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Subject:	Hornsea Project Three (UK) Ltd response to Deadline 2 (Part 2)
Date:	14 December 2018 20:50:39
Attachments:	image001.png D3_HOW03_Appendix 1_Traffic.pdf

Dear Kay, K-J

Please find attached the second instalment of documents.

Best regards,
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Hornsea Project Three
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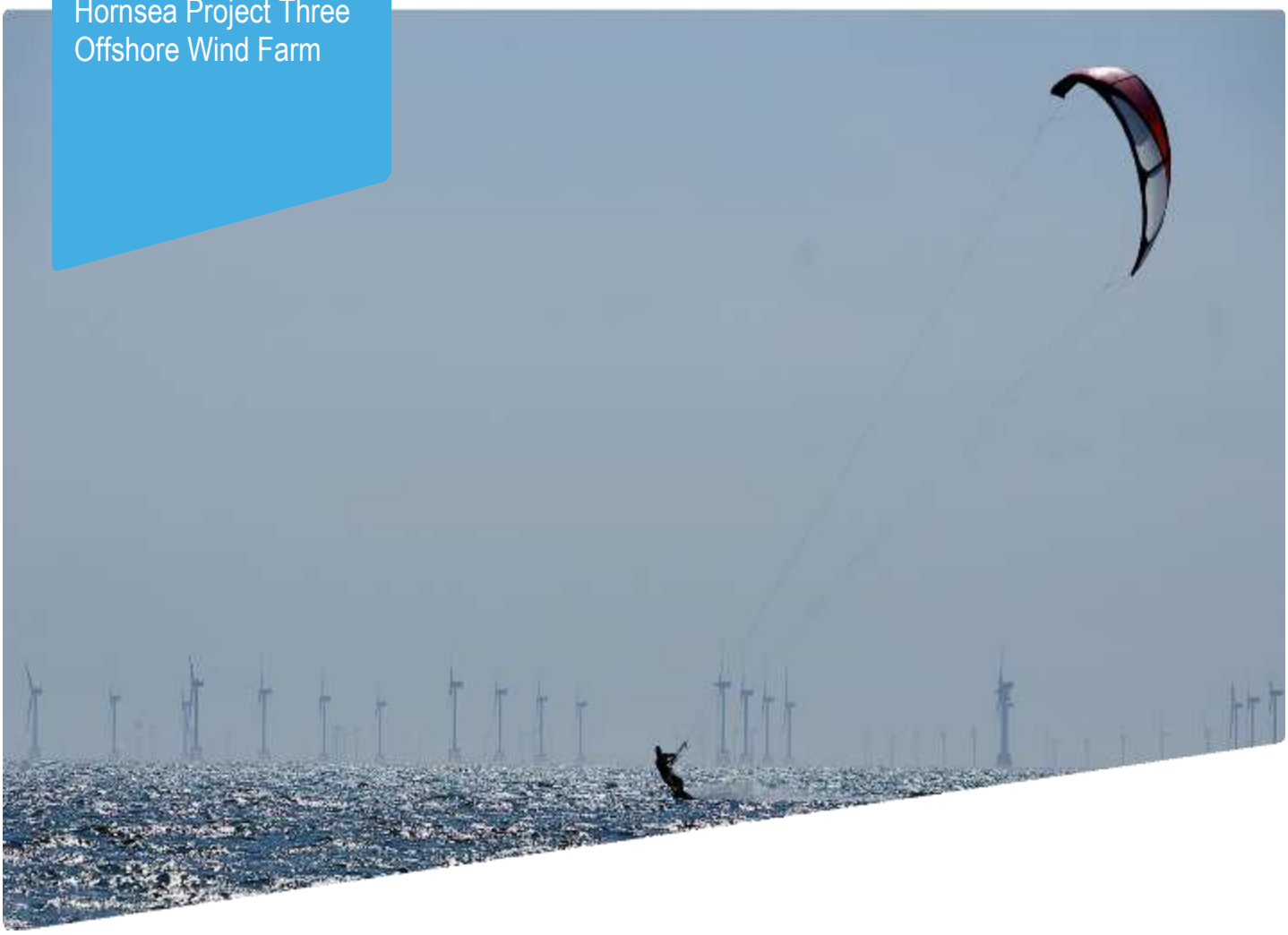

Hornsea Project Three

Offshore Wind Farm

Appendix 1 to Deadline 3 Submission – ~~Appendix 20 to Deadline I Submission –~~

Main Construction Compound Briefing Note

Hornsea 3
Offshore Wind Farm

Ørsted

Date: 14th December 2018

~~**Date:** 7th November 2018~~

Hornsea 3
Offshore Wind Farm

Ørsted

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Front cover picture: Kite surfer near a UK offshore wind farm © Ørsted Hornsea Project Three (UK) Ltd., 2018.

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Glossary

Defined term	Description
the Applicant	This is entity which owns Hornsea Project Three offshore wind farm (i.e. Ørsted Hornsea Project Three (UK) Ltd.).
Hornsea Three	The term Hornsea Three covers all elements within the Development Consent Order (i.e. both the offshore and onshore components).
the Hornsea Three array area	The Crown Estate Agreement for Lease (AfL) area.
the Hornsea Three offshore cable corridor	The corridor within which the offshore export cable will be located. Excludes array cables.
the Hornsea Three onshore cable corridor	The corridor within which the onshore export cable will be located.
statutory consultee	Organisations that are required to be consulted by the Local Planning Authorities and/or PINS, and who also have with a duty to respond to that consultation within a set deadline. This includes consultees that the Applicant is required to consult with, under Section 42 of the Planning Act 2008. Not all consultees will be statutory consultees (see non-statutory consultee definition below).
non-statutory consultee	Organisations that the Local Planning Authorities and/or PINS may choose to engage (if, for example, there are planning policy reasons to do so) who are not designated in law but are likely to have an interest in a proposed development.
Local Authority	The Local Authority is a body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils, District Councils and the Broads Authority, as set out in Section 43 of the Planning Act 2008.
Relevant Planning Authority	The Relevant Planning Authority is the Local Authority in respect of an area within which a project is situated, as set out in Section 173 of the Planning Act 2008. The Relevant Planning Authority is the body empowered by law to exercise statutory town planning functions for a particular area of the United Kingdom. Relevant Planning Authorities may have responsibility for discharging requirements and some functions pursuant to the Development Consent Order, once made.
Local Highway Authority	Public organisation responsible for the maintenance of local roads and consideration of the effects of proposed development projects on the road network.

Acronyms

Acronym	Definition
AD	Anaerobic Digestion
ATC	Automatic Traffic Counter
DCO	Development Consent Order
DfT	Department for Transport
HGVs	Heavy Goods Vehicles
LPA	Local Planning Authority
PEIR	Preliminary Environmental Information Report

1. Introduction

Background

1.1 The Applicant is promoting the development of the Hornsea Project Three Offshore Wind Farm (hereafter referred to as Hornsea Three). Hornsea Three is a project that will consist of an offshore generating station(s) with a capacity of greater than 100 MW and therefore is a Nationally Significant Infrastructure Project (NSIP), as defined by Section 15(3) of the Planning Act 2008, as amended. As such, there is a requirement to submit an application for a Development Consent Order (DCO) to the Planning Inspectorate (PINS) to be decided by the Secretary of State for Business, Energy and Industrial Strategy. A DCO application supported by an Environmental Statement was submitted to the Secretary of State for Development Consent in May 2018.

1.2 Within the DCO application, Hornsea Three has applied for consent to establish and use a main construction compound (Work No 13 of the dDCO) to support the construction of the onshore export cables.

Purpose of this briefing note

1.3 This briefing note has been prepared in response to Relevant Representations submitted by interested parties as part of the examination process and Examining Authority First Written Questions regarding the inclusion of the main construction compound within the project envelope. Therefore, to assist the reader, the briefing note provides a summary of the key relevant representations and Examining Authority First Written Questions relating to the main construction compound, as well as the Applicant's response.

1.4 This briefing note has also been prepared to provide a centralised, single source of information pertaining to the main construction compound, drawing from information already provided within the Application and expanding on specific points where relevant.

1.5 This briefing note has been updated at Deadline 3 to provide clarification on specific points raised at ISH4 on 7th December 2018. This includes;

- Provision of a 'roadmap'which defines the potential access strategies for the main construction compound and their status;
- Preliminary technical drawings and safety audit commentary relating to 'Option R' variations developed in response to Oulton Parish Council's written representation (REP2-027); and
- Clarification on the HOW3 construction traffic generation, with specific reference to the main construction compound traffic flows and cable drum movements on a daily basis.

1.41.6 To support this purpose, the briefing note is structured as follows:

- Section 1 provides an introduction to the briefing note;
- Section 2 provides details of the site selection and alternatives considered regard the main construction compound;
- Section 3 provides a description of the main construction compound
- Section 4 provides a summary of the consultation relevant to the main construction compound (pre-application and post-application);
- ~~Section 4 provides a description of the main construction compound~~;
- ~~Section 5 provides a description of the potential interaction of the main construction compound (and its associated access) with Norfolk Vanguard/Norfolk Boreas offshore wind farm projects;~~
- Section ~~6~~5 provides a summary of the environmental impact assessment undertaken relevant to the main construction compound and its conclusions as reported within the Environmental Statement of the Application;
- Section ~~7~~6 provides a summary of the ongoing work being undertaken to inform the detailed Construction Traffic Management Plan, including clarifications on points raised in ISH4; and
- Section ~~8~~7 sets out the approach to be taken to the main construction compound ~~post-Deadline 1~~moving forward.

2. Site Selection and Consideration of Alternatives for the Main Construction Compound

Approach to identifying Construction Compounds

2.1 As stated in Volume 1, Chapter 3: Project Description of the Environmental Statement (APP-058), the Applicant proposes one main construction compound. The benefits of having one main construction compound have been identified through Ørsted's experience from previous projects in the UK. The purpose of the main construction compound is to operate as a central logistics base for the onshore export cable construction works, housing the central offices for project staff, welfare facilities and acting as a staging post and secure storage for equipment and component deliveries. The main construction compound would also provide a central secure location for key specialist construction apparatus such as HDD rigs. It would act as a central location for health and safety management and monitoring, as well as waste management across the full route (from the coastal cable landfall north of Weybourne to the National Grid connection at Norwich Main). It is noted that separate construction compounds would be established to support landfall works and construction of the HVAC booster station, the HVDC converter/HVAC substation and connection works into Norwich Main grid connection and that these would not draw on the main construction compound.

2.2 To support the construction of the onshore cable corridor the Applicant took an early strategic decision to identify a main construction compound to be supported by a number of secondary compounds providing localised welfare facilities and strategic storage areas along parts of the onshore cable corridor route. The secondary construction compounds, which have been located strategically along the onshore cable corridor, would operate as support bases as cable works pass through an area. The location of the five secondary construction compounds are identified in various topic chapters of the Environmental Statement, including Figure 1.1 of Volume 3, Chapter 1: Geology and Ground Conditions of the Environmental Statement (APP-073).

2.3 The Applicant considered the potential to utilise only the smaller secondary compounds along the route. However, it would not be feasible for these secondary compounds to house the main project staff on a location by location basis because of the transient nature of the construction works and how they progress section by section with the sequential activities that are required along the cable route. The use of a main construction compound therefore minimises the size of the secondary compounds, minimises their proposed duration and avoids the traffic movements associated with the relocation of project staff on a monthly basis. It is also noted that these secondary compounds are located on agricultural land.

2.4 Based on this, it is considered by the Applicant that the compound strategy set out in the Application i.e. to have one main construction compound and five secondary construction compounds (supported by localised soil storage locations) is the most appropriate to facilitate construction of the project whilst seeking to minimise unnecessary environmental impact. This is not a theoretical assumption, rather a decision based upon Ørsted's experience of developing projects in the UK and other countries.

Site selection

2.5 Volume 1, Chapter 4: Site Selection and Consideration of Alternatives of the Environmental Statement (APP-059) confirms that:

- Paragraph 4.12.6.2 In order to maintain a range of flexible options for the construction phase, three potential sites were identified and assessed within the PEIR, whilst an additional site was identified during the Phase 2.B and Phase 2.C consultation period. One site (Site 1: Weston Longville) was discounted on the basis of not possessing the required level of access for heavy goods vehicles (HGV), with another two (Sites 2 and 3, near Cawston Road, south of Salle), considered less suitable due to their separation from the strategic road network and being located on agricultural land that would need converting to hardstanding. Further details of these sites and their locations can be found in volume 4, Annex 4.4: Post PEIR Changes to Hornsea Project Three (Stages 8-9).
- Paragraph 4.13.7.2 An area within Oulton Airfield was selected as the main construction compound. While it is recognised that concerns remain regarding the use of this site specifically in terms of access; it is considered that these can be overcome through suitable mitigation, including traffic management measures.

2.6 In support of details documented in Site Selection and Consideration of Alternatives ES chapter, the identification and selection of the main construction compound was undertaken using the following broad criteria:

- The approximate area required would need to be at least 40,000 m^2 in overall extent to provide sufficient storage capacity;
- The land should be located approximately midway along the onshore cable corridor route to provide a central location that would have access to primary road routes to be used by the project;
- The site need not necessarily be within or immediately adjacent to the onshore cable corridor route but should have good access to the cable corridor as a whole along the road network;
- Ability to secure use of the land for the purposes of a main compound from a willing landowner and/or tenant;
- A preference for an existing area of hardstanding to minimise the environmental effect of the land take and earthworks, including impact on the best and most versatile agricultural land and transportation of materials during earthworks, and creation of hardstanding; and
- The land should be available for the duration of the proposed onshore cable corridor construction programme and unencumbered.

Alternative sites considered

2.7 As stated in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives of the Environmental Statement (APP-059) and Volume 4, Annex 4.4: Post-PEIR changes (APP-095), three potential locations for the main construction compound were identified and assessed as part of the Preliminary Environmental Information report (PEIR), whilst an additional site was identified during the Phase 2.B and 2.C consultation period. The consultation associated with this process is set out in Section 3.

2.8 Figure 2.1 shows the location of the three potential locations identified for the main construction compound (relative to the PEIR boundary) and assessed as part of the PEIR.

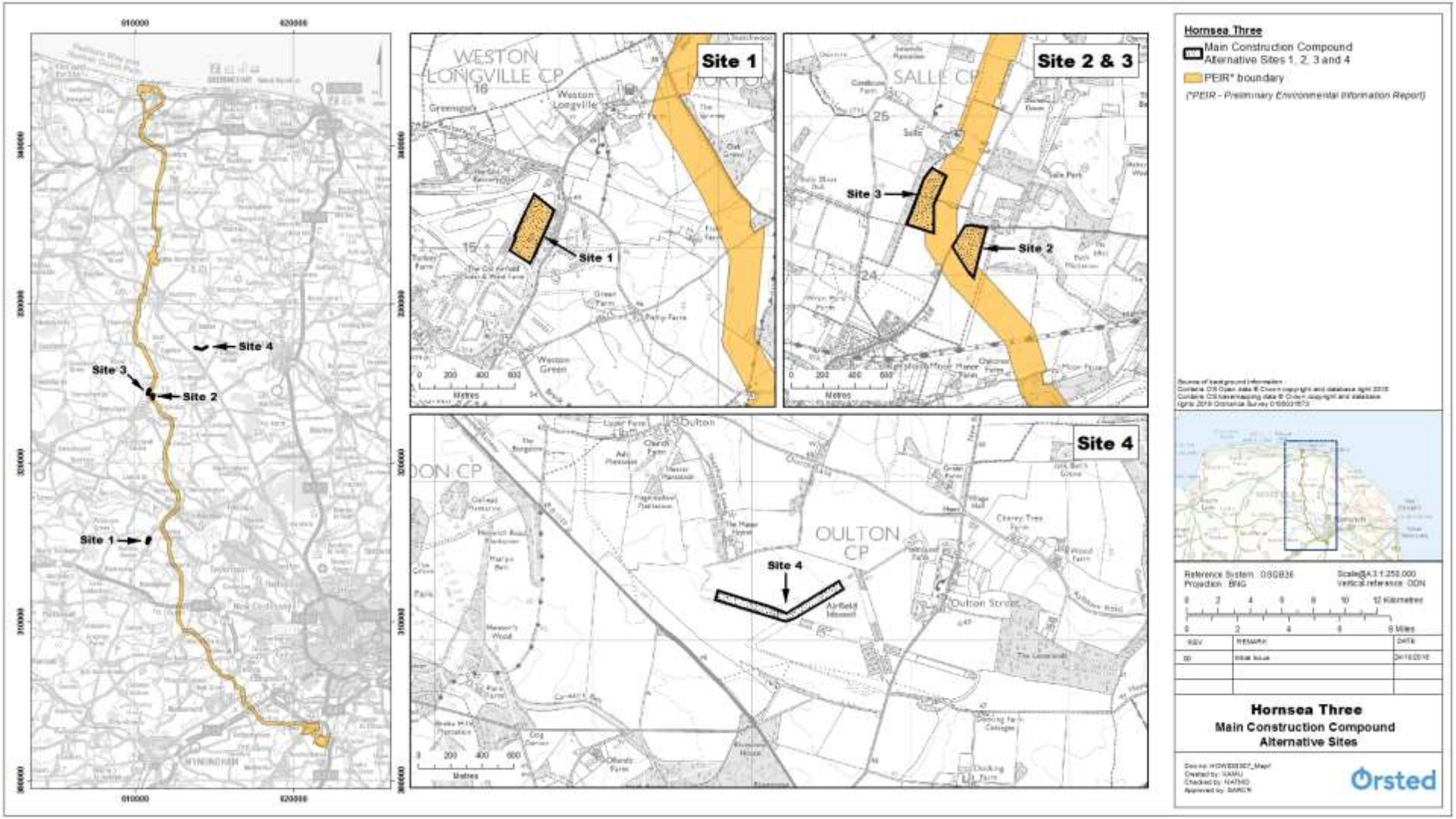

Figure 2.1: Location of Alternative Sites considered for the main construction compound at PEIR

2.9 A summary of each site assessed within the PEIR is provided below:

- Site 1: Weston Longville. This site was located to the south-west of Weston Longville to the north of an existing solar farm on a former airfield. The site had many positive attributes such as comprising existing hard standing and it was a suitable size with some flexibility for design. However, the site's access to the local and strategic road network, particularly for Heavy Goods Vehicles (HGVs) serving the project, to be utilised by the project was poor. This location would have necessitated additional travel requirements and HGV routing to serve the central and northern portion of the onshore cable corridor. This would have resulted in frequent long traffic movements from the south to the north of the onshore cable corridor. In addition, consultation with Norfolk County Council identified concerns regarding the potential for cumulative effects as a result of the proposed A47 dualling works in the locality – with extensive highway works proposed concurrently with Hornsea Three. Further, areas of concern included the impact on the junction between A47 and B1535 and the wider accessibility the settlement of Weston Longville (echoed by concerns raised by local residents and Weston Longville Parish Council). This locality is also subject to further HGV restrictions to manage traffic and the use of local roads in the absence of the Norwich western link. Although not sufficiently progressed to be considered a potential cumulative project to Hornsea Three, there is potential for this locality to be subject to further highway works associated with a new Norwich western link. Taken as a whole this site was discounted from further consideration.
- Sites 2 and 3 near to Cawston Road, south of Salle. These two sites benefitted from their location immediately adjacent to the proposed route of the onshore cable corridor and centrally located along the onshore cable route. However, both sites were slightly separated from the principal road network, placing additional pressure on the local roads over the construction period. The local road network also contained access constraints in and around Reepham and Cawston which had the potential for increased traffic/congestion, dust, vibration, noise etc, which in themselves would require further mitigation. Furthermore, both sites were located on agricultural land of predominantly Grade 3a quality (i.e. "best and most versatile" agricultural land) that would require the converting of agricultural land to hardstanding (and the associated earthworks and movement of aggregate construction materials), resulting in further vehicle movements on the local road during mobilisation and demobilisation periods. These sites were discounted from further consideration.

2.10 Based on additional site visits, a fourth potential site was identified prior to Phase 2.B and 2.C consultation period and is described below:

- Site 4: Oulton Airfield. This site is located to the north east of Reepham and west of Aylsham on a former airfield. The site has many positive attributes such as comprising existing hard standing and it was a suitable size with some flexibility for design. At the time of submission there were concerns regarding the use of this site, specifically in terms of access off the B1149 to the entrance to the airfield along The Street. However, the site has good access to the wider local and strategic road network, in particular the north south linkage provided by the B1149 and access from the recently completed Northern Distributor Road. The site is also free from the complexity of highway access restrictions (seen in respect of the other sites considered) and future highway works and its use as such is supported by the landowner.

2.11 To provide further clarity on the site selection conclusions and provide a clear comparison of all four alternative sites, each alternative is considered against the initial criteria and those criteria identified through consultation (namely interaction with other projects, HGV access feasibility and proximity to residential areas/properties) in Table 2.1 below.

2.12 This analysis identifies HGV access and community concerns to be the limitations which are common to all locations; this reflects the rural nature of Norfolk and the associated narrow local road networks.

Table 2.1: Site Selection Option Analysis for the Main Construction Compound

Site Selection Criteria	Site 1	Site 2	Site 3	Site 4
	Weston Longville	Land Cawston Road, south of Salle		Oulton Airfield
Site Area				
Location along the onshore cable corridor				
Access to the strategic road network required to be used to access the project				
Existing hardstanding				
Land Availability				
HGV Access				
Community concerns and proximity to residential areas/properties				

Identification of preferred site

2.13 In summary, the main construction compound is located at Site 4 at the Oulton Airfield, located off the B1149 near Oulton Street for several reasons:

- Site 4 is available, large enough and already comprises hardstanding;
- Site 4 is approximately mid-way along the onshore cable corridor route and is well placed to serve deliveries to the construction route; and
- Site 4 has close access to the strategic road network and has previously been used as a construction compound for other construction projects.

2.14 Based on the above, Site 4 was considered, and remains, a suitable location which would allow plant and materials to be stored safely and securely at a central location, whilst material and non-static plant could then be transported out to the active cable installation areas as required.

2.15 It is considered by the Applicant that the location chosen is the most appropriate for a main construction compound based on the aforementioned points, and that the concerns raised by stakeholders in respect to residential amenity and HGV traffic access can be addressed via appropriate mitigation measures to be developed in the detailed Construction Traffic Management Plan and detailed Code of Construction Practice, both of which are secured as pre-construction requirements for approval by the local planning authority within the dDCO (Requirement 8 and 17 respectively).

3. Description of the Main Construction Compound

3.1 As noted above, Site 4 was taken forward within the Application as the location for the Main Construction Compound. This section provides further details of the identified site.

Location

3.2 The location of the main construction compound is at the former Oulton Airfield, located approximately 3.5 km west of Aylesham and approximately 5 km north-east of Reepham. The location relative to the onshore cable corridor is shown in Figure 3.29 of Volume 1, Chapter 3: Project Description of the Environmental Statement [APP-058]. The location and Order Limits is shown in Figure 4.1 of Volume 4, Annex 4.4: Post-PEIR Changes (Stages 8-9) of the Environmental Statement [APP-095].

Existing baseline environment

3.3 The site identified for the main construction compound (former Oulton Airfield, off the B1149 near Oulton Street) comprises an area of hardstanding, with an associated existing access track which routes to the south-west for approximately 275 m before turning east for approximately 900 m.

3.4 Access to the main construction compound connects onto the western side of The Street, positioned approximately 950 m to the north of the B1149, approximately opposite the junction with Heydon Road. The Street routes broadly south to north, forming the minor arms of simple priority junctions with the B1149 (Holt Road) and the B1345 (Blickling Road), respectively.

3.5 The Street is a narrow single carriageway road, typically in the order of up to 5m wide with verges, hedgerows and some trees on both sides, although there are sections where the road narrows to below 5m in width. There is evidence of vehicles overrunning the verge and this has resulted in the edges of carriageway being exposed in some locations with localised widening and informal passing places being created through verge scrub and rutting.

3.6 The Street is generally a straight section of road between the B1149 and the access to the main construction compound, except for one bend approximately midway along this section in the vicinity of the access to The Granary on the East side of the road. Along the section between the B1149 and the former Oulton Airfield, The Street provides access to a number of field parcels, Docking Farm, Heydon Road and one residential property (The Old Railway Gatehouse). The residential property is located immediately adjacent to The Street, and in close proximity to a road hump associated with the non-designated railway which runs beneath The Street.

3.7 To the north of the access to the main construction compound, The Street becomes Oulton Street and then New Road and provides access to the community of Oulton Street, a number of fields and farms with associated buildings and working areas etc., Church Lane, Aylsham Road and The National Trust Textile Conservation Studio.

3.8 In summary, the main construction compound is located in an area with multiple land uses including:

- Agricultural land including a pig farm, pasture, arable and commercial shooting;
- Solar Farm;
- National Trust Textile Conservation Studio approximately 1 km to the north-east;
- Blickling Estate, approximately 2.4 km to the north-east (to the nearest section of parkland) at the end of New Road;
- Numerous residential properties located along Oulton Street and New Road, approximately 600m m to the north-east of the proposed access point to The Street;

3.9 The site itself comprises hardstanding with existing uses limited to:

- Agricultural buildings;
- Farm and agricultural machinery storage;
- Hay/straw storage; and
- Other temporary storage as required.

3.10 The status of discussions with the landowner at the main construction compound is provided in updated Appendix B of the Statement of Reasons (submitted at Deadline 1, APP-032).

Proposed use of Site 4 for Hornsea Three

3.11 As identified in paragraph 3.7.3.31 of Volume 1, Chapter 3: Project Description of the Environmental Statement [APP-058], the Applicant has identified that the main construction compound will be required to support the construction of the onshore export cables.

Layout and proposed use

3.12 The main construction compound would operate as a central base for the onshore construction works and would house the central offices, welfare facilities, and stores, as well as acting as a staging post and secure storage for equipment and component deliveries. The site identified (Oulton Airfield, off the B1149 near Oulton Street) comprises hard standing suitable for the temporary placement of site facilities and to allow plant and materials to be stored safely and securely. Material and non-static plant will then be transported out to the active cable installation work locations.

3.13 The layout of the main construction compound will be determined once a contractor is appointed and the detailed design of the onshore cable corridor and construction programme is known. However, as stated in the Outline CoCP (APP-179), the layout of the main construction compound will be designed to avoid overlooking residential properties. Layout plans of the main construction compound, showing sensitive areas and buffer zones (e.g. ecological habitats or protected species), and areas where storage of potential pollutants (e.g. fuels, oils and other chemicals) will be avoided, will be determined in consultation with the Local Planning Authority and the Environment Agency as part of the preparation of the final CoCP (secured by means of Requirement 17 of the dDCO).

3.14 Although the primary function of the main construction compound is to support the construction of the onshore export cables, it may be necessary to retain part of the compound during the commissioning stages of Hornsea Three.

3.15 It is estimated that activities at the main construction compound associated with Hornsea Three would occur within an eight-year construction window. However, the active use (i.e. delivery of cable drums, regular movements by HGVs etc.) of the main construction compound would be limited to up to 30 months, excluding mobilisation and demobilisation. This could be across a single construction phase, or two construction phases. Should Hornsea Three be delivered across two phases, the main construction compound would be demobilised and not in active use during the 'gap', unless otherwise agreed with the local planning authority (as set in Section 3.8 of Volume 1, Chapter 3: Project Description of the Environmental Statement).

3.16 The main construction compound may include:

- Portacabin with offices, briefing and welfare facilities;
- Staff car parking;
- Wheel wash facilities (if deemed necessary);
- Indoor and outdoor lock-up storage areas;
- Storage for materials, machinery, lifting equipment and specialist equipment such as HDD rigs (see below);
- Portable generator(s) which could run on a 24-hour basis;
- Waste management (associated with Hornsea Three only);
- Security facilities, lighting and fencing; and
- Other items associated with supporting the onshore construction works.

Storage

3.17 The types, quantities and intended use of materials to be stored on site will be determined once a contractor is appointed and the detailed construction programme and logistics are known. However, materials to be stored at the main construction compound and their intended uses are likely to include:

- Cable drums for the onshore export cables before they are transported to the onshore cable corridor (see top right of Figure 3.1 below);
- Ducting for the onshore export cables before they are transported to the onshore cable corridor;
- Aggregate to be used for the haul road;
- Construction machinery such as excavators and HDD rigs to be used along the onshore cable corridor;
- Fuels for generators and portable lighting rigs;
- Rumble strips to be used at access points to the onshore cable corridor (see middle left of Figure 3.1 below);
- Signage to be used for safety and operational reasons (i.e. to direct construction traffic, or demarcate public rights of way etc.) (see bottom left of Figure 3.1 below);
- Temporary welfare facilities to be used at secondary compounds and major HDD compounds as required (see bottom right of Figure 3.1 below);
- Portable gates to be used to demarcate and control access through public rights of way along the onshore cable corridor.
- Post and rope or herras fencing to used for demarcation at, for example, the edges of the onshore cable corridor and public rights of way; and
- Portable lighting units.

3.18 Some examples of the material and equipment stored at the Hornsea Project One main construction compound are provided in Figure 3.1.

Figure 3.1: Images from Hornsea Project One Offshore Wind Farm Main Construction Compound (top left: storage of herras fencing); middle left: rumble strips; bottom left: signage; top right: ducting and cable drums and middle right: general storage; bottom right: portable welfare facility)

3.19 The main construction compound would also act as a centralised location for waste and recycling collection to facilitate re-use and recycling of materials wherever possible (see Figure 3.2). Further details on site waste management is provided in Volume 4, Annex 3.4: Site Waste Management Plan of the Environmental Statement (APP-088).

Figure 3.2: Waste and Recycling receptacles on the Hornsea Project One Offshore Wind Farm Main Construction Compound

Proposed management of Site 4 for Hornsea Three

3.20 The operation of the main compound would be managed in accordance with the Outline CoCP (APP-179), section 4.1.2 of which sets out the principles for good housekeeping that would be employed.

3.21 In establishing the main construction compound, the principal contractor would be required to:

- Ensure any crossing points over existing local services will be installed in a manner agreed with the asset owner;
- Ensure surface runoff is managed appropriately;
- Ensure any temporary services necessary to support the main construction compound will be installed in a manner agreed with the landowner and service provider; and
- Co-ordinate activities with other users and tenants of the airfield to minimise wider disruption.

Hours of operation

3.22 The hours of operation for the onshore main construction compound are set out in the Outline CoCP (APP-179) which identifies the core working hours as:

- Monday to Friday: 07:00 - 18:00 hours;
- Saturday: 07:00 - 13:00 hours;
- Up to one hour before and after core working hours for mobilisation ("mobilisation period"), i.e. 06:00 to 19:00 weekdays and 06:00 to 14:00 Saturdays; and
- Maintenance period 13:00 to 17:00 Saturdays.

3.23 During the mobilisation period, the contractor may undertake the following activities:

- Arrival and departure of the workforce at the site and movement to and from areas across the project;
- Site inspections and safety checks; site meetings (briefings and quiet inspections/walkovers);
- Site clean-up (site housekeeping that does not require the use of plant); and
- Low-key maintenance including site maintenance, safety checking of plant and machinery (provided this does not require or cause hammering or banging).

3.24 Importantly, mobilisation does not include HGV movements into and out of the main construction compound (i.e. HGV movements should only occur at the main construction compound during the core working hours unless otherwise agreed) but suppliers can make use of the wider highway network outside these hours to travel. The use of the mobilisation period will be agreed with the relevant local authority EHO officer in consultation with relevant planning authority on a case by case basis.

3.25 It may be beneficial to carry out several activities outside of the standard working hours to utilise periods such as abnormal loads/construction plant delivery, works within the highway/footpaths, or works affecting operational railways.

3.26 Activities outside of the standard working hours will be agreed with the relevant local authority EHO officer in consultation with relevant stakeholders (e.g. third-party asset owner) as required.

Vehicle Movements associated with the main construction compound

3.27 An estimate of the likely number of daily construction vehicles for Hornsea Three at the main construction compound was set out in paragraph 7.8.3.44 of Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement (APP-079). It was estimated in this document that there would be a maximum of 118 two-way HGV movements per day (i.e. all arrivals plus all departures) and 130 staff vehicle movements per day (i.e. all arrivals plus all departures). It should be noted, however, that such levels of traffic generation are highly unlikely to be generated on a day-to-day basis and represent a worst-case scenario.

3.28 The Applicant is undergoing a refinement process, to provide further clarity on the potential fluctuation of traffic flows to and from the main construction compound, as set out in the Applicant's response to Written Question 1.11.2. The Applicant intends to submit this at Deadline 3, if not before.

3.29 A component of the HGV traffic associated with Hornsea Three would involve the transportation of large cable drums via low loader vehicles to/from the main construction compound. These would be delivered to and stored at the main construction compound and then transported to the appropriate location, as required, for installation as part of the overall onshore cable route. Such cable drums (measuring up to approximately 4.5m in height and 4.14m in width) would be classified as abnormal loads and would require transportation under formalised escort conditions in addition to the measures defined in Annex A and B. This is further discussed in Annex E.

3.30 While the nature of the main construction compound can be considered temporary, the duration of its potential use (see paragraph 3.15) warrants comprehensive medium-term solutions to aid the passage of vehicles (particularly HGVs) to/from the main construction compound and to also accommodate the existing traffic on the network to minimise disruption during the 30-month active construction period associated with the onshore cable corridor. Details of the access strategy for the main construction compound are provided in sections ~~7~~6 and ~~8~~7 as well as Annex A and B.

Security and fencing

3.31 A set out in paragraph 4.1.7.5 of the Outline CoCP (APP-179), the main construction compound will be fenced using bolted and anchored herras fencing or its equivalent and on-site security will be deployed on a continuous basis if deemed necessary by the contractor. All boundary fences/screens will be maintained in a tidy condition and will be fit for purpose.

3.32 Access to the main construction compound will be limited to a single entry point and all personnel entries/exits will be recorded for security and health and safety purposes.

Lighting

3.33 Although portable task lighting would be required for any evening and night-time working, it is envisaged that lighting at the main construction compound would not be required during normal daylight hours unless visibility is poor due to weather conditions or low light levels. Light spill during out of hours working will be minimised through the use of task-orientated lighting, and as set out in the Outline CoCP (APP-179, paragraph 4.1.4.1), external lighting will be designed and positioned to:

- Provide the necessary levels for safe working;
- Minimise light spillage or pollution; and
- Avoid disturbance to adjoining residents and occupiers of buildings and to wildlife.

3.34 Lighting at the main construction compound will take into account the requirements set out in BS EB 12464-2:2014 (BSI, 21014). Lighting units will be designed to minimise illumination outside the construction works area, e.g., will be directional, task orientated and where possible, fully shielded.

3.35 Low levels of security lighting will be required, at the entrance to the site and office facilities as well as around the perimeter of the compound. No lighting fixtures would be greater than 4 m in height to avoid spill towards sensitive receptors including residential properties and Dark Sky Discovery Sites in the local area. This is set out in paragraph 4.1.4.2 of the Outline CoCP (APP-179) as amended at Deadline 1.

3.36 The detailed lighting strategy for during construction (i.e. temporary) will be submitted as part of the Code of Construction Practice (Code of Construction Practice) for the approval of the relevant planning authority under DCO Schedule 1, Part 3, Requirement 17 Code of Construction Practice. This document must be approved before works can commence.

Removal and Reinstatement

3.37 The main construction compound will be removed and the hardstanding sections of the site restored to the original condition when construction associated with Hornsea Three has been completed. As noted in updated paragraph 4.1.6.2 of the Outline CoCP (APP-179) submitted at Deadline 1, if works are delivered in phases, temporary construction compounds and accesses will be removed and the land reinstated on completion of construction work associated with that phase unless otherwise approved by the Local Planning Authority.

3.38 Based on feedback from NCC, works to the roadway (as set out in Annex A and Annex B) would be temporary in nature. However works to the junction with the B1149 and road hump, close to the residential property along The Street, would be permanent. Once an agreed access solution has been identified, the Applicant will incorporate commitments into the CTMP to (i) maintain the works for the duration of the project and (ii) remove and re-instate the land upon completion. Temporary and permanent works would mostly like be carried out by the Applicant's contractors under licence from the Highway Authority.

4. Consultation relevant to the Main Construction Compound

Pre-application consultation

4.1 The Applicant introduced the requirement for temporary construction compounds early in the development of Hornsea Three and shared further information with consultees as the compound strategy developed, including the requirement for a main construction compound and potential options being considered by the Applicant for siting the compound. Table 4.1 outlines in chronological order when information regarding the main construction compound was shared and in what format. Importantly, this does not include direct engagement with individual parties carried out during the pre-application period and post-application period, which is summarised in Table 4.2 and Table 4.3**Error! Reference source not found.** respectively.

Table 4.1: Overarching Summary of the pre-application consultation activities undertaken by the Applicant in respect of the main construction compound.

Date	Summary
October 2016	The Applicant published the Hornsea Three Scoping Report. This document outlined the potential requirement for temporary construction compounds during the onshore construction works. It was noted that the exact number, location and size of the compounds required would be confirmed once the substation location and onshore export cable route had been developed. It noted that the Environmental Statement would outline a high-level construction compound strategy, which will be further developed once the route was finalised, to indicate the potential size and broad spread of construction compounds that are likely to be required.
February 2017	In the Phase 1.B Consultation Overview document, the Applicant explained that temporary compounds would be required during the onshore construction works, and that the Applicant was in the process of identifying potential sites for these compounds within or near to the refined onshore export cable corridor. This document was published on the website and the information displayed at the Phase 1.B community consultation events. Individuals were asked to highlight anything that they would like the Applicant to consider when siting these compounds.

Date	Summary
July 2017	The Applicant published its Preliminary Environmental Information Report (PEIR) and carried out its statutory consultation (Phase 2.A) under section 42 of the Planning Act 2008. In the PEIR, the Applicant stated that a main construction compound would be required to operate as a central base for the onshore construction works. It was explained that the main construction compound would not need to be located on the route itself but on a suitable site in a central location in close proximity to export cable route. Three options being considered by the Applicant were presented in the PEIR, with a fourth alternative option presented on the Statutory Consultation Plans that were issued consultees and published on the Hornsea Three website.
September 2017	The PEIR and Statutory Consultation Plans with the four options identified for main construction compound were presented at the Phase 2 community consultation events. Individuals were asked to consider the options presented and highlight any thoughts or concerns.
November 2017	The Applicant carried out further statutory consultation (Phase 2.B) under section 42 of the Planning Act 2008 on additional locations beyond the previous Statutory Consultation boundary, including two minor amends to the main construction compound site at Oulton Airfield, Oulton.
February 2018	The Applicant confirmed in the February 2018 community newsletter that Oulton Airfield had been selected as the preferred site for the main construction compound, with up to five secondary compounds along the cable route to facilitate the construction works in those areas.
May 2018	The Applicant submitted its Development Consent Order (DCO) application to the Planning Inspectorate, including an Environmental Statement and various management plans, including an Outline Construction Traffic Management Plan.
June 2018	The Planning Inspectorate accepted the Applicant's DCO application for examination and the Applicant subsequently issued interested parties with the section 56 notice, detailing where they could view the application and how to register as an interested party and make a relevant representation.

Table 4.2: Summary of pre-application consultation/engagement with interested parties relevant to the Main Construction Compound.

Interested Parties	Consultation Summary
Norfolk County Council (NCC)	• Regular engagement throughout the pre-application consultation period. • Consulted on all aspects of the Project. • July 2017: Consulted with and submitted formal response to the Statutory Consultation (Phase 2.A). • November 2017: Consulted with and submitted formal response to the Further Statutory Consultation (Phase 2.B).
Broadland District Council (BDC)	• Regular engagement throughout the pre- and post-application periods. • Consulted on all aspect of the Project. • July 2017: Consulted with and submitted formal response to the Statutory Consultation (Phase 2.A). • November 2017: Consulted with and submitted formal response to the Further Statutory Consultation (Phase 2.B).
Highways England	• July 2017: Consulted with and submitted formal response to the Statutory Consultation (Phase 2.A) requesting a meeting. • September 2017: Highways England representatives attended the community consultation events to discuss potential interactions with the A47 proposal. • November 2017: Consulted on the Further Statutory Consultation (Phase 2.B). No response received.

Interested Parties	Consultation Summary
Oulton Parish Council	• Oulton Parish Council was invited to attend Parish Council briefing and Q&A sessions organised by the Applicant during the pre-application consultation period. • July 2017: Consulted with and submitted formal response to the Statutory Consultation (Phase 2.A) • November 2017: Consulted with and submitted formal response to the Further Statutory Consultation (Phase 2.B), requesting that Ørsted attend one of their Parish Council meetings. • December 2017: Oulton Parish Council attended the Broadland Parish Council briefing and Q&A session organised by the Applicant. • March 2018: The Applicant attended Oulton Parish Council meeting, specifically focused on the Main Construction Compound. • March 2018: Oulton Parish Council responded to the Focused Statutory Consultation (Phase 2.C).
Cawston Parish Council	• Cawston Paris Council was invited to attend the Broadland Parish Council briefing and Q&A sessions organised by the Applicant throughout the pre-application consultation period. • July 2017: Consulted with as part of the Statutory Consultation (Phase 2.A). • November 2017: Consulted on the Further Statutory Consultation (Phase 2.B). • March 2018: Cawston Parish Council attended the Broadland Parish Council briefing and Q&A session organised by the Applicant.
Weston Longville Parish Council	• Weston Longville Paris Council was invited to attend the Broadland Parish Council briefing and Q&A sessions organised by the Applicant during the pre-application consultation period. • July 2017: Consulted with and submitted formal response to the Statutory Consultation (Phase 2.A). • November 2017: Consultation on the Further Statutory Consultation (Phase 2.B). No response received. • December 2017: Weston Longville Parish Council attended the Broadland Parish Council briefing and Q&A session organised by the Applicant.
Salle Parish Council	• Salle Parish Council was invited to attend the Broadland Parish Council briefing and Q&A sessions organised by the Applicant during the pre-application consultation period. • July 2017: Consulted with as part of the Statutory Consultation (Phase 2.A). No response received. • November 2017: Consulted with as part of the Further Statutory Consultation (Phase 2.B). No response received.
Reepham Town Council	• Reepham Town Council was invited to attend the Broadland Parish Council briefing and Q&A sessions organised by the Applicant during the pre-application consultation period. • July 2017: Consulted with as part of the Statutory Consultation (Phase 2.A). No response received. • August 2017: Reepham Town Council attended Broadland Parish Council briefing and Q&A session organised by the Applicant. • November 2017: Consulted with as part of the Further Statutory Consultation (Phase 2.B). No response received. • December 2017: Cllr Graham Everett (District Councillor for Reepham) responded to the Further Statutory Consultation (Phase 2.B).
Councillor Greg Peck	• December 2017: Cllr Greg Peck responded to the Further Statutory Consultation (Phase 2.B) raising concerns regarding coordination with Vattenfall and use of the Oulton Airfield as the Main Construction Compound. • February 2018: The Applicant attended a meeting with Broadland Representatives, including Cllr Greg Peck and Keith Simpson MP. • March 2018: The Applicant attended Oulton Parish Council meeting, specifically focused on the Main Construction Compound. Cllr Greg Peck was present. • March 2018: Cllr Greg Peck responded to the Focused Statutory Consultation (Phase 2.C).

Post-application consultation

4.2 The Applicant has continued to engage with interested parties post-application. A summary of post-application consultation is provided in Table 4.3 below.

Table 4.3: Summary of consultation/engagement with interested parties relevant to the Main Construction Compound post-application.

