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Executive Summary

Project Overview

National Grid Electricity Transmission plc (the Applicant) submitted an application for development consent to the Planning Inspectorate on the 27 April 2023 to reinforce the transmission network between Bramford Substation in Suffolk, and Twinstead Tee in Essex (the project). The project would be achieved by the construction and operation of a new electricity transmission line over a distance of approximately 29km comprising of overhead lines, underground cables and grid supply point (GSP) substation. It also includes the removal of 25km of the existing distribution network, 2km of the existing transmission network and various ancillary works.

Purpose of this Technical Note

This Technical Note has been produced to explain the inclusion of a temporary access route connecting the A131 near Little Maplestead to the Stour Valley West cable sealing end (CSE) compound in the application for development consent (hereafter referred to as the 'temporary access route'). The Technical Note explores the requirement for access in this area of the project, the need for a temporary access route, the options considered and the rationale for the final design.

This Technical Note has been developed in response to Relevant Representations by affected persons and other interested parties, and questions from the Examining Authority (ExA).

The Need for a Temporary Access Route and Options Assessment

The existing road network at the western end of the project is characterised by very narrow roads with tight bends and a lack of passing places. In its current form it is not suitable for either the number or the size of vehicles required to construct the project.

There is a need to access the western end of the project to construct the Stour Valley West CSE compound, install the trenchless crossing to the south of Ansell's Grove, install underground cables from the CSE compound to the trenchless crossing, remove a section of 400kV overhead line and related construction activities and environmental mitigation and enhancements. The access options to this location do not include an access along the cable route from the west due to constraints that have similarly led to an approach of installing the underground cable using trenchless crossing rather than open cut installation.

Over the construction period 30,000 Light Goods Vehicle (LGV) movements and 29,000 Heavy Goods Vehicles (HGV) movements are forecast to access the works in this area. Fifty Abnormal Indivisible Loads (AIL) vehicles, which are over 28m in length when carrying a cable drum, will also be required.

The Applicant has considered a number of different options to accommodate construction traffic on the local road network, including using the local road network with closures, works to widen the road and one-way systems. These options are known as 'Approach A'. All options have been rejected due to the scale of works required to the local road network, the environmental impacts of those works, the impacts on adjacent properties and the safety and journey time impacts on existing road users. Given the extensive nature of works required, Approach A options were not considered to be reasonable alternatives in the context of options to temporarily create an access road off the local road network. Given the number of roads where two HGVs could not pass one another, one-way systems were also rejected due to the area over which this would be required,

the impact on local communities, the risks associated with drivers not adhering to the system and the impacts of the signage and illumination required to indicate routes.

To avoid the extensive impacts associated with Approach A, the Applicant investigated four options to develop a temporary access route (referred to as 'Approach B'). These routes have been analysed by multi-disciplinary teams, who have concluded that with minor modifications to the routing of options presented, all four routes could be acceptable from a highways, land acquisition and environmental perspective. However, Options 2c and 2a had advantages over the other options in terms of reducing environmental impacts, with Option 2a emerging as the preferred option due to it also responding to comments received from affected persons. The access point proposed for Options 2c and 2a was also considered to be the preferred location of those assessed from a highways design perspective.

Approaches to investigate a hybrid option were also considered (referred to as 'Approach C'), using temporary access route sections for more challenging areas and then utilising some of the local road network. All these options continued to raise issues for the local road network, with significant improvements required to the local highway network to allow vehicles to safely navigate the network. This is both due to the number and size of vehicles using the sections of the local road network. Vehicles moving on and off the local road network at numerous points also created safety and security concerns that were not present with other options. Each route also continued to cross agricultural land as per Approach B options. The need to continue to use sections of unsuitable highway or implement significant improvements meant that these options were also rejected in favour of Option 2a (Approach B).

The selection of an Approach B option and the precise alignment selected (2a) has emerged through iterative stages of consultation and assessment. Whilst there remain interested parties and affected persons who would prefer to see another option implemented, it is the Applicant's position that the option selected (the one included in the application for development consent) is considered to be the most appropriate taking account of the assessment undertaken including, environmental impact; engineering requirements; highway design, access and safety; and consultation feedback.

