



FIVE ESTUARIES OFFSHORE WIND FARM

6.6.8.2 TRAFFIC AND TRANSPORT BASELINE REPORT - PART 6

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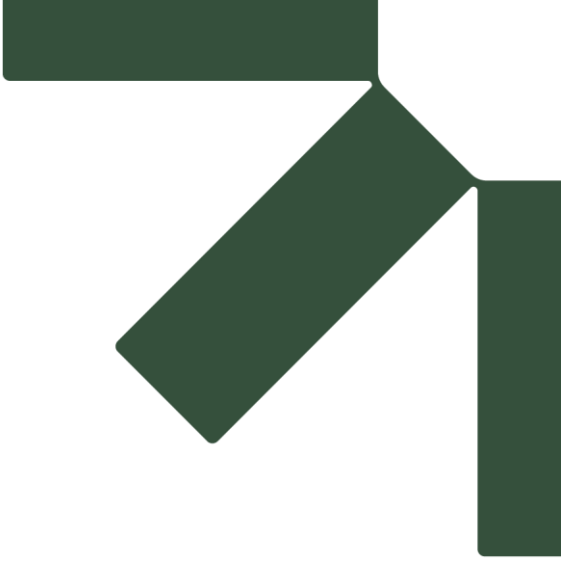


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Appendix U Workforce Distribution Calculations

Volume 6, Part 6, Annex 8.1 Transport Assessment (Onshore)

Five Estuaries Offshore Wind Farm

Five Estuaries Wind Farm Ltd

SLR Project No.: 404.V05356.00010

23 September 2024



Appendix U: Workforce Vehicle Distribution

MSOA	Description	MSOA 003	MSOA 005	MSOA 007	Assignment	
Tendring 001	Harwich	2.6%	0.6%	1.9%	1.7%	average of MSOAs
Tendring 002	Harwich	5.0%	1.3%	2.0%	2.8%	average of MSOAs
Tendring 003	Manningtree (north and south of A120 to the east of A133	23.9%	6.6%	3.0%	11.2%	average of MSOAs
Tendring 004	West of Harwich	5.9%	1.8%	3.7%	3.8%	average of MSOAs
Tendring 005	North and south of the A120, west of the A133	2.6%	8.3%	1.4%	4.1%	average of MSOAs
Tendring 006	Walton on the Naze and Frinton	1.0%	1.1%	5.5%	2.5%	average of MSOAs
Tendring 007	Thorpe-le Soken and areas to the east of the A133	3.0%	1.7%	12.8%	5.8%	average of MSOAs
Tendring 008	Kirby Cross / Great Holland	2.8%	1.0%	8.5%	4.1%	average of MSOAs
Tendring 009	Arlesford / B1027 corridor	2.2%	5.9%	3.2%	3.7%	average of MSOAs
Tendring 010	North east Clacton	1.0%	1.1%	4.5%	2.2%	average of MSOAs
Tendring 011	Point Clear, St Osyth	1.9%	3.5%	2.9%	2.8%	average of MSOAs
Tendring 012	Holland on Sea	0.8%	0.4%	3.1%	1.4%	average of MSOAs
Tendring 013	North west Clacton	1.2%	1.5%	5.1%	2.6%	average of MSOAs
Tendring 014	Central Clacton	1.2%	1.1%	5.3%	2.5%	average of MSOAs
Tendring 015	Central Clacton	1.5%	1.1%	3.8%	2.2%	average of MSOAs
Tendring 016	Central Clacton	0.5%	0.7%	2.5%	1.2%	average of MSOAs
Tendring 017	Central Clacton	0.8%	1.0%	3.3%	1.7%	average of MSOAs
Tendring 018	St Osyth	0.9%	0.7%	3.7%	1.8%	average of MSOAs
Colchester 001	North Colchester (A12/A120 for all journeys)	0.1%	2.1%	0.5%	2.1%	max of MSOAs
Colchester 002	North Colchester (A12/A120 for all journeys)	0.0%	2.5%	1.2%	2.5%	max of MSOAs
Colchester 003	North Colchester (A12/A120 for all journeys)	0.0%	1.1%	0.5%	1.1%	max of MSOAs
Colchester 004	North Colchester (A12/A120 for all journeys)	0.0%	1.9%	1.3%	1.9%	max of MSOAs
Colchester 007	Central Colchester (A133 Clacton Road for all journeys)	0.1%	1.5%	0.6%	1.5%	max of MSOAs
Colchester 008	Central Colchester (A133 Clacton Road for all journeys)	0.0%	3.1%	0.7%	3.1%	max of MSOAs
Colchester 009	Central Colchester (A133 Clacton Road for all journeys)	0.0%	0.7%	0.6%	0.7%	max of MSOAs
Colchester 010	Central Colchester (A133 Clacton Road for all journeys)	0.0%	0.8%	0.5%	0.8%	max of MSOAs
Colchester 011	Central Colchester (A133 Clacton Road for all journeys)	0.0%	2.4%	0.8%	2.4%	max of MSOAs
Colchester 012	West Colchester (A12/A120 for all journeys)	0.0%	1.1%	0.5%	1.1%	max of MSOAs
Colchester 013	Central Colchester (A133 Clacton Road for all journeys)	0.0%	1.5%	0.7%	1.5%	max of MSOAs
Colchester 014	Central Colchester (A133 Clacton Road for all journeys)	0.0%	1.8%	0.5%	1.8%	max of MSOAs
Colchester 015		0.0%	1.1%	0.5%	1.1%	max of MSOAs
Colchester 016		0.0%	2.2%	1.0%	2.2%	max of MSOAs
Colchester 017	South Colchester (B1027 for Beach and Section 1, A133 Clacton Road	0.0%	3.7%	0.7%	3.7%	max of MSOAs
Colchester 018	to A133 for Sections 2 - 4a and A133 Clacton Road to Harwich Road	0.0%	2.7%	0.5%	2.7%	max of MSOAs
Colchester 019	and A120 for Sections 4b - 7)	0.0%	1.1%	0.2%	1.1%	max of MSOAs
Colchester 020		0.0%	0.3%	0.1%	0.3%	max of MSOAs
Colchester 021		0.0%	1.5%	0.5%	1.5%	max of MSOAs
Babergh	A12 North	10.8%	5.9%	1.4%	6.0%	average of MSOAs
Ipswich	A12 North	4.4%	2.4%	1.5%	4.4%	Max of MSOAs
Braintree	A12 South	1.8%	4.5%	1.0%	2.4%	average of MSOAs
Mid Suffolk	A12 North	1.1%	1.2%	0.6%	1.0%	average of MSOAs
Chelmsford	A12 South	0.8%	1.1%	0.5%	0.8%	average of MSOAs
Suffolk Coastal	A12 North	2.0%	1.3%	0.9%	1.4%	average of MSOAs
Other (all A12/A120)	A12 South or A12 North	20.2%	10.9%	5.8%	12.3%	average of MSOAs

Workforce Distribution	
A12 North	18.9%
A12 South	9.4%
Colchester	24.5%
Colchester via A12/A120	8.8%
A120 East of A133 / Manningtree	19.5%
Tendring via A120 (north of A133)	4.1%
B1027 corridor south of Colchester	8.3%
Clacton	13.8%
Frinton / Walton on the Naze	6.6%
Thrope-Le-Soken and surrounding areas	5.6%
Total	119.5%



Appendix W A120/ Bentley Road Junction Road Improvements Technical Note

Volume 6, Part 6, Annex 8.1 Transport Assessment (Onshore)

Five Estuaries Offshore Wind Farm

Five Estuaries Wind Farm Ltd

SLR Project No.: 404.V05356.00010

23 September 2024




Contractor Coversheet

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Co-Located Substation Early Design A120 - Bentley Road Junction Road Improvements

Technical Note

December 2023

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Co-Located Substation Early Design A120 - Bentley Road Junction Road Improvements

Technical Note

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Contents

1	Introduction	1
1.1	Background	1
1.2	Focus of this report	3
2	Swept Path Analysis	4
3	Proposed works	6
4	Traffic Management	11
5	Appendix A – Junction Drawings	12

1 Introduction

1.1 Background

RWE Renewables have procured Mott MacDonald to review the potential for a collocated substation site to accommodate the onshore substations for the Five Estuaries and North Falls Windfarms.

The scope is to develop the design of a co-located substation adjacent to a National Grid proposed substation site between Ardleigh and Little Bromley in Essex, for both North Falls (NF) and Five Estuaries (VE) Windfarms. The operational footprint of the co-located substations shall stay within CO01 (See Figure 1.0 below). NF13 may be proposed for Temporary Construction Compounds (TCCs) if needed.

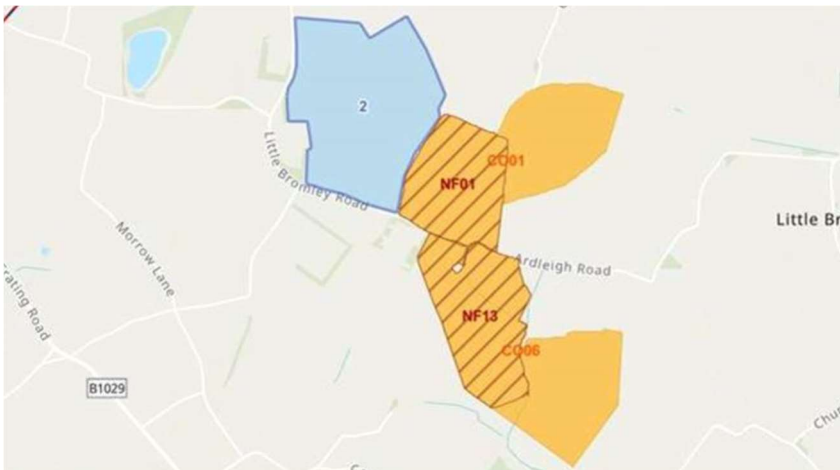


Figure 1.0: Proposed collocated substation site area

To enable the construction of the proposed collocated substations, temporary access from the local road network will be required for construction vehicles.

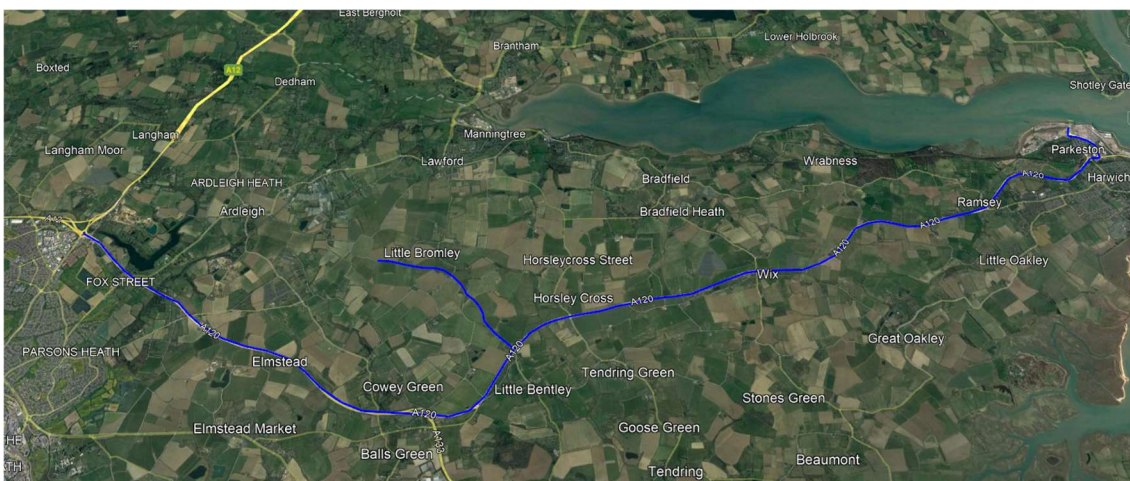


Figure 2.0: Proposed collocated substation construction access.

The proposed construction access is shown in Figure 2.0 and is a combination of local roads including the A120 and Bentley Road plus a section of new access road approximately 1.1km in length. Both North Falls (NF) and Five Estuaries (VE) Windfarms developers and third party developers will be using the same public roads to access their sites (apart from other particular roads and accesses that they will need to construct), therefore required works have been agreed to be split between the interested parties. Further details in Document 104560-MMD-00-XX-TN-VE-1038_P03, Section 1.2.

Construction traffic is predominately expected from the west via the A12, with Abnormal Indivisible Loads (AILs) being routed from the nearest port at Harwich.



Figure 3.0: AIL Movement

The AIL is likely to be one of the determining factors in terms of geometry of the access and the selection of local roads that will be suitable for routing to the site. A full assessment of the routing of AILs will be undertaken at detailed design stage where the vehicle sizes and suppliers can be identified. The selected haulage company will undertake the final assessment to identify any off-site street works that may be required. At this stage of the project a high-level assessment of the likely route for construction vehicles, including AILs, to reach the site has been undertaken identifying any potential areas where improvements may be required. Although the routing of AILs is a defining factor in the assessment, the number of movements is very low with the majority of construction traffic being in the form of normal HGVs, including 40T stone wagons, concrete mixers, mobile cranes, low loader plant deliveries and other delivery vehicles; plus smaller vans and cars servicing the site.

