction**	Tracked Excavator	107	50%	Backhoe Loader	96	50%	Bulldozer	108	50%	Dumper	101	50%	Mobile Crane	106	25%	Cement Mixer	103	25%	Concrete Pump	108	25%	Piling	118	10%	Drilling Rig	105	75%	Water Pump	93	75%	Generator	105	100%	Name	LwA dB(A)*	On time Correction**	Backhoe Loader	96	50%	Dumper	101	50%	Drilling Rig	105	75%
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Parameter	Open Cut Trench Crossing	Trenchless Crossing		
		Water Pump	93	75%
		Generator	105	100%
* A-weighted sound power level in decibels				
** Percentage of assessment period that plant is expected to be in operation				

5. In summary, trenchless crossing methods mitigate direct impacts to the highway and highway users. However, the additional trenchless crossing equipment, associated materials and methodology requirements results in a number of additional wider impacts including an extended installation timescale, notable additional HGV deliveries of materials and additional temporary land requirements.
6. Conversely, open cut trench crossing methods do not require notable additional materials or equipment as the duct installation method is similar to that employed through the majority of the onshore cable route, including in agricultural land either side of the crossing. During the crossing works, impacts to highway users can be mitigated through the use of traffic management measures for the short installation period (typically less than 1 week) and additional impacts associated with trenchless crossing methods (e.g. additional equipment, materials, temporary land, HGV deliveries etc.) are fully mitigated.
7. The application of open cut trenching or trenchless crossing methods at highways crossings has been carefully considered, in consultation with the Highways Authority, acknowledging the benefits and drawbacks of each methodology. Where justification has been provided through an evidential basis that impacts to road users would be significant through the use of open cut trenching, the use of trenchless crossing methods has been committed to (and secured in Requirement 16 of the dDCO). Where assessments have illustrated that traffic management measures are sufficient to mitigate impacts to road users, the use of open cut trenching is proposed to limit additional indirect impacts associated with the onshore duct installation.

3 Considerations for the Proposed Open Cut Method at the B1149

8. Norfolk County Council raised concerns with the use of open cut trenching on the B1149 and an investigation was undertaken in response to the concerns raised, further details are provided below.

3.1 Road Network Disruption Review

9. The principal guidance for temporary traffic management situations in the UK is Chapter 8 of the Traffic Signs Manual (Department for Transport, 2009¹) ('Chapter

¹ Department for Transport, 2009. Traffic and Signs Manual, Chapter 8.

8'). Chapter 8 gives detailed specification for roadworks for a wide range of traffic situations.

10. Open cut trenching for the Project would be carried out by closing a lane of the carriageway and providing traffic signal control to safely introduce single file traffic (known as 'one-way working'). Paragraph D5.1.6 of Chapter 8 details the maximum vehicle flows at which significant delays would be experienced by traffic subjected to one-way working as follows:

'On roads where flows are very high, overload of the controlled area is possible and exceptional delays may result. This can occur with two-way flows as low as 1,300 vehicles per hour (for sites about 50m long)....' (Department for Transport, 2009)

11. Thus, the 1,300 vehicle per hour is adopted as the 'Chapter 8 thresholds' to determine if the open cut method would lead to significant network disruption at the B1149.

3.1.1 Traffic Flow Data

12. Baseline traffic flow data for the B1149 was captured via seven-day Automatic Traffic Counters (ATC) commissioned by Norfolk Vanguard Limited at a location approximately 65m north of the crossing point. Original ATC were captured as part of Chapter 24 of the Environmental Statement (ES), undertaken on the 19th April 2017 to 25th April 2017, and this data is provided in Appendix 1. The traffic count data is summarised in Table 3.1.
13. A review of the surveyed traffic data identifies network peak hours of 7:30am to 8:30am and 4:30pm to 5:30pm.
14. Within Table 3.1, the surveyed flows have been growthed to the forecast year of 2023 (the earliest start of construction for Norfolk Boreas – Scenario 2). Annual Average Weekly Traffic (AAWT) has been derived to reflect the Project's predominate weekday traffic demand. The growth factors for AAWT peak hours have been derived from the Department for Transport Trip End Model Presentation Programme (TEMPro2) Version 7.2 with data set 72 for the Broadland (B1149) geographical area.
15. To account for daily fluctuations in traffic flows a 10% (-5%/+5%) daily fluctuation factor has been applied to the 2023 forecast flows.
16. In addition, the daily development flows (employees and HGVs) for both Norfolk Boreas and Hornsea Project Three have been taken from the respective examination documentation (and as presented in the cumulative impact assessment section 24.8 of ES Chapter 24 [APP-237] and added to the maximum (+5%) 2023 forecast flows.

17. The final 2023 forecast flows presented in Table 3.1 are considered to be the maximum worst case flows that the B1149 would experience during open cut trenching.

Table 3.1 Traffic Flow Data (two-way flows)

Time Periods		Surveyed Flows	TEMPro Growth Factors	2023 Daily Forecast Flows	2023 Forecast Daily Fluctuations		Norfolk Boreas 2023 Daily Development Flows		Hornsea Project 3 Daily Development Flows		Total 2023 Daily Forecast Flows with Developments
					Min (-5%)	Max (+5%)	Employee Vehicles	HGVs	Employee Vehicles	HGVs	Total Vehicles
B1149											
24hr AAWT¹	24hrs	5,645	1.1324	6,292	6,072	6,712	173	212	232	162	7,491
Weekday am Peak	7:30am to 8:30am	513	1.1234	547	540	605	87	21.2	116	17	846
Weekday pm Peak	4:30am to 5:30pm	561	1.1261	631	600	663	87	21.2	116	17	904
¹ Annual Average Weekly Traffic											

3.1.2 Network Disruption Conclusion

18. As can be seen by Table 3.1, both the forecast 2023 AM (846) and PM (904) peak flows (for both Project alone and cumulative traffic flows) are well below the Chapter 8 thresholds of 1,300 two-way vehicle flows for one-way working.
19. Therefore, it is considered that one-way working remains appropriate for the B1149 and will not result in significant network disruption. It is noted that the B1149 is defined by Norfolk County Council as a traffic sensitive route and in accordance with this stipulation, all roadworks will be undertaken outside of the periods of 7:30am to 9am and 4pm to 7pm and the road would be open to two-way traffic thereafter.
20. With the combination of the identified low traffic flows and previously identified traffic mitigation measures in place, no more than a **minor adverse** residual impact would be experienced on the B1149 during the open cut trench crossing works, which is not significant in Environmental Impact Assessment terms.

3.2 Long-Term Maintenance Liability Review

21. Norfolk County Council's concern was that the trench reinstatement would become a long term maintenance liability (after the mandatory 3 year maintenance period).
22. In response, Norfolk Vanguard Ltd. commissioned local pavement specialists, the Norfolk Partnership Laboratory (NPL) to investigate ground conditions at the B1149 and ascertain if an appropriate road reinstatement specification is feasible. NPL

undertook four core sample ground investigations in the approximate location of the proposed open cut trench crossings on the B1149.

23. Appendix 2 contains the core testing results. In summary, the testing indicates that there is good load bearing subgrade (known as the California Bearing Ratio test) and accordingly the road can be suitably reinstated. A specification has been developed for the reinstatements to minimise the potential for future maintenance liability by minimising the risk of differential settlement and reflective cracking. Appendix 2 also contains the recommended pavement specification for each trench location. The specification uses readily available material and established trenching techniques and would be adopted by a suitably accredited contractor.
24. Based on the findings of the laboratory tests and the recommended reinstatement specification, it is concluded that adverse maintenance liability can be mitigated and therefore open cut trenching remains an appropriate method. The specification will be secured in an update to the Outline Traffic Management Plan to be submitted at Deadline 5.

3.3 Cumulative Traffic Management

25. Norfolk County Council has raised specific concerns relating to the cumulative interaction of the Project's and Hornsea Project Three's traffic. With regard to one-way working the specific concerns are:
 - 1) Accommodating the large volume of abnormal loads delivering cable drums to the Hornsea Project Three main compound at Oulton; and
 - 2) Ensuring the roadworks do not lead to 'blocking back' of the B1149/The Street, Oulton junction; or vehicles do not approach the back of a queue unsighted from the B1149 south, hump back bridge; and
 - 3) The need for a 1.2m wide safety zone.
26. Appendix 3 sets out the proposed one-way traffic management concept design for the B1149 (to be included in the updated Outline Traffic Management Plan to be submitted at Deadline 5). The roadworks design incorporates a wide one way lane (4.5m) to accommodate the Hornsea Project Three abnormal loads and a 1.5m wide safety zone within the current Order limits for Norfolk Boreas. It can also be observed from Appendix 3 that the road works terminate some 210m southeast of the B1149/The Street, Oulton junction ensuring that the risk of traffic blocking back to the B1149/The Street junction would be minimised. Furthermore, the roadworks terminate some 430m northwest of the hump back bridge ensuring the risk of queue length collision is minimised. The updated traffic management design was shared with Norfolk County Council at a meeting on the 15th January 2020 and it was confirmed that officers had "no technical objection" to the proposal.

27. The traffic management methodology employs single lane working controlled by traffic signals to enable the trench to be cut and reinstated in sections whilst maintaining the flow of traffic. In order to accommodate the required AIL and safety zone widths it is necessary to widen the carriageway to provide the requisite clearance. This widening will be temporary and will be reinstated following trench reinstatement, however to accommodate the traffic outlined it will be of robust construction and require some additional HGV movements. It is noted that the B1149 is designated a traffic sensitive route and therefore there may be restrictions on working during the hours of 07:30 to 09:00 and 16:00 to 19:00, Monday to Friday
28. It is concluded that the specific cumulative traffic concerns have been designed out at the B1149 crossing.

3.4 Conclusion

29. An open cut trench crossing is deemed appropriate as there is no evidence to suggest that this form of crossing will cause significant adverse impacts or present a maintenance liability.
30. Conversely, the use of a trenchless crossing method would introduce alternate impacts, including up to 450 additional HGV deliveries to support the method, extended installation timescales and the requirement for additional temporary land.
31. It should be noted that there are currently no temporary works areas in proximity to the B1149. As such it would not be possible to undertake a trenchless crossing in this location without additional land outside of the current Order limits. However, the evidence presented within this note demonstrates that that an open cut trench solution is appropriate for the B1149.

4 Considerations for the Proposed Open Cut Method at Church Road, Colby

32. The Environmental Statement Chapter 29 identifies that at Church Road, Colby localised trees are susceptible to significant effects. In these locations open trenching would be carefully sited so as to minimise the number of trees to be removed, targeting poorer condition specimens or by using existing gaps in the tree line. However, restrictions applied to planting over cable easements prevents trees from being replanted over the 13m easement and immediately either side. Therefore, a significant effect would occur in relation to the removal of trees owing to their good condition and that direct replacement planting would not possible.
33. North Norfolk District Council identified in their Local Impact Report [REP2-087] that they believe that at this location the duct should be installed via a trenchless crossing technique so as to avoid the loss of trees at this location. As detailed above the ES considered the potential for localised tree loss at this location.

4.1 Additional Requirements

34. As detailed in section 2, the inclusion of a trenchless crossing of Church Road, Colby would require;
 - Additional laydown areas and facilities associated with additional trenchless crossing equipment not currently secured within the Order Limits;
 - Additional HGV movements;
 - Longer duration for duct installation; and
 - Additional equipment for trenchless crossings required with associated noise.
35. The prolonged works period and alternate construction methodology (compared to trenched installation) would result in additional construction impacts including noise, light, traffic, dust, vibration and land use which have not been assessed within the Environmental Statement.

4.2 Access Layout

36. At this location an access is required directly from the road to the cable route, in order to access works from MA8 (to the south-west) to TC11 (to the north-east). This is because TC11 is committed as a 'stop end' to mitigate direct impacts to Kings Beck (which is a sensitive watercourse), see ES Figure 5.4 Map 3 [APP-268]. Therefore, access either side of Church Road would be required to access the trenchless crossing at this location.
37. Appendix 4 details the general arrangement of the proposed access (AC58) and for context, Appendix 5 details the access layout overlaid on aerial photography.
38. It can be noted that (in accordance with HGV routing embedded mitigation) AC58 has been designed to accommodate HGV access from the north only. An assumed 30mph speed limit is applied (enforced by temporary traffic management) to minimise the required visibility splays and associated clearance of vegetation.
39. Notwithstanding these design relaxations, a significant area vegetation removal is required to implement safe access. As such, a trenchless crossing here would not remove the necessity to open a notable gap in the hedgerow and removal of any associated trees.

4.3 HGV Traffic Management

40. Noting the width of Church Road (single lane carriageway) a road closure may be required to implement an open cut trench. This would be a temporary closure lasting a few days during which traffic would be diverted round via the A140.
41. As set out in Table 2.1, a trenchless crossing generates in excess of 400+ HGVs above the relatively low demand generated by open cut trenching. For this volume of HGV

traffic, mobile traffic management on Church Road would cause notable delays, frequently necessitating temporarily halting traffic and escorting HGVs to and from site. This would introduce disruption for the entire periods of drilling, lasting six weeks.

4.4 Conclusion

42. Considering the access layout and visibility splay for construction accessibility through the hedgerow/trees will be required for a trenchless crossing of Church Road, Colby the benefits of a trenchless crossing at this location are not realised.
43. Furthermore, HGV movements for trenchless crossing techniques will introduce disruption to the travelling public for a period of up to six weeks.
44. In comparison, the Applicant's use of a trenched method will minimise construction impacts, land requirements and timescales and will look to microsite so far as possible to minimise impacts to trees. The Applicant has committed to replacing trees as close as practicable to the location where they were removed, outside of the permanent operational easement and subject to landowner agreements [OLEMS, Version 2, REP1-020]. This commitment to replace trees as close as possible to the location where they are removed, combined with reinstatement of the hedgerow, will assist in minimising the identified impact.

Norfolk Boreas Offshore Wind Farm

Appendix 1 –

B1149

Automatic Traffic

Counters Data

Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-3.D4.V1
Deadline 4
Date: January 2020
Revision: Version 1

Photo: Ormonde Offshore Wind Farm

Site 7
Location Holt Road, Att - Signpost, OSGR: TG 14536 25672
Direction Two way
19 April 2017

7346 / Norfolk
April 2017
Automatic Traffic Count

Time	Total	Classification												>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DFT	>SL2% 75 DFT	Mean	Vpp 85
		1 MCL	2 SV	3 SVT	4 TB2	5 TB3	6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD	12 DRT								
0000	3	0	3	0	0	0	0	0	0	0	0	0	0	1	33.3	0	0	0	0	57.8	-
0015	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.6	-
0030	5	1	4	0	0	0	0	0	0	0	0	0	0	1	20	0	0	0	0	53.6	-
0045	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.4	-
0100	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.6	-
0115	5	0	4	0	1	0	0	0	0	0	0	0	0	1	20	1	20	1	20	42.9	-
0130	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.6	-
0145	2	0	1	0	0	0	0	0	0	1	0	0	0	1	50	1	50	1	50	66.6	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0230	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	47.2	-
0245	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53.8	-
0300	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.4	-
0315	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.3	-
0330	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	33.2	-
0345	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.8	-
0400	2	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	39	-
0415	4	1	3	0	0	0	0	0	0	0	0	0	0	1	25	1	25	1	25	58.5	-
0430	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	38.1	-
0445	3	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	41.6	-
0500	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.8	-
0515	22	0	20	0	0	0	0	0	1	1	0	0	0	2	9.1	0	0	0	0	51.8	58.4
0530	12	0	8	0	1	0	0	0	1	1	1	0	0	1	8.3	0	0	0	0	49.6	55.3
0545	27	0	22	0	2	0	0	0	1	0	2	0	0	6	22.2	1	3.7	0	0	50.9	60.6
0600	25	0	16	1	2	0	1	0	1	2	2	0	0	5	20	1	4	0	0	51.4	60.8
0615	42	0	35	0	3	0	2	0	2	0	0	0	0	4	9.5	0	0	0	0	50.8	56.1
0630	55	0	47	0	7	0	1	0	0	0	0	0	0	5	9.1	0	0	0	0	52.9	57.3
0645	68	1	61	3	3	0	0	0	0	0	0	0	0	8	11.8	1	1.5	0	0	52.1	57.9
0700	106	0	95	3	4	1	0	0	0	0	3	0	0	9	8.5	1	0.9	0	0	48.3	57
0715	125	0	103	1	17	0	0	0	1	1	2	0	0	8	6.4	0	0	0	0	49.6	56.1
0730	127	0	106	1	15	0	0	0	1	1	3	0	0	8	6.3	0	0	0	0	47.8	56.1
0745	110	0	97	0	6	1	1	0	1	1	2	0	1	4	3.6	1	0.9	0	0	49.1	55.5
0800	112	2	100	2	5	0	1	0	1	0	1	0	0	7	6.3	0	0	0	0	49.6	57
0815	139	0	118	2	15	0	0	1	1	0	2	0	0	3	2.2	1	0.7	0	0	46.4	53.5
0830	122	1	104	2	9	1	2	0	1	1	1	0	0	4	3.3	1	0.8	0	0	46.4	52.6
0845	102	2	89	2	5	1	1	0	1	0	1	0	0	5	4.9	0	0	0	0	47.4	56.1
0900	68	1	56	1	6	0	1	0	0	1	2	0	0	2	2.9	0	0	0	0	48.7	54.1
0915	88	2	71	4	6	1	2	0	1	0	1	0	0	1	1.1	0	0	0	0	45.1	52.6
0930	96	1	83	3	2	3	0	0	1	0	3	0	0	5	5.2	2	2.1	1	1	45.1	52.8
0945	92	1	78	1	7	0	2	0	2	1	0	0	0	1	1.1	0	0	0	0	44.5	51.2
1000	100	1	84	1	12	0	0	0	0	1	1	0	0	3	3	0	0	0	0	44.6	49.9
1015	88	0	73	2	9	0	0	0	2	1	1	0	0	1	1.1	0	0	0	0	44	50.8
1030	101	0	86	1	9	1	1	0	1	1	1	0	0	3	3	2	2	2	2	44	52.1
1045	112	1	97	1	10	1	1	0	0	1	0	0	0	0	0	0	0	0	0	44.5	50.1
1100	82	0	71	0	7	0	2	0	2	0	0	0	0	1	1.2	0	0	0	0	45.6	52.1
1115	95	2	79	0	9	1	0	0	2	0	2	0	0	2	2.1	0	0	0	0	44.5	53.2
1130	93	1	85	0	5	0	0	0	0	0	2	0	0	2	2.2	0	0	0	0	44.8	51.2
1145	81	0	68	3	8	0	2	0	0	0	0	0	0	4	4.9	1	1.2	0	0	42.4	49.7
1200	79	3	58	1	11	1	2	0	1	0	2	0	0	1	1.3	0	0	0	0	42.8	51
1215	94	1	77	2	10	0	0	0	0	0	4	0	0	3	3.2	1	1.1	0	0	45.5	51.4
1230	86	0	72	0	9	0	1	0	2	0	1	1	0	2	2.3	0	0	0	0	46.9	53.5
1245	88	0	79	1	4	0	0	0	1	2	1	0	0	2	2.3	0	0	0	0	46.3	53.7
1300	98	1	79	5	6	2	0	0	2	1	2	0	0	2	2	1	1	0	0	45.8	52.3
1315	81	0	67	3	10	1	0	0	0	0	0	0	0	2	2.5	1	1.2	0	0	45.6	52.3
1330	88	1	76	0	6	0	0	0	2	1	2	0	0	1	1.1	0	0	0	0	46.2	51.9
1345	74	1	60	2	7	1	1	0	0	0	1	0	0	2	2.7	0	0	0	0	44.5	51.7
1400	86	2	75	1	6	0	0	0	0	1	1	0	0	1	1.2	0	0	0	0	45.2	52.1
1415	109	4	92	2	7	1	1	0	0	0	2	0	0	3	2.8	0	0	0	0	45	51.4
1430	86	3	71	1	9	0	1	0	1	0	0	0	0	9	10.5	1	1.2	0	0	46.9	54.8
1445	92	0	76	3	8	1	0	0	1	2	1	0	0	0	0	0	0	0	0	43.2	49.4
1500	77	1	61	2	10	0	0	0	0	1	2	0	0	3	3.9	0	0	0	0	46.4	53
1515	99	0	86	1	9	1	1	0	0	1	0	0	0	5	5.1	0	0	0	0	47	54.6
1530	105	0	93	2	9	0	0	0	0	0	1	0	0	2	1.9	0	0	0	0	44.5	50.6
1545	116	0	106	0	9	0	0	0	0	1	0	0	0	3	2.6	1	0.9	0	0	46.3	51.7
1600	115	1	99	1	12	0	0	0	1	0	1	0	0	2	1.7	0	0	0	0	46.5	53.5
1615	136	1	118	4	11	0	1	0	0	1	0	0	0	2	1.5	0	0	0	0	47.3	53
1630	146	3	129	2	11	0	0	0	0	0	1	0	0	3	2.1	0	0	0	0	46.9	51
1645	146	0	131	2	13	0	0	0	0	0	0	0	0	4	2.7	0	0	0	0	47.1	53.9
1700	137	1	122	2	11	1	0	0	0	0	0	0	0	3	2.2	1	0.7	1	0.7	47.8	54.4
1715	166	4	153	1	8	0	0	0	0	0	0	0	0	7	4.2	0	0	0	0	49.2	53.7
1730	125	0	115	1	7	0	0	0	0	2	0	0	0	5	4	0	0	0	0	48.4	55
1745	141	0	130	1	8	0	1	0	0	0	1	0	0	0	0	0	0	0	0	45.4	53
1800	118	0	111	1	6	0	0	0	0	0	0	0	0	10	8.5	5	4.2	2	1.7	48.6	54.1
1815	94	0	91	0	3	0	0	0	0	0	0	0	0	5	5.3	2	2.1	1	1.1	48.8	56.6
1830	92	0	89	0	2	0	0	0	0	0	1	0	0	7	7.6	0	0	0	0	49.3	57.7
1845	68	1	62	1	3	0	1	0	0	0	0	0	0	9	13.2	0	0	0	0	47.5	55.9
1900	55	0	53	0	2	0	0	0	0	0	0	0	0	7	12.7	2	3.6	0	0	51.2	59.1
1915	62	2	58	0	2	0	0	0	0	0	0	0	0	7	11.3	1	1.6	1	1.6	47.2	56.6
1930	35	1	34	0	0	0	0	0	0	0	0	0	0	3	8.6	0	0	0	0	50.8	57.7
1945	35	0																			

