



# Hornsea Project Four: Environmental Statement (ES)

PINS Document Reference: A6.7.1  
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## Volume A6, Annex 7.1: Traffic and Transport Technical Report

**Prepared** Royal HaskoningDHV, July 2021  
**Checked** Royal HaskoningDHV, July 2021  
**Accepted** Thomas Watts, Orsted, August 2021  
**Approved** Julian Carolan, Orsted, September 2021

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I	Resident Labour Distribution
J	Assignment of Light Vehicle Traffic to the Traffic and Transport Study Area.
K	Summary of HGV and Light Vehicles per Link
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## Glossary

Term	Definition
Commitment	<p>A term used interchangeably with mitigation and enhancement measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in EIA terms.</p> <p>Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or ES).</p> <p>Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.</p>
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Energy balancing infrastructure (EBI)	The onshore substation includes energy balancing Infrastructure. These provide valuable services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability.
Export cable corridor (ECC)	The specific corridor of seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Project Four array area to the Creyke Beck National Grid substation, within which the export cables will be located.
Heavy Goods Vehicle (HGV)	HGV is the term for a commercial vehicle with a gross weight over 3.5 tonnes. This assessment also uses the term HGV as a proxy for HGVs, buses and coaches recognising the similar size and environmental characteristics of the respective vehicle types.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Landfall	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all construction works, including the offshore and onshore ECC, intertidal working area and landfall compound. Where the offshore cables come ashore east of Fraisthorpe.
Light Vehicles	The term 'Light Vehicles' is used to describe a range of vehicles (such as cars, vans, pickups, minibuses, etc.) that do not constitute a HGV (i.e. all vehicles with a gross weight less than 3.5 tonnes). These vehicles would be predominantly associated with the movement of employees and incidental deliveries for Hornsea Four.

Term	Definition
Maximum Design Scenario (MDS)	The maximum design parameters of each Hornsea Four asset (both on and offshore) considered to be a worst case for any given assessment.
National Grid Electricity Transmission (NGET) substation	The grid connection location for Hornsea Four.
Onshore substation (OnSS)	Comprises a compound containing the electrical components for transforming the power supplied from Hornsea Project Four to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. If a HVDC system is used the OnSS will also house equipment to convert the power from HVDC to HVAC.
Order Limits	The onshore limits within which Hornsea Project Four (the 'authorised project') may be carried out.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Two-way movement	A movement is the process of transporting goods from a source location to a predefined destination. A two-way movement represents the inbound (laden trip from source) and the outbound unladen trip (back to source). For example, 20 two-way movements comprise 10 laden trips from source and 10 outbound unladen trips back to source.

## Acronyms

Acronym	Definition
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
ATC	Automated Traffic Count
DCO	Development Consent Order
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EBI	Energy balancing infrastructure
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
GEART	Guidelines for the Environmental Assessment of Road Traffic
HCC	Hull City Council
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
MDS	Maximum Design Scenario
MHWS	Mean High Water Spring
NGET	National Grid Electricity Transmission
OnSS	Onshore substation
PEIR	Preliminary Environmental Information Report
TEMPro	Trip End Model Presentation Program

## 1 Introduction

- 1.1.1.1 Orsted Hornsea Project Four Limited (the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore of the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and on to an onshore substation (OnSS) with energy balancing infrastructure (EBI), and connection to the electricity transmission network.
- 1.1.1.2 Royal HaskoningDHV was commissioned to undertake a Traffic and Transport Technical Report within and around the Hornsea Four Order Limits (i.e. the landfall, onshore export cable corridor (ECC), the OnSS including EBI, and 400 kV National Grid Electricity Transmission (NGET) connection area,) as shown within [Figure 1](#).
- 1.1.1.3 This Technical Report provides detail of the derivation and distribution of construction traffic and access strategy that has informed the assessment of potential transport impacts associated with Hornsea Four and is provided as an annex to the Environmental Statement (ES) Traffic and Transport chapter ([Volume A3, Chapter 7: Traffic and Transport](#)).
- 1.1.1.4 This Technical Report is structured as follows:
- [Section 2](#) provides a detail of the derivation of baseline and future year traffic flows;
  - [Section 3](#) provides details of the derivation of construction traffic demand and the assignment of this demand to the traffic and transport study area; and
  - [Section 4](#) provides details of the proposed access strategy including the design of new temporary points of access to the highway network.

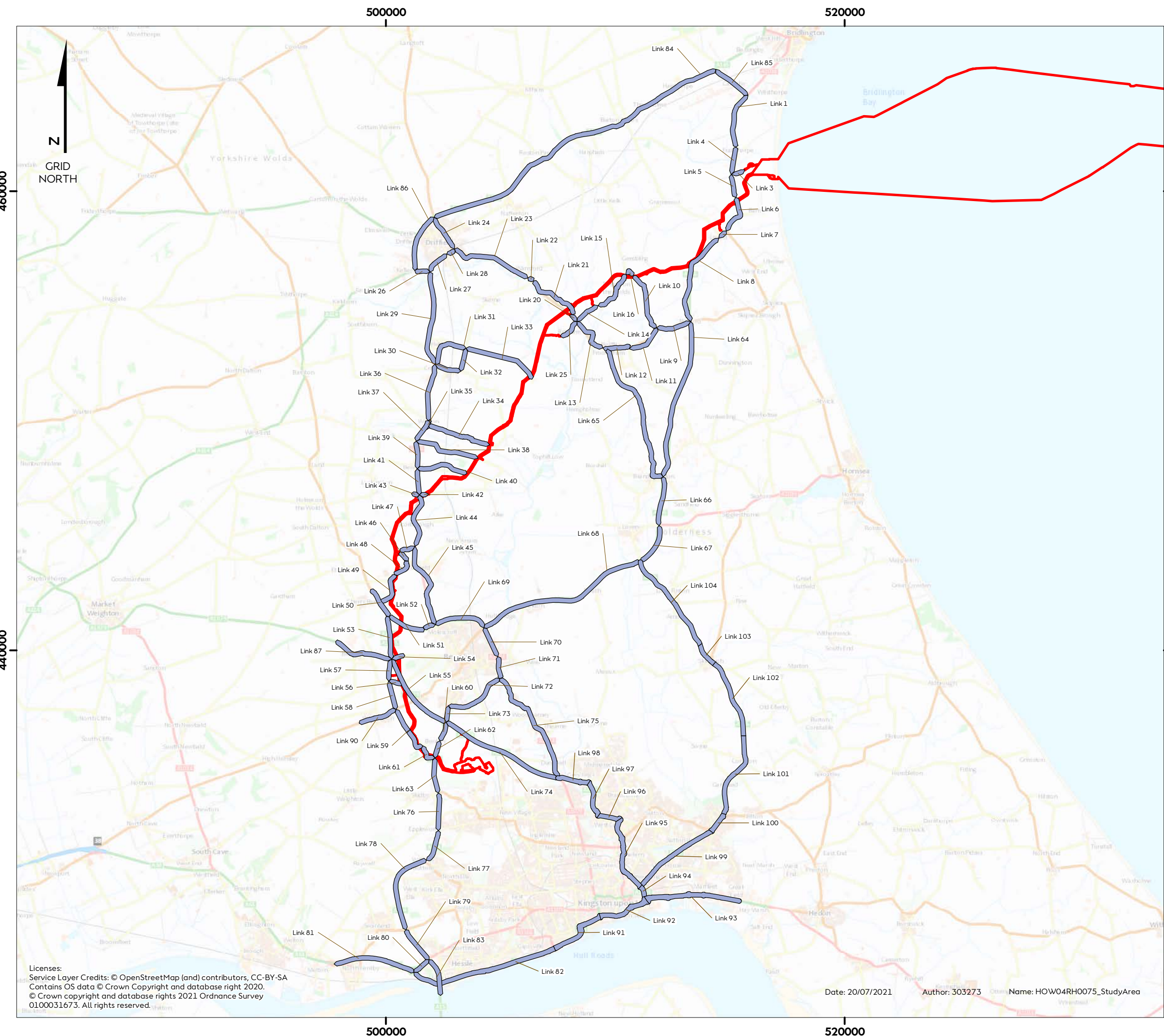
## 2 Baseline Traffic Flows

### 2.1 Introduction

- 2.1.1.1 [Volume A3, Chapter 7: Traffic and Transport](#) is underpinned by the Guidelines for the Environmental Assessment of Road Traffic (GEART) for establishing the potential impacts associated with changes in traffic from Hornsea Four. GEART sets out broad thresholds for where changes in total daily traffic flows and Heavy Goods Vehicles (HGVs) may be considered significant for the effects of severance, pedestrian delay and amenity and accidents and road safety.
- 2.1.1.2 In the context of the GEART thresholds, it is necessary to establish annual average daily traffic flows (AADT) and annual average weekday traffic flows (AAWT) including HGV component for all links within the transport study area (depicted graphically within [Figure 1](#)). The extent of the traffic and transport study area is defined within [Volume A3, Chapter 7: Traffic and Transport](#).

### 2.2 Data Collection

- 2.2.1.1 The traffic and transport study area comprises of 104 links, which are shown within [Figure 1](#).

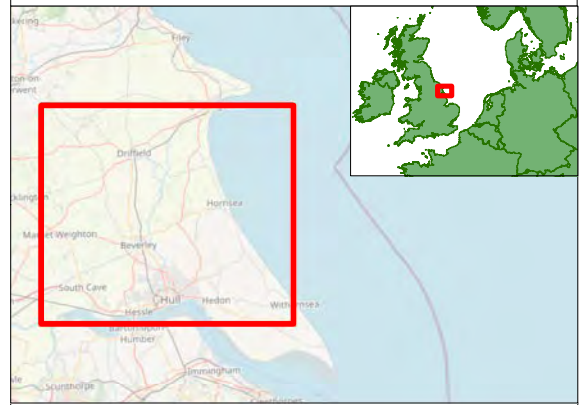


# Hornsea Four

## Figure 1

### Traffic and Transport Study Area

- Order Limits
- Traffic Links



Coordinate system: British National Grid  
 Scale@A3: 1:160,000

0 2 4 8 Kilometres


0 1 2 4 Miles

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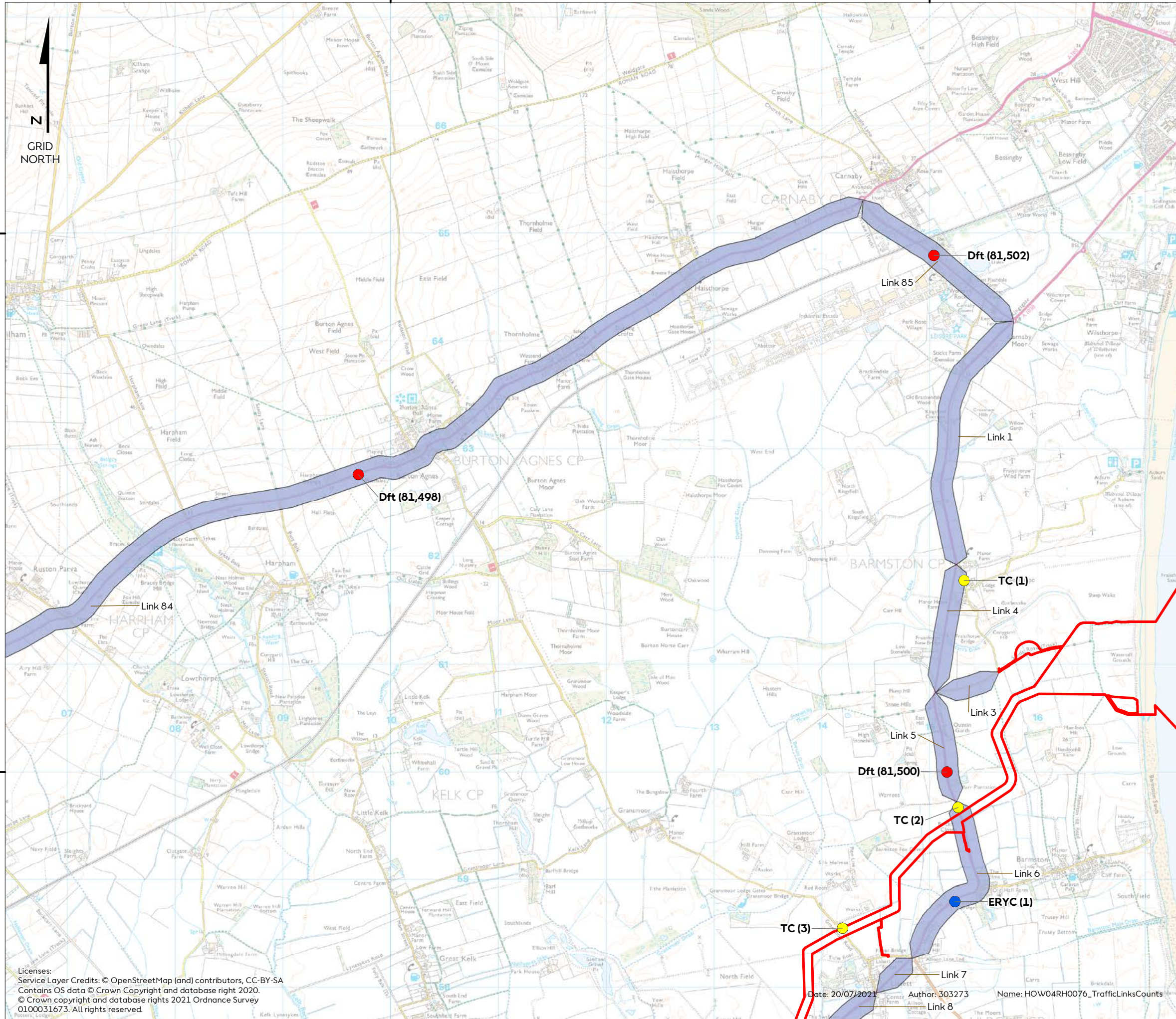


- 2.2.1.2 To understand the baseline traffic flows along each of the links within the traffic and transport study area, a data capture exercise has been undertaken. This established the availability of public data from two sources, namely, the East Riding of Yorkshire Council (ERYC) traffic counts and Department for Transport (DfT) traffic counts.
- 2.2.1.3 The ERYC data provides details of total traffic flows for nine of the main A road links within the traffic and transport study area. The data includes total daily traffic flows for every day in 2018. The data does not however include detail of vehicle classification i.e. what percentage of the number of total vehicles are cars, vans, buses, etc.
- 2.2.1.4 The DfT counts provide AADT flows (from 2019) for 28 of the main A road links within the traffic and transport study area. The DfT counts provide vehicle classification (in accordance with the DfT classification system).
- 2.2.1.5 The location of the ERYC and DfT counts are highlighted on [Figure 2](#) to [Figure 10](#). It can be noted from these figures that these data sources do not provide coverage for all links within the traffic and transport study area. As such, additional traffic counts were commissioned by the Applicant.
- 2.2.1.6 An additional 26 traffic counts were commissioned. These counts comprise of Automatic Traffic Counts (ATCs) at the locations shown on [Figure 2](#) to [Figure 10](#). The ATCs were undertaken in March 2019 and captured data for 24 hours over a seven-day period. The ATCs also capture classified traffic count data using the DfT classification system.



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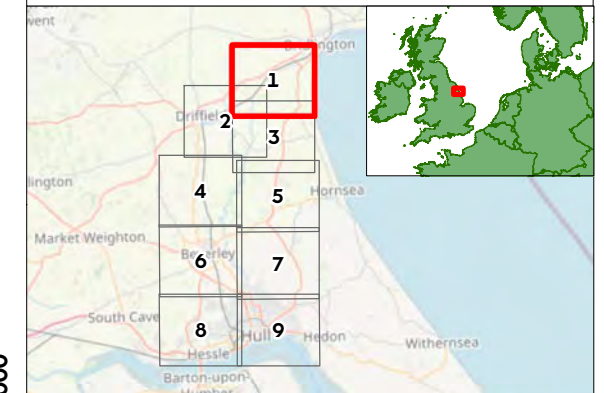
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## Figure 2

### Traffic Links and Counts

- Sheet 1 of 9

- Order Limits
- Commissioned Traffic Counts
- DfT Traffic Counts
- East Riding of Yorkshire Council Traffic Counts
- Traffic Links



Coordinate system: British National Grid  
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 0 500 1,000 1,500 2,000 Yards

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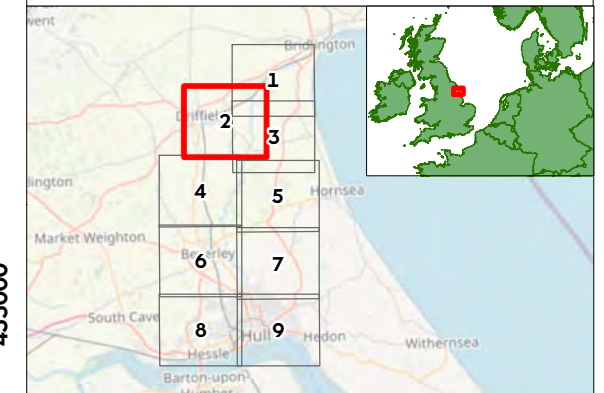
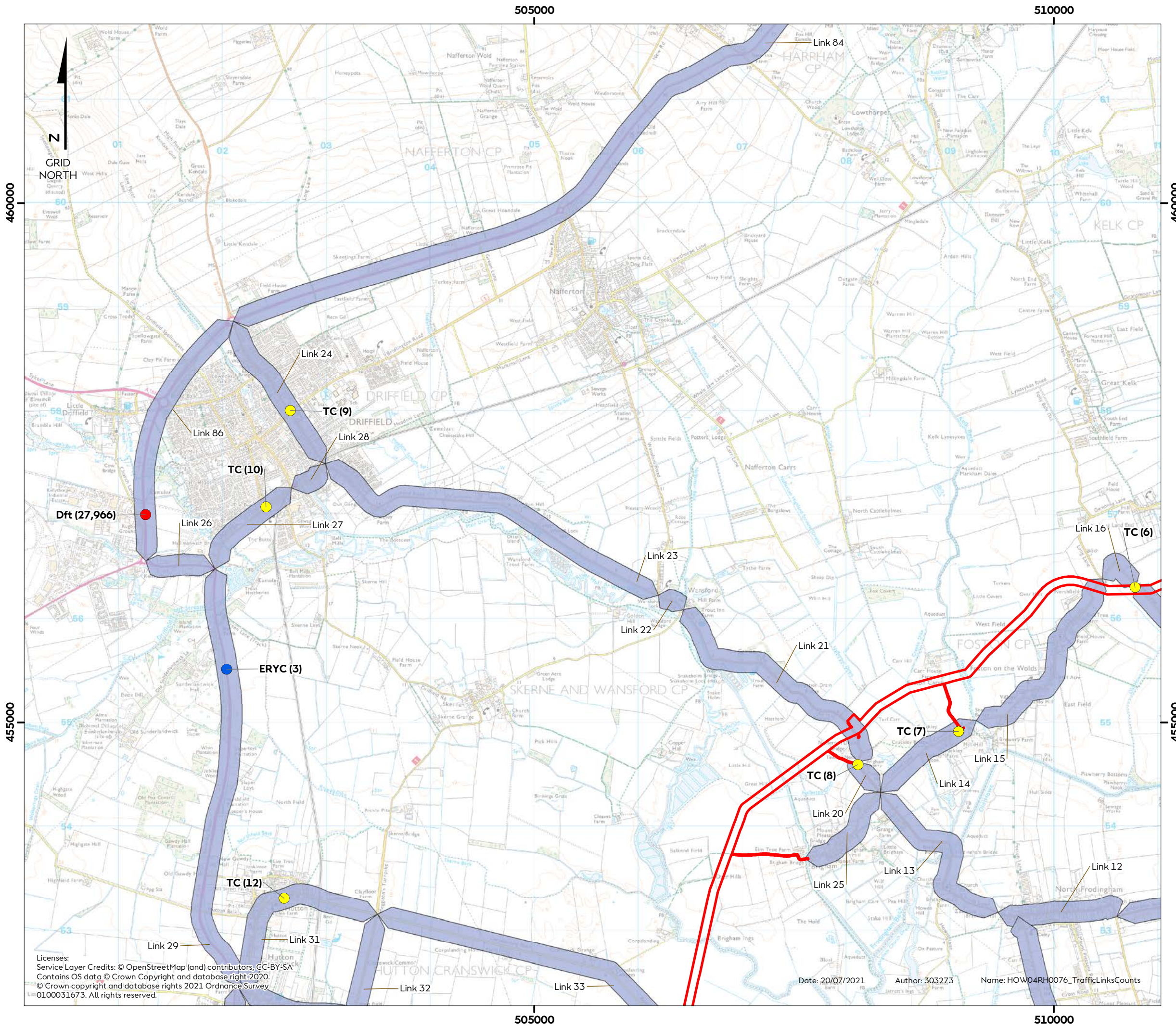
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## Figure 3