1.2 Focus of this report

This report focuses on the junction of the A120 with Bentley Road to identify any junction improvements that may be required and identify a works boundary at this location. The report will consider the following standards in relation to road geometry to assist in the development of any proposed works, whilst also considering the temporary nature of the works as part of a construction project and the future operational and maintenance needs of the proposed development.

Standards:

- National Highways - Design Manual for Roads and Bridges (DMRB)
- DfT - Manual for Streets
- HAUC – Safety at Street Works and Road Works (The Red Book)

Within this report Autodesk Vehicle Tracking software will be used to identify the likely swept path requirements for potential construction vehicles. The vehicles used are generic and may not reflect the vehicles ultimately used on site. The swept paths produced along with the geometric design standards will be used to determine and improvement works required at the junction.

2 Swept Path Analysis

Autodesk Vehicle Tracking software has been used to identify the likely swept path requirements for potential construction vehicles at the junction of the A120 and Bentley Road.



Figure 4.0 – A120 junction with Bentley Road

At the junction the A120 is a single lane dual carriageway with vehicle restraint systems (VRSs) along a central reservation separating the carriageways. A cycle and footway crossing is routed to cross the A120 north of the junction with a central refuge between the VRSs. The Bentley Road junction is a left in and left out junction only, vehicles heading west will need to travel to the A120/B1035 roundabout at Horsley Cross (approximately 1.4km east) to turn round.

Two scenarios have been assessed with swept path analysis, the first is an AIL vehicle turning into the junction from the east (from Harwich). The second scenario is the movement of two HGVs entering and exiting the junction at the same time.

A 74.72m long multiple axle girder frame transporter vehicle similar to that shown in Figure 3.0 has been used in scenario one, see Figure 5.0. Drawing 104560-MMD-00-XX-DR-CE-1026 shows the tracking proposed.

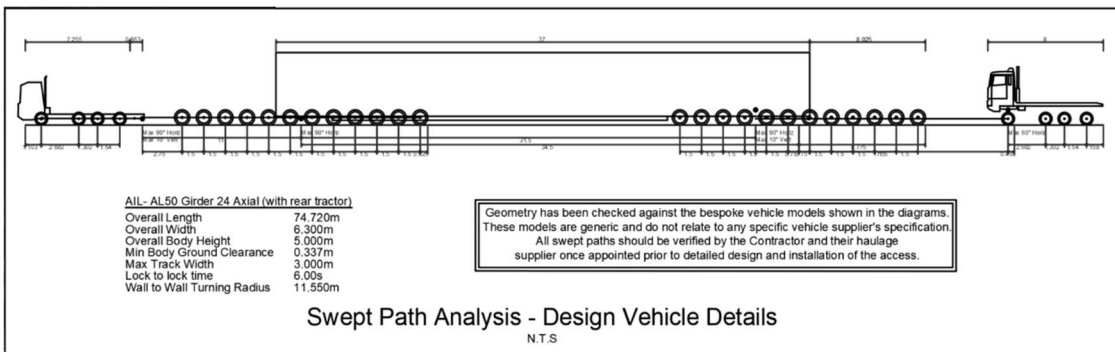


Figure 5.0 – AIL Model

The HGV model in Figure 6.0 has been used for scenario two. Drawing 104560-MMD-00-XX-DR-CE-1027 shows the tracking proposed.

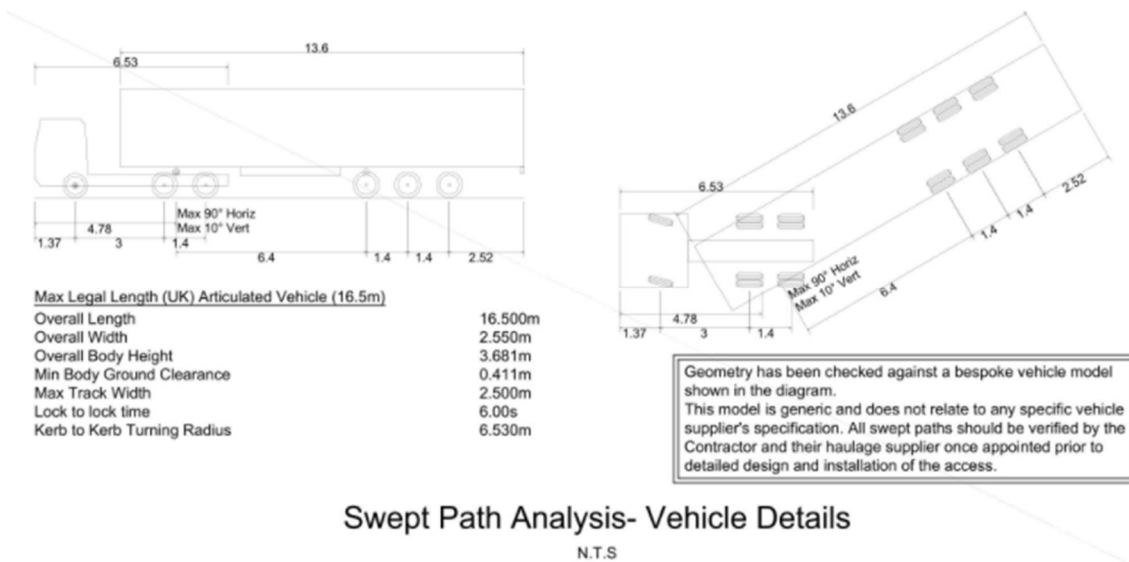


Figure 6.0 – HGV Model

3 Proposed works

3.1 This section of the assessment identifies the proposed junction improvement works required to facilitate the use of the junction as a construction access route for AIL vehicles.

Drawing 104560-MMD-00-XX-DR-CE-1026 shows the tracking of the AIL entering Bentley Road from the A120. The benefit of the tracking shown is that no significant widening or realignment of the junction is required to accommodate the AIL movement as it can be fully accommodated within the existing highways boundary. It should be noted that this drawing is based on OS mapping and aerial imagery and will need to be further assessed following surveys of the junction.

The tracking does require amendments to the central reservation where the vehicle restraint systems (VRS) and signage will need to be removed temporarily to accommodate the AIL movement. The vegetated areas of the central reserve will also need to be hardened temporarily or covered with trackway or similar for the movements.

Due to the removal of the VRS, mitigation for the cycle and footway crossing will be needed. This could be in the form of relocating the crossing further north away from the section of VRS being removed, an enforced reduction in the speed limit or the provision of temporary VRS that can be moved quickly prior to the AIL movement. During the AIL movement the cycle/footway would need to be closed.

3.2 This section of the assessment identifies the proposed junction improvement works required to facilitate the use of the junction as a construction access for two way HGV traffic.

Drawing 104560-MMD-00-XX-DR-CE-1027 shows the tracking proposed for the HGVs entering and exiting the junction. The tracking depicted shows that there is insufficient width along Bentley Road on the approach to the junction to accommodate the passing HGVs. Assessment of the available aerial imagery shows Bentley Road to be approximately 5.15m wide through this section. It should be noted that this drawing is based on OS mapping and aerial imagery and will need to be further assessed following surveys of the junction.

The tracking shows that widening of Bentley Road will be required through this section to accommodate the passing movement of the HGVs. Given the proximity to the junction and the limited visibility of vehicles turning into Bentley Road from the A120, it is considered unsuitable to rely on a passing place solution at this location. This assessment had initially focused on the junction including a 100m section of the approach to the junction along Bentley Road, however further assessments along Bentley Rd (summarized in document 104560-MMD-00-XX-TN-VE-1038) indicated the need to widen its length up to the junction with the temporary cable haul road to accommodate the two way HGVs traffic. Therefore, the widening at this junction will be tying in with the widening along Bentley Rd as illustrated in drawings 104560-MMD-00-XX-DR-CE-1028 and 104560-MMD-00-XX-DR-CE-1031-1 to 3..

The DMRB 'CD127 – Cross-sections and headrooms figure 2.1.1N1e' shows carriageway widths for rural all purpose single carriageway roads as 7.3m, however it is not considered necessary to meet the requirements of the DMRB in this instance given the nature and use of Bentley Road. Manual for Streets clause 7.2.2 states that carriageway widths should be appropriate for the particular context and uses of the street and shows an illustrative single

carriageway arrangement with a width of 5.5m. The HAUC Red Book identifies 6.75m as a minimum for two way traffic. Both the HAUC guidance and Manuel for Streets identify a problem with lane widths between 2.75m and 3.25m, as this width encourages the unsafe overtaking of cyclists using the carriageway when there is no dedicated cycle infrastructure.

Given the cycle crossing, cycle markings at the junction and without any traffic survey data to confirm otherwise, it is assumed that cyclists do use this junction. Therefore, in the case of no dedicated cycle provision being installed, either a narrow 5.5m carriageway width or a width in excess of 6.5m should be considered. Based on the turning requirement at the junction and the curved alignment of Bentley Road over the first 100m from the junction a 5.5m wide carriageway is considered too restrictive to the passing of HGVs and may lead to vehicles stopping in close proximity to the junction creating a hazard. Therefore, a wider carriageway in line with the guidance from HAUC of 6.75m should be installed. Alternatively, dedicated cycle provision could be installed, allowing for a narrower carriageway width determined by the two-way HGV traffic swept path analysis without further considerations.

Drawings 104560-MMD-00-XX-DR-CE-1058-1 and 2 show three possible design options for the widening of the carriageway. Option 1 represents the widening to 6.75m, with no dedicated cycle infrastructure. Options 2 and 3 represent the widening in the case of installing a cycle track.

At Option 3, the proposed cycle track would run at a distance of 5m from the Bentley Road carriageway for the majority of its length but at the junction between the A120 and Bentley Rd it would gradually approach the edge of carriageway as it turns left following the corner radius of the junction and the A120 alignment afterwards, up to reaching the height of the existing crossing north of the junction. A safety buffer from the main carriageway would be provided at all times, either via a grassed verge (swale) or hatched markings, with a minimum width of 1.5m¹ at the height of the crossing at the A120.

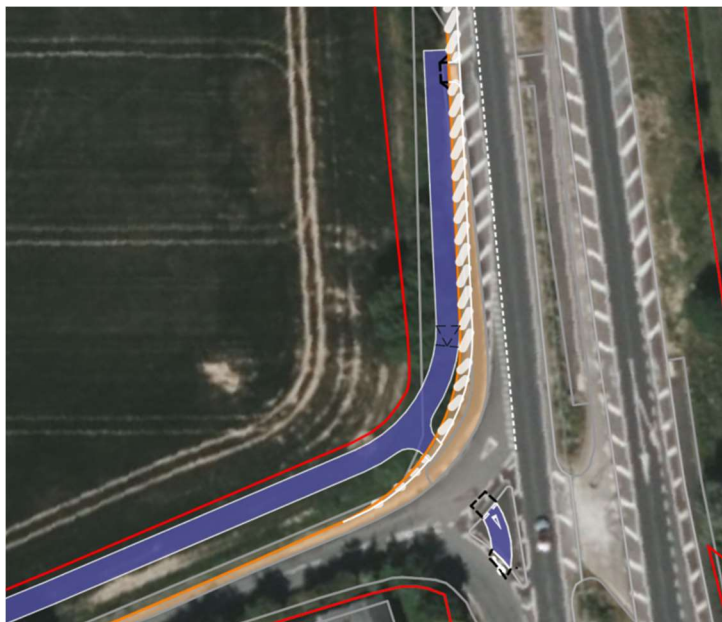


Figure 7.0 – A120 & Bentley Rd Junction widening and proposed cycle track layout (Option 3)

¹ Minimum safety buffer width as per Table 6-1 of the Local Transport Note 1/20, Cycle Infrastructure Design, for a speed limit of 50mph (speed limit on the A120, along the junction).

The proximity of a residential property on the south side of Bentley Road and the close proximity of the boundary fence to the carriageway means that the widening works should be accommodated on the northern side. The widening works are expected to consist of approximately 1.6m of additional carriageway width constructed into the existing verge of the highway. Between the main carriageway and the proposed cycle track there would be a grassed verge separation of 5m (where possible), likely used to install a drainage swale.

The proposed allowance (Red Line Boundary) to accommodate the works has been set at a distance of 10m from the current edge of the carriageway on the road side to be widened. Incomplete utility data is available that shows a water main within the northern verge, this may require diversion or protection. There are also other utilities on the northern verge, like communications, which can be relocated under the cycle track and under the road, if needed.