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Time	Total	1 MCL	2 SV	3 SVT	4 TB2	5 TB3	Classification						12 DRT	>PSL 60	>PSL 60	>SL1 68 ACPO	>SL1 68 ACPO	>SL2 75 DIT	>SL2 75 DIT	Mean	Vpp 85
							6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD									
0000	4	0	3	0	0	0	0	0	0	1	0	0	0	1	25	1	25	0	0	50.3	-
0015	3	0	3	0	0	0	0	0	0	0	0	0	0	2	66.7	2	66.7	2	66.7	69.5	-
0030	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.1	-
0045	2	0	2	0	0	0	0	0	0	0	0	0	0	1	50	0	0	0	0	56.7	-
0100	5	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57.1	-
0115	4	0	3	0	0	0	0	0	0	1	0	0	0	2	50	0	0	0	0	50.2	-
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0145	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	28.5	-
0200	3	0	3	0	0	0	0	0	0	0	0	0	0	1	33.3	0	0	0	0	54.6	-
0215	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55.7	-
0230	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	28.2	-
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.8	-
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0330	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.1	-
0345	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.6	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0415	2	0	2	0	0	0	0	0	0	0	0	0	0	1	50	0	0	0	0	61.6	-
0430	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.2	-
0445	6	1	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	46.3	-
0500	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.3	-
0515	18	0	15	0	1	0	0	0	0	1	1	0	0	4	22.2	0	0	0	0	51.6	63.1
0530	16	0	12	0	3	0	0	0	1	0	0	0	0	5	31.3	2	12.5	0	0	56	65.5
0545	16	0	16	0	0	0	0	0	0	0	0	0	0	5	31.3	1	6.3	1	6.3	56.7	62
0600	26	0	20	0	2	0	2	0	0	2	0	0	0	4	15.4	1	3.8	1	3.8	44	58.6
0615	43	0	36	0	6	0	0	0	1	0	0	0	0	8	18.6	2	4.7	0	0	53.8	62.4
0630	61	0	46	1	7	0	1	0	1	2	3	0	0	7	11.5	0	0	0	0	49.7	56.8
0645	75	2	64	4	3	1	1	0	0	0	0	0	0	7	9.3	2	2.7	1	1.3	49.7	57.3
0700	106	1	90	2	9	1	1	0	0	0	2	0	0	5	4.7	1	0.9	1	0.9	49.6	55.3
0715	135	1	112	3	17	0	0	0	0	2	0	0	0	6	4.4	3	2.2	0	0	47	54.1
0730	150	0	133	1	13	1	2	0	0	0	0	0	0	6	4	1	0.7	0	0	45.6	54.6
0745	120	0	100	4	9	0	1	0	1	0	5	0	0	9	7.5	2	1.7	1	0.8	48.1	55.7
0800	124	3	103	0	11	1	1	0	2	1	2	0	0	5	4	0	0	0	0	44.7	53
0815	153	0	134	0	13	2	0	0	2	1	1	0	0	3	2	0	0	0	0	45.3	52.6
0830	111	0	93	3	9	1	0	0	1	2	2	0	0	4	3.6	1	0.9	0	0	45.6	54.6
0845	104	0	83	2	14	0	1	1	1	0	2	0	0	1	1	0	0	0	0	44.5	50.6
0900	96	0	84	1	6	1	1	0	1	1	1	0	0	1	1	1	1	0	0	46.6	53
0915	96	0	85	1	6	0	0	0	0	1	3	0	0	0	0	0	0	0	0	46.7	52.3
0930	87	1	74	2	6	1	2	0	1	0	0	0	0	7	8	0	0	0	0	47.5	56.4
0945	95	0	82	0	8	0	1	0	0	1	3	0	0	1	1.1	1	1.1	0	0	44.8	52.8
1000	84	0	74	0	4	1	1	0	0	4	0	0	0	2	2.4	0	0	0	0	44.4	51.2
1015	84	1	69	0	10	0	1	0	1	1	1	0	0	3	3.6	0	0	0	0	45.6	51.9
1030	104	1	88	1	11	1	0	0	1	1	0	0	0	0	0	0	0	0	0	46.1	51
1045	89	0	75	0	9	2	0	0	1	0	2	0	0	1	1.1	0	0	0	0	43.6	50.3
1100	90	0	68	3	13	0	2	0	1	0	3	0	0	0	0	0	0	0	0	42	48.5
1115	90	0	76	0	11	2	0	0	0	1	0	0	0	3	3.3	0	0	0	0	44.7	51.4
1130	76	1	70	0	1	1	2	0	1	0	0	0	0	2	2.6	0	0	0	0	46.3	54.1
1145	82	0	74	1	5	0	0	0	0	0	2	0	0	1	1.2	0	0	0	0	43.8	51
1200	93	1	77	1	8	0	0	0	0	1	5	0	0	1	1.1	0	0	0	0	43.6	48.5
1215	87	0	79	1	4	1	0	0	0	0	2	0	0	4	4.6	1	1.1	1	1.1	43.6	49.4
1230	72	0	58	3	7	1	1	0	0	1	0	0	0	2	2.8	1	1.4	0	0	46.1	55.3
1245	66	0	54	3	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.3	54.1
1300	90	0	80	1	5	2	1	0	0	0	1	0	0	3	3.3	1	1.1	0	0	46.4	53
1315	85	1	67	3	9	1	1	0	2	0	1	0	0	0	0	0	0	0	0	44	49.7
1330	81	1	67	0	8	3	0	0	1	1	0	0	0	1	1.2	0	0	0	0	44.7	51.9
1345	90	0	74	0	12	0	1	0	1	0	2	0	0	2	2.2	0	0	0	0	45.6	49.9
1400	84	1	64	0	11	2	2	0	1	0	3	0	0	4	4.8	1	1.2	0	0	45.2	52.8
1415	93	0	85	2	2	0	2	0	0	0	2	0	0	2	2.2	0	0	0	0	45.7	52.1
1430	75	1	65	2	7	0	0	0	0	0	0	0	0	5	6.7	2	2.7	0	0	46.3	51.4
1445	85	1	70	2	6	2	1	0	0	0	3	0	0	4	4.7	1	1.2	1	1.2	45	51
1500	97	1	85	0	9	0	1	0	1	0	0	0	0	1	1	0	0	0	0	46.4	51.2
1515	113	1	100	0	9	1	0	1	0	0	1	0	0	4	3.5	1	0.9	1	0.9	48.2	54.8
1530	94	0	88	0	3	1	0	0	1	0	1	0	0	4	4.3	1	1.1	0	0	47.4	54.8
1545	93	0	81	2	7	1	1	0	0	1	0	0	0	4	4.3	1	1.1	0	0	46.4	53
1600	115	0	101	2	12	0	0	0	0	0	0	0	0	2	1.7	1	0.9	1	0.9	43.2	53.9
1615	125	0	106	2	11	0	3	0	0	2	1	0	0	4	3.2	0	0	0	0	46.3	53.5
1630	130	1	114	2	12	0	0	0	0	0	1	0	0	1	0.8	0	0	0	0	44.8	53.2
1645	147	0	128	4	14	0	0	0	0	0	1	0	0	2	1.4	0	0	0	0	45.7	52.6
1700	134	1	123	0	7	0	1	0	1	0	1	0	0	3	2.2	0	0	0	0	43.2	50.1
1715	168	2	152	0	10	1	1	0	0	1	0	0	1	5	3	3	1.8	0	0	48.1	54.4
1730	131	0	127	1	3	0	0	0	0	0	0	0	0	10	7.6	3	2.3	2	1.5	47.5	56.1
1745	90	1	83	2	4	0	0	0	0	0	0	0	0	6	6.7	1	1.1	0	0	49	56.8
1800	94	1	89	0	4	0	0	0	0	0	0	0	0	3	3.2	1	1.1	0	0	48.7	54.6
1815	97	1	87	0	8	1	0	0	0	0	0	0	0	8	8.2	0	0	0	0	48.8	56.8
1830	87	0	85	0	2	0	0	0	0	0	0	0	0	5	5.7	0	0	0	0	46.8	55.3
1845	73	0	66	4	3	0	0	0	0	0	0	0	0	2	2.7	1	1.4	0	0	44.9	52.3
1900	69	0	63	3	2	0	0	0	0	0	1	0	0	3	4.3	1	1.4	1	1.4	48.1	54.1
1915	59	1	57	0	1	0	0	0	0	0	0	0	0	6	10.2	0	0	0	0	52.2	57
1930	40	0	37	0	3	0	0	0	0	0	0	0	0	8	20	2	5	0	0	51.7	61.5
1945	25	0	25	0	0	0	0	0	0	0	0	0	0	4	16	0	0	0	0	48.2	57.3
2000	37	1	36	0	0																

Time	Total	Classification												>PSL	>PSL%	>SL1	>SL1%	>SL2	>SL2%	Mean	Vpp
		1 MCL	2 SV	3 SVT	4 TB2	5 TB3	6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD	12 DRT	60	60	68 ACPO	68 ACPO	75 DIT	75 DIT		
0000	7	0	7	0	0	0	0	0	0	0	0	0	3	42.9	2	28.6	0	0	55.1	-	
0015	3	0	3	0	0	0	0	0	0	0	0	0	2	66.7	2	66.7	1	33.3	62.3	-	
0030	4	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	45.7	-	
0045	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35.2	-	
0100	2	0	2	0	0	0	0	0	0	0	0	0	1	50	1	50	1	50	73.5	-	
0115	4	0	4	0	0	0	0	0	0	0	0	0	2	50	1	25	1	25	60.6	-	
0130	4	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	43.3	-	
0145	2	0	2	0	0	0	0	0	0	0	0	0	1	50	1	50	1	50	59.1	-	
0200	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.9	-	
0215	1	0	1	0	0	0	0	0	0	0	0	0	1	100	0	0	0	0	67	-	
0230	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42.6	-	
0245	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59.9	-	
0300	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55.1	-	
0315	3	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	47.3	-	
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	
0345	4	0	4	0	0	0	0	0	0	0	0	0	1	25	0	0	0	0	55.9	-	
0400	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.5	-	
0415	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	43.4	-	
0430	4	0	4	0	0	0	0	0	0	0	0	0	1	25	0	0	0	0	51.5	-	
0445	7	0	5	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	47.1	-	
0500	7	1	6	0	0	0	0	0	0	0	0	0	3	42.9	1	14.3	0	0	49.5	-	
0515	23	1	17	0	2	0	0	0	1	1	1	0	5	21.7	1	4.3	1	4.3	51	62.9	
0530	18	0	15	0	2	0	0	0	0	1	0	0	3	16.7	1	5.6	0	0	52.3	59.1	
0545	17	0	13	0	2	0	0	0	0	1	1	0	7	41.2	0	0	0	0	56.3	62.2	
0600	27	0	19	0	1	0	3	0	1	0	3	0	2	7.4	0	0	0	0	48.3	56.8	
0615	37	0	32	0	4	0	0	0	0	1	0	0	10	27	0	0	0	0	51.3	62.9	
0630	48	0	43	0	4	0	0	0	0	0	1	0	11	22.9	4	8.3	0	0	53.8	63.1	
0645	59	1	52	1	2	1	0	0	0	2											

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Time	Total	1 MCL	2 SV	3 SVT	4 TB2	5 TB3	Classification						8 ART4	9 ART5	10 ART6	11 BD	12 DRT	>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DIT	>SL2% 75 DIT	Mean	Vpp 85
0000	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	25	0	0	0	0	50	59.9
0015	4	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.8	-
0030	8	0	7	0	0	0	0	0	0	0	0	1	0	0	0	0	1	12.5	1	12.5	0	0	0	49.7	-
0045	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	33.3	0	0	0	0	0	50.6	-
0100	7	0	5	0	2	0	0	0	0	0	0	0	0	0	0	0	1	14.3	0	0	0	0	0	53.8	-
0115	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	66.7	0	0	0	0	0	58.3	-
0130	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51.7	-
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.8	-
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0230	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.1	-
0245	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	25	0	0	0	0	0	57.2	-
0300	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.4	-
0315	3	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	-
0330	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54.1	-
0345	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.3	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0415	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14.3	0	0	0	0	0	46	-
0430	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52.6	-
0445	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.1	-
0500	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58.2	-
0515	4	0	2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	41.8	-
0530	10	0	6	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	-
0545	9	0	6	0	3	0	0	0	0	0	0	0	0	0	0	0	5	55.6	2	22.2	2	22.2	59.5	-	
0600	9	0	8	0	0	0	1	0	0	0	0	0	0	0	0	0	2	22.2	0	0	0	0	0	47.3	-
0615	23	0	14	0	4	0	2	0	3	0	0	0	0	0	0	0	2	8.7	1	4.3	0	0	0	53.4	58.4
0630	25	0	24	0	1	0	0	0	0	0	0	0	0	0	0	0	7	28	1	4	0	0	0	54.4	61.5
0645	16	0	12	1	1	0	0	1	0	0	1	0	0	0	0	0	2	12.5	0	0	0	0	0	51.3	57.9
0700	28	0	21	1	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	46.1	55
0715	35	1	26	1	3	0	1	0	0	2	1	0	0	0	0	0	5	14.3	0	0	0	0	0	48.8	59.5
0730	55	0	51	2	1	0	0	0	0	0	1	0	0	0	0	0	4	7.3	0	0	0	0	0	48.7	56.1
0745	48	1	39	1	3	0	1	0	0	0	1	2	0	0	0	0	7	14.6	1	2.1	0	0	0	51.6	59.9
0800	60	0	51	2	6	0	0	0	0	0	0	1	0	0	0	0	3	5	0	0	0	0	0	49.3	57.9
0815	57	0	51	0	4	0	1	0	0	0	0	1	0	0	0	0	2	3.5	0	0	0	0	0	47.7	54.6
0830	60	1	51	3	2	0	0	0	1	1	1	1	0	0	0	0	4	6.7	0	0	0	0	0	45.5	54.6
0845	54	1	49	0	1	0	1	0	1	1	0	0	0	0	0	0	1	1.9	0	0	0	0	0	48	54.8
0900	72	1	65	1	5	0	0	0	0	0	0	0	0	0	0	0	3	4.2	1	1.4	0	0	0	47.5	53.2
0915	71	0	60	1	8	0	0	0	2	0	0	0	0	0	0	0	1	1.4	0	0	0	0	0	45.8	52.1
0930	90	1	86	0	3	0	0	0	0	0	0	0	0	0	0	0	3	3.3	0	0	0	0	0	49.1	55
0945	79	0	71	1	6	0	0	0	0	0	1	0	0	0	0	0	5	6.3	1	1.3	0	0	0	47	53.2
1000	109	1	96	7	4	0	1	0	0	0	0	0	0	0	0	0	5	4.6	1	0.9	0	0	0	43.4	51.2
1015	101	1	89	1	6	2	0	0	0	0	1	1	0	0	0	0	4	4	1	1	0	0	0	44.4	53.7
1030	118	2	108	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42.4	48.8
1045	102	2	92	1	5	0	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	0	44.8	51
1100	112	0	103	1	6	0	2	0	0	0	0	0	0	0	0	0	4	3.6	0	0	0	0	0	46.5	51.9
1115	100	2	85	1	9	1	1	0	1	0	0	0	0	0	0	0	2	2	1	1	0	0	0	45.4	52.8
1130	92	0	85	0	7	0	0	0	0	0	0	0	0	0	0	0	6	6.5	2	2.2	0	0	0	47.3	54.8
1145	105	0	94	3	5	0	2	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	45	52.8
1200	109	0	104	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.8	51.7
1215	89	1	82	1	3	0	0	0	1	0	1	0	0	0	0	0	4	4.5	2	2.2	0	0	0	45.7	53.5
1230	85	0	78	1	5	0	1	0	0	0	0	0	0	0	0	0	5	5.9	0	0	0	0	0	46.5	52.6
1245	105	0	99	0	3	0	1	0	1	0	1	0	0	0	0	0	2	1.9	0	0	0	0	0	45.2	51.7
1300	91	3	85	1	0	0	2	0	0	0	0	0	0	0	0	0	2	2.2	1	1.1	0	0	0	46.5	53.9
1315	111	1	104	1	4	0	0	0	0	0	0	1	0	0	0	0	4	3.6	2	1.8	0	0	0	45.9	54.6
1330	107	1	100	1	4	0	1	0	0	0	0	0	0	0	0	0	2	1.9	0	0	0	0	0	45.8	51.4
1345	82	1	77	0	2	0	0	0	0	0	0	1	0	0	0	1	8	9.8	1	1.2	0	0	0	47.1	52.8
1400	72	2	67	0	1	1	0	0	1	0	0	0	0	0	0	0	7	9.7	0	0	0	0	0	47.9	56.1
1415	92	1	83	1	6	0	0	0	0	0	1	0	0	0	0	0	2	2.2	0	0	0	0	0	44.4	50.8
1430	91	1	86	1	2	0	0	0	0	1	0	0	0	0	0	0	2	2.2	0	0	0	0	0	45.8	53.7
1445	108	3	98	3	3	0	0	0	0	0	1	0	0	0	0	0	2	1.9	0	0	0	0	0	44.6	51.7
1500	79	0	76	2	1	0	0	0	0	0	0	0	0	0	0	0	2	2.5	1	1.3	0	0	0	46.1	51.9
1515	91	5	83	1	2	0	0	0	0	0	0	0	0	0	0	0	7	7.7	3	3.3	0	0	0	48.8	55.5
1530	80	0	78	0	2	0	0	0	0	0	0	0	0	0	0	0	1	1.3	0	0	0	0	0	48.3	53.7
1545	118	0	117	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1.7	0	0	0	0	0	46.2	51.7
1600	88	0	85	1	2	0	0	0	0	0	0	0	0	0	0	0	2	2.3	0	0	0	0	0	46.5	52.8
1615	100	3	94	2	1	0	0	0	0	0	0	0	0	0	0	0	5	5	1	1	0	0	0	47.3	53
1630	87	4	76	3	2	0	1	0	0	0	0	1	0	0	0	0	1	1.1	1	1.1	0	0	0	44.3	52.3
1645	101	0	98	0	3	0	0	0	0	0	0	0	0	0	0	0	5	5	1	1	0	0	0	45.5	53.7
1700	79	1	76	1	0	0	0	0	0	0	1	0	0	0	0	0	5	6.3	0	0	0	0	0	48.8	56.6
1715	99	2	92	0	5	0	0	0	0	0	0	0	0	0	0	0	5	5.1	0	0	0	0	0	46.6	53.5
1730	79	0</																							