1. Introduction

1.1 Introduction

- 1.1.1 National Grid Electricity Transmission plc (here on referred to as the Applicant) submitted an application for development consent to the Planning Inspectorate on 27 April 2023 to reinforce the transmission network between Bramford Substation in Suffolk, and Twinstead Tee in Essex (the project). The project would be achieved by the construction and operation of a new electricity transmission line over a distance of approximately 29km comprising of overhead lines, underground cables and GSP substation. It also includes the removal of 25km of the existing distribution network, 2km of the existing transmission network and various ancillary works.
- 1.1.2 This Technical Note has been produced to explain the need for the temporary access route off the A131 (referred hereafter as ‘the temporary access route’ in this document) in the application for development consent connecting the A131 at Access Point H-AP20, near Little Maplestead to the Stour Valley West CSE compound. This Technical Note defines the requirement for access in this location, the types of construction vehicles and the traffic volumes that are required to access this location, the options considered to facilitate construction access in this location and the rationale for the final design. Figure 1.1 at Appendix A shows the proposed temporary access route in the context of the Order limits and the main design components in this area. It also shows the location of the access points referenced in this Technical Note, including H-AP20 in the A131. Section 2.1 of this report describes the works in this area of the project that will need to be accessed during construction.
- 1.1.3 This Technical Note builds on the rationale provided in Environmental Statement (ES) Chapter 3 (Alternatives Considered) [APP-071] (paragraphs 3.10.7 to 3.10.12 and Table 3.15) which explored the main alternatives in terms of the use of a temporary access route off the A131 instead of using the local road network. This Technical Note provides greater detail to aid interested parties in understanding the position and includes information on additional options that were also considered by the Applicant during the evolution of the design, but were not considered to be ‘main alternatives’ so were not included in the ES. The numbers of the options have been retained as presented in the ES, with additional numbers given to other discounted options that were not presented previously.

1.2 Background

- 1.2.1 The Applicant has committed to undergrounding the 400kV transmission line in the most sensitive parts of the Stour Valley. Undergrounding requires installation of cables below ground to transmit the 400kV electricity. The cables are of a large diameter and would be delivered to site in continuous lengths of approximately 1km. The cables are, therefore, transported on very large cable drums, meaning the vehicle on which they are transported, are of a very large width, length and weight. The vehicle on which they are transported are AIL which are larger than conventional Heavy Goods Vehicles (HGVs).
- 1.2.2 The local road network in the area where the Stour Valley West CSE compound is located is rural in nature with local roads being of restricted widths, with weight restrictions in place, narrow turns and properties located close to the highway edge. The character of the roads is acknowledged in paragraph 4.2.4 of the Braintree District Council and Essex

County Council Local Impact Report **[REP1-039]**. The roads in the area were not designed for either a high volume of traffic or for large construction vehicles.

- 1.2.3 Prior to the inclusion of a temporary access route off the A131 within its proposals, the Applicant held a Statutory Consultation based principally on using the existing local road network for construction traffic (see Consultation Report sections 6 and 7 **[APP-043]**). For completeness it should be noted that this itself did include a small section of temporary access route to avoid the geometry constraint at Cripple Corner. This was included in the consultation draft general arrangement plans and is for example shown in the Section G – Stour Valley plan on page 12 of the Consultation Feedback Form in Appendix I10 of the Consultation Report **[APP-052]**.
- 1.2.4 The preliminary environmental information report published as part of the Statutory Consultation identified a number of potential impacts related to traffic and transport. One key area where consultation feedback was received related to construction traffic, with respondents suggesting that some of the roads proposed as construction traffic routes were not suitable for large construction vehicles, particularly in the Braintree District Council (BDC) area. Therefore, the Applicant investigated in more detail the extent to which the highway network and access points were suitable for construction vehicles to access the works in this area of the project.
- 1.2.5 Analysis of the existing road network showed that the local road network could not accommodate the number or size of vehicles required without significant interventions, particularly for AIL movements. An AIL is a vehicle larger than conventional HGV which carry goods on all roads, as defined in The Road Vehicles (Construction and Use) Regulations 1986. Abnormal loads larger than these Regulations allow are only permitted to use the network with specific route authorisation and, where necessary, a police escort when arriving with cable drums and when returning empty to their base.
- 1.2.6 Therefore, the Applicant explored whether a dedicated temporary access route could be provided to alleviate impacts on the local road network by accommodating some or all of the construction traffic to the Stour Valley West CSE compound and the surrounding works. A temporary access route off the A131 would avoid the need for HGV construction traffic to use the local road network.
- 1.2.7 Upon identifying the need for the temporary access route (alongside other amendments to the plans), the Applicant held a Targeted Consultation on the amendment to its plans in September and October 2022 (see Consultation Report section 8 **[APP-043]**). The evaluation of broad options to access the Stour Valley West CSE compound and surrounding area considered many factors such as ecology, heritage, engineering constraints, impact on agricultural land, safety and accessibility of the highway network during the works, and impact on local residents, landowners and businesses. This information was used to compare options and support a decision between key principles (for example a temporary access route or use of the public highway network) and more granular level e.g. which option for a specific route is optimal.
- 1.2.8 Following the Targeted Consultation, the applicant made further refinements to the detailed routing of the temporary access route (amongst other changes) in response to feedback received (see Consultation Report section 8.9 **[APP-043]**). This included feedback from the Affected Persons but also the Local Highway Authority (referred to below) and other Interested Parties. The Applicant subsequently undertook additional consultation with Affected Persons where these amendments (amongst other changes) had been made (see Consultation Report section 9 **[APP-043]**).