The works relating to the North Falls & Five Estuaries co-located substations can be considered temporary for the duration of construction as during operation and maintenance the volume of HGV traffic will be considerably lower than required for construction. However, the highways authority may wish to adopt the widened infrastructure to retain the improved alignment. This will need to be discussed with the local highway authority, local planning authority and the land owner.. The proposed allowance (Red Line Boundary) to accommodate the works may need to be reassessed following completion of a topographical survey and detailed design. Currently, there is no positive drainage system along this section of Bentley Road with surface runoff shedding to the adjacent land. As mentioned above, one of the design options comprises the installation of drainage swales along Bentley Rd between the main carriageway and the proposed cycle track. A formal drainage design strategy has not been developed at this stage and will need to be further investigated at later stages of the project.

3.3 This section of the assessment identifies the proposed junction improvement works required to facilitate the use of the junction as a construction access for multiple construction sites.

Construction traffic volumes have been estimated in documents 104560-MMD-00-XX-RP-CE-1041 and 104560-MMD-00-XX-TN-CE-1051, Construction Methodologies and Parameters for the co-located substation works and for Bentley Rd, Ardleigh Rd and the New Haul Rd respectively.. For a single substation it has been estimated that an AADT flow of approximately 57 vehicle movements (two way) would be required. Given that there is the potential for up to 3 substations to be under construction at the site then 171 vehicle movements (two way) have been assumed for the substations works. There will also be the requirement for cabling works along the route, an early estimate of 150 vehicle movements (two way) has been assumed for this assessment. The total construction traffic volume for this assessment has therefore been taken to be 321 vehicle movements (two way).

Apart from these values relative to the substations construction and cable installation works, there will also be significant HGV traffic (using different lengths of the access roads) for the duration of the improvement/widening works at Bentley Rd and Ardleigh Rd themselves and the construction of the new haul road. We estimate a monthly average of 370 two-way HGV movements. A manual traffic survey was undertaken by Streetwise Services Ltd on 20th September 2022, the survey was a single survey between 06:30 to 18:30. The data from the survey is summarised below.

Table 1 – Summary of traffic survey data

Traffic Movement	Total number of vehicles
A120 Eastbound (Through movement)	3498
A120 Westbound (Through movement)	4105
A120 to Bentley Road	332
Bentley Road to A120	166

In addition to the survey data available, historic data has been reviewed where available. This has shown a traffic flow on the A120 (both directions) of 13281 vehicle movements. (Source: <https://roadtraffic.dft.gov.uk/#14/51.9019/1.0518/basemap-countpoints>, from manual count location 7938, located approx. 470m north of the Bentley Road A120 junction. Disclaimer: this is an estimated count based on previous data). Given a two way AADT from the Streetwise survey of 7603, for this assessment we have used the 13281 value as more conservative. For Bentley Road the two way AADT can be estimated to be approximately 819 vehicle movements, calculated as 321 + 498, considering the predicted construction flow and the existing traffic flow respectively.

Using CD123 - Geometric design of at-grade priority and signal-controlled junctions, from the Design Manual for Roads and Bridges (DMRB), Figure 2.3.1 shows approximate priority junction provision on single carriageway roads based on traffic flows only. Using a main line flow of 13281 vehicles, and an estimated minor road flow of 819, Figure 2.3.1 shows that a simple junction arrangement is not suitable.

Figure 2.3.1 Approximate priority junction provision on single carriageway roads based on flows only

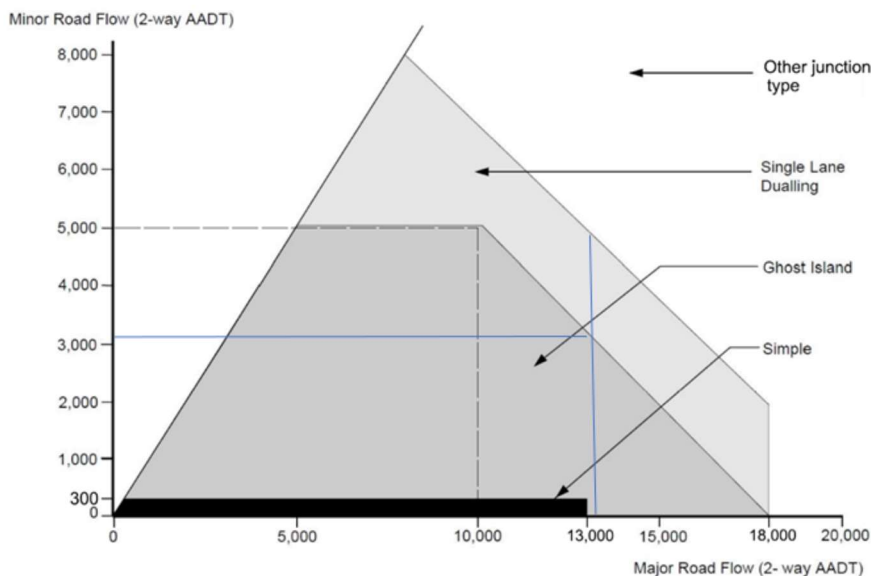


Figure 8.0 – extract from CD123

Figure 2.3.1 suggests a Ghost Island or Single Lane Dualling arrangement should be used at the Bentley Road A120 junction.

The mainline arrangement at the junction has been installed in line with a Single Lane Dualling (SLD) arrangement, (noting that the right turn movements have been excluded through the

installation of VRS within the central reserve). Therefore, the minor road junction arrangement in line with a SLD design has been considered in this assessment.

There are two arrangements for a merge corner under an SLD arrangement, with and without a merge taper. The requirement for a merge taper at a SLD junction is triggered by the number of left out turning movements. Greater than 600 vehicles turning out, as a AADT flow, would necessitate the merge taper, this number is reduced to 450 vehicles if greater than 20% of the vehicles are HGVs., The existing traffic flows surveyed show 166 vehicles and the estimated construction vehicles would be 321 vehicles, so a total of 487 vehicles with in excess of 20% being HGVs.

It is considered suitable to allow for a merge taper within the design of the junction, given the early stage of design development and the uncertainty over traffic volumes.

Where a merge taper is to be provided a 25m merge corner radius should be used leading into a 3.5m wide merging taper that reduces to join the main line carriageway. The length of the taper is dependent on the design speed of the mainline, for this assessment given the posted speed limit of 50mph, a design speed of 85kph has been used, equating to a taper length of 90m.

Widening into the footway will be required as well as vegetation and tree removal behind the existing footway to accommodate the cycle track replacing it. The carriageway road marking will need to be amended to allow for the merge taper markings to be installed. Land take is likely to be required to facilitate footway replacement, planting and relocation of utilities and signage.

The proposed works can be seen on drawing 104560-MMD-00-XX-DR-CE-1028.

No consultation has been undertaken with the local highway authority to date, and no traffic survey data or traffic modelling data has been available for this assessment. Further improvements to the junction may be required following stakeholder engagement and traffic modelling works, for example a signal controlled junction may be preferred if queuing lengths on Bentley Road are shown to be excessive. From a land take perspective it is considered viable to install a signal controlled crossing within the current highway boundary, although widening of Bentley Road would still be required the merge taper would not be.

4 Traffic Management

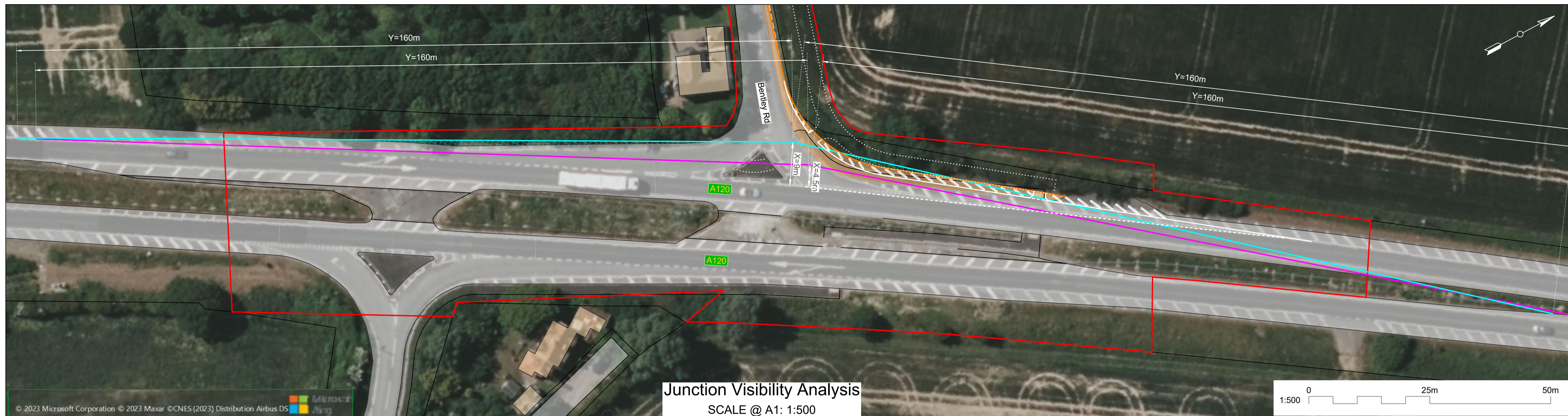
The junction improvements will require traffic management during the installation. This section of the assessment identifies the likely traffic management requirements and their potential impacts.

To complete the widening works along Bentley Road the road will need to be closed to traffic, although access to residences would need to be retained for the duration. A diversion along Payne's Lane, Hilliards Road and Park Road will be needed, this is approximately a 4km diversion.

The A120 lanes are sufficiently wide to accommodate a narrowed open lane past the working area within the central reserve but the A120 carriageway will require some widening at the northern corner radius with Bentley Rd and along mainline up to the height of the crossing, for the installation of a shoulder strip functioning also as safety buffer for users of the proposed cycle track. Road marking would need to be removed and vehicles routed over the chevroned sections of the carriageway.

Lane closure of the A120 eastbound carriageway will be required for the installation of the merge taper at the junction and the carriageway widening. With works undertaken to remove a section of the island at the junction of Little Bromley Road on the westbound carriageway, a contraflow traffic management arrangement would be possible under a reduced speed limit. Alternatively works could be undertaken with traffic signals and shuttle working through the works, this could be accommodated over a series of night works to limit the impact on road users.

5 Appendix A – Junction Drawing



- Notes
1. Do not scale from this drawing.
 2. All dimensions are in meters unless otherwise stated.
 3. This drawing is to be printed in colour.
 4. This drawing is to be read in conjunction with all relevant documents and drawings.
 5. No unauthorised disclosure, storage or copying.
 6. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36).
 7. All levels are in meters and relate to AOD (Ordnance Survey, Newlyn).
 8. The A road A120 has a 50mph (~80.5kph) speed limit applying to the dual carriageway section, where the junction with Bentley Road is located. For the purpose of visibility analysis, it has been considered a design speed of 85kph (~100kph) for the A120, as the above closer value as per DMRB, CD 109 Highway link design, Table 2.10. Based on Table 2.10, the desirable minimum length of visibility splays (Stopping sight distance - SSD) for a design speed of 85kph is 160m.
 9. Indicative design layout based on OS grid, works may vary subject to detailed design and site survey.
 10. Only partial utilities data has been provided for this indicative design, full PAS128 utilities surveys shall be required and additional land take may be required to accommodate diversions.
 11. For swept path details, refer to drawings 104560-MMD-00-XX-DR-CE-1026 and 104560-MMD-00-XX-DR-CE-1027.
 12. For further information on the transition detail carriageway/cycle track for the proposed cycle track, please refer to drawing 104560-MMD-00-XX-DR-CE-1059, Sheet 2.
 13. Existing water utility may require diversion or protection in some areas.