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Time	Total	1 MCL	2 SV	3 SVT	4 TB2	5 TB3	Classification						12 DRT	>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DIT	>SL2% 75 DIT	Mean	Vpp 85
							6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD									
0000	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.1	56.4
0015	11	0	11	0	0	0	0	0	0	0	0	0	0	1	9.1	0	0	0	0	52.6	53.2
0030	13	0	12	0	1	0	0	0	0	0	0	0	0	5	38.5	3	23.1	3	23.1	57.1	76.1
0045	6	0	5	0	1	0	0	0	0	0	0	0	0	1	16.7	0	0	0	0	48.3	-
0100	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.1	-
0115	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.7	-
0130	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.3	-
0145	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.4	-
0200	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.8	-
0215	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	-
0230	7	0	6	0	1	0	0	0	0	0	0	0	0	1	14.3	1	14.3	0	0	51.6	-
0245	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57.8	-
0300	1	0	1	0	0	0	0	0	0	0	0	0	0	1	100	1	100	0	0	70.3	-
0315	3	0	3	0	0	0	0	0	0	0	0	0	0	1	33.3	1	33.3	0	0	60.5	-
0330	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45.5	-
0345	3	0	2	0	1	0	0	0	0	0	0	0	0	2	66.7	1	33.3	1	33.3	63.1	-
0400	3	0	3	0	0	0	0	0	0	0	0	0	0	1	33.3	0	0	0	0	48.8	-
0415	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54.1	-
0430	3	0	3	0	0	0	0	0	0	0	0	0	0	1	33.3	1	33.3	0	0	53.9	-
0445	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55.7	-
0500	6	0	3	0	2	0	0	0	0	1	0	0	0	2	33.3	0	0	0	0	50.9	-
0515	1	0	1	0	0	0	0	0	0	0	0	0	0	1	100	1	100	0	0	68.5	-
0530	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	-
0545	5	0	5	0	0	0	0	0	0	0	0	0	0	3	60	0	0	0	0	59.4	-
0600	7	1	4	0	2	0	0	0	0	0	0	0	0	2	28.6	0	0	0	0	53	-
0615	6	0	6	0	0	0	0	0	0	0	0	0	0	2	33.3	2	33.3	1	16.7	61.2	-
0630	19	0	17	0	2	0	0	0	0	0	0	0	0	4	21.1	1	5.3	0	0	52.1	62.6
0645	21	0	19	1	1	0	0	0	0	0	0	0	0	3	14.3	2	9.5	1	4.8	54.2	59.5
0700	21	1	20	0	0	0	0	0	0	0	0	0	0	4	19	1	4.8	0	0	49.3	60.4
0715	20	0	19	0	1	0	0	0	0	0	0	0	0	3	15	0	0	0	0	53.2	58.4
0730	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.2	54.1
0745	21	2	18	0	0	0	0	0	1	0	0	0	0	2	9.5	1	4.8	1	4.8	48.9	56.4
0800	24	1	21	0	1	0	0	0	1	0	0	0	0	1	4.2	0	0	0	0	47.8	55.7
0815	44	2	41	0	1	0	0	0	0	0	0	0	0	5	11.4	1	2.3	0	0	51.6	59.5
0830	54	0	53	0	1	0	0	0	0	0	0	0	0	7	13	1	1.9	0	0	49.7	55.5
0845	37	2	31	1	2	0	1	0	0	0	0	0	0	4	10.8	0	0	0	0	49.4	57.3
0900	55	0	52	0	3	0	0	0	0	0	0	0	0	6	10.9	1	1.8	0	0	49.7	57.5
0915	84	2	75	3	4	0	0	0	0	0	0	0	0	1	1.2	0	0	0	0	47.6	53.9
0930	74	3	70	1	0	0	0	0	0	0	0	0	0	4	5.4	0	0	0	0	47.2	53.9
0945	71	2	69	0	0	0	0	0	0	0	0	0	0	2	2.8	0	0	0	0	48.4	55
1000	76	3	69	1	2	1	0	0	0	0	0	0	0	5	6.6	1	1.3	0	0	40.9	54.6
1015	84	1	80	0	3	0	0	0	0	0	0	0	0	5	6	1	1.2	0	0	46.3	52.3
1030	77	0	70	1	5	0	1	0	0	0	0	0	0	2	2.6	0	0	0	0	46.2	53
1045	93	1	90	0	2	0	0	0	0	0	0	0	0	7	7.5	1	1.1	0	0	45.3	53.9
1100	76	0	73	1	1	0	1	0	0	0	0	0	0	2	2.6	1	1.3	0	0	46.5	52.8
1115	105	4	94	3	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	45.8	51.7
1130	101	2	96	2	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	44	51
1145	80	1	77	1	1	0	0	0	0	0	0	0	0	1	1.3	1	1.3	0	0	45.9	49.9
1200	96	0	96	0	0	0	0	0	0	0	0	0	0	2	2.1	0	0	0	0	44.6	52.1
1215	108	2	102	2	1	0	0	0	0	1	0	0	0	1	0.9	0	0	0	0	44.1	50.1
1230	94	0	93	1	0	0	0	0	0	0	0	0	0	2	2.1	1	1.1	1	1.1	44.6	51
1245	93	2	89	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.5	50.3
1300	86	1	78	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	54.1
1315	87	5	78	1	3	0	0	0	0	0	0	0	0	5	5.7	0	0	0	0	47.5	55.9
1330	94	4	87	0	3	0	0	0	0	0	0	0	0	5	5.3	0	0	0	0	43.5	51.2
1345	102	2	94	4	1	0	1	0	0	0	0	0	0	3	2.9	2	2	1	1	46.8	54.1
1400	90	4	84	1	1	0	0	0	0	0	0	0	0	5	5.6	1	1.1	0	0	48.8	53.5
1415	90	0	90	0	0	0	0	0	0	0	0	0	0	8	8.9	0	0	0	0	47.7	55.3
1430	75	2	71	0	2	0	0	0	0	0	0	0	0	2	2.7	2	2.7	1	1.3	46.4	52.1
1445	79	2	76	0	1	0	0	0	0	0	0	0	0	1	1.3	0	0	0	0	46.7	52.1
1500	78	1	75	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.8	50.8
1515	78	1	76	1	0	0	0	0	0	0	0	0	0	3	3.8	0	0	0	0	46.2	53.7
1530	91	3	82	1	5	0	0	0	0	0	0	0	0	4	4.4	0	0	0	0	45.7	51.7
1545	94	0	91	1	2	0	0	0	0	0	0	0	0	2	2.1	0	0	0	0	44.8	52.1
1600	101	3	96	1	1	0	0	0	0	0	0	0	0	5	5	0	0	0	0	46	51.4
1615	78	0	73	1	4	0	0	0	0	0	0	0	0	2	2.6	1	1.3	0	0	46.7	51.4
1630	100	3	94	0	3	0	0	0	0	0	0	0	0	5	5	3	3	1	1	46.5	53
1645	104	1	95	2	6	0	0	0	0	0	0	0	0	3	2.9	0	0	0	0	47	52.6
1700	100	2	96	0	2	0	0	0	0	0	0	0	0	7	7	3	3	0	0	47.7	53
1715	74	1	70	0	3	0	0	0	0	0	0	0	0	7	9.5	1	1.4	0	0	48.7	56.4
1730	65	3	61	0	1	0	0	0	0	0	0	0	0	11	16.9	3	4.6	1	1.5	51.6	60.6
1745	67	3	64	0	0	0	0	0	0	0	0	0	0	4	6	2	3	0	0	50.3	56.6
1800	53	1	50	0	1	0	1	0	0	0	0	0	0	8	15.1	3	5.7	0	0	53	58.2
1815	46	0	43	1	2	0	0	0	0	0	0	0	0	5	10.9	3	6.5	1	2.2	50.7	55.5
1830	52	0	49	0	3	0	0	0	0	0	0	0	0	5	9.6	1	1.9	1	1.9	49.9	57.7
1845	42	0	40	2	0	0	0	0	0	0	0	0	0	2	4.8	0	0	0	0	47.6	54.6
1900	42	1	38	1	2	0	0	0	0	0	0	0	0	7	16.7	0	0	0	0	52.9	59.9
1915	36	1	34	0	1	0	0	0	0	0	0	0	0	1	2.8	1	2.8	0	0	50.2	55.5
1930	37	0	36	0	1	0	0	0	0	0	0	0	0	5	13.5	1	2.7	1	2.7	51.4	56.6
1945	33	1	31	0																	

Time	Total	Classification												>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DIT	>SL2% 75 DIT	Mean	Vpp 85
		1 MCL	2 SV	3 SVT	4 TB2	5 TB3	6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD	12 DRT								
0000	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	50.5	-		
0015	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45.3	-		
0030	5	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	45.6	-		
0045	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.3	-		
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0245	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	54	-		
0300	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	48.5	-		
0315	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	43.2	-		
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0345	8	0	6	0	0	0	0	0	2	0	0	0	0	0	0	0	0	48.2	-		
0400	4	0	2	0	1	0	0	0	0	1	0	0	0	1	25	1	25	53.1	-		
0415	3	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	44.8	-		
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-		
0445	6	0	5	0	1	0	0	0	0	0	0	0	1	16.7	0	0	0	52.2	-		
0500	10	0	8	0	1	0	0	0	1	0	0	0	1	10	0	0	0	50.8	-		
0515	24	0	23	0	1	0	0	0	0	0	0	0	4	16.7	0	0	0	52.4	58.6		
0530	15	0	14	0	1	0	0	0	0	0	0	0	2	13.3	0	0	0	52.1	57.7		
0545	25	0	18	0	3	0	0	0	2	0	2	0	0	4	16	0	0	51.3	59.3		
0600	25	0	16	0	3	0	3	0	1	1	1	0	0	2	8	0	0	50.4	57.7		
0615	36	0	31	0	3	1	0	0	0	0	1	0	0	4	11.1	1	2.8	52	59.7		
0630	66	0	55	0	7	0	3	0	0	1	1	0	0	5	7.6	1	1.5	51.6	58.6		
0645	62	0	52	2	5	0	0	0	0	3	0	0	0	6	9.7	1	1.6	50.1	58.6		
0700	100	1	86	1	8	0	0	0	0	4	0	0	0	5	5	0	0	49	55.9		
0715	131	0	113	2	12	0	1	0													

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Time	Total	1 MCL	2 SV	3 SVT	4 TB2	5 TB3	Classification						12 DRT	>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DfT	>SL2% 75 DfT	Mean	Vpp 85
							6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD									
0000	2	0	2	0	0	0	0	0	0	0	0	0	0	1	50	0	0	0	0	53.3	-
0015	6	0	6	0	0	0	0	0	0	0	0	0	0	2	33.3	0	0	0	0	50.4	-
0030	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.9	-
0045	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0215	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	53.5	-
0230	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58.7	-
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0330	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52.8	-
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56.8	-
0415	3	0	3	0	0	0	0	0	0	0	0	0	0	1	33.3	0	0	0	0	57.7	-
0430	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.6	-
0445	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.7	-
0500	7	0	6	0	1	0	0	0	0	0	0	0	0	1	14.3	0	0	0	0	50.2	-
0515	30	0	25	0	2	0	0	0	1	1	1	0	0	3	10	0	0	0	0	48.6	52.8
0530	11	0	9	0	2	0	0	0	0	0	0	0	0	1	9.1	1	9.1	0	0	49.3	52.8
0545	24	0	21	0	0	1	0	0	1	1	0	0	0	3	12.5	1	4.2	0	0	50.6	54.8
0600	33	0	25	0	4	0	0	0	0	0	4	0	0	6	18.2	1	3	0	0	49.8	60.2
0615	42	0	33	0	1	5	2	0	0	1	0	0	0	2	4.8	1	2.4	0	0	49.6	55.7
0630	67	0	55	0	5	4	1	0	0	1	1	0	0	5	7.5	0	0	0	0	49.1	55.5
0645	56	1	44	0	3	4	3	0	0	1	0	0	0	4	7.1	1	1.8	0	0	51.2	55.9
0700	113	0	95	1	9	5	1	0	0	0	2	0	0	3	2.7	0	0	0	0	49.4	54.1
0715	137	1	117	3	9	7	0	0	0	0	0	0	0	3	2.2	0	0	0	0	49.7	54.1
0730	144	1	114	1	15	8	1	0	0	1	0	3	0	6	4.2	0	0	0	0	45.9	54.8
0745	149	1	122	3	10	8	0	0	3	0	1	1	0	2	1.3	0	0	0	0	46.8	52.8
0800	127	0	104	3	12	2	0	2	1	2	1	0	0	4	3.1	0	0	0	0	44.3	53.2
0815	124	2	109	2	5	2	3	0	1	0	0	0	0	0	0	0	0	0	0	43.6	50.8
0830	106	0	89	1	12	3	0	1	0	0	0	0	0	4	3.8	0	0	0	0	48	53.7
0845	95	0	82	0	8	0	1	0	2	0	1	0	1	3	3.2	0	0	0	0	47.2	56.6
0900	84	0	64	0	13	3	1	0	1	0	2	0	0	1	1.2	0	0	0	0	45.4	54.1
0915	96	1	82	0	8	3	0	0	1	1	0	0	0	4	4.2	2	2.1	1	1	48	52.6
0930	81	1	71	0	6	2	0	0	0	0	1	0	0	5	6.2	1	1.2	0	0	48.4	54.8
0945	93	0	75	0	12	1	3	1	0	0	1	0	0	0	0	0	0	0	0	44.9	51.4
1000	93	1	67	0	18	3	0	1	1	0	2	0	0	3	3.2	0	0	0	0	44.7	50.1
1015	83	0	65	2	9	1	0	0	1	0	5	0	0	3	3.6	1	1.2	0	0	43.6	51.9
1030	85	0	69	2	10	0	0	0	2	0	2	0	0	7	8.2	0	0	0	0	47.2	57.7
1045	92	0	83	2	3	1	0	0	1	1	1	0	0	2	2.2	0	0	0	0	46.3	52.3
1100	85	1	70	0	8	3	2	0	0	0	1	0	0	2	2.4	0	0	0	0	44.2	51.9
1115	78	1	60	2	9	2	0	1	2	0	1	0	0	0	0	0	0	0	0	42.2	49.4
1130	76	0	68	2	2	0	1	0	1	0	2	0	0	4	5.3	2	2.6	0	0	44.6	51.4
1145	64	0	52	0	8	2	1	0	0	1	0	0	0	1	1.6	0	0	0	0	45.3	53.2
1200	76	0	67	0	6	2	0	1	0	0	0	0	0	4	5.3	0	0	0	0	43.7	53.5
1215	65	0	51	0	6	1	2	0	2	2	1	0	0	0	0	0	0	0	0	43.5	51.2
1230	91	1	75	0	14	0	1	0	0	0	0	0	0	2	2.2	1	1.1	0	0	46.1	50.8
1245	74	1	63	0	6	2	1	0	0	0	1	0	0	2	2.7	0	0	0	0	46.8	53.5
1300	64	0	52	0	9	0	0	0	1	0	2	0	0	3	4.7	0	0	0	0	46.8	52.6
1315	70	2	59	0	7	0	0	0	0	1	1	0	0	2	2.9	0	0	0	0	45.3	53
1330	89	0	75	0	11	0	0	1	1	1	0	0	0	2	2.2	0	0	0	0	43.2	51.2
1345	69	0	57	3	9	0	0	0	0	0	0	0	0	1	1.4	1	1.4	1	1.4	46.4	53
1400	75	1	59	2	7	0	0	0	0	1	2	3	0	3	4	2	2.7	0	0	44.8	52.6
1415	122	1	105	5	6	3	0	0	1	0	1	0	0	1	0.8	0	0	0	0	44.1	49.2
1430	67	0	57	2	4	1	1	1	0	0	1	0	0	5	7.5	2	3	0	0	48.8	54.6
1445	80	0	68	0	8	1	0	0	0	1	2	0	0	1	1.3	1	1.3	0	0	45.2	51
1500	74	0	61	2	8	0	1	0	2	0	0	0	0	1	1.4	0	0	0	0	43.8	48.3
1515	96	0	84	2	9	0	0	0	0	0	1	0	0	3	3.1	0	0	0	0	47.8	52.8
1530	81	1	66	2	10	0	1	0	0	0	1	0	0	3	3.7	0	0	0	0	44.3	51.7
1545	114	0	102	0	9	1	0	0	1	0	1	0	0	0	0	0	0	0	0	41.7	51.9
1600	104	1	83	3	9	4	0	0	1	0	2	0	1	3	2.9	1	1	0	0	47.1	53.2
1615	113	1	94	7	9	0	0	0	0	0	1	1	0	4	3.5	2	1.8	0	0	44.6	53
1630	140	0	132	1	5	2	0	0	0	0	0	0	0	2	1.4	0	0	0	0	47.8	52.8
1645	129	0	111	2	9	4	1	0	1	1	0	0	0	1	0.8	0	0	0	0	43.2	50.1
1700	144	2	127	0	8	5	1	0	0	0	1	0	0	6	4.2	2	1.4	1	0.7	45	52.6
1715	156	2	133	2	5	13	0	0	0	1	0	0	0	2	1.3	0	0	0	0	45.3	50.3
1730	150	0	132	0	7	11	0	0	0	0	0	0	0	2	1.3	0	0	0	0	46.5	49.9
1745	96	0	86	2	4	4	0	0	0	0	0	0	0	4	4.2	0	0	0	0	47.5	55
1800	93	0	90	0	2	0	0	0	1	0	0	0	0	8	8.6	2	2.2	0	0	49.9	55
1815	105	1	96	0	4	3	0	0	0	0	1	0	0	4	3.8	1	1	0	0	47.2	54.8
1830	87	0	82	0	2	1	0	0	1	0	1	0	0	3	3.4	0	0	0	0	48.5	53.5
1845	66	0	62	0	2	1	0	0	0	0	1	0	0	7	10.6	0	0	0	0	48.5	59.1
1900	50	0	48	1	0	0	0	0	1	0	0	0	0	5	10	1	2	0	0	49.7	57.5
1915	41	0	39	0	2	0	0	0	0	0	0	0	0	2	4.9	0	0	0	0	49.8	53.9
1930	29	0	28	1	0	0	0	0	0	0	0	0	0	8	27.6	1	3.4	0	0	50.8	62.4
1945	36	0	34	0	2	0	0	0	0	0	0	0	0	3	8.3	1	2.8	0	0	50.9	57
2000	35	0	33	0	1	0	0	0	0	1	0	0									

Virtual Day (7)																					
Time	Total	Classification												>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DfT	>SL2% 75 DfT	Mean	Vpp 85
		1 MCL	2 SV	3 SVT	4 TB2	5 TB3	6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD	12 DRT								
0000	19	0	17	0	1	0	0	0	0	0	0	0	0	4	20.3	2	8.3	1	4.5	51.9	62.2
0100	8	0	6	0	1	0	0	0	0	0	0	0	0	2	19.3	1	8.8	1	8.8	52.2	-
0200	6	0	5	0	0	0	0	0	0	0	0	0	0	1	10	0	2.5	0	0	52.4	-
0300	7	0	5	0	1	0	0	0	0	0	0	0	0	1	10	0	6	0	2	49.7	-
0400	11	0	9	0	1	0	0	0	0	1	1	0	0	1	11.4	0	3.8	0	1.3	49.3	57.7
0500	54	0	45	0	5	0	0	0	1	2	1	0	0	10	18.6	2	3.1	1	1	51.8	61.3
0600	154	1	127	2	12	2	4	0	1	1	4	0	0	20	13.2	4	2.8	1	0.7	51.2	59.1
0700	385	2	326	7	33	5	2	0	2	1	6	0	0	18	4.7	3	0.7	1	0.1	47.6	55
0800	391	3	333	5	33	3	3	1	4	2	3	0	0	13	3.3	2	0.4	0	0	46.1	53.7
0900	347	2	297	5	27	3	3	0	2	2	5	0	0	8	2.4	2	0.5	0	0.1	46.1	53
1000	368	3	313	6	31	2	3	0	2	3	4	0	0	9	2.4	1	0.3	0	0.1	44.2	51.4
1100	355	3	306	5	28	3	4	0	3	1	3	0	0	7	2.1	2	0.4	0	0	44.4	51.4
1200	342	2	299	5	24	2	3	0	2	2	4	0	0	7	2	1	0.4	0	0.1	45.1	51.7
1300	345	4	298	6	27	2	2	0	2	1	3	0	0	9	2.6	2	0.5	0	0.1	45.6	52.6
1400	357	4	311	6	23	3	2	0	1	2	4	0	0	12	3.3	2	0.6	0	0.1	45.5	52.1
1500	376	3	335	5	26	1	1	0	1	1	2	0	0	10	2.8	2	0.5	0	0.1	46.2	52.8
1600	474	4	422	8	33	2	1	0	1	1	1	0	0	11	2.4	2	0.5	1	0.1	46.2	52.8
1700	470	5	434	3	20	5	1	0	0	1	0	0	0	19	4.1	5	1	1	0.2	47.4	53.9
1800	319	2	300	2	11	1	0	0	0	0	1	0	0	21	6.5	4	1.3	1	0.3	48.3	55.5
1900	170	2	162	1	5	0	0	0	0	0	0	0	0	18	10.4	3	1.5	1	0.5	50.3	57.5
2000	111	1	106	1	3	1	0	0	0	0	0	0	0	11	10.3	3	2.8	1	0.8	49.5	57.7
2100	86	0	84	0	2	0	0	0	0	0	0	0	0	10	12.1	2	2.5	1	0.7	49.7	58.2
2200	87	0	84	0	2	0	0	0	0	0	0	0	0	8	9	2	2	0	0.3	48.8	56.6
2300	31	0	29	0	1	0	0	0	0	0	0	0	0	5	16.4	1	3.2	0	1.4	51.1	60.4
1200	4528	38	3974	63	317	32	25	4	21	17	37	1	2	145	3.2	27	0.6	5	0.1	46.1	53.2
1215	5050	41	4451	67	339	35	29	4	22	18	41	1	2	205	4.1	39	0.8	8	0.2	46.5	53.9
1230	5169	42	4564	67	343	35	29	4	23	19	41	1	2	218	4.2	42	0.8	9	0.2	46.6	53.9
1245	5274	43	4651	68	351	36	29	5	24	22	43	1	2	236	4.5	47	0.9	12	0.2	46.7	54.1