### Traffic Links and Counts

- Sheet 2 of 9

- Order Limits
- Commissioned Traffic Counts
- DfT Traffic Counts
- East Riding of Yorkshire Council Traffic Counts
- Traffic Links



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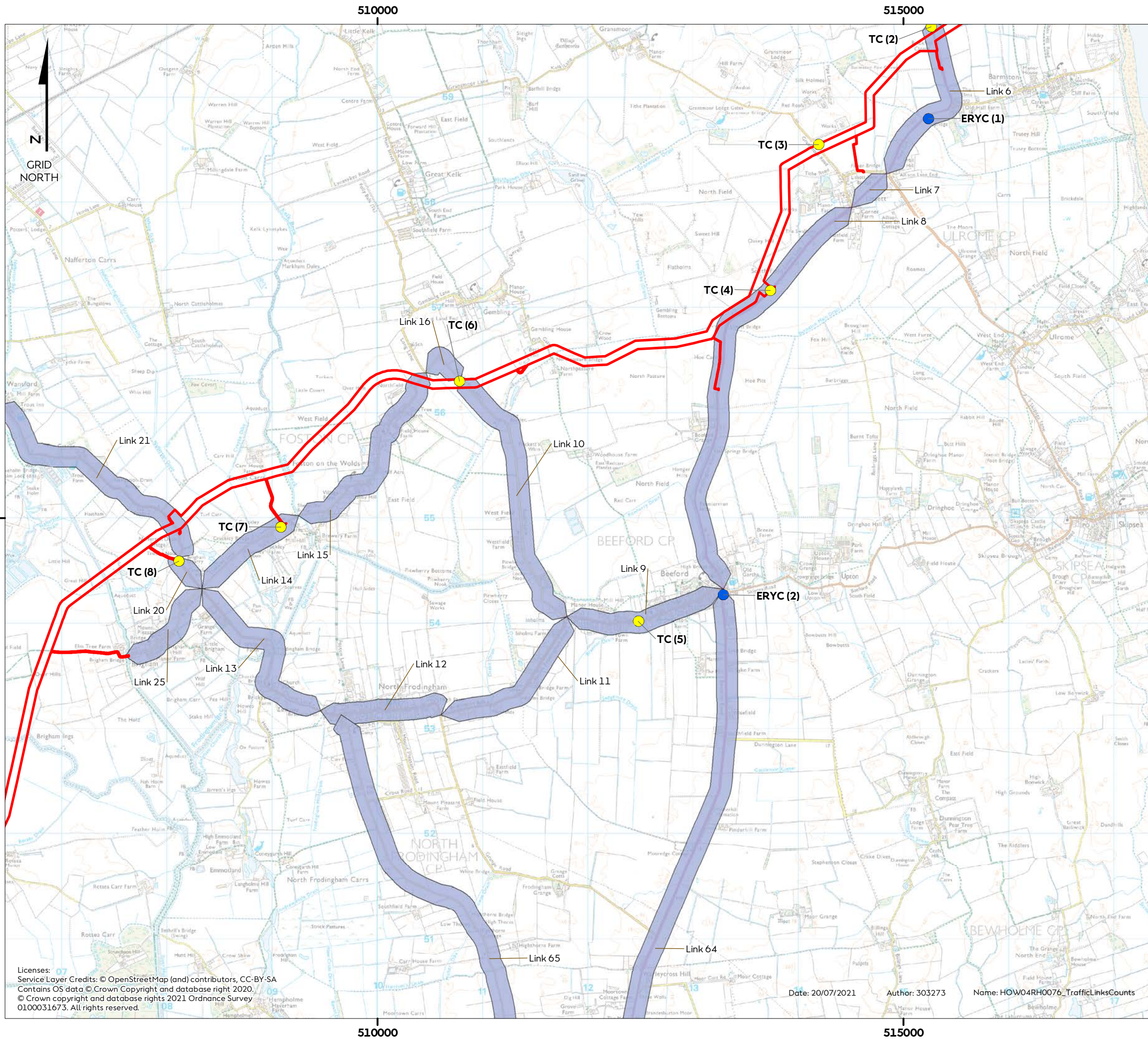
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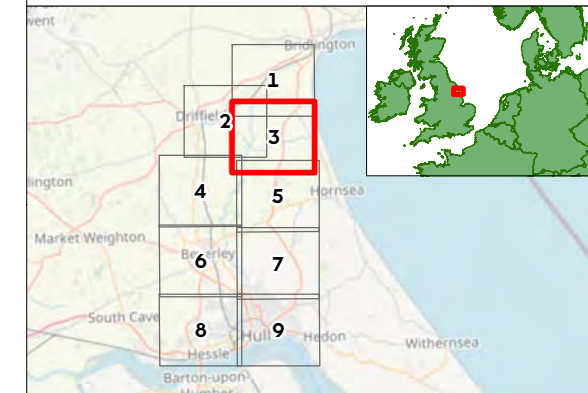
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**Hornsea Four**  
 Figure 4  
 Traffic Links and Counts  
 - Sheet 3 of 9

- Order Limits
- Commissioned Traffic Counts
- East Riding of Yorkshire Council Traffic Counts
- Traffic Links



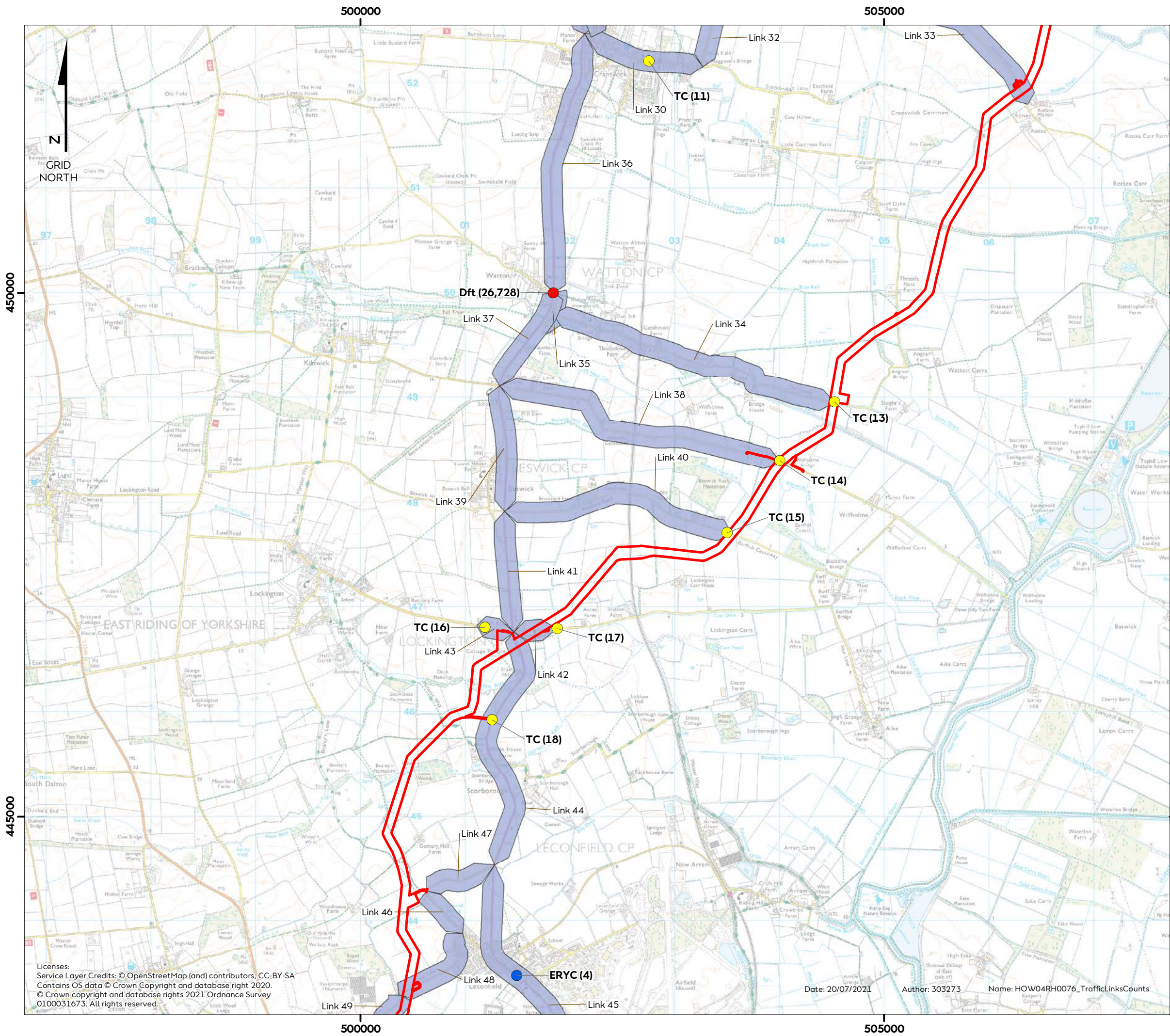
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 0 500 1,000 1,500 2,000 Yards

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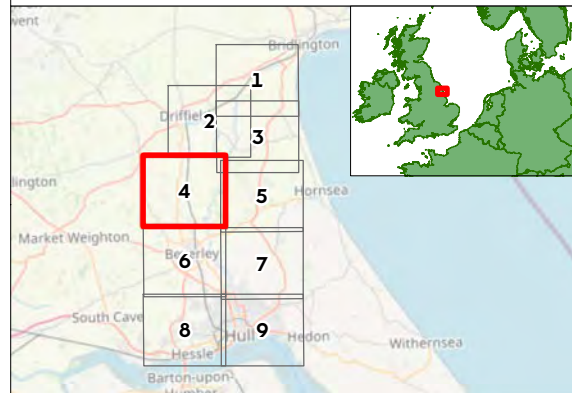
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**Hornsea Four**  
 Figure 5  
 Traffic Links and Counts  
 - Sheet 4 of 9

- Order Limits
- Commissioned Traffic Counts
- DfT Traffic Counts
- East Riding of Yorkshire Council Traffic Counts
- Traffic Links



Coordinate system: British National Grid  
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 0 500 1,000 1,500 2,000 Yards

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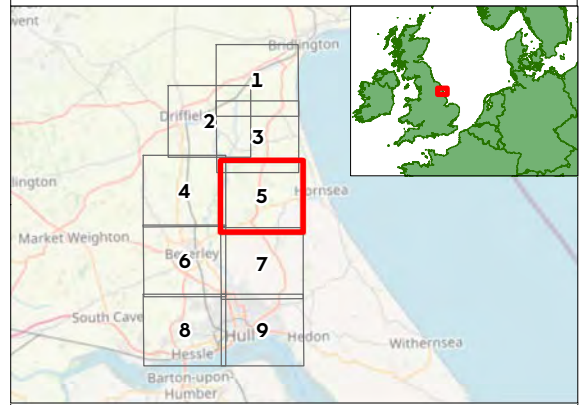
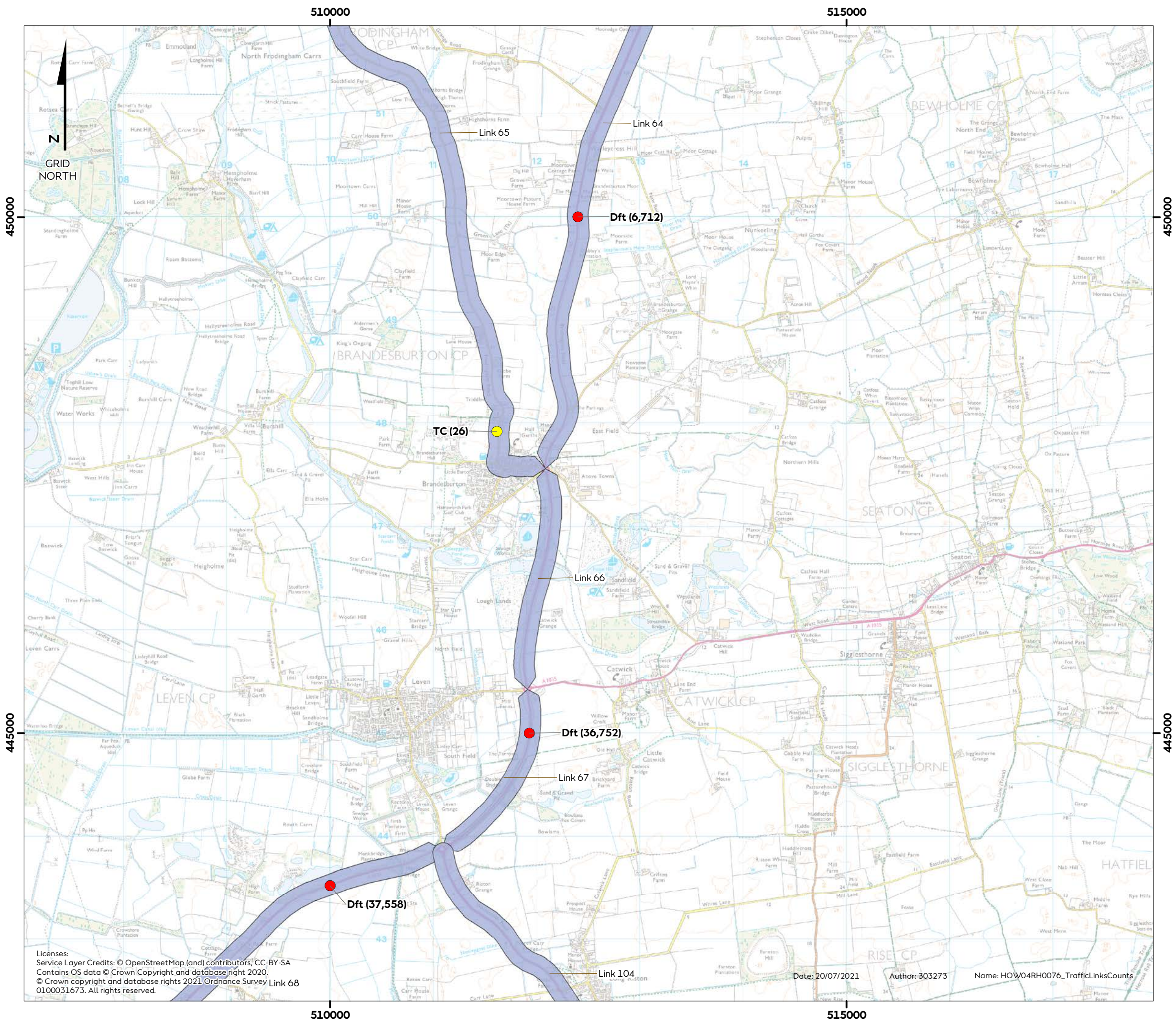
# Hornsea Four

## Figure 6

### Traffic Links and Counts

- Sheet 5 of 9

- Commissioned Traffic Counts
- DfT Traffic Counts
- Traffic Links



Coordinate system: British National Grid  
 Scale@A3: 1:35,000

0 0.5 1 1.5 Kilometres

0 500 1,000 1,500 2,000 Yards

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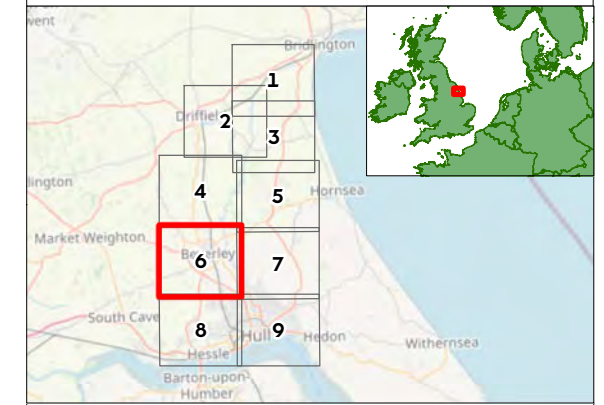
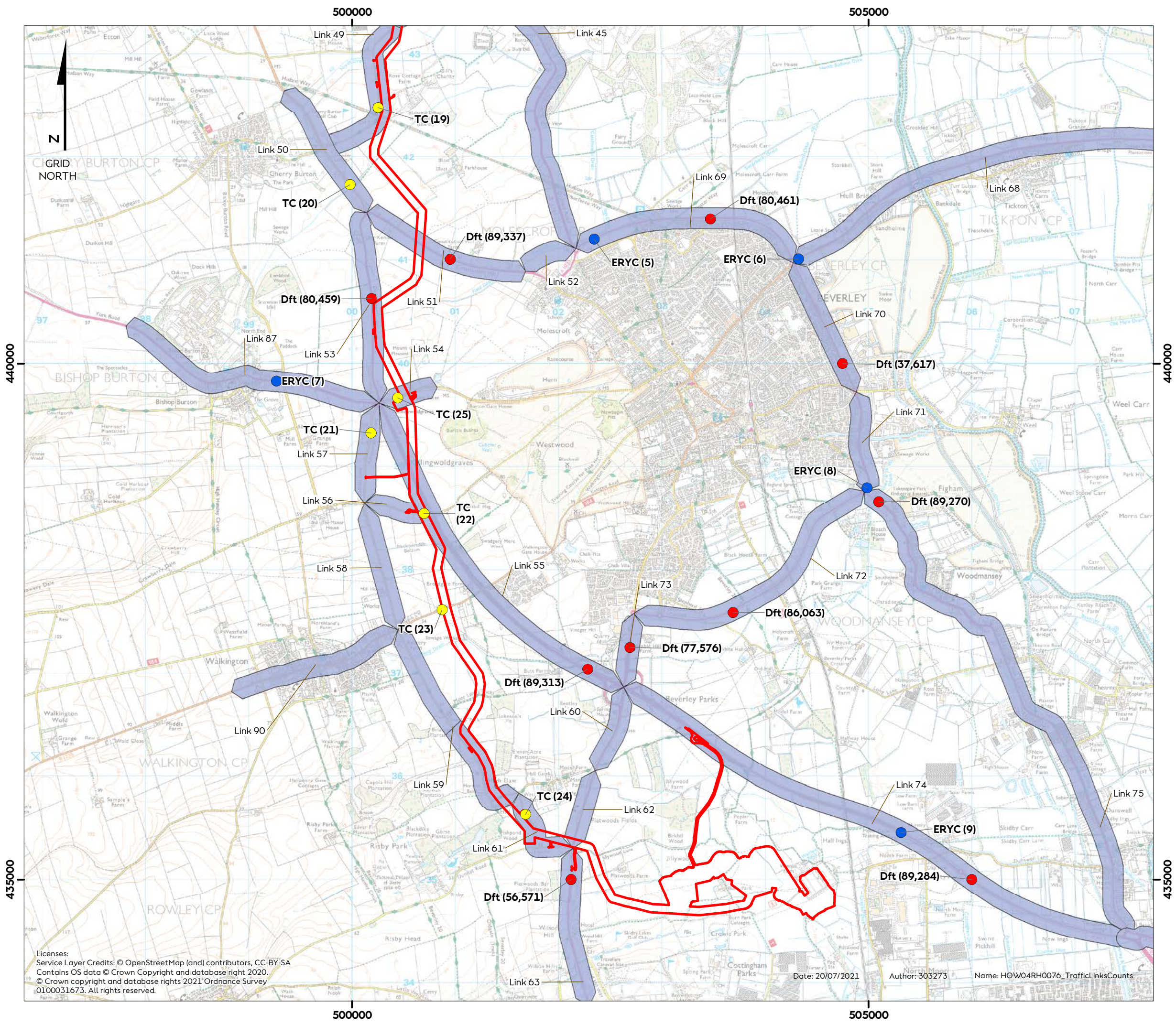
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## Figure 7