- Legend:
- OS grid map feature lines
 - Visibility splays at 4.5m from stopping line
 - Visibility splays at 9m from stopping line
 - Extents of vegetation and street furniture clearance to achieve visibility requirements at X=9m
 - Construction works boundary (red line boundary)
 - Proposed new edge of carriageway
 - Proposed permanent carriageway widening at junction
 - Proposed new carriageway edge (indicative) for a width of 6.75m
 - Proposed location for a potential cycle track installation
 - ALL vehicle body & load swept path envelope
 - Wheels swept path envelope for HGV exiting Bentley Rd
 - Existing underground water pipes
 - Existing road restraint system at central reservation
 - Existing road restraint system elements to be temporarily removed
 - Area of works in central reservation for TTM
 - Existing road signs to be removed during ALL movements
 - Existing road signs to be relocated for road widening
 - Existing bollard to be removed during ALL movements
 - Electricity pole to be relocated (location extracted from Survey)
 - Utility diversion or undergrounding required (Comms)
 - Utility diversion or undergrounding required (Electricity)
 - Water pipe protection or diversion required
 - Vegetation / trees to be trimmed (or removed if on side to be widened; subject to detailed survey)
 - Existing trees to be removed (subject to detailed survey)
 - Existing electricity pole (location extracted from Survey)
 - Existing communications chamber/pole (location extracted from Survey)
 - Existing water chambers (location extracted from Survey)

Reference drawings
 104560-MMD-00-XX-DR-CE-1026 - Swept Path Analysis AIL (...) accessing Bentley Rd
 104560-MMD-00-XX-DR-CE-1027 - Swept Path Analysis (...) Artic. Veh.-Two Way Traff.
 104560-MMD-00-XX-DR-CE-1031-1 to 3 - Bentley Rd Improvements Layout and Red Line Boundary for works
 104560-MMD-00-XX-DR-CE-1059-1 & 2 - Proposed Cross-over points for Cycle Track
 Utility Report Digitised_OSGB36 (dated January 2023)
 UK_FES_Work_Areas_py_OSGB36_v8_13_Extract (dated 16/11/2023)
 UK_FES_Work_Areas_py_OSGB36_v8_13B_Extract (dated 16/11/2023)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P03	30/11/2023	SAP	Cycle track added; road width updated	JW	AFC
P02	13/04/2023	SAP	Merge taper incorporated	JW	MB
P01	05/04/2023	SAP	Preliminary	JW	MB

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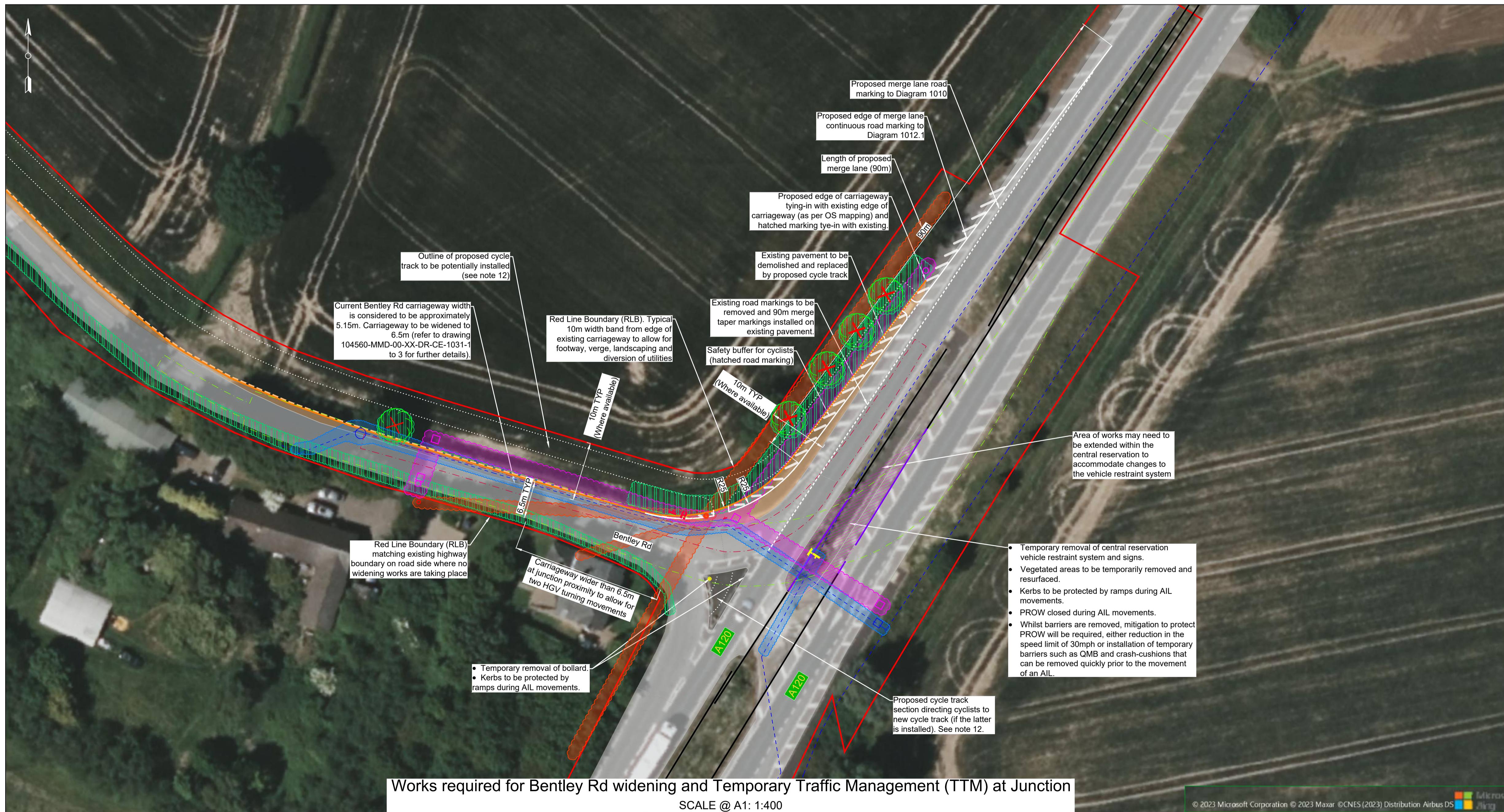
NORTH FALLS
 Offshore Wind Farm

FIVE ESTUARIES
 OFFSHORE WIND FARM

Title
**A120 - Bentley Road Junction
 Swept Path Analysis
 Road improvements layout**

Sheet 01 of 01

Designed	S. Amado-Pedrosa	SAP	Eng check	John Weeks	JW
Drawn	S. Amado-Pedrosa	SAP	Coordination	Andrea F. Crespo	AFC
Dwg check	Ollie Jeffcock	OJ	Approved	Matthew Barton	MB
MMD Project Number	104560-001	Scale at A1	As Shown	Security	STD
Client Number	004781329-03			Suit. Code	S3
Drawing Number	104560-MMD-00-XX-DR-CE-1028			Revision	P03



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Appendix X A120/Bentley Road Improvements

Volume 6, Part 6, Annex 8.1 Transport Assessment (Onshore)

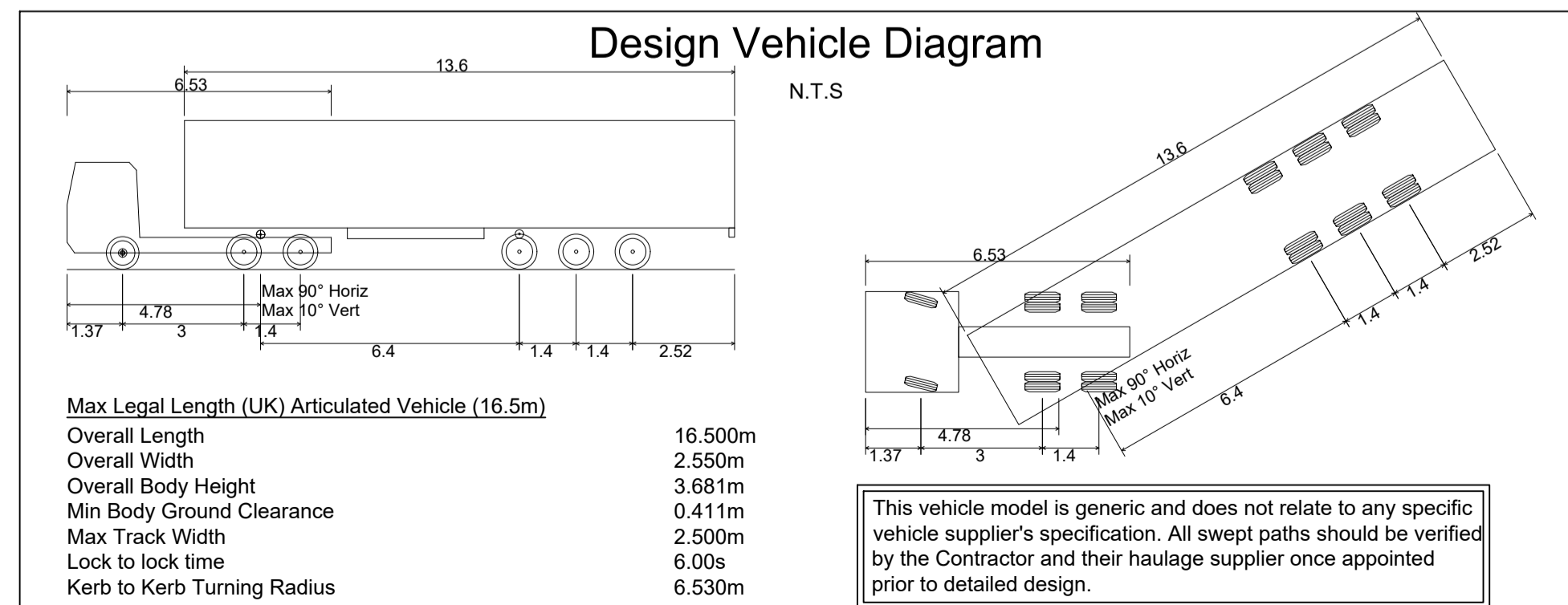
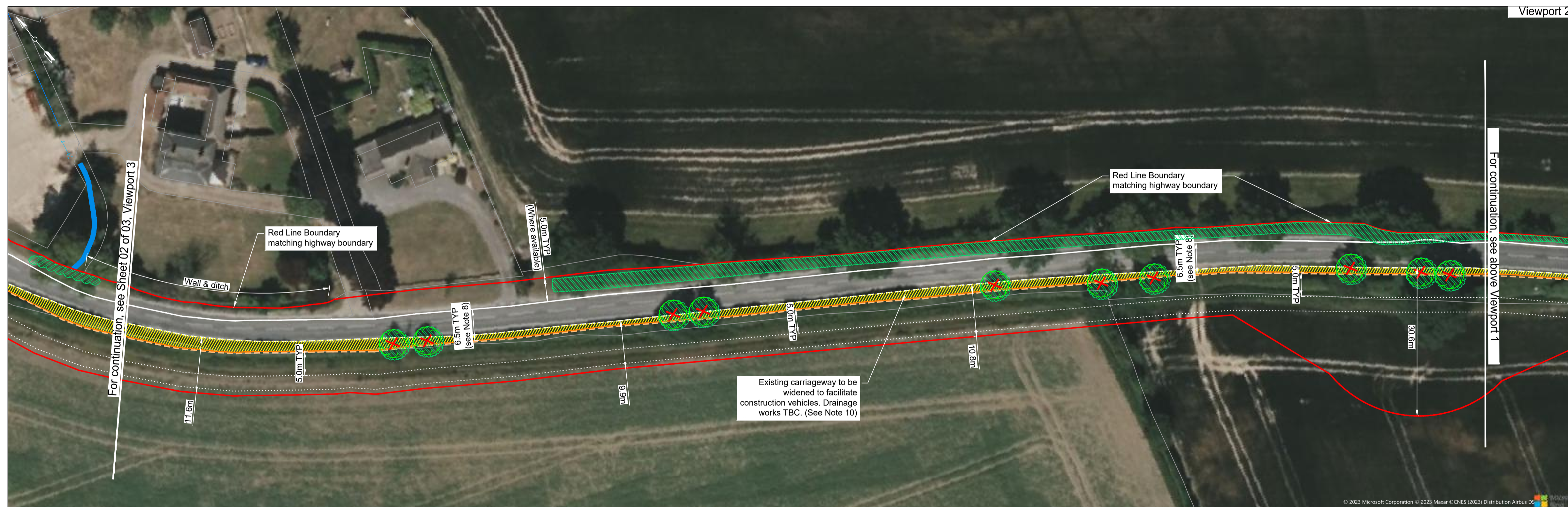
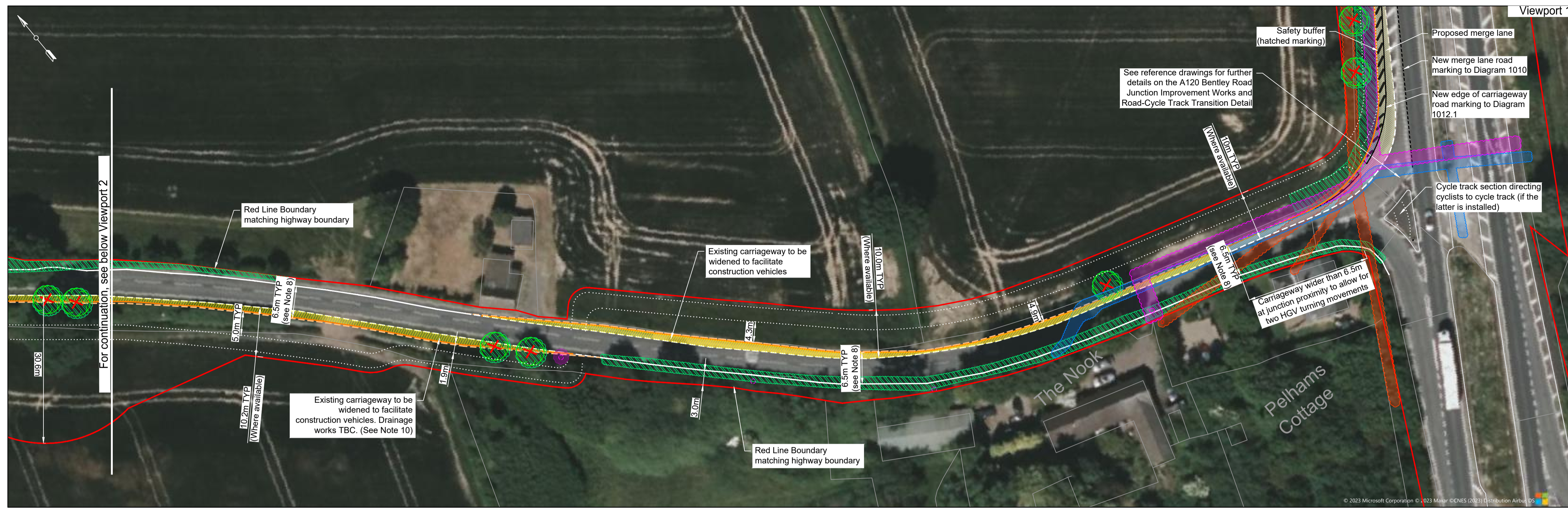
Five Estuaries Offshore Wind Farm