Interested Parties	Consultation Summary
Norfolk County Council	• 21/09/2018: Meeting on SoCG and Outline Construction Traffic Management Plan. • 26/09/2019: Email to Stephen Faulkner and John Shaw advise of the updated TA, TA Clarification Note and Main construction compound traffic survey results. • 26/09/2018: Email to Liz Poole and John Shaw to provide Main Construction Compound Access Strategy ahead of Development Team Meeting on 01/10/2018. • 27/09/2018: Meeting with Martin Dixon of NCC to discuss The Street, Oulton. • 03/10/2018: Meeting on SoCG and feedback from John Shaw on Main Construction Compound Access Strategy. • 16/10/2018: Informed NCC of additional traffic surveys being undertaken along The Street. • 30/10/2018: Meeting with NCC to discuss traffic and transport matters, including the main construction compound.
Broadland District Council	• 01/10/2019: Email to Matthew Rooke to advise of the updated TA, TA Clarification Note, Main construction compound traffic survey results and Main Construction Compound Access Strategy. • 16/10/2018: Informed of additional traffic surveys being undertaken along The Street. • 31/10/2018: Meeting with Broadland to discuss SoCG and Main Construction Compound
Highways England	• 29/09/2019: Email to Shamsul Hoque and Planning Team email to advise of the updated TA, TA Clarification Note and Main construction compound traffic survey results • 01/10/2019: Email to Shamsul Hoque and Planning Team email to advise of the Main Construction Compound Access Strategy. • 16/10/2018: Informed of additional traffic surveys being undertaken along The Street. • 17/10/2018: Email received from HE indicating no concerns regarding impacts of the main construction compound on the Strategic Road Network.

Interested Parties	Consultation Summary
Oulton Parish Council	*A Working Group was set up between Ørsted and representatives of Oulton Parish Council to further explore the specific traffic management measures that would be put in place along The Street to facilitate safe access to the Main Construction Compound.* • 25/07/2018: Working Group meeting #1 • 27/09/2018: Working Group meeting #2 • 21/09/2018: Email to Alison Shaw providing drawings of the Access Options to be presented at Working Group meeting #2 • 22/09/2018: Hard copies sent to Alison Shaw providing drawings of the Access options to be presented at Working Group Meeting #2 • 26/09/2018: Email to Alison Shaw providing the Main Construction Compound Access Strategy and Main construction compound traffic survey results. • 02/10/2019: Email to Allison Shaw to advise of the updated TA and TA Clarification Note • 16/10/2018: Email informing OPC of additional traffic surveys being undertaken along The Street. • 17/10/2018: Emailed to confirm agreed meeting minutes from Working Group #2, including update captured in post meeting notes. • 19/10/2018: Email from OPC providing further information on the traffic figures for the Street Farm potato store application. • 02/11/2018: Emailed to provide update on the consultation between the Applicant and NCC. • 06/11/2018: Email from OPC providing feedback from the OPC Meeting on 23 October, as well as feedback from meeting with NCC.
Cawston Parish Council	*A Working Group was set up between Ørsted and representatives of Cawston Parish Council to discuss traffic management measures of relevance to Cawston Parish Council.* • 18/10/2018: The Applicant emailed CPC to arrange the first working group meeting and to advise them that their full representation may not have been submitted to PINS. • 29/10/2018: Working Group Meeting #1 covering main construction compound and traffic and transport impacts in Cawston.
Councillor Greg Peck	• 17/10/2018: Emailed to provide update on Main Construction Compound and Access Strategy.
Closest Residential Property (The Old Railway Gatehouse)	• 27/09/18: Meeting on Main Construction Compound Access Strategy. • 14/10/18: Phone Call to gain approval for noise and vibration survey and methodology at the Old Railway Gatehouse • 15/10/18: Create Consulting Engineers Limited met with residents on site when setting up survey equipment at property. • 18/10/2018: Email informing ORG of additional traffic surveys being undertaken along The Street and offering follow up meeting during week commencing 12/11/2018. *The Applicant intends to discuss the results of the surveys undertaken at their property and to request their feedback on the options being considered by the Applicant to feed into the Main Construction Compound Strategy.*
Bluestone Bungalow, Holt Road, Cawston, Norwich, NR10 4HU	• 19/10/2018: Introductory letter sent to residents of Bluestone Bungalow to update them on the proposal and offer a meeting to discuss the Main Construction Compound Access Strategy.

4.3 In addition to the above, the Applicant has consulted with Vattenfall (Norfolk Vanguard) during the pre-application and post-submission phases, and shared information about each project's requirements for compounds and access to them.

4.4 The Applicant will continue to engage with interested parties beyond Deadline I and during the examination period, through the development of Statements of Common Ground with Norfolk County Council and Broadland District Council. At the Parish Council level, the Applicant will continue to meet with the delegated working groups and will provide information to these groups that can be distributed more widely.

Relevant Representations relevant to main construction compound

4.5 Table 4.4 provides a summary of the key issues raised through the Relevant Representations which have been made and extend to the inclusion of the main construction compound within the project envelope. A full reproduction of the Relevant Representations and the Applicant's response to those representations is provided in the Applicant's Comments on Relevant Representations (including Summaries of RR over 1500 words).

Table 4.4: Summary of key issues raised through Relevant Representations regarding the Main Construction Compound at Oulton Airfield

RR Number	Summary of key issues relevant to Main Construction Compound raised in Relevant Representations	Applicant's Response
RR-005; RR-006; RR-034; RR-035; RR-038; RR-041; RR-042; RR-043; RR-044; RR-046; RR-056; RR-057; RR-064; RR-074	• Site Selection • Construction Programme/duration of use • Traffic and Transport (including suitability, safety and impact on tourism routes) • Residential Amenity (including noise) • Historic Environment • Lighting • Cumulative Impacts with Norfolk Vanguard	The Applicant has responded, through the preparation of this Briefing Note to the specific points raised in these Relevant Representations. In particular: • site selection is addressed in section 3; • construction programme/duration of use is addressed in paragraph 3.15; • traffic and transport points are addressed in paragraph 3.27 – 3.30; paragraphs 5.2 – 5.4, Section 6 and 7; and Annex A and B. • residential amenity points are addressed in paragraphs 5.5 – 5.11 and Section 6 and 7; • historic environment points are addressed in paragraphs 5.12 – 5.14; • Lighting points are addressed in paragraphs 3.33 – 3.36; and • Cumulative impacts with Norfolk Vanguard are addressed in Table 3.6; paragraphs 5.15 – 5.19 and Annex A and B.

Examining Authority First Written Questions relevant to main construction compound

4.6 Table 4.5 provides a summary of the Examining Authorities first written questions around the inclusion the main construction compound within the project envelope. The Applicant's response to those questions is provided in the Applicant's Responses to the ExA's First Written Questions.

Table 4.5: Summary of Examining Authority First Written Questions regarding the Main Construction Compound at Oulton Airfield

Question	Examining Authority First Written Questions (Main Construction Compound)	Where in this document the Applicant has provided a response
1.1.13	Figure 3.21 of Annex 4.3 to the ES [APP-094] indicates the construction compound options that were considered. Please provide further justification for the selection of Oulton Street as the proposed location for the main construction compound	The Applicant has provided further justification for the selection of the former Oulton Airfield as the main construction compound in Section 3 of this Briefing note.
1.8.8	The NT [RR-056] refers to Oulton Airfield as a non-designated heritage asset. Does the Applicant agree that Oulton Airfield is a non-designated heritage asset? Please can the Applicant and NT provide their respective assessments of the heritage significance of Oulton Airfield (including its association with the Grade I listed Blickling Hall) and the effects of the proposed construction compound on that significance.	The Applicant has provided further discussion regarding Oulton Airfield as a non-designated heritage asset and the effects of the main construction compound in Section 6 of this Briefing note.
1.11.8	Paragraph 7.8.3.44 of the ES [APP-079] provides an estimate of the potential vehicle movements at the main construction compound at Oulton Street. A) Please provide further details of the proposed use of the main construction compound at Oulton Street including: the types, quantities and intended use of materials to be stored; B) the calculations of the potential traffic movements in connection with the use of the compound; and C) the hours of operation and the expected times/frequency of particular traffic movements.	The Applicant has provided details of the proposed use, including hours of operation, of the main construction compound in Section 2 of this Briefing note. Details on the potential traffic movements are set out in 3.27 – 3.30, although further work to refine this is ongoing as set out in Sections 6 and 7. Work is also ongoing in respect to the access strategy as a whole as identified in Annex A and B.
1.11.9	The main construction compound at Oulton Street would be located close to some construction and storage components of the proposed Norfolk Vanguard/Norfolk Boreas scheme. Please provide an assessment of the potential in-combination traffic and transport effects of the proposal in the locality of Oulton Street, including details of likely construction timetables for all projects and proposed measures to minimise any impacts.	The applicant has agreed a SoCG with Norfolk Vanguard Ltd (and Norfolk Boreas Ltd). The SoCG documents the ongoing work in considering the cumulative traffic impacts of these projects on shared roads to be utilised by both projects. With regards to traffic and transport matters (pertinent to this note) the SoCG acknowledges there may be cumulative impacts on a small number of shared road links during construction of the two projects and relevant discussions between Hornsea Three and NV are ongoing. Both parties continue to work together to ensure alignment of highway threshold levels applied by each project, i.e. traffic capacity of each road link before significant impacts are expected, and alignment as to the scope of appropriate traffic management measures that may be required as thresholds are reached – i.e. confirming:- - Thresholds on each street (or part of street) where no or limited ("soft") traffic management measures

Question	Examining Authority First Written Questions (Main Construction Compound)	Where in this document the Applicant has provided a response
		would be required, such as controls on daily traffic demand, driver induction, community liaison; - Thresholds on each street (or part of street) which would trigger further "soft" traffic management measures, such as timing of deliveries, hazard signage, restricted periods, and temporary speed restrictions; and - Thresholds on each street (or part of street) which would trigger further "harder" traffic management measures -such as flow control, pedestrian crossing points, parking restrictions and other traffic management measures, in some instances physical interventions such as localised widening or passing places.
		Any mitigation measures identified for these shared links would be secured through each project's final Construction Traffic Management Plans to be developed post-consent. These would be developed with, and approved by, Norfolk County Council as Highways Authority. Whilst these workstreams are ongoing, the locations which require further consideration due to the potential cumulative impact of both projects include The Street (linking B1149 with Oulton Street). Hornsea Three and NV will be looking to reach an agreement on these matters and engage with Norfolk County Council as the highways authority to reach a shared common point of agreement. This workstream is ongoing and for the purposes of the SoCG submitted at Deadline 1. Whilst the cumulative impact on traffic and transport therefore remains "not agreed" between the Applicant and Norfolk Vanguard, material headway has been made and both projects are confident that agreement can be reached in the short term.
		If CTMP measures are required along The Street (linking B1149 with Oulton Street), these measures will be captured in a revised Outline CTMP to be submitted in due course into the Hornsea Three examination.
1.11.10	Paragraph 1.5.3.6 of the ES [APP-159] states that traffic management measures are to be designed post-submission which might include a diversion route for the main compound at Oulton Street. A) Please provide details of what such measures might be, including any measures to manage HGV movements. B) How they would be secured in the dDCO?	The Applicant has provided details of traffic management measures which may be adopted to facilitate access to the main construction compound in Section 6 and 7, as well as Appendix A (the Main Construction Compound Access Strategy) of this Briefing note.

Question	Examining Authority First Written Questions (Main Construction Compound)	Where in this document the Applicant has provided a response
1.12.9	Paragraphs 3.7.3.32 of the ES [APP -058] states that Oulton Airfield is proposed to be the main construction compound. A)What would be the hours of use of the construction compound, including for vehicles coming to and from the compound? B)Please provide an assessment of noise arising from the use of the compound, including from vehicle movements on Oulton Street. C)What noise mitigation measures may be required at this location?"	The Applicant has provided details of the proposed use, including hours of operation, of the main construction compound in Section 2 of this Briefing note. Details on the noise assessment relating to the use of the compound (excluding vehicle movements) is provided in section 5.5-5.8). Details on the potential traffic movements are set out in 3.27 – 3.30, although further work to refine this and inform the assessment on residential amenity (including noise) is ongoing as set out in Sections 6 and 7. Work is also ongoing in respect to the access strategy as a whole as identified in Annex A and B.
1.15.16	Several interested parties, including BDC [RR-057], have drawn attention to a dismissed planning appeal in 2014 for an anaerobic digester plant at Oulton Airfield. Please comment on the relevance and implications of that appeal decision for Hornsea Project Three, particularly in relation to the appeal Inspector's conclusions regarding effects on local highway conditions, highway safety on Oulton Street and the living conditions of local residents.	The Applicant has demonstrated how the proposed access strategy for the main construction compound has overcome the issues raised in respect to the dismissed planning appeal for an anaerobic digester plant in Annex A and B.

5. Conclusions of the Environmental Statement

5.1 An assessment of the potential impacts resulting from the onshore main construction compound is presented in the Environmental Statement included within the Application. This section provides a summary of the findings of the Environmental Statement relevant to the main compound and issues raised in Relevant Representations, whilst Section 6 summarises the work undertaken post-application prior to Deadline 1 and Section 7 summarises the work ongoing.

Traffic and Transport

5.2 An assessment of traffic and transport impacts is presented in Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement (APP-079).

5.3 As stated in Volume 6, Annex 7.2: Description of Network Links and Sensitivity of the Environmental Statement (APP-160), The Street is included as Link ID 208 and its sensitivity has been assessed. The estimated construction traffic flows along The Street are set out in paragraph 7.8.3.44 of Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement (APP-079). The Applicant has assessed that there is a need for mitigation as set out in Table 7.4 and paragraph 7.7.5.50 of Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement (APP-079).

5.4 Within the Environmental Statement the mitigation is defined as traffic management measures along The Street, to be secured through the development of the Construction Traffic Management Plan (CTMP) (secured under Requirement 18 of the dDCO [APP-027]) which will be submitted to and approved by the relevant planning authority in consultation with the relevant highway authority. To establish the principles of the CTMP, an outline CTMP was submitted with the Application (APP-176).

Noise and Vibration

5.5 An assessment of noise and vibration impacts is presented in Volume 3, Chapter 8: Noise and Vibration of the Environmental Statement (APP-080).

5.6 Volume 3, Annex 8.2: Construction Noise Model Output of the Environmental Statement (APP-168) sets out the assumptions and results of the noise modelling undertaken to identify the likely levels of noise associated with the use of construction compounds and from the construction traffic associated with Hornsea Three. This incorporates the main construction compound and assumes a maximum design scenario of construction activities (synonymous to cable installation) within the assessment. Noise impacts from construction activities have been identified using British Standard guidance (BS 5228-1:2009+A1:2014) and taking into account the duration of an activity, the expected types of plant items and equipment (e.g. generators) that will be used, the times when the plant will be used and the attenuation of sound due to distance, ground attenuation and barriers.

5.7 With the implementation of mitigation measures, the noise and vibration impacts from the construction activities at the main construction compound will have a negligible effect on nearby noise sensitive receptors (as shown in Sheet 4 of Figure 1.1 presented in APP-168).

5.8 Mitigation measures to minimise disturbance to noise sensitive receptors, including those close to the main construction compound, are set out in section 6.2 of the Outline CoCP (APP-179), which will form the basis of the final CoCP to be submitted and approved by the relevant planning authority under Requirement 17 of the draft DCO (APP-027). These mitigation measures include the implementation of Best Practicable Means (e.g. where reasonably practicable, the use of quieter alternative methods, plant or equipment; and the use of hoardings, enclosures or acoustic barriers) and agreeing construction noise management measures for specific construction activities with the relevant local authority prior to the start of construction. These noise management measures will be added to the final CoCP.

Air Quality

5.9 An assessment of noise and vibration impacts is presented in Volume 3, Chapter 9: Air Quality of the Environmental Statement (APP-081).

5.10 A risk-based assessment of potential impacts from fugitive dust emissions was undertaken using the Institute of Air Quality Management (IAQM) method. This indicated that, in the absence of dust control measures, the overall dust impact risk for the construction-phase of Hornsea Three, including at the main construction compound, would be categorised as high.

5.11 Dust control measures that are appropriate to this high level of risk category have been identified in detail in Table 9.29 of Volume 3, Chapter 9: Air Quality of the Environmental Statement [APP-081]. With the application of controls recommended by the IAQM for high risk construction areas, the risk of impacts would be expected to be reduced such that the effect is 'not significant' in EIA terms. Furthermore, the impact is predicted to be of local spatial extent, intermittent and effects are not anticipated to continue beyond the construction phase (i.e. they are predominantly reversible).

Historic Environment

5.12 Paragraph 1.6.2.52 of Volume 6, Annex 5.1: Desk Based Assessment of the Environmental Statement (APP-149) briefly describes the baseline in terms of Oulton airfield and notes that some of the buildings remain, including the control tower, and that a large portion of the runways were removed in 1979. In addition, this appendix notes that the airfield has Historic Environment Record (HER) number 7364 and is therefore a heritage asset.

5.13 The Works Plan - Onshore (APP-013) show Works Numbers 13 and 14 (the main construction compound and associated access), which are secured through DCO, as being located on the existing hardstanding at the airfield. It is the Applicant's view that a detailed assessment of Oulton Airfield is screened out of the EIA, as much of its heritage value has arguably already been lost in the removal of a large portion of the runways and repurposing of the site for agriculture. In any event, the proposed use as a main construction compound (set out throughout the application. Paragraphs 3.7.3.31 to 3.7.3.32 of Volume 1, Chapter 3: Project Description and paragraphs 4.1.7.3 to 4.1.7.6 inclusive of the Outline CoCP (APP_179)) means that no intrusive works would occur and it would be in temporary use only; the remaining section of runway and tracks will be retained and their form will remain unaltered during the proposed use. The airfield already comprises hard standing suitable for the temporary placement of site facilities (such as offices, briefing rooms, catering facilities, storage etc. typically housed in port-a-cabins) and to allow plant and materials to be stored safely and securely. Therefore, no significant effects to Oulton Airfield are anticipated.

5.14 Finally, paragraph 5.11.1.158 et seq. of Volume 3, Chapter 5: Historic Environment (APP-077) of the Environmental Statement outlines the assessment of the setting of the Blickling Conservation Area, located some 600 m east of the main construction compound at its nearest point. The Applicant acknowledges there may be a degree of visibility of the construction activities on the main construction compound, however the impacts on the setting of Blickling Conservation Area, a designated asset of medium sensitivity, would be of local spatial extent, medium term duration, continuous and reversible. It concludes that no significant effects will occur as a result of Hornsea Three.

Interaction with Norfolk Vanguard and Norfolk Boreas

5.15 Hornsea Three's approach to Cumulative effects assessment is documented in Volume 1, Chapter 5, Section 4 of the Environmental Impact Assessment Methodology [APP-060]. The Cumulative Effect Assessment (CEA) considers the likely effects arising from Hornsea Three alongside the likely effects of other development activities in the vicinity of Hornsea Three, based on the information available.

5.16 As noted in Volume 4, Annex 5.2: Cumulative Effects Screening Matrix of the Environmental Statement, Vattenfall is proposing to build a major offshore windfarm called Norfolk Vanguard (alongside elements of Norfolk Boreas), located nearly 50 km from Norfolk's coast. For the purpose of this document this project is hereafter referred to as 'Norfolk Vanguard'. As part of a wider compound strategy set out within their DCO application the construction of the onshore cable corridor for Norfolk Vanguard would be served by cable logistics areas near Oulton Airfield. The physical overlap of the projects is shown in Figure 1 of the Statement of Common Ground between Ørsted Hornsea Project Three (UK) Ltd and Norfolk Vanguard Ltd and Norfolk Boreas Ltd.

5.17 Hornsea Three adopted a tiered approach to its cumulative assessment in line with standard industry practice and in accordance with The Planning Inspectorate Advice Note Nine and its complementary guidance in Advice Note 17. In the case of NV (application reference EN010079), this has been included in the CEA (Tier 3 development) for Hornsea Three due to the fact that the project remained 'in planning', and at the time of writing the Environment Statement for Hornsea Three was typically reliant upon material presented in Norfolk Vanguard's PEIR.

5.18 The Applicant's assessments were undertaken based on Norfolk Vanguard's PEIR which provided initial estimates for the additional traffic loadings to/from The Street to be a primary peak of 16 weeks at 96 daily movements and a secondary peak of 6 weeks at 88 daily movements.

5.19 In 28 June 2018, Norfolk Vanguard submitted its application to the Planning Inspectorate, and this was accepted in 24 July 2018. As documented in the SoCG with Norfolk Vanguard, as well as in the response to Examiners First Written Question 1.15.3, the Applicant is currently working with Norfolk Vanguard to update the cumulative effects assessment in respect to traffic and transport and associated air quality and noise and vibration.

6. ~~Work Undertaken Post-Application, prior to Deadline 1, to inform the Construction Traffic Management Plan~~ Work Undertaken Post-Application to inform the Construction Traffic Management Plan

Update at Deadline 1

5.206.1 In response to submissions made by stakeholders in relevant representations and pre-and post-application consultation (see Section 4), the Applicant has undertaken a range of baseline surveys to clarify the baseline traffic and transport conditions at the main construction compound (including its implications on baseline air quality and noise and vibration). The purpose of these surveys and follow on work is to obtain further clarify on the traffic flows along The Street, providing detailed analysis of types of vehicle, speed etc., and inform the development of traffic management measures which will ultimately be presented in the final CTMP developed post consent / pre-commencement of works.

5.216.2 Whilst this information does help inform the baseline data on which the Environmental Statement is based, the additional data does not alter or amend the findings of the Environmental Statement submitted with the Application. This information includes:

- Automatic Traffic Surveys - 15 June 2018 to 28 June;
- Automatic Traffic Surveys - 16 October;
- Video Turning Counts – 16 October;
- 24 hour traffic flow survey - 16 October; and
- Noise and vibration surveys completed at the Old Railway Gatehouse - 15 October to 22 October.

5.226.3 Using the baseline traffic survey data, the Applicant first identified a number of options which demonstrated how vehicles could access the main construction compound to/from the main road network, via The Street in a safe and efficient manner. This is provided in Annex B: Main Construction Compound Access Strategy which identifies four options:

- Option 1: Passing Places;
- Option 2: Comprehensive Widening;
- Option 3a: Passing Places with B1149/The Street/B1345 Circulatory; and
- Option 3b: Temporary One-Way Northbound All Traffic (The Street);

6.4 These options are included in the overview of access options provided in Annex C, which summarises the potential access strategies considered for the main construction compound and their status.

5.236.5 Annex B also takes into consideration the interaction between Hornsea Three and other projects in the area, most notably Norfolk Vanguard/Norfolk Boreas projects which are currently being promoted by Vattenfall, as well as historic planning history at the proposed main construction compound site (e.g. the Anaerobic Digester facility (planning application reference 20130860)). The access options identified in Annex B were submitted to stakeholders for their review and comment in September and October 2018 (see Section 4). In addition, the proposals were submitted for consideration at NCC's Development Team Meeting on 01 October 2018.

5.246.6 Feedback from NCC, including from the Development Team Meeting, was provided on 30 October 2018 and confirmed that confirmed that Option 1: Passing Places was considered an acceptable and workable solution subject to the findings of a Stage 1 Safety Audit. All other options were considered either unsuitable on highway safety grounds, or to be excessive. Feedback also advised that the NCC would be looking for the works to the road way to be temporary, whilst works to the road hump (as described in Annex A and B) and the B1149 junction to be permanent. This feedback is reflected in the Statement of Common Ground with Norfolk County Council submitted at Deadline 1.

5.256.7 Feedback from Oulton Parish Council (OPC) in September 2018, through an established Working Group, has indicated continued opposition to the use of Site 4 as the main construction compound. This is reflected in the Relevant Representation [RR-034]. Without prejudicing this position, OPC identified Option 1: Passing Places to be the least worst option of the options tabled in Annex B, but noted that there remained concerns.

5.266.8 Based on the feedback received, and to confirm that all other others were unsuitable, the Applicant undertook Stage 1 Road Safety Audits for all access options presented in Annex B. The finding of these audits are reported in Annex A: Main Construction Compound Access Strategy – Safety Review, and confirm that taking account of the Stage 1 Road Safety Audit, and designers response to the findings, Option 1: Passing Places provides an acceptable and workable solution which would provide access the main construction compound to/from the main road network, via The Street in a safe and efficient manner.

5.276.9 Subsequent feedback from OPC received via email on 05 November 2018, noted that none of the options identified in Annex B were well received at an October Parish Council meeting, and that residents raised concerns that the current baseline traffic (including agricultural traffic) had not been satisfactorily considered by the Applicant. This is addressed in Annex B, as well as in response to Examining Authority Question 1.11.11.

6.10 ~~Although the Applicant considers that significant progress has been made in demonstrating a workable access strategy for the main construction compound, it is acknowledged that the measures set out in Annex A and B in respect of Option 1: Passing Places are part of ongoing discussions with NCC (as local highway authority) and other interested stakeholders (including OPC). Notwithstanding this, the Applicant is confident that a solution acceptable to NCC as the local highway authority, taking into consideration the feedback received from OPC, can be reached and will be secured, once agreed, through the Outline CTMP (APP-176). The status of discussions regarding the main construction compound are reflecting in the Statement of Common Ground between Hornsea Project Three and Norfolk County Council, as well as between Hornsea Project Three and Broadland District Council as submitted at Deadline 1.~~Although the Applicant considered that at Deadline 1 significant progress had been made in demonstrating a workable access strategy for the main construction compound, it is acknowledged that at this point in time, measures set out in Annex A and B in respect of Option 1: Passing Places were part of ongoing discussions with NCC (as local highway authority) and other interested stakeholders (including OPC). The status of discussions regarding the main construction compound at Deadline 1 were reflected in the Statement of Common Ground between Hornsea Project Three and Norfolk County Council, as well as between Hornsea Project Three and Broadland District Council as submitted at Deadline 1 (REP1-232 and REP1-099 respectively).

Update at Deadline 3

6.11 Through ongoing engagement with the Applicant, NCC as the local highway authority, have confirmed the inprinciple agreement to Option 1: Passing Places as presented in Annex A. It has been agreed that these measures can be secured through the Outline CTMP (APP-176) although the mechanism for delivery remains under discussion with NCC. The status of discussions regarding the main construction compound will be reflected in an updated Statement of Common Ground between Hornsea Project Three and Norfolk County Council to be submitted at Deadline 4. An update to the Statement of Common Ground between Hornsea Project Three and Broadland District Council will also be submitted at Deadline 4.

Main Construction Compound Access Strategy Roadmap

6.12 To provide clarity on the access strategies under consideration by the Applicant for the main construction compound, Annex C provides a short note which clearly defines the options which have been considered through the deisgn development process and their current status.

6.13 In this regard, the note in Annex C confirms;

- access options which have been considered and deemed unsuitable for further consideration by the Applicant and / or stakeholders;
- the Applicant's preferred access solution; and
- other access options which continute to be explored by the Applicant and NCC as the Highway Authority.

Consideration of Option R variants

6.14 As noted in Annex C, as part of the Deadline 2 submission made by Oulton Parish Council, Option 'R' was proposed and clarified in an email to the Applicant on 12th November 2018 (see Applicant's Comments to Oulton Parish Council Written Representations at Deadline 3, Annex A). This email identified three potential options, referred to hereafter as Option R 'A', Option R 'B' and Option R 'C'. The options include, direct access from the B1149 and providing an alternative access from the Street approximately 240m north of the B1149 / The Street junction, in all situations a haul road will be necessary from the point of access to the main construction compound location, which vary -in length from 850m to 1,300m pending the option considered. These have been evaluated by the Applicant's Traffic and Transport Consultant.

6.15 The Applicant agrees with OPC's position that Option R 'B' should bnot be considered further due to lack of visibility and the number of mature tree specimens which would need to be removed to move towards this location being a safe and usable access.

6.16 The Applicant's evaluation identified two variants of Option R 'C', hereafter referred to Option R 'C1' and Option R 'C2', with the key difference being the proposed location of the new junction on the B1113.

6.17 Option R 'A', Option R 'C1' and Option R 'C2') have therefore been taken forward for further consideration by the Applicant. Each option has been developed to a preliminary level, in sufficient detail to examine the junction form and the impact which could result on other aspects, such as landcape, ecology, tree and hedgerows. These options have been presented to Norfolk County Council, Broadland District Council and Oulton Parish Council for review and comment, accompanied by Stage 1 Safety Audits for each. This information is presented in the Annex D of this document.

6.18 Although the Applicant has demonstrated a willingness to consider alternative feasible and deliverable options, it is noted that:

- Option R 'A' – This option would maintain the use of the junction between the B1149 and The Street, thus requiring junction improvements, and at least one passing bay to be installed at the southern end of the Street. The access point is proposed a short distance from the B1149 access, avoiding the vast majority of the existing trees along The Street and seeking to maximise distance from the Old Railway Gatehouse. However, the visibility requirements at this location would result in substantial trimming and, in some instances, loss of Important Hedgerow along The Street; and
- Option R 'C1' and R 'C2' provide direct access to the B1149. These options would require a new right turn lane on the B1149 to accommodate the movements which are planned and visibility to meet the design speeds observed at this location. Such measures are not necessary at the existing Street junction which is an existing junction and has already been subject to a Stage 1 safety audit with the previous scheme options (presented in REP1-176). In both Option R 'C1' and 'C2', the removal of mature trees and vegetation will be unavoidable to accommodate the access design provision adopted.

6.19 In respect to all Option R variants, the route of the compound access road would be subject to discussions with the landowner; however, Hornsea Three would seek to follow field boundaries where possible as well as maximise distance from sensitive residential receptors. Furthermore, the potential implications of the cumulative scenario with Norfolk Vanguard requires additional consideration and is subject to ongoing discussions with the parties.

6.20 Notwithstanding the position identified above, the Applicant maintains its position that a solution that is acceptable to NCC as the local highway authority for use of The Street under Option 1: Passing Places has been reached and demonstrates a deliverable solution using the existing Street within land under the control of the Highway Authority.

HOW03 Construction Traffic Generation

6.21 At ISH4, clarification was requested to allow the ExA to understand the calculations applied to generate the traffic movements associated with the project. Whilst this is set out in Volume 6, Annex 7.6: Construction Vehicle Trip Generation Assumptions of the Environmental Statement (APP-164) and Appendix 31: Transport Assessment submitted as part of Deadline 1 (REP1-162), specific extracts specific to the main construction compound and associated cross-references are provided below.

6.22 Paragraph 1.6.2.38 and 1.6.2.39 of the Transport Assessment (PINS Document Reference: APP1 - 162) highlights;

"To estimate a number of construction vehicle movements, the results of the above trip generation, distribution and assignment exercise has been utilised. The above results in daily construction vehicle movements being assigned onto each link

These were then reviewed and those on the B1149 near Oulton were disaggregated to remove all traffic associated with landfall, the onshore HVDC converter/HVAC substation and the HVAC booster station, since these all have their own separate compounds. HGVs associated with concrete pouring at link boxes and aggregate for the haul road and secondary compounds will all deliver direct to their respective locations and so these were also removed. The remaining construction vehicle movements are those that could travel to and from the main compound at Oulton Street."

6.23 To assist with the understanding of the calculation behind the construction traffic generation, Annex E of this document takes the calculation assumptions defined in Volume 6, Annex 7.6 – Construction Vehicle Trip Generation Assumptions (APP-164) and provides further details on the work section assumptions and construction activities, to generate the overall construction traffic flows associated with Hornsea Three.

6.24 Within Annex E, details are provided on the method to calculate the number of cable drum vehicles and the vehicles needed per section. It is assumed, at this stage to present a robust assessment that the all the cable drum vehicles will access the main construction compound for storage and preparation.

6.25 Annex E highlights up to 1,121 cable drums are required to deliver the project, with approximately 800 m of cable per roll. As the maximum daily cable drum movements accessing the main construction compound will depend on construction programme, transmission technology and phasing, it is not currently possible to define the maximum number of daily cable drum vehicles which will accesss the main construction compound. However, from experience on Hornsea Project One and Hornsea Project Two, it is assumed that there could be between 8 - 12 abnormal load cable drum vehicles delivering the cable drums to the main construction compound per day over a 3 to 5 day period associated with one delivery of cable drums to the chosen port.

6.26 This assumes approximately 36 cable drums to be delivered to the chosen port at one time. The cable drum deliveries would then repeat throughout the duration of the active use of the main construction compound (see paragraph 3.15 of this document), with a frequency of approximately one delivery to the port 3-5 weeks. The cable drum delivery vehicle would enter the site as an abnormal load, and leave as a normal HGV.

6.27 In summary within the 118 two way HGV daily movements as a robust case upto 12 of the 59 arriving HGV's would be abnormal cable drum deliveries over a 5 day period, with the 12 orignal cable drum vehicles leaving the compound as a normal HGV vehicle having unloaded the shipment.

6.28 During the period between shipments, cable drum vehicles would be transported from the main construction compound for delivery to site on a needs basis. This would not exceed the anticipated delivery daily movements of between 8 - 12 abnormal load cable drum vehicle movements per day.

6.29 These cable drum vehicle movements would leave the main construction compound as an abnormal load and return as a normal HGV.

6.30 The design of the access to the main construction compound, as set out in Annex A and B, has taken the movements of likely abnormal loads into account.

~~6.~~7. Steps to be undertaken ~~Post-Deadline 1~~

Main Construction Compound Access Options

~~Although the Applicant considers that significant progress has been made in demonstrating a workable access strategy for the main construction compound, it is acknowledged that the measures set out in Annex A and B in respect of Option 1: Passing Places are part of ongoing discussions with NCC (as local highway authority) and other interested stakeholders (including OPC).~~

7.1 ~~As such, for the purpose of Deadline 1, the work in respect to traffic and transport at the main construction compound is considered to be ongoing (see also paragraphs 7.3 – 7.6 below in respect to the CEA assessment). Furthermore, as the access strategy to be implemented will have direct impacts on the associated noise and vibration, and air quality assessment – particularly at the residential property located along The Street (The Old Railway Gatehouse).~~ The Applicant considers that significant progress has been made in demonstrating a workable access strategy for the main construction compound, with an inprinciple agreement that Option 1: Passing Places is an acceptable solution (see Annex A). The Applicant continues to engage with NCC in respect to details regarding pavement construction makeup. These results will feed into the detailed design of Option 1: Passing Places to accommodate the axle loading predicted. This detailed design will be progressed post-consent as part of the detailed CTMP, but the principles will be incorporated within an updated version of the outline CTMP to be submitted at Deadline 4.

~~6.1~~ On the basis of the above, the Applicant is now considering the potential implications of Option 1: Passing Places on the noise and vibration, and air quality assessment – particularly at the residential property located along The Street (The Old Railway Gatehouse).

7.2 In agreement with the landowners, noise and vibration baseline surveys have been completed adjacent to the existing Old Railway Gatehouse and will be submitted alongside an assessment of effects at Deadline 4.

7.3 The Applicant is also examining the potential impacts of Option 1: Passing Places on the ecological receptors along The Street, most notably hedgerows and trees, and will report on the impacts and associated mitigation measures at Deadline 4.

7.4 Notwithstanding the above, it is acknowledged that Oulton Parish Council maintain their objection to the proposed Option 1: Passing Places as an access to the main construction compound. The Applicant is therefore preparing a VISSIM Simultation model to assist in demonstrating how the link would function. This will be submitted at Deadline 4.

7.5 The VISSIM Model is a tool to examine the traffic implications of the proposed highway improvements along The Street, Oulton, Norfolk. The purpose of VISSIM model is to demonstrate the impact of the proposed Hornsea Three construction traffic, the cumulative effect of including Norfolk Vanguard compound requirements. It also currently includes the EF Harrold Potato Farm recent planning application approval which increases the existing level of HGV acvitivty along the Street.

7.6 It is appreciated following the LSH4 Hearing that Oulton Parish Council have requested further runs to included an increased level of agricultural traffic to simulate other peak harvesting periods outside of the surveyed potato harvest which the above results are based upon.

7.7 The VISSIM simulation model and report with additional modelled scenerios including an inflated agricultural traffic scenario and abnormal load scenario will be included. Through ongoing engagement, the Applicant will seek to agree with Outlon Parish Council and Norfolk County Council, the parameters for an acceptable delay.

7.8 In addition, the Applicant notes that Option R variants (see Annex D) are part of ongoing discussions with NCC (as local highway authority) and other interested stakeholders (including BDC, OPC and Vattenfall).

7.9 Annex C of this document provides a summary of the status of each access option at Deadline 3.

Cumulative Effects Assessment

6.27.10 There may be cumulative impacts on a small number of shared road links during construction of Hornsea Project Three and Norfolk Vanguard (and works associated with Norfolk Boreas which are included in the Norfolk Vanguard application), including at The Street (linking B1149 with Oulton Street) which is of direct relevance to the main construction compound. Both parties continue to work together to ensure alignment of highway threshold levels applied by each project, i.e. traffic capacity of each road link before significant impacts are expected, and alignment as to the scope of appropriate traffic management measures that may be required as thresholds are reached – i.e. confirming:

- Thresholds on each street (or part of street) where no or limited ("soft") traffic management measures would be required, such as controls on daily traffic demand, driver induction, community liaison;
- Thresholds on each street (or part of street) which would trigger further "soft" traffic management measures, such as timing of deliveries, hazard signage, restricted periods, and temporary speed restrictions; and
- Thresholds on each street (or part of street) which would trigger further "harder" traffic management measures -such as flow control, pedestrian crossing points, parking restrictions and other traffic management measures, in some instances physical interventions such as localised widening or passing places.

6.37.11 Any mitigation measures identified for these shared links would be secured through each project's final Construction Traffic Management Plans to be developed post-consent. These would be developed with, and required to be approved by, Norfolk County Council as Highways Authority under requirement 18 of the draft DCO (Version 1, as submitted for Deadline 1).

6.47.12 Hornsea Three and Norfolk Vanguard will be looking to reach an agreement on these matters and engage with Norfolk County Council as the highways authority to reach a shared common point of agreement. Although these measures have not been agreed at Deadline 1, material headway has been made and both projects are confident that agreement can be reached in the short term.

6.57.13 It is noted that the access strategies being developed, as reported in Annex A and B, take account of these discussions with Norfolk Vanguard and are being designed such that they would provide an acceptable access solution within the cumulative scenario.

Annex A Main Construction Compound Access Strategy – Safety Review

Annex B Main Construction Compound Access Strategy - Options

Annex C Main Construction Compound Access Options Overview

Annex D ~~Oulton~~Main Construction Compound Option 'R' Review

Annex E Hornsea Three~~OW3~~ Traffic Flow Calculations

Annex A Main Construction Compound Access Strategy – Safety Review

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1. Introduction

Background

1.1 As stated in Volume 1, Chapter 3: Project Description of the Environmental Statement (APP-058), one onshore main construction compound is needed as part of the construction process for Hornsea Three to manage the construction and cabling activities and to act as a central base for the construction operations to ensure they progress efficiently. A location for a main construction compound was identified within Volume 1, Chapter 3: Project Description of the Environmental Statement (APP-058), at the former Oulton Airfield which currently has access via The Street, which connects the B1149 to the south and B1345 to the north.

1.2 This access strategy presents a final solution for Hornsea Three construction vehicles to access the main construction compound to/from the main road network, via The Street in a safe and efficient manner.

Purpose of this Safety Review

1.3 This safety review has been prepared to set out the actions taken in order to achieve a safe access to the main construction compound. This review has also been prepared to provide a centralised, single source of information pertaining to the main compound access, drawing from information already provided within the Application and expanding on specific points where relevant.

1.4 A road safety audit was undertaken in October 2018 by CJ Safety Audit, who was appointed by Create Consulting Engineers LTD in order to demonstrate that the provision of the aforementioned compound access did not have any concerning safety implications for the existing traffic on the B1149 or any future traffic generated by Hornsea Three.

1.5 CJ Safety Audit was provided with Main Construction Compound Access Strategy (Design Development Document) – **Annex B to Appendix 20** which considers the 4 options presented to stakeholders to provide highway access to the main construction compound, which has an anticipated life of up to 8 years. Works include improvements to C263, The Street, its junction with B1149 and the site access junction, together with one-way routing of traffic via C593 Blickling Road.

1.6 The road safety audit report is included as part of Appendix A of this report and is also summarised in section 4 of this report.

1.7 In addition to the 'Hornsea 3 Main Construction Compound Access Strategy', Sep 2018, the following drawings were submitted for the road safety audit, and are included as part of Main Construction Compound Access Strategy (Design Development Document) – **Annex B to Appendix 20** -

- 1554/03/101 Proposed Improvements Option 1 (Sheet 1 of 2);
- 1554/03/102 Proposed Improvements Option 1 (Sheet 2 of 2);
- 1554/03/103 Proposed Improvements Option 2 (Sheet 1 of 2);
- 1554/03/104 Proposed Improvements Option 2 (Sheet 2 of 2);
- 1554/03/105 Proposed One-Way Routing Option 3A; and
- 1554/03/106 Proposed One-Way Routing Option 3B.

2. Draft Scheme Options

2.1 The 'Main Construction Compound Access Strategy' report, includes the four options. The four options are as follows:-

- Option 1: Passing Places;
- Option 2: Comprehensive Widening;
- Option 3a: Passing Places with B1149/The Street/B1345 Circulatory;
- Option 3b: Temporary One-Way Northbound All Traffic (The Street);

Option 1: "Passing Places"

2.2 The main feature of this option comprises a total of eight extended passing places (to accommodate two full-length articulated vehicles) at key locations along The Street extending from the junction with the B1149 to the Oulton Airfield access, with all construction traffic routed to/from the B1149 using The Street to the south of the proposed compound; and includes improvements to junction geometry and drainage at the B1149/The Street junction through bellmouth widening, installation of "containment" kerbs to prevent HGV and agricultural vehicle overrunning and a formal means of drainage including filter drain/soakaway on the South side of the junction to minimise the potential for ponding.

2.3 A "shallow-dig" system of road widening is proposed for the passing places and a cellular system of road construction is identified (Grasscrete, or similar) with a view to minimising impact on existing Root Protection Areas (RPAs) associated with mature tree specimen.

Option 2 "Comprehensive Widening"

2.4 Option 2 effectively builds on Option 1 and would provide more extensive road widening (up to 6.0m) along The Street extending from the junction with the B1149 to the Oulton Airfield access, through wider application of the cellular system of road construction referred to above.

Option 3a: Passing Places with B1149/The Street/B1345 Circulatory

Option 3a would provide all of that associated with Option 1, plus additional passing places along The Street to the north of Oulton Airfield, where these can be successfully accommodated. A circulatory system would then be employed (for construction traffic only) involving The Street, the B1149 and the B1345, joining at the B1149/B1345 roundabout.

Option 3b: Temporary One-Way Northbound All Traffic (The Street);

2.5 Option 3a would only provide the bellmouth improvements at the B1149/The Street junction and **all movements** (including existing residential, agricultural and commercial traffic) would be subject to a temporary one-way arrangement for the duration of the Hornsea Three project, northbound along The Street for the entire section between the B1149 to the south and B1345 to the north of the main construction compound at Oulton Airfield,

3. Road Safety Audit

3.1 A road safety audit was undertaken in October 2018 by CJ Safety Audit, who was appointed by Create consulting Engineers LTD in order to demonstrate that the provision of the aforementioned compound access did not have any concerning safety implications for the existing traffic on the The Street or any future traffic generated by Hornsea Three. The road safety audit report is included as part of Appendix A.

3.2 The CJ Safety Audit report raises a number of comments and offers some recommendations to overcome these problems.

3.3 A summary of the Auditor's comments is shown in table 3.1 below.

Table 3.1: Summary of the Safety Audit comments.

Comment	Affected Options					Comments
	1	2	3a	3b	Location	
3.1				✓	The Street	Problem: head-on collisions due to a 12km one-way system that could be contravened by local users/residents of The Street to avoid a lengthy diversion. Recommendation: Re-assess the principle of the proposed one-way system.
3.2	✓	✓	✓		Bend in The Street	Problem: head-on collision on bend due to restricted forward visibility at the bend in The Street. Recommendation: Widen the carriageway on the outside of the bend to reduce the likelihood of conflict. The Auditors note that there is a wide bellmouth on the outside of the bend. It appears that providing an edge of carriageway marking a metre or two back into the bellmouth might achieve much of the desired widening.