### Traffic Links and Counts

- Sheet 6 of 9

- Order Limits
- Commissioned Traffic Counts
- DfT Traffic Counts
- East Riding of Yorkshire Council Traffic Counts
- Traffic Links



Coordinate system: British National Grid  
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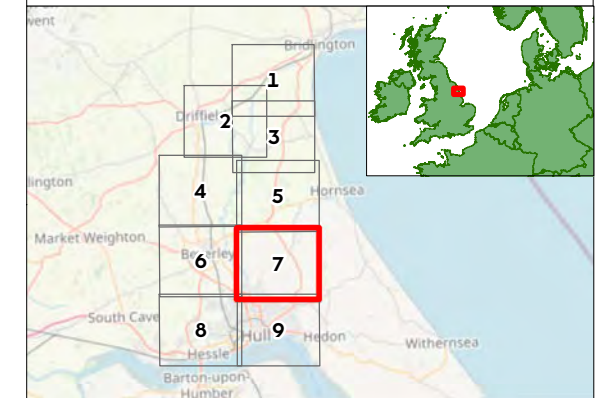
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## Figure 8

### Traffic Links and Counts

- Sheet 7 of 9

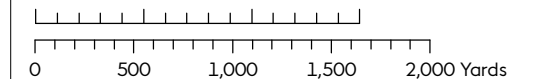
- DfT Traffic Counts
- Traffic Links



Coordinate system: British National Grid

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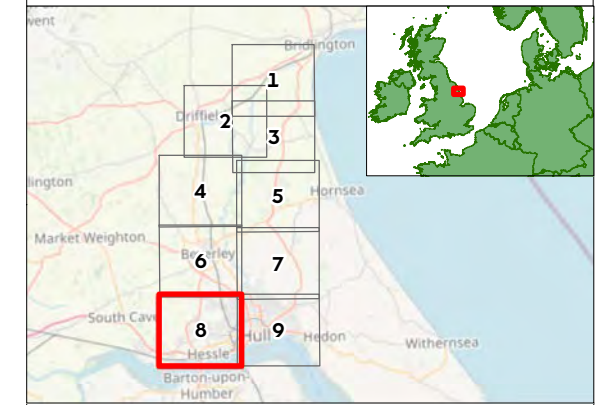
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## Figure 9

### Traffic Links and Counts

- Sheet 8 of 9

- DfT Traffic Counts
- Traffic Links



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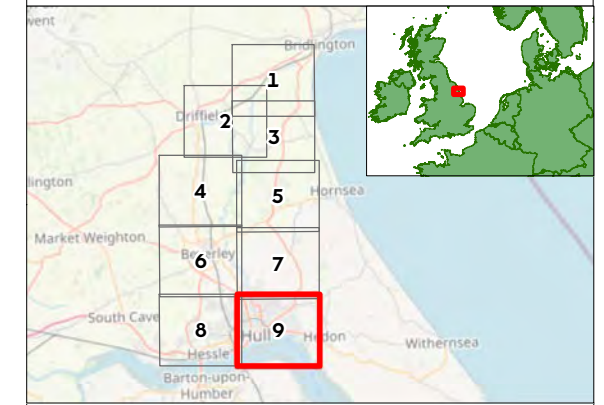
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**Hornsea Four**  
 Figure 10  
 Traffic Links and Counts  
 - Sheet 9 of 9

- Dft Traffic Counts
- Traffic Links



Coordinate system: British National Grid  
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 0 500 1,000 1,500 2,000 Yards

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## 2.3 Standardisation of Baseline Data

- 2.3.1.1 In total, 63 traffic counts have been acquired/ commissioned. It is considered that the counts provide a comprehensive coverage for all 104 links. Details of the count that will be used for each link are detailed within [Appendix A](#) of this document.
- 2.3.1.2 Noting the traffic counts capture data over different durations, each dataset has been converted to a standard AADT/ AAWT with HGV classification. [Table 1](#) sets out available data for each dataset and the adopted methodology to convert data to a standard AADT/ AAWT with HGV classification.

**Table 1: Available data for each dataset and proposed conversion methodology.**

Data Source	Available Data	Conversion Methodology
DfT Counts	2019 AADT flows with full vehicle classification	No requirement to convert
ERYC Counts	2018 AADT and AAWT flows	HGV classification to be derived from averages of HGV flows taken from nearby DfT counts
Hornsea Four ATCs	2019 daily traffic flows, with full vehicle classification	March traffic flows to be converted to an annual average using factors derived from the ERYC counts

## 2.4 Future Year Traffic Flows

- 2.4.1.1 Having established a standard AADT/ AAWT (with HGV classification) for each link, it is necessary to factor background traffic from the respective survey years (2018 and 2019) to a future reference year. It is currently considered that the earliest date that construction could commence would be 2024; as such a reference year for background traffic of 2024 has been derived.
- 2.4.1.2 To take account of sub-regional growth in housing and employment, a proportionate approach to forecasting future traffic growth has been adopted, utilising the Trip End Model Presentation Program (TEMPro).
- 2.4.1.3 It has been discussed and agreed with ERYC that for all links within the ERYC administration area, the baseline 2018 and 2019 flows can be factored to the future year baseline using TEMPro for the East Riding of Yorkshire Area and factoring the growth rate using the National Traffic Model Dataset AF15 all areas (a combination of urban and rural area types).
- 2.4.1.4 The same approach has also been applied to factoring the future year baseline in the HCC administration area, with future year growth extracted from TEMPro for the HCC area and factoring the growth rate using the National Traffic Model Dataset AF15 all areas. Details of the growth factors that have been applied to the entire study area are provided within [Appendix B](#) of this document.

## 2.5 Summary of Baseline Traffic Flows

- 2.5.1.1 [Appendix C](#) provides a summary of the forecast AAWT and AADT traffic flows (including HGV component) for each of the links within the traffic and transport study area.

## 3 Trip Generation and Assignment

### 3.1 Introduction

3.1.1.1 To inform the derivation and distribution of construction traffic demand, a realistic Maximum Design Scenario (MDS) traffic demand scenario has been developed by examining:

- the likely minimum construction programme (and therefore maximum activity intensity);
- peak demand for materials and personnel;
- likely mode share; and
- the assignment of traffic.

3.1.1.2 The assumptions that underpin the MDS scenario are discussed below.

### 3.2 Material and Personnel Demand

3.2.1.1 The traffic generation that will inform the assessment of traffic and transport impacts has been derived and undertaken by way of a 'first principles' approach. The first principles approach generates traffic volumes from an understanding of material quantities and personnel numbers required for Hornsea Four and converts these metrics into vehicle movements. The material quantities and personal numbers have been developed with the input from the Applicant's engineering team and are augmented with experience gained through the construction of previous projects of a similar nature and scale.

3.2.1.2 [Appendix D](#) details the derivation of material movements that could be expected for each of the construction activities.

3.2.1.3 [Appendix E](#) details the expected quantity of materials, plant and personnel movements that could be expected for all onshore construction, and for each of the major construction activities. [Table 2](#) to [Table 4](#) provide 'snapshot' summaries of the peak daily material, plant and personnel movements per activity respectively. The 12 months 'snapshot' accounts for an MDS period of the wider construction programme.

**Table 2: Daily HGV material movements per month.**

Activity	Months												
	0	1	2	3	4	5	6	7	8	9	10	11	12
1. Primary Logistics Compound	26	26											
2. Secondary Logistics Compound	37	37	37	37									
3. Landfall Compound		31	31										
4. Haul road			76	76	76	76	76						
5. Backfill material			26	26	26	26	26	26					
6. Tape / Tile			0.1	0.1	0.1	0.1	0.1	0.1					
7. Ducts			4	4	4	4	4	4					
8. Cables								4	4	4	4	4	4
9. HDD installation				31	31	31	31	31	31	31	31	31	31
10. Drainage ducts			1	1	1	1	1						
11. Joint bays								5	5				
12. Temporary access roads	22	22	22										
13. OnSS (including OnSS access road)	34	37	37	15	15	100	100	100	100	100	25	25	25
Total monthly daily HGV movements	119	153	234	190	153	238	170	139	134	56	56	56	64
Total month daily HGV movements + 10% contingency	131	168	258	209	168	262	262	187	153	148	65	65	65
Total monthly daily two-way HGV movements	262	337	515	418	336	523	523	374	307	296	131	131	142

Key

- Months where traffic flows occur for discrete construction activities
- Peak traffic flows per activity
- Peak monthly HGV movements

**Table 3: Daily HGV plant movements per month.**

Activity	Months												
	0	1	2	3	4	5	6	7	8	9	10	11	12
1. Primary and Secondary Logistics Compounds and Landfall Compound	10	10											
2. Vegetation Removal	2												
3. Creation access points and diversion of Public Rights of Way (PRoW)		2	2	2									
4. Drainage			2	2	2	2	2						
5. Top Soil Strip / Haul Road			6	6	6	6	6						
6. Trenching / Ducting				6	6	6	6	6	6				
8. Cable Installation										4	4	4	4
9. Joint Bays Excavate / Reinstatement								4	4				
10. HDD				6	6	6	6	6	6	6	6	6	
11. Jointing											2	2	2
12. Post Construction Drainage													
13. Reinstatement													
14. Testing													
15. Contractor Management / Office													
Total monthly daily HGV plant movements	12	12	10	22	20	20	20	16	16	10	12	12	6
Total month daily HGV plant movements + 10% contingency	13	13	11	24	22	22	22	18	18	11	13	13	7
Total monthly daily two-way HGV plant movements	26	26	22	48	44	44	44	35	35	22	26	26	13

**Key**

	Months where traffic flows occur for discrete construction activities
	Peak traffic flows per activity
	Peak monthly HGV movements

**Table 4: Daily personnel movements per month, per point of access (excluding OnSS and EBI).**

Activity	Months												
	0	1	2	3	4	5	6	7	8	9	10	11	12
1. Primary and Secondary Logistics Compounds and Landfall Compound	8	8											
2. Vegetation Removal	3												
3. Setting Out /PRoW		8	8	8									
4. Drainage			8	8	8	8	8						
5. Top Soil Strip / Haul Road			8	8	8	8	8						
6. Trenching / Ducting				10	10	10	10	10	10				
8. Cable Installation										8	8	8	8
9. Joint Bays Excavate / Reinstatement								6	6				
10. HDD				6	6	6	6	6	6	6	6	6	6
11. Jointing											3	3	3
12. Post Construction Drainage													
13. Reinstatement													
14. Testing													
Total monthly daily Light Vehicle movements	11	16	24	40	32	32	32	22	22	14	17	17	11
Total monthly daily Light Vehicle movements + 10% contingency	12	18	26	44	35	35	35	24	24	15	19	19	12
Total monthly daily two-way Light Vehicle movements	24	35	53	88	70	70	70	48	48	31	37	37	24

**Key**

	Months where personnel movements occur for discrete construction activities
	Peak personnel movements per activity
	Peak personnel movements per month

- 3.2.1.4 It can be noted from **Table 2** to **Table 4** that the construction traffic demand fluctuates according to the intensity of activities that are occurring at any point in the programme. Overall, the most intense period of construction activity would be during months two and three.
- 3.2.1.5 **Table 2** highlights that during month two there could be a combined peak of 234 HGV deliveries per day (468 two-way HGV movements). The MDS daily HGV movements have been increased further by 10 % to account for incidental deliveries, resulting in a peak of 515 two-way HGV movements per day (i.e. 258 HGVs arrive and 258 depart).
- 3.2.1.6 The selection of a peak month however would not include a tolerance for 'real-time' programme changes (e.g. slippage/acceleration). Therefore, in order to account for any tolerance a theoretical MDS month has been derived by examining the potential for individual construction activities to move relative to each other (selecting orange highlighted cells in **Table 2** and **Table 3** and applying the 10 % contingency for incidental deliveries). The use of a theoretical MDS month results in a peak of 838 two-way HGV movements per day (compared to the peak 515 two-way HGV movements per day in month three).
- 3.2.1.7** The peak of 838 two-way HGV movements per day is therefore adopted for the purposes of considering a MDS. **Table 4** highlights that during month three there could be a combined peak of 40 workers that would be required to complete the onshore ECC works excluding the construction of the OnSS and EBI per point of access. The MDS daily personnel movements have been increased further by 10 % to account for movements between work areas and incidental deliveries throughout the day. This results in a peak of 44 workers per day.
- 3.2.1.8 Similar to the approach adopted for HGVs, in order to consider the potential for slippage/acceleration, a theoretical MDS demand for personnel movements has been selected (selecting orange highlighted cells in **Table 4** and applying the 10 % contingency). This approach results in a peak of 54 persons per day that could travel to a point of access to the onshore ECC (excluding the OnSS and EBI).
- 3.2.1.9 **Table 5** sets out the total numbers of employees that would be required to construct the onshore ECC works (excluding the OnSS and EBI).
- 3.2.1.10 It can be noted from **Table 5** that if all construction activities were to overlap there could be up to 184 persons working on the construction of the onshore ECC works (excluding the OnSS and EBI) at any given time.

**Table 5: Total daily two-way personnel movements (excluding OnSS and EBI).**

Activity	No. of teams	No. of persons per team	No. of persons per activity
1. Primary and Secondary Logistics Compounds and Landfall Compound	1	8	8
2. Vegetation Removal	4	3	13
3. Setting Out /PRoW	3	8	24
4. Drainage	1	8	8
5. Top Soil Strip / Haul Road	1	8	8
6. Trenching / Ducting	3	10	30
8. Cable Installation	2	8	16
9. Joint Bays Excavate / Reinstate	3	6	18
10. HDD	2	6	12
11. Jointing	4	3	12
12. Post Construction Drainage	1	8	8
13. Reinstatement	4	6	24
14. Testing	1	4	4
Total personnel numbers			184
Total personnel number + 10% contingency			202

3.2.1.11 In addition to the peak of 184 employees working on the onshore ECC, a further peak of up to 250 employees would be required for the construction of the OnSS and EBI. The MDS daily personnel movements to the onshore ECC and OnSS and EBI have been increased further by 10 % to account for movements between work areas and incidental deliveries throughout the day to 202 and 275 respectively.

3.2.1.12 It is typical for construction projects that employees will travel to work together and in contractor provided vehicles. However, for the purposes of considering an MDS, no reduction for car-sharing has been applied.

### 3.3 Construction Traffic Assignment

3.3.1.1 At the time of Development Consent Order (DCO) submission, the supply chain for materials and workforce cannot be informed by early contractor involvement as the procurement process has not commenced. Therefore, for the purpose of the assessment, traffic distribution is based upon MDS assumptions for HGV distribution and refined socio economics data for employees.

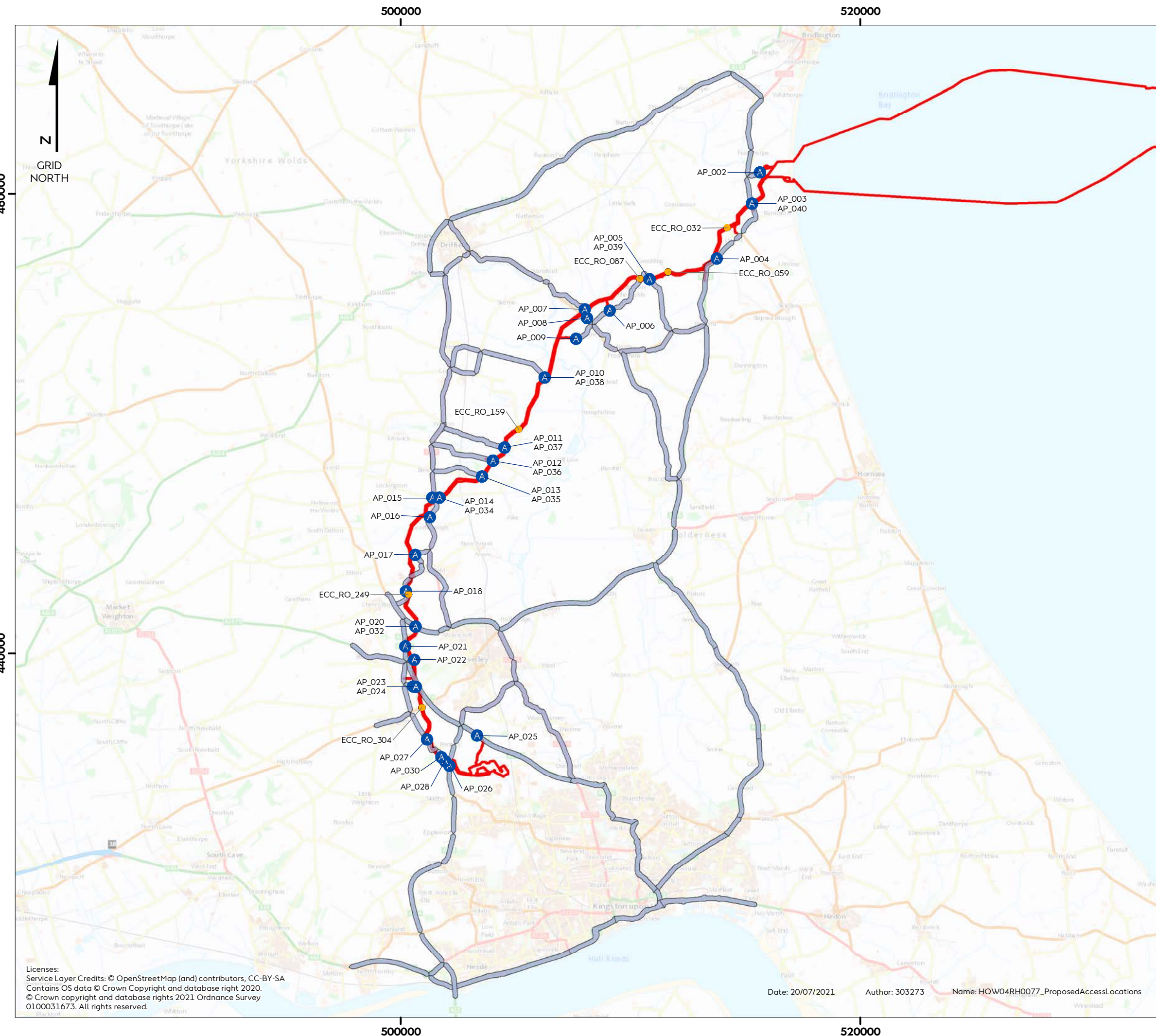
#### 3.3.2 HGV Assignment

3.3.2.1 For the purpose of a MDS HGV assessment, it was agreed with ERYC (at the second Human and Environment Technical Panel Meeting held on the 1<sup>st</sup> May 2019) that HGVs should be distributed to the A164 and then east towards Hull on the A63 (100%) and west on the A63



towards the M62 (100 %) to an origin/ destination outside the traffic and transport study area (ON-HUM-2.1).