Virtual Week (1)																					
Time	Total	Classification												>PSL 60	>PSL% 60	>SL1 68 ACPO	>SL1% 68 ACPO	>SL2 75 DfT	>SL2% 75 DfT	Mean	Vpp 85
		1 MCL	2 SV	3 SVT	4 TB2	5 TB3	6 T4	7 ART3	8 ART4	9 ART5	10 ART6	11 BD	12 DRT								
Mon	5258	27	4518	82	430	24	45	9	29	35	56	1	2	188	3.6	39	0.7	7	0.1	46.2	53.5
Tue	5451	26	4666	62	409	136	29	11	34	21	54	1	2	198	3.6	30	0.6	3	0.1	46.3	53.5
Wed	5811	54	5057	80	438	20	30	2	37	31	59	2	1	272	4.7	42	0.7	17	0.3	47.1	54.4
Thu	5702	30	4978	72	432	33	36	2	26	29	63	0	1	273	4.8	60	1.1	20	0.4	46.6	54.4
Fri	6005	35	5253	83	452	30	38	5	28	24	51	2	4	244	4.1	56	0.9	15	0.2	46.4	53.5
[Sat	4649	52	4277	54	195	5	19	3	12	10	20	1	1	234	5	40	0.9	4	0.1	47	54.6
[Sun	4045	78	3811	41	103	2	5	0	2	3	0	0	0	243	6	61	1.5	15	0.4	47.4	55
5 Day Ave.	5645	34	4894	76	432	49	36	6	31	28	57	1	2	235	4.2	45	0.8	12	0.2	46.5	53.9
7 Day Ave.	5274	43	4651	68	351	36	29	5	24	22	43	1	2	236	4.5	47	0.9	12	0.2	46.7	54.1
--	36921	302	32560	474	2459	250	202	32	168	153	303	7	11	1652	4.5	328	0.9	81	0.2	46.7	54.1

Summary Graphs



Norfolk Boreas Offshore Wind Farm

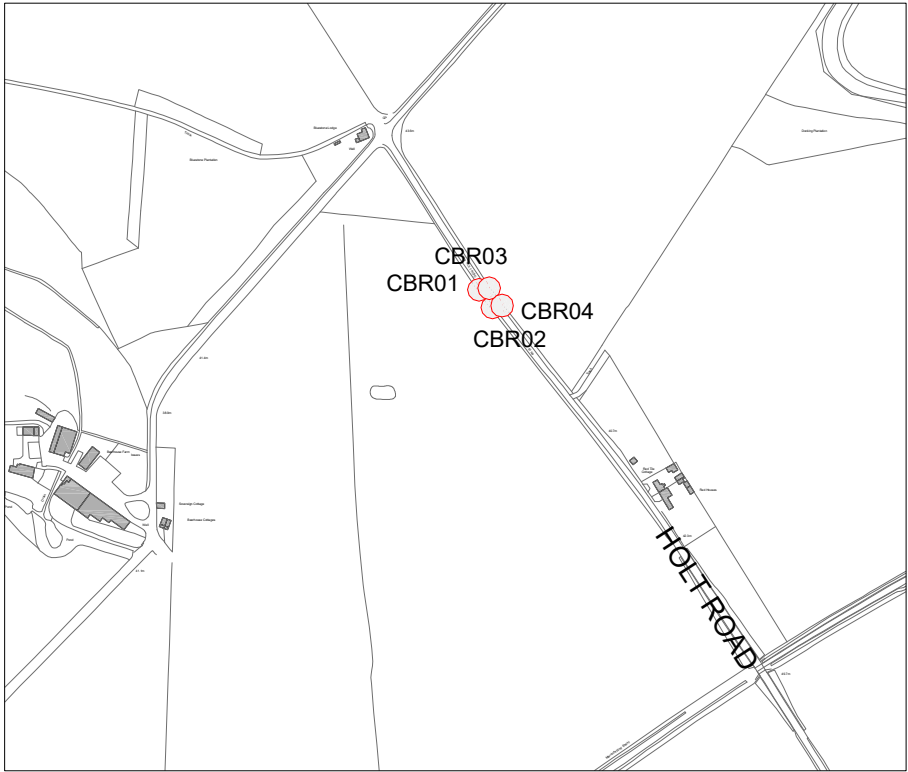
Appendix 2 –

B1149 Pavement

Testing Results

Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-3.D4.V1
Deadline 4
Date: January 2020
Revision: Version 1

Photo: Ormonde Offshore Wind Farm



B1149 HOLT ROAD

CBR01 CBR03
CBR02 CBR04

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Survey 100019340



Tom McCabe
Executive Director of
Community and Environmental Services
Norfolk County Council
County Hall, Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
CBR Location Plan
Norfolk Vanguard

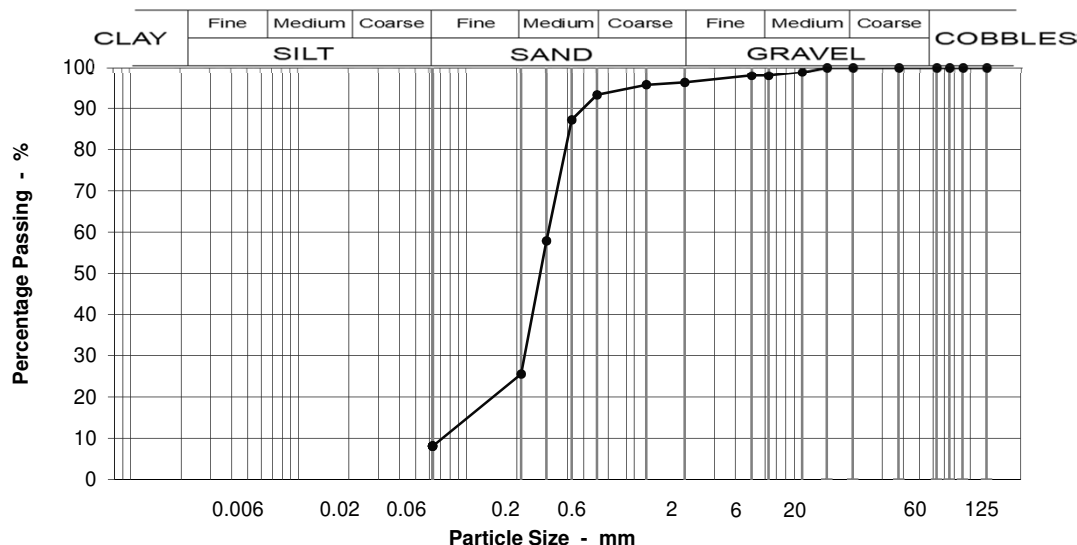
REV.	DESCRIPTION	DRAWN BY	CHECKED	DATE

SURVEYED BY	DESIGNED BY	DRAWN BY	CHECKED BY	INITIALS	DATE	DRAWING No.	PROJECT TITLE	SCALE	FILE No.
		GS	MLB		18/04/19	ROHA0001/1	Norfolk Vanguard	1: 500 @ A4	ROHA0001

Particle Size Distribution to BS 1377 : Part 2 :1990 Section 9
Scheme: Norfolk Vanguard and Boreas
Location: CBR 1 @ 0.7m

Location and orientation within sample not applicable

Bulk disturbed sample



Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
37.5	100
20	100
14	100
10	99
6.3	98
5	98
2	96
1.18	96
0.600	93
0.425	87
0.300	58
0.212	26
0.063	8

**Specification for Highway
Works Classification**
Table 6/2

**This material complies
with the following
material classes 1B,
6E/6R, 6M.**

Moisture content % 6

Sample Proportions	
BOULDERS	0
COBBLES	0
Coarse GRAVEL	0
Medium GRAVEL	2
Fine GRAVEL	2
Coarse SAND	3
Medium SAND	68
Fine SAND	17
Silt & Clay	8

Grading Analysis	
D100	10
D60	0.31
D10	0.08
Uniformity Coefficient	4

Description	
Dark yellowish brown, slightly gravelly, medium SAND. Gravel is fine and medium, sub-angular flint.	

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Test Code = 610

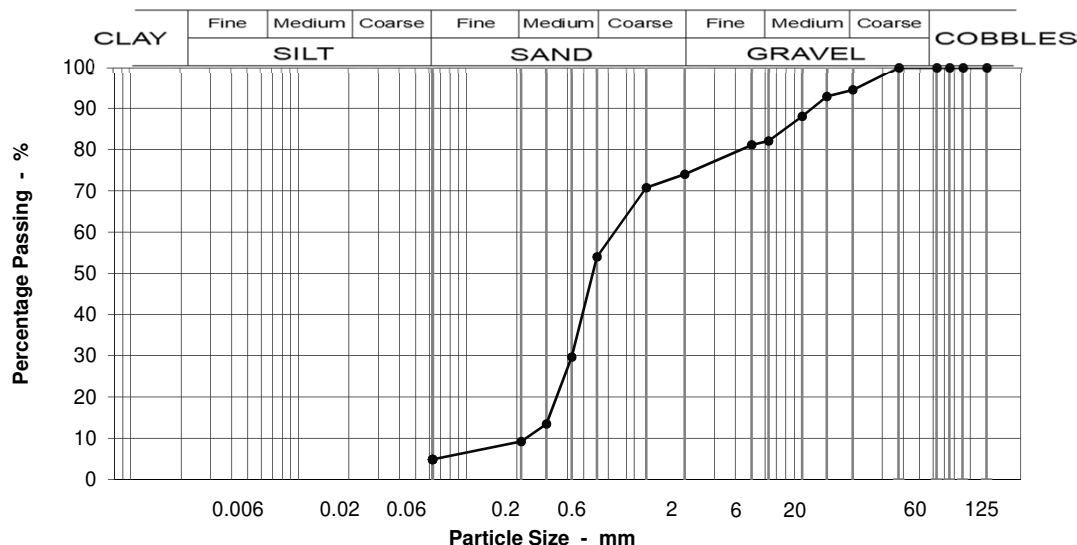


Peter Hardiment (Operations Manager)

Particle Size Distribution to BS 1377 : Part 2 :1990 Section 9
Scheme: Norfolk Vanguard and Boreas
Location: CBR 2 @ 0.2m

Location and orientation within sample not applicable

Bulk disturbed sample



Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
37.5	100
20	94
14	93
10	88
6.3	82
5	81
2	74
1.18	71
0.600	54
0.425	30
0.300	13
0.212	9
0.063	5

Specification for Highway Works Classification
Table 6/2

This material complies with the following material classes 1B, 6E/6R, 6M.

Moisture content % 5

Sample Proportions	
BOULDERS	0
COBBLES	0
Coarse GRAVEL	6
Medium GRAVEL	12
Fine GRAVEL	8
Coarse SAND	20
Medium SAND	45
Fine SAND	4
Silt & Clay	5

Grading Analysis	
D100	20
D60	0.81
D10	0.23
Uniformity Coefficient	4

Description	
Light brown and orangey brown, very gravelly, medium and coarse SAND. Gravel is fine, medium and coarse, sub-angular flint.	

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Test Code = 610

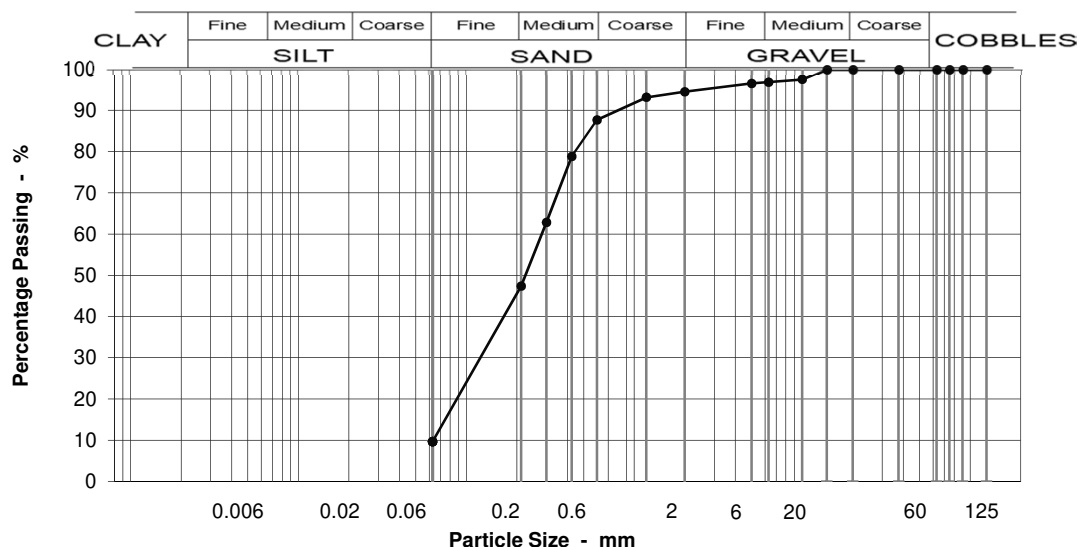


Peter Hardiment (Operations Manager)

Particle Size Distribution to BS 1377 : Part 2 :1990 Section 9
Scheme: Norfolk Vanguard and Boreas
Location: CBR 3 @ 0.2m

Location and orientation within sample not applicable

Bulk disturbed sample



Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
37.5	100
20	100
14	100
10	97
6.3	97
5	97
2	94
1.18	93
0.600	88
0.425	79
0.300	63
0.212	47
0.063	10

**Specification for Highway
Works Classification**
 Table 6/2

**This material complies
with the following
material classes 1B,
6E/6R, 6M.**
Moisture content % 10

Sample Proportions	
BOULDERS	0
COBBLES	0
Coarse GRAVEL	0
Medium GRAVEL	3
Fine GRAVEL	2
Coarse SAND	7
Medium SAND	40
Fine SAND	38
Silt & Clay	10

Grading Analysis	
D100	10
D60	0.28
D10	0.06
Uniformity Coefficient	4

Description	
Light brown and orangey brown, slightly gravelly, fine and medium SAND. Gravel is fine and medium, sub-angular flint.	

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Test Code = 610

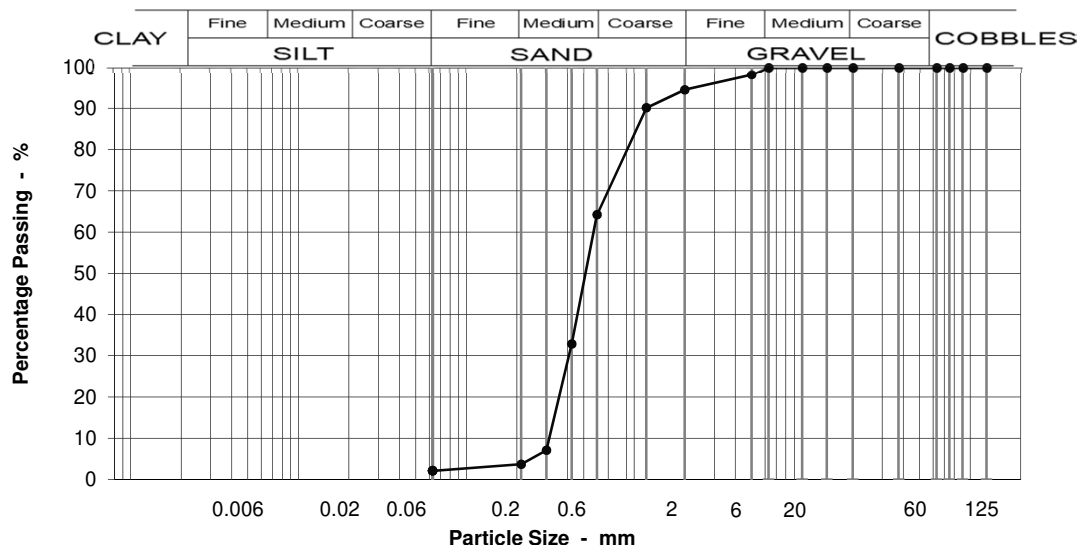


Peter Hardiment (Operations Manager)

Particle Size Distribution to BS 1377 : Part 2 :1990 Section 9
Scheme: Norfolk Vanguard and Boreas
Location: CBR 4 @ 0.2m

Location and orientation within sample not applicable

Bulk disturbed sample



Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
37.5	100
20	100
14	100
10	100
6.3	100
5	98
2	94
1.18	90
0.600	64
0.425	33
0.300	7
0.212	4
0.063	2

**Specification for Highway
Works Classification**
Table 6/2

**This material complies
with the following
material classes 1B,
6E/6R, 6M.**

Moisture content % 5

Sample Proportions	
BOULDERS	0
COBBLES	0
Coarse GRAVEL	0
Medium GRAVEL	0
Fine GRAVEL	6
Coarse SAND	30
Medium SAND	61
Fine SAND	2
Silt & Clay	2

Grading Analysis	
D100	5
D60	0.58
D10	0.31
Uniformity Coefficient	2

Description	
Orangey brown and yellowish brown, slightly gravelly, medium to coarse SAND. Gravel is fine, sub-angular flint.	

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Test Code = 610



Peter Hardiment (Operations Manager)

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 Bretton
 Peterborough
 PE3 8DW

Our Project No ROHA0001
Our Report and sample No NCCL201904029-642
Your Sample Ref B4029
Your Project or Order No
Date Report Issued 23-Apr-19
Date Tested 08-Apr-19

Page 1 of 1

Determination of the California Bearing Ratio to BS 1377 : PART 4 : 1990

Scheme	Norfolk Vanguard and Boreas		
Location	CBR 1 @ 0.7m		
Date sampled	27-Mar-19	Date received	29-Mar-19
Sample type	Bulk Disturbed	Sample Mass	18.955kg

If a sample certificate was provided it is available for inspection.
 The accuracy of information provided by third parties cannot be guaranteed.

Material	Soil
Description	Dark yellowish brown, slightly gravelly, medium SAND. Gravel is fine and medium, sub-angular flint.