3.3		✓			The Street	Problem: Loss of control due to differential skidding resistance if a pre-cast modular construction is used for the widening of The Street, in Option 2. Recommendation: If this option is pursued, the carriageway widening should have a similar surface to the adjacent carriageway as regards ride quality and skidding resistance.
3.4		✓			The Street	Problem: elevated accident risk due to increased speed as the Street is to be widened to a uniform 6m carriageway. Recommendation: Carriageway widening is not recommended without improving the other safety aspects of the highway.
3.5			✓	✓	Blickling Road	Problem: Blickling Road is particularly narrow and twisty between Itteringham Road and The Bure bridge, with limited forward visibility and may be unsuitable for large articulated HGV, which may lead on head-on collision. Recommendation: Re-assess in detail the suitability of this route for use by large HGVs.
3.6			✓	✓	The Street	Problem: elevated accident risk to local users because of proposed diversion of site traffic, including large HGVs, northwards through the settlement of Oulton Street Recommendation: If either of these options is to be pursued, a 20mph speed limit within the settlement would help offset the risk from increased traffic.
3.7				✓	The Street	Problem: Elevated accident risk due to increased northbound traffic speeds. On the undeveloped lengths this could be detrimental to roadside and to the risk of collision at field accesses. Recommendation: If this option is pursued, appropriate traffic calming measures should be included.

3.0	✓	✓	✓	✓	B1149 at junction with The Street	Problem: The junction lies on a long straight high-speed section of B1149 where drivers may be tempted to overtake. Specific advance signing is suggested to warn drivers of the potential for conflict with slow turning HGVs.

4. Designer Response to Road Safety Audit

4.1 In response to the comments raised within the road safety audit report, a designer response to road safety audit has been prepared by Create Consulting Engineers and the aforementioned report is included as part of Appendix B of this report.

4.2 A summary of the reasons or proposals the designer has put together in response to the safety audit comments is shown in table 4.1 below.

Table 4.1: Summary of the Designer Response

Comment Ref.	Agree/Disagree	Reasons/Proposals
3.1	Agree	Option 3b is no longer pursued
3.2	Agree	Carriageway is to be widened by edge of carriageway marking a metre or two back into the bellmouth.
3.3	Agree	Option 2 is no longer pursued
3.4	Agree	Option 2 is no longer pursued
3.5	Agree	Options 3a and 3b are no longer pursued.
3.6	Agree	Options 3a and 3b are no longer pursued.
3.7	Agree	Option 3b is no longer pursued
3.10	Agree	Signing is to be proposed as part of the access design layout. A red background sign stating 'CAUTION HGVs TURNING' is to be provided on the B1149 near the junction (or similar signing to be agree with the Highway Authority).

4.3 Taking account of the Safety Audit and designer's response Option 1 as shown on Create Drawings number 1554_03_101 and 1554_03_102 contained in Appendix C is recommended for approval by Norfolk County Council.

4.4 It has been agreed with Norfolk County Council that a final scheme design will be prepared and submitted prior to Deadline 2 which will also include the following;

- Scheme to be updated to include safety audit comments; and
- Pavement Assessment of The Street;
- Construction details of the passing bays with confirmed axle loading; and
- Construction design of the vertical alignment changes adjacent to the Old Railway Gatehouse.

Appendix A Road Safety Audits

C J Safety Audit

HORNSEA 3 OFF-SHORE WIND FARM
OULTON, NORFOLK: MAIN CONSTRUCTION COMPOUND HIGHWAY ACCESS WORKS

STAGE 1 ROAD SAFETY AUDIT

REPORT REF: CCE11C/NGC/RSA1
October 2018

Report prepared for: Create Consulting Engineers Ltd
15 Princes Street
Norwich
Norfolk
NR3 1AF

Project Information:

Client	Create Consulting Engineers Ltd on behalf of Orsted
Client Ref	1554
Title	Main Construction Compound, Oulton, Norfolk: Highway Access Works
Report author	N G Calder BSc(Hons) CEng MICE MCIHT MSoRSA

Report Status:

Issue	Status	Purpose	Date
1	Draft	Client approval	29/10/18
2	Final	Client issue	30/10/18

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1. Introduction

1.1 This report has been produced as a result of a Stage 1 Road Safety Audit (RSA) carried out at the request of Create Consulting Engineers Ltd on behalf of Orsted.

1.2 The RSA Team membership was as follows:-

N G Calder BSc(Hons) CEng MICE MCIHT MSoRSA
Principal Road Safety Consultant
CJ Safety Audit

J M Jones IEng MCIHT FIHE MSoRSA
Principal Road Safety Consultant
CJ Safety Audit

1.3 The RSA was undertaken in October 2018 and comprised an examination of the documents provided by the client (see Appendix A) together with a site visit on 24 October 2018 between the hours of 14:00 and 15:15. The weather was bright and the road surface dry. Traffic flows on The Street were very light, and on B1149 moderate; all were free-flowing.

1.4 The terms of reference of the RSA are as described in Road Safety Audit Standard HD19/15. The audit team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

1.5 The proposed Main Construction Compound for the Hornsea 3 project is located at a former airfield at Oulton Street, just north of B1149. The audited scheme comprises 4 options to provide highway access to the compound, which has an anticipated life of 8 years. Works include improvements to C263 The Street, its junction with B1149 and the site access junction, together with one-way routing of traffic via C593 Blickling Road.

1.6 The auditors have reviewed the most recent 5-year police accident record (2013-2017) for the location on Crashmap.co.uk. During this period there have been no recorded accidents on C263 The Street. However, two (both slight) occurred on B1149 in immediate vicinity of its junction with The Street: one involved tail-end collision on B1149, the other a left-turn conflict at the junction. A further two accidents (both slight) occurred on C593 Blickling Road on the potential one-way re-routing section.

The record is considered to be low with no specific implications for the proposed scheme.

1.7 A problem location plan has been included in Appendix B to the report.

2. Items Raised at Previous Road Safety Audits

The auditors are not aware of any previous audits.

3. Items Raised at this Stage 1 Road Safety Audit

General

3.1 Problem

Location: The Street (Option 3b)
Summary: head-on collisions due to one-way contravention

Option 3b imposes a lengthy diversion of up to 12km for local users/residents of The Street, which some drivers may consider an unreasonable burden. In a very rural location (with no practical enforcement) this may lead to contravention of the one-way system, particularly at quieter times. This could result in head-on collisions.

Recommendation

Re-assess the principle of the proposed one-way system.

Road Alignment

3.2 Problem

Location: bend in The Street (Options 1, 2, 3a)
Summary: head-on collision on bend

Approx. 400m north-east of B1149 there is a bend in The Street with restricted forward visibility. It is proposed to improve visibility by hedge trimming, however the Auditors estimate that it will still be substandard, raising the risk of head-on collision on the narrow carriageway, particularly between larger vehicles.

Recommendation

Widen the carriageway on the outside of the bend to reduce the likelihood of conflict (widening on the inside would further reduce northbound forward visibility). The Auditors note that there is a wide bellmouth on the outside of the bend (serving The Granary). It appears that providing an edge of carriageway marking a metre or two back into the bellmouth might achieve much of the desired widening.

3.3 Problem

Location: The Street (Option 2)
Summary: loss of control due to differential surface

Under Option 2, it is proposed to widen the carriageway of The Street to a uniform 6m; however, the Auditors note that this is to be achieved using a pre-cast modular

construction. This raises concern over surface performance when driven at any speed. A vehicle with nearside wheels running on the modular surface and off-side wheels on the original carriageway may prove difficult to control, particularly when braking, due to the differential skidding resistance.

Recommendation

If this option is pursued, the carriageway widening should have a similar surface to the adjacent carriageway as regards ride quality and skidding resistance.

3.4 Problem

Location: The Street (Option 2)
Summary: elevated accident risk due to increased speed

Under Option 2, it is proposed to widen the carriageway of The Street to a uniform 6m. This will produce more free-flowing traffic conditions and is likely to result in increased speeds. This would be detrimental to roadside safety, where narrowed verges, trees and telegraph poles pose a hazard to any errant vehicle. It would also raise the risk of collision at field accesses, at the bend and on approach to proposed shuttle working at the Old Railway Gatehouse.

Recommendation

Carriageway widening is not recommended without improving the other safety aspects of the highway.

3.5 Problem

Location: Blickling Road (Options 3a & 3b)
Summary: risk of head-on collision

C593 Blickling Road follows an historic alignment and HGV traffic is currently very low. The 1.5km section between Itteringham Road and The Bure bridge is particularly narrow (too narrow for a centreline) and twisty with limited forward visibility. The Auditors are concerned that it is unsuitable for the proposed increase in large articulated HGVs under these two Options, which may lead to head-on collisions.

Recommendation

Re-assess in detail the suitability of this route for use by large HGVs.

3.6 Problem

Location: The Street (Options 3a & 3b)
Summary: elevated accident risk to local users

These two options propose diversion of site traffic, including large HGVs, northwards through the settlement of Oulton Street. The Auditors noted that this section of road

is more eventful, with frequent private accesses, on-street parking and some pedestrian activity. The additional traffic would be detrimental to the safety of existing users.

Recommendation

If either of these options is to be pursued, a 20mph speed limit within the settlement would help offset the risk from increased traffic.

3.7 Problem

Location: The Street (Option 3b)
Summary: elevated accident risk due to increased speed

Option 3b proposes one-way operation on The Street for all users. The removal of all opposing traffic is likely to result in increased northbound traffic speeds. On the undeveloped lengths this could be detrimental to roadside safety (where narrow verges, trees and telegraph poles pose a hazard to any errant vehicle) and to the risk of collision at field accesses. Within the settlement of Oulton Street, it could be detrimental to the safety of local users.

Recommendation

If this option is pursued, appropriate traffic calming measures should be included.

Junctions

3.8 No comment

Non-Motorised Users

3.9 No comment

Signing and Lighting

3.10 Comment – for consideration at detailed design

Location: B1149 at junction with The Street (all Options)

The junction lies on a long straight high-speed section of B1149 where drivers may be tempted to overtake. Specific advance signing is suggested to warn drivers of the potential for conflict with slow turning HGVs.

4. Audit Team Statement

We certify that this audit has been carried out in accordance with Road Safety Audit Standard HD19/15.

Audit Team Leader

Nevil Calder
Member of the Society of Road Safety Auditors (MSoRSA)
Principal Road Safety Consultant
CJ Safety Audit

Signed:

Date: 30 October 2018

Audit Team Members

Malcolm Jones
Member of the Society of Road Safety Auditors (MSoRSA)
Principal Road Safety Consultant
CJ Safety Audit

Signed:

Date: 30 October 2018

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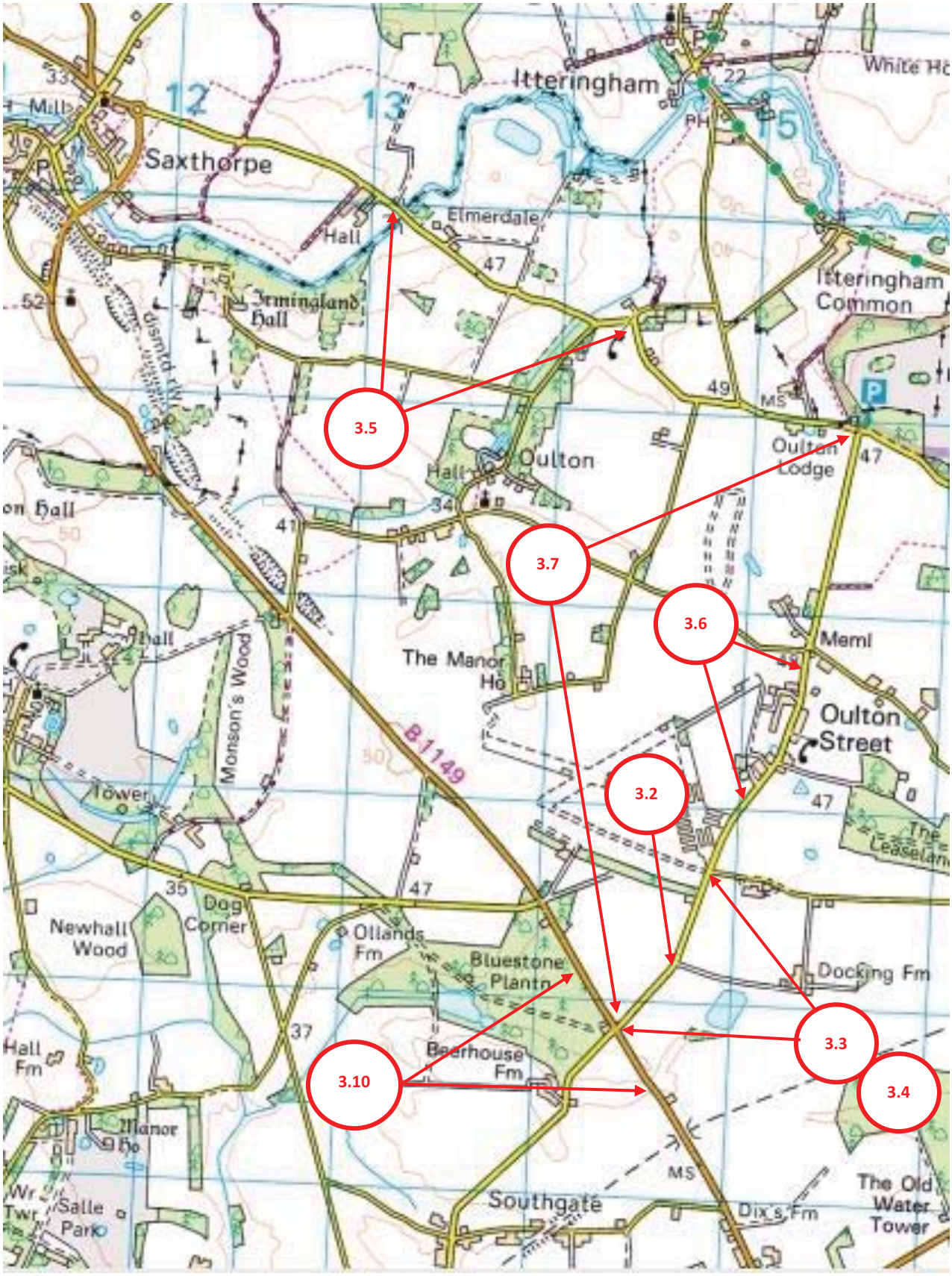
APPENDIX A - Audit Submission Documents

The following documents were submitted for this road safety audit:-

Hornsea 3	Main Construction Compound Access Strategy	Sep 2018
Drg no 1554/03/101	1:1000	Proposed Improvements Option 1 (Sheet 1 of 2)
Drg no 1554/03/102	1:1000	Proposed Improvements Option 1 (Sheet 2 of 2)
Drg no 1554/03/103	1:1000	Proposed Improvements Option 2 (Sheet 1 of 2)
Drg no 1554/03/104	1:1000	Proposed Improvements Option 2 (Sheet 1 of 2)
Drg no 1554/03/105	1:1000	Proposed One-Way Routing Option 3A
Drg no 1554/03/106	1:1000	Proposed One-Way Routing Option 3B
Predicted HGV movement data		
5yr Accident Data from Crashmap.co.uk		

No departures from standard were advised.

APPENDIX B – Problem Location Plan



Appendix B Designers Response

Oulton Access Strategy Stage 1 RSA Designer Response

Ørsted

5 Howick Place,

London, SW1P 1WG

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Front cover picture: Kite surfer near a UK offshore wind farm © Ørsted Hornsea Project Three (UK) Ltd., 2018.

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1. Introduction

1.1 A road safety audit was undertaken in October 2018 by CJ Safety Audit, who was appointed by Create consulting Engineers LTD on behalf of Orsted in order to demonstrate that the provision of the Oulton main compound access did not have any concerning safety implications for the existing traffic on The Street or any future traffic generated by Hornsea Three.

1.2 This report details Create Consulting Engineers Ltd's ('Create') response to the Stage 1 Road Safety Audit (RSA) Report carried out on the proposed main compound access off The Street ('the Site'). A site visit on 24 October between the hours of 14:00 and 15:15 was undertaken and the results were issued in report reference CCE11C/NGC/RSA1.

2. Response to Items Raised at the Stage 1 Road Safety Audit

2.1 This section provides a formal "Designer Response" to the comments made in the Stage 1 Road Safety Audit including the general comments in Section 3 of the RSA. The RSA's paragraph numbers are used here as reference numbers. Items raised by the Stage 1 Road Safety Audit carried out by CJ Safety Audit are presented below and addressed by Create Consulting Engineer's as a formal "Designer Response".

General:

2.2 Ref 3.1: Option 3b imposes a lengthy diversion of up to 12km for local users/residents of The Street, which some drivers may consider an unreasonable burden. In a very rural location (with no practical enforcement) this may lead to contravention of the one-way system, particularly at quieter times. This could result in head-on collisions. Therefore, head-on collisions due to the one-way contravention are likely to occur on The Street.

Recommendation

2.3 Re-assess the principle of the proposed one-way system

Engineer's Response:

2.4 Agreed. Therefore, for this and other reasons, this option (Option 3b) is no longer pursued.

Road Alignment:

2.5 Ref 3.2: Approx. 400m north-east of B1149 there is a bend in The Street with restricted forward visibility. It is proposed to improve visibility by hedge trimming, however the Auditors estimate that it will still be substandard, raising the risk of head-on collision on the narrow carriageway, particularly between larger vehicles. This comment affects options 1, 2 and 3a.

Recommendation

2.6 Widen the carriageway on the outside of the bend to reduce the likelihood of conflict (widening on the inside would further reduce northbound forward visibility). The Auditors note that there is a wide bellmouth on the outside of the bend (serving The Granary). It appears that providing an edge of carriageway marking a metre or two back into the bellmouth might achieve much of the desired widening

Engineer's Response:

2.7 Agree. Carriageway is to be widened by edge of carriageway marking a metre or two back into the bellmouth.

2.8 Ref 3.3: Under Option 2, it is proposed to widen the carriageway of The Street to a uniform 6m; however, the Auditors note that this is to be achieved using a pre-cast modular construction. This raises concern over surface performance when driven at any speed. A vehicle with nearside wheels running on the modular surface and off-side wheels on the original carriageway may prove difficult to control, particularly when braking, due to the differential skidding resistance.

Recommendation

2.9 If this option is pursued, the carriageway widening should have a similar surface to the adjacent carriageway as regards ride quality and skidding resistance.

Engineer's Response:

2.10 Agreed. Due to this and other comments raised by the Auditors, this option (Option 2) is no longer pursued.

2.11 Ref 3.4: Under Option 2, it is proposed to widen the carriageway of The Street to a uniform 6m. This will produce more free-flowing traffic conditions and is likely to result in increased speeds. This would be detrimental to roadside safety, where narrowed verges, trees and telegraph poles pose a hazard to any errant vehicle. It would also raise the risk of collision at field accesses, at the bend and on approach to proposed shuttle working at the Old Railway Gatehouse.

Recommendation

2.12 Carriageway widening is not recommended without improving the other safety aspects of the highway.

Engineer's Response:

2.13 Agreed. Due to this and other comments raised by the Auditors, this option (Option 2) is no longer pursued.

2.14 Ref 3.5: C593 Blickling Road follows an historic alignment and HGV traffic is currently very low. The 1.5km section between Itteringham Road and The Bure bridge is particularly narrow (too narrow for a centreline) and twisty with limited forward visibility. The Auditors are concerned that it is unsuitable for the proposed increase in large articulated HGVs under these two Options, which may lead to head-on collisions. This comment affects options 3a and 3b.

Recommendation

2.15 Re-assess in detail the suitability of this route for use by large HGVs.

Engineer's Response:

2.16 Agreed. Due to this and other comments raised by the Auditors, these two options (Options 3a and 3b) are no longer pursued.

2.17 Ref 3.6: These two options propose diversion of site traffic, including large HGVs, northwards through the settlement of Oulton Street. The Auditors noted that this section of road is more eventful, with frequent private accesses, on-street parking and some pedestrian activity. The additional traffic would be detrimental to the safety of existing users. This comment affects options 3a and 3b.

Recommendation

If either of these options is to be pursued, a 20mph speed limit within the settlement would help offset the risk from increased traffic.

Engineer's Response:

2.18 Agreed. Due to this and other comments raised by the Auditors, these two options (Options 3a and 3b) are no longer pursued.

2.19 Ref 3.7: Option 3b proposes one-way operation on The Street for all users. The removal of all opposing traffic is likely to result in increased northbound traffic speeds. On the undeveloped lengths this could be detrimental to roadside safety (where narrow verges, trees and telegraph poles pose a hazard to any errant vehicle) and to the risk of collision at field accesses. Within the settlement of Oulton Street, it could be detrimental to the safety of local users.

Recommendation

If this option is pursued, appropriate traffic calming measures should be included.

Engineer's Response:

2.20 Agreed. Due to this and other comments raised by the Auditors, this option (Option 3b) is no longer pursued.

Signing and Lighting:

2.21 Ref 3.10: The junction lies on a long straight high-speed section of B1149 where drivers may be tempted to overtake. Specific advance signing is suggested to warn drivers of the potential for conflict with slow turning HGVs.

Recommendation

Specific advance signing is suggested to warn drivers of the potential for conflict with slow turning HGVs.

Engineer's Response:

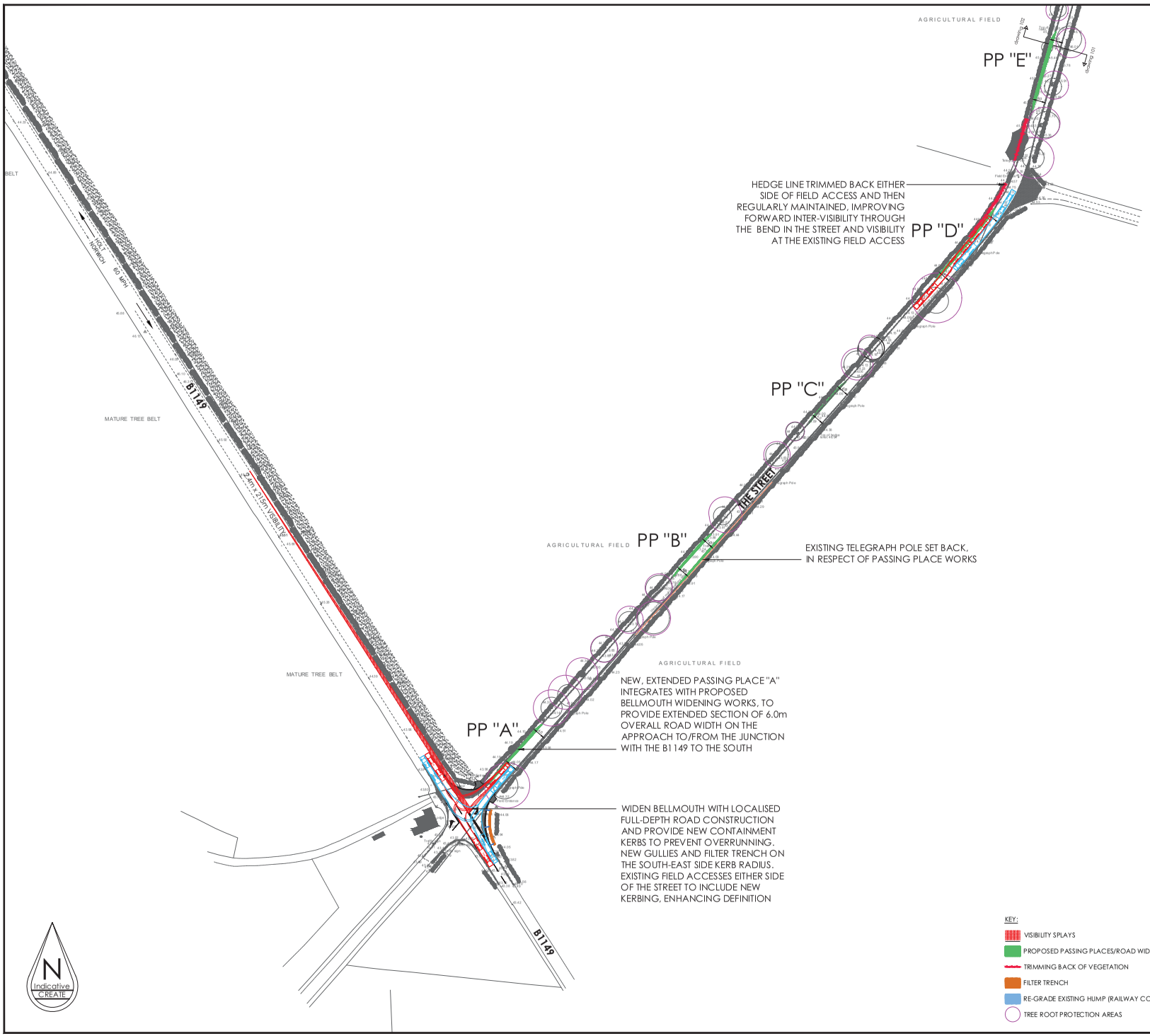
2.22 Agree. Signing is to be proposed as part of the access design layout. A red background sign stating 'CAUTION HGVs TURNING' is to be provided on the B1149 near the junction (or similar signing to be agree with the Highway Authority).

3. Conclusion

3.1 It can be concluded from the aforementioned Engineer responses in section 2 that following the Stage 1 Road Safety Audit, the engineers agrees that the safest option is **Option 1**, where only two problems have been raised and these raised concerns can be overcame with the following measures:

- Carriageway is to be widened by edge of carriageway marking a metre or two back into the bellmouth serving The Granary; and
- Signage warning the presence of HGVs turning within the vicinity of the junction to be added as part of the access design layout.

Appendix C Promoted Access Strategy



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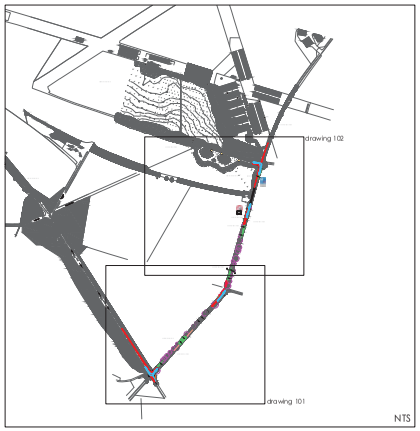

OPTION 1: PASSING PLACES

GENERAL NOTES:

1. PASSING PLACES (PP) TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE LOCATED AND SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 18.09.18	DRAWING STATUS: INFORMATION	
	SCALE(S): 1:1,000	DESIGNED: MDA / DRAWN: MDA	
		CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON (OPTION 1) SHEET 1 OF 2	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/101	REVISION:	

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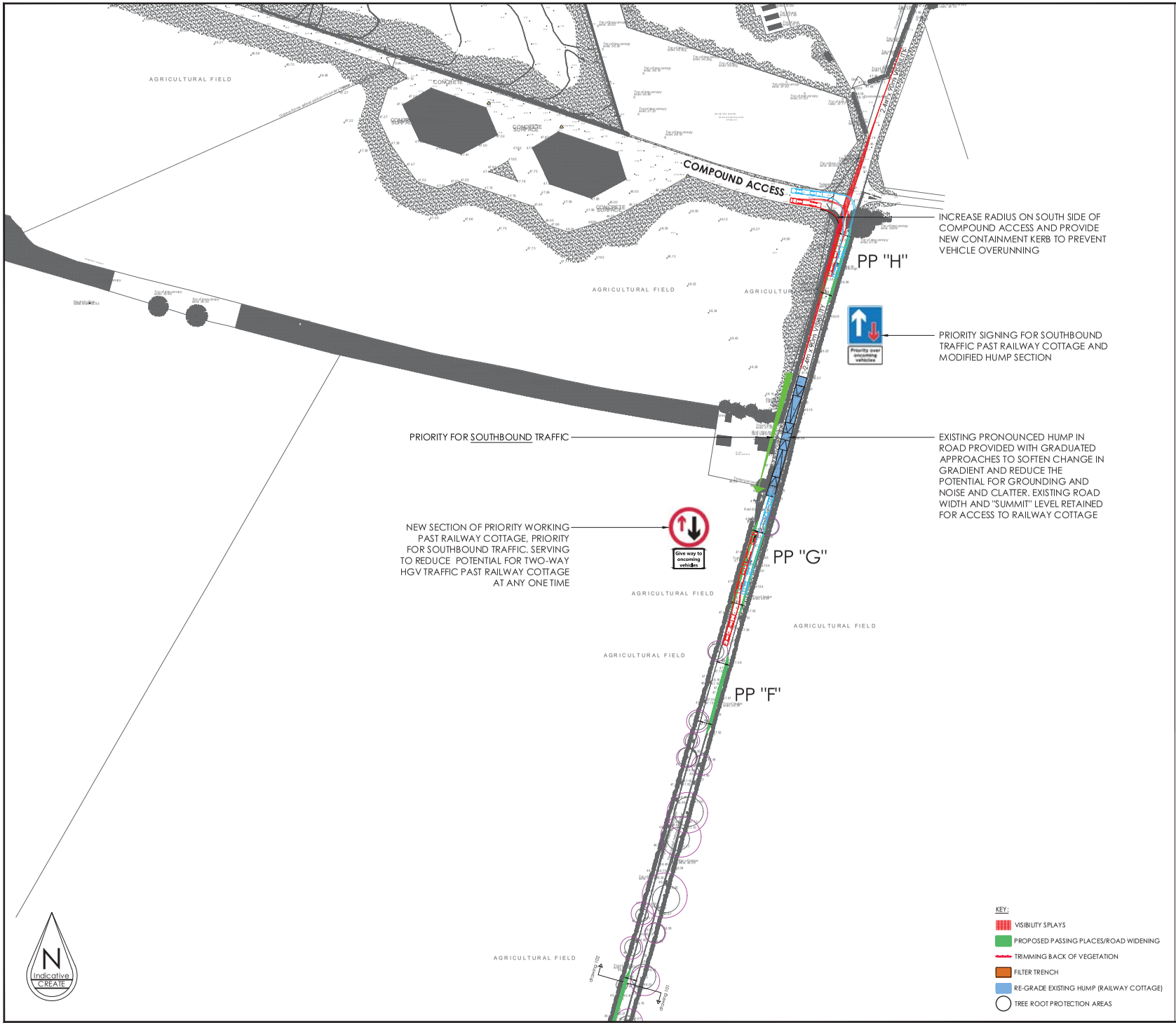

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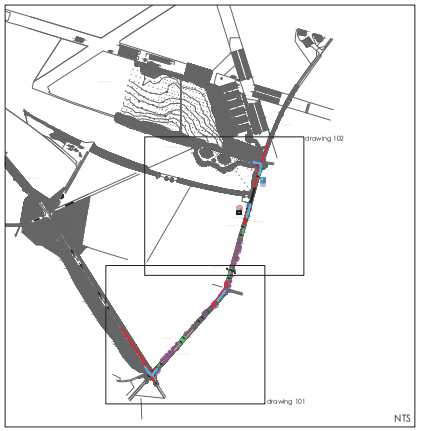

OPTION 1: PASSING PLACES

GENERAL NOTES:

1. PASSING PLACES (PP) TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE LOCATED AND SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
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		CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON (OPTION 1) SHEET 2 OF 2	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/102	REVISION:	

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Annex B Main Construction Compound Access Strategy - Options

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Revision History

Version	Date	Author	Context

Abbreviation

Abbreviation	Definition
AADT	Annual Average Daily Traffic
AD	Anaerobic Digestion
ATC	Automatic Traffic Counter
CRF	Congestion Reference Flow
DfT	Department for Transport
HGVs	Heavy Goods Vehicles
LPA	Local Planning Authority

1. Introduction

1.1 This document with accompanying appendices and plans comprises the access strategy for vehicles to the proposed main construction compound for the Hornsea Project Three offshore wind farm (hereafter referred to as Hornsea Three).

1.2 It has been identified that an onshore main construction compound is needed as part of the construction process for Hornsea Three to manage the construction and cabling activities and to act as a central base for the construction operations to ensure they progress efficiently. The main construction compound will be used for storage of some materials, for example cable drums, and will be the key base for construction management to coordinate the operations.

1.3 A location for a main construction compound was identified within Volume 1, Chapter 3: Project Description of the Environmental Statement (document reference A6.1.3), at the former Oulton Airfield which currently has access via The Street, which connects the B1149 to the south and B1345 to the north.

1.4 This access strategy demonstrates options for how Hornsea Three construction vehicles could access the main construction compound to/from the main road network, via The Street in a safe and efficient manner. It has been informed by consultation with the Oulton Parish Council and Norfolk County Council (as Highway Authority).

1.5 The strategy has also taken account of the following development proposals and recent developments that used (or proposed to use) access to the former Oulton Airfield:

- An Anaerobic Digestion (AD) facility (refused planning consent) on the former Oulton Airfield;
- A wind turbine (application withdrawn) on the former Oulton Airfield; and
- A solar park (now constructed) to the west of the former Oulton Airfield;

1.6 An overview of two most relevant of these developments (the AD facility and solar park) is set out in Section 3 and 4 below. Of particular note is the AD facility (planning application reference 20130860) which was refused at Appeal (Appeal reference APP/K2610/A/14/2212257), where the Planning Inspector's decision (dated 11 June 2014) was influenced by its proposed access strategy.

2. Existing Conditions

2.1 Access to the former Oulton Airfield is on the western side of The Street, which routes broadly south to north, forming the minor arms of simple priority junctions with the B1149 and the B1345 Blickling Road, respectively. The entire length of The Street is currently derestricted with a mandatory 60mph speed limit in force, although traffic speeds are generally constrained on account of the width and alignment of the road.

2.2 The (T-junction) access to the former Oulton Airfield is positioned approximately 950m to the north of the B1149, approximately opposite the junction with Heydon Road.

2.3 The Street is a narrow single carriageway road, typically in the order of up to 5m wide with verges, hedgerows and some trees on both sides, although there are sections where the road narrows to below 5m in width. There is evidence of vehicles overrunning the verge and this has resulted in the edges of carriageway being exposed in some locations with localised widening and informal passing places being created through verge scrub and rutting.

Photo 1: The Street (looking north from the junction with B1149)

2.4 The Street is generally a straight section of road between the B1149 and the access to the former Oulton Airfield, except for one bend approximately midway along this section in the vicinity of the access to The Granary on the East side of the road. Forward visibility along this section of The Street is, therefore, generally good except for at the aforementioned bend where the hedgerow currently restricts levels of forward visibility (particularly northbound).

2.5 Along the section between the B1149 and the former Oulton Airfield, The Street provides access to a number of field parcels, Docking Farm, Heydon Road and one residential property (The Old Railway Gatehouse).

2.6 To the north of the former Oulton Airfield, The Street becomes Oulton Street and then New Road and provides access to the community of Oulton Street, a number of fields and farms with associated buildings and working areas etc., Church Lane, Aylsham Road and The National Trust Textile Conservation Studio.

2.7 For the purposes of this report, the section of road between the B1149 and B1345 comprising The Street, Oulton Street and New Road will simply be referred to as "The Street".

Photo 2: The Street (looking south from the access serving The Granary)

Photo 3: The Street (looking north from the access serving The Granary)

2.8 To determine baseline traffic flows along The Street, a traffic survey was undertaken by way of an Automatic Traffic Counter (ATC) at a point midway between the B1149 and the access to Docking Farm over a consecutive 14-day (two-week) period from Friday 15 June 2018 to Thursday 28 June 2018 inclusive.

2.9 A summary of the traffic survey data for the average weekday, the average Saturday and the average Sunday of the two-week survey period is set out in Table 2.1 and a more detailed summary containing hourly traffic flows over these periods is attached at Appendix A.

Table 2.1: Summary of Traffic Flows along "The Street".

	Average Weekday			Average Saturday			Average Sunday		
	Total	**HGV**	**% HGVs**	**Total**	**HGV**	**% HGVs**	**Total**	**HGV**	**% HGVs**
12-Hour Total (07:00-19:00)	502	18	4%	508	5	1%	443	5	1%
24-hour total	605	31	5%	591	6	1%	516	5	1%
Note: traffic flows are two-way (northbound plus southbound) traffic flows.									

2.10 It is known that agricultural vehicles travel along The Street, and these are identified within the traffic surveys as Heavy Goods Vehicles (HGVs) (i.e. vehicles with a maximum permissible gross laden weight in excess of 7.5 Tonnes).

2.11 The surveys show that there are typically 18 HGV movements over a 12 hour weekday period of 07:00 to 19:00 (4% of all traffic) along The Street and typically 31 HGV movements over a 24 hour weekday (5% of all traffic) along The Street.

2.12 Guidance set out in the Department for Transport (2007) publication 'Manual for Streets' sets out that 5.5m is the minimum width required for two HGVs to pass one-another in motion, 4.8m is the minimum width for a HGV to pass a car and that 4.1m is the minimum recommended width for two large cars to pass one-another.

2.13 Cars currently travelling along The Street are generally able to pass one-another. However, when a car meets a HGV (including agricultural vehicles), or when a HGV meets another HGV (including agricultural vehicles), then vehicles are required to pass one-another by at least one of those vehicles overrunning onto the verge.

2.14 There are similar occurrences at the B1149/The Street junction to the south whereby when a HGV (including agricultural vehicles) turns through the junction arrangement and then other vehicles are rendered unable to pass.

Photo 4: The Street (note: use of informal passing areas)

2.15 A review of local highway safety has been undertaken utilising personal injury accident data obtained using the "Crash Map" database.

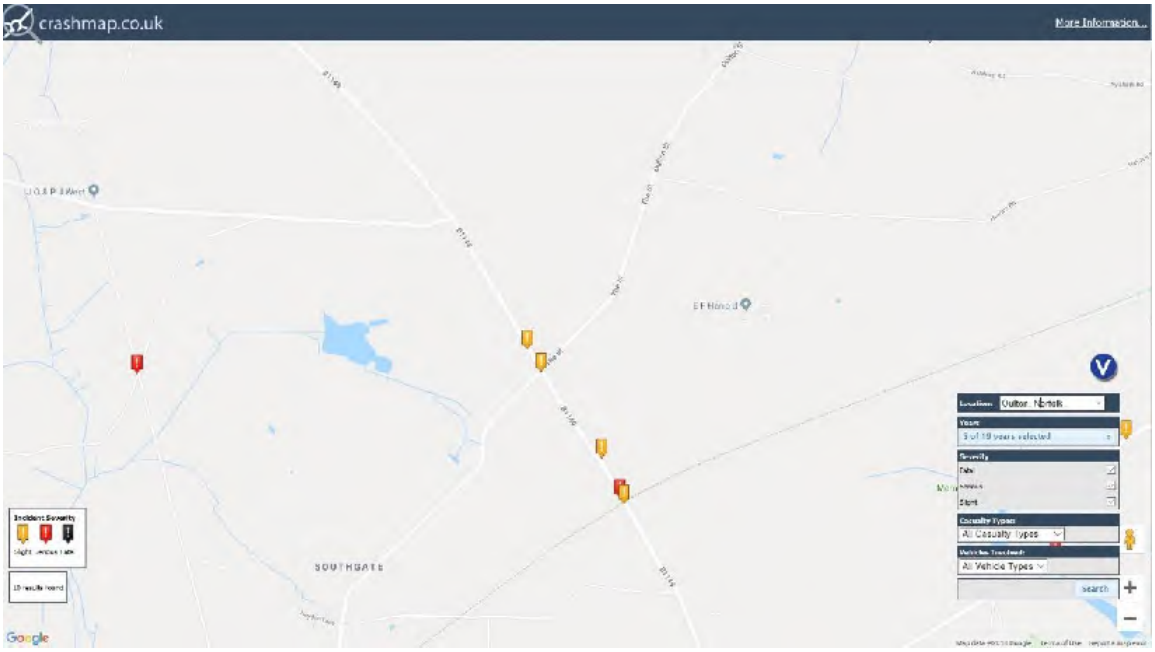


Figure 2.1: Crash Map Data Extract

2.16 The Crash Map database includes information collected by the police relating to road traffic incidents where there has been a "Personal Injury Accident". This data is approved by the National Statistics Authority and reported on by the Department for Transport.

2.17 The current Crash Map database includes incidents from 1999 up to 2017 and data outputs extracted for the most recent five year period to date which are presented on Figure 2.1. This shows that no recorded accidents have occurred within the review period for the section of The Street between the access serving Oulton Airfield and the B1149.

2.18 Two accidents have been recorded within 100m of the B1149 / The Street junction, both "Slight" in classification occurring on 14 November 2015 (involving 2 vehicles and 1 casualty) with the second incident occurring on 09 January 2015 (involving 1 vehicle and 1 casualty). Both of the incidents appear to be unrelated in terms of position and accident type.

2.19 It can be concluded therefore that the local highway network does not exhibit any readily identifiable multi-modal road safety issues that should hinder access to the proposed main construction compound.

3. AD Facility Access Strategy

3.1 Proposals for an AD facility (planning application reference 20130860) on the former Oulton Airfield was refused at Appeal (Appeal reference APP/K2610/A/14/2212257). The Planning Inspector's decision dated 11 June 2014 considered its proposed access strategy.

3.2 The planning application set out that deliveries would only be made to the AD facility during the two-month harvest periods of September and October. During these two months of the year, the planning application set out there would be 68 HGV movements per day (predicted to be 8 HGV movements per hour).

3.3 Six passing spaces were proposed along The Street. Each passing space would have provided a total carriageway width of 5.5m over a length of approximately 10m with tapers provided at each end to enable vehicles to enter and exit the passing spaces. Including the tapers, each passing space would have been a total length of approximately 14m.

3.4 The passing spaces were proposed to accommodate small articulated HGVs of 10.5m length, which would have been generated by the AD facility.

3.5 Information on the position of the Local Highway Authority (Norfolk County Council) on the proposed access strategy can be determined from the Statement of Common Ground (SoCG) that was submitted to the Appeal, a copy of which is attached at Appendix B.

3.6 Paragraph 4.1 of the SoCG sets out the agreed Reasons for Refusal and states the following:

'It is agreed that the following represent the LPA's [Local Planning Authority] reasons for refusal, as confirmed by Ruth Sainsbury's [the Planning Officer] email of 13 November 2013:

- *The appeal proposals would generate additional vehicular traffic, the impact of which is so severe that it would have a significant impact upon the safety and satisfactory functioning of the local highway network;*
- *That additional vehicular traffic would result in a significant detrimental impact upon the character of the area;*
- *That additional vehicular traffic would result in a significant detrimental impact upon the amenities of local residents'.*

3.7 Paragraph 4.2 of the SoCG goes on to state:

'After further discussions with the Highway Authority [Norfolk County Council], the LPA will not be pursuing the reason for refusal based upon highway safety (bullet point 1, paragraph 4.1 above)'.

3.8 Paragraph 4.3 of the SoCG then states:

'It is agreed that, in all other respects, the appeal proposals are acceptable, including:…

The proposed passing bays are acceptable and have no unacceptable impacts, including in terms of trees or landscape character.''

3.9 The Appeal decision provides the Inspector's considerations on access to the AD facility, a copy of which is attached at Appendix C. Key extracts are set out as follows:

3.10 Paragraph 8 states:

'Though 2 cars may pass each other, if driven with care, over much of the lane, the carriageway is not wide enough for a vehicle larger than a car to pass any other vehicle except at the existing informal 'passing places'.

3.11 Paragraph 8 goes on to state:

'Approximately halfway between the site access and the junction with Holt Road [the B1149] the lane bends sharply, preventing visibility between the passing places on either side of the bend. Elsewhere on this stretch, the lane runs straight and visibility is good'.

3.12 Paragraph 9 states:

'The proposal is to formalise several of the existing 'passing places', and to reposition and/or create others, to provide 6 individual passing places in all. The Highway Authority is satisfied that, subject to some repositioning, 6 passing places would meet the need; that opposing HGV tractor/trailer units would be able to pass each other at the new passing places; and that intervisibility between passing places would be adequate'.