- 3.3.2.2 It has also been agreed with ERYC (at the second Human and Environment Technical Panel Meeting held on the 1<sup>st</sup> May 2019) that movements from any local suppliers (such as quarries) within the traffic and transport study area would be captured within the existing permissions and therefore do not need to be assessed (ON-HUM-2.2).
- 3.3.2.3 HCC requested that the HGVs assigned on the A1165 northbound from Hull should also be considered to travel via the A1079/A1033. The HGV assignment therefore considers a MDS of 100 % of HGV traffic travelling to and from Hull via the A164 (links 60, 62, 63, 76, 77, 78, 79) and a sensitivity case of 100 % of HGV traffic travelling via the A1079/A1033 to and from Hull (links 94, 95, 96, 97 and 98).
- 3.3.2.4 ERYC and HCC also identified that the A165 (from Leven to Hull) could provide an alternative route for HGVs travelling from the north of Beverley wishing to access the A63 at Hull (links 99, 100, 101, 102, 103 and 104).
- 3.3.2.5 The assessment has therefore been updated to consider a MDS of 100 % of HGVs travelling from the northern sections of the onshore ECC served from accesses AP\_002 - AP\_009, AP\_039 and AP\_040 (depicted graphically in [Figure 11](#)) via the A165.
- 3.3.2.6 To identify how the 838 two-way HGV movements would assign to the traffic and transport study area, the entire onshore construction footprint has been divided in to 25 sections based upon the maximum length of cable route that can be served by each of the points of access, taking into account watercourse/ rail segregation, available access points and the number of HDD sites. The proposed access locations are depicted graphically in [Figure 11](#), whilst the assignment of the 838 two-way HGV movements to these accesses is detailed within [Appendix F](#) of this document.
- 3.3.2.7 The distribution of the HGVs from each of these points of access on to the wider highway network is detailed within [Appendix G](#) of this document.

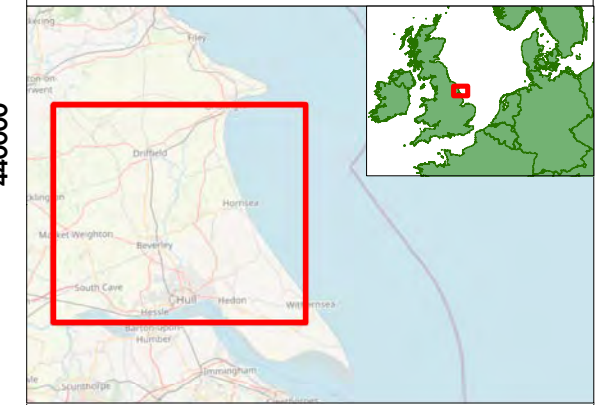


# Hornsea Four

## Figure 11

### Proposed Access Locations Overview

- Order Limits
- A Proposed Access Point
- Crossing Point
- Traffic Links



Coordinate system: British National Grid  
 Scale@A3: 1:160,000

0 2 4 6 8 Kilometres

0 2 4 6 Miles

REV	REMARK	DATE
	First Issue for PEIR	25/06/2019
A	Updated following PEIR consultations, for DCO	20/07/2021

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### 3.3.3 Light Vehicle Assignment

- 3.3.3.1 To inform the potential distribution of construction employees, the availability of local labour and rented accommodation has been reviewed.
- 3.3.3.2 The types of specialist skills required for projects such as Hornsea Four means that construction personnel often have to be drawn from across the country and not necessarily from local labour sources. The socio-economic consultant for Hornsea Four has estimated that 70 % of the workforce would be drawn from the local area (known as 'resident' labour). The remaining 30 % of the workforce would be sourced from a distance beyond a reasonable daily commute (referred to as 'in-migrant' labour).
- 3.3.3.3 Those personnel who are not local (in-migrant labour) i.e. beyond a reasonable daily commute (up to a 45-minute drive from Beverley) are likely to base themselves within temporary local accommodation. To inform the distribution of in-migrant labour the availability of local hotel bed spaces within a 45-minute commute of the proposed Hornsea Four project has been captured.
- 3.3.3.4 **Table 6** provides a summary of likely distribution, point of entry into the traffic and transport study area and origin for in-migrant labour. The distribution set out in **Table 6** includes for 'distance decay' i.e. those areas closest to Beverley are likely to be most attractive.
- 3.3.3.5 The distance decay approach divides the number of bed spaces by the journey time (taken from a route planner) from the centre of the postcode cluster to Beverley. Further details of the distribution of local hotel bed spaces and the application of distance decay are provided within **Appendix H** of this document.

**Table 6: Distribution of in-migrant labour.**

Point of entry to the traffic and transport study area	% distribution (in-migrants)	Incorporating the areas of:
Link 63	11.9%	Cottingham and Hull
Link 74 or 75	1.4%	North of Hull
Link 77	2.2%	South of Hull
Link 78	7.5%	Swanland and North Ferriby
Link 79	0.5%	Hessle
Link 83	0.6%	Barton-upon-Humber, Wootton and Ulceby
Link 84 or 86	3.0%	Driffield
Link 85	1.0%	Bridlington
Link 87	2.9%	York, Pocklington and Market Weighton
Link 90	3.0%	Brough
Link 95	36.6%	South and central Hull
Link 96	5.8%	East of Hull
Link 104	0.7%	New Ellerby
Beverley, multiple point of access	22.9%	Beverley

3.3.3.6 To inform the distribution of the 70 % of employees who could potentially be drawn from the local area (resident workers), the distribution of residents within the local area (a 90-minute drive of Beverley) with the relevant skill sets has been examined. The number of residents working in the construction sector per postcode within the region has been informed by Table LC6602EW (Industry by economic activity) derived from the 2011 Census (ONS 2019).

3.3.3.7 **Table 7** provides a summary of likely distribution, point of entry onto the traffic and transport study area and origin for resident workers. Similar to the distribution of in-migrants, the distribution of resident workers set out in **Table 7** includes for distance decay.

3.3.3.8 Further detail of the distribution of resident workers is provided within **Appendix I** of this document.

**Table 7: Distribution of resident workers.**

Point of entry to the Hornsea Four traffic and transport study area	% distribution (residents)	Incorporating the areas of:
Link 63	2.9%	Cottingham and Hull
Link 67	0.3%	Hornsea
Link 74 or 75	1.1%	North of Hull
Link 77	3.6%	South west of Hull
Link 78	0.4%	Swanland and North Ferriby
Link 79	0.8%	Hessle
Link 83	14.2%	Scunthorpe, Barton-upon-Humber, Barrow-upon-Humber, Brigg, Gainsborough, Grimsby, Humberston, Cleethorpes, Barnetby, Immingham, Doncaster, Lincoln, Woodhall Spa, Louth, Market Rasen, Horncastle, Sleaford
Link 85	1.2%	Bridlington
Link 86	2.2%	Driffield
Link 87	9.3%	Goole, Harrogate, Leeds, Wetherby, York
Link 90	46.7%	Bradford, Cleckheaton, Scunthorpe, Doncaster, Huddersfield, Harrogate, Brough, Leeds, Newark, Sheffield, Chesterfield, Rotherham, Barnsley, Worksop, Dewsbury, Liversedge, Heckmondwike, Normanton, Pontefract
Link 93	1.2%	East of Hull
Link 95	3.4%	South and central Hull
Link 96	1.5%	East of Hull
Link 98	3.1%	North east of Hull
Link 104	2.9%	New Ellerby
Beverley, multiple points of access	5.2%	Beverley

- 3.3.3.9 **Section 3.2** identifies that for the onshore ECC works (excluding the OnSS and EBI) the number of personnel travelling to each point of access would be 54, and assuming a MDS of no car-sharing or use of other sustainable modes of transport (walking, cycling, bus, etc.) there could be up to 108 two-way light vehicle movements at each access.
- 3.3.3.10 It is not possible at this stage to confirm how the construction works would be sequenced. Therefore, to inform a worst-case assessment of impacts on the local highway network, all 54 employees have been assigned to each access at the same time (108 two-way light vehicle movements per day, per access). However, in order to ensure that the impacts are realistic on the main 'A' roads (where all the access traffic collects), all light vehicle movements have been capped at 404 two-way light vehicle movements per day, i.e. the peak number of daily employee movements for the onshore ECC works (excluding the OnSS and EBI).
- 3.3.3.11 Having assigned the light vehicle movements associated with the onshore ECC works (excluding the OnSS and EBI) and capped these at 404 two-way light vehicle movements per day, the additional 275 employees (550 two-way light vehicle movements) associated with the construction of the OnSS and EBI have been assigned to the traffic and transport study area. The detailed distribution of light vehicle movements to the traffic and transport study area is provided as **Appendix J** of this document.

## 3.4 Trip Generation and Assignment Summary

- 3.4.1.1 **Appendix K** provides a summary of the forecast MDS peak daily HGV and light vehicle movements on each of the 104 links within the traffic and transport study area.

## 4 Access Strategy

- 4.1.1.1 During the construction phase there would be a requirement for Hornsea Four traffic to access the onshore ECC via the existing public highway. It is proposed that in total there could be up to 35 points of access, the location of which are shown on **Figure 11**.
- 4.1.1.2 In addition to the 35 points of access, to minimise the impact of construction traffic on a number of sensitive communities, a series of haul road crossings have been established across the public highway. These haul road crossings would allow construction traffic to cross the highway (but not take direct access) thereby allowing access to be taken from a more suitable location.
- 4.1.1.3 **Table 8** sets out the location of the haul road crossings and the rationale for their use, the location of the crossings are depicted on **Figure 11**. The location of these crossings are also shown in the Onshore Crossing Schedule (**Volume A4, Annex 4.2 - Onshore Crossing Schedule**).

**Table 8: Haul road crossing points**

Haul road crossing number	Road crossed by haul road	Rationale for haul road crossings
ECC_RO_032	Gransmoor Road to the north of the village of Lissett.	Haul road crossing ECC_RO_032 allows construction traffic to avoid having to travel via the village of Lissett to access the ECC by providing access from AP_040 and AP_004.
ECC_RO_059	Out Gates to the south of the hamlet of Gembling.	Haul road crossing ECC_RO_059 allows construction traffic to avoid having to travel via the hamlet of Gembling to access the ECC by providing access from AP_004 and AP_005.
ECC_RO_087	Old Howe Lane to the east of the village of Foston on the Wolds	Haul road crossing ECC_RO_087 allows construction traffic to avoid having to travel via the village of Foston on the Wolds to access the ECC by providing access from AP_006 and AP_039.
ECC_RO_159	Unnamed road to the east of Watton	Haul road crossing ECC_RO_159 reduces the distance that HGVs need to travel via sections of single carriageway road by providing access from AP_011 and AP_038.
ECC_RO_515	Miles Lane to the west of Leconfield	Haul road crossing ECC_RO_515 reduces the requirement for construction traffic to travel along Miles Lane (where a pattern of traffic collisions have been identified) by providing access from AP_017 and AP_018.
ECC_RO_242	Rose Lane to the west of Leconfield	Haul road crossing ECC_RO_242 removes the requirement for construction traffic to travel via a single lane road by accessing the ECC from AP_018.
ECC_RO_304	Broadgate to the east of the village of Walkington.	Haul road crossing ECC_RO_304 allows construction traffic to avoid having to travel via the edges of the village of Walkington to access the onshore ECC by providing access from AP_024 and AP_027.

4.1.1.4 It has been agreed with ERYC (at the second Human and Environment Technical Panel Meeting held on the 1 May 2019) that rather than developing bespoke designs for each of the accesses and crossings, that at this stage it would be reasonable and proportionate to include a series of outline access concepts appropriate to the range of road types within the traffic and transport study area (ON-HUM-2.4). The five design concepts include:

- **Type A access:** a fully standard compliant, Design Manual for Roads and Bridges (DMRB) major/ minor road junction. Intended for use on A and major B roads;
- **Type B and C access:** a reduced footprint access suitable for small B roads, minor and unclassified roads;
- **Type D access:** to facilitate the haul road crossing the public highway only;
- **Type E access:** access via an extension to an existing layby on the A1079 to the OnSS, EBI and NGET connection area;
- **Type F access:** access via an existing layby from the A164 and widening of the existing footway/cycleway that heads north from the layby and would interface with the onshore ECC.

- 4.1.1.5 Outline access designs for these five access types are provided within [Appendix L](#) of this document. Any future design changes are anticipated to be minor in nature and shall not materially alter the assessment presented within [Volume A3, Chapter 7: Traffic and Transport](#).
- 4.1.1.6 Six of the 35 proposed access points have been identified as requiring additional measures to safely accommodate turning construction traffic, due to either reduced forward visibility or high background traffic flows/speeds. [Table 9](#) details those accesses where specific access controls would be implemented and the rationale for their adoption.

**Table 9: Proposed access control measures**

Access number	Access location	Proposed access control measures
AP_007	B1249 to the west of Foston on the Wolds	The existing highway geometry would restrict forward visibility of vehicles approaching from the south and wishing to turn right into access AP_007. It is therefore proposed that right turns would not be permitted into this access and all traffic would therefore be required to approach from the north only.
AP_008	B1249 to the west of Foston on the Wolds	The existing highway geometry would restrict forward visibility of vehicles approaching from the north waiting to turn right in to access AP_008. It is therefore proposed that right turns into the access would not be permitted and all traffic would therefore be required to approach from the south only.
AP_020 and AP_032	A1035 to the north west of Beverley	Direct access is proposed from the A1035 to the west of Beverley. Due to the volumes of traffic along this road it is proposed that right turns into and out of these accesses would not be permitted and instead vehicles would be expected to use the roundabouts either side of the accesses to U-turn.
AP_021	A1035 to the west of Beverly	Direct access is proposed from the A1035 to the west of Beverley. Due to the volumes of traffic along this road it is proposed that right turns into and out of this access would not be permitted and instead vehicles would be expected to use the roundabouts either side of the access to U-turn.
AP_025	A1079 south of Beverly	A new access is proposed from a layby on the southern side the A1079. A second accesses is also proposed (by ERYC) from this layby that will be provided as part of the Jocks Lodge works to facilitate access to Jillywood Farm. To reduce the potential for conflict between the two accesses, the Applicant has agreed with ERYC that the layby can be extended to the east thereby increasing the separation between the access points.
AP_026	A164 south of Beverley	ERYC are proposing works to widen the A164 to the south of Beverley as part of the Jocks Lodge improvements. These works would convert the A164 from a single carriageway to a dual carriageway. To remove the requirement for a direct access from the A164 (either in its current alignment or it proposed alignment) and reduce any potential conflicts with the Jocks Lodge improvement works, it has been agreed with ERYC that access to the east of the A164 can be taken from an existing layby. It has been agreed with ERYC that vehicles would left turn off the A164 (only) into the existing layby and then access the ECC by travelling north along the route of an existing footway/ cycleway. To avoid conflict with pedestrians and cyclists, it is proposed that

Access number	Access location	Proposed access control measures
		this route will be widened to provide passing places for HGVs as well as room for oncoming pedestrians and cyclists to pass HGVs.

4.1.1.7 The visibility splay requirements for each access and crossing would be determined based upon measured speeds and provided in accordance with the requirements of the DMRB. Where the visibility splay requirements could not be fully achieved or may have significant adverse environmental impacts (e.g. extensive tree/hedgerow removal) a reduction in the visibility requirement (through temporary speed limit reductions) would be discussed and agreed with ERYC.