Five Estuaries Wind Farm Ltd

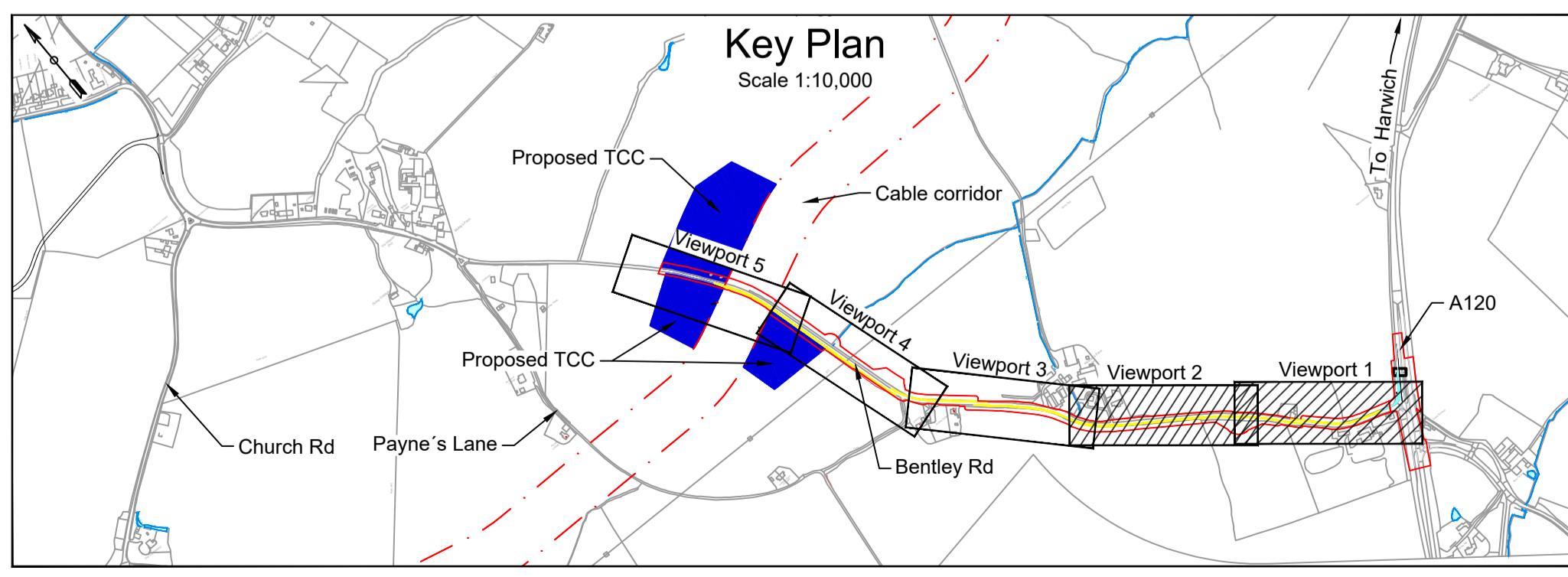
SLR Project No.: 404.V05356.00010

23 September 2024





- Legend (continuation)**
- Existing trees to be removed (subject to detailed survey)
 - Assumed location of existing electricity / communication poles
 - Location of existing communication pole extracted from survey
 - Location of existing electricity pole extracted from survey



- Notes**
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 - No unauthorised disclosure, storage or copying.
 - This drawing is for development purposes only and should not be used for construction. The proposed arrangements shown are for indicative purposes only. Dimensions and design may vary following completion of site surveys and the subsequent stages of design.
 - Existing carriageway widths are not sufficient along Bentley Road. Improvement / widening works are required to allow for two way HGV traffic flow. Additional enabling works and vegetation clearance / groundwork may be required.
 - All vehicle deliveries are expected to use both carriageway lanes and will require traffic control / pilots during movements. Additional works (not shown), i.e. removal of street furniture, vegetation and structures may be required to facilitate ALL vehicle over-swings. All swept paths should be verified by the Contractor and their haulage suppliers at the earliest opportunity to ensure clearances are suitable for the intended vehicles.
 - Existing carriageway lines have been determined using OS Mastermap data in absence of Topographical survey data. OS data is considered to be less accurate. Widening works are intended to show the concept of an increase to a 6.5m carriageway width where the installation of a segregated cycle track is included in the final arrangement. The outline of a potential carriageway widening to 6.75m (where no dedicated cycle/pedestrian provision is to be installed) is also shown as another option. The extents of the widening works and planning application boundary are therefore subject to change following detailed horizontal alignment design and receipt of Topographical data.
 - Only partial / incomplete utilities data has been provided. No clearance data is available. Where available, additional utilities have been traced from aerial imagery. Full utilities surveys shall be required at later design stages. Planning application boundaries may need to be increased where additional utilities works are required. Clearance to overhead utilities will need to be reviewed in conjunction with the relevant vehicle models.
 - Drainage works/strategy have not been considered as part of this concept design and will need to be developed in liaison with the lead local flood authority / Environment Agency (EA) and local highways authority during subsequent stages of design. Replacement and/or realignment of existing drainage may be required, existing watercourse crossings may need to be replaced and mitigation measures may be necessary to account for an increase in impermeable areas. The planning application boundary may need to be increased to incorporate these drainage works where required.

- Legend:**
- OS grid map feature lines
 - Construction works boundary (red line boundary) at Bentley Rd
 - Existing carriageway edge - OS feature line - to remain unaltered
 - Existing carriageway edge - OS feature line - to be modified
 - Proposed new carriageway edge (indicative) for a width of 6.5m
 - Proposed carriageway widening at Bentley Rd for a width of 6.5m
 - Proposed new carriageway edge (indicative) for a width of 6.75m
 - Proposed location for a potential cycle track installation
 - Proposed carriageway widening at junction with the A120
 - Existing surface water wide ditch / watercourse to remain
 - Utility diversion or undergrounding required (Comms)
 - Utility diversion or undergrounding required (HV)
 - Water pipe protection or diversion required
 - Vegetation / trees to be trimmed (or removed if on side to be widened; subject to detailed survey)

- Reference drawings**
- 104560-MMD-00-XX-DR-CE-1028 - A120 Bentley Road Junction Improvement Works
 - 104560-MMD-00-XX-DR-CE-1032-1 & 2 - Bentley Rd w/ Cable Haul Rd Jct & SPA (Sheets 1 & 2)
 - 104560-MMD-00-XX-DR-CE-1033 - New Bellmouth Access at Bentley Rd Jct for AIL Haul Road Diversion
 - 104560-MMD-00-XX-DR-CE-1034 - Bentley Rd to Ardleigh Rd AIL Haul Rd Diversion
 - 104560-MMD-00-XX-DR-CE-1059-1 & 2 - Proposed Cross-over points for Cycle Track
 - Utility Report Digitilised_OSGB36 (received in January 2023)
 - VE-NF Draft_Combined_Cable_Corridor_Rev_6 (received 29/09/2023)
 - VE-NF Draft_TCC_Locations_Rev_6 (received 29/09/2023)
 - UK_FES_Work_Areas_py_OSGB36_v8_13_Extract (received 16/11/2023)
 - UK_FES_Work_Areas_py_OSGB36_v8_13B_Extract (received 16/11/2023)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P03	30/11/2023	SAP	RLB & cycle track updated	JW	AFC
P02	08/09/2023	SAP	Red Line Boundary updated	JW	AFC
P01	24/04/2023	SG	Concept design for comment	JW	MB