Supplier	Not applicable	Source	Ex site
-----------------	----------------	---------------	---------

Location		Test Specimen			
Orientation		Not applicable			
		Preparation Details			
Method of Division		Quartering			
Preparation Method		Sieving, Natural Moisture Content			
Condition		Unsoaked			
Retained 37.5mm	%	1			
Retained 20mm	%	2.1			
Number of layers		3	CBR Value Top	%	43.0
Blows per layer		N/A	CBR Value Bottom	%	104.0
BS Method		3.7, Vib.Hammer			
Bulk Density	Mg/m ³	2.07	Moisture Content Top	%	7.0
Dry Density	Mg/m ³	1.94	Moisture Cont. Bottom	%	7.0
Initial Moisture Content	%	6.6	Moisture Content Method	Oven dried @ 105-110°C	

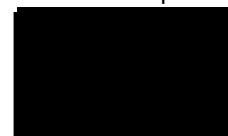
Remarks

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Test Code = 642



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Our Project No ROHA0001
Our Report and sample No NCCL2019040210-642
Your Sample Ref B40210
Your Project or Order No
Date Report Issued 23-Apr-19
Date Tested 08-Apr-19

Page 1 of 1

Determination of the California Bearing Ratio to BS 1377 : PART 4 : 1990

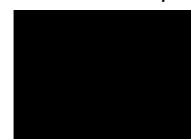
Scheme	Norfolk Vanguard and Boreas		
Location	CBR 2 @ 0.2m		
Date sampled	27-Mar-19	Date received	29-Mar-19
Sample type	Bulk Disturbed	Sample Mass	22.35kg
If a sample certificate was provided it is available for inspection. The accuracy of information provided by third parties cannot be guaranteed.			
Material	Soil		
Description	Light brown and orangey brown, very gravelly, medium and coarse SAND. Gravel is fine, medium and coarse, sub-angular flint.		
Supplier	Not applicable	Source	Ex site
Location	Test Specimen Not applicable		
Orientation	Not applicable		
Method of Division	Preparation Details Quartering		
Preparation Method	Sieving, Natural Moisture Content		
Condition	Unsoaked		
Retained 37.5mm	%	3	
Retained 20mm	%	7.2	
Number of layers		3	CBR Value Top % 46.0
Blows per layer		N/A	CBR Value Bottom % 133.0
BS Method		3.7, Vib.Hammer	
Bulk Density	Mg/m ³	2.10	Moisture Content Top % 5.3
Dry Density	Mg/m ³	2.00	Moisture Cont. Bottom % 5.5
Initial Moisture Content	%	5.4	Moisture Content Method Oven dried @ 105-110°C
Remarks			

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Our Project No ROHA0001
Our Report and sample No NCCL2019040211-642
Your Sample Ref B40211
Your Project or Order No
Date Report Issued 23-Apr-19
Date Tested 08-Apr-19

Page 1 of 1

Determination of the California Bearing Ratio to BS 1377 : PART 4 : 1990

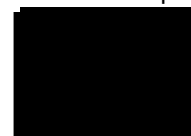
Scheme	Norfolk Vanguard and Boreas		
Location	CBR 3 @ 0.2m		
Date sampled	27-Mar-19	Date received	29-Mar-19
Sample type	Bulk Disturbed	Sample Mass	20.95kg
If a sample certificate was provided it is available for inspection. The accuracy of information provided by third parties cannot be guaranteed.			
Material	Soil		
Description	Light brown and orangey brown, slightly gravelly, fine and medium SAND. Gravel is fine and medium, sub-angular flint.		
Supplier	Not applicable	Source	Ex site
Location	Test Specimen Not applicable		
Orientation	Not applicable		
Method of Division	Preparation Details Quartering		
Preparation Method	Sieving, Natural Moisture Content		
Condition	Unsoaked		
Retained 37.5mm	%	0	
Retained 20mm	%	0.6	
Number of layers		3	CBR Value Top % 15.0
Blows per layer		N/A	CBR Value Bottom % 12.0
BS Method		3.7, Vib.Hammer	
Bulk Density	Mg/m ³	2.22	Moisture Content Top % 11.0
Dry Density	Mg/m ³	2.01	Moisture Cont. Bottom % 9.7
Initial Moisture Content	%	11.0	Moisture Content Method Oven dried @ 105-110°C
Remarks			

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Peter Hardiment (Operations Manager)



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Our Project No ROHA0001
Our Report and sample No NCCL2019040212-642
Your Sample Ref B40212
Your Project or Order No
Date Report Issued 23-Apr-19
Date Tested 08-Apr-19

Page 1 of 1

Determination of the California Bearing Ratio to BS 1377 : PART 4 : 1990

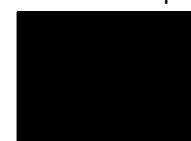
Scheme	Norfolk Vanguard and Boreas		
Location	CBR 4 @ 0.2m		
Date sampled	27-Mar-19	Date received	29-Mar-19
Sample type	Bulk Disturbed	Sample Mass	19.9kg
If a sample certificate was provided it is available for inspection. The accuracy of information provided by third parties cannot be guaranteed.			
Material	Soil		
Description	Orangey brown and yellowish brown, slightly gravelly, medium to coarse SAND. Gravel is fine, sub-angular flint.		
Supplier	Not applicable	Source	Ex site
Location	Test Specimen Not applicable		
Orientation	Not applicable		
Method of Division	Preparation Details Quartering		
Preparation Method	Sieving, Natural Moisture Content		
Condition	Unsoaked		
Retained 37.5mm	%	0	
Retained 20mm	%	1.1	
Number of layers		3	CBR Value Top % 32.0
Blows per layer		N/A	CBR Value Bottom % 64.0
BS Method		3.7, Vib.Hammer	
Bulk Density	Mg/m ³	1.90	Moisture Content Top % 5.4
Dry Density	Mg/m ³	1.80	Moisture Cont. Bottom % 5.5
Initial Moisture Content	%	5.5	Moisture Content Method Oven dried @ 105-110°C
Remarks			

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Peter Hardiment (Operations Manager)



Norfolk Boreas Offshore Wind Farm

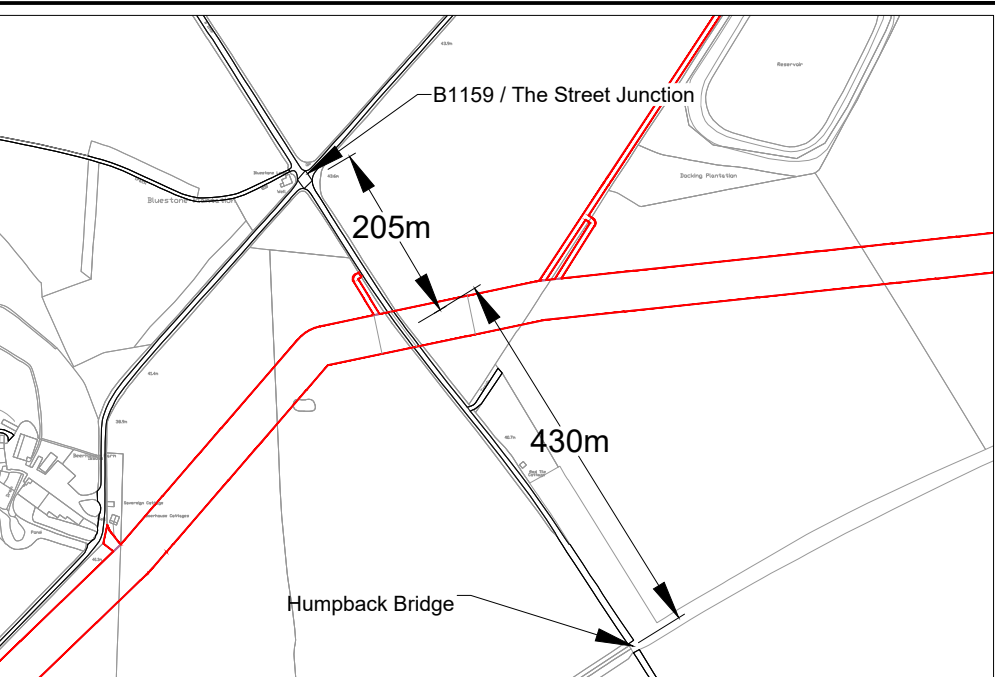
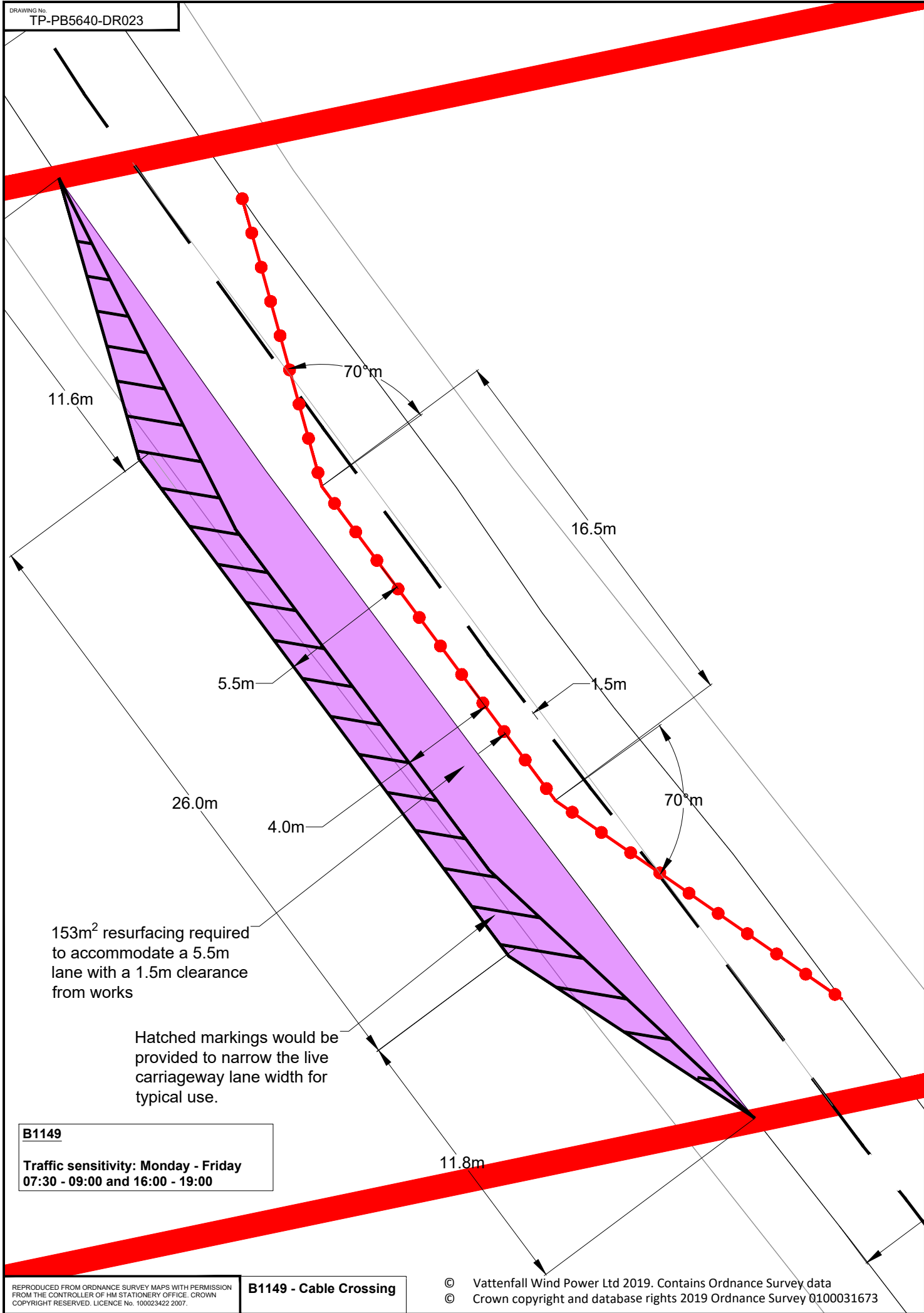
Appendix 3 - B1149

Traffic

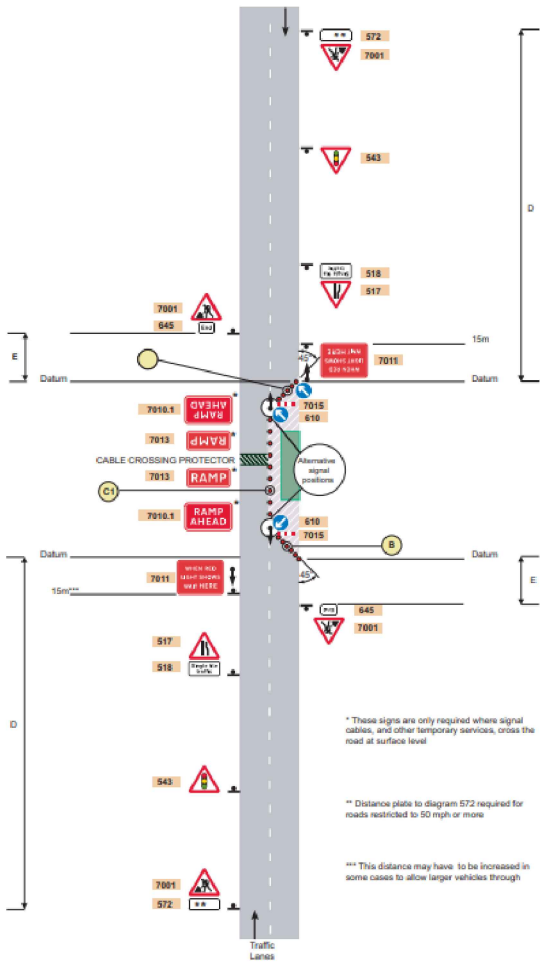
Management Plans

Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-3.D4.V1
Deadline 4
Date: January 2020
Revision: Version 1

Photo: Ormonde Offshore Wind Farm



Plan SC7: Portable traffic signals on a two-lane single carriageway road



NOTE: Refer to Table 5.3 in Section D5.4 for recommended range of distances for dimensions D and E.

		Single carriageway road:			
		Permanent speed limit			
		30mph or less	40mph	50mph	Unrestricted (60 mph)
Minimum and normal maximum sighting distance D of first sign in advance of lead-in taper in metres		20* – 45	45 – 110	275 – 450	275 – 450
Minimum longitudinal clearance L in metres ¹		0.5	15	30	60
Length of taper T in metres ² :					
1	13	20	25	25	25
Width of hazard	2	26	40	50	50
(metres) including	3	39	60	75	75
safety zone S	4	52	80	100	100
	5	65	100	125	125
Minimum lateral safety zone clearance		0.5	0.5	1.2	1.2
Distance E to 'end of road works' sign		10 – 30	10 – 30	30 – 45	30 – 45

Extracts from Traffic Signs Manual (2009)
Chapter 8 Part 1

- ## NOTES
1. Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. This drawing is an update to PB4476-DR033, first issued in the Norfolk Vanguard DCO application.

KEY

- DCO ORDER LIMITS
 REQUIRED RESURFACING
 INDICATIVE CONES

1.0		FIRST ISSUE			
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISION

CLIENT

VATTENFALL

PROJECT NORFOLK BOREAS OFFSHORE WIND FARM

TITLE

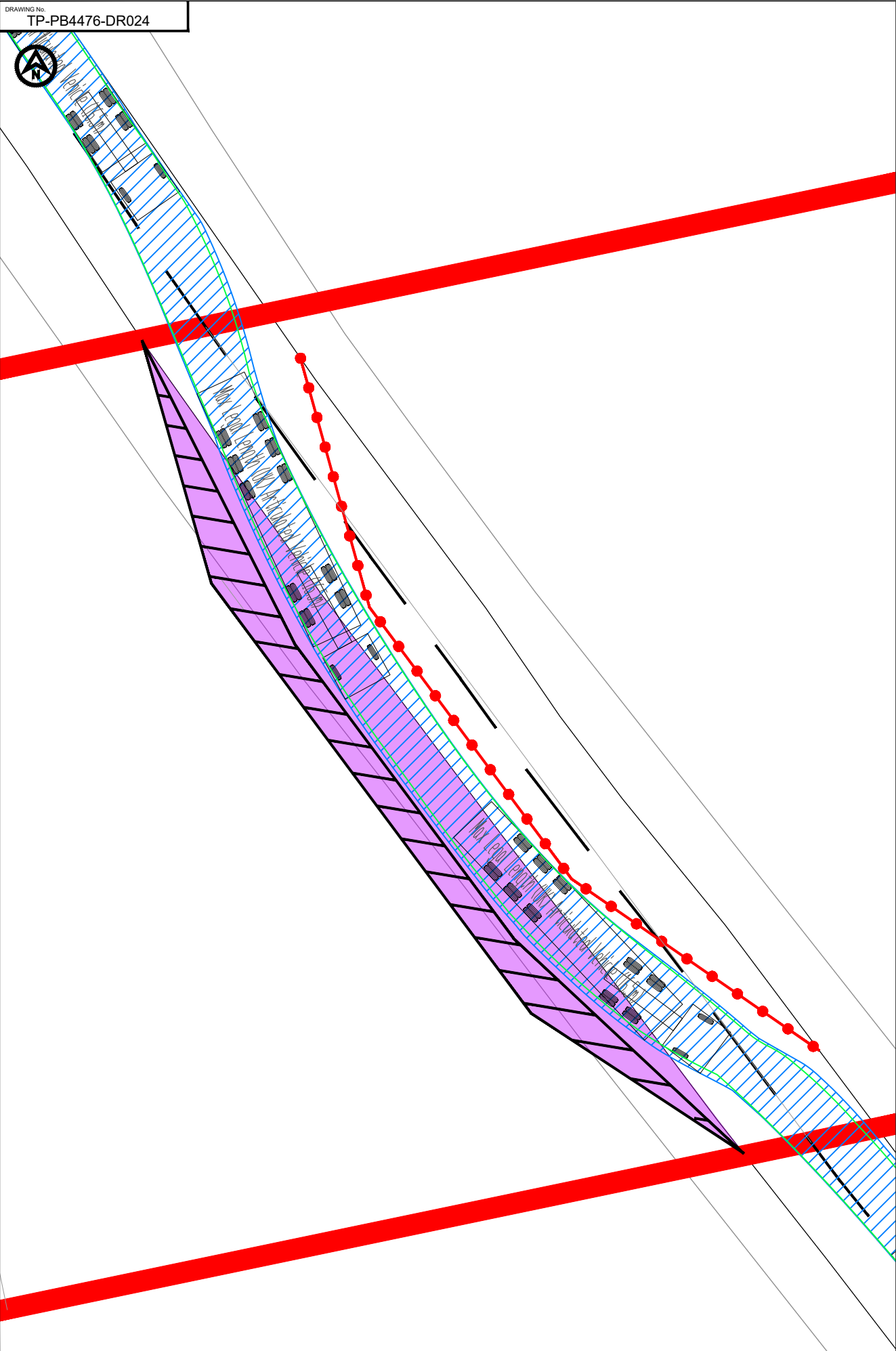
B1149 TRAFFIC MANAGEMENT (SOUTH WESTERN VERGE)



RAWN	RNE	CHECKED	ADR	APPROVED	ADR
ATE	23.01.20	SCALE AT A1	1:250	CLIENTS REF.	

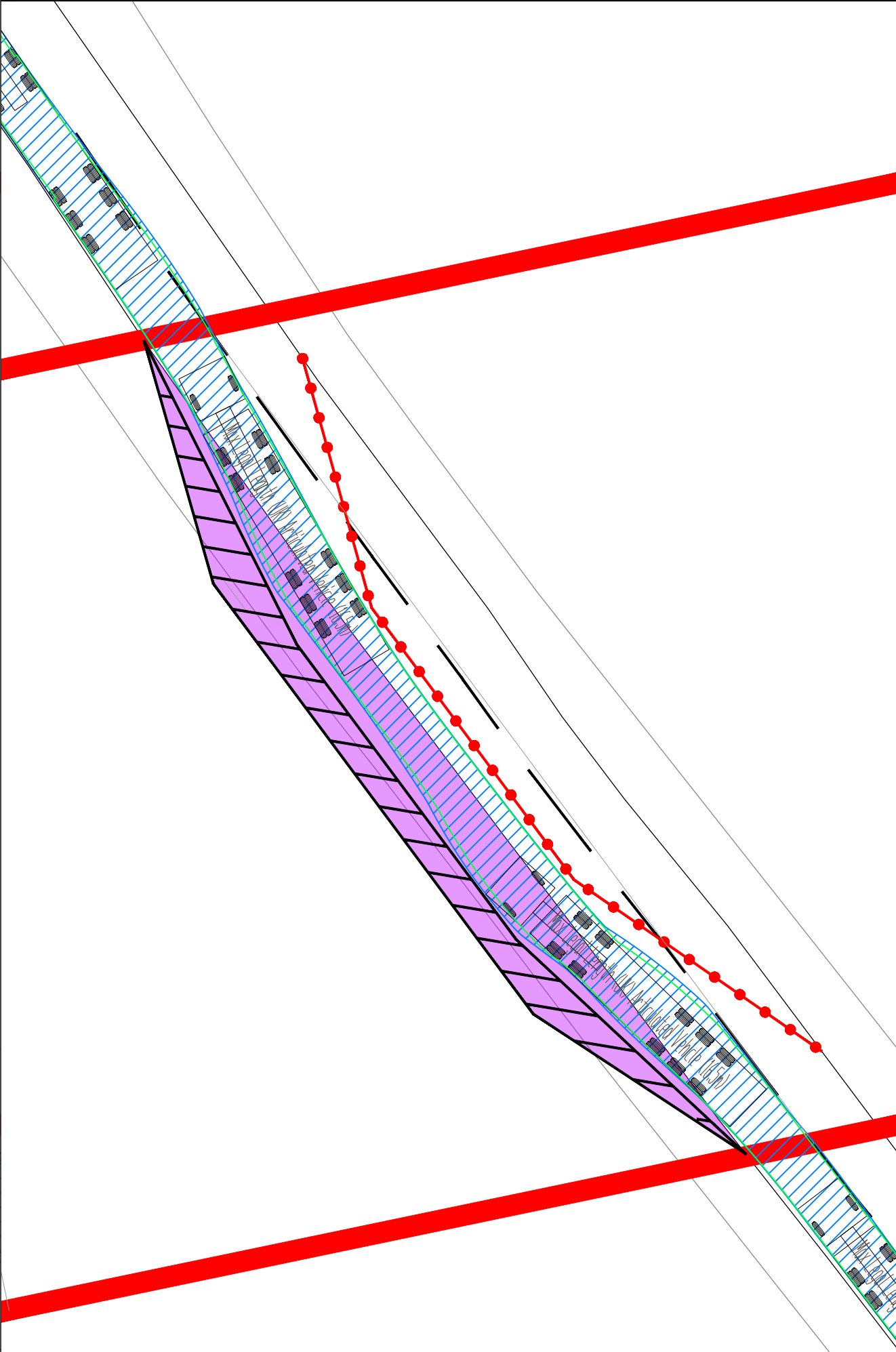
DRAWING No. **TP-PB5640-DR023** REVISION **F1.0**

DRAWING No.
TP-PB4476-DR024



REPRODUCED FROM ORDNANCE SURVEY MAPS WITH PERMISSION
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Southbound
SCALE - 1:250



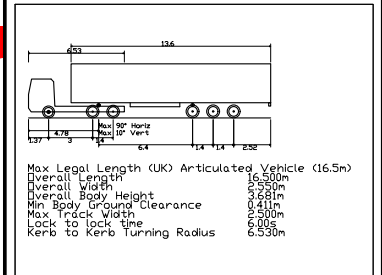
Northbound
SCALE - 1:250

- NOTES**
1. Do not scale from this drawing. all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. This drawing is an update to PB4476-DR034, first issued in the Norfolk Vanguard DCO application.