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## Appendix A

List of Traffic Counts Used for Each Link

## Link Details

Link	Survey Type	Survey Year	Month	Traffic Count Reference	Road
1	Commissioned ATC	2019	March	TC (2)	A165 from Moor Ln to Fraisthorpe
2	Commissioned ATC	2019	March	TC (1)	Unnamed Road running south of Fraisthorpe
3	Commissioned ATC	2019	March	TC (1)	Unnamed Road from its junction with A165 south of Fraisthorpe
4	Commissioned ATC	2019	March	TC (2)	A165 to the west of Fraisthorpe
5	Commissioned ATC	2019	March	TC (2)	A165 south of Fraisthorpe
6	ERYC ATC	2018	N/A	ERYC (1)	A165 west of Barmston
7	Commissioned ATC	2019	March	TC (4)	A165 east of Lissett
8	Commissioned ATC	2019	March	TC (4)	A165 south of Lissett to Beeford
9	Commissioned ATC	2019	March	TC (5)	B1249 through Beeford
10	Commissioned ATC	2019	March	TC (6)	Foston Lane / Old Howe Lane
11	Commissioned ATC	2019	March	TC (8)	B1249 between Beeford and North Frodingham
12	Commissioned ATC	2019	March	TC (8)	B1249 through North Frodingham
13	Commissioned ATC	2019	March	TC (8)	B1249 Church Lane
14	Commissioned ATC	2019	March	TC (7)	Cruckley Lane / Cowslam Lane
15	Commissioned ATC	2019	March	TC (7)	Sheepdike Lane through Foston on the Wolds
16	Commissioned ATC	2019	March	TC (6)	Old Howe Lane
17	Commissioned ATC	2019	March	TC (6)	Long Lane
18	Commissioned ATC	2019	March	TC (6)	Gambling Lane
19	Commissioned ATC	2019	March	TC (6)	Out Gates
20	Commissioned ATC	2019	March	TC (8)	B1249 north of Brigham Lane
21	Commissioned ATC	2019	March	TC (8)	B1249 south of Wansford
22	Commissioned ATC	2019	March	TC (8)	B1249 through Wansford
23	Commissioned ATC	2019	March	TC (9)	B1249 Wansford to Driffield
24	Commissioned ATC	2019	March	TC (9)	B1249 Wansford Road / Scarborough Road
25	Commissioned ATC	2019	March	TC (7)	Brigham Lane
26	ERYC ATC	2018	N/A	ERYC (3)	A164 south of Driffield
27	Commissioned ATC	2019	March	TC (10)	Beverley Road from A164 to River Head
28	Commissioned ATC	2019	March	TC (10)	Anderson Street / River Head
29	ERYC ATC	2018	N/A	ERYC (3)	A164 between Driffield and Hutton Cranswick
30	Commissioned ATC	2019	March	TC (11)	Station Road / Main Street through Hutton Cranswick
31	Commissioned ATC	2019	March	TC (12)	Corpslanding Road / Howl Lane / Church Street / Hutton Road
32	Commissioned ATC	2019	March	TC (11)	Maeggison's Turnpike
33	Commissioned ATC	2019	March	TC (12)	Corpslanding Road / Rotsea Lane
34	Commissioned ATC	2019	March	TC (13)	Carr Lane / Church Lane east of Watton
35	Commissioned ATC	2019	March	TC (13)	Church Lane east of Watton
36	Dft	2019	N/A	90246	A164, Hutton Cranswick to Watton
37	Dft	2019	N/A	90246	A614, Watton to Wilfholme Road
38	Commissioned ATC	2019	March	TC (14)	Wilfholme Road
39	Commissioned ATC	2019	March	TC (18)	A164, Wilfholme Road to Beswick
40	Commissioned ATC	2019	March	TC (15)	Beswick Road / Barhill Causeway
41	Commissioned ATC	2019	March	TC (18)	A164, Beswick Road to Station Road
42	Commissioned ATC	2019	March	TC (17)	Station Road east of A164
43	Commissioned ATC	2019	March	TC (16)	Station Road west of A164
44	Commissioned ATC	2019	March	TC (18)	A164 south of Station Road
45	ERYC ATC	2018	N/A	ERYC (4)	A164 north of Leconfield
46	Commissioned ATC	2019	March	TC (19)	Old Road west of Leconfield
47	Commissioned ATC	2019	March	TC (19)	Unnamed Road west of junction with A164 to Old Road
48	Commissioned ATC	2019	March	TC (19)	Miles Lane west of Leconfield
49	Commissioned ATC	2019	March	TC (19)	Miles Lane east of B1248
50	Commissioned ATC	2019	March	TC (20)	B1248 north of the A1035
51	Dft	2019	N/A	89337	A1035 Constitution Hill
52	Dft	2019	N/A	89337	Beverley Northern Bypass
53	Dft	2019	N/A	80459	A1035 Dog Kennel Lane
54	Commissioned ATC	2019	March	TC (25)	A1174 east of the A1035
55	Dft	2019	N/A	89313	A1079, A1174 and A164
56	Commissioned ATC	2019	March	TC (22)	Newbald Road
57	Commissioned ATC	2019	March	TC (21)	Killingwoldgraves Lane / Copleflat Lane
58	Commissioned ATC	2019	March	TC (21)	Copleflat Lane south of Newbald Road
59	Commissioned ATC	2019	March	TC (21)	Copleflat Lane south of Walkington
60	Dft	2019	N/A	56571	A164 south of A1079
61	Commissioned ATC	2019	March	TC (24)	Unnamed Road south of Copleflat Lane to junction with A164
62	Dft	2019	N/A	56571	A164 south of Copleflat Lane
63	Dft	2019	N/A	56571	A164 north of Skidby
64	ERYC ATC	2018	N/A	ERYC (2)	A165 Beeford to Brandesburton
65	Commissioned ATC	2019	March	TC (26)	Main Street / Frodingham Road, Brandesburton to North Frodingham
66	Dft	2019	N/A	36752	A165, Brandesburton to Leven
67	Dft	2019	N/A	36752	A165, B1244 to A1035
68	ERYC ATC	2018	N/A	ERYC (6)	A1035, A165 to A1174
69	ERYC ATC	2018	N/A	ERYC (5)	A1035 Grange Way, north of Beverley
70	Dft	2019	N/A	37617	A1174 Swinemoor Lane
71	ERYC ATC	2018	N/A	ERYC (8)	A1174 Hull Road
72	Dft	2019	N/A	86063	A164 Minster Way
73	Dft	2019	N/A	77576	A164, Minster Way to A1079
74	ERYC ATC	2018	N/A	ERYC (9)	A1079, A164 to A1033
75	Dft	2019	N/A	89270	A1174 Beverley Road / Hull Road
76	Dft	2019	N/A	56571	A164, B1233 to Castle Road
77	Dft	2019	N/A	56571	A164, Castle Road to B1232
78	Dft	2019	N/A	7979	A164 south of B1232
79	Dft	2019	N/A	7979	A164 south of B1231
80	Dft	2019	N/A	57978	A15 Boothferry Road
81	Dft	2019	N/A	16592	A63 west of A15
82	Dft	2019	N/A	57832	A63 Clive Sullivan Way
83	Dft	2019	N/A	86061	A15 Humber Bridge
84	Dft	2019	N/A	81498	A614 north of Driffield
85	Dft	2019	N/A	81502	Bridlington Bay Road, A614 to A165
86	Dft	2019	N/A	27966	A614 east of Driffield
87	ERYC ATC	2018	N/A	ERYC (7)	A1079 through Bishop Burton
88	Commissioned ATC	2019	March	TC (28)	B1233 Harland Way / Northgate
89	Commissioned ATC	2019	March	TC (27)	Park Lane
90	Commissioned ATC	2019	March	TC (21)	B1230 through Walkington
91	Dft	2019	N/A	28361	A63 from the A1166 to Ferensway
92	Dft	2019	N/A	89142	A63 from the Ferensway to A1165
93	Dft	2019	N/A	89143	A1033 east of the A1165
94	Dft	2019	N/A	38670	A1033 Mount Pleasant
95	Dft	2019	N/A	70046	A1033 Holwell Road
96	Dft	2019	N/A	70047	A1033 Sutton Road
97	Dft	2019	N/A	70047	A1033 Thomas Clarkson Way
98	Dft	2019	N/A	73467	A1033 Raich Carter Way
99	Dft	2019	N/A	6713	A165 north east from Hull
100	Dft	2019	N/A	46741	A165 Holderness Road
101	Dft	2019	N/A	16700	A165 Ganstead Lane
102	Dft	2019	N/A	16700	A165 Northfield Road
103	Dft	2019	N/A	16700	A165 through Skirtaugh
104	Dft	2019	N/A	16700	A165 south of A1035 to Skirtaugh

## Appendix B

Future Year Growth Factors

## ERYC Area

TEMPro Growth Factors (Vehicles)	AADT	AAWT
2017 - 2018	1.012	1.012
2018 - 2017	0.988	0.988
2018 - 2019	1.012	1.012
2019 - 2018	0.988	0.988
2019 - 2024	1.071	1.071
2019 - 2027	1.104	1.103

**Note:**

Used - car driver only, East Riding of Yorkshire region only, NTEM urban trunk road dataset af15

## HCC Area

TEMPro Growth Factors (Vehicles)	AADT	AAWT
2017 - 2018	1.017	1.017
2018 - 2017	0.984	0.984
2018 - 2019	1.016	1.016
2019 - 2018	0.984	0.984
2019 - 2024	1.082	1.082
2019 - 2027	1.118	1.117

**Note:**

Used - car driver only, Hull City region only, NTEM urban trunk road dataset af15

## Appendix C

Summary of 2024 Background Traffic Flows



## Appendix D

Derivation of Construction Material Quantities and Associated HGV Demand



## Derivation of HGV deliverers

<b>1. Primary Logistics Compound</b>	
No. of Compounds	1
Length (m)	140
Width (m)	140
Average depth (m)	0.5
Volume (m <sup>3</sup> )	9800
Tonnes (assume density of 2.2tonnes per cubic meter)	21560
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>1078</b>
<b>Duration of deliveries, months</b>	<b>2</b>
<b>Monthly HGV deliveries</b>	<b>539</b>
<b>2. Secondary Logistics Compounds</b>	
No. of Compounds	7
Length (m)	90
Width (m)	90
Average depth (m)	0.5
Volume (m <sup>3</sup> )	28350
Tonnes (assume density of 2.2tonnes per cubic meter)	62370
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>3119</b>
<b>Duration of deliveries, months</b>	<b>4</b>
<b>Monthly HGV deliveries</b>	<b>780</b>
<b>3. Landfall Compound</b>	
No. of Compounds	1
Length (m)	200
Width (m)	200
Average depth (m)	0.3
Volume (m <sup>3</sup> )	12000
Tonnes (assume density of 2.2tonnes per cubic meter)	26400
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>1320</b>
<b>Duration of deliveries, months</b>	<b>2</b>
<b>Monthly HGV deliveries</b>	<b>660</b>
<b>4. Haul Road</b>	
No. of Haul Roads	1
Length (m)	37000
Width (m)	6
Average depth (m)	0.4
Volume (m <sup>3</sup> )	88800
Tonnes (assume density of 1.8tonnes per cubic meter)	159840
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>7992</b>
<b>Duration of deliveries, months</b>	<b>5</b>
<b>Monthly HGV deliveries</b>	<b>1598</b>
<b>5. Backfill Material</b>	
Route Length (m)	39064
HDD Route Length (m)	6802
Total Length (m)	32262
Trench Volume 0.5m <sup>3</sup> / m	0.5
Duct Space (m <sup>3</sup> )	0.05
Total Volume of Backfill ( m <sup>3</sup> )	0.45
No. of Circuits	6
Total Volume (m <sup>3</sup> )	87107
Tonnes (assume density of 1.53tonnes per cubic meter)	1.53
Total Tonnes	133274
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>6664</b>
<b>Duration of deliveries, months</b>	<b>12</b>
<b>Monthly HGV deliveries</b>	<b>555</b>
<b>6. Tape / Tile</b>	
Route Length (m)	39064
HDD Length (m)	6802
Total Length (m)	32262
No. of Circuits	6
No. of Tapes / Circuit	1
Total Length of Tape (m)	193572
Tape Roll Length (m)	400
No. of Rolls	484
HGV payload (Rolls / HGV)	50
<b>Total HGV deliveries</b>	<b>10</b>
<b>Duration of deliveries, months</b>	<b>12</b>
<b>Monthly HGV deliveries</b>	<b>0.8</b>
<b>7. Ducts</b>	
Route Length (m)	39064
HDD Length (m)	6802
Total Length (m)	32262
No. of Circuits	6
No. of Ducts / Circuit	3
Total Length of Ducts (m)	580716
Fibre duct Length (m)	193572
HGV payload (Ducts / HGV)	750
HGV payload (Fibre Ducts / HGV)	1000
Total HGV duct deliveries	774
Total HGV fibre ducts deliveries	194
<b>Total HGV deliveries</b>	<b>968</b>
<b>Duration of deliveries, months</b>	<b>12</b>
<b>Monthly HGV deliveries</b>	<b>81</b>

<b>8. Cables</b>	
Route Length (m)	39064
No. of Circuits	6
Total Length (m)	703152
Drum Length (m)	950
No. of Cable Deliveries	740
No. of Cable Deliveries (Grid Connection)	48
Total No of Cable Deliveries	788
Fibre optic length (m)	234384
Fibre optic drum length (m)	3000
No. of fibre optic drums	78
HGV payload (Fibre optic drums / HGV)	6
Total HGV fibre ducts deliveries	13
<b>Total HGV deliveries</b>	<b>801</b>
<b>Duration of deliveries, months</b>	<b>10</b>
<b>Monthly HGV deliveries</b>	<b>80</b>
<b>9. HDD installation</b>	
HDD Route Length (m)	6802
No. of Circuits	6
No. of HDD Ducts	3
Total number of HDD ducts	122436
HGV payload (Ducts / HGV)	500
No. of HGV Loads	245
Fibre Ducting Length (m)	40812
No. Fibre ducting HGV Loads	30
No. of HDD Compounds	45
HDD Compound Length (m)	50
HDD Compound Width (m)	50
HDD Compound Depth (m)	0.3
HDD compound volume of stone (m <sup>3</sup> )	33750
HDD compound stone volume and removal (m <sup>3</sup> )	67500
Tonnes (assume density of 2.2tonnes per cubic meter)	148500
HGV payload (tonnes)	20
Total HDD compound deliveries	7425
<b>Total HGV deliveries</b>	<b>7700</b>
<b>Duration of deliveries, months</b>	<b>12</b>
<b>Monthly HGV deliveries</b>	<b>642</b>
<b>10. Drainage Ducts</b>	
Route Length (m)	39064
No. of Drainage Pipes	2
Total Length of Pipes (m)	78128
HGV payload (pipes / HGV)	1000
<b>Total HGV deliveries</b>	<b>78</b>
<b>Duration of deliveries, months</b>	<b>5</b>
<b>Monthly HGV deliveries</b>	<b>16</b>
<b>11. Joint Bays</b>	
No. of Joint Bays	240
Concrete slab length (m)	10
Concrete slab width (m)	4
Concrete slab depth (m)	0.5
Concrete volume (m <sup>3</sup> )	4800
HGV payload (concrete / HGV)	6
Total HGV concrete deliveries	800
Aggregate stone base length (m)	10
Aggregate stone base width (m)	5
Aggregate stone base depth (m)	0.1
Aggregate stone base volume (m <sup>3</sup> )	1200
HGV Load	20
Total HGV aggregate stone base deliveries	60
<b>Total HGV deliveries</b>	<b>860</b>
<b>Duration of deliveries, months</b>	<b>8</b>
<b>Monthly HGV deliveries</b>	<b>108</b>
<b>12. Temporary access roads</b>	
Length (m)	5163
Width (m)	6
Average depth (m)	0.4
Volume (m <sup>3</sup> )	12391
Tonnes (assume density of 2.2tonnes per cubic meter)	27261
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>1363</b>
<b>Duration of deliveries, months</b>	<b>3</b>
<b>Monthly HGV deliveries</b>	<b>454</b>
<b>13. Onshore substation access road</b>	
Length (m)	1800
Width (m)	7
Average depth (m)	0.5
Volume (m <sup>3</sup> )	6300
Export of spoil (m <sup>3</sup> )	6300
Total Volume of import/export	12600
Tonnes (assume density of 2.2tonnes per cubic meter)	27720
HGV payload (tonnes)	20
<b>Total HGV deliveries</b>	<b>1386</b>
<b>Duration of deliveries, months</b>	<b>3</b>
<b>Monthly HGV deliveries</b>	<b>462</b>
<b>14. Onshore substation</b>	
	<b>Daily HGV deliveries</b>
Month 0 - 1 (12 HGVs per day)	12
Month 1 - 4 (15 HGVs per day)	15
Month 5 - 9 (100 HGVs per day)	100
Month 10 - 25 (25 HGVs per day)	25
Month 25 - 36 (8 HGVs per day)	8

## Appendix E

HGV and Light Vehicle Demand Assigned to the Construction Programme

Daily Personnel Movements per Month

Table with columns: Activity, No. of teams, No. of persons per team, Total Light Vehicles, Total persons, Notes, and Months (0-36). Rows include activities like Primary and Secondary Logistics, Vegetation Removal, etc. Summary rows at the bottom show total monthly movements.

Daily Plant Movements per Month

Table with columns: Activity, No. of teams, No. of HGVs per team, Total HGVs, Notes, and Months (0-36). Rows include activities like Primary and Secondary Logistics, Vegetation Removal, etc. Summary rows at the bottom show total monthly HGV plant movements.

Daily Material Movements per Month

Table with columns: Activity, Total HGVs, Duration (months), Duration (days), Notes, and Months (0-36). Rows include activities like Primary Logistics Compound, Secondary Logistics Compounds, etc. Summary rows at the bottom show total monthly HGV movements.

## Appendix F

HGV Distribution per Access

Peak HGV movements per access

Accesses	Primary Logistics Compound			Secondary Logistics Compounds			Landfall Compound			Onshore ECC and 400kV NGET Connection			OnSS and EBI			Total two-way daily HGV movements per access
	No. of compounds per access	Daily HGV movements per access	Two-way daily HGV movements per access	No. of compounds per access	Daily HGV movements per access	Two-way daily HGV movements per access	No. of compounds per access	Daily HGV movements per access	Two-way daily HGV movements per access	Length of cable route per access (km)	Daily HGV movements per access	Two-way daily HGV movements per access	No. of substations per access	Daily HGV movements per access	Two-way daily HGV movements per access	
AP_002 & AP_003							1	35	69	2.3	12	24				93
AP_040				1	6	12				1.6	8	17				28
AP_004				1	6	12				3.7	19	39				51
AP_005 & AP_039										1.4	7	15				15
AP_006										2.2	12	23				23
AP_007				1	6	12				0.7	4	7				19
AP_008										0.8	4	8				8
AP_009										1.8	9	19				19
AP_010 & AP_038										3.0	16	32				32
AP_011 & AP_037				1	6	12				1.3	7	14				25
AP_012 & AP_036										1.1	6	12				12
AP_013 & AP_035										1.5	8	16				16
AP_014 & AP_034										1.3	7	14				14
AP_015	1	28	56							1.0	5	11				67
AP_016										1.0	5	11				11
AP_017				1	6	12				2.2	12	23				35
AP_018										1.0	5	11				11
AP_020 & AP_032										1.4	7	15				15
AP_021										1.7	9	18				18
AP_022				1	6	12				0.8	4	8				20
AP_023 & AP_024										2.3	12	24				24
AP_025										2.3	12	24	1	110	220	244
AP_026										0.6	3	6				6
AP_027										1.1	6	12				12
AP_028 & AP_030				1	6	12				0.9	5	9				21
<b>Total</b>	<b>1</b>	<b>28</b>	<b>56</b>	<b>7</b>	<b>41</b>	<b>82</b>	<b>1</b>	<b>35</b>	<b>69</b>	<b>39.0</b>	<b>205</b>	<b>410</b>	<b>1</b>	<b>110</b>	<b>220</b>	<b>838</b>

Average HGV movements per access

Accesses	Primary Logistics Compound			Secondary Logistics Compounds			Landfall Compound			Onshore ECC and 400kV NGET Connection			OnSS and EBI			Total two-way daily HGV movements per access
	No. of compounds per access	Daily HGV movements per access	Two-way daily HGV movements per access	No. of compounds per access	Daily HGV movements per access	Two-way daily HGV movements per access	No. of compounds per access	Daily HGV movements per access	Two-way daily HGV movements per access	Length of cable route per access (km)	Daily HGV movements per access	Two-way daily HGV movements per access	No. of substations per access	Daily HGV movements per access	Two-way daily HGV movements per access	
AP_002 & AP_003							1	6	12	2.3	6	12				24
AP_040				1	2	4				1.6	4	8				12
AP_004				1	2	4				3.7	10	19				23
AP_005 & AP_039										1.4	4	7				7
AP_006										2.2	6	12				12
AP_007				1	2	4				0.7	2	4				8
AP_008										0.8	2	4				4
AP_009										1.8	5	9				9
AP_010 & AP_038										3.0	8	16				16
AP_011 & AP_037				1	2	4				1.3	3	7				11
AP_012 & AP_036										1.1	3	6				6
AP_013 & AP_035										1.5	4	8				8
AP_014 & AP_034										1.3	3	7				7
AP_015	1	5	9							1.0	3	5				15
AP_016										1	3	5				5
AP_017				1	2	4				2.2	6	12				15
AP_018										1.0	3	5				5
AP_020 & AP_032										1.4	4	7				7
AP_021										1.7	4	9				9
AP_022				1	2	4				0.8	2	4				8
AP_023 & AP_024										2.3	6	12				12
AP_025										2.3	6	12	1	63	126	138
AP_026										0.6	2	3				3
AP_027										1.1	3	6				6
AP_028 & AP_030				1	2	4				0.9	2	5				9
<b>Total</b>	<b>1</b>	<b>5</b>	<b>9</b>	<b>7</b>	<b>14</b>	<b>27</b>	<b>1</b>	<b>6</b>	<b>12</b>	<b>39.0</b>	<b>102</b>	<b>205</b>	<b>1</b>	<b>63</b>	<b>126</b>	<b>379</b>