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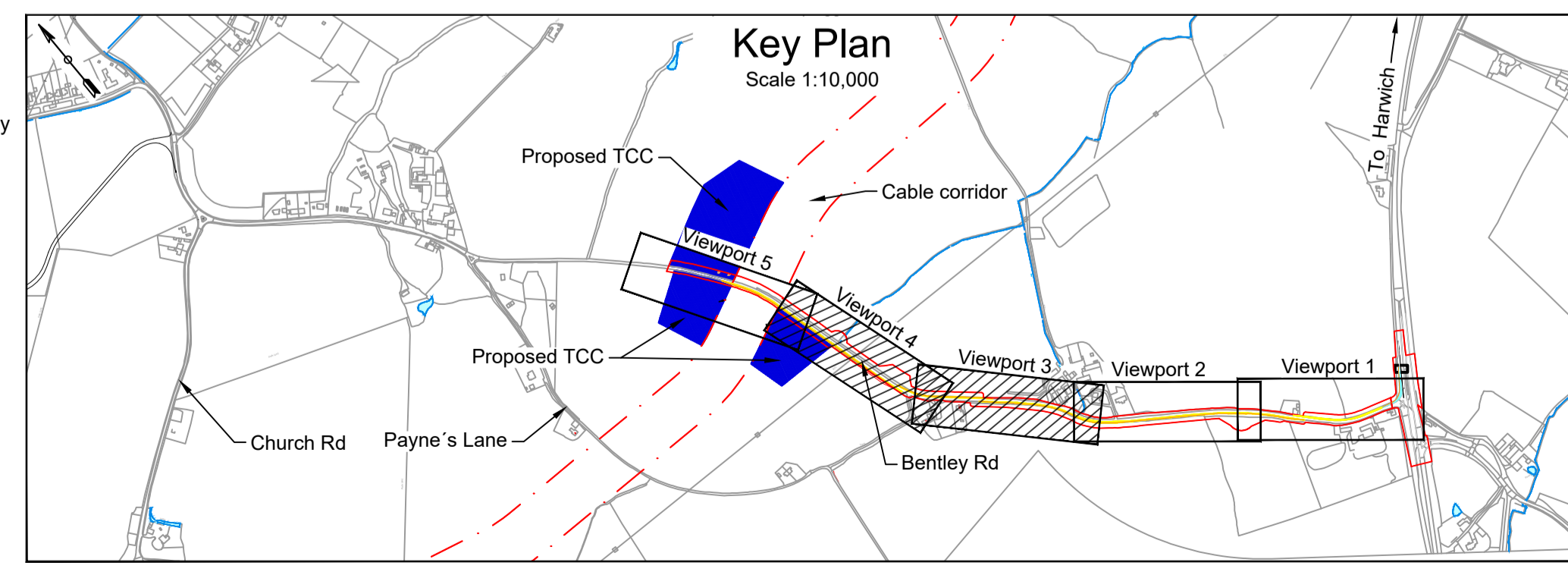
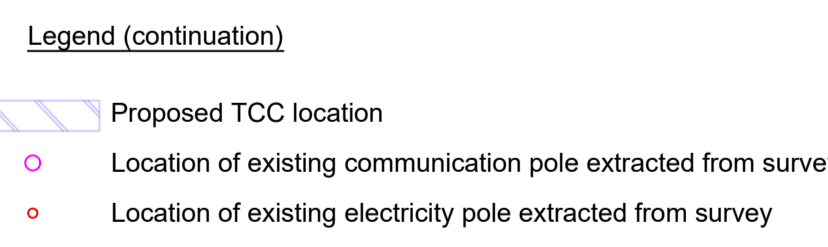
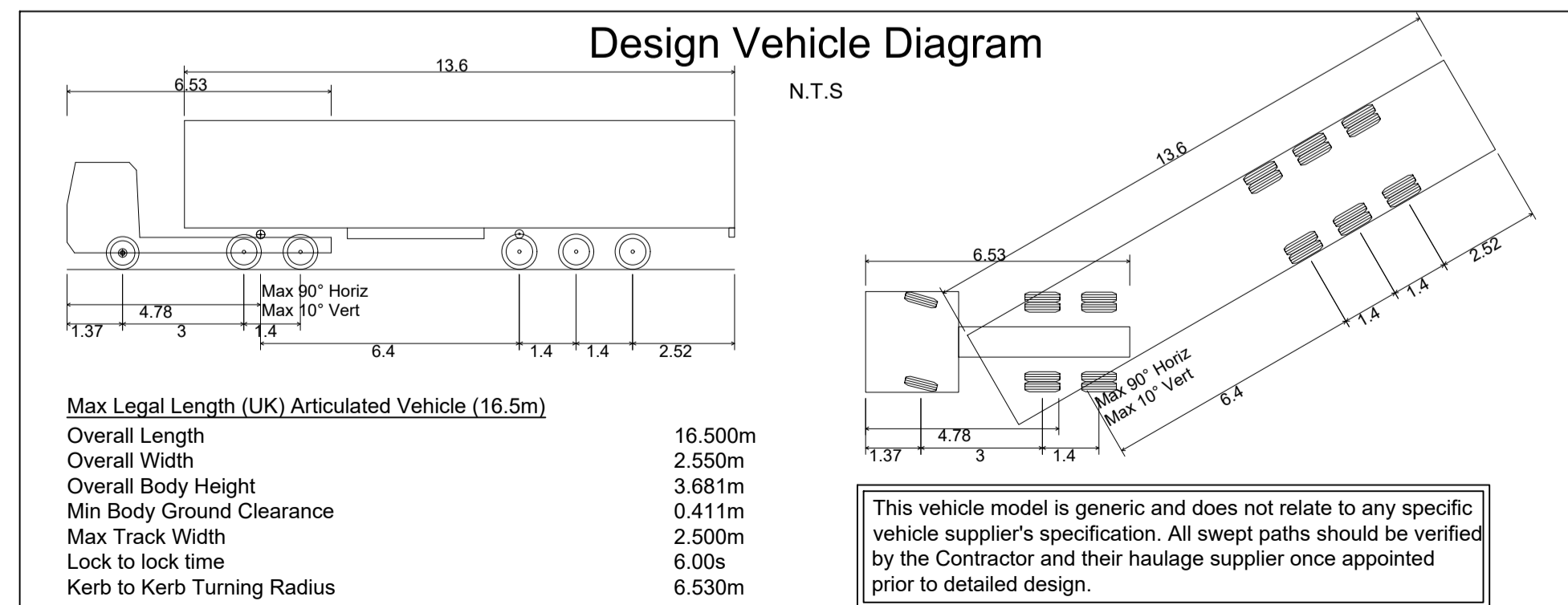
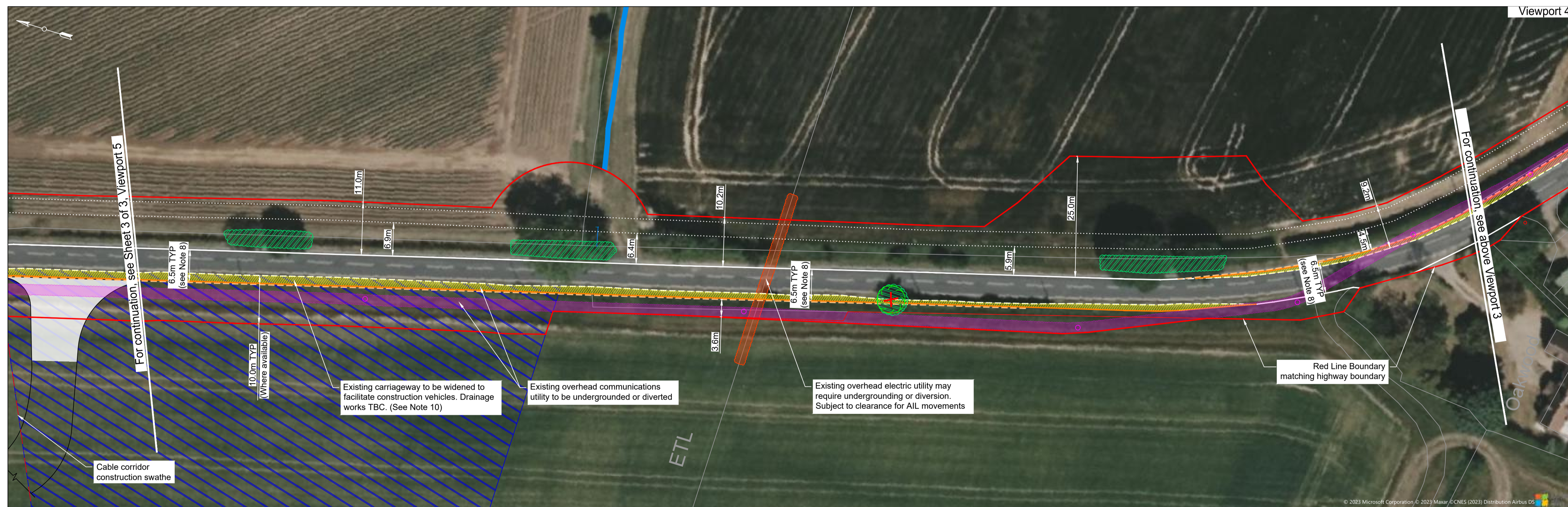
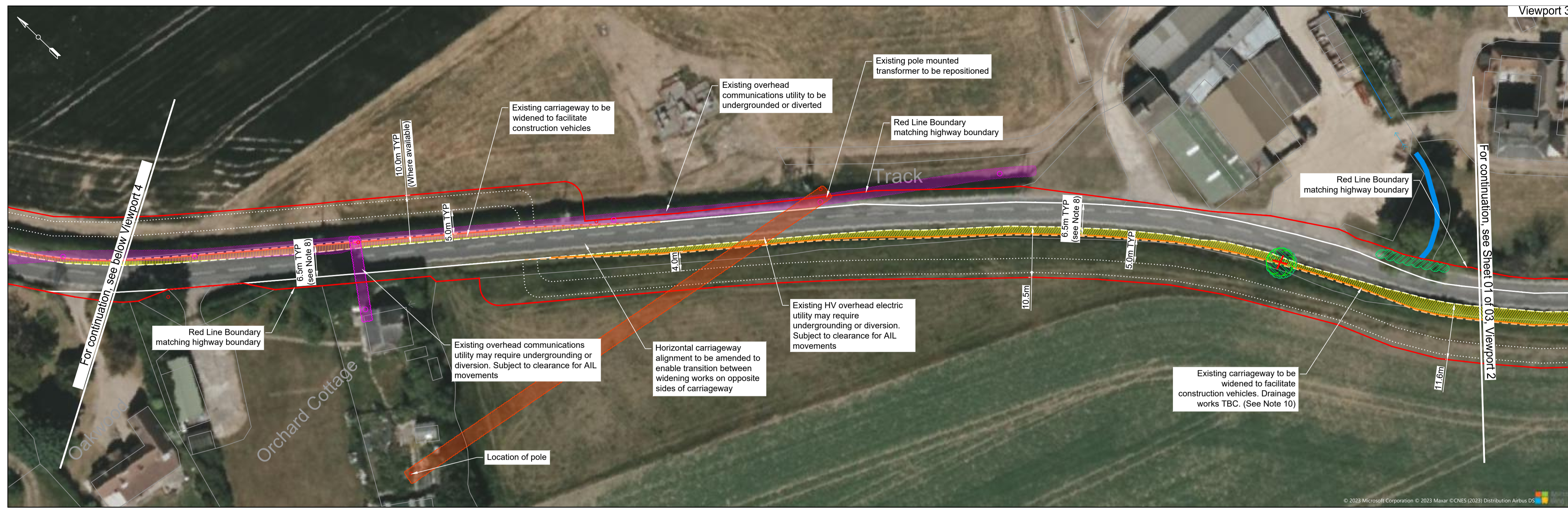
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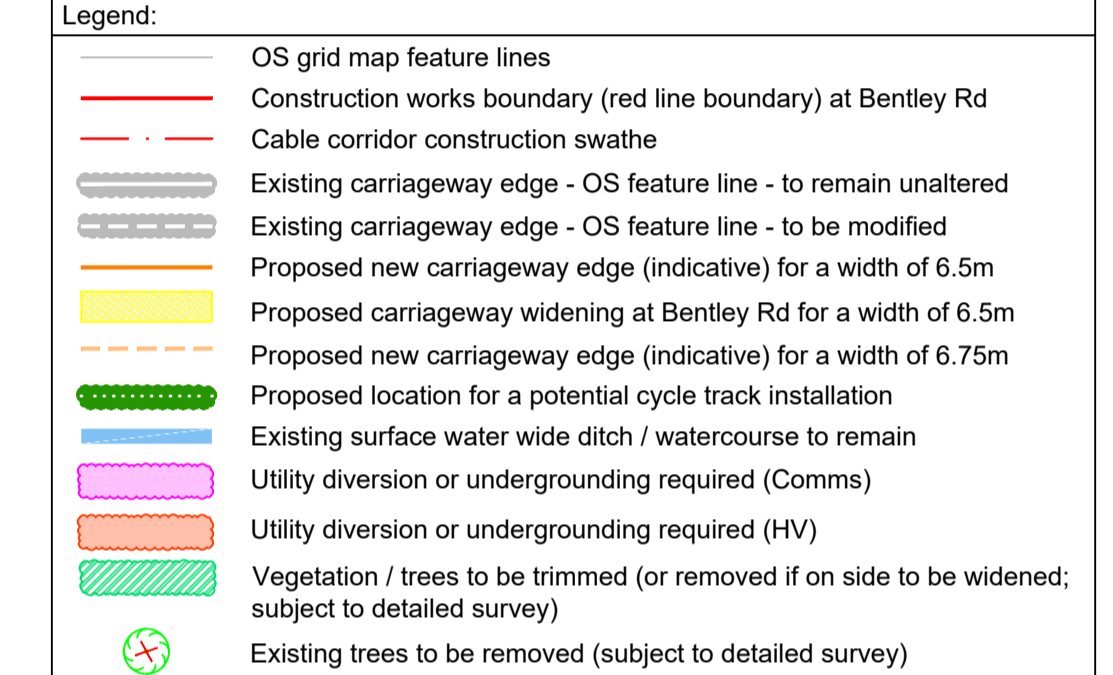
Title
Co-located Substation Early Design Bentley Rd Improvements Layout and Red Line Boundary for works

Sheet 01 of 03

Designed	S. Goode	SG	Eng check	J. Weeks	JW
Drawn	S. Goode	SG	Coordination	J. Weeks	JW
Dwg check	S. Amado-Pedrosa	SAP	Approved	M. Barton	MB
MMD Project Number	104560-001	Scale at A1	1:500	Security	STD
Client Number	004786178-03			Suit. Code	S3
Drawing Number	104560-MMD-00-XX-DR-CE-1031-1			Revision	P03



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 - Existing carriageway lines have been determined using OS Mastermap data in absence of Topographical survey data. OS data is considered to be less accurate. Widening works are intended to show the concept of an increase to a 6.5m carriageway width where the installation of a segregated cycle track is included in the final arrangement. The outline of a potential carriageway widening to 6.75m (where no dedicated cycle/pedestrian provision is to be installed) is also shown as another option. The extents of the widening works and planning application boundary are therefore subject to change following detailed horizontal alignment design and receipt of Topographical data.
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 - Drainage works/strategy have not been considered as part of this concept design and will need to be developed in liaison with the lead local flood authority / Environment Agency (EA) and local highways authority during subsequent stages of design. Replacement and/or realignment of existing drainage may be required. existing watercourse crossings may need to be replaced and mitigation measures may be necessary to account for an increase in impermeable areas. The planning application boundary may need to be increased to incorporate these drainage works where required.