3.13 Paragraphs 10 and 11 of the decision notice set out that the Inspector considered the traffic movements generated by the appeal proposal would be problematic for the following reasons:

- *The vehicle movements would be very frequent [8 HGV movements per hour] and concentrated on this particular stretch of The Street over a period of several months each year.*
- *During that time the vehicle movements would continue at high frequency over a very long working day, extending from early morning until late evening, and into periods of dusk and darkness.*
- *The existing mix of traffic on The Street includes domestic cars, agricultural vehicles, tankers and other HGVs.*
- *Each passing place proposed would not be long enough to contain more than one HGV at a time. The consequences of a mistake could be especially severe in the area around the passing place closest to the junction with the B1149 Holt Road. Here, northbound traffic positioned on the B1149 ready to turn right into The Street could be left stranded and exposed in that position while waiting for two HGVs to pass on The Street itself close to the junction, and would be unable to exit the B1149 whilst the first passing place was still occupied; or, worse, might turn into the lane unaware that a HGV was about to exit.*

3.14 Paragraph 12 of the decision notice states:

'The proposed arrangement would markedly intensify and exacerbate the difficulties presented by the current arrangement…. The provision of more formal passing places would neither eliminate nor sufficiently ameliorate the consequences of the proposed increase in traffic movements of the most problematic form of vehicle and at the most problematic times'.

3.15 The Inspector concluded at paragraph 13:

'The conclusion is therefore that the proposed development would be likely to result in material harm to highway safety and convenience'.

3.16 In terms of vehicle routing, the AD facility proposed access to / from the south via the B1149 in preference to a route from the north via Oulton Street. The applicant for the AD facility submitted a Unilateral Undertaking that included an undertaking that no access would be taken to / from the north via Oulton Street. The highway geometries are similar along both routes, therefore the same considerations arise in this regard, but there are more properties along the route to / from the north via Oulton Street.

3.17 The AD facility Appeal decision notice did not consider the alternative of routing to / from the north via Oulton Street due to the Unilateral Undertaking. However, given the Inspector's conclusions on the impact upon highway safety and convenience (which equates to highway geometries) and the impact upon the living conditions of neighbouring residents, these apply to both routes, but the latter element would be considered in relation a larger number of residential properties for the route to / from the north via Oulton Street.

3.18 This conclusion was formed based on the appeal proposal that was in front of the Inspector at that time. As a result, this access strategy for the main construction compound addresses the Inspector's comments and proposes a number of access options that overcome the Inspector's concerns.

Photo 5: Existing Oulton Airfield Access onto The Street (looking to the west)

4. Solar Park on the Former Oulton Airfield

4.1 A solar park at the former Oulton Airfield received planning consent in September 2015 (Application 20150952) and has been fully constructed and is now operational.

4.2 A Construction Traffic Management Plan (CTMP) was submitted as part of the planning application and key extracts from the application are set out below.

4.3 Condition 8 states:

'Means of access to and egress for construction traffic from the development hereby permitted shall be derived from, and to, the B1149 only; as shown on Indicative Site Location Plan contained with Appendix E of the submitted Construction Traffic Management Plan'.

4.4 Appendix E of the CTMP depicts the construction route for the solar park as being the B1149 and The Street, past The Old Railway Gatehouse, as extracted and replicated in **Figure 4.1**.

4.5 As set out in Section 0, it is noted that this is the same access route as proposed by Hornsea Three to the main construction compound.

Figure 4.1: Solar Park Construction Haul Road

(extract from Appendix E of the solar parks Construction Traffic Management Plan: haul route).

4.6 Condition 9 states:

'For the duration of the construction period, all traffic associated with the construction of the development will comply with the submitted Construction Traffic Management Plan and use only the route specified and no other local roads unless approved in writing with the local planning authority in consultation with the Highway Authority'.

4.7 Condition 10 states:

'Prior to any works starting on site, access visibility splays shall be provided in full accordance with the details indicated on the approved plan (Access Visibility Plan contained within Appendix C of the submitted Construction Traffic Management Plan). The splay shall thereafter be maintained at all times free from any obstruction exceeding 0.6m above the level of the adjacent highway carriageway'.

4.8 An extract from Appendix C of the submitted Construction Traffic Management Plan depicting the visibility splay at the access onto The Street is replicated in **Figure 4.2**.

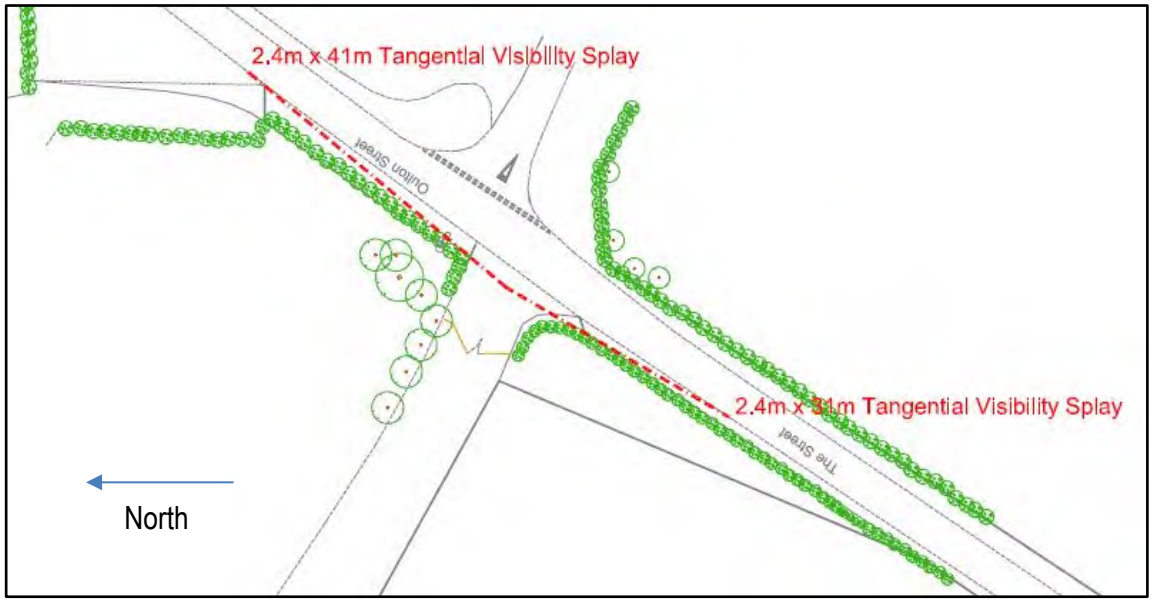


Figure 4.2: Solar Park Construction Access Visibility Splay

(extract from Appendix C of the solar parks Construction Traffic Management Plan: Access Visibility Plan).

5. Main Construction Compound Oulton Access Strategy Hornsea Three

Construction vehicle movements generated at the main construction compound

5.1 An estimate of the likely number of daily construction vehicles for Hornsea Three at the main construction compound was set out in paragraph 7.8.3.44 of Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement (Document A6.3.7).

5.2 It was estimated in the aforementioned (Document A6.3.7) that there would be a maximum of 118 two-way HGV movements per day (i.e. all arrivals plus all departures) and 130 staff vehicle movements per day (i.e. all arrivals plus all departures). It should be noted, however, that such levels of traffic generation are highly unlikely to be generated on a day-to-day basis and represent a worst-case scenario.

5.3 A component of the HGV traffic associated with Hornsea Three would involve the transportation of large cable drums via low loader vehicles to/from the main construction compound. These would be delivered to and stored at the main construction compound and then transported to the appropriate location, as required, for installation as part of the overall onshore cable route.

5.4 Such cable drums (measuring up to approximately 4.5m in height and 4.14m in width) would be classified as abnormal loads and would require transportation under formalised escort conditions in additional to the measures defined within this document.

5.5 At this stage, it is estimated that activities at the main construction compound associated with Hornsea Three would occur within an eight year construction window, however the active use (i.e. delivery of cable drums, regular movements by HGVs etc.) of the main construction compound would be limited to up to 30 months excluding mobilisation and demobilisation. This could be across a single construction phase, or two construction phases that may be separated by a "gap" period of reduced activity (as set in Section 3.8 of Volume 1, Chapter 3: Project Description of the Environmental Statement). Should Hornsea Three be delivered across two phases with a gap period, the main construction compound would be demobilised and not in active use during the 'gap', unless otherwise agreed with the local planning authority.

5.6 While the nature of the main construction compound can be considered temporary, the duration of its potential use warrants comprehensive medium-term solutions to aid the passage of vehicles (particularly HGVs) to/from the main construction compound and to also accommodate the existing traffic on the network to minimise disruption during the 30 month period of most intense activity associated with Hornsea Three.

Consideration of cumulative vehicle movements generated at the main construction compound

5.7 As noted in Volume 4, Annex 5.2: Cumulative Effects Screening Matrix of the Environmental Statement, Vattenfall is proposing to build a major offshore windfarm called Norfolk Vanguard (alongside elements of Norfolk Boreas), located nearly 50 km from Norfolk's coast. For the purpose of this document this project is hereafter referred to as 'Norfolk Vanguard'.

5.8 As part of a wider compound strategy set out within their DCO application (EN010079 the construction of the onshore cable corridor for Norfolk Vanguard would be served by a cable logistics areas near Oulton Airfield. An extract from Vattenfall's literature is presented in Figure 5.1.

5.9 Initial estimates for the additional traffic loadings to/from The Street (known as link 68) as part of Norfolk Vanguard have been reviewed and are considered to be a primary peak of 16 weeks at 96 daily movements and a secondary peak of 6 weeks at 88 daily movements.

5.10 For the purpose of this Technical Note and to offer a 'predicted worse case' (i.e. maximum design scenario for cumulative effects), a scenario has been presented in the following sections which considers the cumulative effect of both Hornsea Three and Norfolk Vanguard construction traffic on The Street and junction with the B1149.

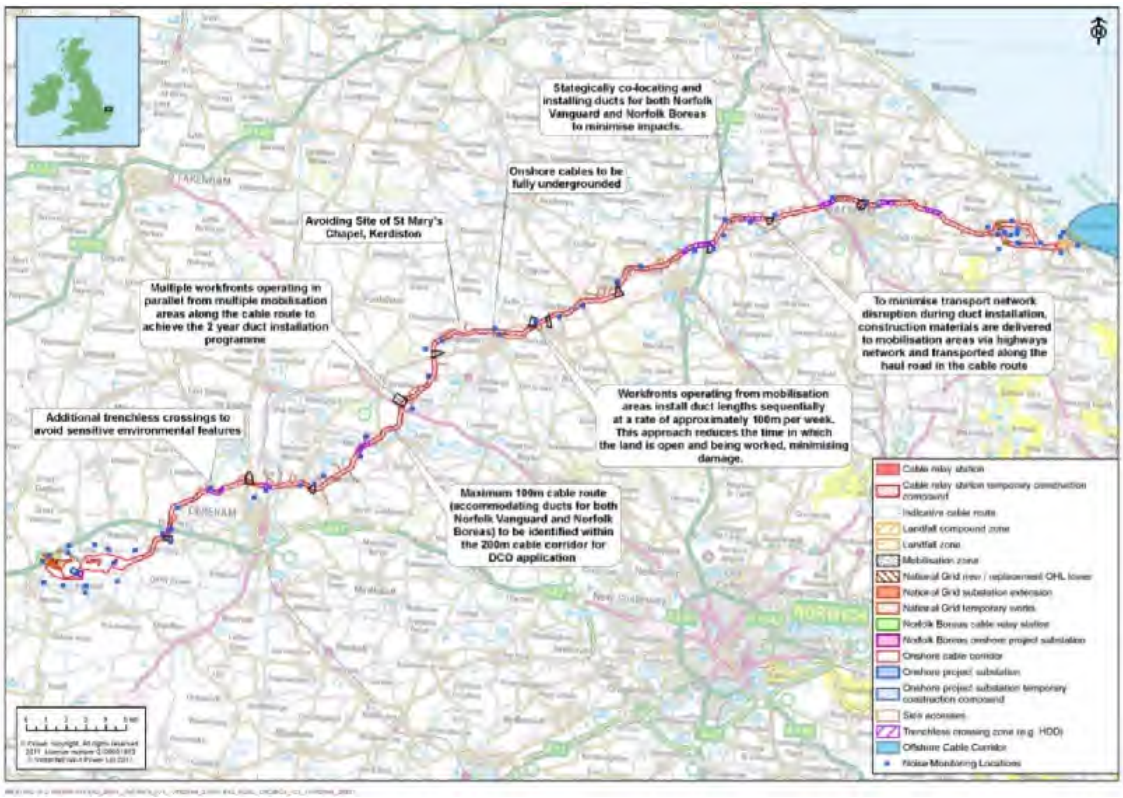


Figure 5.1: Vattenfall Onshore Cable Route

(extract from "Full Set Information Boards" 2017).

Principles and Design of the Oulton Access Strategy

5.11 The options proposed herein for access to the main construction compound from The Street take into account the Inspector's consideration of the AD facility Appeal with a view to addressing the issues raised in that Appeal.

5.12 In relation to the highway geometry and the passing places, the following key points were set out by the Inspector at the AD facility Appeal decision notice:

- Each passing place would not be long enough to accommodate more than one HGV at a time;

- There would be a visibility issue between passing places at the bend in The Street, located broadly between the access and the B1149; and
- HGVs would be unable to turn through the B1149 / The Street junction simultaneously.

5.13 In connection with the Hornsea Three proposals, four options have been devised as outlined below:

Option 1: "Passing Places"

5.14 The main feature of this option comprises a suite of extended passing places at key locations along The Street extending from the junction with the B1149 to the Oulton Airfield access, with all construction traffic routed to/from the B1149 using The Street to the south of the proposed compound.

5.15 Option 1 also includes improvements to junction geometry and drainage at the B1149/The Street junction through bellmouth widening, installation of "containment" kerbs to prevent HGV and agricultural vehicle overrunning and a formal means of drainage including filter drain/soakaway on the South side of the junction to minimise the potential for ponding.

5.16 This option also includes a means of shuttle working (priority for southbound vehicles) in the vicinity of The Old Railway Gatehouse with a view to minimising the potential for two opposing HGVs to pass by this property simultaneously while also serving as a means of speed attenuation. The shuttle working section would cover a distance of approximately 100m and extensive levels of forward visibility are available over this distance, meaning that the shuttle working system should operate successfully and in an orderly manner.

5.17 The existing pronounced, localised hump in the road adjacent to Old Railway Gatehouse would also be regraded to effectively graduate the approaches to the hump and this is intended to reduce the potential for noise and clatter arising from passing HGVs, improving the existing situation. The top of hump level (approximately 48.5m AOD) would remain as is currently the case (given this corresponds with the level of the private drive serving The Old Railway Gatehouse). However, the approaches to the top of the hump (which itself is up to approximately 1.0m above the general road level) would be formed over an extended length meaning the severity of the change in level would be greatly reduced compared to the existing situation.

5.18 Access to the main construction compound would be improved by visibility enhancement (cutting back of the existing hedge line) and modified bellmouth geometry and installation of containment kerbs.

5.19 Forward visibility through the bend adjacent to the access serving The Granary would also be included as part of the package of improvements, by trimming back and maintaining the existing hedge line on the west side of the road.

5.20 The passing places would result in an overall carriageway width of 6.0m to readily enable the passage of two-way HGVs (above the minimum 5.5m width referred in the preceding section 2.10).

5.21 A total of eight passing place improvements are proposed and at key locations, the passing places would be extended in length to accommodate two full-length articulated vehicles. These locations are on the approaches to/from the B1149/The Street junction, on the approach to the bend adjacent to the access serving The Granary and on the approach to the proposed shuttle working section past The Old Railway Gatehouse.

5.22 A "shallow-dig" system of road widening is proposed for the passing places and a cellular system of road construction is identified (Grasscrete, or similar) with a view to minimising impact on existing Root Protection Areas (RPAs) associated with mature tree specimen. The locations of the passing places themselves have been positioned to avoid RPAs where feasible. The specification of the cellular system would be designed, in due course, to accommodate the maximum gross vehicle weight requirements associated with the project and may necessitate an enhancement to a "standard" 40t specification.

5.23 At this stage, it is anticipated that the system would include cellular, cast-in-situ concrete blocks over a compacted permeable sub-base with overall construction depth of approximately 350mm, potentially also including a geo-textile membrane for enhanced stability.

5.24 The cellular system proposed would be permeable, draining directly to the sub-strata and therefore, would not require a separate means of discharge (i.e. to ditch, or watercourse) and appropriate soakage testing (and also soil stability testing) would be carried out, in due course, as part of the detailed design work for the preferred highways improvement option.

Option 2 "Comprehensive Widening"

5.25 Option 2 effectively builds on Option 1 and would provide more extensive road widening (up to 6.0m) along The Street extending from the junction with the B1149 to the main construction compound access, through wider application of the cellular system of road construction referred to above.

5.26 All components of Option 1 (outlined) above would also be incorporated into Option 2. It should be noted that road widening is not proposed where the road passes the Old Railway Gatehouse given that the shuttle working system outlined above is considered a more appropriate solution at this location.

5.27 The impact on existing RPAs along The Street would be more extensive, however, compared to Option1. Additionally, the increased extent of road widening associated with Option 2 (rather than the carefully selected passing place locations for Option 1) could potentially see increased vehicle speeds on account of offering more free-flowing sections for two-way traffic conditions between the junction with the B1149 to the main construction compound access, which could be undesirable from highway safety, noise and vibration perspectives.

5.28 Comprehensive preliminary design drawings are presented for Options 1 and 2 at Appendix D of this report. These drawings also include AutoTrack swept path analysis illustrating the swept path requirements of "low-loader" vehicles between the junction with the B1149 and the main construction compound access to the north, given that these are anticipated to be the largest vehicle type to regularly travel to/from the main construction compound outside of a formal escorted solution.

Option 3a: Passing Places with B1149/The Street/B1345 Circulatory

5.29 Option 3a would provide all of that associated with Option 1, plus additional passing places along The Street to the north of Oulton Airfield, where these can be successfully accommodated. A circulatory system would then be employed (for construction traffic only) involving The Street, the B1149 and the B1345, joining at the B1149/B1345 roundabout. Traffic could then be circulated around the resultant "triangle" in either a clockwise or anti-clockwise rotation depending on the preference of the Highway Authority in consultation with the Oulton Parish Council.

5.30 The advantage of this arrangement would be to remove the potential for opposing compound traffic movements along The Street, reduce the number of opposing movements with existing/proposed background traffic and reduce the number of turning movements associated with Hornsea Three at the B1149/The Street junction to the south.

5.31 The disadvantages associated with Option 3a, compared to Options 1 & 2 would be the routing of construction traffic past numerous residential properties on The Street to the north of Oulton Airfield and the significant fuel and time costs to the project resulting from use of the overall circulatory route.

5.32 A schematic plan for Option 3a is included at Appendix D.

Option 3b: Temporary One-Way Northbound All Traffic (The Street);

5.33 Option 3a would only provide the bellmouth improvements at the B1149/The Street junction and all movements (including existing residential, agricultural and commercial traffic) would be subject to a temporary one-way arrangement for theduration of the main construction compounds use, northbound along The Street for the entire section between the B1149 to the south and B1345 to the north of the main construction compound at Oulton Airfield.

5.34 The advantage of this arrangement would be to remove all opposing traffic movements along The Street and reduce the number of turning movements associated with Hornsea Three at the B1149/The Street junction to the south.

5.35 The disadvantages associated with Option 3b, compared to Options 1 & 2 would be the routing of construction traffic past numerous residential properties on The Street to the north of Oulton Airfield and the cost and time implications to Hornsea Three as well as existing users of The Street resulting from use of the one-way system.

5.36 An additional disadvantage would be the likelihood of increased traffic speeds along The Street due to there being no opposing southbound traffic movements which would need to be suitably addressed as part of the detailed design process.

5.37 A schematic plan for Option 3b is included at Appendix D.

5.38 It is worth noting that the specific routing of compound traffic northbound itself introduces further constraints at the interface with Blickling Road and in particular at the river crossing with the River Bure.

Main construction compound access junction onto The Street

5.39 The access into the main construction compound from The Street will re-use the same access that was used for the construction of the solar park, as described in Section 0, and it will take the same form and layout – albeit with improved bellmouth geometry and visibility.

5.40 These developments generated HGV movements through the access junction and the proposal for access to the main construction compound replicates this.

5.41 Condition 10 of the solar park planning consent required visibility splays of 2.4m x 41m (tangential) to the left (north) and 2.4m x 31m (tangential) to the right (south) to be maintained at all times free from any obstruction exceeding 0.6m above the level of the adjacent highway carriageway. Although, Condition 10 did not reference it, the CTMP set out that banksmen will be used to control turning movements from the access track onto the main public highway.

5.42 These visibility splays and measures were proposed by the applicants of the solar park as part of their CTMP and accepted by NCC, as the Local Highway Authority, leading to the imposition of Condition 10. The solar park was constructed using the access on that basis.

5.43 Reviewing detailed topographic survey data, it is evident that with only minor trimming back of exiting hedge lines, improved levels of visibility could be provided to allow access to the main construction compound for the purpose of Hornsea Three.

5.44 It is proposed that visibility splays of 2.4m x 90m (tangential) to the left (north) and 2.4m x 90m (tangential) to the right (south) will be maintained at all times at the access to the main construction compound free from any obstruction exceeding 0.6m above the level of the adjacent highway carriageway. The final Construction Traffic Management Plan to be submitted and approved under Requirement 18 of the draft DCO, document reference A3.1, will be used to control HGV turning movements from the access track onto the main public highway.

5.45 The DCO provides for a temporary reduction in the speed limit at all access points on roads where the speed limit is 40mph or higher. This applies to The Street, where the speed limit is currently 60mph. The DCO will, therefore, provide for a temporary reduction in the speed limit along The Street and in the vicinity of the access into the main construction compound to 30mph and the visibility splays of 90m x 2.4m x 90m referred to above are based on a resultant design speed of approximately 37mph, in respect of Design Manual for Roads & Bridges guidelines.

5.46 Although The Street can be described as generally straight at the immediate location of the access, there is in fact a very slight bend in the road and the access to the main construction compound is located on the outside of this bend. This improves visibility from the main construction compound in comparison to if The Street was straight.

Highway Capacity of the B1149 / The Street junction

5.47 A suite of traffic surveys have been undertaken on B1149 and The Street in 2018, respectively through the installation of Automatic Traffic Counters (ATCs).

5.48 For the purposes of traffic capacity assessment, the construction phase of Hornsea Three, with respect to the more intensive use of the main construction compound, is considered to be until circa 2028. The Tempro 7.2 computer programme has been used to obtain growth factors from the aforementioned ATCs to a future year of 2028.

5.49 Forecast development traffic flows (for HGVs and staff movements) for Hornsea Three and the Norfolk Vanguard projects have been loaded onto the B1149/The Street crossroads with trips assigned equally inbound and outbound for the morning and evening peak hours of operation. In order to obtain a 'worse-case' assessment in terms of traffic loadings, all inbound traffic is considered to turn right in and then right out to/from The Street. In reality, traffic would also turn left in and left out of The Street. Details of the forecast traffic flows are provided in Appendix E.

5.50 A theoretical capacity assessment of the B1149/The Street crossroads junction has been undertaken as part of this report using the PICADY computer programme, based on the aforementioned traffic flows for the following scenarios.

- 2028 AM and PM background;
- 2028 AM and PM background plus Hornsea Three;
- 2028 AM and PM background plus Hornsea Three plus Norfolk Vanguard.

5.51 PICADY (Priority Intersection Capacity and Delay) is a programme for modelling three and four arm priority junctions and is based on empirical relationships which link capacity and safety with various geometric junction parameters such as lane widths, flares and visibility sight lines.

5.52 Results from the modelling are expressed in queue length, Ratio of Flow to Capacity (RFC) and delay (seconds) as measures of theoretical junction performance. Modelling values of less than 0.85 RFC indicate that the approach (es) to the junction being modelled are operating well within theoretical capacity.

5.53 The results of the PICADY modelling for the various test scenarios, which also take into account the potential traffic loading arising from the Vattenfall project are presented below:

Arm A: B1149 (NW)

Arm B: The Street

Arm C: B1149 (SE)

Arm D: "Southgate"

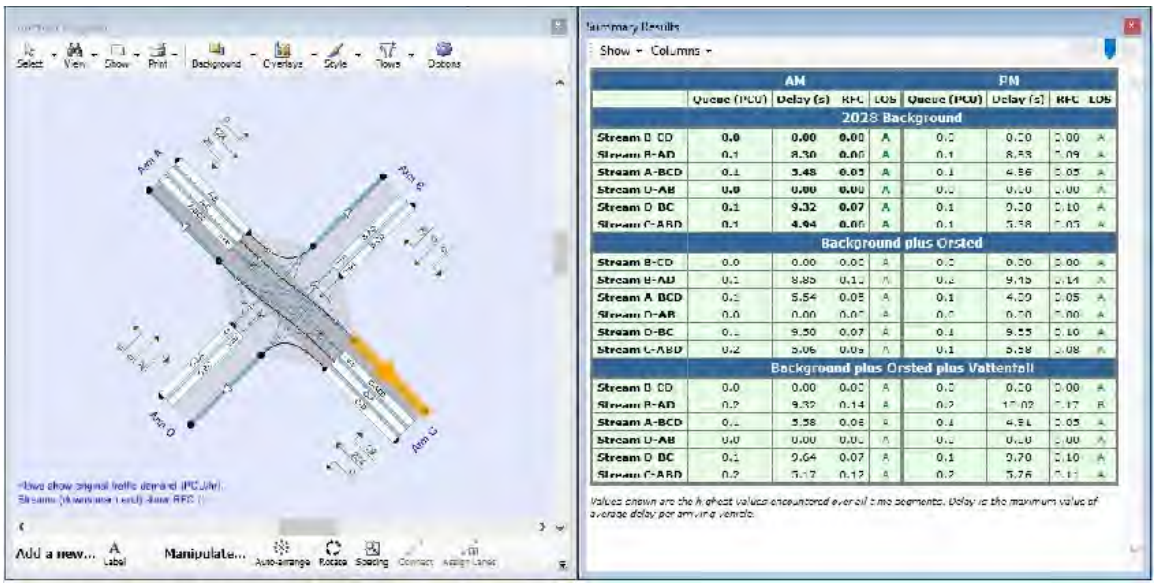


Figure 5.2: PICADY modelling results

5.54 The results of the PICADY modelling for the various test scenarios clearly show that the junction would be operating well within theoretical capacity with the introduction of the traffic loadings arising from the proposed development projects.

5.55 The traffic flow assumptions and the junction modelling parameters are provided in Appendix E.

Highway geometry design check of the B1149 / The Street junction

5.56 The B1149/The Street junction is a non-staggered crossroads arrangement also including Chapel Street leading to Southgate to the south-west. The major arm (B1149) follows a generally straight, but, undulating alignment and is approximately 6.0m in width and is subject to a derestricted National Speed Limit of 60mph.

5.57 Bellmouth radii for The Street's connection with the B1149 are in the order of 15m and kerbing is not currently provided at the junction and overrunning of the verge is evident anticipated to be primarily on account of agricultural vehicles with trailers.

5.58 Field access are provided in the vicinity of the junction either side of The Street.

5.59 Highway drainage is provided via an informal system of verge "grips", although there is evidence of ponding, potholes and broken carriageway edges on The Street within the bellmouth.

5.60 Hedge lines on the B1149 do not appear to have been recently trimmed back as part of routine highway maintenance (see Photo 4 below – dated 10 September 2018). However, analysis of digital Ordnance Survey mapping indicates that visibility splays of 215m x 2.4m x 215m could be provided to/from The Street at this junction by means of improved hedge line maintenance.

5.61 Such levels of visibility accord with the requirements of the Design Manual for Roads & Bridges for a design speed in excess of the existing 60mph speed limit. As part of Hornsea Three, there would be a commitment to maintaining hedge lines on the approaches to this junction (and along The Street) with a view to providing maximum levels of visibility that are achievable within the highway boundary.

5.62 The proposed geometric, visibility and drainage improvements for the B1149/The Street junction presented on the accompanying preliminary design drawings (Appendix D) also include AutoTrack swept path analysis for low loader vehicles.

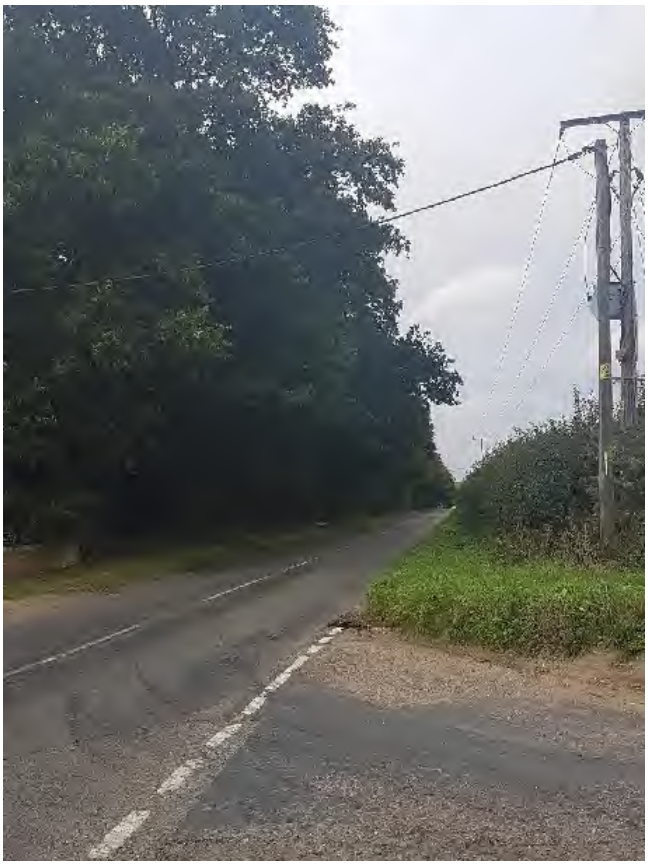


Photo 6: B1149/The Street junction (looking north-west from The Street)

Highway capacity estimate using TA46/97

5.63 The Department for Transport (DfT) (1997) published TA46/97, 'Traffic flow ranges for use in the Assessment of New Rural Roads' as an advice note for the purposes of assessing new rural trunk road schemes. The document defines a 'rural' road as one which is not subject to a local speed limit and defines an 'urban' road as one which is subject to a local speed limit. The Street does not have a local speed limit and, although it is not a trunk road, has the definition of a 'rural' road in the overall context of TA46/97.

5.64 TA46/97 provides guidance with regard to appropriate carriageway designs for new rural trunk roads and provides a methodology for calculating the Congestion Reference Flow (CRF), which is an estimate of the Annual Average Daily Traffic (AADT) flow at which the carriageway is likely to be 'congested' in the peak periods on an average day.

5.65 The CRF of a link is dependent upon a number of factors including carriageway width and composition of traffic amongst others.

5.66 It should be noted that TA46/97 does not take into account the fact that passing places would be needed to allow HGVs to pass one-another. It should also be noted that TA46/97 is designed for the trunk road network rather than roads like The Street. Furthermore, TA46/97 is applicable to new trunk roads and it is not intended to be applicable to existing roads.

5.67 However, TA46/97 has been reviewed to calculate the CRF of The Street for guide purposes only.

5.68 Using the advice within TA46/97, the calculated CRF of The Street is an AADT (Annual Average Daily Traffic) flow of 20,203 vehicles.

5.69 The AADT is broadly comparable to the 14 day average daily traffic flow from the traffic survey undertaken along The Street. Inspection of Appendix A shows that the 14 day average daily traffic flow along The Street was 590 vehicle movements.

5.70 This is substantially lower than the CRF and indeed represents only 3% of it. However, caveats to the calculated CRF are explained above and it is considered that the document is not suitable for estimating the highway capacity of The Street.

Highway capacity estimate for single track roads

5.71 There are three identified research documents that consider the capacity of single track roads (for example 2.5 m wide) with passing places. It is noted that The Street is not a single track road because cars can pass one-another along it; it is a narrow single carriageway road.

5.72 These three research documents, therefore, do not strictly apply to The Street, however, they may form a useful reference for guide purposes only. The findings from these three documents are summarised below:

- The Walker et al (1967) *'LR71 Single Track Roads in the Scottish Highlands'* study found that the capacity of a single track road with passing places was between 100-220 vehicles per hour depending on the alignment.
- The Burrow (1977) *'Delays on single-lane roads with passing places'* study found that the capacity of a single track road with passing places was between 100-300 vehicles per hour depending on the number of passing spaces.
- The Sweet (2012) *'The capacity of single-track rural lanes: an initial investigation'* study also found that the effective capacity of a single-track lane with passing spaces lies somewhere between 100-300 vehicles per hour.

Photo 7: The Street (looking north from The Granary Access, note scrubbed verges)

5.73 These three documents found that the capacity of a single track road with passing places is likely to be within the range of 100 to 300 vehicle movements per hour. The findings from the study in 2012 is comparable to the findings from the earlier studies.

5.74 As explained above, The Street is not a single track road with passing places but it is a narrow single carriageway road able to accommodate cars passing one-another. Its capacity will, therefore, be substantially higher than the range found within these three documents.

5.75 Notwithstanding this, inspection of the results from the traffic survey undertaken on The Street at Appendix A shows that vehicle movements along it peaked at 70 vehicle movements per hour, which is less than the lower end of the range found within these three documents.

5.76 Even if the construction vehicle movements generated at the main construction compound were added to the observed vehicle movements along The Street, the total hourly vehicle movements would still not exceed the range identified for single track roads with passing places.

Section Conclusion

5.77 There are no relevant guidance documents available which can be used reliably to estimate the capacity of The Street, either with or without the passing places or more extensive widening works outlined in the options presented in this document.

5.78 Of the documents that are available for the two types of road, TA46/97 takes no account for the fact that passing places would be needed to allow HGVs to pass one-another, and the research documents do not take into account that cars would not need passing places to pass one-another on account of their reduced width.

5.79 There is a substantial variance between the capacities estimated by both types of documents and the actual capacity of The Street will fall somewhere between the two. However, there is no guidance available to determine where the capacity falls.

5.80 However, on the basis of an estimate of capacity being in the range of 100 to 300 vehicle movements per hour, it could reasonably be concluded that the theoretical capacity of The Street would not be exceeded with the addition of the construction vehicles generated by Hornsea Three and Norfolk Vanguard at travelling to/from the main construction compound.

6. Summary and Conclusions

6.1 This document has been prepared to set out the access strategy options for vehicles to/from the proposed main construction compound at the former Oulton Airfield and sets out how vehicles could access the compound from the B1149 via The Street in a safe and efficient manner.

6.2 Four options have been presented for consideration:

- Option 1: Passing Places;
- Option 2: Comprehensive Widening;
- Option 3a: Passing Places with B1149/The Street/B1345 Circulatory;
- Option 3b: Temporary One-Way Northbound All Traffic (The Street);

6.3 The strategy options have taken account of consultation with key stakeholders as well as recent developments and development proposals with access to the former Oulton Airfield. A cumulative assessment including Norfolk Vanguard has also been included within this Technical Note.

6.4 In due course, the preferred access strategy option will be incorporated in to the final Construction Traffic Management Plan secured through Schedule 1, Part 3, and Requirement 17 of the draft DCO (document reference A3.1) and will be subject to an independent Road Safety Audit (RSA) as part of the overall design process.

6.5 A PICADY traffic modelling exercise has been undertaken which demonstrates that the B1149/ The Street crossroads junction has sufficient theoretical operating capacity to accommodate the traffic loadings associated with Hornsea Three and those other upcoming projects that also propose to use access via The Street to compound(s) at Oulton Airfield.

6.6 In summary, access to the main construction compound will be taken from the B1149 via The Street and the access strategy options included herein take account of the temporary nature of the use of the main construction compound and offer the ability to provide a range of access options that satisfy highway capacity and safety requirements while also considering the representations made by the local community and residents.

7. References

Burrow (1977) Delays on single-lane roads with passing places.

Department for Transport (1997) TA46/97 Traffic flow ranges for use in the Assessment of New Rural Roads. Available online: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol5/section1/ta4697.pdf [Accessed: 27 July 2018].

Department for Transport (2007) Manual for Streets. London, Thomas Telford Publishing.

Sweet (2012) The capacity of single-track rural lanes: an initial investigation.

Walker et al (1967) LR71 Single Track Roads in the Scottish Highlands.

Appendix A - Summary of Traffic Survey along The Street

	Weekday Average						14-Day Average						Saturday Average						Sunday Average					
Hour	Northbound		Southbound		Two-Way		Northbound		Southbound		Two-Way		Northbound		Southbound		Two-Way		Northbound		Southbound		Two-Way	
Begin	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs
00.00	1	0	1	0	2	1	1	0	1	0	3	0	2	0	1	0	2	0	3	0	2	0	5	0
01.00	2	1	0	0	2	1	2	0	1	0	2	1	1	0	3	0	4	0	1	0	0	0	1	0
02.00	2	0	0	0	2	1	1	0	0	0	2	0	2	0	0	0	2	0	1	0	1	0	1	0
03.00	3	1	1	1	4	2	2	1	1	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0
04.00	1	1	1	1	2	1	2	1	1	0	3	1	4	0	0	0	4	0	3	0	0	0	3	0
05.00	5	1	2	1	8	2	4	1	2	1	6	1	2	0	2	0	3	0	1	0	2	0	2	0
06.00	11	1	11	3	22	4	9	1	9	2	18	3	3	0	3	1	6	1	5	0	4	0	9	0
07.00	19	2	15	2	34	3	16	1	12	1	27	3	7	1	5	0	12	1	6	0	3	0	8	0
08.00	25	1	23	2	49	2	26	1	20	1	46	2	43	1	15	0	58	1	14	1	7	0	21	1
09.00	25	1	22	1	47	2	23	1	21	1	44	2	18	0	26	1	44	1	18	1	14	0	32	1
10.00	24	1	19	1	43	2	23	1	23	1	46	2	24	0	42	1	66	1	18	0	26	1	44	1
11.00	21	1	21	1	42	2	25	1	22	1	47	1	44	0	26	1	70	1	27	0	23	0	49	0
12.00	18	0	15	0	33	1	20	0	17	0	37	1	23	1	20	0	43	1	29	1	25	0	53	1
13.00	18	0	19	1	37	1	18	0	20	1	38	1	15	1	19	0	34	1	23	0	23	1	46	1
14.00	20	1	17	1	37	2	18	0	20	1	38	1	18	0	24	1	42	1	13	0	28	0	41	0
15.00	15	1	25	1	40	2	16	1	25	1	41	1	15	1	21	0	36	1	22	0	25	1	47	1
16.00	22	0	33	0	55	0	21	0	32	0	52	0	15	0	27	0	41	0	22	2	30	0	52	2

	Weekday Average						14-Day Average						Saturday Average						Sunday Average					
17.00	24	0	30	1	54	1	22	0	26	0	48	1	19	0	16	0	34	0	15	0	18	0	33	0
18.00	18	0	14	0	32	0	17	0	13	0	30	0	16	0	16	0	32	0	11	0	8	0	19	0
19.00	13	1	12	0	25	1	13	0	12	0	24	1	12	0	9	0	21	0	11	0	12	0	23	0
20.00	8	0	6	0	14	1	7	0	6	0	13	0	5	0	10	0	15	0	4	0	5	0	9	0
21.00	7	0	6	0	13	0	7	0	6	0	13	0	4	0	7	0	11	0	6	0	7	0	12	0
22.00	4	0	3	0	6	0	4	0	3	0	7	0	5	0	6	0	11	0	2	0	4	0	5	0
23.00	2	0	1	0	3	0	2	0	2	0	3	0	2	0	5	0	7	0	4	0	1	0	5	0
12 hr (07:00 to 19:00	249	8	253	10	502	18	245	6	249	8	495	14	255	3	253	2	508	5	215	3	228	2	443	5
24 hr	307	14	298	17	605	31	297	11	293	13	590	24	294	3	297	3	591	6	253	3	263	2	516	5

Appendix B - AD Facility Statement of Common Ground

Statement of Common Ground

Oulton Airfield, The Street, Oulton, Norfolk

Biomass Renewable Energy Facility, associated landscaping and vehicular access

Appeal Reference: APP/K2610/A/14/2212257

LPA Reference: 20130860

Hearing Date: 09 April 2014

1. Description of the Site and Surrounding Area

1.1 The appeal site lies between Oulton Street to the north-east, and the B1149 Holt Road to the south-west. The site is around 4.07 hectares in area including the access road to The Street. Historically the site formed part of the former RAF Oulton airfield; the former airfield is now in agricultural (currently arable) use. The site is flat with a significant, mature tree belt to the north and east and also close by to the south.

1.2 Immediately to the east is a Bernard Matthew's poultry farm. This comprises twelve large poultry buildings sited on a concrete hard-standing with parking close to the road.

1.3 To the south east of the site is the closest detached dwelling, known as The Old Railway Gatehouse. It is 125 metres along The Street from the proposed access, 185 metres from the nearest part of the silage clamps, and 390 metres from the nearest storage tank building on site. There is a detached property to the south-west - Bluestone Cottage - which is 316 metres from the nearest part of the site. To the north-east is the village of Oulton Street with a concentration of houses, the closest being house is approximately 600 metres away from the appeal site.

2 Planning History of the Site

2.1 The appeal site has no planning history, save for the submission of a request for an EIA screening opinion, in relation to the appeal proposals, in July 2013. The following represents a summary of the planning history of adjacent land:

- 2013 – application for a 77m high wind turbine (LPA ref. 20130177) on land to the north-east of the appeal site. Application withdrawn;
- 2013 – application for 6 no. biomass boilers and fuel stores (replacement for LPG tanks on the site of the poultry buildings to the east of the appeal site) (LPA ref. 20131126). Application withdrawn.

3 Application Documents

- Site Location Plan (17697/100 Rev. B) April 2013 – A3;
- Site Layout Plan (17697/003 Rev. G) February 2013- A3;
- Topographical Survey (17697/001 Rev. A) 04 February 2013–A0;
- Topographical Survey (17697/002 Rev. B) 04 February 2013 –A0;
- Elevations and Details (17697/010 Rev. B) May 2013 – A0;

- Proposed Cross Sections (17697/011 Rev. B) May 2013 – A1;
- Application covering letter dated 28 June 2013;
- Design and Access Statement – June 2013;
- Planning Statement – June 2013;
- Transport Assessment – June 2013;
- Phase 1 Habitat Survey Rev. A- May 2013;
- Flood Risk Assessment Rev. A – May 2013;
- Archaeological Desk-based Assessment – April 2013;
- Air Quality Assessment – 20 May 2013;
- Odour Assessment – 20 May 2013;
- Noise Impact Assessment – 05 June 2013;
- Planting & Landscaping Maintenance Schedule – June 2013;
- Photomontages – Indicative Model and Viewpoints 1-4, August 2013;
- Photomontages – Additional Viewpoints 5-9, August 2013;
- Photomontage Methodology, 25 September 2013;
- Transport Assessment with Amendments, September 2013;
- Revised Planting and Landscaping Maintenance Schedule, June 2013;
- DMRB Assessment dated 11 October 2013.

4 Reasons for Refusal

4.1 It is agreed that the following represent the LPA's reasons for refusal, as confirmed by Ruth Sainsbury's email of 13 November 2013:

- The appeal proposals would generate additional vehicular traffic, the impact of which is so severe that it would have a significant impact upon the safety and satisfactory functioning of the local highway network;
- That additional vehicular traffic would result in a significant detrimental impact upon the character of the area;
- That additional vehicular traffic would result in a significant detrimental impact upon the amenities of local residents.

4.2 After further discussions with the Highway Authority, the LPA will not be pursuing the reason for refusal based upon highway safety (bullet point 1, paragraph 4.1 above).

4.3 It is agreed that, in all other respects, the appeal proposals are acceptable, including:

- The principle of the development of the site for renewable energy is agreed;
- There are no flood risk issues;
- The appeal proposal is acceptable in terms of ecology and biodiversity;
- There are no unacceptable landscape or visual impacts resulting from the proposed development;
- There proposed passing bays are acceptable and have no unacceptable impacts, including in terms of trees or landscape character;
- There is no unacceptable impact on designated or non-designated heritage assets;
- There are no unacceptable impacts in terms of noise, odour or air quality as regards the operation of the appeal proposals itself;
- The principle of using a s.106 obligation to control routing of traffic is agreed.