## Appendix G

Assignment of HGV Traffic to the Traffic and Transport Study Area





Access	Entry Link	Peak deliveries (two-way movements)	Links																																																																																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102
Access AP_014 and AP_34	A164 A1165	14	Links																																																																																																					
			Two-way daily HGV movements																																																																																																					
			Access AP_015	A164 A1165	67	Links																																																																																																		
Two-way daily HGV movements																																																																																																								
Access AP_016	A164 A1165	11				Links																																																																																																		
			Two-way daily HGV movements																																																																																																					
			Access AP_017	A164 A1165	35	Links																																																																																																		
Two-way daily HGV movements																																																																																																								
Access AP_018	A164 A1165	11				Links																																																																																																		
			Two-way daily HGV movements																																																																																																					
			Access AP_020 and AP_032	A164 A1165	15	Links																																																																																																		
Two-way daily HGV movements																																																																																																								
Access AP_021	A164 A1165	18				Links																																																																																																		
			Two-way daily HGV movements																																																																																																					
			Access AP_022	A164 A1165	20	Links																																																																																																		
Two-way daily HGV movements																																																																																																								
Access AP_023 and AP_024	A164 A1165	24				Links																																																																																																		
			Two-way daily HGV movements																																																																																																					
			Access AP_025	A164 A1165	244	Links																																																																																																		
Two-way daily HGV movements																																																																																																								
Access AP_026	A164 A1165	6				Links																																																																																																		
			Two-way daily HGV movements																																																																																																					
			Access AP_027	A164 A1165	12	Links																																																																																																		
Two-way daily HGV movements																																																																																																								
Access AP_028 and AP_030	A164 A1165	21				Links																																																																																																		
			Two-way daily HGV movements																																																																																																					
			Peak deliveries (two-way movements)		Links																																																																																																			
Two-way weekday (AAWT) HGV movements		838																																																																																																						
Two-way daily (AADT) HGV movements		718																																																																																																						





## Appendix H

### In-migrant Labour Distribution

# Hornsea 4



## In-migrant Labour Distribution

Postcode	No. of rooms per post code	Journey time (mins) *	No. of rooms factored by journey time **	Percentage distribution	Point of entry to study area	Percentage distribution of rooms by point of entry
HU16	43	9	4.8	7.6%	Link 63	11.9%
HU5	63	23	2.7	4.3%		
HU6	15	17	0.9	1.4%	Link 74 or 75	1.4%
HU3	23	27	0.9	1.3%	Link 77	2.2%
HU4	14	26	0.5	0.9%		
HU14	95	20	4.8	7.5%	Link 78	7.5%
HU13	6	21	0.3	0.5%	Link 79	0.5%
DN18	4	30	0.1	0.2%	Link 83	0.6%
DN39	8	37	0.2	0.3%		
YO16	30	49	0.6	1.0%	Link 85	1.0%
YO25	65	34	1.9	3.0%	Link 84 or 86	3.0%
YO19	7	50	0.1	0.2%	Link 87	2.9%
YO42	24	34	0.7	1.1%		
YO43	23	23	1.0	1.6%		
HU15	16	24	0.7	1.1%	Link 90	3.0%
HU20	16	13	1.2	1.9%		
HU1	224	29	7.7	12.2%	Link 95	36.6%
HU2	370	24	15.4	24.4%	Link 96	5.8%
HU9	103	28	3.7	5.8%		
HU11	14	31	0.5	0.7%	Link 104	0.7%
HU17	116	8	14.5	22.9%	Beverley	22.9%
<b>Total</b>	<b>1279</b>			<b>100%</b>		<b>100%</b>

### Notes:

\* journey time from centre of post code to Beverley (capped at 45 minutes)

\*\* number of rooms divided by the journey time

## Appendix I

Resident Labour Distribution

## Resident Labour Distribution

Postcode	No. of workers per post code	Journey time (mins) *	No. of workers factored by journey time **	Percentage distribution	Point of entry to study area	Percentage distribution of workers by point of entry
HU16	451	16	28	1.0%	63	2.9%
HU5	1,099	22	50	1.9%		
HU18	236	30	8	0.3%	67	0.3%
HU6	475	16	30	1.1%	74	1.1%
HU10	876	35	25	0.9%	77	3.6%
HU3	1,387	27	51	1.9%		
HU4	509	26	20	0.7%		
HU14	204	20	10	0.4%	78	0.4%
HU13	453	21	22	0.8%	79	0.8%
DN15	1,605	60	27	1.0%	83	14.2%
DN16	1,185	65	18	0.7%		
DN17	1,082	70	15	0.6%		
DN18	815	50	16	0.6%		
DN19	311	55	6	0.2%		
DN20	497	55	9	0.3%		
DN21	1,357	80	17	0.6%		
DN31	1,029	65	16	0.6%		
DN32	844	75	11	0.4%		
DN33	239	80	3	0.1%		
DN34	264	70	4	0.1%		
DN35	888	80	11	0.4%		
DN36	377	80	5	0.2%		
DN36	360	80	5	0.2%		
DN37	1,275	65	20	0.7%		
DN38	681	60	11	0.4%		
DN40	517	65	8	0.3%		
DN9	565	80	7	0.3%		
LN1	1,974	75	26	1.0%		
LN10	210	84	3	0.1%		
LN11	1,242	73	17	0.6%		
LN2	1,794	78	23	0.9%		
LN3	269	74	4	0.1%		
LN4	1,013	96	11	0.4%		
LN5	3,426	88	39	1.4%		
LN6	2,545	77	33	1.2%		
LN8	313	65	5	0.2%		
LN9	238	74	3	0.1%		
NG34	1,306	112	12	0.4%		
YO14	337	57	6	0.2%		
YO15	1,136	52	22	0.8%	86	2.2%
YO16	262	48	5	0.2%		
YO11	849	56	15	0.6%	87	9.3%
YO12	1,260	53	24	0.9%		
YO25	729	34	21	0.8%		
DN14	1,235	45	27	1.0%		
LS14	1,817	69	26	1.0%		
LS8	742	76	10	0.4%		
YO1	3,154	56	56	2.1%		
YO2	2,177	59	37	1.4%		
YO3	2,678	59	45	1.7%		
YO30	232	69	3	0.1%		
YO4	1,143	31	37	1.4%		
YO6	358	68	5	0.2%		
YO7	251	90	3	0.1%		
BD11	530	100	5	0.2%		
BD19	1,103	100	11	0.4%		
DN1	1,553	70	22	0.8%		
DN10	1,139	80	14	0.5%		
DN11	1,094	80	14	0.5%		
DN12	792	80	10	0.4%		
DN2	633	65	10	0.4%		
DN3	1,425	75	19	0.7%		
DN4	2,751	70	39	1.5%		
DN5	1,390	75	19	0.7%		
DN6	1,052	70	15	0.6%		
DN7	749	60	12	0.5%		
DN8	521	60	9	0.3%		
HD2	283	120	2	0.1%		
HD3	115	130	1	0.0%		
HD5	194	120	2	0.1%		
HD8	1,061	110	10	0.4%		
HG1	1,657	120	14	0.5%		
HG2	436	110	4	0.1%		
HG3	702	130	5	0.2%		
HG4	1,094	120	9	0.3%		
HG5	672	100	7	0.2%		
HU15	884	24	37	1.4%		
LS1	1,807	74	24	0.9%		
LS10	2,125	68	31	1.2%		



Postcode	No. of workers per post code	Journey time (mins) *	No. of workers factored by journey time **	Percentage distribution	Point of entry to study area	Percentage distribution of workers by point of entry
LS11	3,002	70	43	1.6%	90	46.7%
LS12	1,931	74	26	1.0%		
LS15	1,441	70	21	0.8%		
LS17	92	79	1	0.0%		
LS2	515	72	7	0.3%		
LS22	384	71	5	0.2%		
LS25	1,726	61	28	1.0%		
LS26	832	63	13	0.5%		
LS27	2,014	68	30	1.1%		
LS4	280	75	4	0.1%		
LS6	399	77	5	0.2%		
LS7	200	77	3	0.1%		
LS9	1,328	72	18	0.7%		
NG23	250	83	3	0.1%		
S12	204	75	3	0.1%		
S13	1,260	71	18	0.7%		
S19	1,206	70	17	0.6%		
S2	240	76	3	0.1%		
S21	764	70	11	0.4%		
S25	1,085	69	16	0.6%		
S26	858	70	12	0.5%		
S30	1,517	70	22	0.8%		
S35	203	79	3	0.1%		
S36	161	92	2	0.1%		
S42	404	88	5	0.2%		
S43	1,441	72	20	0.7%		
S44	585	76	8	0.3%		
S5	326	71	5	0.2%		
S60	2,943	67	44	1.6%		
S61	940	72	13	0.5%		
S62	642	72	9	0.3%		
S63	1,376	73	19	0.7%		
S63	763	73	10	0.4%		
S64	1,102	70	16	0.6%		
S65	803	66	12	0.5%		
S66	1,522	64	24	0.9%		
S70	2,983	78	38	1.4%		
S71	1,812	73	25	0.9%		
S72	907	77	12	0.4%		
S73	1,054	75	14	0.5%		
S74	306	75	4	0.2%		
S75	809	79	10	0.4%		
S80	499	74	7	0.3%		
S81	763	66	12	0.4%		
S9	1,411	68	21	0.8%		
WF1	1,683	63	27	1.0%		
WF10	2,576	54	48	1.8%		
WF11	419	53	8	0.3%		
WF12	1,261	74	17	0.6%		
WF13	550	75	7	0.3%		
WF14	546	82	7	0.2%		
WF15	552	78	7	0.3%		
WF16	205	76	3	0.1%		
WF17	1,215	73	17	0.6%		
WF2	1,689	71	24	0.9%		
WF3	959	62	15	0.6%		
WF4	2,323	72	32	1.2%		
WF5	866	66	13	0.5%		
WF6	576	59	10	0.4%		
WF7	542	61	9	0.3%		
WF8	692	52	13	0.5%		
WF9	1,054	59	18	0.7%		
HU12	1,513	47	32	1.2%	93	1.2%
HU1	2,048	26	79	2.9%	95	3.4%
HU2	286	23	12	0.5%		
HU9	1,081	26	42	1.5%	96	1.5%
HU7	1,039	18	58	2.1%	98	3.1%
HU8	559	22	25	0.9%		
HU11	2,373	30	79	2.9%	104	2.9%
HU17	1,406	10	141	5.2%	Beverly	5.2%

**Notes:**

\* journey time from centre of post code to centre of Beverley

\*\* number of workers divided by the journey time

## Appendix J

Assignment of Light Vehicle Traffic to the Traffic and Transport Study Area

Peak Light Vehicle Distribution

Light vehicle movements by the SCC (weekends only)

Table for Access AP\_001 and AP\_003. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_040. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_004. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_005 and AP\_030. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_006. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_007. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_008. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_009. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Table for Access AP\_010. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-30). Rows include Total employees, Car share ratio, Total Light Vehicle, Percentage resident workers, Percentage in-migrant workers, Total resident Light Vehicles, Total in-migrant Light Vehicles, and Banerley.

Main data table with multiple sections for different teams (Accross AP\_2012 and AP\_2017). Each section includes a summary of metrics like Total employees, Car share ratio, and Total Light Vehicles, followed by a detailed grid of data points across various categories and locations.





Average Light Vehicle Distribution  
Light Vehicle counts by the BCC (vehicles/Day/Week)

Table for Area AP\_001 and AP\_003. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_040. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_004. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_005 and AP\_009. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_006. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_007. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_008. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.

Table for Area AP\_009. Columns include Point of entry to study area, Residents (Percentage split, Total worker vehicles), In-migrant (Percentage split, Total worker vehicles), Combined (Total worker vehicles), and Links (1-35). Rows include Total employees, Car share ratio, Total Light Vehicles, and various vehicle categories.









## Appendix K

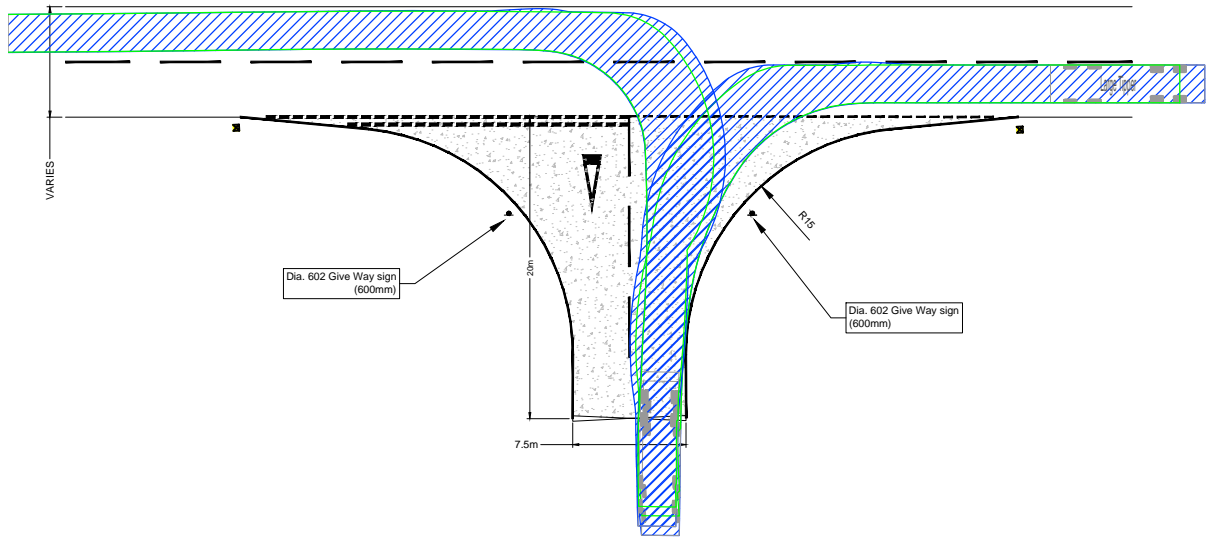
Summary of HGV and Light Vehicles per Link



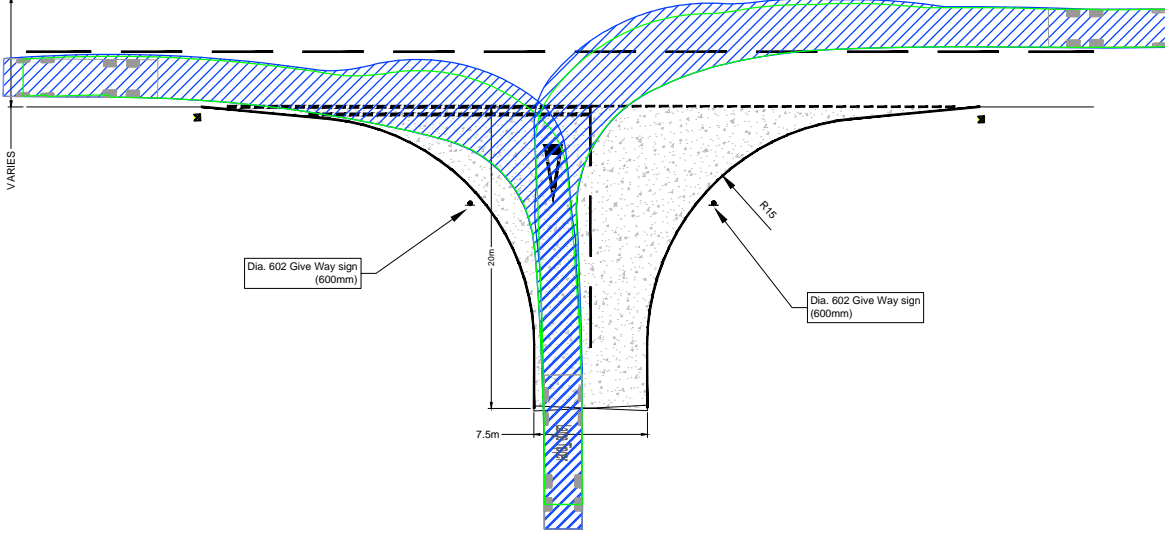
## Appendix L

### Outline Access Design Concepts

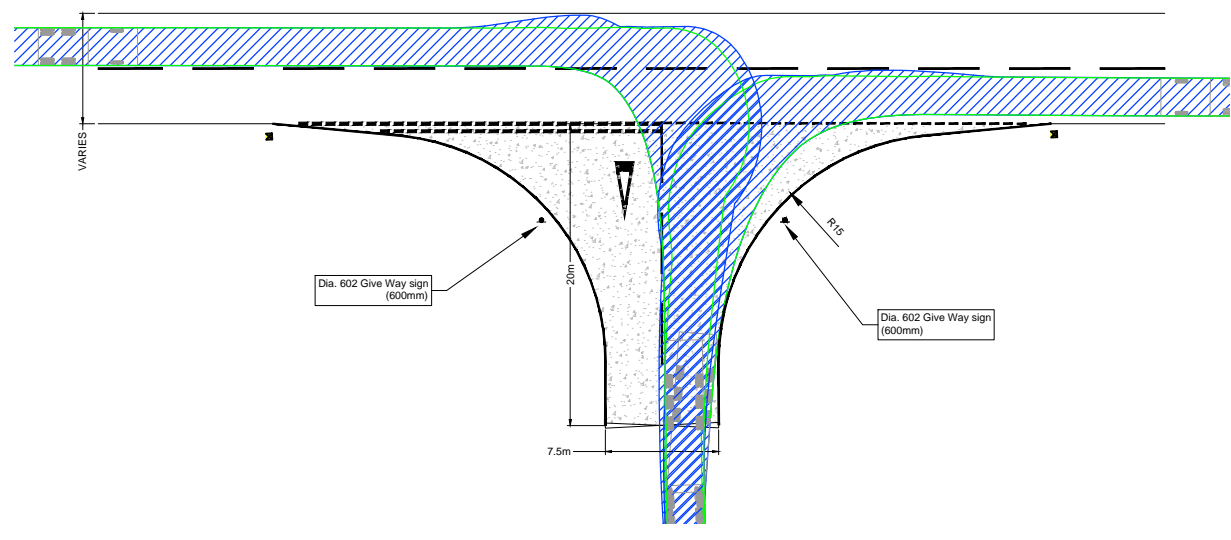
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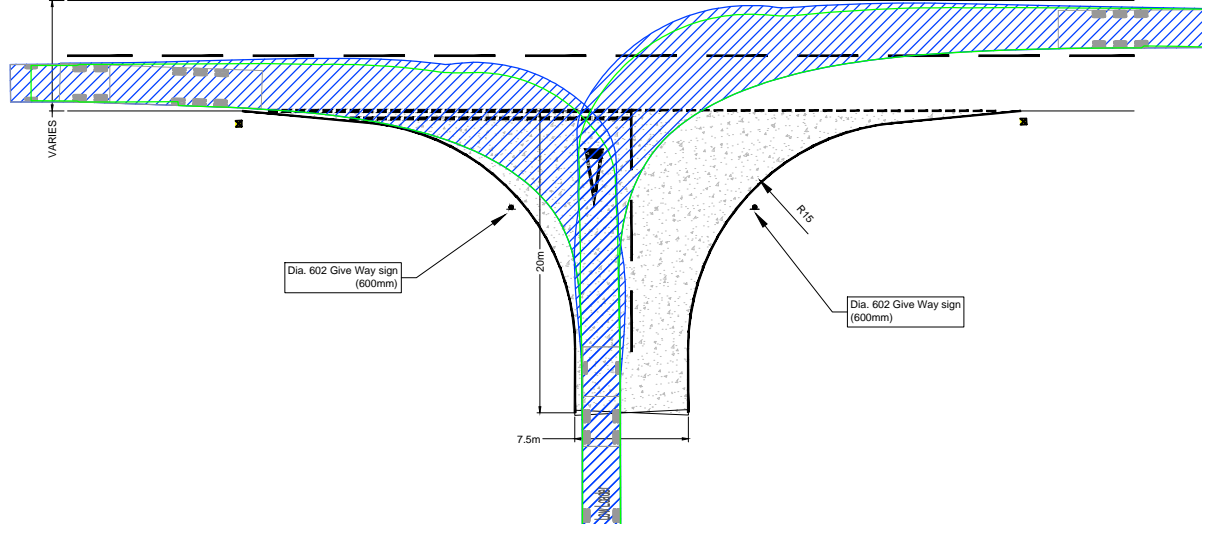
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LOW LOADER IN



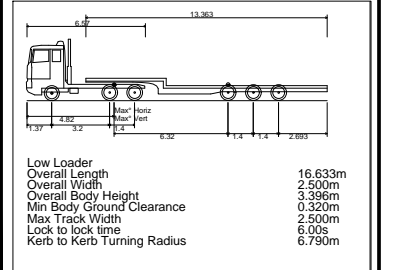
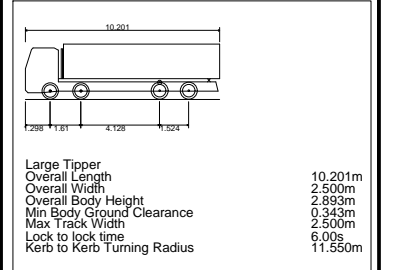
LOW LOADER OUT



- NOTES**
- Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
  - Exact junction types and geometry to be determined from relevant section of Design Manual for Roads & Bridges (DMRB TD 42/95).
  - All road markings and signs to conform with the Traffic Signs Regulation and General Directions 2016 and Chapter 8.