Reference drawings

104560-MMD-00-XX-DR-CE-1028 - A120 Bentley Road Junction Improvement Works
 104560-MMD-00-XX-DR-CE-1032-1 & 2 - Bentley Rd w/ Cable Haul Rd Jct & SPA (Sheets 1 & 2)
 104560-MMD-00-XX-DR-CE-1033 - New Bellmouth Access at Bentley Rd Jct for ALL Haul Road Diversion
 104560-MMD-00-XX-DR-CE-1034 - Bentley Rd to Ardleigh Rd AIL Haul Rd Diversion
 104560-MMD-00-XX-DR-CE-1059-1 & 2 - Proposed Cross-over points for Cycle Track Utility Report Digitilised_OSGB36 (received in January 2023)
 VE-NF Draft_Combined_Cable_Corridor_Rev_6 (received 29/09/2023)
 VE-NF Draft_TCC_Locations_Rev_6 (received 29/09/2023)
 UK_FES_Work_Areas_py_OSGB36_v8_13_Extract (received 16/11/2023)
 UK_FES_Work_Areas_py_OSGB36_v8_13B_Extract (received 16/11/2023)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P03	30/11/2023	SAP	RLB & cycle track updated	JW	AFC
P02	08/09/2023	SAP	Red Line Boundary updated	JW	AFC
P01	24/04/2023	SG	Concept design for comment	JW	MB

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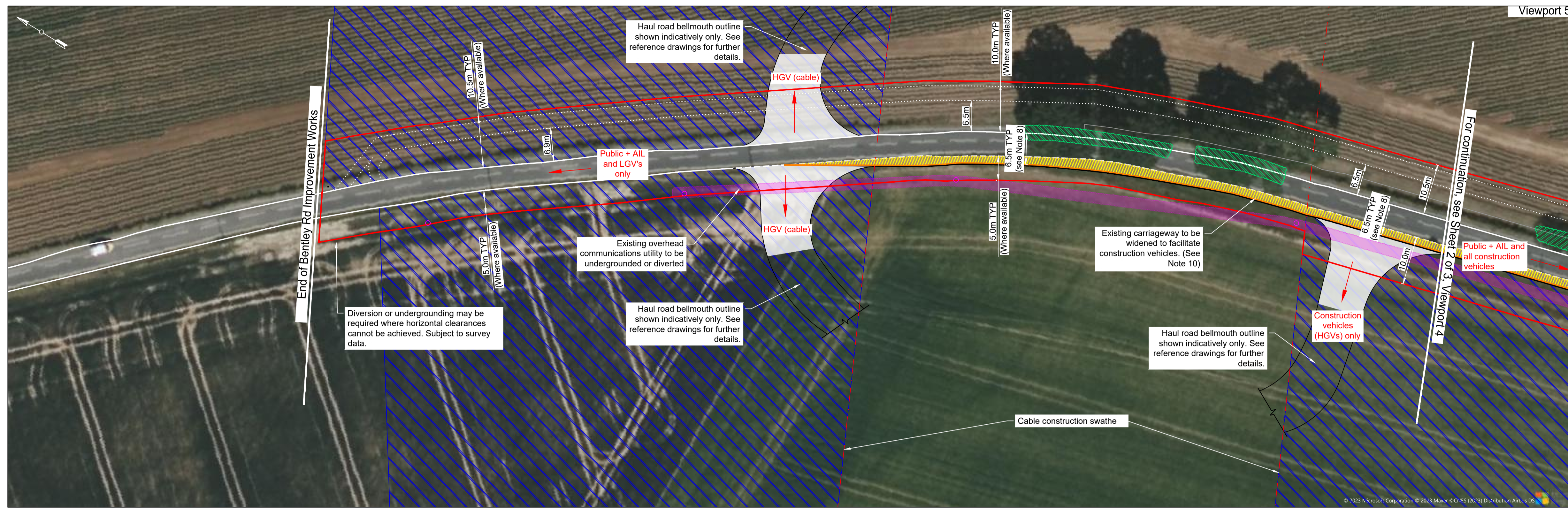
FIVE ESTUARIES
OFFSHORE WIND FARM

Title
Co-located Substation Early Design Bentley Rd Improvements Layout

Sheet 02 of 03

Designed	S. Goode	SG	Eng check	J. Weeks	JW
Drawn	S. Goode	SG	Coordination	J. Weeks	JW
Dwg check	S. Amado-Pedrosa	SAP	Approved	M. Barton	MB
MMD Project Number	104560-001	Scale at A1	1:500	Security	STD
Client Number	004786179-03			Suit. Code	S3
Drawing Number	104560-MMD-00-XX-DR-CE-1031-2			Revision	P03

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 - All vehicle deliveries are expected to use both carriageway lanes and will require traffic control / pilots during movements. Additional works (not shown), i.e. removal of street furniture, vegetation and structures may be required to facilitate AIL vehicle over-swings. All swept paths should be verified by the Contractor and their haulage suppliers at the earliest opportunity to ensure clearances are suitable for the intended vehicles.
 - Existing carriageway lines have been determined using OS Mastermap data in absence of Topographical survey data. OS data is considered to be less accurate. Widening works are intended to show the concept of an increase to a 6.5m carriageway width where the installation of a segregated cycle track is included in the final arrangement. The outline of a potential carriageway widening to 6.75m (where no dedicated cycle/pedestrian provision is to be installed) is also shown as another option. The extents of the widening works and planning application boundary are therefore subject to change following detailed horizontal alignment design and receipt of Topographical data.
 - Only partial / incomplete utilities data has been provided. No clearance data is available. Where available, additional utilities have been traced from aerial imagery. Full utilities surveys shall be required at later design stages. Planning application boundaries may need to be increased where additional utilities works are required. Clearance to overhead utilities will need to be reviewed in conjunction with the relevant vehicle models.
 - Drainage works/strategy have not been considered as part of this concept design and will need to be developed in liaison with the lead local flood authority / Environment Agency (EA) and local highways authority during subsequent stages of design. Replacement and/or realignment of existing drainage may be required, existing watercourse crossings may need to be replaced and mitigation measures may be necessary to account for an increase in impermeable areas. The planning application boundary may need to be increased to incorporate these drainage works where required.

Legend:

- OS grid map feature lines
- Construction works boundary (red line boundary) at Bentley Rd
- Cable corridor construction swathe
- Existing carriageway edge - OS feature line - to remain unaltered
- Existing carriageway edge - OS feature line - to be modified
- Proposed new carriageway edge (indicative) for a width of 6.5m
- Proposed carriageway widening at Bentley Rd for a width of 6.5m
- Proposed new carriageway edge (indicative) for a width of 6.75m
- Proposed location for a potential cycle track installation
- Utility diversion or undergrounding required (Comms)
- Location of existing communication pole extracted from survey
- Vegetation / trees to be trimmed
- Proposed TCC location

Reference drawings

104560-MMD-00-XX-DR-CE-1028 - A120 Bentley Road Junction Improvement Works
 104560-MMD-00-XX-DR-CE-1032-1 & 2 - Bentley Rd w/ Cable Haul Rd Jct & SPA (Sheets 1 & 2)
 104560-MMD-00-XX-DR-CE-1033 - New Bellmouth Access at Bentley Rd Jct for AIL Haul Road Diversion
 104560-MMD-00-XX-DR-CE-1034 - Bentley Rd to Ardleigh Rd AIL Haul Rd Diversion
 104560-MMD-00-XX-DR-CE-1059-1 & 2 - Proposed Cross-over points for Cycle Track
 Utility Report Digitised_OSGB36 (received in January 2023)
 VE-NF Draft_Combined_Cable_Corridor_Rev_6 (received 29/09/2023)
 VE-NF Draft_TCC_Locations_Rev_6 (received 29/09/2023)
 UK_FES_Work_Areas_py_OSGB36_v8_13_Extract (received 16/11/2023)
 UK_FES_Work_Areas_py_OSGB36_v8_13B_Extract (received 16/11/2023)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P03	30/11/2023	SAP	RLB & cycle track updated	JW	AFC
P02	08/09/2023	SAP	Red Line Boundary updated	JW	AFC
P01	24/04/2023	SG	Concept design for comment	JW	MB

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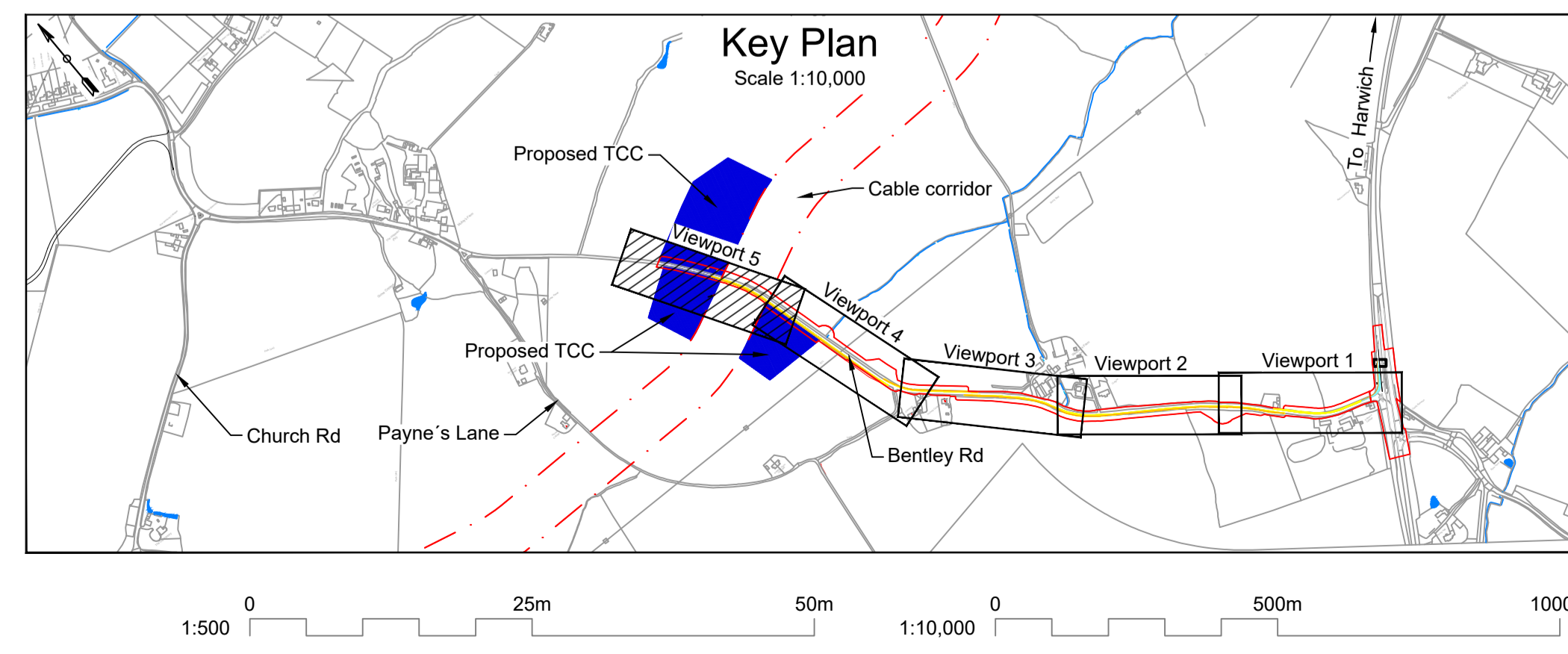
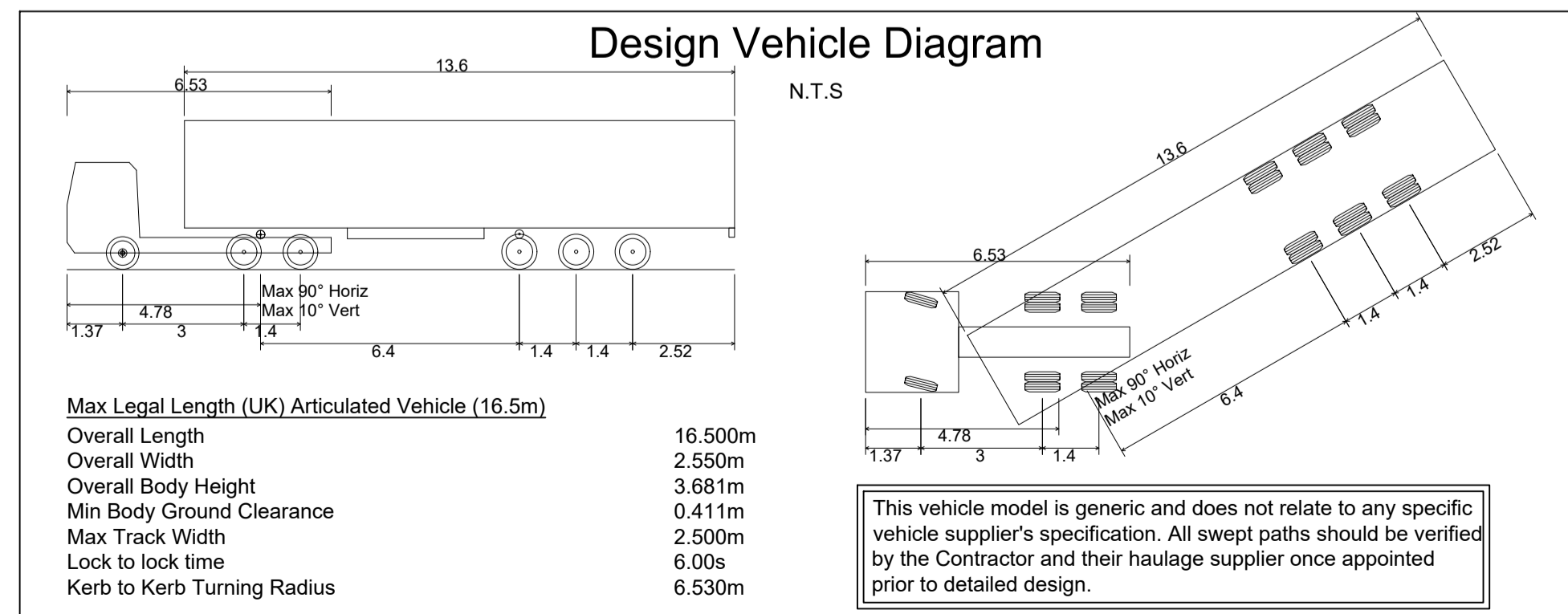
Title