5 Development Plan

5.1 It is agreed that for the purpose of this appeal, the Development Plan comprises:

- Joint Core Strategy (JCS) for Broadland, Norwich and South Norfolk (March 2011) – amendments adopted January 2014 (the amendments relate to the Broadland part of the Norwich Policy Area (NPA), adopted on 10 January 2014 and are subject to a period of legal challenge ending on 21 February 2014). NB: Oulton is not in the NPA;
- Broadland District Local Plan Replacement May 2006 - saved policies (May 2009), excluding those policies superseded by the JCS.

5.2 For the purpose of this appeal, the following Development Plan policies are considered relevant:

Joint Core Strategy (JCS) for Broadland, Norwich and South Norfolk

- Policy 1: Addressing Climate Change;
- Policy 3: Energy and Water;
- Policy 5: The Economy.

Broadland District Local Plan Replacement 2006 (saved polices - 2009)

5.3 The following saved policies of the Local Plan are considered relevant to the determination of this appeal:

- Policy GS3: General Considerations for Development;
- Policy ENV2: General Considerations for Development;
- Policy EMP9: Farm Diversification;
- Policy CS7: Renewable Energy;
- Policy CS12: Pollution Prevention;
- Policy CS14: Noise;
- Policy TRA14: Highway Safety.

5.4 The interpretation of these policies – insofar as they relate to the LPA's stated reasons for refusal – is not agreed.

6 Status of draft Development Plan documents and weight to be attached

6.1 Broadland District Council is progressing a Development Management Policies and Site Allocations DPD; these are at relatively early stages (the 'Proposed Submission' versions are expected to be published in Spring/Summer 2014). It is agreed that having regard to Government policy and guidance in this context, these emerging plans have little weight.

7 Material Considerations

7.1 It is agreed that the following represent material considerations in the determination of this appeal:

- The National Planning Policy Framework (March 2012);

- Planning Practice Guidance for Renewable and Low Carbon Energy (July 2013);
- Noise Policy Statement for England [NPSE] Section 1.7;
- Explanatory Note to the NPSE Section 2.2.1.

8 Technical Studies

8.1 The methodology and assessment criteria of the following application documents are agreed:

- Transport Assessment and Automated Traffic Count data (amended September 2013);
- Landscape and visual impact photomontages;
- Noise Impact Assessment (June 2013);
- Air Quality Assessment;
- Odour Assessment;
- Flood Risk Assessment;
- Phase 1 Habitat Survey;
- Archaeological Assessment;
- Planting and Landscaping Maintenance Schedule.

8.2 Furthermore, the methodology of the Traffic Noise Technical Memorandum of 10 January 2014 (ref. 10935-M001 Rev. C) prepared by Adrian James Acoustics Ltd. is agreed as being appropriate. The conclusions are not agreed.

8.3 The methodology and assessment criteria of the following application documents are not agreed:

- DMRB Assessment dated 11 October 2013 (Resource and Environmental Consultants Ltd.)

9 Other Core Documents

9.1 In addition to those referred to in 7.1 above, it is agreed that the following may be referred to:

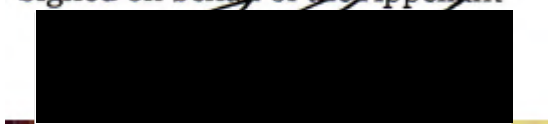
- Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 HD213/11 – Revision 1. Highways Agency, November 2011;
- Calculation of Road Traffic Noise (CRTN) Department of Transport, HMSO, 1988;
- BS7445-1:2003 "Description and measurement of environmental noise – Part 1 – Guide to quantities and procedures" (Note that this is identical to the superseded ISO 1996-2:1982 and that the 2003 revision to this part of the ISO has not been adopted by BSI in the UK);
- BS7445-2:1991 "Description and measurement of environmental noise – Part 2 – Guide to the acquisition of data pertinent to land use" (Note that this is identical to the superseded ISO 1996-2:1987 and that the 2007 revision to this part of the ISO has not been adopted by BSI in the UK);
- BS7445-3:1991 "Description and measurement of environmental noise – Part 3 – Guide to application to noise limits" (Note that this is identical to the withdrawn ISO 1996-3:1987;

- ANC Guidelines "Environmental Noise Measurement Guide" Association of Noise Consultants, 2013;
- Planning Practice Guidance: Noise. March 2014;
- BS8233:2014 "Guidance on sound insulation and noise reduction for buildings".

10 Conditions

10.1 It has been agreed that in the event of the appeal being allowed, then the planning permission can be the subject of conditions set out in Appendix A attached (except as indicated/noted*):

(* Condition 6 is only agreed by the appellant in the event of the Inspector finding against the appellant's initial position as set out in paragraph 6.12 of the accompanying Statement of Case.)

Signed on behalf of the Appellant 	Signed on behalf of the Local Planning Authority
Date: 13.03.2014	Date: 13.03.2014
Position: Agent to the Appellant	Position: Senior Planning Officer Broadland District Council

Appendix A to Statement of Common Ground

Conditions

1) The development to which this permission relates must be begun not later than three years beginning with the dates on which this permission is granted.

2) The development hereby permitted shall not be carried out otherwise than in accordance with the following drawings:

- Site Location Plan (17697/100 Rev. B) April 2013
- Layout Plan (17697/003 Rev. G) February 2013;
- Topographical Survey (17697/001 Rev. A) 04 February 2013;
- Topographical Survey (17697/002 Rev. B) 04 February 2013;
- Elevations and Details (17697/010 Rev. B) May 2013;
- Proposed Cross Sections (17697/011 Rev. B) May 2013.

3) The feedstock shall only be silage derived from plant-based material.

4) With the exception of urgent maintenance requirements, all site operations, including the import and export of material, which take place in the period from 1 November to 31 August, shall take place only between the hours of 07:30 and 19:00 (Monday to Friday) and 09:00 and 18:00 (Saturdays, Sunday and Bank Holidays).

In the period from 1 September to 31 October (the 'harvest period'), all site operations, including the import and export of material, shall take place only between the hours of 07:30 and 21:30 (Monday to Friday) and 9:00 and 20:00 (Saturdays, Sundays and Bank Holidays).

With the exception of urgent maintenance requirements any temporary variation to the harvest period defined above will be agreed in writing with the Local Planning Authority two weeks prior to the proposed implementation of the variation.

5) The number of vehicle feedstock deliveries to the facility shall not exceed 2,000 per annum. A log of these deliveries shall be kept and these records shall be made available for inspection by the LPA at seven days' notice.

6) Prior to the commencement of development details of the measures to mitigate noise and disturbance to The Old Railway Gatehouse shall be submitted to and approved in writing by the Local Planning Authority. The site shall not be brought into operation until the agreed mitigation has been carried out to the satisfaction of the Local Planning Authority. The approved mitigation work shall remain in perpetuity.*

7) Prior to the installation of any external lighting details shall be submitted to and approved in writing by the Local Planning Authority. The lights shall then be installed and retained in accordance with the approved details unless otherwise approved in writing by the Local Planning Authority.

8) Where used, reversing alarms on all vehicles on site should be of the broadband white noise type.

9) Best Practicable Means shall be used to ensure that all equipment and machinery used on site is operating in order to minimise noise emissions.

10) Emissions from the activities (including those associated with commissioning the plant) shall be free from odour at levels likely to cause harm to amenity outside the site, as perceived by an authorised officer of Broadland District Council. The operator shall use appropriate measures to prevent or where that is not practicable, to minimise, odour.

11) No airborne dust arising from the site shall be visible at any boundary with sensitive domestic premises.

12) Prior to the commencement of the development hereby permitted adequate arrangements for the control of pests on site, including bird pests, shall be submitted for approval to the Local Planning Authority. The development shall then be operated in accordance with the approved details.

13) The gas engine shall be installed, maintained and operated in accordance with the manufacturer's and servicing company's instructions and the exhaust gases shall be emitted through a stack with a height of not less than 10m.

14) The emission concentrations of the parameters in the following table shall not exceed the stated concentrations.

Parameter	Concentration
Nox	<500mg/m3
CO	<1400mg/m3
NMHC	<75mg/m3
Total VOCs	<1000mg/m3
SO2	<350mg/m3

The exhaust emission limits specified are at reference conditions of 273 K, 101.3 KPa, 5% Oxygen dry gas and 0 % R. H.

15) Prior to the CHP gas engine being brought into use the operator must submit a written proposal for sampling all parameters in the above table together with the efflux velocity, discharge volume and discharge temperature. Sampling shall take place not later than two months from the date that Broadland District Council agrees the sampling proposal and the results shall be reported to the Council not later than six weeks from the date of sampling. Thereafter, six monthly sampling and reporting of NOx and CO shall take place to the satisfaction of the Local Planning Authority.

If the engine is replaced the emissions shall not exceed the parameters in the above table.

16) Prior to the commencement of operation of the site, noise levels from the CHP unit shall be measured and submitted to the Local Planning Authority to ensure that they comply with the levels submitted in table 5.1 of the noise impact assessment report 90215r4.

17) Prior to the first use of the development hereby permitted the proposed on-site parking areas and turning shall be laid out, demarcated, levelled and surfaced in accordance with the approved plan and retained thereafter available for that specific use.

18) Prior to the first occupation of the development hereby permitted a visibility splay measuring 120m x 4.5m x 120m shall be provided to each side of the access where it meets the highway and such splays shall thereafter be maintained at all times free from any obstruction exceeding 0.6 metres above the level of the adjacent highway carriageway**.**

19) Prior to the first occupation of the development hereby permitted any access gates, bollard, chain or other means of obstruction shall be hung to open inwards, set back, and thereafter

retained a minimum distance of 8 metres from the near channel edge of the adjacent carriageway.

20) No works shall commence on site until the details of wheel cleaning facilities associated with the proposal have been submitted to and approved in writing by the Local Planning Authority in consultation with the Highway Authority.

Prior to the commencement of the use hereby permitted the approved wheel cleaning facilities shall be provided to the written satisfaction of the Local Planning Authority in consultation with the Highway Authority and thereafter maintained and used as appropriate.

21) Prior to any works starting on site a vehicular access allowing traffic movements to and from The Street (C263) to the site from the southerly direction only shall be constructed in the position shown on the submitted plan in accordance with a detailed scheme to be agreed in writing with the Local Planning Authority in consultation with the Highway Authority. The access is to be constructed using High Containment Kerbs and surfaced to Norfolk County Council Industrial Access Construction Specification for the first 15m into the site from the near channel edge of the adjacent highway carriageway.

Prior to the commencement of the use hereby approved a no-left turn sign shall be erected within the site close to the access, the details of its design and location shall be agreed in writing with the Local Planning Authority.

22) Notwithstanding the details indicated on the submitted drawings no works shall commence on site until a detailed scheme for informal carriageway widening (passing places) on Oulton Street (C263) up to, and including, the development site access from the B1145 have been submitted to and approved in writing by the Local Planning Authority in consultation with the Highway Authority.

Prior to the first occupation of the development hereby permitted these off-site highway improvement works shall be completed to the written satisfaction of the Local Planning Authority in consultation with the Highway Authority.

23) Landscaping of the site as shown on the submitted Proposed Planting drawing No 17697/901 Rev C and the Planting and Landscaping Maintenance Schedule received 27 September 2013 shall be carried out before the end of the current or first available planting season following practical completion of the development hereby permitted.

Prior to first use of the CHP unit the 3.7m earth bund shall be constructed along the western boundary as shown in the approved landscaping plan. The bund shall be retained thereafter.

Any such trees that are removed, die or become, in the opinion of the Local Planning Authority seriously damaged or defective within five years of planting shall be replaced with specimens of a similar size and species as originally required.

24) No development shall take place until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the Local Planning Authority. The drainage strategy should demonstrate the surface water run-off generated up to and including the 1 in 100 year return period critical storm including allowances for climate change will be managed to ensure it does not cause nuisance or damage. The scheme shall subsequently be implemented in accordance with the approved details before the development is completed.

The scheme shall include:

(i) Sizing of the infiltration pond to ensure the volume of water produced by the contributing area can be safely managed in all rainfall events up to the 1 in 100 year return period event including allowances for climate change, as per the calculations provided within Appendix A of the FRA. Information should be submitted to clarify if the pond is to

maintain a retained water level, and if so, sized accordingly.

(ii) Details of how the infiltration pond will be designed in accordance with the best practice contained in the CIRIA document C697 "The SUDS Manual".

(iii) Plans and drawings showing the locations and dimensions of all aspects of the proposed surface water management scheme. The submitted plans should demonstrate that the proposed drainage layout will perform as intended based on the topography of the site and the location of the proposed surface water management features. In addition, full design details, including cross sections of any proposed infiltration or attenuation features will be required.

(iv) Supporting calculations, drawings and flow routing to demonstrate that the surface water drainage system, including pipe network, has the ability to manage the volumes of water produced by all rainfall events up to the critical duration 1 in 100 year return period event including allowances for climate change.

(v) Confirmation that in the event of exceedance flows that surpass the critical duration rainfall event or a blockage/failure occurs within the drainage network the proposed infiltration pond should incorporate an emergency spillway as part of the design. We suggest that the emergency spillway directs any exceedance flows away from the development.

(vi) Sufficient information to demonstrate that people and property will be kept safe from flooding, with consideration given to overland flow routing where required.

(vii) Details of how the scheme shall be maintained and managed after completion, for the lifetime of the development. Appendix B of the FRA submitted should formulate the basis of a proposed management strategy.

25) (A) No development shall commence until a Written Scheme of Archaeological Investigation has been submitted to and approved by the local planning authority in writing. The scheme shall include an assessment of significance and research questions; and

1. The programme and methodology of site investigation and recording

2. The programme for post investigation assessment

3. Provision to be made for analysis of the site investigation and recording

4. Provision to be made for publication and dissemination of the analysis and records of the site investigation

5. Provision to be made for archive deposition of the analysis and records of the site investigation

6. Nomination of a competent person or persons/organization to undertake the works set out within the Written Scheme of Investigation

(B) No development shall take place other than in accordance with the Written Scheme of Investigation approved under part (A).

(C) The development shall not be brought into use until the site investigation and post investigation assessment has been completed in accordance with the programme set out in the Written Scheme of Investigation approved under part (A) and the provision to be made for analysis, publication and dissemination of results and archive deposition has been secured.

26) Prior to the commencement of this development details of the following must be submitted to and approved in writing by the Local Planning Authority before the commencement of each stage of the following process:

(A) A desk study to be completed in line with current good practice guidance must be completed. The report must include a conceptual site model and risk assessment to determine whether there is a potentially significant risk of contamination that requires further assessment.

(B) Based on the findings of the desk study a site investigation and detailed risk assessment must be completed to assess the nature and extent of any contamination on the site, whether or not it originated on the site. The report must include:
1) A survey of the extent, scale and nature of contamination
2) An assessment of the potential risks to
- Human health, property (existing or proposed) including buildings, crops, livestock, pets, woodland, service lines and pipes.
- Adjoining land, groundwaters and surface waters, ecological systems, archaeological sites and ancient monuments;
- The report must also include a revised and updated conceptual site model and detailed risk assessment. There must be an appraisal of the remedial options, and proposal of the preferred remedial option(s). This must be conducted in accordance with DEFRA and the Environment Agency's 'Model Procedures for the Management of Land Contamination, CLR 11' and other accepted good practice guidance.

(C) Based on the findings of the site investigation a detailed remediation method statement must be submitted for approval. Remediation must bring the site to a condition suitable for the intended use by removing or mitigating unacceptable risks to the identified receptors. The method statement must include all works to be undertaken, proposed remediation objectives and remediation criteria, timetable of works and site management procedures. The scheme must ensure that the site cannot be determined as Contaminated Land as defined under Part 2A of the Environmental Protection Act 1990. The Local Planning Authority must be given a minimum of two weeks written notification of the commencement of the remediation scheme works.

(D) Following the completion of the remedial measures identified in the approved remediation method statement a verification report (also called a validation report) that scientifically and technically demonstrates the effectiveness and success of the remediation scheme must be produced. Where remediation has not been successful further work will be required

(E) In the event that previously unidentified contamination is found during the development, it must be reported in writing immediately to the Local Planning Authority. An investigation and risk assessment must be undertaken as per part B above, and where remediation is necessary a remediation method statement and post remedial validation testing must be produced and approved in accordance with parts C & D above.

Appendix C - AD Facility Appeal Decision

The Planning Inspectorate

Appeal Decision

Hearing held on 9 April 2014
Site visit made on 9 April 2014

by Susan Holland MA DipTP MRTPI DipPollCon

an Inspector appointed by the Secretary of State for Communities and Local Government

Decision date: 11 June 2014

Appeal Ref: APP/K2610/A/14/2212257
Oulton Airfield, The Street, Oulton, Norfolk

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by Black Bridge Energy Ltd against the decision of Broadland District Council.
- The application Ref 20130860, dated 28 June 2013, was refused by notice dated 6 November 2013.
- The development proposed is an anaerobic digestion renewable energy facility, associated landscaping and vehicular access.

Procedural Matters

1. Notwithstanding the description of the proposed development as stated on the application form, the development is described on the Council's decision notice and on the Appeal form as a *biomass renewable energy facility*. It was confirmed at the Hearing that the development is designed and intended to process purpose-grown crops of maize and grass, and is neither designed nor adaptable to process food waste. The description given on the decision notice and on the notice of appeal is more accurately representative of the proposal, and the appeal is dealt with on the basis of the description as amended.

Decision

2. The appeal is dismissed.

Main Issues

3. The main issues are the effects of the proposed development (a) upon highway safety and convenience; and (b) upon the living conditions of neighbouring residents at The Old Railway Gatehouse with reference to noise and disturbance; in each case arising from the proposed vehicular movements to and from the site.

Reasons

Issue (a): Highway Safety and Convenience

4. The appeal site is located on land to the rear (west) of an existing turkey farm comprising around a dozen large poultry houses, and to the south-west of a farm depot for crops (peas, beans, barley, wheat, potatoes, sugar beet, and carrots) grown on the surrounding agricultural land. These establishments have separate accesses to Oulton Street (the lane). The proposed biomass

plant would have its own separate access to the lane, taken from an existing hard-surfaced track. Adequate new visibility splays at the access junction with the lane have recently been formed, by the repositioning of a hedge and fence.

5. In addition to the turkey farm and the agricultural depot, the lane serves the neighbouring residential settlement, also known as Oulton Street (Oulton Street), and the village of Itteringham to the north. For these settlements and for the existing enterprises, the lane serves as the means of access to the B1149 Holt Road. The appeal scheme would add, to the traffic generated by these sources, the traffic associated with the proposed biomass plant.

6. The biomass plant would be fuelled principally by a purpose-grown maize crop – by a particular variety of maize grown for its properties as a fuel crop. Grass and rye would form alternative/additional feedstocks. This restricted range of material would ensure the required consistency of fuel input. The maize would take a place in the normal rotation of food and fodder crops grown on the 10 subscribing farms: the number sufficient to produce a regular harvest, each year, of the overall quantity required to fuel the anaerobic digestion plant. Harvested maize would be transported to the appeal site and stored in silage clamps. The by-products of the energy generation process, in the forms of solid digestate fertiliser and liquid fertiliser, would be returned to the subscribing farms and to the land.

7. On an annual basis, 30,000 tonnes of input biomass would be delivered to the site, by tractor and 15-tonne trailer units. 17,500 tonnes of liquid biofertiliser would be transported from the site in 27-tonne tankers. Additional movements would be required for the removal of solid digestate fertiliser. Some removal of the solid digestate could take place in the empty trailers, so saving on movements; but the overlap would be limited, and outgoing movements would take place throughout the year. However, the maize harvest itself would be concentrated into a 2-month period of the year, in September-October, and the grass harvest, somewhat earlier, from June to early August. During the harvest period, tractor/trailer movements would be frequent, at about 8 trips per hour (4 in, 4 out) over a continuous 10hr-14hr day.

8. Though 2 cars may pass each other, if driven with care, over much of the lane, the carriageway is not wide enough for a vehicle larger than a car to pass any other vehicle except at the existing informal 'passing places'. These have been formed over time by overrunning and consequent erosion of the low banks and grass verge. (There is no footway on the lane). Approximately halfway between the site access and the junction with Holt Road the lane bends sharply, preventing visibility between the passing places on either side of the bend. Elsewhere on this stretch, the lane runs straight and visibility is good. At the point where a former railway line crossed the lane, now marked by a broad elevation or 'hump' in the surface, stands the cottage known as The Old Railway Gatehouse.

9. The proposal is to formalise several of the existing 'passing places', and to reposition and/or create others, to provide 6 individual passing places in all. The Highway Authority is satisfied that, subject to some repositioning, 6 passing places would meet the need; that opposing HGV tractor/trailer units would be able to pass each other at the new passing places; and that intervisibility between passing places would be adequate.

10. It is acknowledged that in this highly agricultural area, some movement of crops in large vehicles - tractor/trailer combinations, tankers, or other HGV – is 'normal' and to be expected by other road users. Nevertheless, the traffic movements generated by the appeal proposal would be problematic for the following reasons. Firstly, they would be very frequent and concentrated on this particular stretch of lane over a period of several months each year. Secondly, during that time the movements would continue at high frequency over a very long working day, extending from early morning until late evening, and into periods of dusk and darkness. Thirdly, the existing mix of traffic on the lane, revealed by the surveys submitted with the transport assessment, includes domestic cars, agricultural vehicles, tankers and other HGVs: the existing turkey farm and agricultural depot themselves generating HGV traffic.

11. Fourthly, each passing place proposed would not be long enough to contain more than 1 HGV at a time: so that the driver of any vehicle following one of the Appellant's tractor-trailer units would have to anticipate, accurately, the arrival of an opposing vehicle in order to avoid being left facing such a vehicle on the narrow part of the lane. In such cases the only option would be to reverse the length of the previous stretch, to gain refuge in the earlier passing place: a manoeuvre which would be difficult for some drivers and for the drivers of some large vehicles, including tractor-trailers, and particularly in conditions of poor light, dusk and darkness. The consequences of a mistake could be especially severe in the area around the passing place closest to the junction with the B1149 Holt Road. Here, northbound traffic positioned on the B1149 ready to turn right into the lane could be left stranded and exposed in that position while waiting for 2 HGVs to pass on the lane itself close to the junction, and would be unable to exit the B1149 whilst the first passing place was still occupied; or, worse, might turn into the lane unaware that a HGV was about to exit.

12. The proposed arrangement would markedly intensify and exacerbate the difficulties presented by the current arrangement, in which the drivers of vehicles are obliged to engage in a form of 'musical chairs' or 'running the gauntlet' on the narrow lane. The provision of more formal passing places would neither eliminate nor sufficiently ameliorate the consequences of the proposed increase in traffic movements of the most problematic form of vehicle and at the most problematic times.

Conclusion on Issue (a)

13. The conclusion is therefore that the proposed development would be likely to result in material harm to highway safety and convenience. The proposal would fail to comply with statutory saved Policy TRA14 of the Broadland District Local Plan Replacement 2006 in that it would *endanger highway safety [and] the satisfactory functioning of the highway network*; with companion Policy GS3(d) in respect of highway safety; and with the National Planning Policy Framework (the Framework) at paragraph 32, in that despite the proposed improvements to the highway network the cumulative impacts of the proposed development would be *severe*.

Issue (b): Living Conditions at The Old Railway Gatehouse

14. The current occupier of The Old Railway Gatehouse initially objected to the appeal proposal, but has since withdrawn her objections following receipt of an e-mail dated 4 April 2014, in which *Philipp Lucas, on behalf of Blackbridge*

Renewable Energy Ltd, confirmed agreement to buying my property, should the above appeal be successful. Firstly, however, no legal agreement has been submitted to ensure the purchase of the property, and it could not be made the subject of a condition on any planning permission that might be granted. Secondly, the factors relating to living conditions would apply no matter who might be the residential occupier of the property: and so the issue would be likely to continue to arise even after such purchase.

15. The Old Railway Gatehouse is a small, single-storey building positioned directly adjoining the verge at the carriageway edge, and immediately adjacent to the raised platform in the carriageway which marks the route of the former railway. The windows to all habitable rooms either, in the front elevation, face directly onto the carriageway or, in the side elevations to the dwelling, face up and down the lane at close quarters to the carriageway edge. The only window which faces the rear garden is a small window belonging to a bathroom. (There is also a skylight in the open roof to the main living-room/kitchen).

16. The existing windows are double-glazed. Even so, during the site visit the sound of each vehicle which passed the cottage was clearly audible indoors with the windows closed. These vehicles were cars. Sounds of the proposed tractor-trailer units, whether laden or not, would be likely to be louder and to be perceived as disturbances. Their frequent occurrence as separate bursts of loud sound, including vibration with passage over the 'hump' in the carriageway, over long periods of the day from early morning to late in the evening at harvest time, would be likely to be a source of genuine disturbance.

17. Whilst acknowledging that when superimposed upon the existing pattern of traffic movements on the lane, *noise from [up to 8 vehicle movements per hour] would be perceived as a series of separate events rather than a continuous noise*, the Appellant insists upon an approach which works by averaging surveyed noise levels over time. On the basis of an 18-hour average (L_{Aeq}), the predicted increase is calculated to be 3dB(A) and so said to be 'minor'. The Council has followed an approach which emphasises peak flows, with the proposed 8 tractor-trailer movements per hour to be added to existing flows, and uses the L_{max} measure: in this way the Council calculates that there would be an increase of 7dB(A), which would be noticeable and intrusive. In assessing the magnitude of the noise impact, therefore, the Appellant and the Council disagree.

18. The Appellant's submitted noise evidence has been prepared using perfectly conventional measurements and numerical representations of noise. However, such representations inevitably incorporate some degree of statistical smoothing: and so in themselves understate the effects, upon the human receptor, of separate, sudden bursts of sound which conventional practice recognises to be potentially disturbing. Where such bursts of sound – as in the proposed passage of heavy tractor-trailer units– are not continuous but are frequent and regular, the human response is to expect, predict or anticipate the interruption, so that the anticipation itself adds to and prolongs the disturbance when it comes. Thus, the response is not only to the increased level of noise, but includes the anticipation of the increased noise. The presence of the hump in the road outside the Old Railway Gatehouse would intensify the bursts of sound and their suddenness.

19. Recently-issued national Planning Practice Guidance on noise does not rely upon numerical measures but on qualitative descriptors. *Noticeable* noise

ranges from *noticeable and intrusive* noise, which can be *mitigated*, to *noticeable and disruptive* noise, which should be *avoided*. The first *causes small changes in behaviour … e.g. speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise*. The second *causes a material change in behaviour .. e.g. avoiding certain activities during periods of intrusion; where there is no alternative source of ventilation, having to keep windows closed most of the time because of the noise. … Quality of life diminished due to change in acoustic character of the area*.

20. Having visited the interior of The Old Railway Gatehouse, listened to the sound of passing traffic on the lane, and observed the layout of the property, the nature and position of the windows, and the condition of the lane, I have no doubt that the levels and character of the traffic noise generated by the appeal proposal during periods of harvest would be at the very least *noticeable and intrusive*, and almost certainly, at times, *noticeable and disruptive* as perceived by any residential occupiers of the dwelling. The property already has double glazing: so that there is no mitigation which could be easily specified as part of a planning permission. It is possible that an alternative interior layout of the dwelling might provide appropriate mitigation: but such action is beyond the scope of conditions upon a planning permission and there is no evidence that it could be achieved.

Conclusion on Issue (b)

21. The conclusion is therefore that the proposed development would, on balance, be likely to result in material harm to the living conditions of residential occupiers of The Old Railway Gatehouse with reference to noise and disturbance. The proposal would fail to comply with the requirements of statutory saved Policy GS3(d) of the Local Plan that the surrounding highway network should be able to *accommodate the traffic likely to be generated without significant detriment to the amenity of nearby occupiers*.

Other Matters

Noise (other sources) and Odours

22. As part of the appeal site visit, the site of an existing biogas plant of similar construction, at Spring Farm, Taverham, was also visited. Odours are said to have been a problem at that site: however, it was not demonstrated that the biogas plant itself was the source. At the time of the visit the Spring Farm site was odour-free. The digestion process itself is contained within the dome of the tank; the gas produced is said to be odourless; and the silage clamps have a smell similar to other such installations on farms.

23. The turbines themselves are noisy, but they are contained within a well-insulated building. Extractor outlets also produce a noise which might carry; but the proposed layout would place buildings between these and any potential residential receptors in the settlement of Oulton Street.

Character of the Area

24. The surrounding area is rural and largely agricultural in character. The immediate surroundings include a number of extensive agricultural buildings, including the adjacent cluster of turkey sheds and, not far beyond, the buildings of the agricultural depot. From the site boundary, other large farm

buildings are visible. The proposed anaerobic digestion plant would be marginally higher than these, but any visual impact would be lessened by the adjacent tree belt and, from the available viewpoints, perspective would have the effect of reducing its apparent height.

25. The site occupies part of a former airfield. The National Trust claims that this is a heritage asset; and also cites links with the Grade 1 Listed Building of Blickling Hall. The Hall is separated from the site by several kilometres and by intervening woodland: so that the proposal would have no visual impact upon it. As for the airfield, though the turkey sheds have been built upon parts of it, the runway layout continues to be reflected in the arrangement of field boundaries and tracks, and is clearly visible in aerial photo representation. The appeal proposal would not interrupt that layout, but would occupy one of the fields. No evidence has been submitted sufficient to demonstrate that the appeal proposal would interfere irreparably with the historical authenticity of the airfield.

Renewable Energy Policy

26. The proposed biogas plant would generate clean, renewable energy from local biomass: sufficient energy (electricity) for around 4,000 homes. The Framework states clearly, at paragraph 97, that *to help increase the use and supply of renewable and low carbon energy, local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable or low carbon sources*; and at paragraph 98 that they should *recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions*.

27. In this case the Council has, in its approach to the proposal, complied with the requirements of the Framework, and has acknowledged the contribution of the proposal to providing renewable energy. The Council has granted planning permission for other such developments locally, including those put forward and operated by the current Appellant. However, in stating that *local planning authorities should … approve the application (unless material considerations indicate otherwise) if its impacts are (or can be made) acceptable*, the Framework necessarily and appropriately qualifies its encouragement for renewable energy development. The Council's refusal of the current proposal is based upon the impacts of the traffic generated by it, and to that extent the proposal would not comply with the provisions of the Framework.

Overall Conclusion

28. Whilst some relevant matters are in favour of the proposal or at least neutral in their effect upon it, these are both individually and collectively insufficient to outweigh the conclusion based upon consideration of the main issues: which is, on balance, that the appeal should be dismissed.

S Holland

INSPECTOR

APPEARANCES

FOR THE APPELLANT:

Mr Trevor Ivory	Solicitor, of Howes Percival, Norwich
Mr Alan Presslee	of Cornerstone Planning Consultants, Cringleford
Dr William Mezzullo	Associate Director, Project Development at Future Biogas
Mr Jon Myhill	of Future Biogas
Mr Adrian James	Noise Consultant, of Adrian James Acoustics Ltd, Norwich

FOR THE LOCAL PLANNING AUTHORITY:

Ms Ruth Sainsbury	Senior Planning Officer, Broadland DC
Mr Graham Parry	Noise Consultant, Accon UK Ltd, Aldermaston
Mr John Shaw	Senior Highways Engineer, Norfolk County Council
Cllr Claudette Bannock	Councillor (Taverham South ward), Broadland DC

INTERESTED PERSONS:

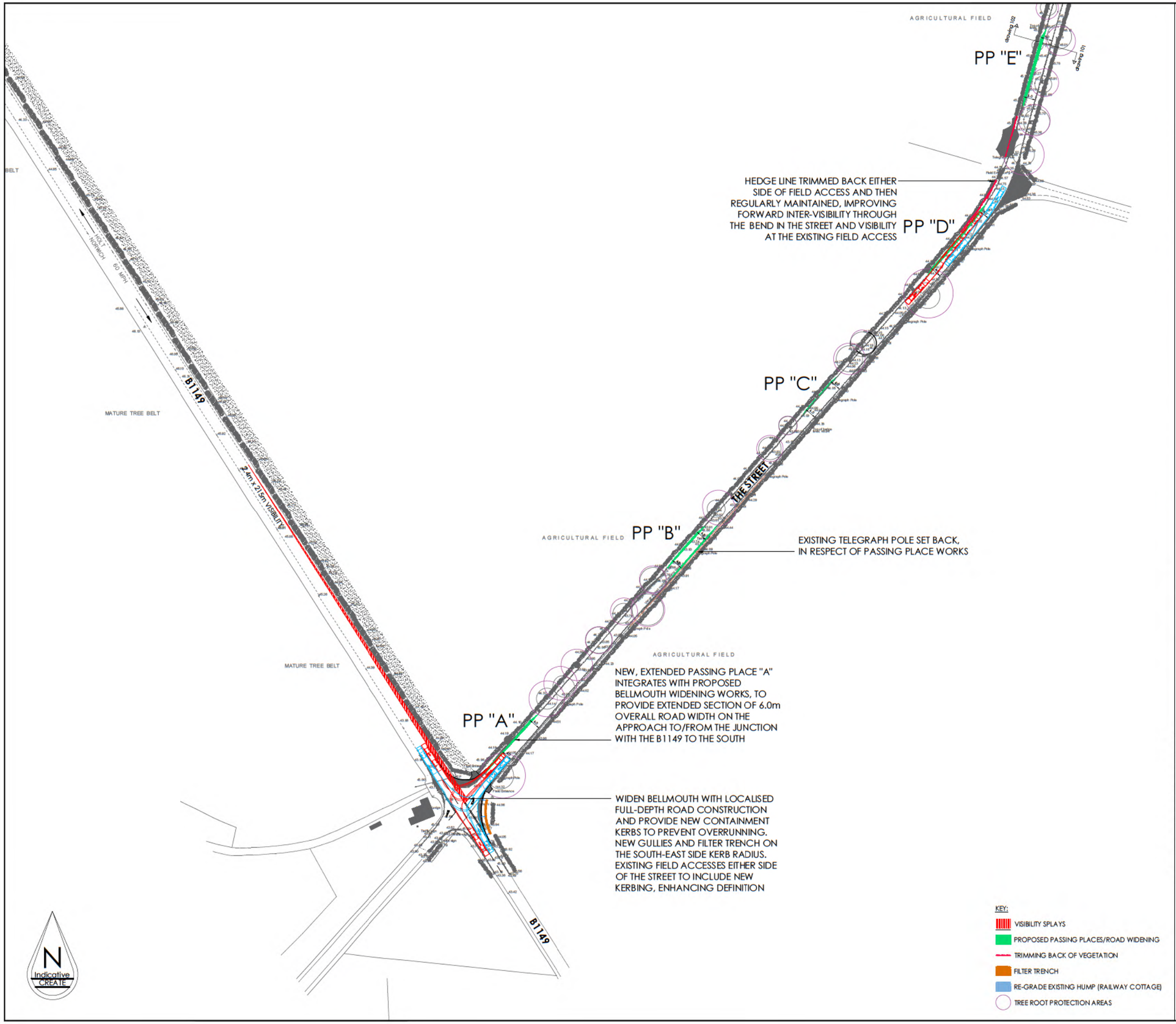
Mr Paul Killingback	Chair, Oulton Parish Council
Ms Alison Shaw	Former Chair, Oulton Parish Council
Mr Sam Booker	Local resident, Oulton Street
Ms Anne Roy	Local resident, of The Old Railway Gatehouse

DOCUMENTS

Documents submitted by the Appellant

1 Appeal Decision APP/K2610/A/13/2195384 Reepham Road, Felthorpe
2 Completed S106 Planning Obligation by Saltcarr Farms Ltd and Black Bridge Energy Ltd

Appendix D - Create Consulting Engineers Ltd Drawing Package



KEY:

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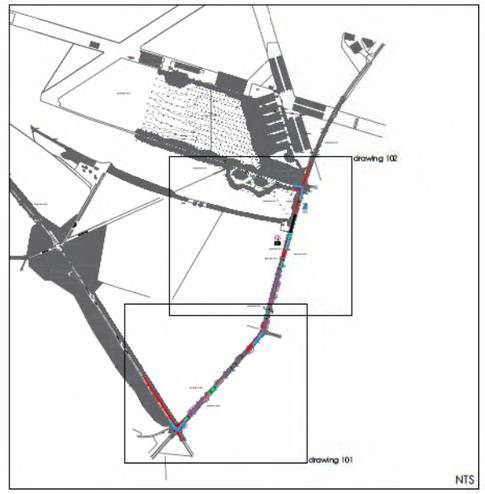
- PROPOSED PASSING PLACES/ROAD WIDENING
- TRIMMING BACK OF VEGETATION
- FILTER TRENCH
- RE-GRADE EXISTING HUMP (RAILWAY COTTAGE)
- TREE ROOT PROTECTION AREAS

Ørsted



OPTION 1: PASSING PLACES

GENERAL NOTES:

1. PASSING PLACES (PP) TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE LOCATED AND SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

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PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 18.09.18	DRAWING STATUS: INFORMATION	
	SCALE(S): 1:1,000	DESIGNED: MDA	DRAWN: MDA
		CHECKED: PZ	APPROVED: PZ
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON (OPTION 1) SHEET 1 OF 2	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/101	REVISION:	

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AGRICULTURAL FIELD

CONCRETE SURFACE

COMPOUND ACCESS

2.4m x 90m VISIBILITY

INCREASE RADIUS ON SOUTH SIDE OF COMPOUND ACCESS AND PROVIDE NEW CONTAINMENT KERB TO PREVENT VEHICLE OVERUNNING

PP "H"

Priority over oncoming vehicles

PRIORITY SIGNING FOR SOUTHBOUND TRAFFIC PAST RAILWAY COTTAGE AND MODIFIED HUMP SECTION

PRIORITY FOR SOUTHBOUND TRAFFIC

EXISTING PRONOUNCED HUMP IN ROAD PROVIDED WITH GRADUATED APPROACHES TO SOFTEN CHANGE IN GRADIENT AND REDUCE THE POTENTIAL FOR GROUNDING AND NOISE AND CLATTER. EXISTING ROAD WIDTH AND "SUMMIT" LEVEL RETAINED FOR ACCESS TO RAILWAY COTTAGE

NEW SECTION OF PRIORITY WORKING PAST RAILWAY COTTAGE, PRIORITY FOR SOUTHBOUND TRAFFIC. SERVING TO REDUCE POTENTIAL FOR TWO-WAY HGV TRAFFIC PAST RAILWAY COTTAGE AT ANY ONE TIME

Give way to oncoming vehicles

PP "G"

PP "F"

AGRICULTURAL FIELD

AGRICULTURAL FIELD

AGRICULTURAL FIELD

AGRICULTURAL FIELD

AGRICULTURAL FIELD

Indicative CREATE

KEY:

- VISIBILITY SPLAYS
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- TREE ROOT PROTECTION AREAS

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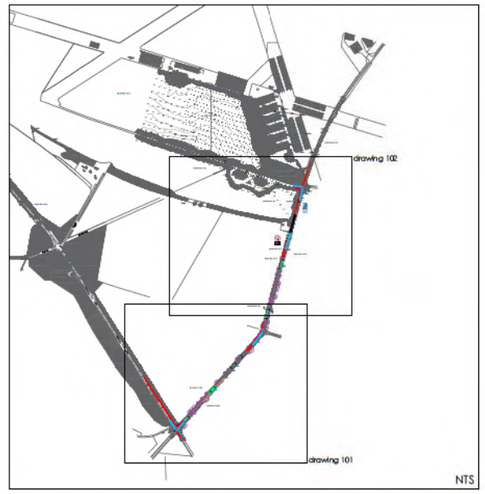

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	SCALE(S): 1:1,000	DESIGNED: MDA / DRAWN: MDA	
		CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON (OPTION 1) SHEET 2 OF 2	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/102	REVISION:	

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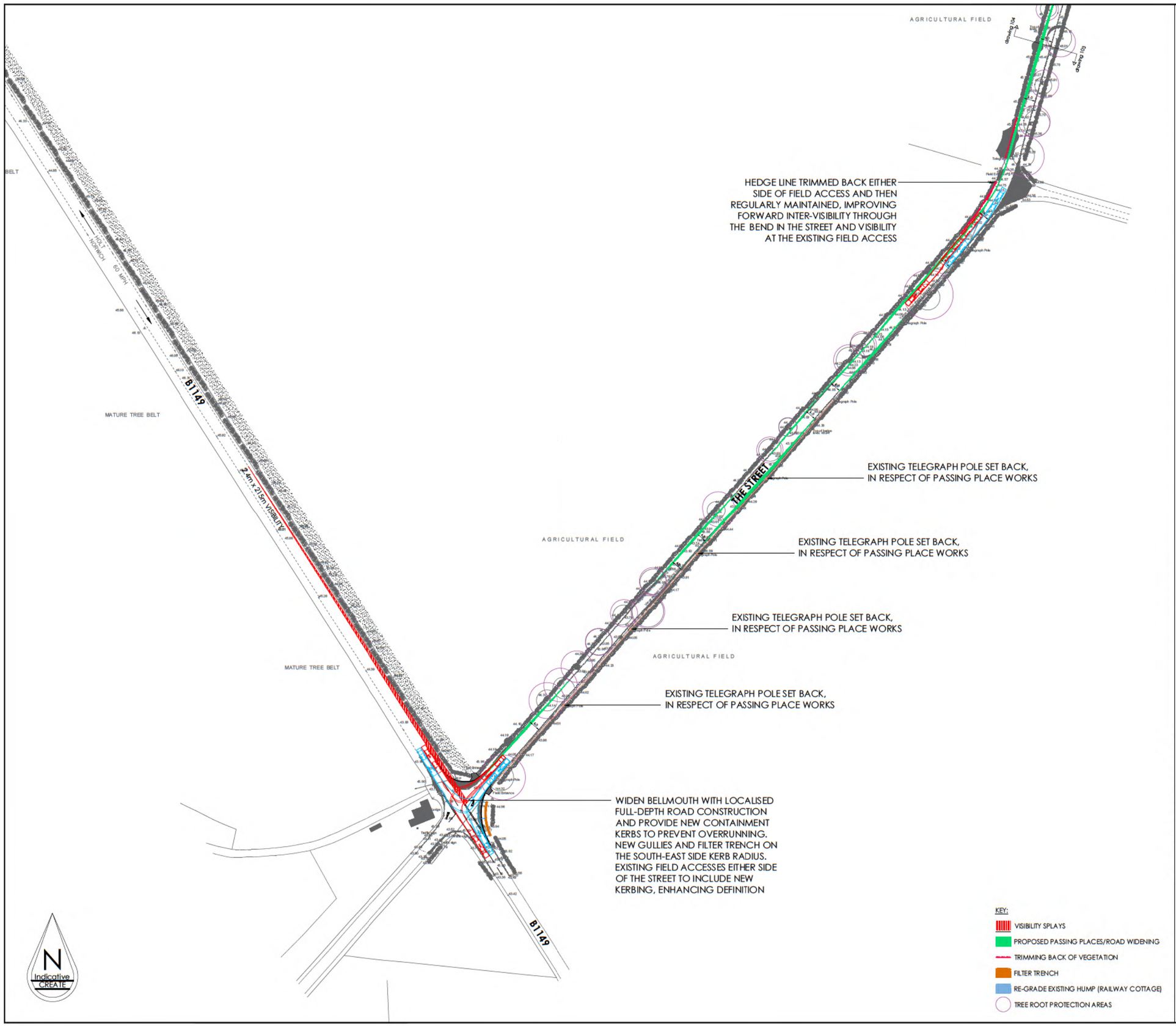

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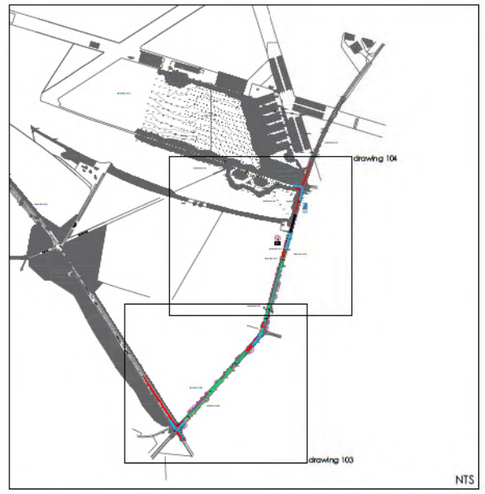