KEY

— ORDER LIMITS

VEHICLE TRACKING



- ▨ VEHICLE BODY SWEEP PATH (FORWARD GEAR)
— VEHICLE CHASSIS SWEEP PATH
■ REQUIRED RESURFACING
●●●● INDICATIVE CONES

**DRAFT - NOT FOR
CONSTRUCTION**

F1.0		FIRST ISSUE			
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

CLIENT

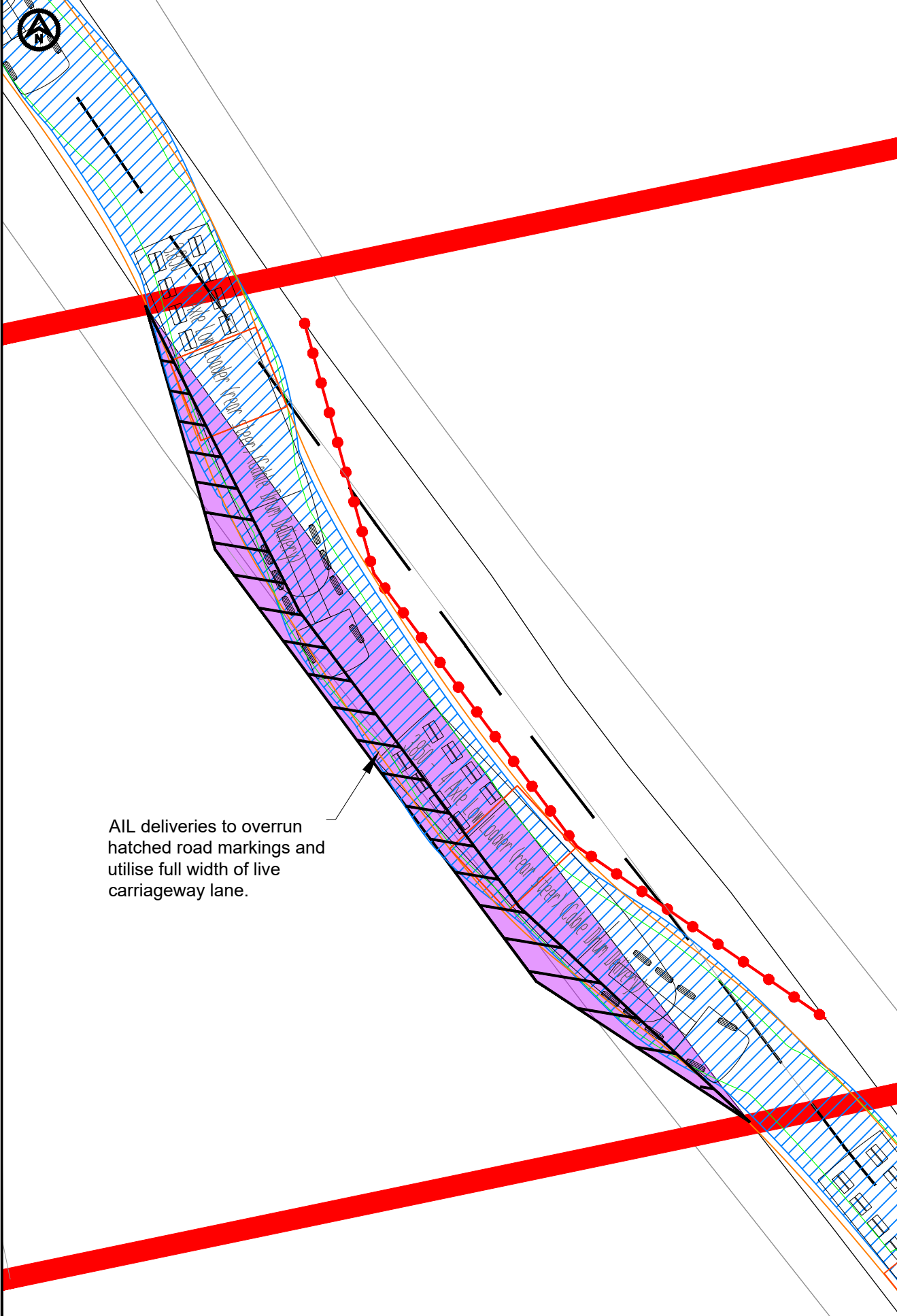
VATTENFALL

PROJECT
NORFOLK BOREAS
OFFSHORE WIND FARM

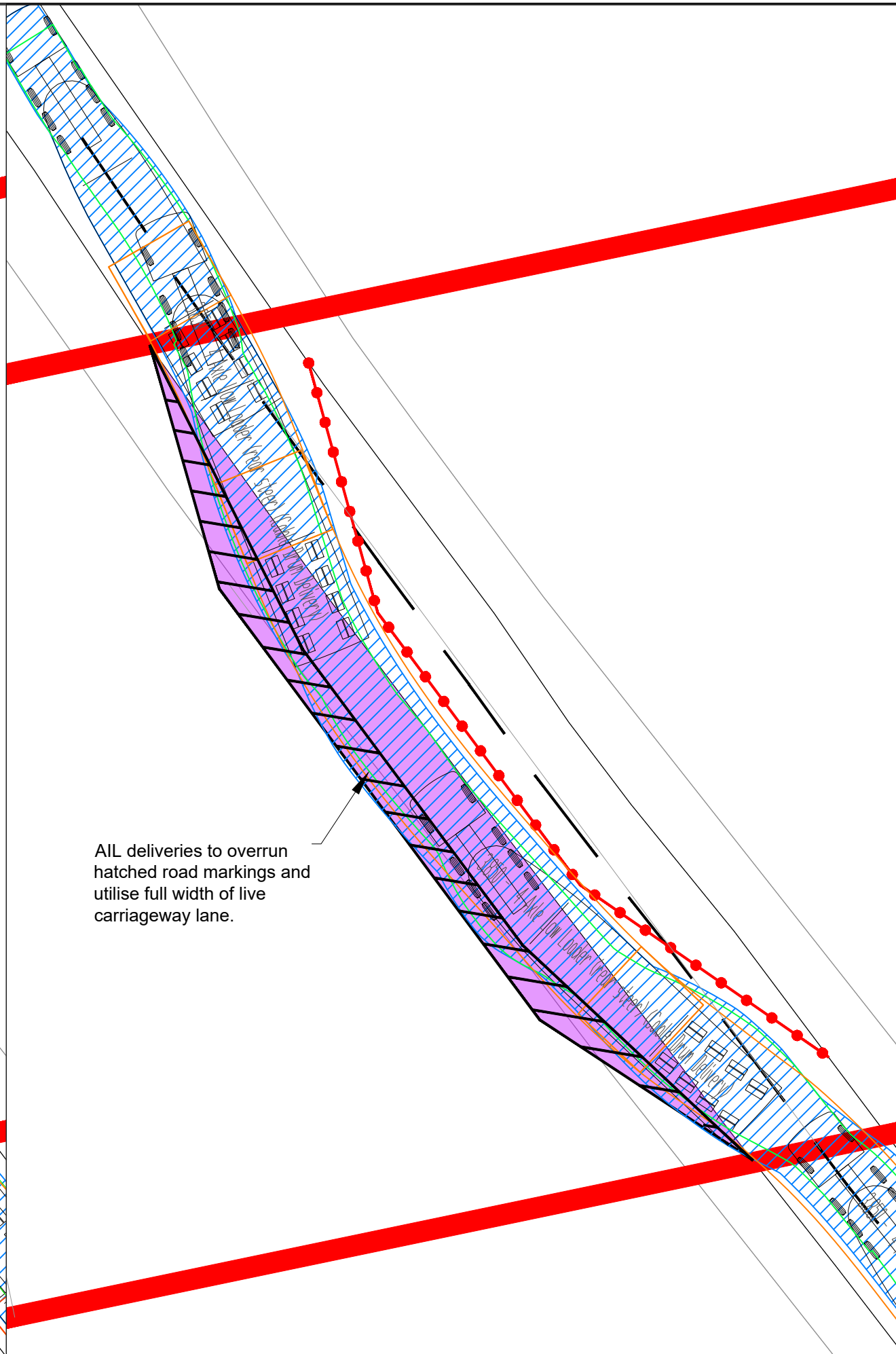
TITLE
B1149 TRAFFIC MANAGEMENT
ARTICULATED LORRY SWEEP
PATH ANALYSIS
(SOUTH WESTERN VERGE)



DRAWN	RNE	CHECKED	ADR	APPROVED	ADR
DATE	23.01.20	SCALE AT A3	1:250	CLIENTS REF.	
DRAWING No.	TP-PB4476-DR024	REVISION			
CLIENT DWG No.					F1.0



ALL deliveries to overrun
hatched road markings and
utilise full width of live
carriageway lane.



ALL deliveries to overrun
hatched road markings and
utilise full width of live
carriageway lane.

NOTES

- Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
- This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
- This drawing is an update to PB4476-DR035, first issued in the Norfolk Vanguard DCO application.
- Cable drum dimensions taken from Hornsea 3 Offshore Wind Farm document 'Main Construction Compound Access Strategy' September 2018.
- Typical AIL vehicle used suitable for cable drum loadings.

KEY

ORDER LIMITS

VEHICLE TRACKING

3.850 - 4 Axle Low Loader (rear steer) (Cable Drum Delivery)

Overall Length	12.500m
Overall Width	2.500m
Overall Height	3.500m
Min Body Ground Clearance	0.200m
Max Body Width	2.500m
Lock to lock time	3.000s
Max wheel angle	35.00°

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REV	DATE	DESCRIPTION	BY	CHK	APP
D.01		FIRST ISSUE			

REVISIONS

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PROJECT

NORFOLK BOREAS OFFSHORE WIND FARM

TITLE

**B1149 TRAFFIC MANAGEMENT
TYPICAL AIL CABLE DRUM
DELIVERY
SWEEP PATH ANALYSIS
(SOUTH WESTERN VERGE)**

Royal HaskoningDHV
Enhancing Society Together

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Email: info@rhdhv.com
www.royalhaskoningdhv.com

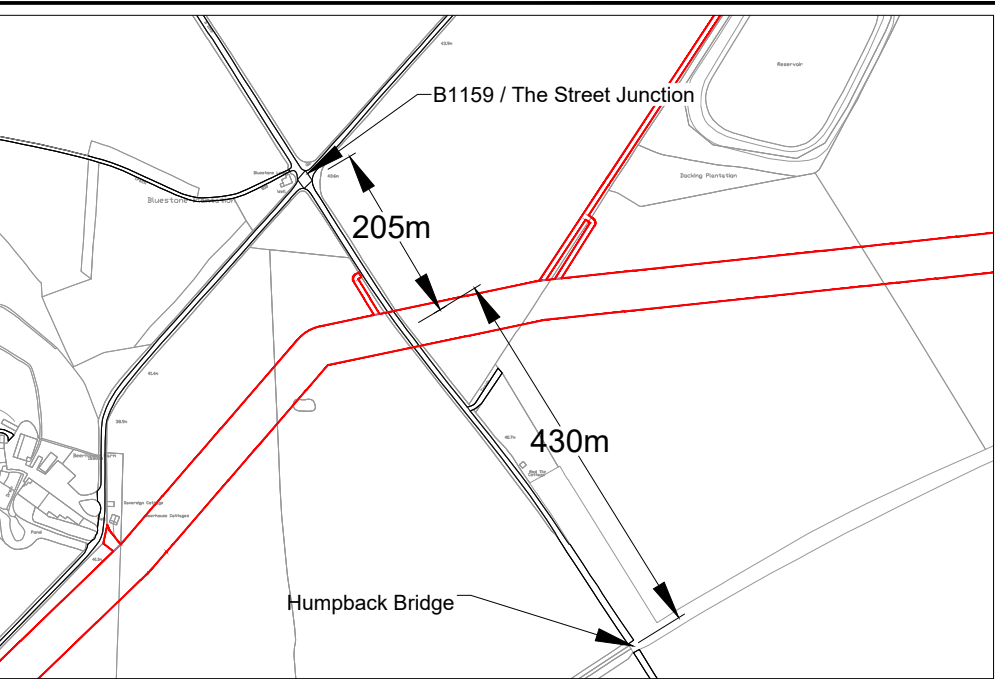
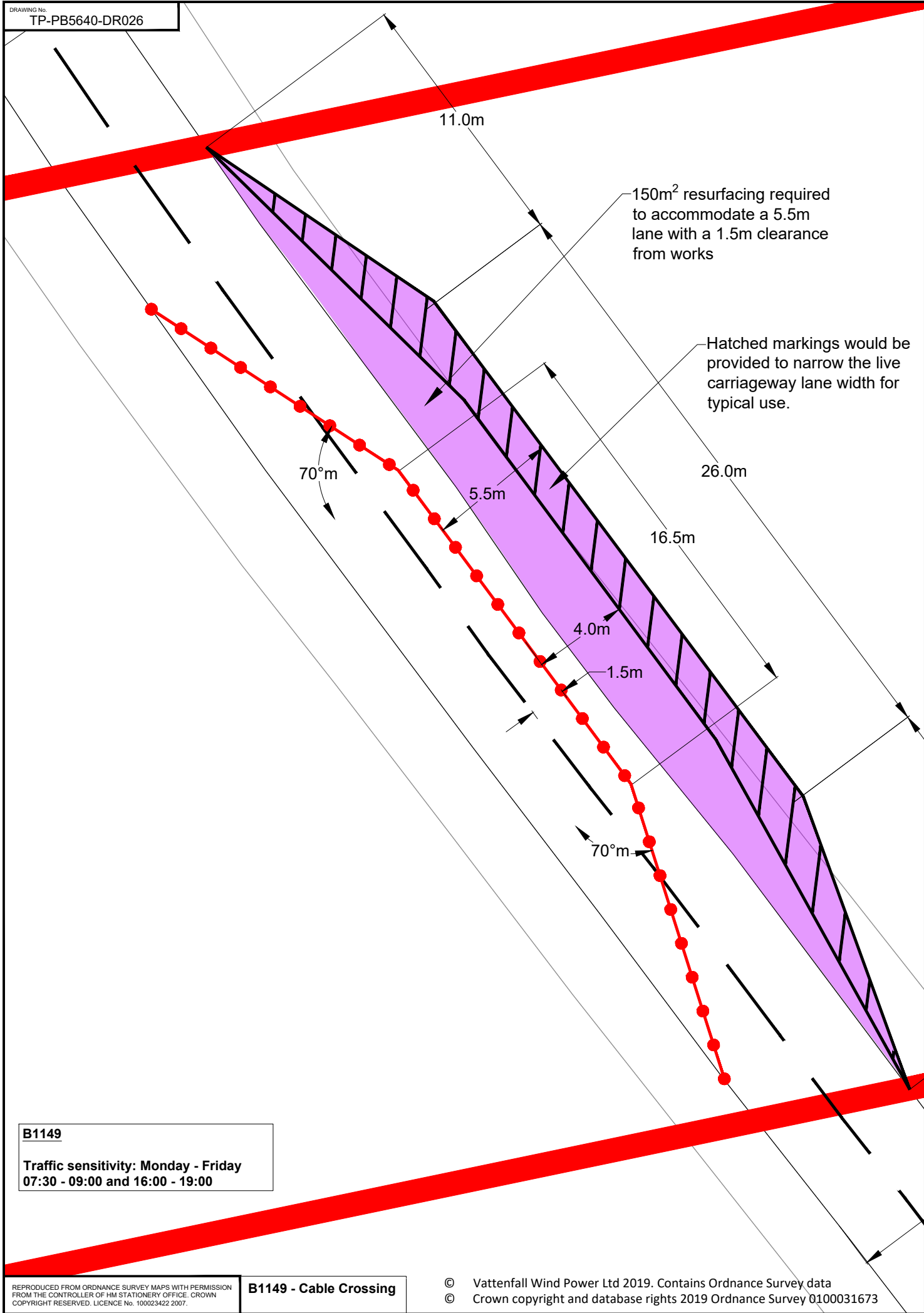
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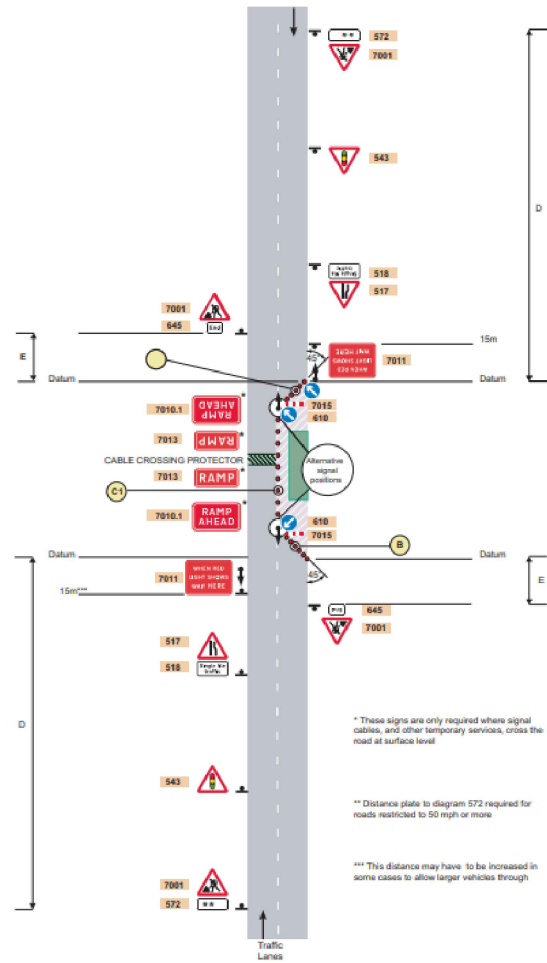
CLIENT DWG No.