- KEY**
- EXISTING METELED ROAD BOUNDARY
  - PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
  - PROPOSED GATE
  - PROPOSED PLASTIC DEMARCATION BOLLARD
  - PROPOSED POST MOUNTED TRAFFIC SIGN
  - PROPOSED ACCESS CONSTRUCTION

**VEHICLE TRACKING**



- VEHICLE BODY SWEEP PATH (FORWARD GEAR)
- VEHICLE CHASSIS SWEEP PATH

**DRAFT - NOT FOR CONSTRUCTION**

REV	DATE	DESCRIPTION	BY	CHK	APP
REVISIONS					



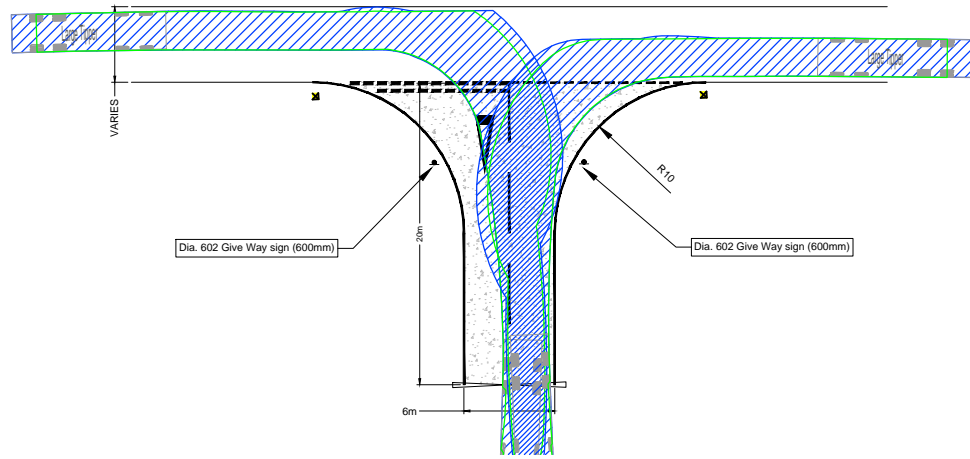
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HORNSEA PROJECT FOUR  
OFFSHORE WIND FARM

**TITLE**  
TYPE A ACCESS  
DMRB A/B ROAD JUNCTION  
20t TIPPER & LARGE LOW LOADER

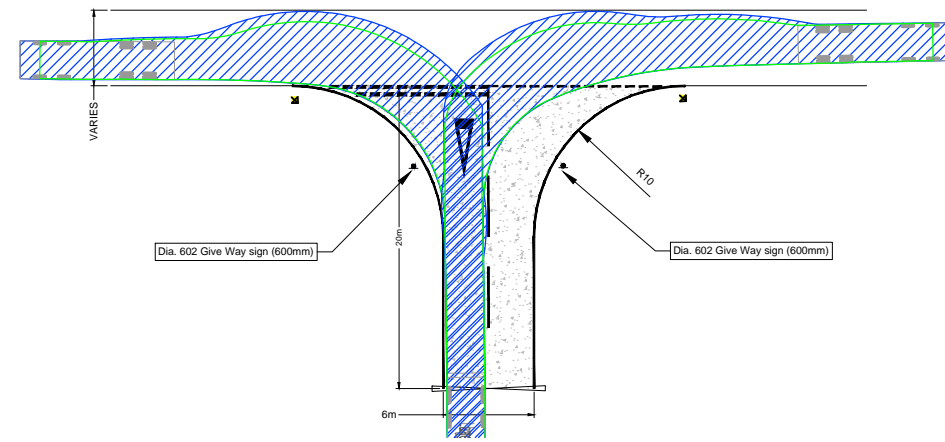


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DATE	MAY 2019	SCALE AT AS	1:500	CLIENTS REF.	
DRAWING No.	TP-PB8783-DR-001				REVISION
CLIENT DWG No.					D0.1

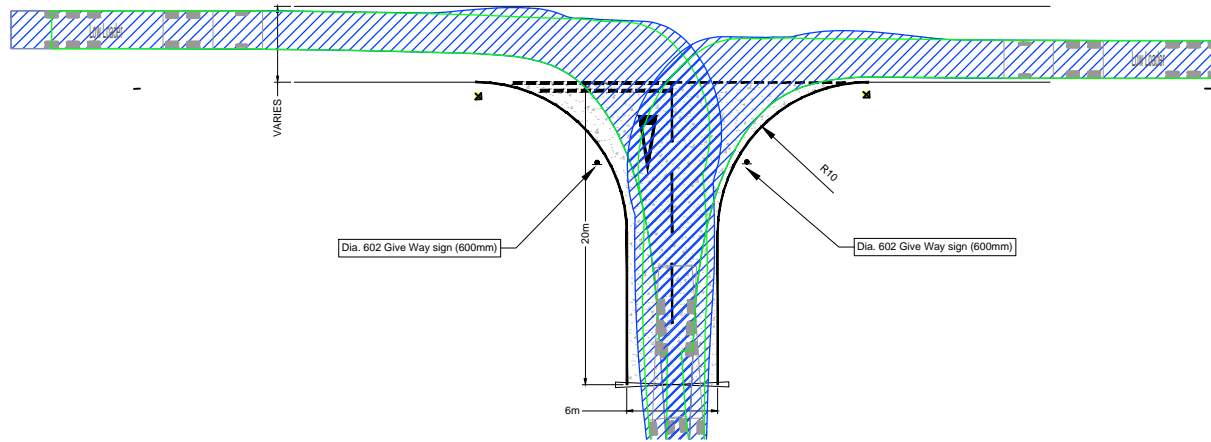
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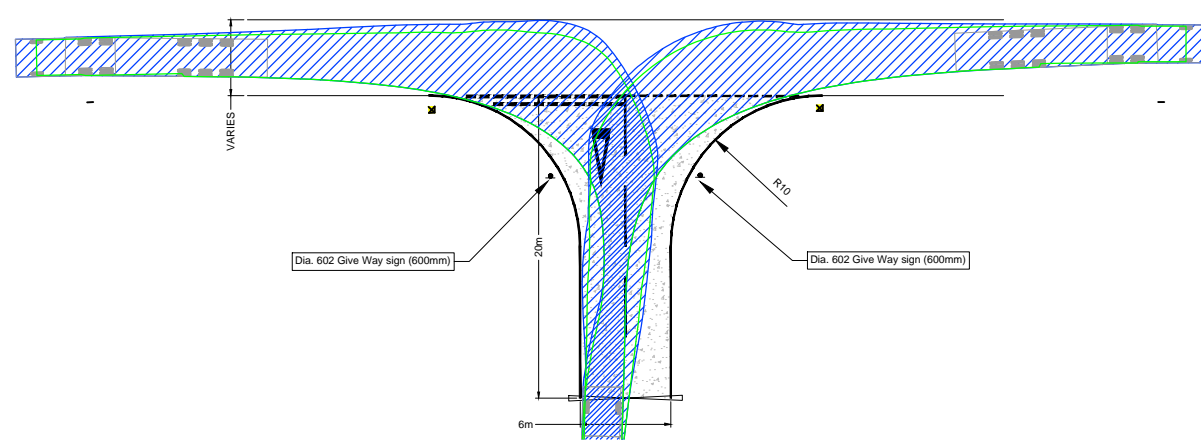
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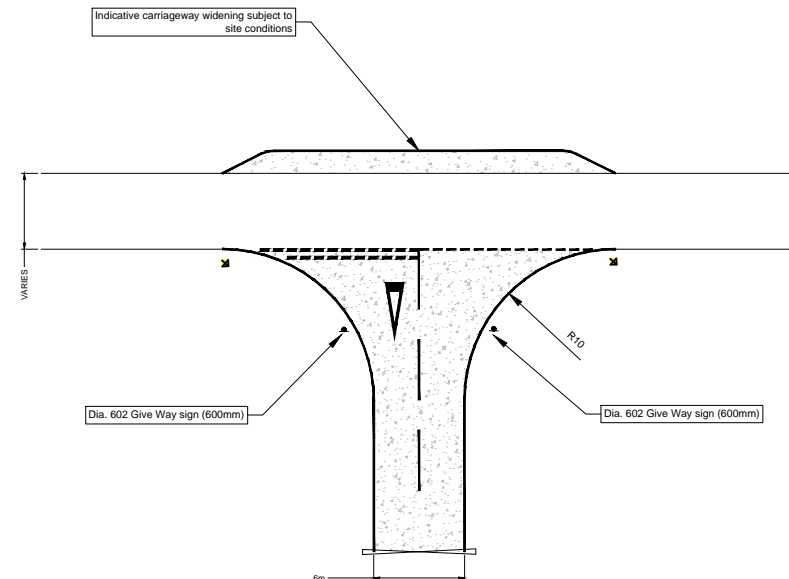
TYPE B ACCESS - LOW LOADER IN



TYPE B ACCESS - LOW LOADER OUT



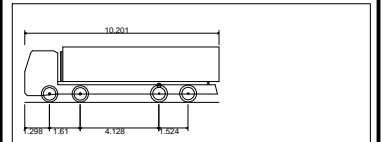
TYPE C ACCESS WITH OPPOSITE VERGE WIDENING



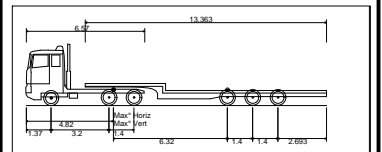
- NOTES**
- Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
  - Exact junction types and geometry to be determined from relevant section of Design Manual for Roads & Bridges (TD 42/95).
  - All road markings and signs to conform with the Traffic Signs Regulation and General Directions 2016 and Chapter 8.

- KEY**
- EXISTING METEALED ROAD BOUNDARY
  - PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
  - PROPOSED GATE
  - PROPOSED PLASTIC DEMARCATION BOLLARD
  - PROPOSED POST MOUNTED TRAFFIC SIGN
  - PROPOSED ACCESS CONSTRUCTION

**VEHICLE TRACKING**



Large Tipper	
Overall Length	10.201m
Overall Width	2.500m
Overall Body Height	2.893m
Min Body Ground Clearance	0.343m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	11.550m



Low Loader	
Overall Length	16.633m
Overall Width	3.396m
Overall Body Height	3.396m
Min Body Ground Clearance	0.320m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.790m

- VEHICLE BODY SWEEP PATH (FORWARD GEAR)
- VEHICLE CHASSIS SWEEP PATH

**DRAFT - NOT FOR CONSTRUCTION**

REV	DATE	DESCRIPTION	BY	CHK	APP
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**REVISIONS**

CLIENT



PROJECT  
HORNSEA PROJECT FOUR  
OFFSHORE WINDFARM

TITLE  
TYPE B & C ACCESS  
REDUCED JUNCTION WITH 20t  
TIPPER & LARGE LOW LOADER



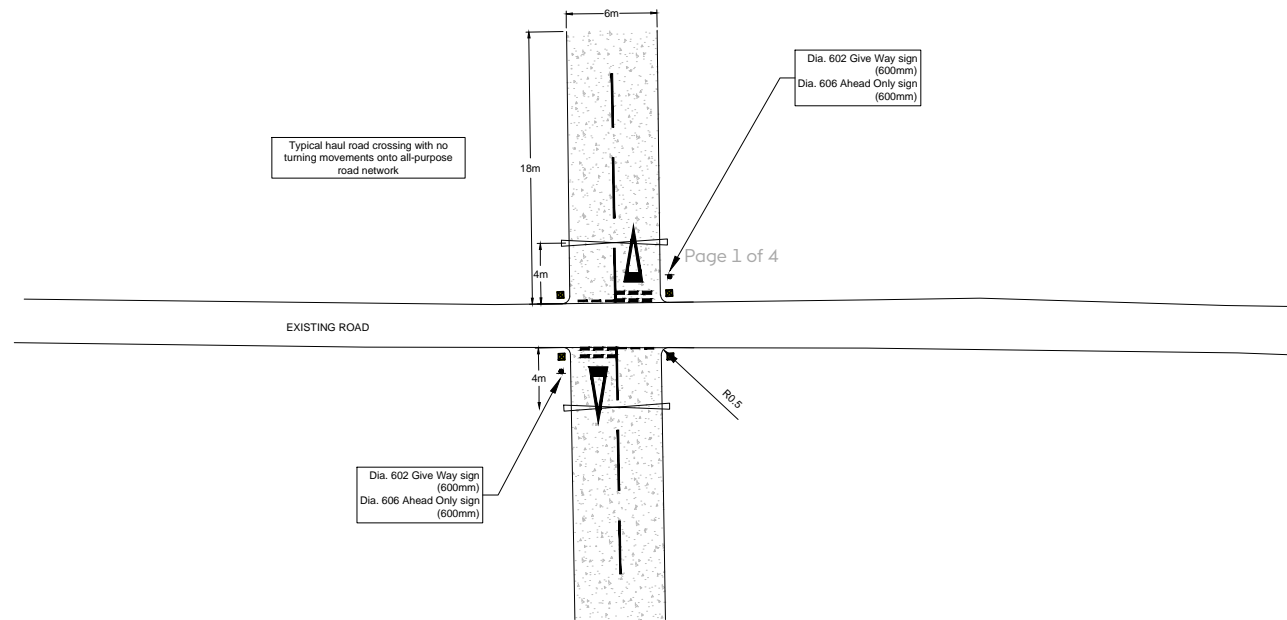
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DRAWING No.	TP-PB8783-DR-002	REVISION	
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CLIENT DWG No.		REVISION	D0.1
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TYPICAL HAUL ROAD CROSSING WITH NO TURNING MOVEMENTS ONTO ALL-PURPOSE ROAD NETWORK



- NOTES**
1. Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
  2. Exact junction types and geometry to be determined from relevant section of Design Manual for Roads & Bridges (TD 42/95).
  3. All road markings and signs to conform with the Traffic Signs Regulation and General Directions 2016 and Chapter 8.

- KEY**
- EXISTING METEALED ROAD BOUNDARY
  - PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
  - PROPOSED GATE
  - PROPOSED PLASTIC DEMARCATION BOLLARD
  - ▲ PROPOSED POST MOUNTED TRAFFIC SIGN
  - PROPOSED ACCESS CONSTRUCTION

**DRAFT - NOT FOR CONSTRUCTION**

REV	DATE	DESCRIPTION	BY	CHK	APP
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REVISIONS