OPTION 2: COMPREHENSIVE WIDENING

GENERAL NOTES:

1. NEW WIDENED AREAS TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
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Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 19.09.18	DRAWING STATUS: INFORMATION	
	SCALE(S): 1:1,000	DESIGNED: MDA	DRAWN: MDA
		CHECKED: PZ	APPROVED: PZ
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON (OPTION 2) SHEET 1 OF 2	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/103	REVISION:	

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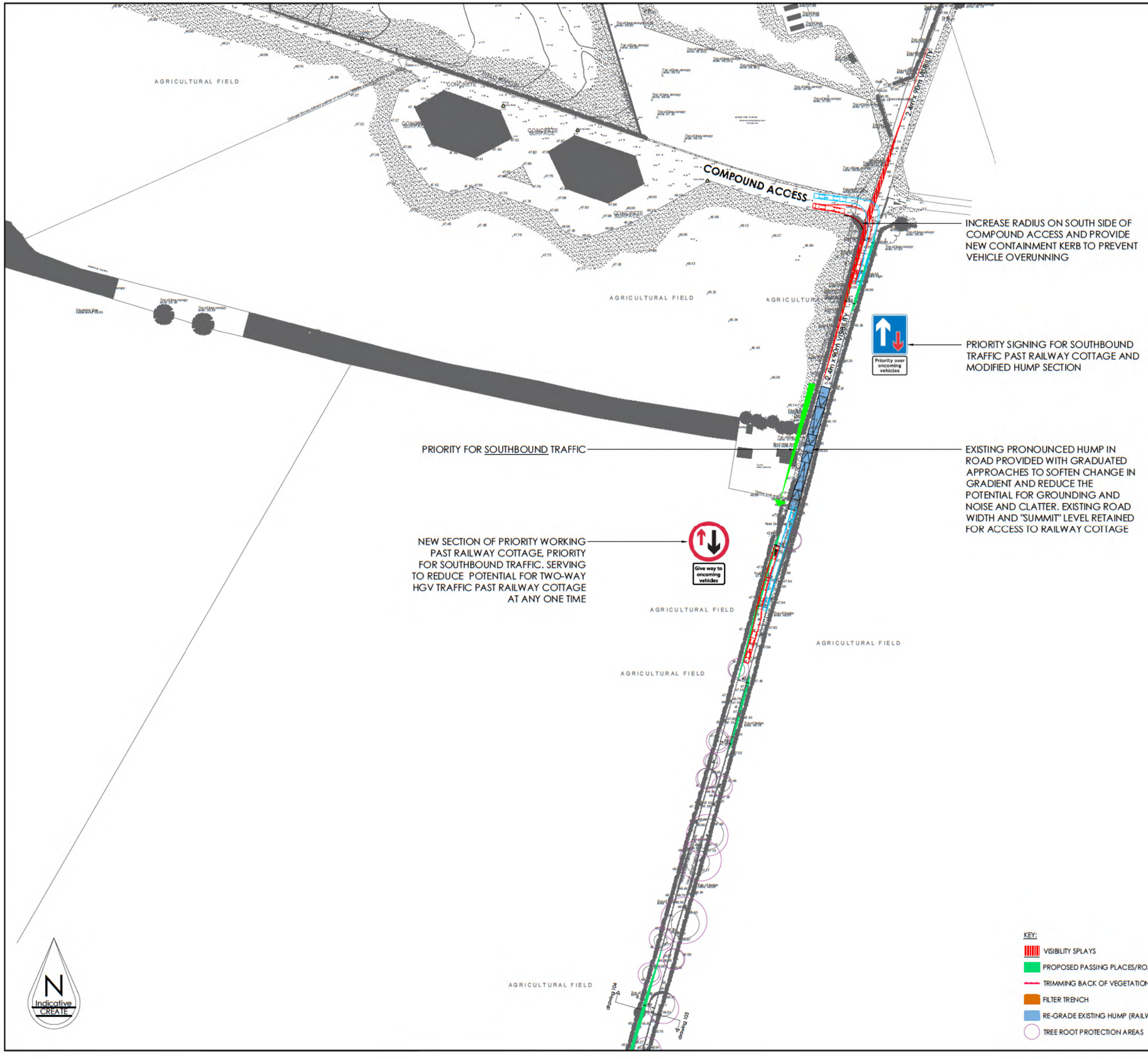

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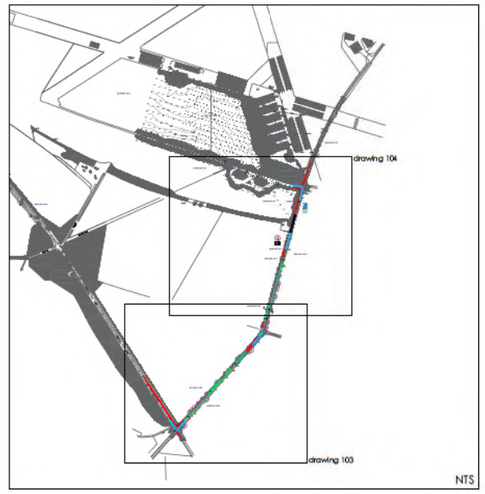

OPTION 2: COMPREHENSIVE WIDENING

GENERAL NOTES:

1. NEW WIDENED AREAS TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 19.09.18	DRAWING STATUS: INFORMATION	create CONSULTING ENGINEERS LTD
	SCALE(S): 1:1,000	DESIGNED: MDA / DRAWN: MDA	
		CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON (OPTION 2) SHEET 2 OF 2	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/104	REVISION:	

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KEY:

- VEHICLE ROUTE TO COMPOUND
- ALTERNATIVE VEHICLE ROUTE TO COMPOUND FROM SOUTH FOR LARGE VEHICLES I.E. LOW LOADERS
- VEHICLE ROUTE FROM COMPOUND
- INDICATIVE PROPOSED PASSING PLACE LOCATION
- EXISTING PRONOUNCED HUMP IN ROAD TO BE PROVIDED WITH GRADUATED APPROACHES

GENERAL NOTES:

1. PASSING PLACES TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE LOCATED AND SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON DIGITAL OS 1:10,000 MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES, ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 19.09.18	DRAWING STATUS: INFORMATION	
DRAWING TITLE: PROPOSED ONE WAY ROUTING (OPTION 3A)	SCALE(S): 1:10,000	DESIGNED: AF / DRAWN: AF / CHECKED: PZ / APPROVED: PZ	
	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/105	REVISION: -	create CONSULTING ENGINEERS LTD

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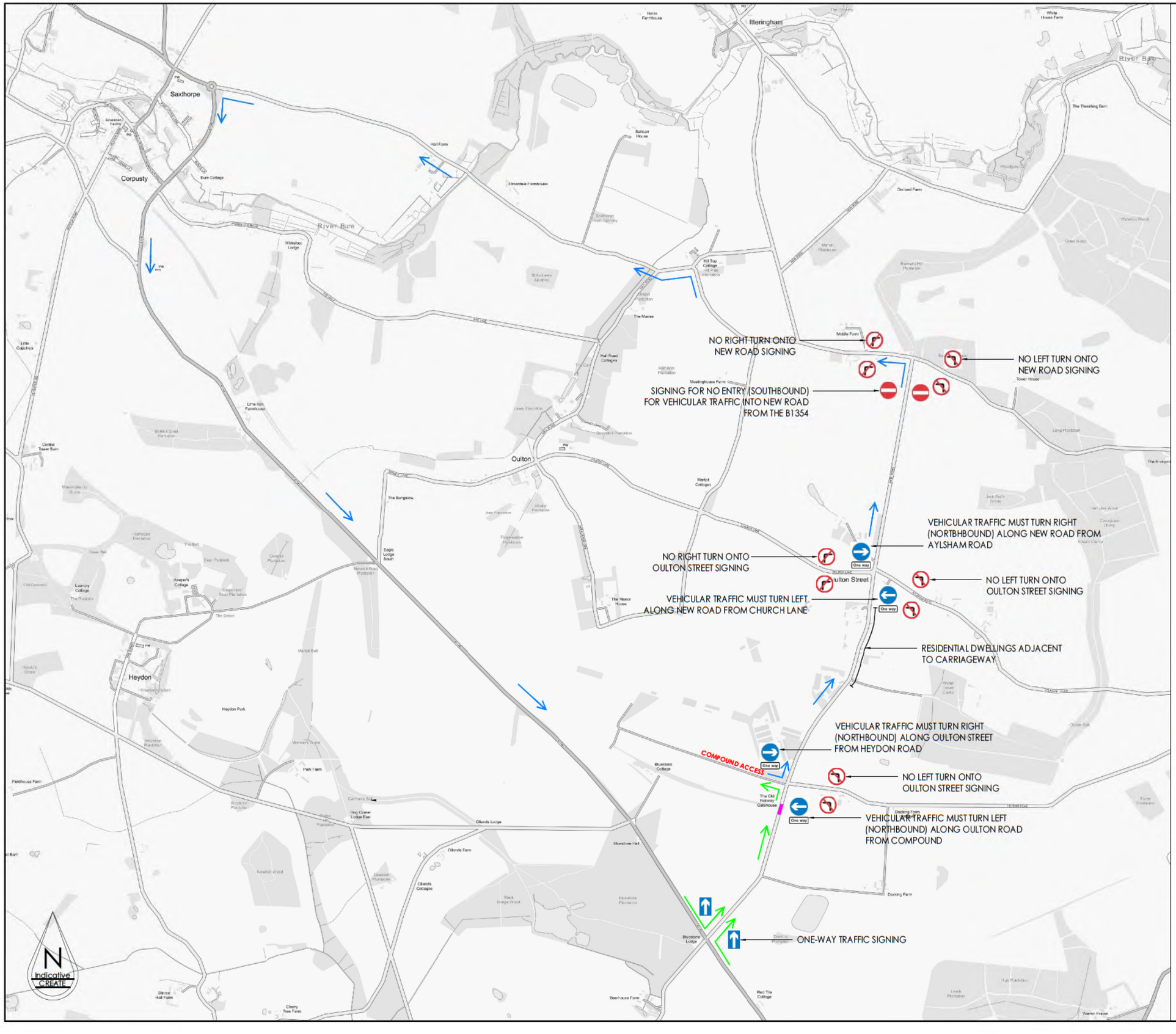

Ørsted

KEY:

- VEHICLE ROUTE TO COMPOUND
- VEHICLE ROUTE FROM COMPOUND
- EXISTING PRONOUNCED HUMP IN ROAD TO BE PROVIDED WITH GRADUATED APPROACHES

GENERAL NOTES:

1. THE DRAWING IS BASED ON DIGITAL OS 1:10,000 MAPPING.
2. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
3. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
4. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
5. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES, ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
6. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 19.09.18	DRAWING STATUS: INFORMATION	
	SCALE(S): 1:10,000	DESIGNED: AF / DRAWN: AF	
		CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: TEMPORARY ONE WAY OPERATION OF THE STREET FOR ALL TRAFFIC (OPTION 3B)	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/106	REVISION: -	

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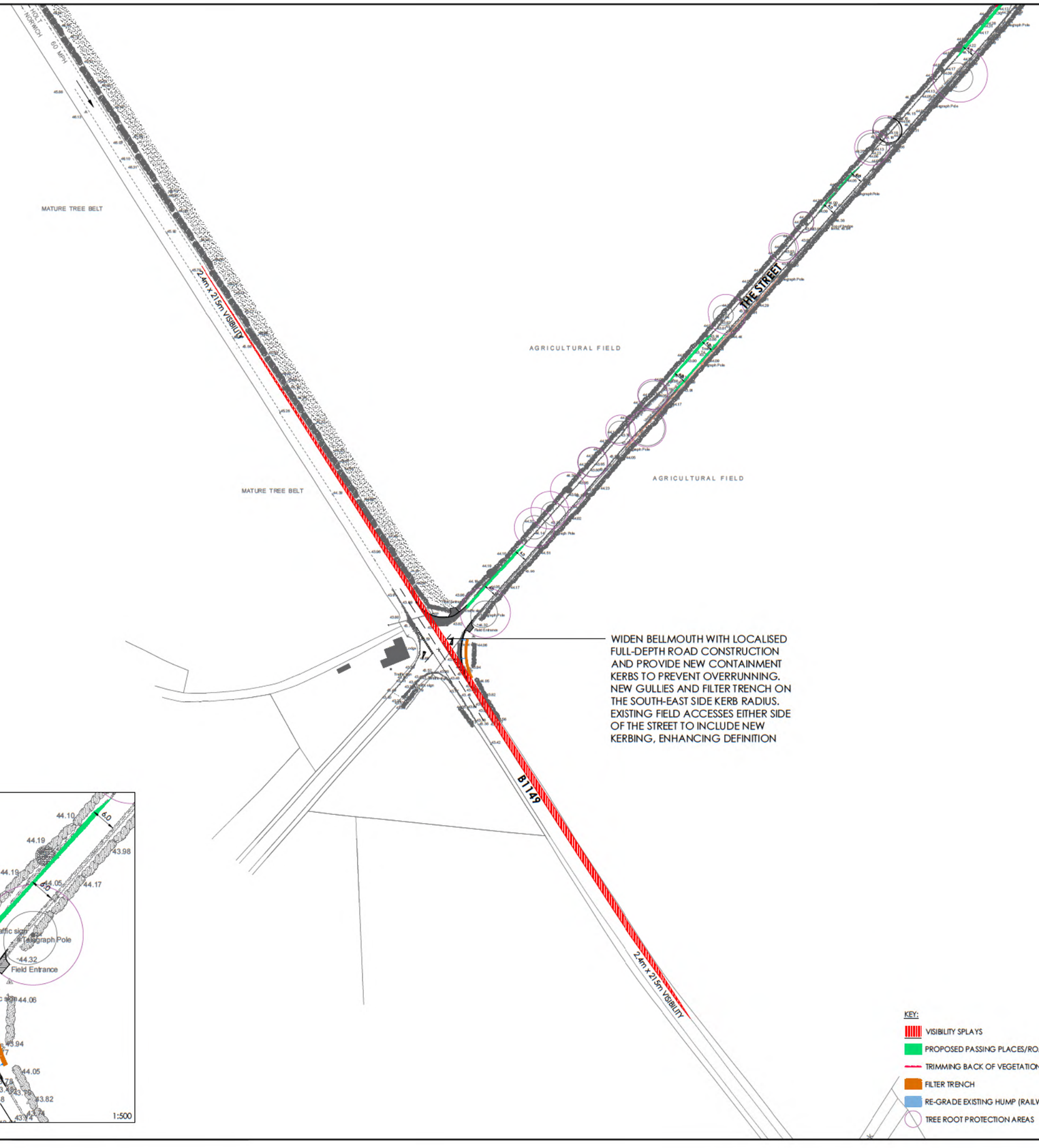
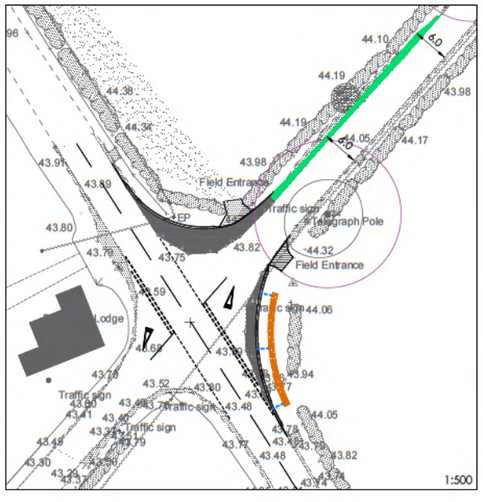
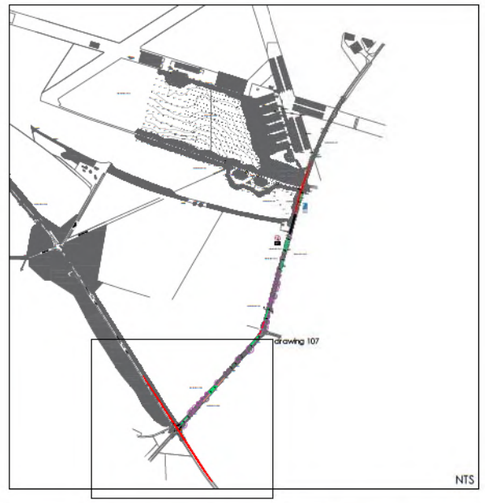




KEY:
- VISIBILITY SPLAYS
- PROPOSED PASSING PLACES/ROAD WIDENING
- TRIMMING BACK OF VEGETATION
- FILTER TRENCH
- RE-GRADE EXISTING HUMP (RAILWAY COTTAGE)
- TREE ROOT PROTECTION AREAS

Ørsted



B1149/THE STREET JUNCTION

GENERAL NOTES:

1. PASSING PLACES (PP) TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE LOCATED AND SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
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7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 21.09.18	DRAWING STATUS: INFORMATION		
	SCALE(S): 1:1,000	DESIGNED: MDA	DRAWN: MDA	
		CHECKED: PZ	APPROVED: PZ	
DRAWING TITLE: PROPOSED IMPROVEMENTS THE STREET, OULTON B1149/THE STREET JUNCTION	JOB No: 1554			
CLIENT: ORSTED	DRAWING No: 03/107	REVISION:		

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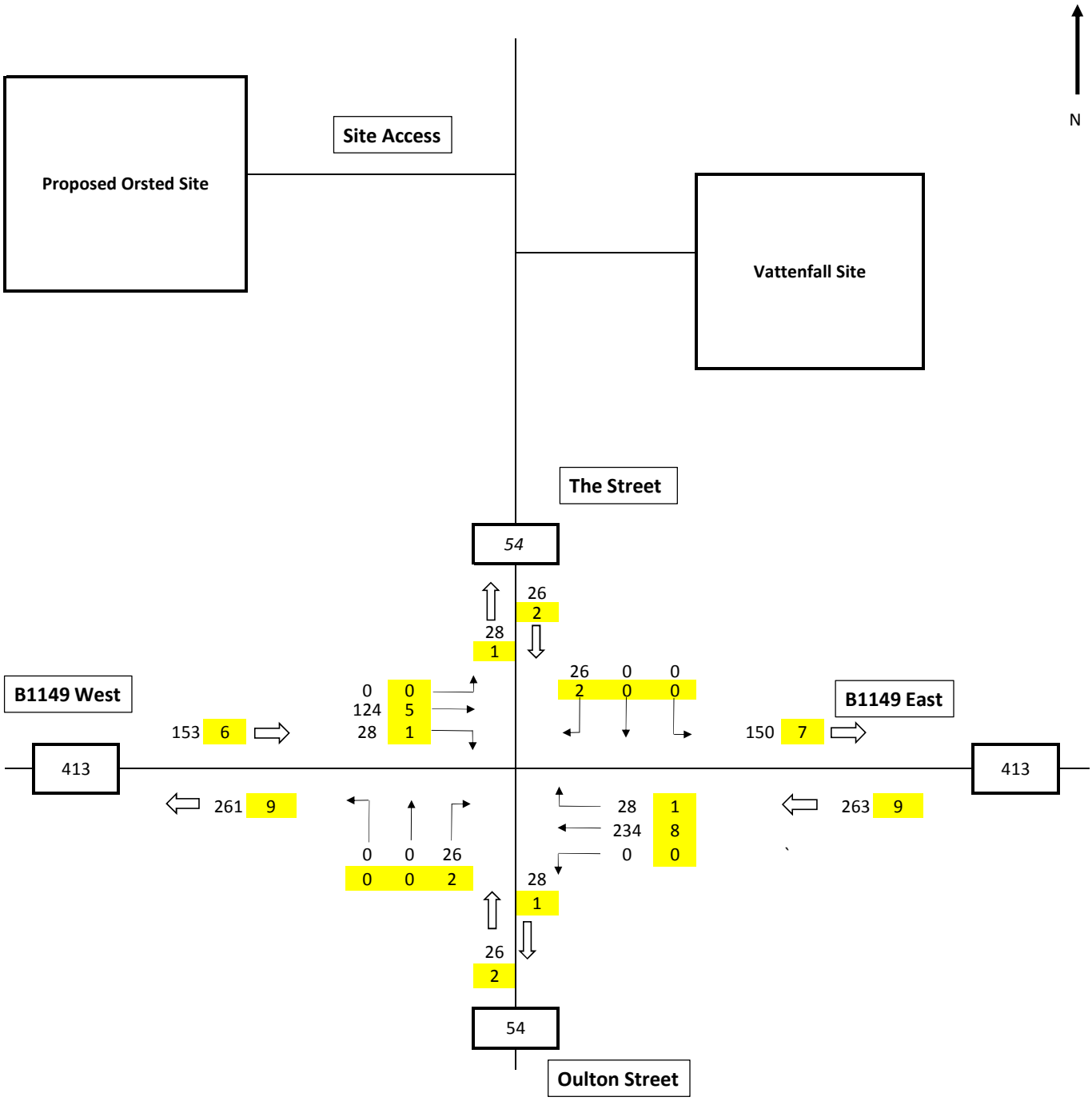
Appendix E B1149 / The Street Junction Capacity Assessments



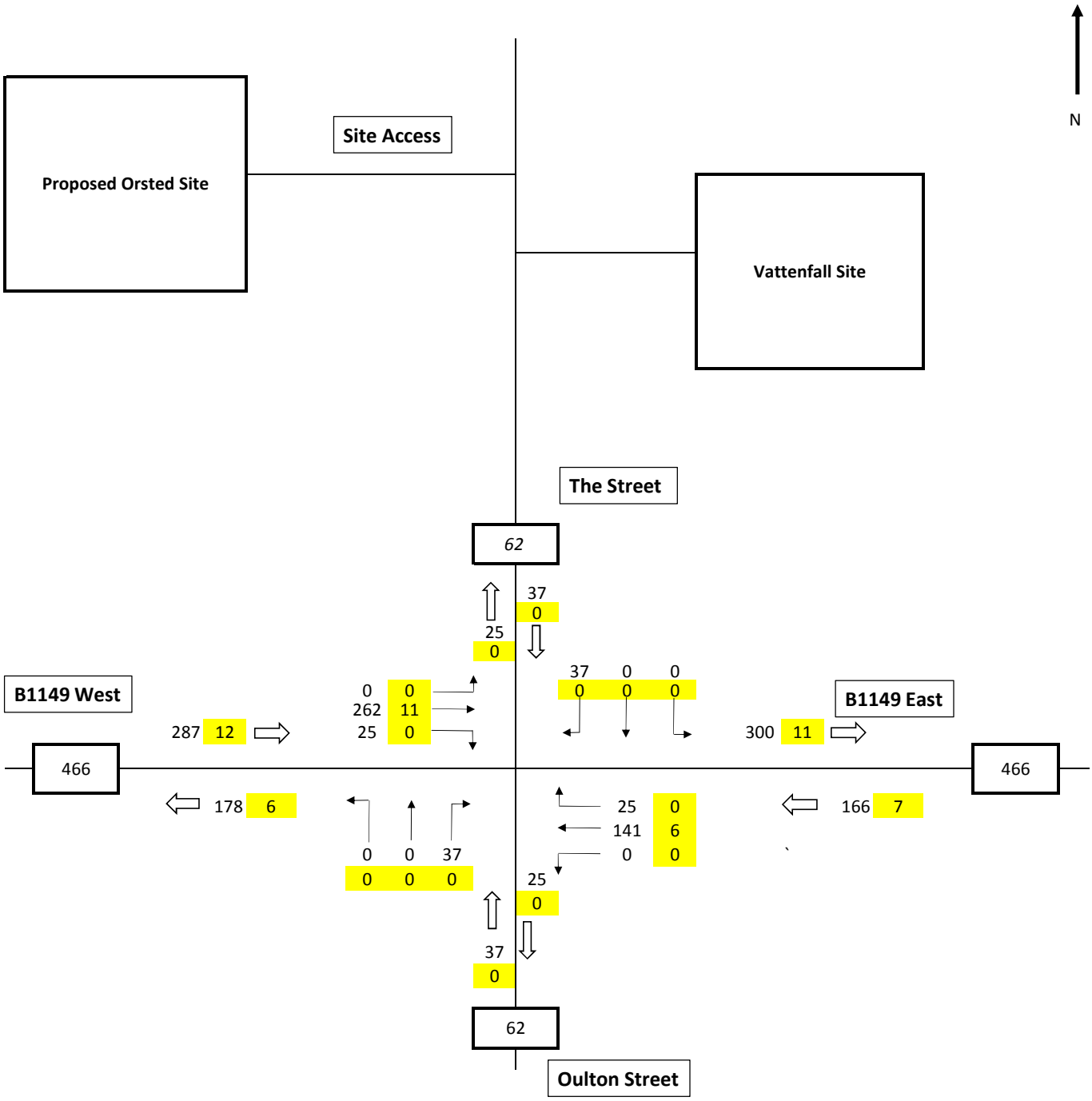
Assumptions
1. Traffic on Oulton Street is equal to traffic on The Street
2. Trafffic on B1149 South has been calculated using traffic flows from B1149 North and The Street
3. Assuming a worst case and that all vehicles into the minor arms are undertaking a right turn in and right turn out

Key:
Totals 0
HGV's 0

Create Consulting Engineers Ltd
15 Princes Street
Norwich
NR3 1AF

Project - Hornsea Project Three Offsfore Wind Farm

Title - 2028 base traffic - AM Peak - 08:00-09:00



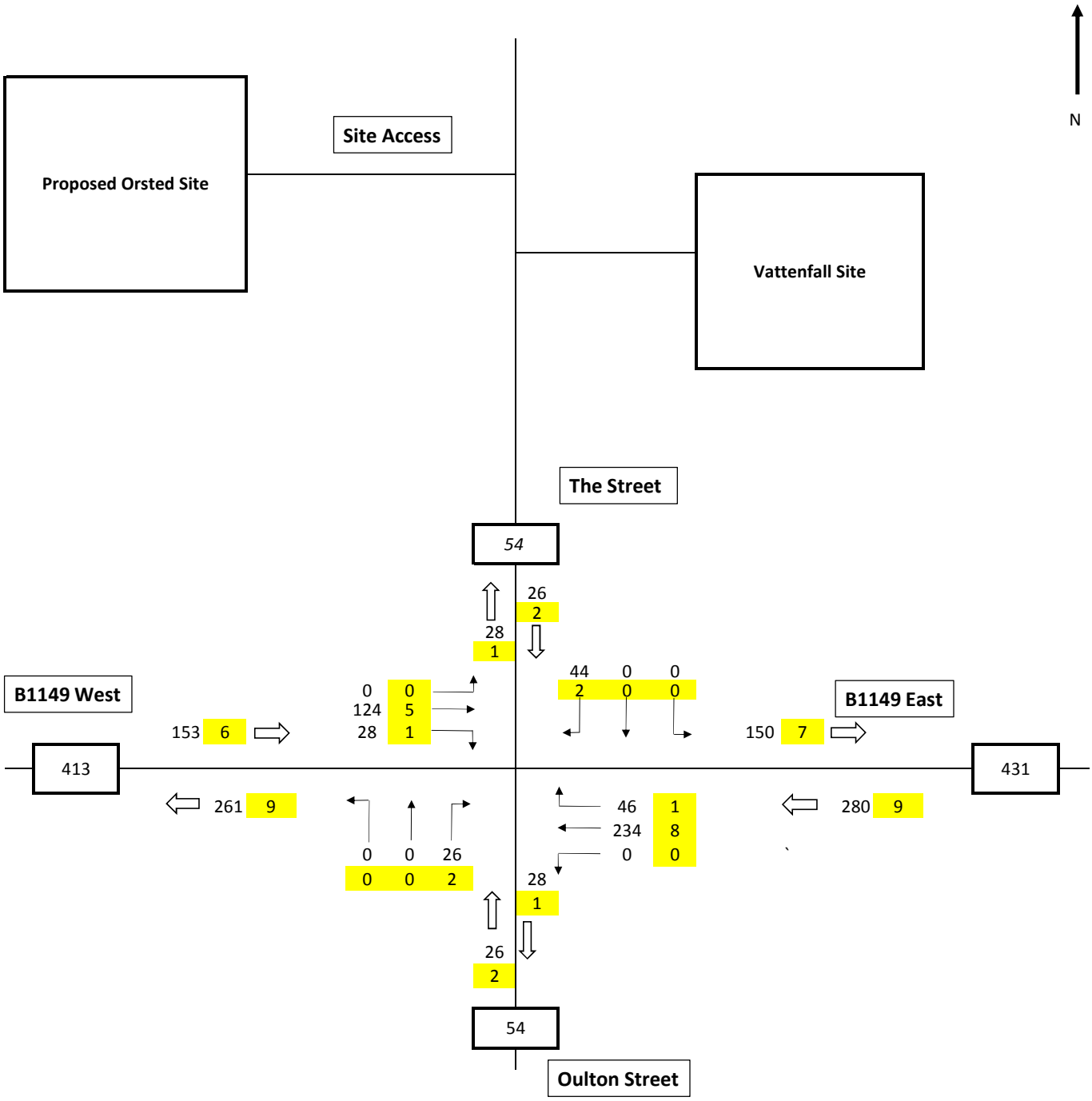
Assumptions
1. Traffic on Oulton Street is equal to traffic on The Street
2. Trafffic on B1149 South has been calculated using traffic flows from B1149 North and The Street
3. Assuming a worst case and that all vehicles into the minor arms are undertaking a right turn in and right turn out

Key:
Totals 0
HGV's 0

Create Consulting Engineers Ltd
15 Princes Street
Norwich
NR3 1AF

Project - Hornsea Project Three Offsfore Wind Farm

Title - 2028 base traffic - PM Peak - 16:00-17:00



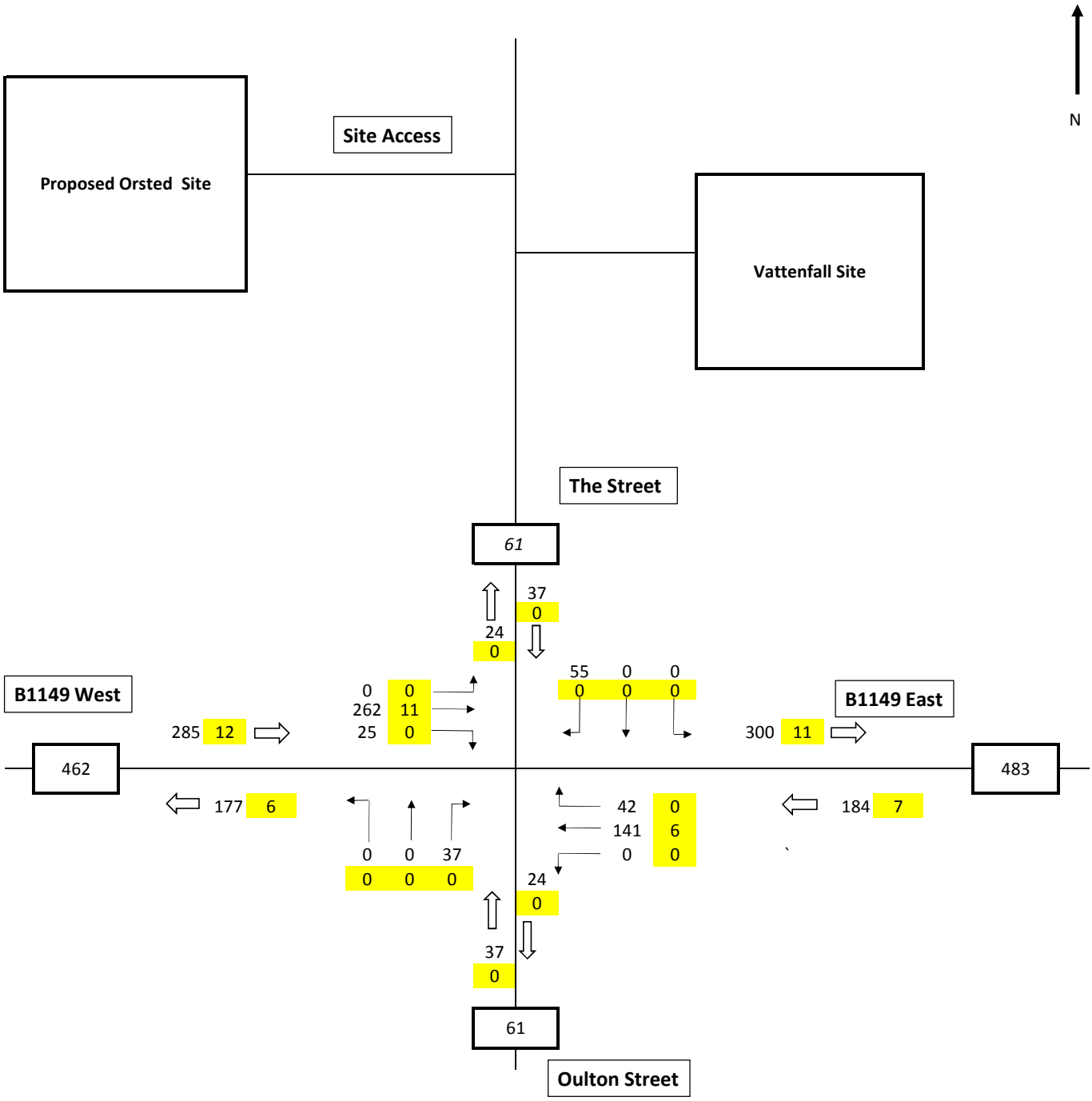
Assumptions
1. Assuming a worst case and that all development traffic into the minor arms are undertaking a right turn in and right turn out

Key:
Totals 0
HGV's 0

Create Consulting Engineers Ltd
15 Princes Street
Norwich
NR3 1AF

Project - Hornsea Project Three Offsfore Wind Farm

Title - 2028 base plus Orsted traffic - AM Peak - 08:00-09:00



Assumptions
1. Assuming a worst case and that all development traffic into the minor arms are undertaking a right turn in and right turn out

Key:
Totals 0
HGV's 0

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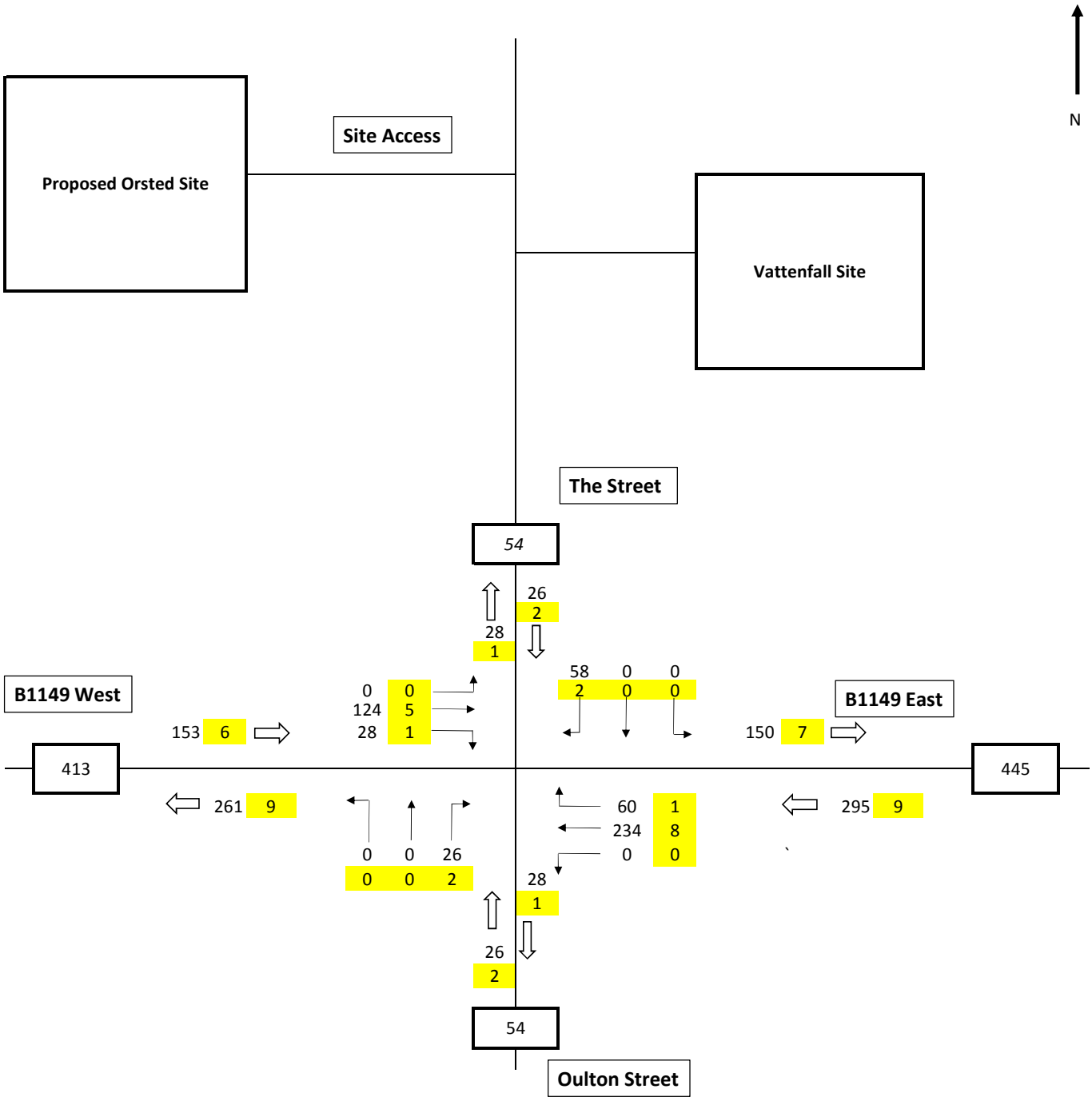
Create Consulting Engineers Ltd
15 Princes Street
Norwich
NR3 1AF

Project - Hornsea Project Three Offsfore Wind Farm

Title - 2028 base plus Orsted traffic - PM Peak - 16:00-17:00



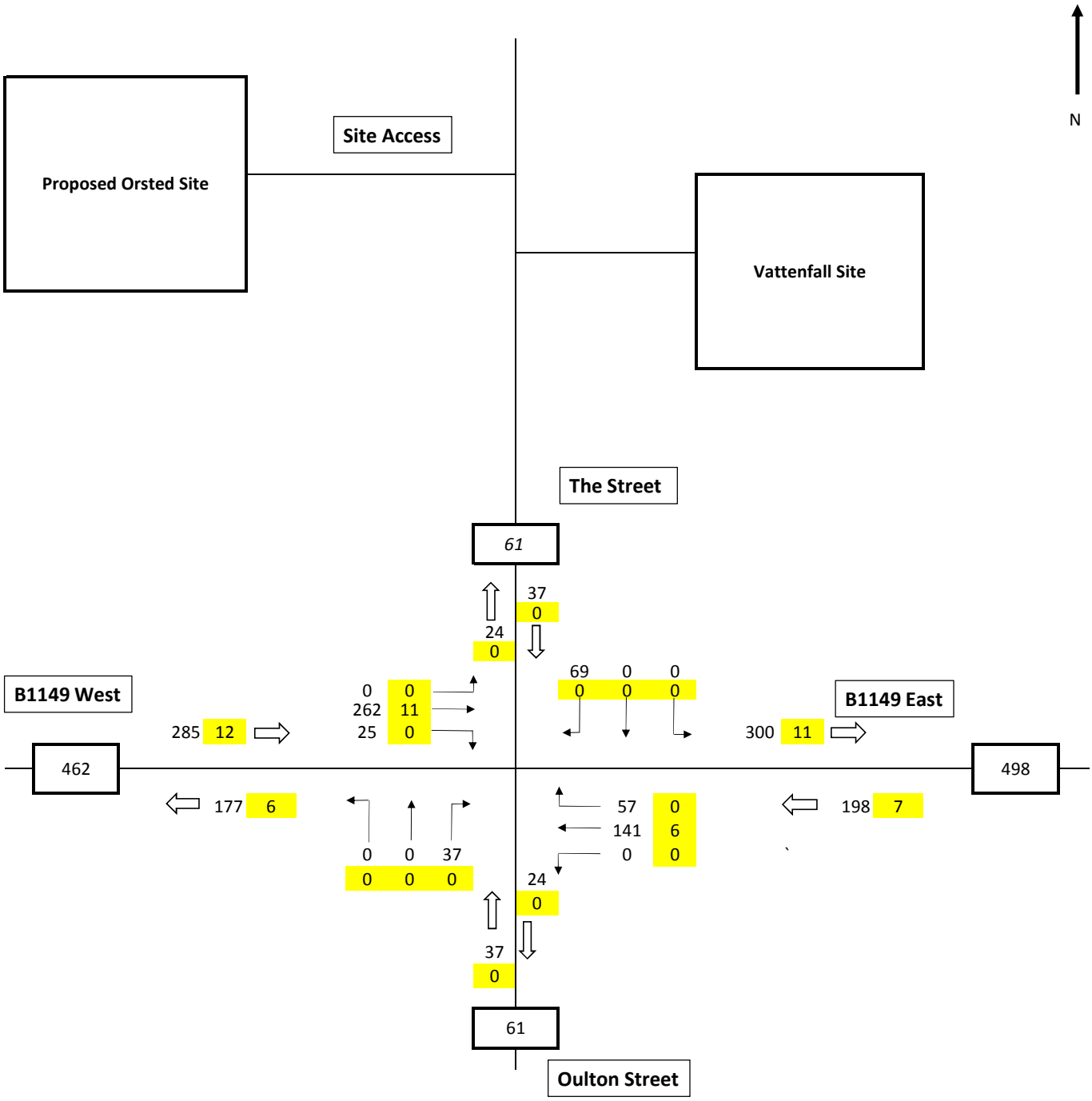
Assumptions
1. Assuming a worst case and that all development traffic into the minor arms are undertaking a right turn in and right turn out

Key:
Totals 0
HGV's 0

Create Consulting Engineers Ltd
15 Princes Street
Norwich
NR3 1AF

Project - Hornsea Project Three Offsfore Wind Farm

Title - 2028 base plus Orsted plus Vattenfall traffic - AM Peak - 08:00-09:00



Assumptions
1. Assuming a worst case and that all development traffic into the minor arms are undertaking a right turn in and right turn out

Key:	
Totals	0
HGV's	0

Create Consulting Engineers Ltd
15 Princes Street
Norwich
NR3 1AF

Project - Hornsea Project Three Offsfore Wind Farm

Title - 2028 base traffic plus Orsted plus Vattenfall traffic - PM Peak - 16:00-17:00

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.1.4646 []
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Filename: Hornsea Orsted PICADY.j9
Path: W:\2.0 NEW PROJECTS\2018\P18-1554 - Hornsea 3 (offshore Windfarm)\4.0 Transport
Report generation date: 24/09/2018 16:33:44

»2028 Background, AM
»2028 Background, PM
»Background plus Orsted, AM
»Background plus Orsted, PM
»Background plus Orsted plus Vattenfall, AM
»Background plus Orsted plus Vattenfall, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2028 Background							
Stream B-CD	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream B-AD	0.1	8.30	0.06	A	0.1	8.83	0.09	A
Stream A-BCD	0.1	5.48	0.05	A	0.1	4.86	0.05	A
Stream D-AB	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream D-BC	0.1	9.32	0.07	A	0.1	9.38	0.10	A
Stream C-ABD	0.1	4.94	0.06	A	0.1	5.38	0.05	A
	Background plus Orsted							
Stream B-CD	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream B-AD	0.1	8.85	0.10	A	0.2	9.45	0.14	A
Stream A-BCD	0.1	5.54	0.05	A	0.1	4.89	0.05	A
Stream D-AB	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream D-BC	0.1	9.50	0.07	A	0.1	9.55	0.10	A
Stream C-ABD	0.2	5.06	0.09	A	0.1	5.58	0.08	A
	Background plus Orsted plus Vattenfall							
Stream B-CD	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream B-AD	0.2	9.32	0.14	A	0.2	10.02	0.17	B
Stream A-BCD	0.1	5.58	0.06	A	0.1	4.91	0.05	A
Stream D-AB	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream D-BC	0.1	9.64	0.07	A	0.1	9.70	0.10	A
Stream C-ABD	0.2	5.17	0.12	A	0.2	5.76	0.11	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