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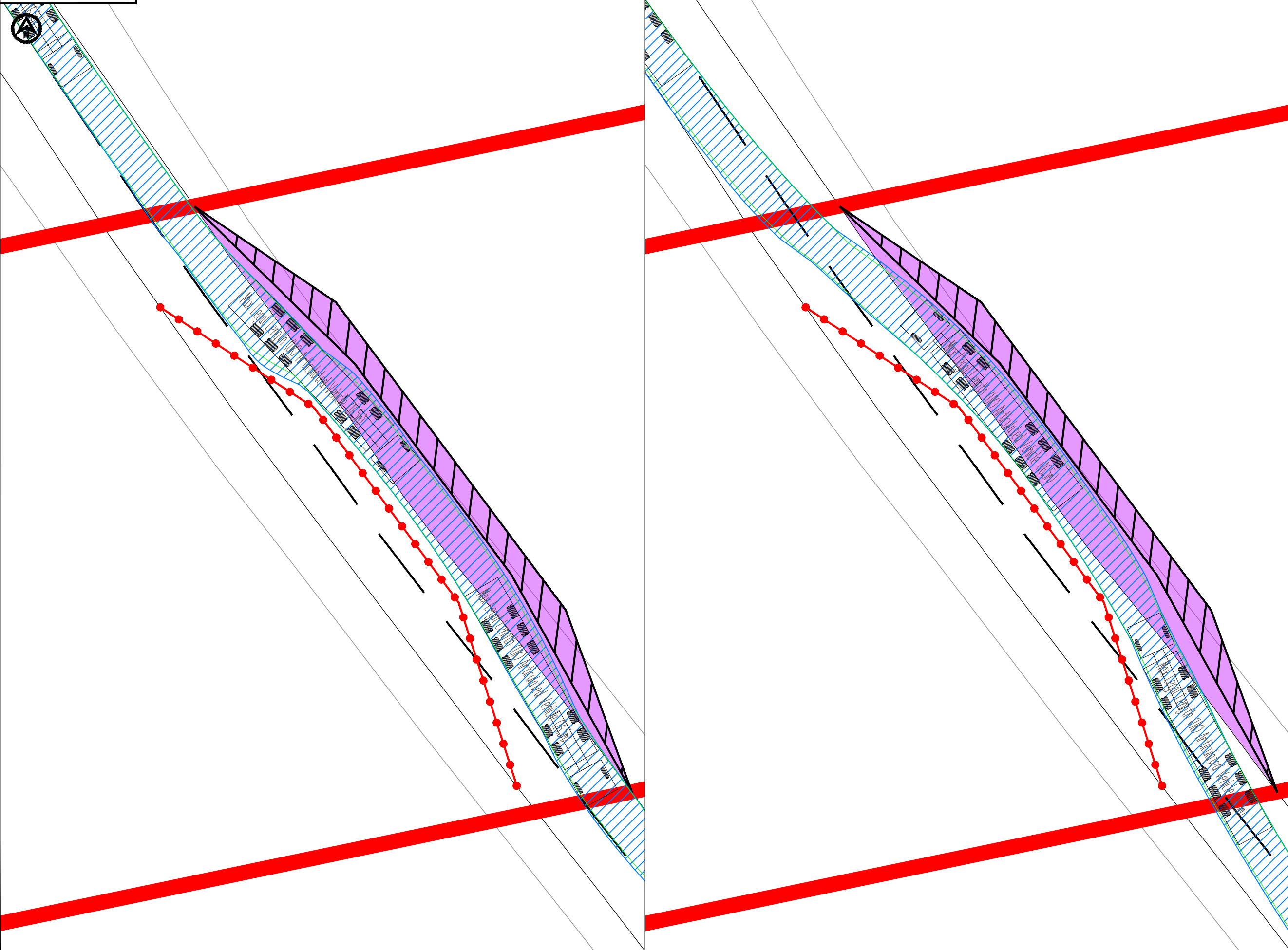
F1.0



Plan SC7: Portable traffic signals on a two-lane single carriageway road



DRAWING No.
TP-PB5640-DR027



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Southbound
SCALE - 1:250

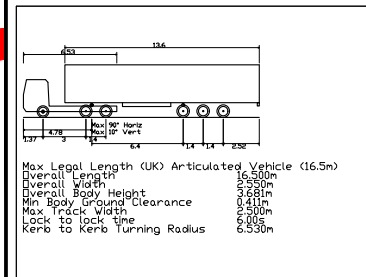
Northbound
SCALE - 1:250

- NOTES
1. Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. This drawing is an update to PB4476-DR037, first issued in the Norfolk Vanguard DCO application.

KEY

ORDER LIMITS

VEHICLE TRACKING



- VEHICLE BODY SWEEP PATH (FORWARD GEAR)
- VEHICLE CHASSIS SWEEP PATH
- REQUIRED RESURFACING
- INDICATIVE CONES

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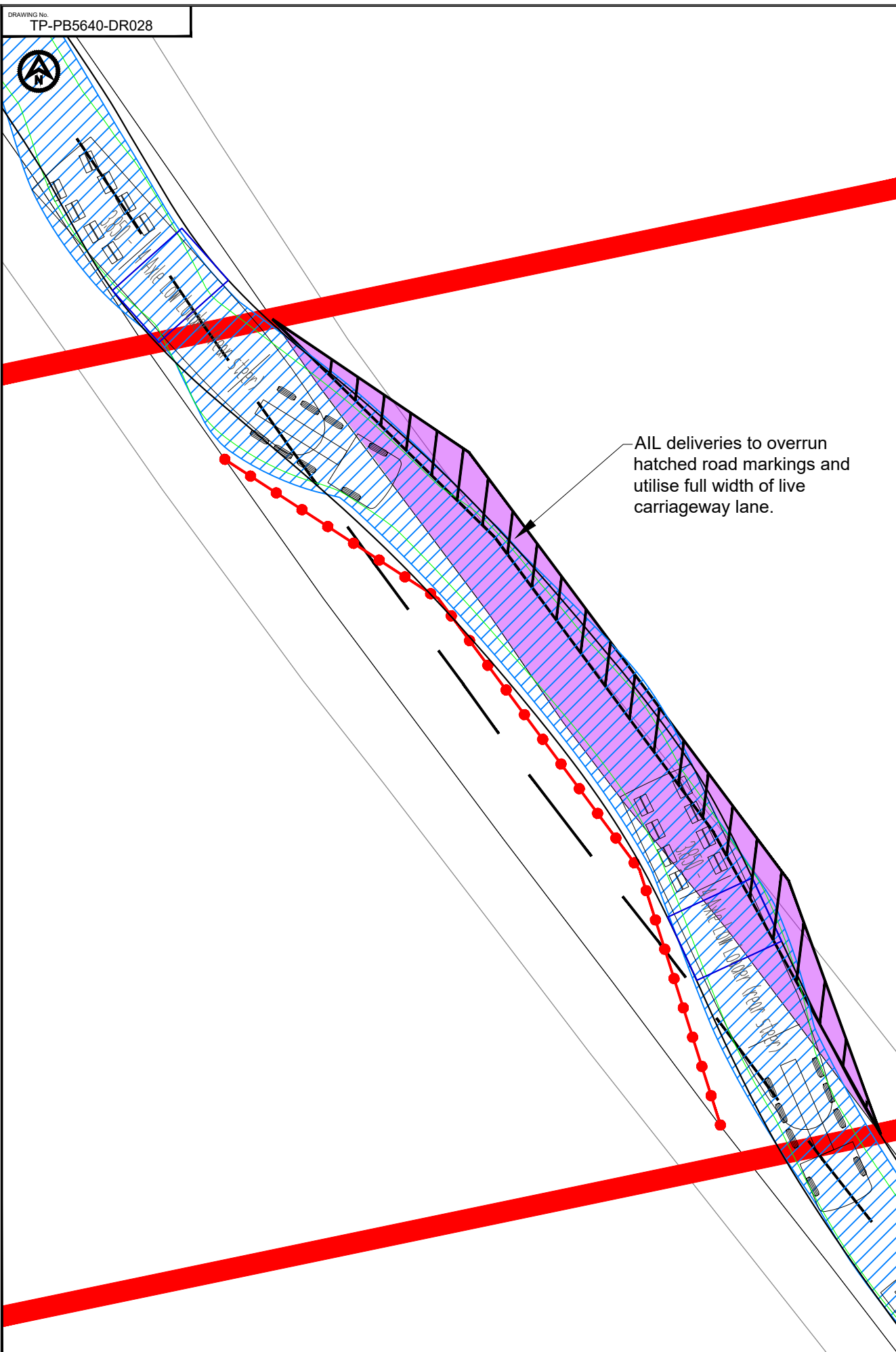
PROJECT
NORFOLK BOREAS OFFSHORE
WIND FARM

TITLE
B1149 TRAFFIC MANAGEMENT
ARTICULATED LORRY SWEEP
PATH ANALYSIS
(NORTH EASTERN VERGE)

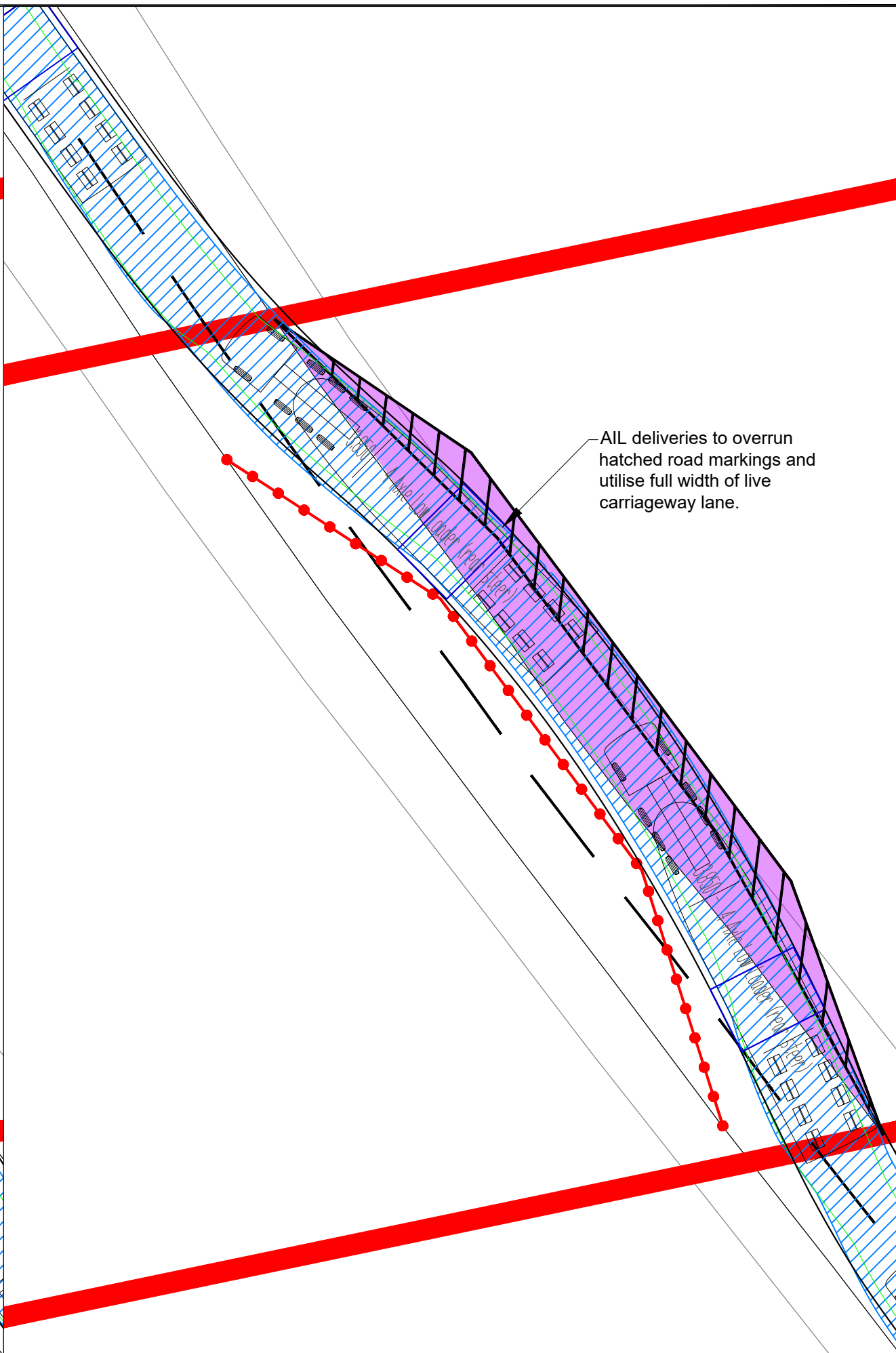
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DATE	23.01.20	SCALE AT A3	1:250	CLIENTS REF.	
DRAWING No.	TP-PB5640-DR027	REVISION			F1.0
CLIENT DWG No.					



AIL deliveries to overrun
hatched road markings and
utilise full width of live
carriageway lane.



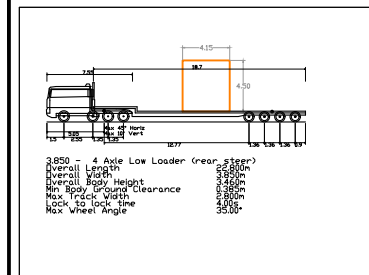
AIL deliveries to overrun
hatched road markings and
utilise full width of live
carriageway lane.

- NOTES
1. Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. This drawing is an update to PB4476-DR034, first issued in the Norfolk Vanguard DCO application.
 4. Cable drum dimensions taken from Hornsea 3 Offshore Wind Farm document 'Main Construction Compound Access Strategy' September 2018.
 5. Typical AIL vehicle used suitable for cable drum loadings.

KEY

— ORDER LIMITS

VEHICLE TRACKING



- VEHICLE BODY SWEEP PATH (FORWARD GEAR)
- VEHICLE CHASSIS SWEEP PATH
- INDICATIVE CABLE DRUM SWEEP PATH
- REQUIRED RESURFACING
- INDICATIVE CONES

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PROJECT
NORFOLK BOREAS OFFSHORE
WIND FARM

TITLE
B1149 TRAFFIC MANAGEMENT
TYPICAL AIL CABLE DRUM
DELIVERY
SWEEP PATH ANALYSIS
(NORTH EASTERN VERGE)



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DATE	23.01.20	SCALE AT A3	1:250	CLIENTS REF.	
DRAWING No.	TP-PB5640-DR028	REVISION			F1.0
CLIENT DWG No.					

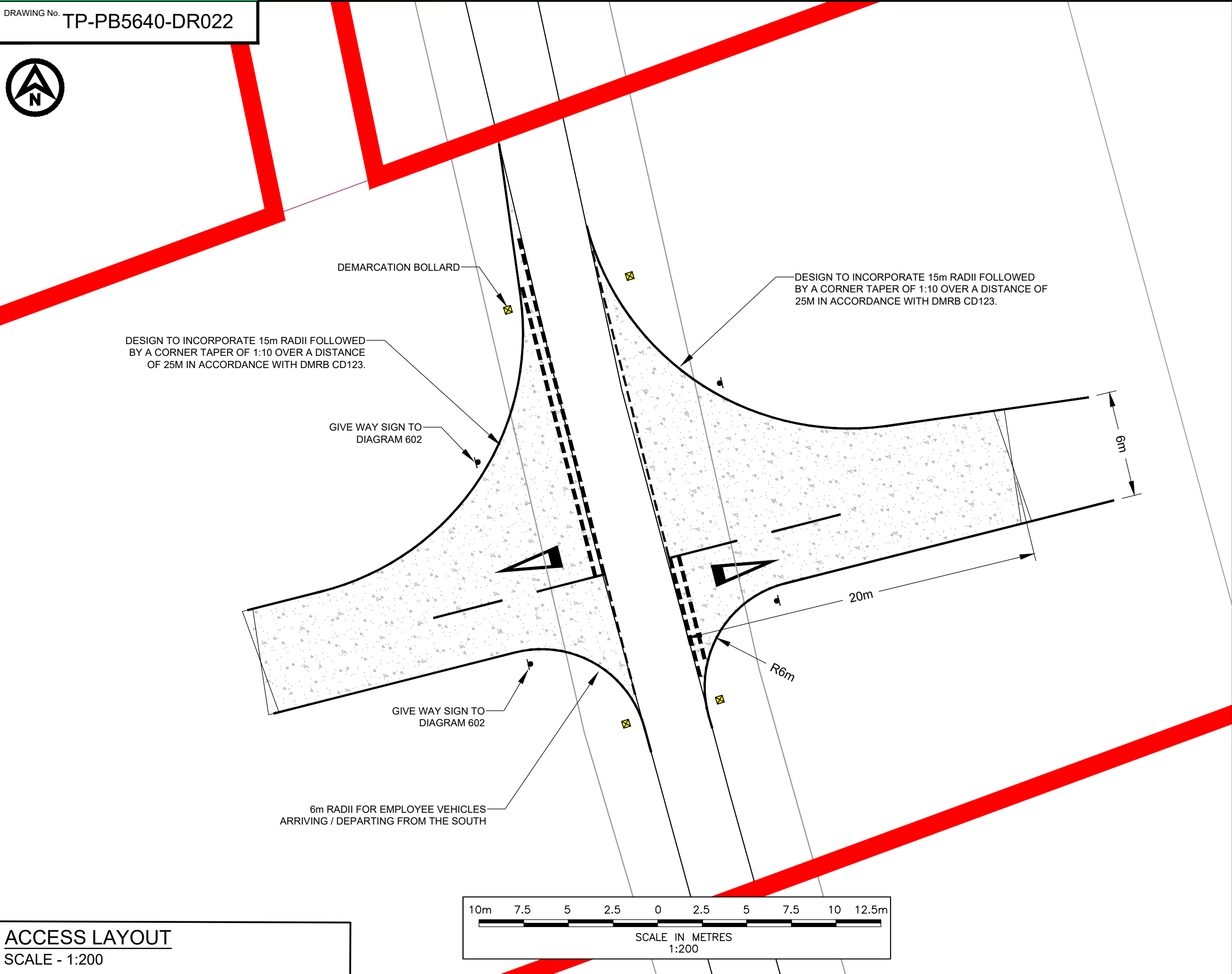
Norfolk Boreas Offshore Wind Farm

Appendix 4 – Church Road, Colby Access Layout

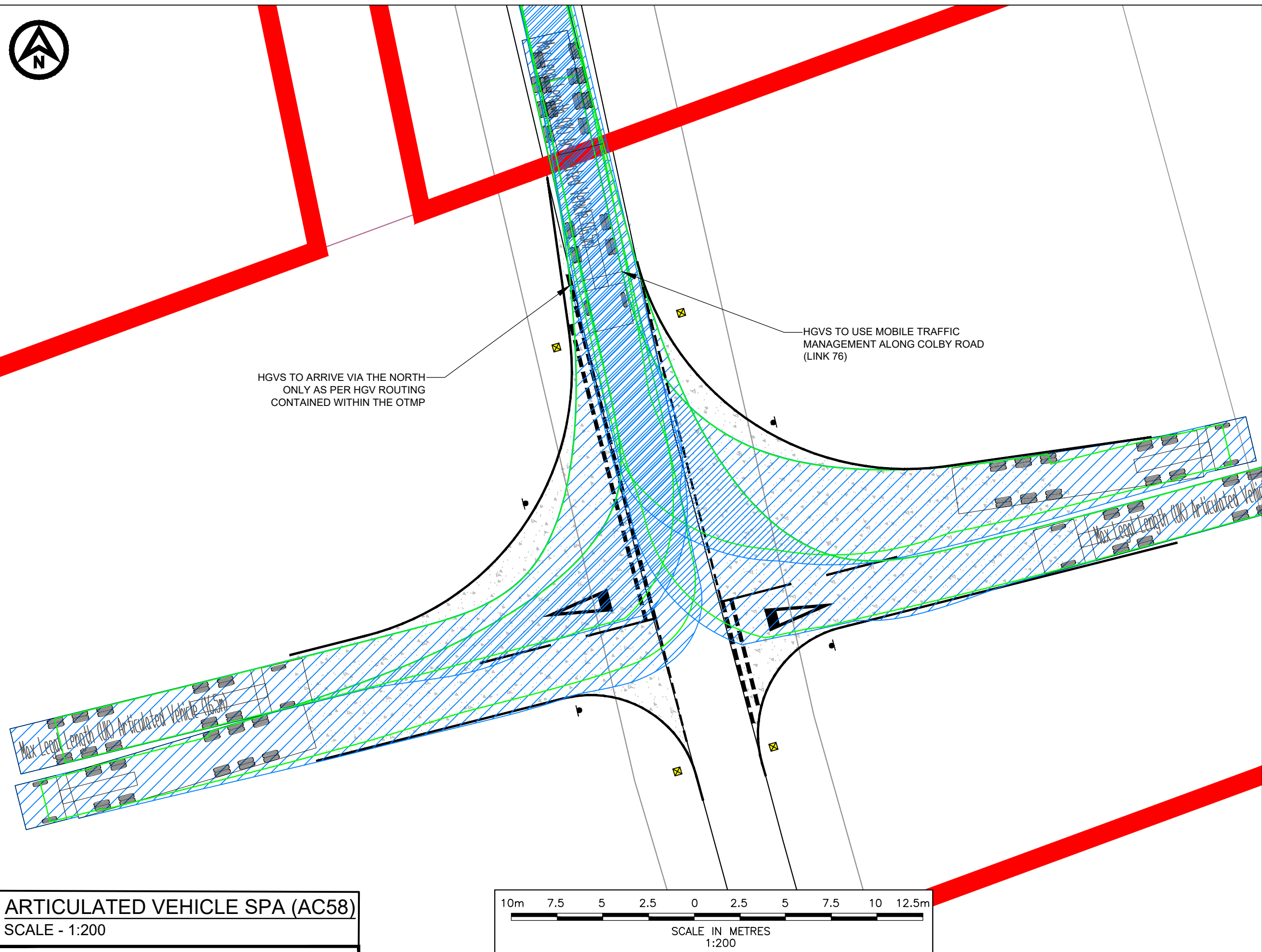
Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-3.D4.V1
Deadline 4
Date: January 2020
Revision: Version 1