Co-located Substation Early Design Bentley Rd Improvements Layout

Sheet 03 of 03

Designed	S. Goode	SG	Eng check	J. Weeks	JW
Drawn	S. Goode	SG	Coordination	J. Weeks	JW
Dwg check	S. Amado-Pedrosa	SAP	Approved	M. Barton	MB
MMD Project Number	104560-001	Scale at A1	1:500	Security	STD
Client Number	004786180-03	Suit. Code	S3	Revision	P03
Drawing Number	104560-MMD-00-XX-DR-CE-1031-3				

End of sheet set





Appendix Y Abnormal Indivisible Load Investigations

Volume 6, Part 6, Annex 8.1 Transport Assessment (Onshore)

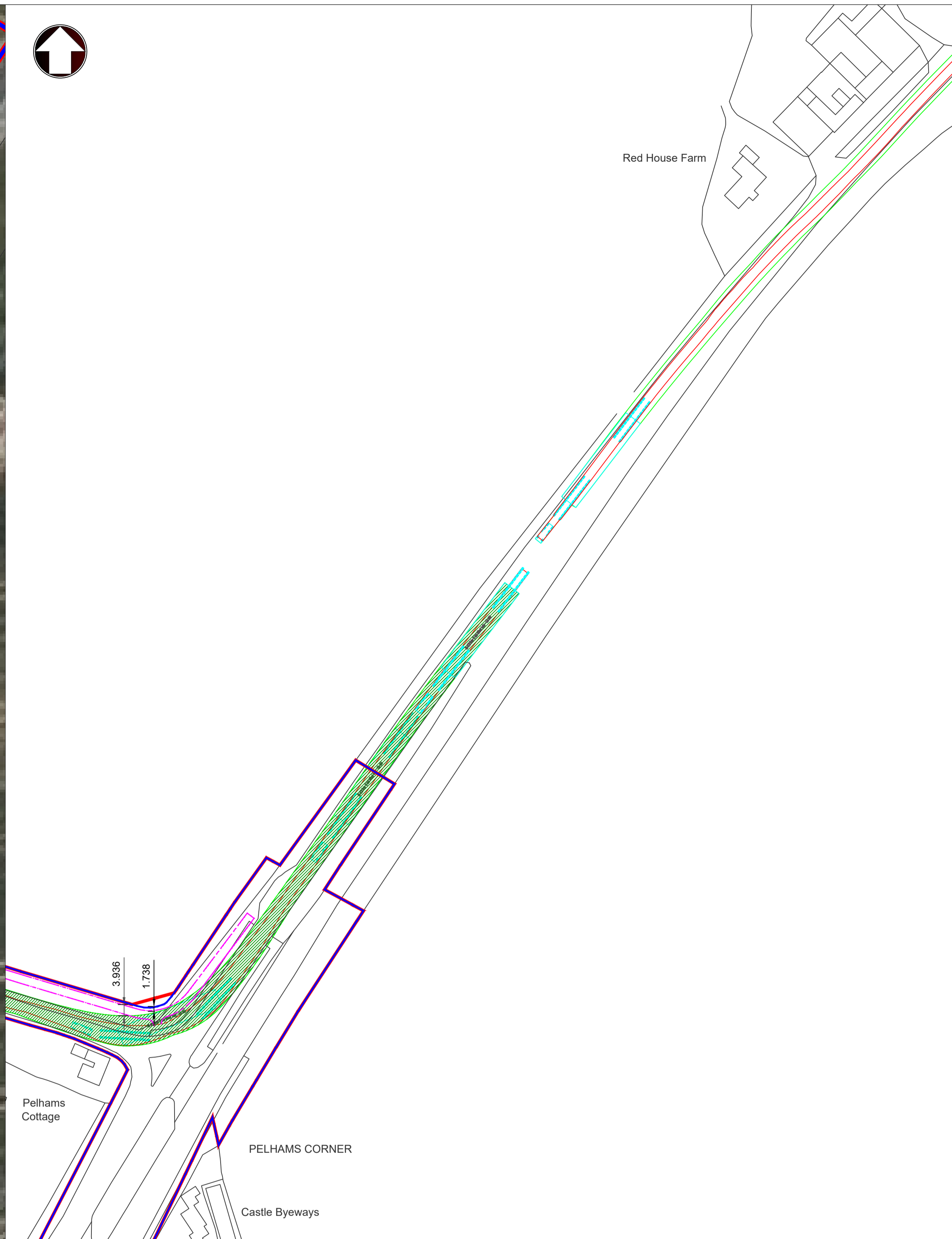
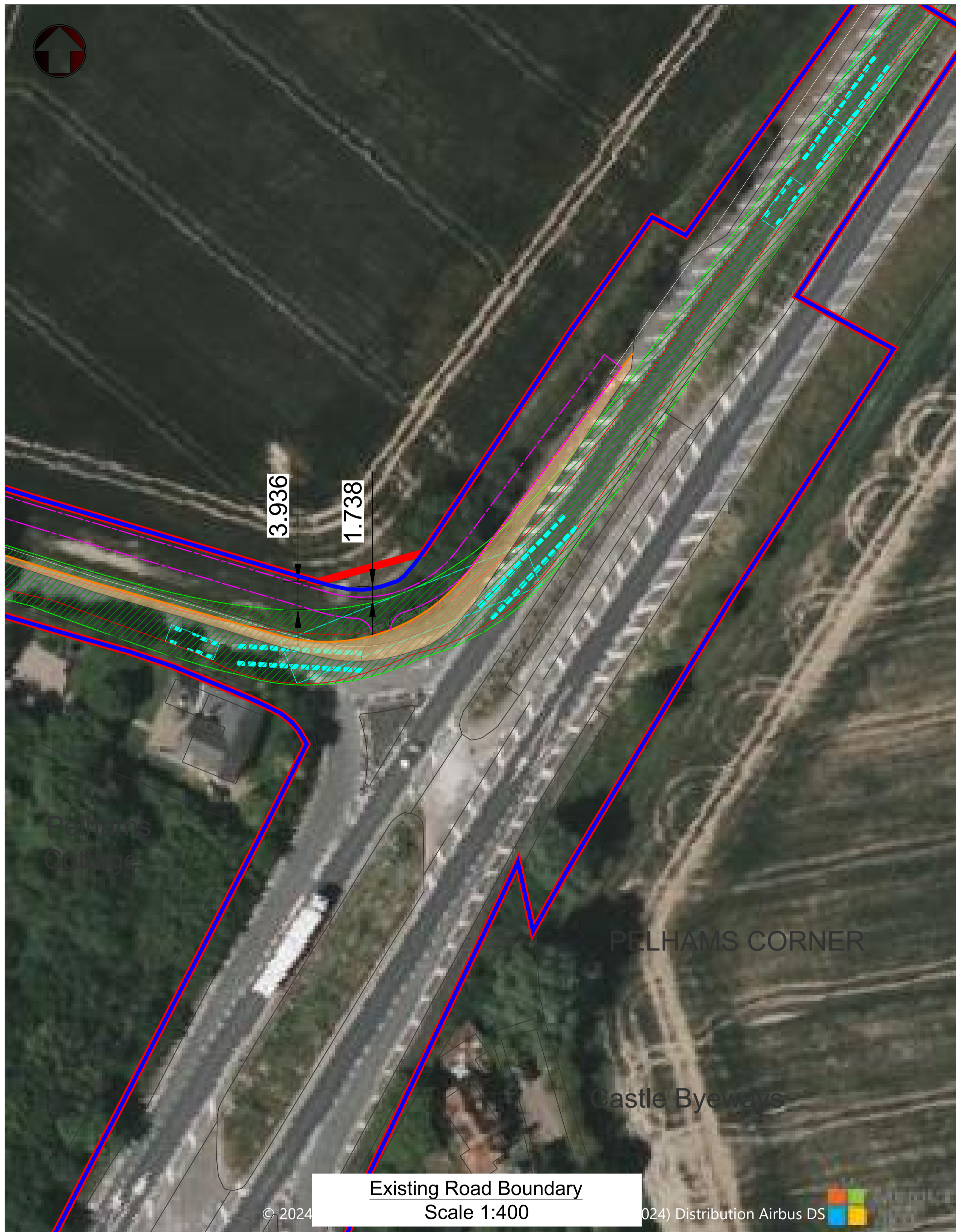
Five Estuaries Offshore Wind Farm

Five Estuaries Wind Farm Ltd

SLR Project No.: 404.V05356.00010

23 September 2024





- Notes**
1. Do not scale from this drawing
 2. All dimensions are in metres unless otherwise stated
 3. This drawing is to be read in conjunction with all relevant documents and drawings
 4. No unauthorised disclosure, storage or copying
 5. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36)
 6. All levels are in meters and relate to AOD (Ordnance Survey, Newlyn)
 7. Geometry has been checked against a bespoke vehicle model shown in the diagram. This model is generic and does not relate to any specific vehicle suppliers specification. All swept paths should be verified by the Contractor and their haulage supplier once appointed prior to detailed design and installation of the access.
 8. Kerb line would need to be realigned to accommodate AIL movement requiring increased pavement widening.
 9. AIL switch to contraflow position can occur between Red House Farm and the Single Lane Dual Carriageway section of the A120.

- Key to symbols**
- Chassis outline
 - Body outline
 - ▨ Swept path area by vehicle body
 - OS map feature lines
 - Five Estuaries Order Limits Boundary
 - Proposed kerb line
 - Proposed pavement widening
 - Cycle path
 - North Falls Order Limits Boundary

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	07/03/2024	AT	Issue for comment	JW	AFC
P2	23/02/2024	AT	Issue for comment	JW	AFC
P1	08/02/2024	AT	Issue for comment	JW	AFC

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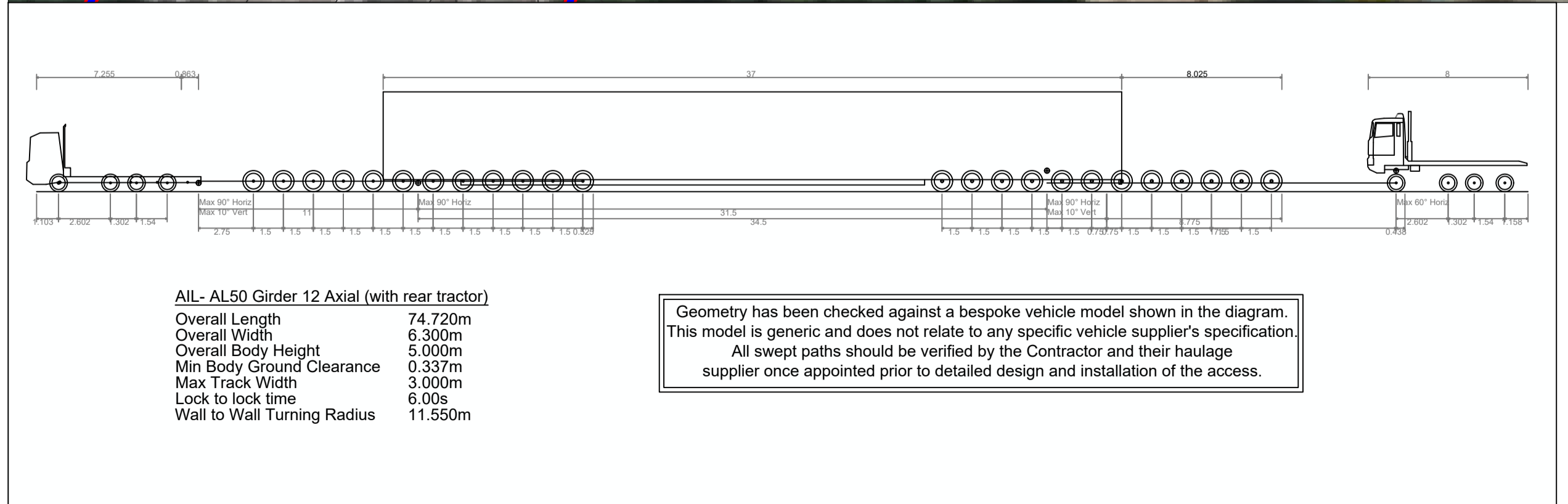
NORTH FALLS
Offshore Wind Farm

FIVE ESTUARIES
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Title

**Co-located Substation Early Design
A120 - Bentley Road Junction
Swept Path Analysis
"contra-flow" Option
Sheet 01 of 01**

Designed	A. Towse	AT	Eng check	J. Weeks	JW
Drawn	A. Towse	AT	Coordination	A. Fontaina Crespo	AFC
Dwg check	J. Weeks	JW	Approved	A. Fontaina Crespo	AFC
MMD Project Number	104560	Scale at A1	1:400	Security	STD
Client Number	005069954-03	Suit. Code	S3	Revision	P3
Drawing Number	104560-MMD-00-XX-DR-CE-1064				





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OFFSHORE WIND FARM

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company number 12292474