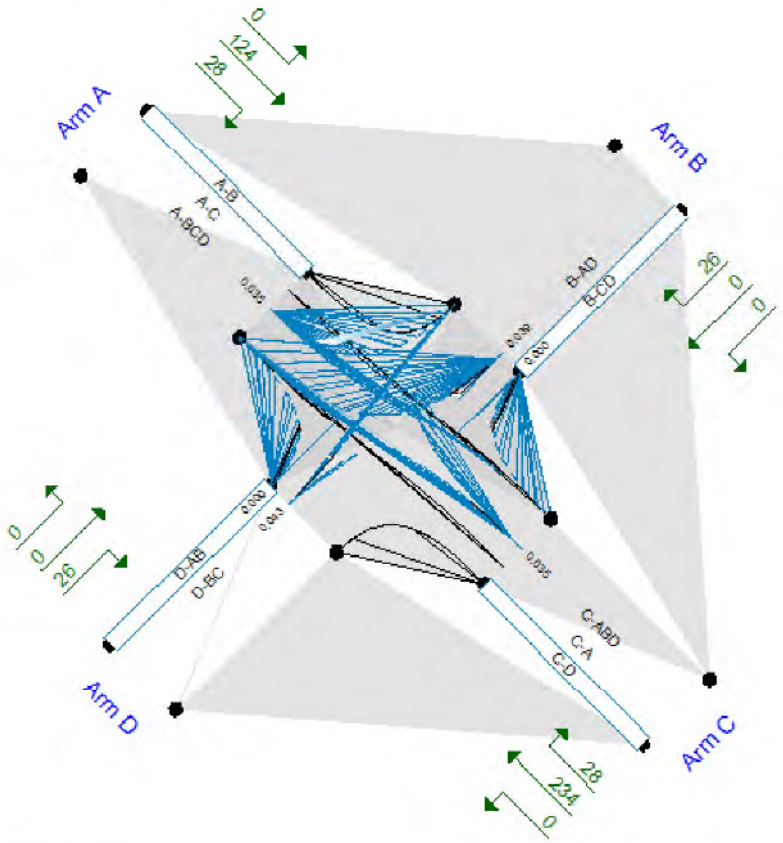
File summary

File Description

Title	Hornsea, Orsted
Location	B1149/The Street
Site number	
Date	24/09/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	CREATE\m.allen
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Flows show original traffic demand (PCU/hr).
Streams (downstream end) show RFC ()

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2028 Background	AM	ONE HOUR	07:45	09:15	15	✓
D2	2028 Background	PM	ONE HOUR	16:45	18:15	15	✓
D3	Background plus Orsted	AM	ONE HOUR	07:45	09:15	15	✓
D4	Background plus Orsted	PM	ONE HOUR	16:45	18:15	15	✓
D5	Background plus Orsted plus Vattenfall	AM	ONE HOUR	07:45	09:15	15	✓
D6	Background plus Orsted plus Vattenfall	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2028 Background, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	1.79	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	B1149 (NW)		Major
B	The Street		Minor
C	B1149 (SE)		Major
D	"Southgate"		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	6.20			215.0	✓	0.00
C	6.20			215.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	9.60	4.60	3.40	3.00		1.00	55	32
D	One lane plus flare	10.00	5.40	3.00	2.60	2.40		1.00	26	22

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
1	A-D	698	-	-	-	-	-	-	0.268	0.383	0.268	-	-	-
1	B-A	572	0.103	0.261	0.261	-	-	-	0.164	0.373	-	0.261	0.261	0.131
1	B-C	657	0.100	0.252	-	-	-	-	-	-	-	-	-	-
1	B-D, nearside lane	521	0.094	0.238	0.238	-	-	-	0.150	0.340	0.150	-	-	-
1	B-D, offside lane	572	0.103	0.261	0.261	-	-	-	0.164	0.373	0.164	-	-	-
1	C-B	698	0.268	0.268	0.383	-	-	-	-	-	-	-	-	-
1	D-A	619	-	-	-	-	-	-	0.238	-	0.094	-	-	-
1	D-B, nearside lane	482	0.138	0.138	0.314	-	-	-	0.220	0.220	0.087	-	-	-
1	D-B, offside lane	527	0.151	0.151	0.343	-	-	-	0.240	0.240	0.095	-	-	-
1	D-C	527	-	0.151	0.343	0.120	0.240	0.240	0.240	0.240	0.095	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically

D1	2028 Background	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	152	100.000
B		ONE HOUR	✓	26	100.000
C		ONE HOUR	✓	262	100.000
D		ONE HOUR	✓	26	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	124	28
	B	26	0	0	0
	C	234	28	0	0
	D	0	0	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	5	1
	B	2	0	0	0
	C	8	1	0	0
	D	0	0	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.00	0.00	0.0	A	0	0
B-AD	0.06	8.30	0.1	A	24	36
A-BCD	0.05	5.48	0.1	A	31	46
A-B					0	0
A-C					109	163
D-AB	0.00	0.00	0.0	A	0	0
D-BC	0.07	9.32	0.1	A	24	36
C-ABD	0.06	4.94	0.1	A	36	53
C-D					0	0
C-A					205	307

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	528	0.000	0	0.0	0.0	0.000	A
B-AD	20	5	503	0.039	19	0.0	0.0	7.588	A
A-BCD	24	6	703	0.035	24	0.0	0.0	5.380	A
A-B	0	0			0				
A-C	90	23			90				
D-AB	0	0	480	0.000	0	0.0	0.0	0.000	A
D-BC	20	5	456	0.043	19	0.0	0.0	8.416	A
C-ABD	27	7	776	0.035	27	0.0	0.0	4.923	A
C-D	0	0			0				
C-A	170	42			170				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	517	0.000	0	0.0	0.0	0.000	A
B-AD	23	6	490	0.048	23	0.0	0.1	7.875	A
A-BCD	30	7	705	0.042	30	0.0	0.1	5.420	A
A-B	0	0			0				
A-C	107	27			107				
D-AB	0	0	468	0.000	0	0.0	0.0	0.000	A
D-BC	23	6	442	0.053	23	0.0	0.1	8.778	A
C-ABD	34	9	792	0.043	34	0.0	0.1	4.877	A
C-D	0	0			0				
C-A	201	50			201				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	502	0.000	0	0.0	0.0	0.000	A
B-AD	29	7	471	0.061	29	0.1	0.1	8.298	A
A-BCD	38	10	707	0.054	38	0.1	0.1	5.472	A
A-B	0	0			0				
A-C	129	32			129				
D-AB	0	0	451	0.000	0	0.0	0.0	0.000	A
D-BC	29	7	422	0.068	29	0.1	0.1	9.321	A
C-ABD	45	11	815	0.055	45	0.1	0.1	4.819	A
C-D	0	0			0				
C-A	243	61			243				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	502	0.000	0	0.0	0.0	0.000	A
B-AD	29	7	471	0.061	29	0.1	0.1	8.301	A
A-BCD	38	10	707	0.054	38	0.1	0.1	5.479	A
A-B	0	0			0				
A-C	129	32			129				
D-AB	0	0	451	0.000	0	0.0	0.0	0.000	A
D-BC	29	7	422	0.068	29	0.1	0.1	9.324	A
C-ABD	45	11	815	0.055	45	0.1	0.1	4.826	A
C-D	0	0			0				
C-A	243	61			243				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	517	0.000	0	0.0	0.0	0.000	A
B-AD	23	6	490	0.048	23	0.1	0.1	7.878	A
A-BCD	30	7	705	0.043	30	0.1	0.1	5.430	A
A-B	0	0			0				
A-C	107	27			107				
D-AB	0	0	468	0.000	0	0.0	0.0	0.000	A
D-BC	23	6	442	0.053	23	0.1	0.1	8.784	A
C-ABD	34	9	792	0.043	34	0.1	0.1	4.895	A
C-D	0	0			0				
C-A	201	50			201				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	528	0.000	0	0.0	0.0	0.000	A
B-AD	20	5	503	0.039	20	0.1	0.0	7.598	A
A-BCD	24	6	703	0.035	24	0.1	0.0	5.390	A
A-B	0	0			0				
A-C	90	23			90				
D-AB	0	0	480	0.000	0	0.0	0.0	0.000	A
D-BC	20	5	455	0.043	20	0.1	0.0	8.429	A
C-ABD	27	7	776	0.035	27	0.1	0.0	4.937	A
C-D	0	0			0				
C-A	170	42			170				

2028 Background, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	1.92	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2028 Background	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	287	100.000
B		ONE HOUR	✓	37	100.000
C		ONE HOUR	✓	166	100.000
D		ONE HOUR	✓	37	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	262	25
	B	37	0	0	0
	C	141	25	0	0
	D	0	0	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	11	0
	B	0	0	0	0
	C	6	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.00	0.00	0.0	A	0	0
B-AD	0.09	8.83	0.1	A	34	51
A-BCD	0.05	4.86	0.1	A	33	50

A-B					0	0
A-C					230	345
D-AB	0.00	0.00	0.0	A	0	0
D-BC	0.10	9.38	0.1	A	34	51
C-ABD	0.05	5.38	0.1	A	28	42
C-D					0	0
C-A					124	186

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	508	0.000	0	0.0	0.0	0.000	A
B-AD	28	7	488	0.057	28	0.0	0.1	7.816	A
A-BCD	25	6	787	0.032	25	0.0	0.0	4.842	A
A-B	0	0			0				
A-C	191	48			191				
D-AB	0	0	485	0.000	0	0.0	0.0	0.000	A
D-BC	28	7	457	0.061	28	0.0	0.1	8.378	A
C-ABD	22	6	707	0.031	22	0.0	0.0	5.302	A
C-D	0	0			0				
C-A	103	26			103				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	493	0.000	0	0.0	0.0	0.000	A
B-AD	33	8	471	0.071	33	0.1	0.1	8.215	A
A-BCD	32	8	806	0.040	32	0.0	0.1	4.784	A
A-B	0	0			0				
A-C	226	57			226				
D-AB	0	0	474	0.000	0	0.0	0.0	0.000	A
D-BC	33	8	443	0.075	33	0.1	0.1	8.777	A
C-ABD	27	7	709	0.039	27	0.0	0.1	5.329	A
C-D	0	0			0				
C-A	122	30			122				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	473	0.000	0	0.0	0.0	0.000	A
B-AD	41	10	449	0.091	41	0.1	0.1	8.821	A
A-BCD	42	11	831	0.051	42	0.1	0.1	4.714	A
A-B	0	0			0				
A-C	274	68			274				
D-AB	0	0	458	0.000	0	0.0	0.0	0.000	A
D-BC	41	10	425	0.096	41	0.1	0.1	9.374	A
C-ABD	35	9	713	0.049	35	0.1	0.1	5.371	A
C-D	0	0			0				
C-A	148	37			148				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	473	0.000	0	0.0	0.0	0.000	A
B-AD	41	10	449	0.091	41	0.1	0.1	8.826	A
A-BCD	42	11	831	0.051	42	0.1	0.1	4.729	A
A-B	0	0			0				
A-C	274	68			274				
D-AB	0	0	458	0.000	0	0.0	0.0	0.000	A
D-BC	41	10	425	0.096	41	0.1	0.1	9.379	A
C-ABD	35	9	713	0.049	35	0.1	0.1	5.380	A
C-D	0	0			0				
C-A	148	37			148				

17:45 - 18:00

Stream	Total Demand	Junction	Capacity	RFC	Throughput	Start queue	End queue	Delay (s)	LOS

	(PCU/hr)	Arrivals (PCU)	(PCU/hr)		(PCU/hr)	(PCU)	(PCU)		
B-CD	0	0	493	0.000	0	0.0	0.0	0.000	A
B-AD	33	8	471	0.071	33	0.1	0.1	8.222	A
A-BCD	32	8	806	0.040	32	0.1	0.1	4.810	A
A-B	0	0			0				
A-C	226	57			226				
D-AB	0	0	474	0.000	0	0.0	0.0	0.000	A
D-BC	33	8	443	0.075	33	0.1	0.1	8.786	A
C-ABD	27	7	709	0.039	27	0.1	0.1	5.344	A
C-D	0	0			0				
C-A	122	30			122				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	508	0.000	0	0.0	0.0	0.000	A
B-AD	28	7	488	0.057	28	0.1	0.1	7.829	A
A-BCD	25	6	787	0.032	25	0.1	0.0	4.858	A
A-B	0	0			0				
A-C	191	48			191				
D-AB	0	0	485	0.000	0	0.0	0.0	0.000	A
D-BC	28	7	457	0.061	28	0.1	0.1	8.396	A
C-ABD	22	6	707	0.031	22	0.1	0.0	5.311	A
C-D	0	0			0				
C-A	103	26			103				

Background plus Orsted, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	2.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	Background plus Orsted	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	152	100.000
B		ONE HOUR	✓	44	100.000
C		ONE HOUR	✓	280	100.000
D		ONE HOUR	✓	26	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	124	28
	B	44	0	0	0
	C	234	46	0	0
	D	0	0	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	5	1
	B	2	0	0	0
	C	8	1	0	0
	D	0	0	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.00	0.00	0.0	A	0	0
B-AD	0.10	8.85	0.1	A	40	61

A-BCD	0.05	5.54	0.1	A	31	46
A-B					0	0
A-C					109	163
D-AB	0.00	0.00	0.0	A	0	0
D-BC	0.07	9.50	0.1	A	24	36
C-ABD	0.09	5.06	0.2	A	59	88
C-D					0	0
C-A					198	298

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	521	0.000	0	0.0	0.0	0.000	A
B-AD	33	8	498	0.067	33	0.0	0.1	7.886	A
A-BCD	24	6	698	0.035	24	0.0	0.0	5.420	A
A-B	0	0			0				
A-C	90	23			90				
D-AB	0	0	478	0.000	0	0.0	0.0	0.000	A
D-BC	20	5	451	0.043	19	0.0	0.0	8.511	A
C-ABD	45	11	776	0.058	44	0.0	0.1	5.041	A
C-D	0	0			0				
C-A	166	42			166				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	509	0.000	0	0.0	0.0	0.000	A
B-AD	40	10	484	0.082	39	0.1	0.1	8.268	A
A-BCD	30	7	699	0.043	30	0.0	0.1	5.468	A
A-B	0	0			0				
A-C	107	27			107				
D-AB	0	0	465	0.000	0	0.0	0.0	0.000	A
D-BC	23	6	436	0.054	23	0.0	0.1	8.903	A
C-ABD	56	14	792	0.071	56	0.1	0.1	5.021	A
C-D	0	0			0				
C-A	195	49			195				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	492	0.000	0	0.0	0.0	0.000	A
B-AD	48	12	464	0.105	48	0.1	0.1	8.842	A
A-BCD	38	10	700	0.055	38	0.1	0.1	5.531	A
A-B	0	0			0				
A-C	129	32			129				
D-AB	0	0	448	0.000	0	0.0	0.0	0.000	A
D-BC	29	7	415	0.069	29	0.1	0.1	9.495	A
C-ABD	74	19	815	0.091	74	0.1	0.2	5.008	A
C-D	0	0			0				
C-A	234	59			234				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	492	0.000	0	0.0	0.0	0.000	A
B-AD	48	12	463	0.105	48	0.1	0.1	8.847	A
A-BCD	38	10	700	0.055	38	0.1	0.1	5.539	A
A-B	0	0			0				
A-C	129	32			129				
D-AB	0	0	448	0.000	0	0.0	0.0	0.000	A
D-BC	29	7	415	0.069	29	0.1	0.1	9.498	A
C-ABD	74	19	815	0.091	74	0.2	0.2	5.018	A
C-D	0	0			0				
C-A	234	59			234				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	509	0.000	0	0.0	0.0	0.000	A
B-AD	40	10	483	0.082	40	0.1	0.1	8.278	A
A-BCD	30	7	699	0.043	30	0.1	0.1	5.478	A
A-B	0	0			0				
A-C	107	27			107				
D-AB	0	0	465	0.000	0	0.0	0.0	0.000	A
D-BC	23	6	436	0.054	23	0.1	0.1	8.912	A
C-ABD	56	14	792	0.071	57	0.2	0.1	5.042	A
C-D	0	0			0				
C-A	195	49			195				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	521	0.000	0	0.0	0.0	0.000	A
B-AD	33	8	498	0.067	33	0.1	0.1	7.902	A
A-BCD	24	6	698	0.035	24	0.1	0.0	5.430	A
A-B	0	0			0				
A-C	90	23			90				
D-AB	0	0	478	0.000	0	0.0	0.0	0.000	A
D-BC	20	5	450	0.043	20	0.1	0.0	8.526	A
C-ABD	45	11	776	0.058	45	0.1	0.1	5.057	A
C-D	0	0			0				
C-A	166	41			166				

Background plus Orsted, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	2.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	Background plus Orsted	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	287	100.000
B		ONE HOUR	✓	55	100.000
C		ONE HOUR	✓	183	100.000
D		ONE HOUR	✓	37	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	262	25
	B	55	0	0	0
	C	141	42	0	0
	D	0	0	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	11	0
	B	0	0	0	0
	C	6	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.00	0.00	0.0	A	0	0
B-AD	0.14	9.45	0.2	A	50	76

A-BCD	0.05	4.89	0.1	A	33	50
A-B					0	0
A-C					230	345
D-AB	0.00	0.00	0.0	A	0	0
D-BC	0.10	9.55	0.1	A	34	51
C-ABD	0.08	5.58	0.1	A	47	71
C-D					0	0
C-A					120	181

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	501	0.000	0	0.0	0.0	0.000	A
B-AD	41	10	483	0.086	41	0.0	0.1	8.136	A
A-BCD	25	6	783	0.032	25	0.0	0.0	4.871	A
A-B	0	0			0				
A-C	191	48			191				
D-AB	0	0	483	0.000	0	0.0	0.0	0.000	A
D-BC	28	7	452	0.062	28	0.0	0.1	8.472	A
C-ABD	37	9	707	0.053	37	0.0	0.1	5.419	A
C-D	0	0			0				
C-A	101	25			101				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	485	0.000	0	0.0	0.0	0.000	A
B-AD	49	12	466	0.106	49	0.1	0.1	8.646	A
A-BCD	32	8	800	0.040	32	0.0	0.1	4.815	A
A-B	0	0			0				
A-C	226	57			226				
D-AB	0	0	471	0.000	0	0.0	0.0	0.000	A
D-BC	33	8	438	0.076	33	0.1	0.1	8.900	A
C-ABD	46	12	709	0.065	46	0.1	0.1	5.478	A
C-D	0	0			0				
C-A	118	30			118				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	463	0.000	0	0.0	0.0	0.000	A
B-AD	61	15	442	0.137	60	0.1	0.2	9.439	A
A-BCD	42	11	825	0.051	42	0.1	0.1	4.752	A
A-B	0	0			0				
A-C	274	68			274				
D-AB	0	0	455	0.000	0	0.0	0.0	0.000	A
D-BC	41	10	418	0.098	41	0.1	0.1	9.547	A
C-ABD	59	15	713	0.083	59	0.1	0.1	5.567	A
C-D	0	0			0				
C-A	142	36			142				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	463	0.000	0	0.0	0.0	0.000	A
B-AD	61	15	442	0.137	61	0.2	0.2	9.448	A
A-BCD	42	11	825	0.051	42	0.1	0.1	4.768	A
A-B	0	0			0				
A-C	274	68			274				
D-AB	0	0	455	0.000	0	0.0	0.0	0.000	A
D-BC	41	10	418	0.098	41	0.1	0.1	9.552	A
C-ABD	59	15	713	0.083	59	0.1	0.1	5.576	A
C-D	0	0			0				
C-A	142	36			142				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	485	0.000	0	0.0	0.0	0.000	A
B-AD	49	12	466	0.106	50	0.2	0.1	8.658	A
A-BCD	32	8	800	0.040	32	0.1	0.1	4.845	A
A-B	0	0			0				
A-C	226	57			226				
D-AB	0	0	471	0.000	0	0.0	0.0	0.000	A
D-BC	33	8	438	0.076	33	0.1	0.1	8.908	A
C-ABD	46	12	709	0.065	46	0.1	0.1	5.496	A
C-D	0	0			0				
C-A	118	30			118				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	501	0.000	0	0.0	0.0	0.000	A
B-AD	41	10	483	0.086	42	0.1	0.1	8.158	A
A-BCD	25	6	783	0.032	25	0.1	0.0	4.888	A
A-B	0	0			0				
A-C	191	48			191				
D-AB	0	0	483	0.000	0	0.0	0.0	0.000	A
D-BC	28	7	452	0.062	28	0.1	0.1	8.490	A
C-ABD	37	9	707	0.053	37	0.1	0.1	5.432	A
C-D	0	0			0				
C-A	101	25			101				

Background plus Orsted plus Vattenfall, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	2.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	Background plus Orsted plus Vattenfall	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	152	100.000
B		ONE HOUR	✓	58	100.000
C		ONE HOUR	✓	294	100.000
D		ONE HOUR	✓	26	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	124	28
	B	58	0	0	0
	C	234	60	0	0
	D	0	0	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	5	1
	B	2	0	0	0
	C	8	1	0	0
	D	0	0	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.00	0.00	0.0	A	0	0
B-AD	0.14	9.32	0.2	A	53	80

A-BCD	0.06	5.58	0.1	A	31	46
A-B					0	0
A-C					109	163
D-AB	0.00	0.00	0.0	A	0	0
D-BC	0.07	9.64	0.1	A	24	36
C-ABD	0.12	5.17	0.2	A	76	114
C-D					0	0
C-A					193	290

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	516	0.000	0	0.0	0.0	0.000	A
B-AD	44	11	494	0.088	43	0.0	0.1	8.136	A
A-BCD	24	6	694	0.035	24	0.0	0.0	5.451	A
A-B	0	0			0				
A-C	90	23			90				
D-AB	0	0	477	0.000	0	0.0	0.0	0.000	A
D-BC	20	5	447	0.044	19	0.0	0.0	8.587	A
C-ABD	58	15	776	0.075	58	0.0	0.1	5.135	A
C-D	0	0			0				
C-A	163	41			163				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	503	0.000	0	0.0	0.0	0.000	A
B-AD	52	13	479	0.109	52	0.1	0.1	8.602	A
A-BCD	30	8	694	0.043	30	0.0	0.1	5.504	A
A-B	0	0			0				
A-C	107	27			107				
D-AB	0	0	463	0.000	0	0.0	0.0	0.000	A
D-BC	23	6	431	0.054	23	0.0	0.1	9.003	A
C-ABD	74	18	792	0.093	73	0.1	0.1	5.143	A
C-D	0	0			0				
C-A	191	48			191				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	484	0.000	0	0.0	0.0	0.000	A
B-AD	64	16	458	0.140	64	0.1	0.2	9.314	A
A-BCD	38	10	695	0.055	38	0.1	0.1	5.579	A
A-B	0	0			0				
A-C	129	32			129				
D-AB	0	0	445	0.000	0	0.0	0.0	0.000	A
D-BC	29	7	410	0.070	29	0.1	0.1	9.635	A
C-ABD	97	24	815	0.119	97	0.1	0.2	5.165	A
C-D	0	0			0				
C-A	227	57			227				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	484	0.000	0	0.0	0.0	0.000	A
B-AD	64	16	458	0.140	64	0.2	0.2	9.324	A
A-BCD	38	10	695	0.055	38	0.1	0.1	5.584	A
A-B	0	0			0				
A-C	129	32			129				
D-AB	0	0	445	0.000	0	0.0	0.0	0.000	A
D-BC	29	7	410	0.070	29	0.1	0.1	9.639	A
C-ABD	97	24	815	0.119	97	0.2	0.2	5.174	A
C-D	0	0			0				
C-A	227	57			227				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	503	0.000	0	0.0	0.0	0.000	A
B-AD	52	13	479	0.109	52	0.2	0.1	8.616	A
A-BCD	30	8	694	0.043	30	0.1	0.1	5.515	A
A-B	0	0			0				
A-C	107	27			107				
D-AB	0	0	463	0.000	0	0.0	0.0	0.000	A
D-BC	23	6	431	0.054	23	0.1	0.1	9.011	A
C-ABD	74	18	792	0.093	74	0.2	0.2	5.166	A
C-D	0	0			0				
C-A	191	48			191				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	516	0.000	0	0.0	0.0	0.000	A
B-AD	44	11	494	0.088	44	0.1	0.1	8.158	A
A-BCD	24	6	694	0.035	24	0.1	0.0	5.462	A
A-B	0	0			0				
A-C	90	23			90				
D-AB	0	0	476	0.000	0	0.0	0.0	0.000	A
D-BC	20	5	447	0.044	20	0.1	0.0	8.601	A
C-ABD	59	15	776	0.075	59	0.2	0.1	5.152	A
C-D	0	0			0				
C-A	163	41			163				

Background plus Orsted plus Vattenfall, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	2.76	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	Background plus Orsted plus Vattenfall	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	287	100.000
B		ONE HOUR	✓	69	100.000
C		ONE HOUR	✓	198	100.000
D		ONE HOUR	✓	37	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	262	25
	B	69	0	0	0
	C	141	57	0	0
	D	0	0	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	11	0
	B	0	0	0	0
	C	6	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.00	0.00	0.0	A	0	0
B-AD	0.17	10.02	0.2	B	63	95

A-BCD	0.05	4.91	0.1	A	33	50
A-B					0	0
A-C					230	345
D-AB	0.00	0.00	0.0	A	0	0
D-BC	0.10	9.70	0.1	A	34	51
C-ABD	0.11	5.76	0.2	A	64	97
C-D					0	0
C-A					117	176

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	496	0.000	0	0.0	0.0	0.000	A
B-AD	52	13	479	0.108	51	0.0	0.1	8.412	A
A-BCD	25	6	779	0.032	25	0.0	0.0	4.897	A
A-B	0	0			0				
A-C	191	48			191				
D-AB	0	0	481	0.000	0	0.0	0.0	0.000	A
D-BC	28	7	448	0.062	28	0.0	0.1	8.552	A
C-ABD	50	13	707	0.071	50	0.0	0.1	5.526	A
C-D	0	0			0				
C-A	99	25			99				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	479	0.000	0	0.0	0.0	0.000	A
B-AD	62	16	461	0.135	62	0.1	0.2	9.027	A
A-BCD	32	8	796	0.040	32	0.0	0.1	4.845	A
A-B	0	0			0				
A-C	226	57			226				
D-AB	0	0	469	0.000	0	0.0	0.0	0.000	A
D-BC	33	8	433	0.077	33	0.1	0.1	9.006	A
C-ABD	62	16	709	0.088	62	0.1	0.1	5.617	A
C-D	0	0			0				
C-A	116	29			116				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	455	0.000	0	0.0	0.0	0.000	A
B-AD	76	19	435	0.174	76	0.2	0.2	10.003	B
A-BCD	43	11	820	0.052	42	0.1	0.1	4.787	A
A-B	0	0			0				
A-C	273	68			273				
D-AB	0	0	452	0.000	0	0.0	0.0	0.000	A
D-BC	41	10	412	0.099	41	0.1	0.1	9.698	A
C-ABD	80	20	713	0.113	80	0.1	0.2	5.753	A
C-D	0	0			0				
C-A	138	34			138				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	455	0.000	0	0.0	0.0	0.000	A
B-AD	76	19	435	0.175	76	0.2	0.2	10.017	B
A-BCD	43	11	820	0.052	43	0.1	0.1	4.801	A
A-B	0	0			0				
A-C	273	68			273				
D-AB	0	0	452	0.000	0	0.0	0.0	0.000	A
D-BC	41	10	412	0.099	41	0.1	0.1	9.704	A
C-ABD	80	20	713	0.113	80	0.2	0.2	5.765	A
C-D	0	0			0				
C-A	138	34			138				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	479	0.000	0	0.0	0.0	0.000	A
B-AD	62	16	460	0.135	62	0.2	0.2	9.045	A
A-BCD	32	8	796	0.040	32	0.1	0.1	4.876	A
A-B	0	0			0				
A-C	226	56			226				
D-AB	0	0	469	0.000	0	0.0	0.0	0.000	A
D-BC	33	8	433	0.077	33	0.1	0.1	9.018	A
C-ABD	63	16	709	0.088	63	0.2	0.1	5.637	A
C-D	0	0			0				
C-A	115	29			115				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-CD	0	0	496	0.000	0	0.0	0.0	0.000	A
B-AD	52	13	479	0.109	52	0.2	0.1	8.443	A
A-BCD	25	6	779	0.032	25	0.1	0.0	4.914	A
A-B	0	0			0				
A-C	191	48			191				
D-AB	0	0	481	0.000	0	0.0	0.0	0.000	A
D-BC	28	7	448	0.062	28	0.1	0.1	8.572	A
C-ABD	51	13	707	0.072	51	0.1	0.1	5.540	A
C-D	0	0			0				
C-A	98	25			98				

Annex C Main Construction Compound Access Options Overview

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Revision History

Version	Date	Author	Context
1	14.12.2018	Create Consulting Engineers Ltd	Final for submission at Deadline 3

1. Introduction

Background

1.1 Orsted Hornsea Project Three (UK) Ltd., on behalf of Orsted Power (UK) Ltd., is promoting the development of the Hornsea Project Three Offshore Wind Farm (hereafter referred to as Hornsea Three). Hornsea Three is a project that will consist of an offshore generating station(s) with a capacity of greater than 100 MW and therefore is a Nationally Significant Infrastructure Project (NSIP), as defined by Section 15(3) of the Planning Act 2008, as amended. As such, there is a requirement to submit an application for a Development Consent Order (DCO) to the Planning Inspectorate (PINS) to be decided by the Secretary of State for Business, Energy and Industrial Strategy.

1.2 As stated in Volume 1, Chapter 3: Project Description of the Environmental Statement (APP-058), one on-shore main construction compound is needed as part of the construction process for Hornsea Three to manage the construction and cabling activities and to act as a central base for the construction operations to ensure they progress efficiently. A location for a main construction compound was identified within Volume 1, Chapter 3: Project Description of the Environmental Statement (APP-058), at the former Oulton Airfield which currently has access via The Street, which connects the B1149 to the south and B1345 to the north.

1.3 This annex has been prepared in response to ISH4 (7th December 2018) and presents a summary of the access options considered for Hornsea Three construction vehicles to access the main construction compound to/from the main road network, as well as their current status.

1.4 The location of the access options considered is shown in Appendix A to this report.

2. Compound Access Options Overview

Options Identified by the Applicant

2.1 The Applicant initially identified four potential access options for consideration to enable Hornsea Three construction vehicles to access the main construction compound to/from the main road network, via The Street in a safe and efficient manner.

2.2 The four options were communicated to stakeholders in September 2018 within a document titled 'Main Construction Compound Access Strategy' which also evaluated the suitability of the options with due consideration of traffic flows likely to be generated by Hornsea Three, the potential cumulative impacts with Norfolk Vanguard and development proposals and recent developments that used (or proposed to use) access to the former Oulton Airfield (for example the refused Anaerobic Digester facility (planning application reference 20130860). This document is provided as Annex B of Appendix 1 submitted at Deadline 3.

2.3 The four options were as follows:

- Option 1: Passing Places;
- Option 2: Comprehensive Widening;
- Option 3a: Passing Places with B1149/The Street/B1345 Circulatory;
- Option 3b: Temporary One-Way Northbound All Traffic (The Street);

Option 1: "Passing Places"

2.4 The main feature of this option comprises a total of eight extended passing places (to accommodate two full-length articulated vehicles) at key locations along The Street extending from the junction with the B1149 to the Oulton Airfield access, with all construction traffic routed to/from the B1149 using The Street to the south of the proposed compound; and includes improvements to junction geometry and drainage at the B1149/The Street junction through bellmouth widening, installation of "containment" kerbs to prevent HGV and agricultural vehicle overrunning and a formal means of drainage including filter drain/soakaway on the South side of the junction to minimise the potential for ponding.

2.5 A "shallow-dig" system of road widening is proposed for the passing places and a cellular system of road construction is identified (Grasscrete, or similar) with a view to minimising impact on existing Root Protection Areas (RPAs) associated with mature tree specimen.

2.6 **Option 1 is the preferred scheme promoted by the Applicant and has been agreed in principle by Norfolk County Council.**

Option 2 "Comprehensive Widening"

2.7 Option 2 effectively builds on Option 1 and would provide more extensive road widening (up to 6.0m) along The Street extending from the junction with the B1149 to the Oulton Airfield access, through wider application of the cellular system of road construction referred to above.

2.8 **Option 2 is no longer under consideration as agreed with Norfolk County Council based on the findings of the Stage 1 Safety Audit (reported in Annex A of Appendix 1 to Deadline 3).**

Option 3a: Passing Places with B1149/The Street/B1345 Circulatory

2.9 Option 3a would provide all of that associated with Option 1, plus additional passing places along The Street to the north of Oulton Airfield, where these can be successfully accommodated. A circulatory system would then be employed (for construction traffic only) involving The Street, the B1149 and the B1345, joining at the B1149/B1345 roundabout.

2.10 **Option 3a is no longer under consideration as agreed with Norfolk County Council based on the findings of the Stage 1 Safety Audit (reported in Annex A of Appendix 1 to Deadline 3).**

Option 3b: Temporary One-Way Northbound All Traffic (The Street);

2.11 Option 3a would only provide the bellmouth improvements at the B1149/The Street junction and all movements (including existing residential, agricultural and commercial traffic) would be subject to a temporary one-way arrangement for the duration of the Hornsea Three project, northbound along The Street for the entire section between the B1149 to the south and B1345 to the north of the main construction compound at Oulton Airfield.

2.12 **Option 3b is no longer under consideration as agreed with Norfolk County Council based on the findings of the Stage 1 Safety Audit (reported in Annex A of Appendix 1 to Deadline 3).**

Options Identified through Consultation – Option 'R'

2.13 As part of their Deadline 2 submission, Oulton Parish Council proposed an alternative Option 'R' (the option identified by residents), and followed up with an email to the Applicant on 12th November 2018 which identified three potential options (see Applicant's Comments to Oulton Parish Council Written Representations and Section 5 of Appendix 1: Main Construction Compound Briefing Note, both submitted to Deadline 3). The Applicant's initial evaluation identified two variants of one of the potential options, with the key difference being the proposed location of the new junction on the B1113, resulting a total of four options.

2.14 The four options were as follows:

- Option R 'A': Access Via The Street/Off Network Haul Road;
- Option R 'B': Access Via 1149;
- Option R 'C1': Access Via B1149 Ghost Island (north); and
- Option R 'C2': Access Via B1149 Ghost Island (south).

2.15 All parties (NCC, OPC and the Applicant) agreed early in the considerations that Option R 'B' should not be considered further, due to the topography of the B1149 at the suggested location (thus visibility constraints) and the presence of numerous mature tree and hedgerow specimens which would require removal.

2.16 On this basis, three options (Option R 'A', R 'C1 'and R 'C2') were communicated to relevant stakeholders (NCC, BDC and OPC) in December 2018 within a document titled 'Compound Access Option R Review' which looks at each of the three access options and presents their suitability following an independent Stage 1 Road Safety Audit (RSA). An updated version of this document is provided as Annex D of Appendix 1 submitted at Deadline 3.

2.17 The Applicant has also contacted all of the landowners affected by Options R 'A', R 'C1' and R 'C2' and has received responses from all of them. At this stage negotiations in respect of a potential access road are in progress and the Applicant wishes at this stage to keep those negotiations and the landowners' respective positions confidential. The Applicant will continue discussions with landowners in respect of potential options until a conclusion can be reached on the viability of all Option R variants from a land availability perspective.

2.18 The Applicant is awaiting feedback on these options, but would maintain that although willing to consider alternative feasible and deliverable options, a solution that is acceptable to NCC as the local highway authority for use of The Street under Option 1: Passing Places has been reached and demonstrates a deliverable solution using the existing Street within land under the control of the Highway Authority.

Option R 'A': "Access Via The Street/Off Network Haul Road"

2.19 The main feature of this option comprises one extended passing place (to accommodate two full-length articulated vehicles) on The Street extending from the junction with the B1149. With this Option all construction traffic is routed to/from the B1149 using The Street to the south of the proposed compound; and includes improvements to junction geometry and drainage at the B1149/The Street junction through bellmouth widening, installation of "containment" kerbs to prevent HGV and agricultural vehicle overrunning and a formal means of drainage including filter drain/soakaway on the South side of the junction to minimise the potential for ponding.

2.20 This option also proposes and off network haul route through the land to the west of The Street extending north to the compound.

2.21 **Option R 'A' is currently with Norfolk County Council for consideration.**

Option R 'C1': "Access Via B1149 Ghost Island" (north)

2.22 Option R 'C1' is shown on Create drawing 1554/03/500 and proposes that HGV/construction traffic would access the main compound from a new access constructed on the B1149 approximately 2.4km north of the junction with The Street.

2.23 To accommodate the levels of construction traffic associated with the Hornsea Three project it is deemed necessary for the proposed junction to have a ghost island to accommodate right turns into the compound.

2.24 The ghost island layout is based on a design speed of 120kph, and is presented with 3.25m wide running lanes north and southbound and a 4.5m wide right turn lane, to accommodate large HGVs.

2.25 As shown on Create drawing 1554/03/500 visibility splays of 295m can be achieved to the north and south from the proposed compound access. Create drawing 1554/03/504 also provides long sections demonstrating 295m visibility splays are achievable in the vertical plane.

2.26 **Option R 'C1' is currently with Norfolk County Council for consideration.**

Option R 'C2': "Access Via B1149 Ghost Island" (south)

2.27 Option R 'C2' is shown on Create drawing 1554/03/503 (included in Appendix A) and proposes that HGV/construction traffic would access the main compound from a new access constructed on the B1149 approximately 1.9km north of the junction with The Street.

2.28 To accommodate the levels of construction traffic associated with the Hornsea Three project it is deemed necessary for the proposed junction to have a ghost island to accommodate right turns into the compound.

2.29 The ghost island layout is based on a design speed of 120kph, and is presented with 3.25m wide running lanes north and southbound and a 4.5m wide right turn lane, to accommodate large HGVs.

2.30 As shown on Create drawing 1554/03/503 visibility splays of 295m can be achieved to the north and the south from the proposed compound access. Create drawing 1554/03/505 also provides long sections demonstrating 295m visibility splays are achievable in the vertical plane.

2.31 **Option R 'C2' is currently with Norfolk County Council for consideration.**

3. Summary

3.1 Table 3.1 summarises the access options considered and evaluated by the Applicant, as well as their current status.

Table 3.1: Summary of Access Option considered and their current status

Access Option	Status
Option 1: Passing Places	Option 1 is the **preferred scheme** promoted by the Applicant and has been **agreed in principle** by Norfolk County Council.
Option 2: Comprehensive Widening	Option 2 is **no longer under consideration**.
Option 3A: Passing Places with B1149/The Street/B1345 Circulatory	Option 3a is **no longer under consideration**.
Option 3B: Temporary One-Way Northbound All Traffic (The Street	Option 3b is **no longer under consideration**.
Option R 'A': Access Via The Street/Off Network Haul Road	Option R 'A' is **currently with Norfolk County Council for consideration**.
Option R 'B': Access Via 1149	Option R 'B' is **no longer under consideration**.
Option R 'C1': Access Via B1149 Ghost Island (north)	Option R 'C1' is **currently with Norfolk County Council for consideration.**
Option R 'C2': Access Via B1149 Ghost Island (south)	Option R 'C2' is **currently with Norfolk County Council for consideration.**

Appendix A Location of Access Options

Ørsted

KEY:

- OPTION 1 - ACCESS FROM THE STREET, WITH PASSING PLACE MITIGATION (REFER TO CREATE DRAWINGS 1544/03/101 & 1544/03/102)
- OPTION 2 - ACCESS FROM THE STREET, WITH ROAD WIDENING MITIGATION (REFER TO CREATE DRAWINGS 1544/03/103 & 1544/03/104)
- OPTION 3A - ACCESS FROM THE STREET, WITH ONE WAY ROUTING OF CONSTRUCTION TRAFFIC (REFER TO CREATE DRAWING 1544/03/105)
- OPTION 3B - ACCESS FROM THE STREET, WITH ONE WAY ROUTING OF ALL TRAFFIC (REFER TO CREATE DRAWING 1544/03/105)
- OPTION A - ACCESS VIA THE STREET, WITH OFF NETWORK HAUL ROAD THROUGH THIRD PARTY LAND (REFER TO CREATE DRAWING 1544/03/501)
- OPTION A - INDICATIVE HAUL ROUTE TO COMPOUND
- OPTION C1 - ACCESS VIA NEW GHOST ISLAND ON THE B1149, WITH OFF NETWORK HAUL ROAD THROUGH THIRD PARTY LAND (REFER TO CREATE DRAWINGS 1544/03/500 & 1544/03/504)
- OPTION C1 - INDICATIVE HAUL ROUTE TO COMPOUND
- OPTION C2 - ACCESS VIA NEW GHOST ISLAND ON THE B1149, WITH OFF NETWORK HAUL ROAD THROUGH THIRD PARTY LAND (REFER TO CREATE DRAWINGS 1544/03/503 & 1544/03/505)
- OPTION C2 - INDICATIVE HAUL ROUTE TO COMPOUND

GENERAL NOTES:

1. THE DRAWING IS BASED ON DIGITAL OS 1:10,000 MAPPING.
2. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
3. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
4. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
5. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
6. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 12.12.18	DRAWING STATUS: INFORMATION	create CONSULTING ENGINEERS LTD
	SCALE(S): 1:10,000	DESIGNED: AF / DRAWN: AF / CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: COMBINED COMPOUND ACCESS OPTIONS PLAN	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/600	REVISION: -	

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ORIGINAL SHEET SIZE - A1 Landscape

DO NOT SCALE

Annex D ~~Oulton~~Main Construction Compound Option 'R' Review

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3. Option C1 Direct Compound Access off B1149....4
4. Option C2 Direct Compound Access off B1149....5
5. Summary and Conclusions....6

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Appendix B Stage 1 Road Safety Audit....8

Revision History

Version	Date	Author	Context
1	30.11.18	AF/PZ	For Discussion with NCC
A	14.12.2018	AF/PZ	Final version for submission at Deadline 3

Abbreviations

Abbreviation	Definition
RSA	Road Safety Audit
NCC	Norfolk County Council
HGVs	Heavy Goods Vehicles

1. Introduction

1.1 As part of their Deadline 2 submission, Oulton Parish Council proposed an alternative access to the main construction compound, termed Option 'R' (the option identified by residents), and followed up with an email to the Applicant on 12th November 2018 which identified three potential variations of this option (see Applicant's Comments to Oulton Parish Council Written Representations and Section 5 of Appendix 1: Main Construction Compound Briefing Note, both submitted to Deadline 3). The Applicant's initial evaluation identified two variants of one of the potential options, with the key difference being the proposed location of the new junction on the B1113, resulting a total of four options.

1.2 The four options were as follows:

- Option R 'A': Access Via The Street/Off Network Haul Road;
- Option R 'B': Access Via 1149;
- Option R 'C1': Access Via B1149 Ghost Island (north); and
- Option R 'C2': Access Via B1149 Ghost Island (south).

1.3 All parties (NCC, OPC and the Applicant) agreed early in the considerations that Option R 'B' should not be considered further, due to the topography of the B1149 at the suggested location (thus visibility constraints) and the presence of numerous mature tree and hedgerow specimens which would require removal. As such, this is not reported on within this annex.

1.4 This document therefore provides a review of three Option 'R' variations (Option R 'A', R 'C1 'and R 'C2') and presents their suitability following an independent Stage 1 Road Safety Audit (RSA) under taken on 28 November 2018 by CJ Safety Audit.

1.5 The designs reviewed in this Technical Note are based on detailed topographical surveys with vertical alignment taken into consideration regarding visibility along the B1149.

2. Option R 'A' Access Review

2.1 Option R 'A' is shown on Create drawing 1554/03/501 (included in Appendix A) and proposes that HGV/construction traffic would access the main compound from a new access constructed on The Street via the existing B1149 junction to the south.