Photo: Ormonde Offshore Wind Farm

DRAWING No. TP-PB5640-DR022

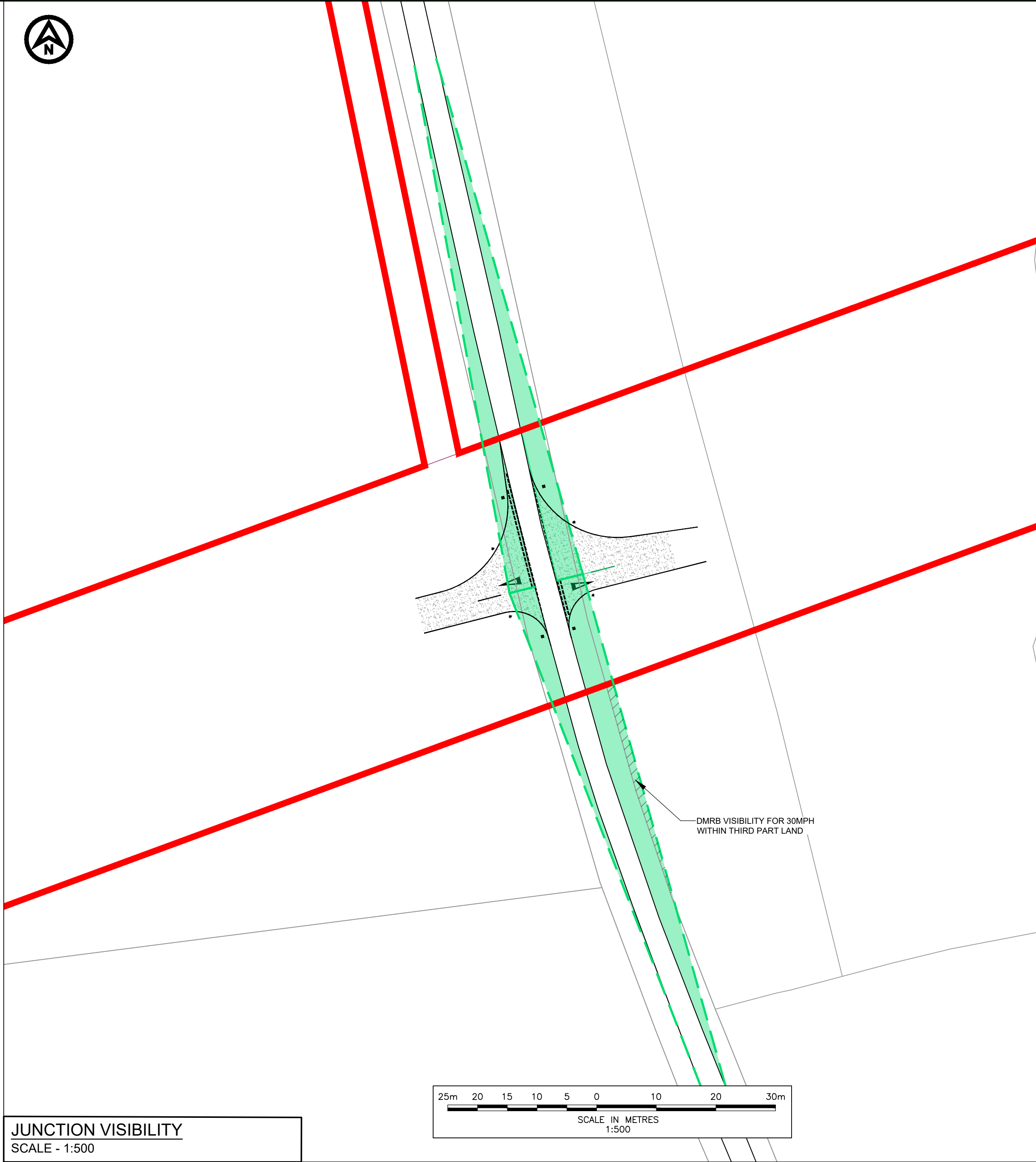


ACCESS LAYOUT
SCALE - 1:200



ARTICULATED VEHICLE SPA (AC58)
SCALE - 1:200

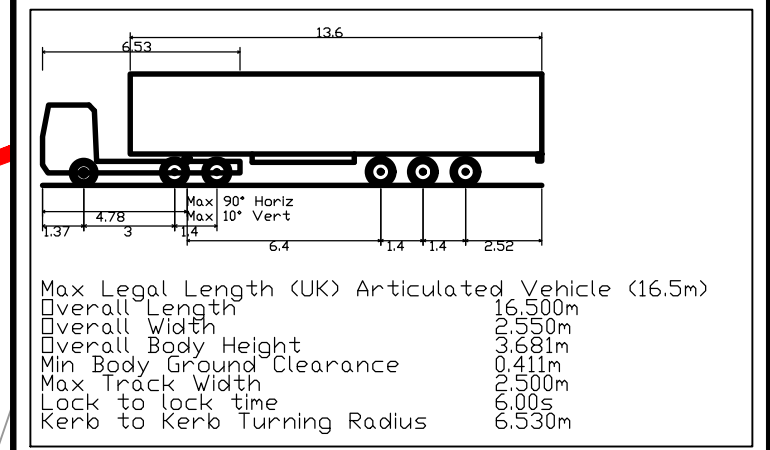
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JUNCTION VISIBILITY
SCALE - 1:500

- NOTES
1. Do not scale from this drawing. all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. Road markings and road signs are to be in accordance with the SI document "Traffic Signs Regulations and General Directions, 2016".

- GENERAL KEY
- DEVELOPMENT CONSENT ORDER LIMITS
 - PROPOSED ACCESS BOUND MATERIAL
 - PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
 - PROPOSED GATE
 - APPROXIMATE SIGN LOCATION
- VISIBILITY KEY
- 2.4m x 90m (DMRB) VISIBILITY SPLAY FOR A 30MPH SPEED LIMIT
 - DMRB CLEAR VISIBILITY ENVELOPE
 - DMRB VISIBILITY ENVELOPE WITHIN THIRD PARTY LAND
- SWEPT PATH ANALYSIS KEY
- VEHICLE BODY SWEPT PATH (FORWARD GEAR)
 - VEHICLE CHASSIS SWEPT PATH



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PROJECT
NORFOLK BOREAS
OFFSHORE WIND FARM

TITLE
CHURCH ROAD - AC58 ACCESS

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DRAWING No.	TP-PB5640-DR022	REVISION			
CLIENT DWG No.		F1.0			

Norfolk Boreas Offshore Wind Farm

Appendix 5 –

Church Road, Colby

Access Aerial Image

Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-3.D4.V1
Deadline 4
Date: January 2020
Revision: Version 1

Photo: Ormonde Offshore Wind Farm



- NOTES**
1. Do not scale from this drawing: all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. Road markings and road signs are to be in accordance with the SI document "Traffic Signs Regulations and General Directions, 2016".

- GENERAL KEY**
- DEVELOPMENT CONSENT ORDER LIMITS
 - PROPOSED ACCESS BOUNDARY/ROAD MARKINGS

- VISIBILITY KEY**
- 2.4m x 90m (DMRB) VISIBILITY SPLAY FOR A 30MPH SPEED LIMIT
 - DMRB CLEAR VISIBILITY ENVELOPE

FOR CONSULTATION

REV	DATE	DESCRIPTION	BY	CHK	APP
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PROJECT
NORFOLK BOREAS
OFFSHORE WIND FARM

TITLE
CHURCH ROAD - AC58 ACCESS



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DATE	28.01.2020	SCALE AT A1	1:250	CLIENTS REF.	
DRAWING No.	TP-PB5640-DR037	REVISION			
CLIENT DWG No.		F1.0			

Appendix D – Norfolk Boreas [APP-018] – Norfolk Boreas Limited 2.11 Important Hedgerows Plan (See Sheet 13 of 42)

Norfolk Boreas Offshore Wind Farm

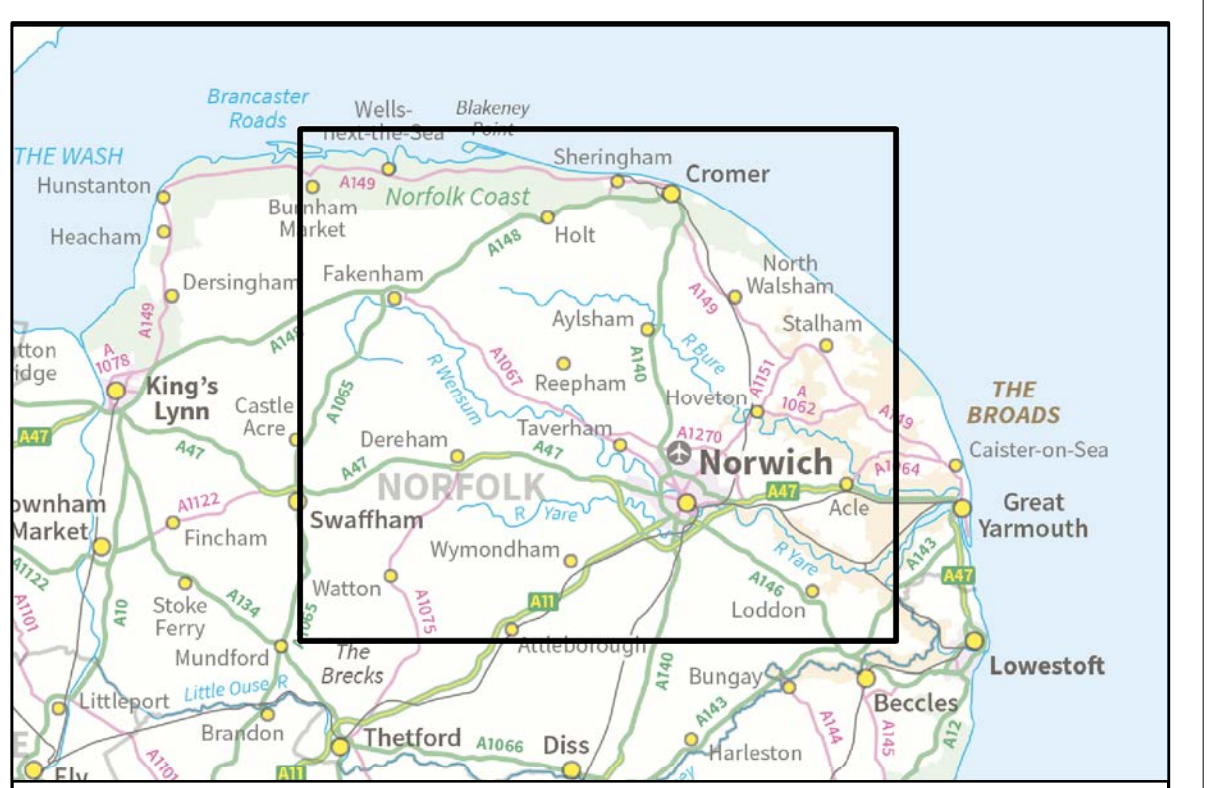
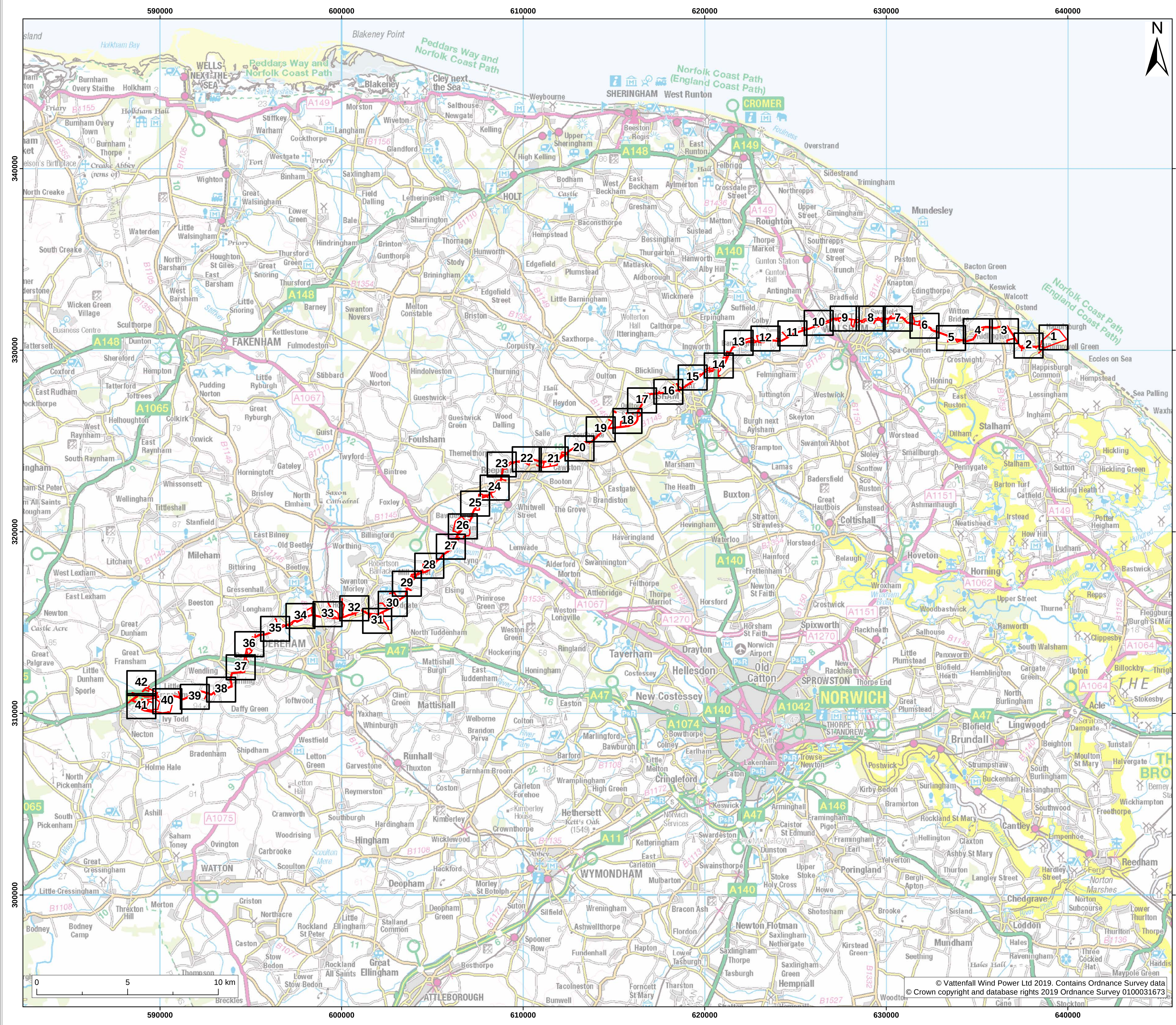
Important hedgerows plan

DCO Document 2.11

Applicant: Norfolk Boreas Limited
Document Reference: 2.11
Pursuant to APFP Regulation: 5(2)(o)

Date: June 2019
Revision: Version 1
Author: Royal HaskoningDHV

Photo: Ormonde Offshore Wind Farm



Legend:

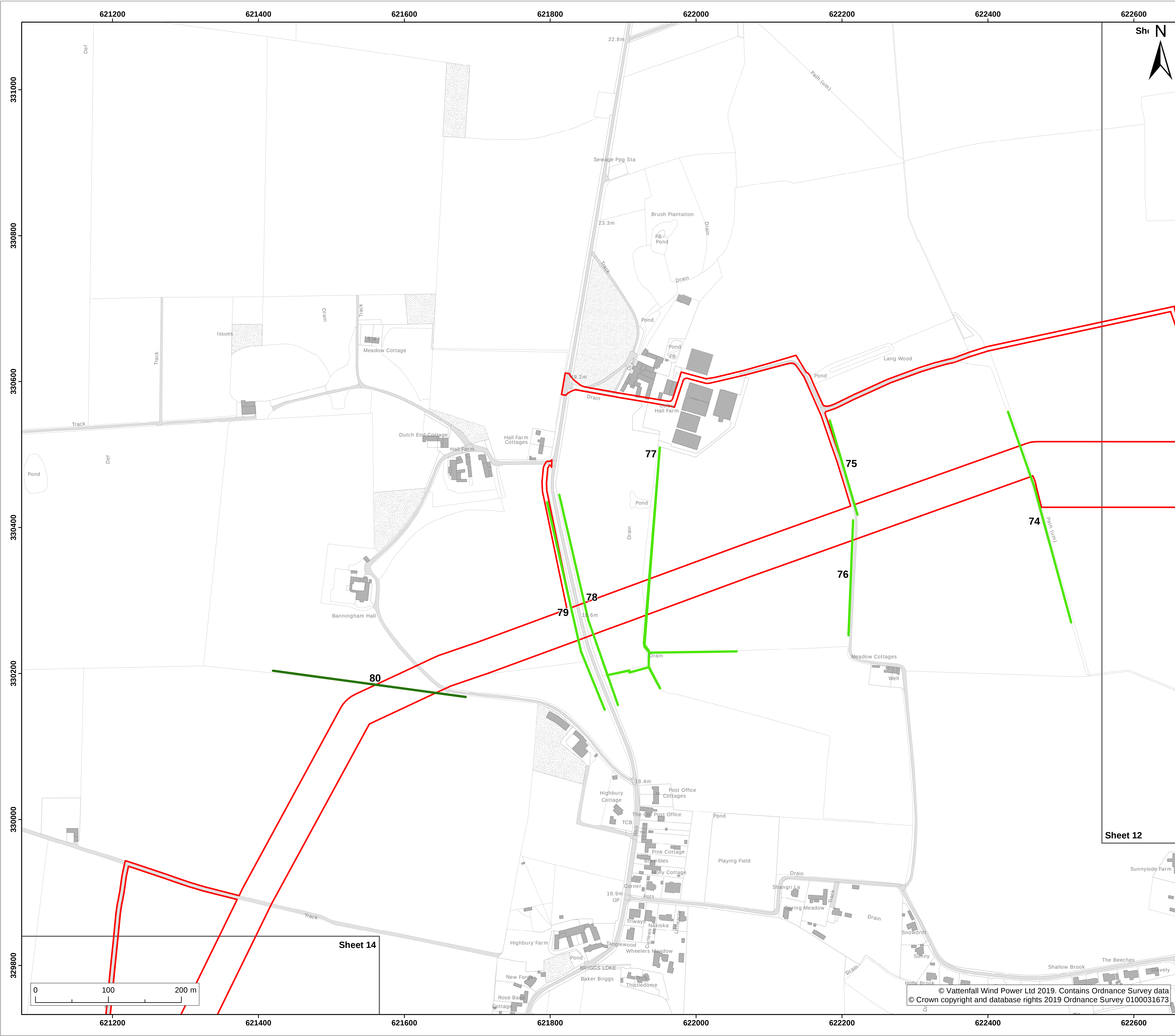
- Order limits
- Sheet boundary

Project: Norfolk Boreas Offshore Wind Farm	Report: Development Consent Order
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Title:
2.11 Important hedgerows plan (key plan)

Doc Ref: 2.11	APFP Ref: 5(2)(o)	Drawing No: PB5640-007-000-027			
Revision: 03	Date: 16/04/2019	Drawn: JT	Checked: CD	Size: A1	Scale: 1:100,000
02	06/02/2019	LB	CD	A1	1:100,000

Co-ordinate system: British National Grid EPSG: 27700



- Legend:
- Order limits
 - Sheet boundary
 - Important hedgerow
 - Hedgerow

Project:	Report:
Norfolk Boreas Offshore Wind Farm	Development Consent Order

Title:
2.11 Important hedgerows plan (sheet 13 of 42)

Doc Ref:	APFP Ref:	Drawing No:			
2.11	5(2)(o)	PB5640-007-000-025			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
05	29/04/2019	LB	CD	A1	1:2,500
04	04/03/2019	JT	CD	A1	1:2,500

Co-ordinate system: British National Grid EPSG: 27700



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