CLIENT



PROJECT  
HORNSEA PROJECT FOUR  
OFFSHORE WIND FARM

TITLE  
TYPE D ACCESS  
TYPICAL ROAD CROSSINGS



DRAWN	JI	CHECKED	SKT	APPROVED	ADR
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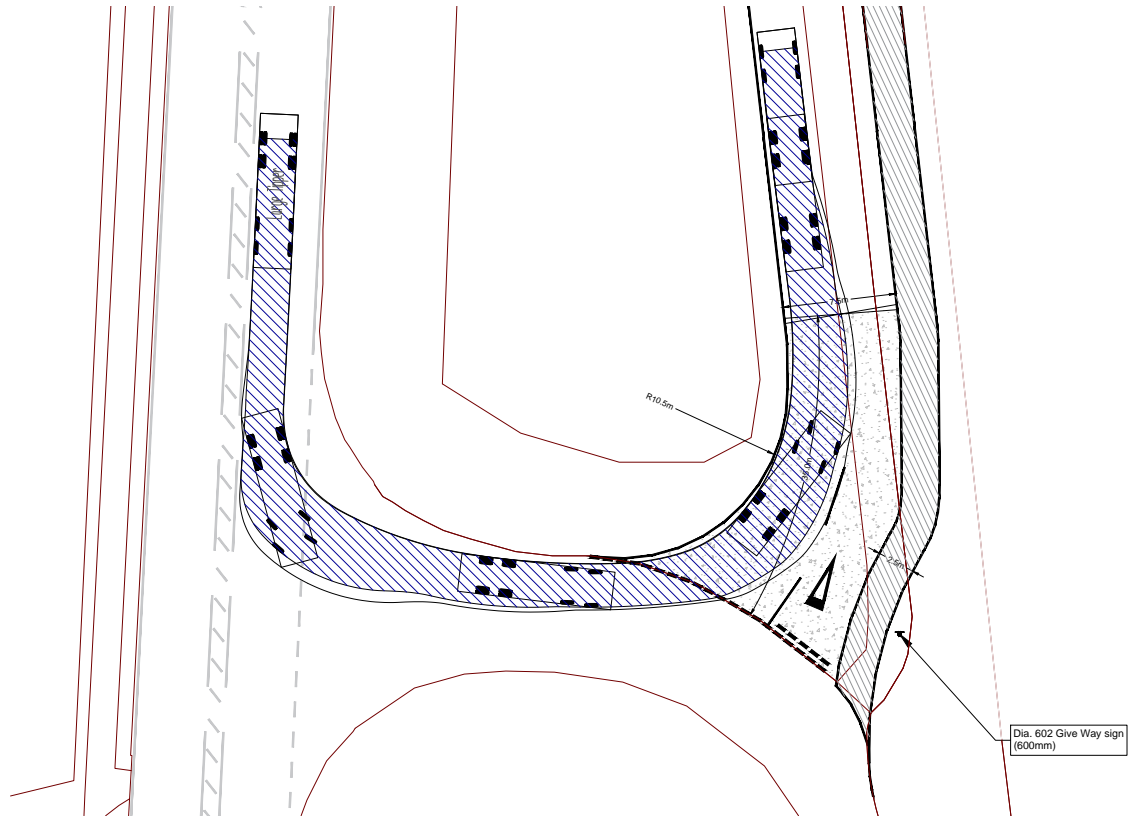
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DRAWING No.	TP-PB8783-DR-003	REVISION
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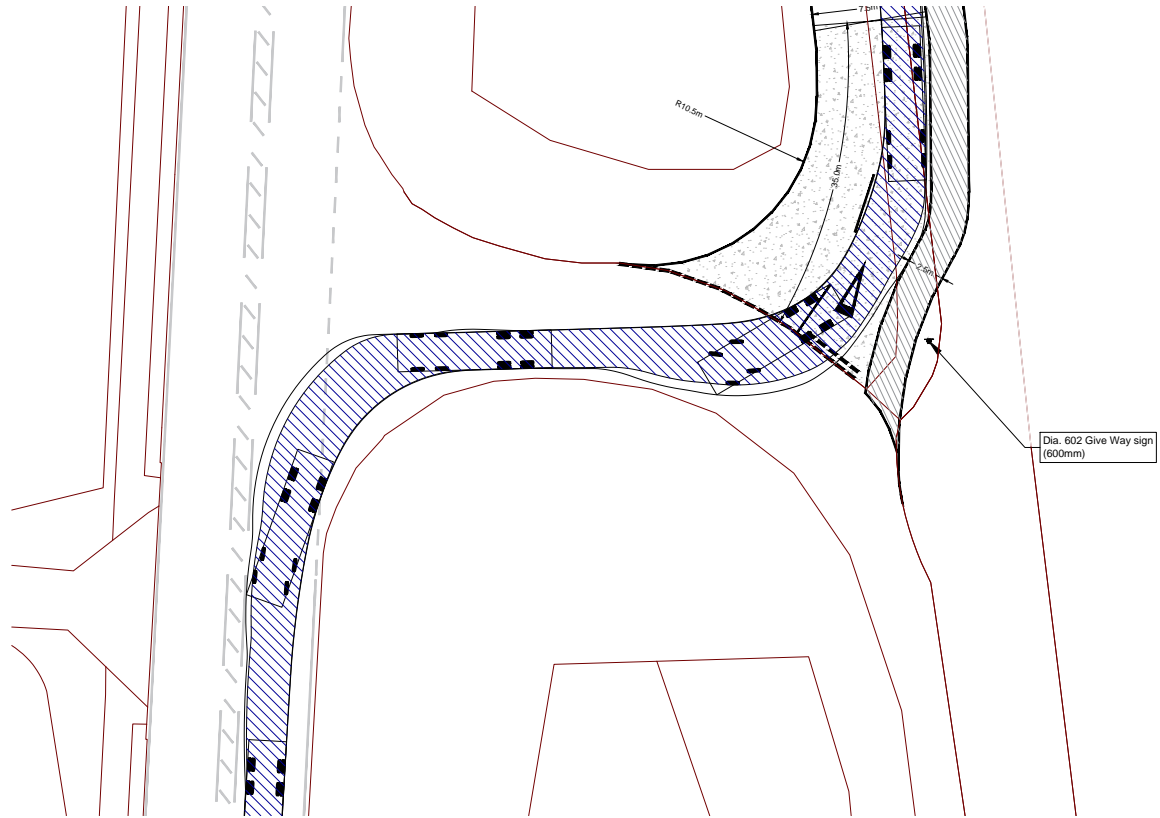
CLIENT DWG No.	D0.1
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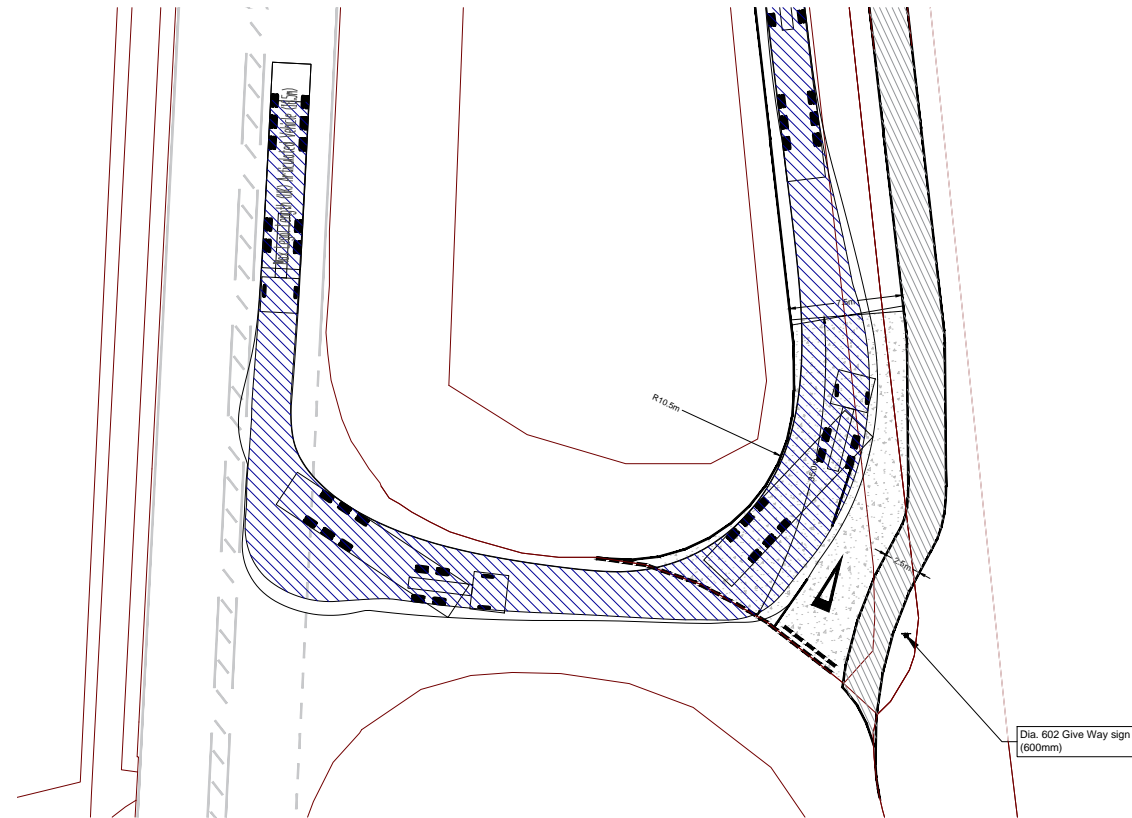
LARGE TIPPER IN



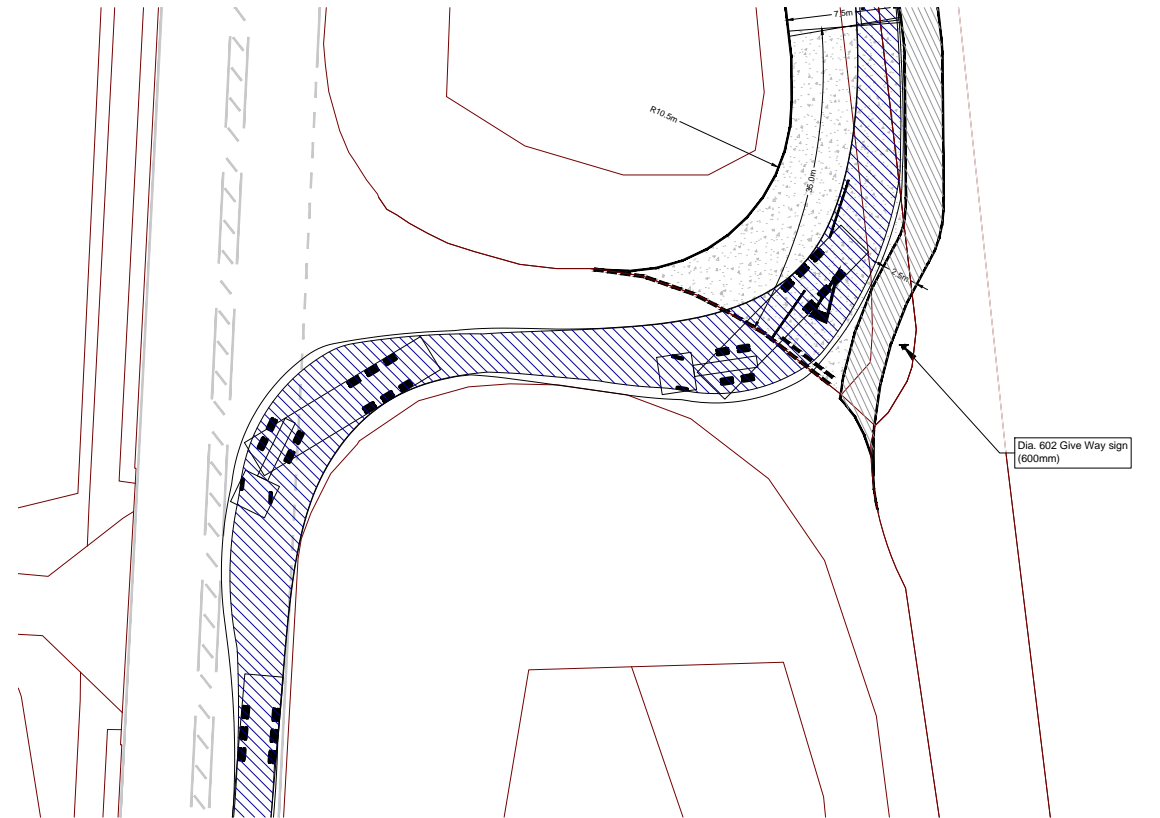
LARGE TIPPER OUT



LOW LOADER IN



LOW LOADER OUT



**NOTES**  
 1. Do not scale from this drawing, all dimensions are in metres unless noted otherwise.  
 2. Exact junction types and geometry to be determined from relevant section of Design Manual for Roads & Bridges (CD123).  
 3. All road markings and signs to conform with the Traffic Signs Regulation and General Directions 2016 and Chapter 8.

- KEY**
- EXISTING METALED ROAD BOUNDARY
  - PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
  - PROPOSED GATE
  - ▲ PROPOSED POST MOUNTED TRAFFIC SIGN
  - ▨ PROPOSED ACCESS CONSTRUCTION
  - ▧ PROPOSED FOOTWAY/CYCLEWAY
- VEHICLE TRACKING**

Large Tipper  
 Overall Length 10.201m  
 Overall Width 2.495m  
 Overall Body Height 2.890m  
 Min Body Ground Clearance 0.341m  
 Track Width 2.471m  
 Lock to lock time 6.00s  
 Kerb to Kerb Turning Radius 11.550m

Max Legal Length (UK) Articulated Vehicle (16.5m)  
 Overall Length 16.500m  
 Overall Width 2.550m  
 Overall Body Height 3.651m  
 Min Body Ground Clearance 0.411m  
 Max Track Width 2.500m  
 Lock to lock time 6.00s  
 Kerb to Kerb Turning Radius 6.530m

- ▨ VEHICLE BODY SWEPT PATH (FORWARD GEAR)
- ▧ VEHICLE CHASSIS SWEPT PATH

**DRAFT - NOT FOR CONSTRUCTION**

REV	DATE	DESCRIPTION	BY	CHK	APP
REVISIONS					
CLIENT					

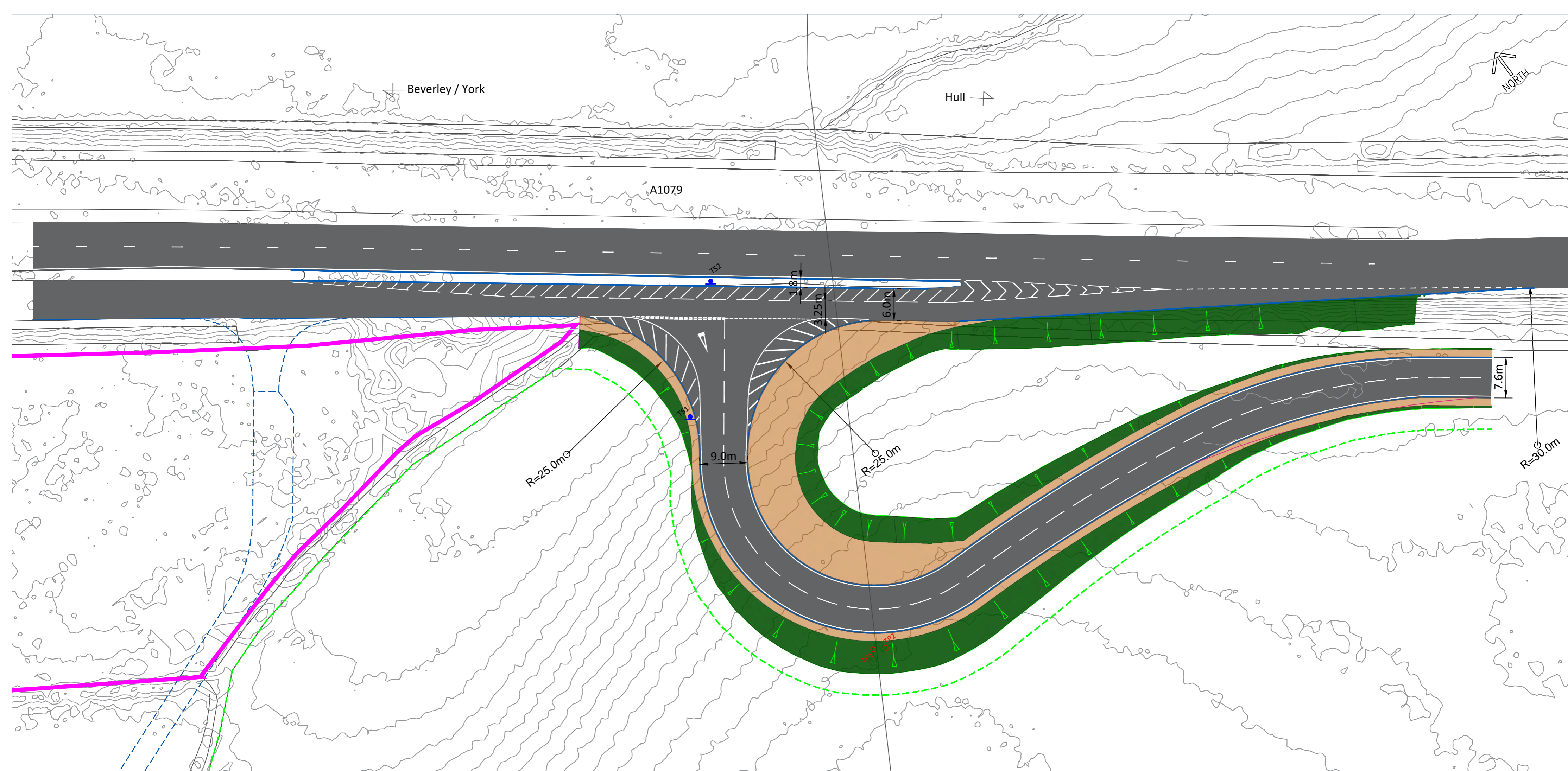


**PROJECT**  
 HORNSEA PROJECT FOUR  
 OFFSHORE WIND FARM

**TITLE**  
 TYPE F ACCESS  
 DMRB A164 LAYBY ACCESS  
 20t TIPPER & LARGE LOW LOADER



DRAWN	SKT	CHECKED	ADR	APPROVED	ADR
DATE	JULY 2021	SCALE AT A3	1:500	AUTOCAD REF.	
DRAWING No.	TP-PB8783-DR-004				REVISION
CLIENT DWG No.					D0.1



**Key:**

- Proposed Kerblines
- Proposed Embankment
- Proposed cutting / flat area to accommodate ALE swept path and allow min 1.5m corridor either side of road
- 3rd Party Land Boundary
- Bridleway Extents
- Mousehill / Jillywood Farm Access
- Existing 33kV Overhead Line H Pole

**Notes:**

1. Preliminary Design Layout Only. Scheme subject to further detailed design.
2. All dimensions in meters unless stated otherwise.
3. Any discrepancies to be immediately notified to the Engineer.
4. Segregation island to be constructed on full depth carriageway construction.
5. Maximum kerb check to be 125mm to allow vehicle overrun for ALE delivery vehicle.
6. Layby extension TRO will be covered by existing Clearway Order for A1079.
7. Proposed carriageway widths as shown required for ALE swept path analysis.

**Proposed Traffic Signs:**

Drawing Ref	Sign Diagram Number	Sign Face Diagram	Distance from Junction	Sign Size (mm)	' Height (mm)
TS1	602		2m	600	-

Sign Diagram Number	Sign Face Diagram	Sign Size (mm)
TS2		600

**Disclaimers:-**

- i. This drawing is copyright and must not be copied in part or in whole unless agreed in writing by Local Transport Projects Ltd.
- ii. Reference should be made to the project's drawing register to ensure the latest drawing is being referred to.
- iii. All dimensions are to be checked by the contractor prior to commencement of work. Any discrepancy shall be reported immediately to Local Transport Projects Ltd.
- iv. All work shall be carried out in accordance with local authority, statutory authority and health & safety requirements & regulations.
- v. This drawing is produced to be printed and read in colour. Reproduction in black and white may prevent correct interpretation of some aspects.
- vi. Based on LIDAR survey data and OS mapping provided by the client.

**HEALTH AND SAFETY INFORMATION**

- IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:
- CONSTRUCTION:**
    - WORKS ADJACENT TO LIVE TRAFFIC
    - WORKS IN VICINITY OF LIVE SERVICES
  - MAINTENANCE/CLEANING/OPERATION:**
    - WORKS ADJACENT TO LIVE TRAFFIC
    - WORKS IN VICINITY OF LIVE SERVICES
  - DECOMMISSIONING/DEMOLITION:**
    - WORKS ADJACENT TO LIVE TRAFFIC
    - WORKS IN VICINITY OF LIVE SERVICES

There are no specific Risks or Hazards identified by the Designer which a Competent Contractor should not already be aware of. If the Contractor considers otherwise, he must bring the matter to the attention of the Principal Designer at the earliest opportunity and in the meantime must not undertake any operation pertaining to that matter.

<b>Client</b>	Ørsted	<b>Title</b>	Proposed OnSS Access - A1079 Northbound Layby Extension	<b>Drawing number</b>					<b>Rev.</b>	<b>Date</b>	<b>By</b>	<b>Chk</b>	<b>Description</b>
				Project	Job	Drawing	Sheet	Revision					
<b>Project</b>	Hornsea Project Four Offshore Wind Farm	<b>Status</b>	PRELIMINARY (DRAFT)	Drawn		Date		Checked		Approved		A2	
				MH		05 11 20		NW		NW			
				Scale 1 : 500									
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traffic engineering and transport planning

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HIGHWAY  
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Accredited Contractor  
www.has.org.uk

Armstrong House,  
The Flemingate Centre,  
Beverley,  
East Riding of Yorkshire.  
HU17 0NW.

01482 679 911  
info@local-transport-projects.co.uk  
www.local-transport-projects.co.uk  
Registered No. 5295328