2.2 To accommodate the increased levels of HGV traffic associated with the Hornsea Three project improvements are proposed at the existing junction on the B1149 with The Street. These are shown on drawing 1554/03/501 as a widened bell mouth with localised full-depth road construction and new containment kerbs to prevent overrunning.

2.3 New gullies and filter trench on the south-east side kerb radius and the existing field accesses either side of The Street would be upgraded to include new kerbing and enhanced definition.

2.4 To better accommodate HGV movements a new, extended passing place is proposed on The Street which integrates with the proposed bell mouth widening works, to provide an extended section of 6.0m overall road width on the approach to/from the junction with the B1149 to the south.

2.5 Approximately 190m north of the B1149/The Street junction a new access is proposed on the north-west side of The Street for compound traffic with a carriageway width of 8.5m and 15.0m bell mouth radius.

Stage 1 Road Safety Audit Comments

2.6 Regarding Option R 'A' the RSA raised two potential problems and provided one comment.

2.7 Paragraph 3.4 of the RSA raises the point that the 15.0m radius proposed on the northern side of the junction could encourage HGVs to turn left out of the compound and route through Oulton.

2.8 The solution suggested in the RSA is to reduce the northern radius to discourage left turns out of the compound.

2.9 This will not be an issue as all HGV drivers will be under strict instruction to turn right out of the compound access and route onto the B1149 to the south-west. The northern bell mouth radius could be reduced to discourage HGV movements north if deemed necessary following NCC feedback.

2.10 Parag 3.5 of the RSA raises the potential problem that the sinuous alignment and throat width of the proposed access junction suggest that two large opposing vehicles entering/leaving could result in head-on conflict, or stopping mid-manoeuvre with potential for tail end collision by following traffic on The Street.

2.11 HGV traffic could be instructed to stop and wait for the compound access to clear before attempting to turn into the Site. The compound access carriageway width could also be widened to 10.0m to allow for two way HGV movements, this will be tested and simulated using swept path analysis when the design is refined at detailed design.

2.12 The final RSA comment for Option R 'A' is at paragraph 3.7 and is stated for consideration at detailed design. The comment raised is that the existing junction lies on a long straight high-speed section of the B1149 where drivers may be able to overtake. In the absence of a right turn lane, specific advance signing is suggested to warn drivers of the potential for conflict with slowing right-turning HGVs ahead. As is suggested this will be considered at the detailed design stage.

3. Option R 'C1' Direct Compound Access off B1149

3.1 Option R 'C1' is shown on Create drawing 1554/03/500 (included in Appendix A) and proposes that HGV/construction traffic would access the main compound from a new access constructed on the B1149 approximately 2.4km north of the junction with The Street.

3.2 To accommodate the levels of construction traffic associated with the Hornsea Three project it is deemed necessary for the proposed junction to have a ghost island to accommodate right turns into the compound.

3.3 The ghost island layout is based on a design speed of 120kph, and is presented with 3.25m wide running lanes north and southbound and a 4.5m wide right turn lane, to accommodate large HGVs.

3.4 As shown on Create drawing 1554/03/500 visibility splays of 295m can be achieved to the north and south from the proposed compound access. Create drawing 1554/03/504 also provides long sections demonstrating 295m visibility splays are achievable in the vertical plane.

Stage 1 Road Safety Audit Comments

3.5 Regarding Option R 'C1' the RSA raised two potential problems.

3.6 The first being paragraph 3.2 of the RSA which states that;

"A traffic island appears to be indicated within the central hatching approx. 120m south-east of the proposed access junction. Its purpose may be to deter overtaking; however, on an unlit high-speed road it would pose a significant hazard, particularly at night or in adverse weather conditions. Even with passively safe street furniture, any collision is likely to result in loss of control and collision with other traffic or roadside features. The Auditors consider that the safety disbenefit would outweigh the potential benefit."

3.7 The auditor's recommendation is to remove the traffic island from Option C1 and instead provide a prohibitory double white line system to deter overtaking through the junction without the need for a physical feature which could result in loss of control collisions.

3.8 This solution will be discussed with Norfolk County Council (NCC) and if deemed acceptable worked into the final detailed design.

3.9 The second problem noted at paragraph 3.3 of the RSA states that the proposed junction radius scales approximately 15.0m, without a lead-out taper as recommended in TD42/95. This could result in a large vehicle turning left from the proposed access onto the B1149 and overswinging into the path of mainline traffic.

3.10 The RSA recommends that a lead-out taper or compound curve radius is added to cater for large vehicle movements. This will be discussed with NCC and worked into the final detailed design following approval in principle and swept path analysis.

4. Option R 'C2' Direct Compound Access off B1149

4.1 Option R 'C2' is shown on Create drawing 1554/03/503 (included in Appendix A) and proposes that HGV/construction traffic would access the main compound from a new access constructed on the B1149 approximately 1.9km north of the junction with The Street.

4.2 To accommodate the levels of construction traffic associated with the Hornsea Three project it is deemed necessary for the proposed junction to have a ghost island to accommodate right turns into the compound.

4.3 The ghost island layout is based on a design speed of 120kph, and is presented with 3.25m wide running lanes north and southbound and a 4.5m wide right turn lane, to accommodate large HGVs.

4.4 As shown on Create drawing 1554/03/503 visibility splays of 295m can be achieved to the north and the south from the proposed compound access. Create drawing 1554/03/505 also provides long sections demonstrating 295m visibility splays are achievable in the vertical plane.

Stage 1 Road Safety Audit Comments

4.5 In regard to Option R 'C2' the RSA raised two potential problems.

4.6 The first being paragraph 3.2 of the RSA which states that;

"A traffic island appears to be indicated within the central hatching approx. 120m south-east of the proposed access junction. Its purpose may be to deter overtaking; however on an unlit high-speed road it would pose a significant hazard, particularly at night or in adverse weather conditions. Even with passively safe street furniture, any collision is likely to result in loss of control and collision with other traffic or roadside features. The Auditors consider that the safety disbenefit would outweigh the potential benefit."

4.7 The auditor's recommendation is to remove the traffic island from Option C2 and instead provide a prohibitory double white line system to deter overtaking through the junction without the need for a physical feature which could result in loss of control collisions.

4.8 This solution will be discussed with Norfolk County Council (NCC) and if deemed acceptable worked into the final detailed design.

4.9 The second problem noted at paragraph 3.3 of the RSA states that the proposed junction radius scales approximately 15.0m, without a lead-out taper as recommended in TD42/95. This could result in a large vehicle turning left from the proposed access onto the B1149 and overswinging into the path of mainline traffic.

4.10 The RSA recommends that a lead-out taper or compound curve radius is added to cater for large vehicle movements. This will be discussed with NCC and worked into the final detailed design following approval in principle and swept path analysis.

5. Summary and Conclusions

5.1 This document comprises a technical note that reviews three alternative access options to the main compound compound for the Hornsea Three Offshore Wind Farm as proposed by Oulton Parish Council within their written representation (REP2-027) and subsequent engagement with the Applicant.

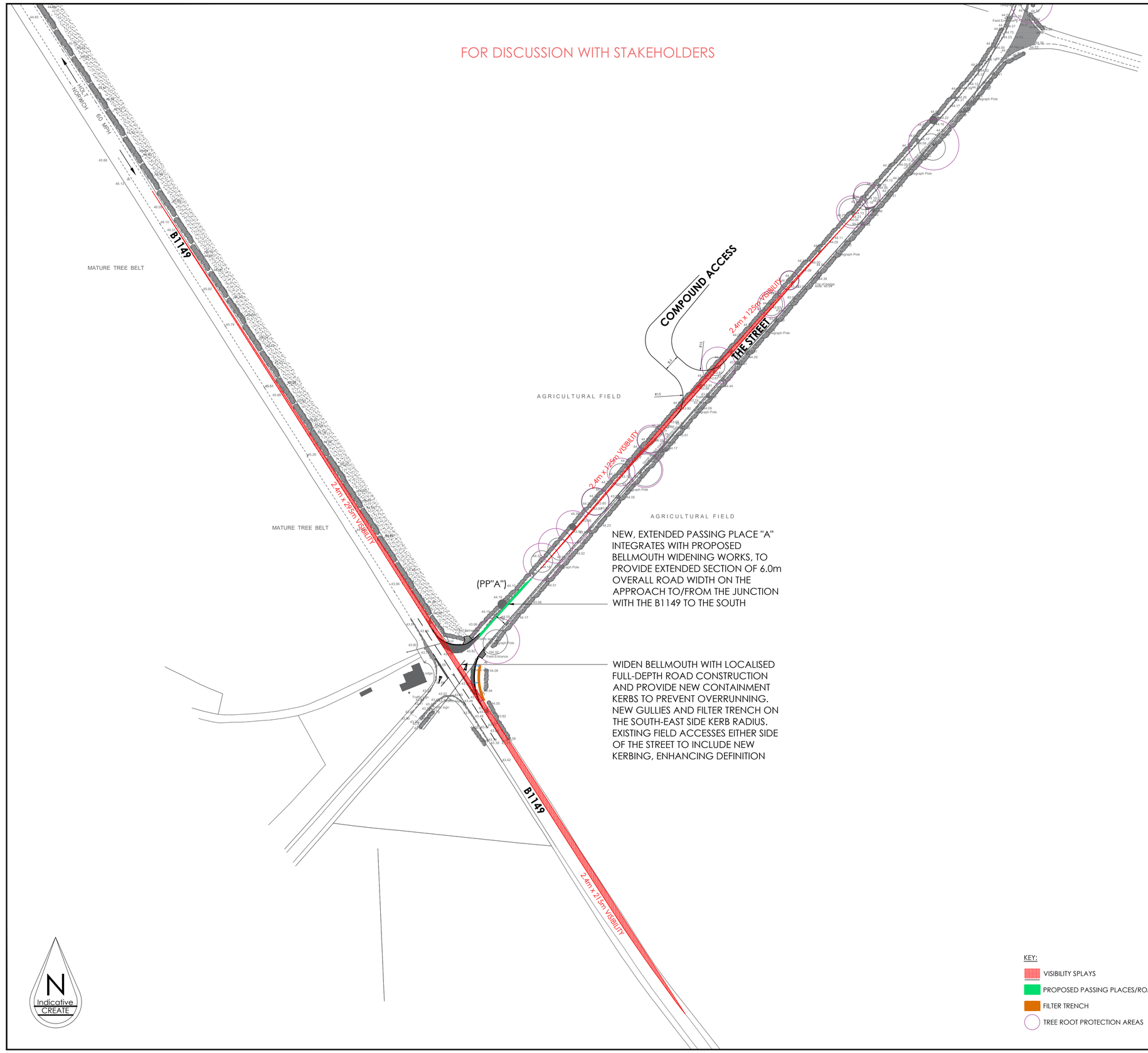
5.2 This assessment looks at each of the three access options (Option R 'A', 'C1' and 'C2') located both on the B1149 as well as The Street and tests their suitability following an independent Stage 1 Road Safety Audit (RSA) under taken on 28 November 2018 by CJ Safety Audit.

5.3 Feedback from Norfolk County Council, as local highways authority, is requested on this document, to ascertain the acceptability of the proposed Option R scenarios. A view from NCC is also asked regarding the safety auditor's comments to determine which suggested improvements should be incorporated into the option designs should they be taken forward for further consideration.

5.4 The Applicant is awaiting feedback on these options from NCC, but would maintain that although willing to consider alternative feasible and deliverable options, a solution that is acceptable to NCC as the local highway authority for use of The Street – termed Option 1: Passing Places (as defined in Annex A of Appendix 1 submitted at Deadline 3) - has been reached and demonstrates a deliverable solution using the existing Street within land under the control of the Highway Authority.

Appendix A Create Design Drawings

FOR DISCUSSION WITH STAKEHOLDERS



KEY:

- VISIBILITY SPLAYS
- PROPOSED PASSING PLACES/ROAD WIDENING
- FILTER TRENCH
- TREE ROOT PROTECTION AREAS

Ørsted

OPTION A: HAUL ROAD OFF THE STREET

GENERAL NOTES:

1. PASSING PLACES (PP) TO BE FORMED BY SHALLOW-DIG CELLULAR SYSTEM (E.G. GRASSCRETE, OR SIMILAR) PROVIDING LOCALISED 6.0m OVERALL ROAD WIDTH, WITH PERMEABLE DRAINAGE TO SUB-STRATA. PASSING PLACES ARE LOCATED AND SPECIFIED WITH SHALLOW-DIG CELLULAR SYSTEM SO TO MINIMISE IMPACT OF THEIR CONSTRUCTION ON EXISTING TREE ROOT PROTECTION AREAS.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
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Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 27.11.18	DRAWING STATUS: FOR DISCUSSION	
	SCALE(S): 1:1,000	DESIGNED: AF / DRAWN: AF	
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	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/501	REVISION:	

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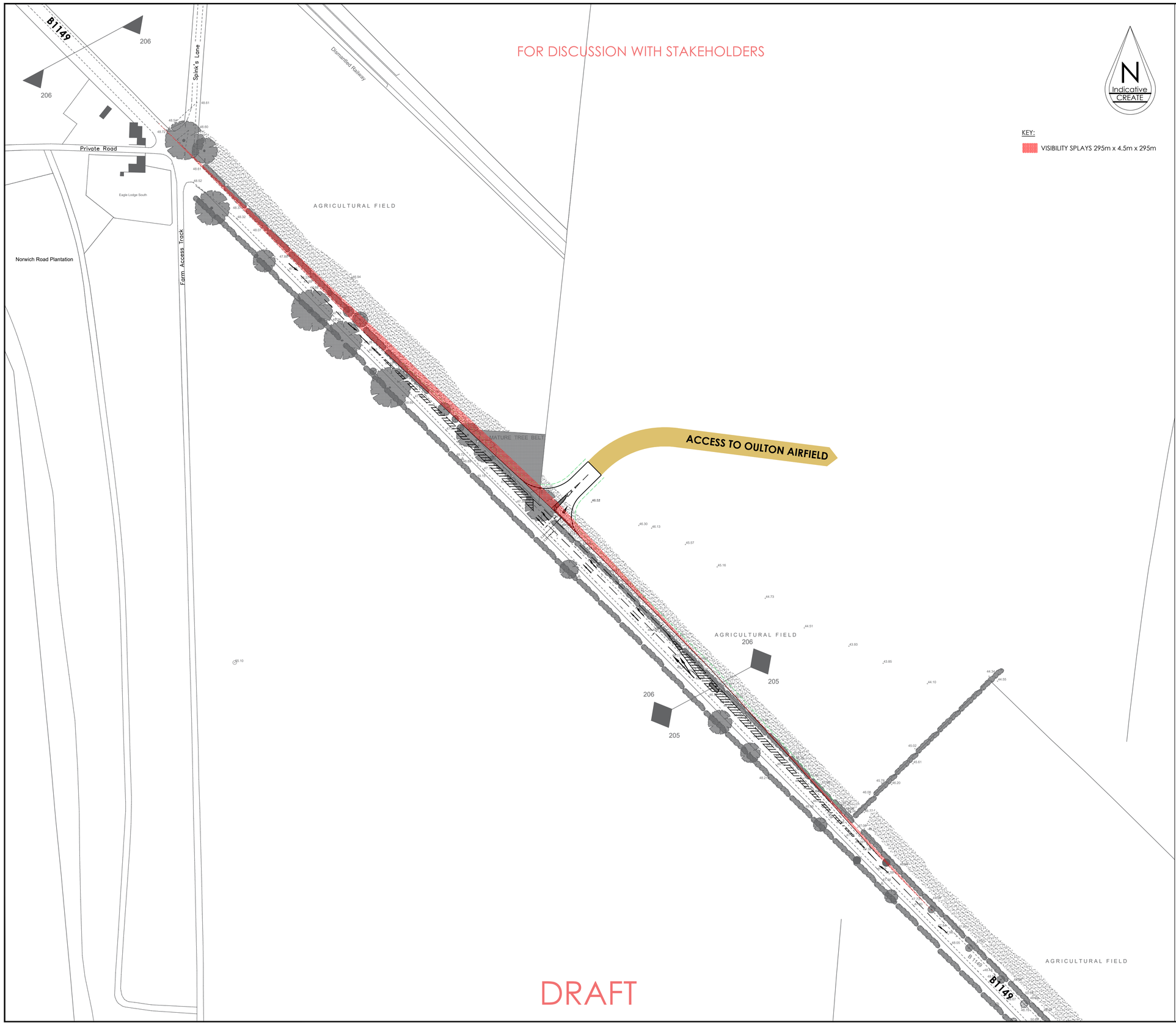
FOR DISCUSSION WITH STAKEHOLDERS



DRAFT

N
Indicative
CREATE

KEY:

VISIBILITY SPLAYS 295m x 4.5m x 295m

Ørsted

B1149 GHOST ISLAND JUNCTION

GENERAL NOTES:

1. THE GHOST ISLAND LAYOUT IS BASED ON A DESIGN SPEED OF 120kph, IN RESPECT OF RECENT ATC TRAFFIC SURVEY RESULTS FOR THE LOCAL SECTION OF B1149 AND IS PRESENTED WITH 3.25m WIDE RUNNING LANES NORTH AND SOUTHBOUND AND A 4.5m WIDE RIGHT TURN LANE, TO ACCOMMODATE LARGE HGVs.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

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Telephone: 01603 877010

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DRAWING TITLE: B1149 GHOST ISLAND OPTION C1 DIRECT ACCESS	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/500	REVISION:	

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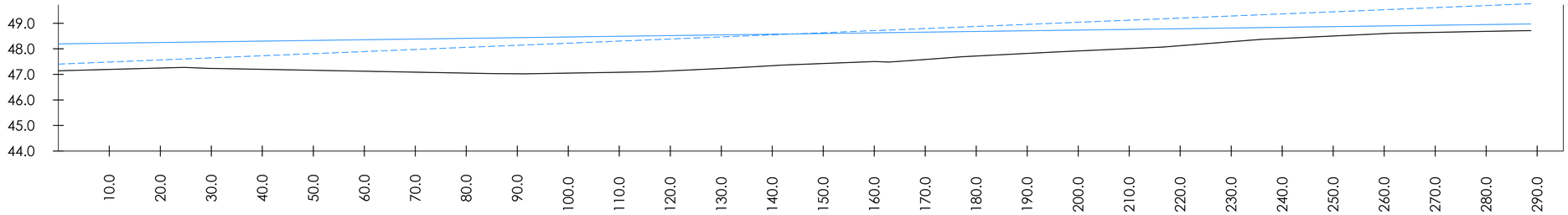
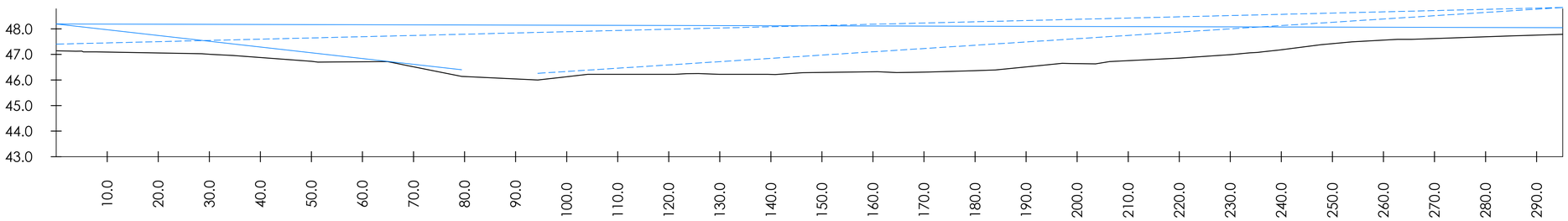
OPTION C1: VISIBILITY SPLAY LONG SECTIONS

FOR DISCUSSION WITH STAKEHOLDERS



Option C1 Northbound Visibility



Option C1 Southbound VISIBILITY

KEY:

——— VISIBILITY SPLAY LOOKING FROM THE ACCESS ALONG THE B1149

– – – – VISIBILITY SPLAY LOOKING TO THE ACCESS ALONG THE B1149

GENERAL NOTES:

1. LINES VISIBILITY IN ACCORDANCE WITH DMRB TD9/93: STOPPING SIGHT DISTANCES IN VERTICAL PLANES (IN BOTH DIRECTIONS) MEASURED FROM A MINIMUM DRIVER'S EYE HEIGHT OF BETWEEN 1.05m AND 2.00m, TO AN OBJECT HEIGHT OF BETWEEN 0.26m AND 2.00m BOTH ABOVE THE ROAD SURFACE.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. TO BE READ IN CONJUNCTION WITH 1554/03/500 B1149 Ghost Island Option C1 DRAFT.

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REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 27.11.18	DRAWING STATUS: FOR DISCUSSION	
	SCALE(S): V=1:100 H=1:500	DESIGNED: AF / DRAWN: AF	
		CHECKED: PZ / APPROVED: PZ	
DRAWING TITLE: VISIBILITY LONG SECTIONS OPTION C1	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/504	REVISION:	

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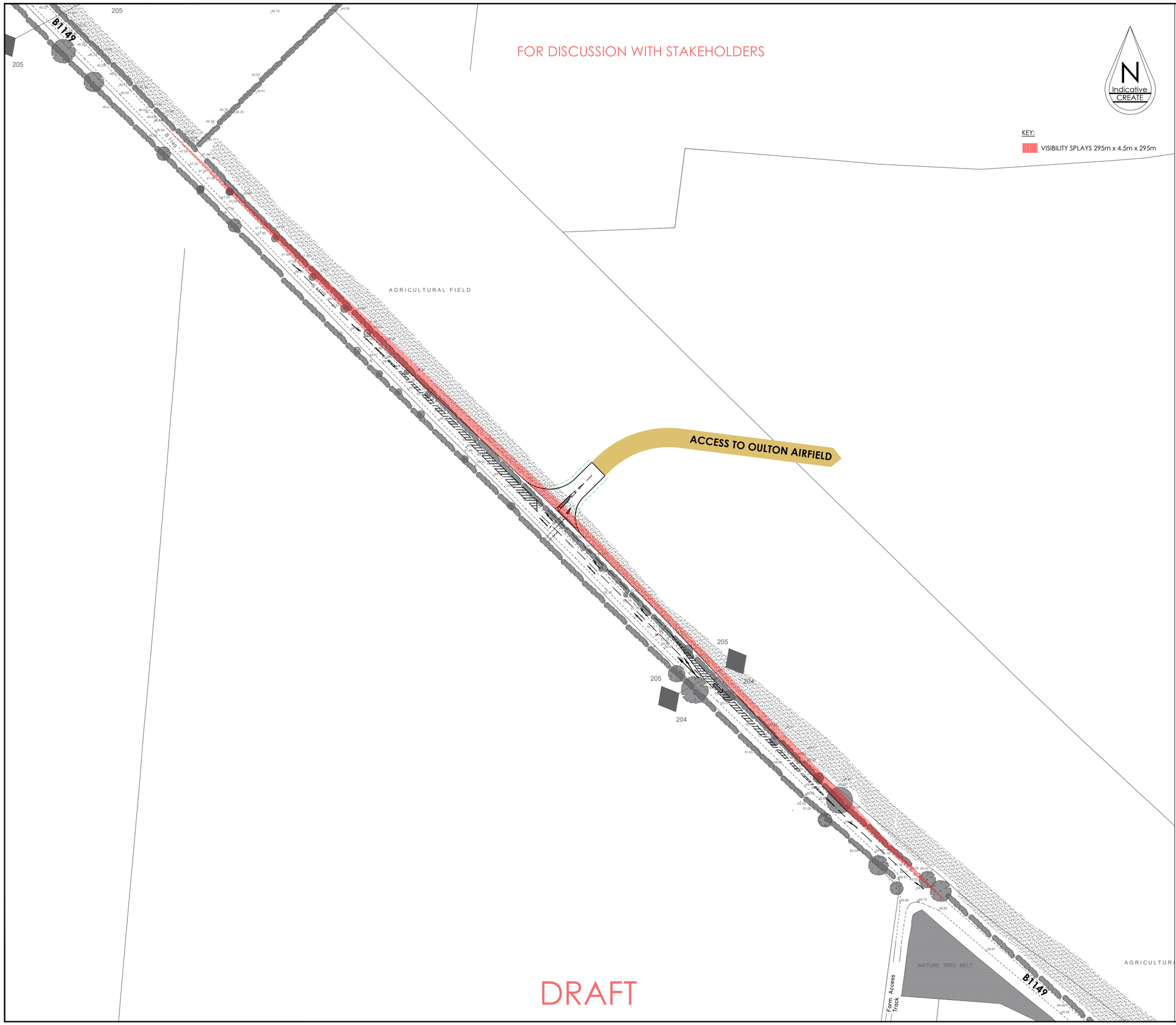
DO NOT SCALE ORIGINAL SHEET SIZE - A1 Landscape

FOR DISCUSSION WITH STAKEHOLDERS



DRAFT

N
Indicative
CREATE

KEY:

VISIBILITY SPLAYS 295m x 4.5m x 295m

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B1149 GHOST ISLAND JUNCTION

GENERAL NOTES:

1. THE GHOST ISLAND LAYOUT IS BASED ON A DESIGN SPEED OF 120kph, IN RESPECT OF RECENT ATC TRAFFIC SURVEY RESULTS FOR THE LOCAL SECTION OF B1149 AND IS PRESENTED WITH 3.25m WIDE RUNNING LANES NORTH AND SOUTHBOUND AND A 4.5m WIDE RIGHT TURN LANE, TO ACCOMMODATE LARGE HGVs.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. ANY EXCAVATION CLOSE TO TREES/HEDGES TO BE CARRIED OUT IN ACCORDANCE WITH NJUG GUIDELINES.
4. SERVICES ARE TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES.
5. TO BE READ IN CONJUNCTION WITH ALL OTHER LAYOUT AND DETAIL DRAWINGS.
6. ACCESS FOR PEDESTRIANS AND CYCLISTS IS TO BE MAINTAINED AT ALL TIMES. ACCESSES TO PROPERTIES ARE TO BE MAINTAINED AND WORKS PROGRAMMED IN CONSULTATION WITH PROPERTY OWNERS.
7. ANY ROAD MARKINGS/ROAD SIGNS ARE TO BE IN ACCORDANCE WITH THE SI DOCUMENT "TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS, 2016"

REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 21.09.18	DRAWING STATUS: INFORMATION	
	SCALE(S): 1:1,000	DESIGNED: MDA	DRAWN: MDA
DRAWING TITLE: B1149 GHOST ISLAND OPTION C2 DIRECT ACCESS		CHECKED: PZ	APPROVED: PZ
	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/503	REVISION:	

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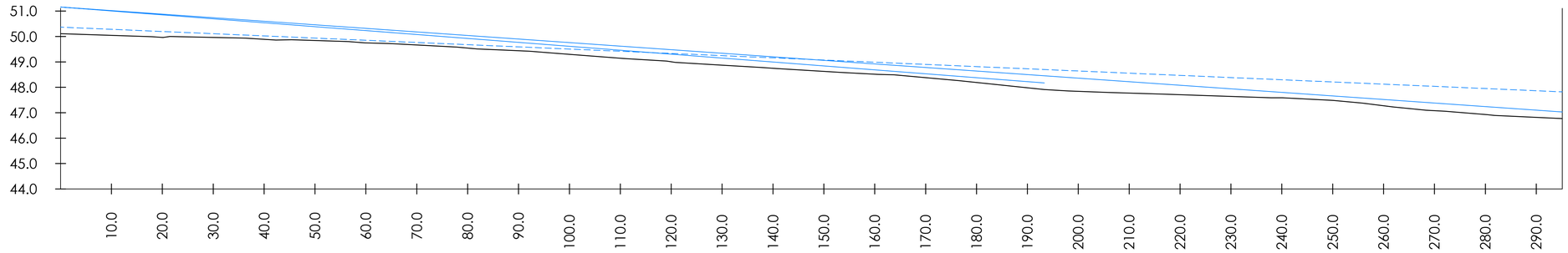
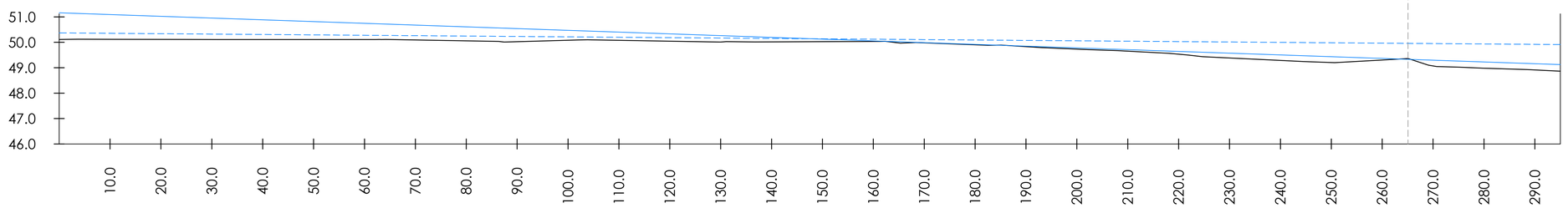
DO NOT SCALE ORIGINAL SHEET SIZE - A1 Landscape

OPTION C2: VISIBILITY SPLAY LONG SECTIONS

FOR DISCUSSION WITH STAKEHOLDERS



Option C2 Northbound Visibility



Option C2 Southbound Visibility

KEY:

——— VISIBILITY SPLAY LOOKING FROM THE ACCESS ALONG THE B1149

– – – – VISIBILITY SPLAY LOOKING TO THE ACCESS ALONG THE B1149

GENERAL NOTES:

1. LINES VISIBILITY IN ACCORDANCE WITH DMRB TD9/93: STOPPING SIGHT DISTANCES IN VERTICAL PLANES (IN BOTH DIRECTIONS) MEASURED FROM A MINIMUM DRIVER'S EYE HEIGHT OF BETWEEN 1.05m AND 2.00m, TO AN OBJECT HEIGHT OF BETWEEN 0.26m AND 2.00m BOTH ABOVE THE ROAD SURFACE.
2. THE DRAWING IS BASED ON A TOPOGRAPHIC SURVEY UNDERTAKEN BY PLANDESCIL REF 17697 IN CONJUNCTION WITH DIGITAL OS MAPPING.
3. TO BE READ IN CONJUNCTION WITH 1554/03/503 B1149 Ghost Island Option C2 DRAFT.

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REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

Telephone: 01603 877010

PROJECT: HORNSEA 3 OFF-SHORE WIND FARM	DATE: 27.11.18	DRAWING STATUS: FOR DISCUSSION	
	SCALE(S): V=1:100 H=1:500	DESIGNED: AF / DRAWN: AF	
DRAWING TITLE: VISIBILITY LONG SECTIONS OPTION C2		CHECKED: PZ / APPROVED: PZ	
	JOB No: 1554		
CLIENT: ORSTED	DRAWING No: 03/505	REVISION:	

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DO NOT SCALE

ORIGINAL SHEET SIZE - A1 Landscape

Appendix B Stage 1 Road Safety Audit

C J Safety Audit

HORNSEA 3 OFF-SHORE WIND FARM
OULTON, NORFOLK: MAIN CONSTRUCTION COMPOUND
FURTHER ACCESS OPTIONS

STAGE 1 ROAD SAFETY AUDIT

REPORT REF: CCE11D/NGC/RSA1
November 2018

Report prepared for: Create Consulting Engineers Ltd
15 Princes Street
Norwich
Norfolk
NR3 1AF

Project Information:

Client	Create Consulting Engineers Ltd on behalf of Orsted
Client Ref	1554
Title	Main Construction Compound, Oulton, Norfolk: Further Access Options
Report author	N G Calder BSc(Hons) CEng MICE MCIHT MSoRSA

Report Status:

Issue	Status	Purpose	Date
1	Draft	Client approval	29/11/18

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Disclaimer: C J Safety Audit accepts no responsibility to any third parties to whom the information contained in this report is made known.

1. Introduction

1.1 This report has been produced as a result of a Stage 1 Road Safety Audit (RSA) carried out at the request of Create Consulting Engineers Ltd on behalf of Orsted. The audit brief was supplied by P Zanna and A Fisher.

1.2 The RSA Team membership was as follows:-

N G Calder BSc(Hons) CEng MICE MCIHT MSoRSA
Principal Road Safety Consultant
CJ Safety Audit

J M Jones IEng MCIHT FIHE MSoRSA
Principal Road Safety Consultant
CJ Safety Audit

1.3 The RSA was undertaken in November 2018 and comprised an examination of the documents provided by the client (see Appendix A) together with a site visit on 28 November 2018 between the hours of 11:15 and 12:15. The weather was overcast/drizzling and the road surface wet. Traffic flows were moderate on B1149 and free-flowing. On C263 The Street, flows were very light (although there was a temporary closure further north within Oulton Street).

1.4 The terms of reference of the RSA are as described in GG 119 *Road Safety Audit* (formerly HD19/15). The audit team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

1.5 The proposed Main Construction Compound for the Hornsea 3 project is located at a former airfield at Oulton Street, just north of B1149. The audited scheme comprises 3 options to provide highway access to the compound, which has an anticipated life of 8 years. These comprise 2 options for a right turn lane junction directly off B1149, and one option for access off C263 The Street including improvements to its existing junction with B1149.

1.6 The auditors have reviewed the most recent 5-year police accident record (2013-2017) for the location on Crashmap.co.uk. During this period there have been no recorded accidents on B1149 within 500m of the proposed junctions, and none on C263 The Street. However, two (both slight) have occurred on B1149 in immediate vicinity of its existing junction with The Street: one involved tail-end collision on B1149, the other a left-turn conflict at the junction.

The record is considered to be low with no specific implications for the proposed scheme.

1.7 A problem location plan has been included in Appendix B to the report.

1.8 Issues that are beyond the scope of the audited scheme or not directly related to road safety have been included as General Remarks in Appendix C to the report.

2. Items Raised at Previous Road Safety Audits

The auditors are not aware of any previous audits of these proposals (previous options were subject to stage 1 RSA in October 2018).

3. Items Raised at this Stage 1 Road Safety Audit

General

3.1 No comment

Road Alignment

3.2 Problem

Location: B1149 south-east of proposed junction (Direct Access Options C1 & C2)
Summary: loss of control collisions

A traffic island appears to be indicated within the central hatching approx. 120m south-east of the proposed access junction. Its purpose may be to deter overtaking; however on an unlit high-speed road it would pose a significant hazard, particularly at night or in adverse weather conditions. Even with passively safe street furniture, any collision is likely to result in loss of control and collision with other traffic or roadside features. The Auditors consider that the safety disbenefit would outweigh the potential benefit.

Recommendation

Remove the proposed traffic island from both these Options and instead provide a prohibitory double white line system to deter overtaking through the junction.

Junctions

3.3 Problem

Location: Proposed junction onto B1149 (Direct Access Options C1 & C2)
Summary: overswing collision with mainline traffic

The Auditors note that the proposed south-eastern junction radius scales approx. 15m, without a lead-out taper as recommended in TD42/95. This could result in a large vehicle turning left from the site overswinging into the path of mainline traffic.

Recommendation

A lead-out taper or compound curve radius is recommended in both these Options to cater for large vehicle movements.

3.4 Problem

Location: proposed junction onto The Street (Option A)
Summary: elevated accident risk to local users

The Auditors note that a 15m radius is proposed on the northern side of the junction, which would facilitate left turns out of the site by large HGVs. This would take them northwards through the settlement of Oulton Street and to other unsuitable local roads. This is considered potentially detrimental to the safety of existing users.

Recommendation

A tight northern radius is recommended to discourage left turns out of the site.

3.5 Problem

Location: proposed junction onto The Street (Option A)
Summary: head-on conflict or tail-end collision

The sinuous alignment and throat width of the proposed access junction suggest that two large opposing vehicles entering/leaving could result in head-on conflict, or stopping mid-manoeuvre with potential for tail end collision by following traffic on The Street.

Recommendation

Undertake HGV track simulations and increase the junction throat width accordingly.

Non-Motorised Users

3.6 No comment

Signing and Lighting

3.7 Comment – for consideration at detailed design

Location: B1149 at existing junction with The Street (Option A)

The existing junction lies on a long straight high-speed section of B1149 where drivers may be tempted to overtake. In the absence of a right turn lane, specific advance signing is suggested to warn drivers of the potential for conflict with slowing right-turning HGVs ahead.

4. Audit Team Statement

We certify that this audit has been carried out in accordance with Road Safety Audit Standard GG 119.

Audit Team Leader

Nevil Calder
Member of the Society of Road Safety Auditors (MSoRSA)
Principal Road Safety Consultant
CJ Safety Audit

Signed:

Date: 29 November 2018

Audit Team Members

Malcolm Jones
Member of the Society of Road Safety Auditors (MSoRSA)
Principal Road Safety Consultant
CJ Safety Audit

Signed:

Date: 29 November 2018

C J Safety Audit

t: [redacted]

e: nevil@cjsafetyaudit.co.uk

w: www.cjsafetyaudit.co.uk

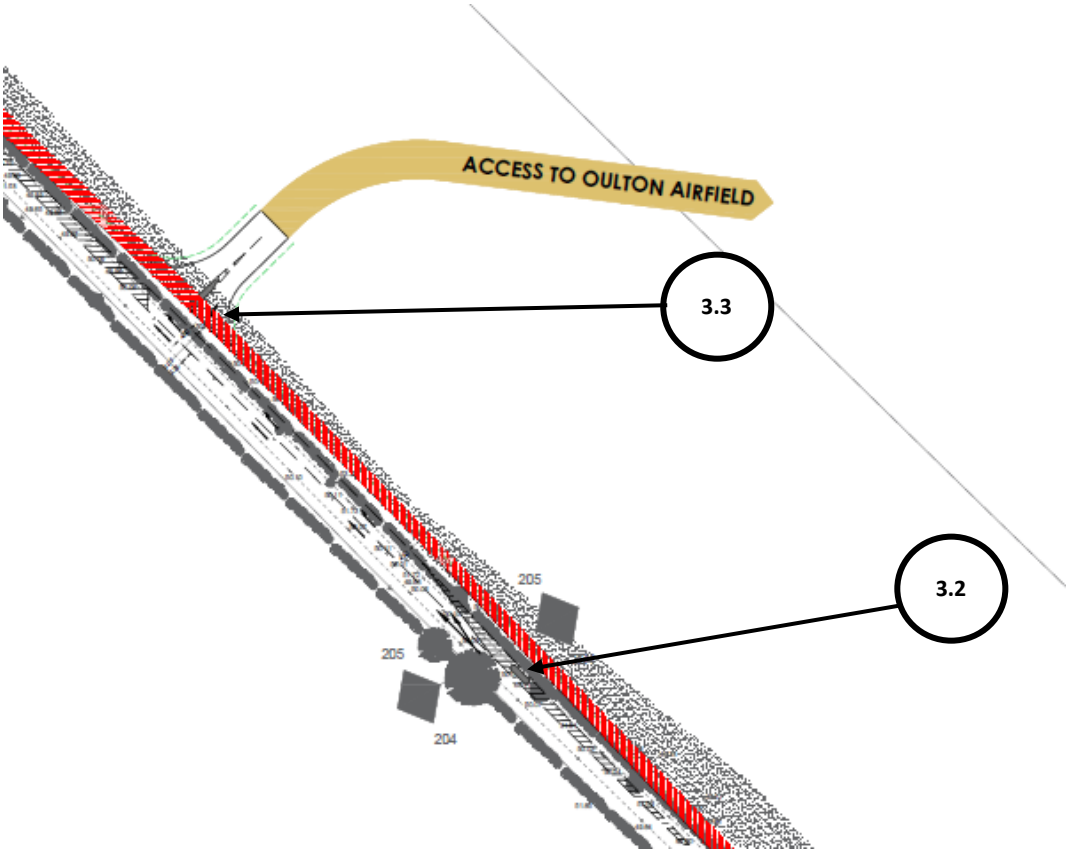
APPENDIX A - Audit Submission Documents

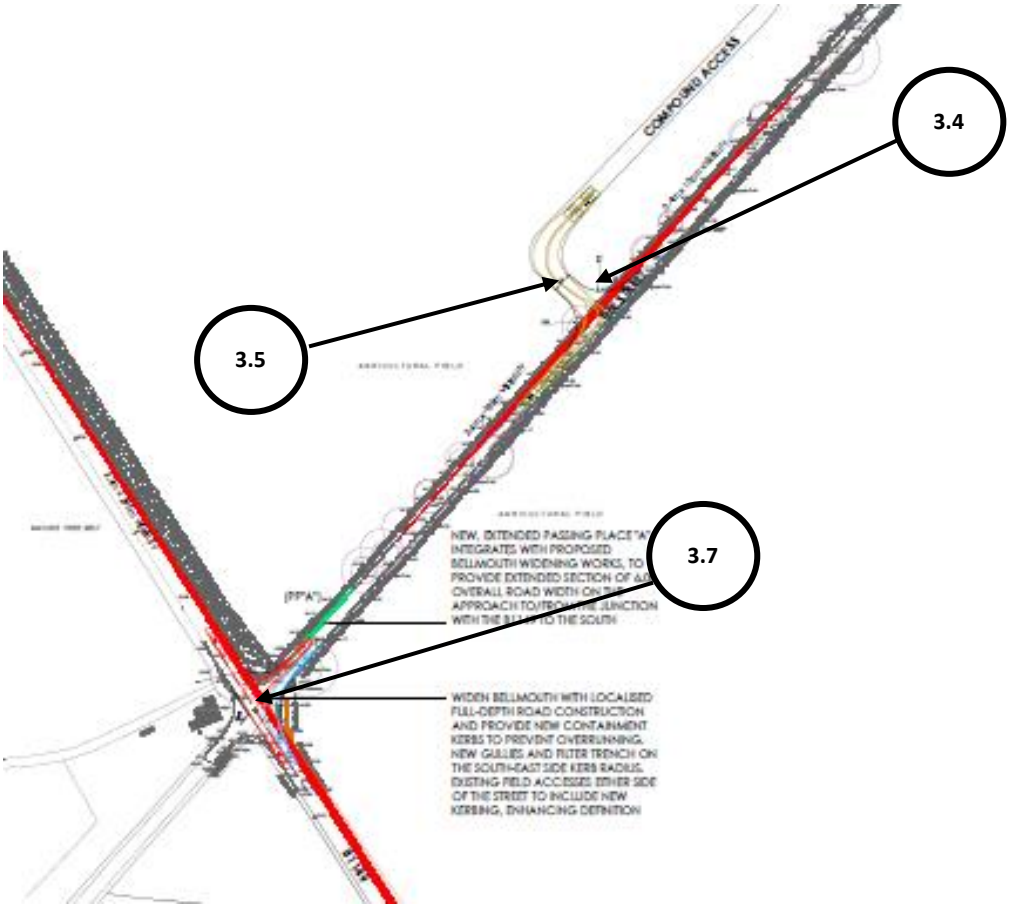
The following documents were submitted for this road safety audit:-

Hornsea 3	Main Construction Compound Access Strategy	Sep 2018
Drg no 1554/03/500	1:1000	B1149 Direct Access Option C1
Drg no 1554/03/503	1:1000	B1149 Direct Access Option C2
Drg no 1554/03/501	1:1000	The Street, Oulton Option A
Drg no 1554/03/504	1:100&1:500	Visibility Long-sections Option C1
Drg no 1554/03/505	1:100&1:500	Visibility Long-sections Option C2
5yr Accident Data from Crashmap.co.uk		

No departures from standard were advised.

APPENDIX B – Problem Location Plan





APPENDIX C – General Remarks

C.1 The Auditors note that a design speed of 120kph (rather than 100kph) has been adopted for works on B1149. While there may be advantages in providing additional visibility for drivers of slower moving HGVs exiting the site, the benefit of a longer RTL direct taper and deceleration length for traffic entering the site, is less apparent.

Annex E Hornsea Three—— Traffic Flow Calculations

Construction Vehicle Trip Generation Calculations

JNY8772 Hornsea Project Three
Construction Vehicle Movements by Cable Route Section

| | | | | | | | | | | | Temporary Site Compounds | | | | | | Site facilities and equipment | | | | Fencing and temporary Roadway construction along cable route | | | | | | | | | | |