- 1.2.9 Alongside the formal consultation periods outlined above the Applicant held a series of meetings, calls and exchanges with various interested parties including the affected persons and their appointed agents.
- 1.2.10 The proposed temporary access route off the A131 (referred to as 'Approach B' in this Technical Note) and the area of the project that it will be accessing is located in an area administered by Essex County Council (ECC) and BDC. The principle of the temporary access route off the A131 has subsequently been supported by ECC as the highway authority but questioned by BDC as the district local authority for the area. The Local Impact Report from the local authorities [REP1-039] states that:
- 'Temporary Haul Road to Cable Sealing Compound - In October 2022 ECC provided comments regarding the Temporary Haul Road from the A131 to the sealing compound. The proposal to provide a temporary haul road between the western sealing compound and the A131 is supported in principle by ECC and would significantly reduce the impact of construction traffic, particularly HGVs, on the local road network in this rural area, and reduce the necessity to carry out local mitigation schemes significantly on these roads. It is acknowledged that BDC have a different view to ECC on the acceptability of the Haul Route, given the impact on local farmers (see Agriculture and Soils section for further details) and wish for further alternative measures to be explored to access the sealing compound from the A131.'*
- 1.2.11 This Technical Note has been developed in response to comments from ECC, BDC, Relevant and Written Representations by affected persons and other interested parties; and questions from the ExA.

2. The Local Road Network

2.1 Area of the Project to be Accessed

2.1.1 The area of the project that would be accessed by the temporary access route off the A131 is located at the western end of the project. It will facilitate the majority of the works shown on sheets 27 to 30 of the General Arrangement Plans [APP-018].

2.1.2 The access is required to construct the following:

- Stour Valley West CSE compound;
- Trenchless crossing to the South of Ansell's Grove;
- 400kV ducted underground cables between the CSE compound and the trenchless crossing;
- Removal of the existing 400kV overhead line (4YLA003 to 4YLA007) and realignment of part of the 400kV overhead line (4YLA006A and B to 4YLA007);
- All associated temporary construction activities including the access routes themselves and temporary construction compounds 9 and 12; and
- Environmental mitigation and enhancement.

2.1.3 A description of what these activities are likely to entail is provided in ES Chapter 4: Project Description [APP-072]. Hereafter in this report these works collectively are referred to as the 'described works'.

2.1.4 The trenchless crossing to the south of Ansell's Grove will install the underground cable using a trenchless crossing technique rather than through open cut trenches. This method is being used in this location to avoid environmental impacts, particularly on the woodland which provides important habitat and is a landscape feature. This trenchless crossing will require the use of specialist trenchless drilling equipment. To avoid impacts on this area, a commitment has been made not to route heavy construction traffic in this area. Measure EM-G08 in the Register of Environmental Actions and Commitments (**document 7.5.2 (B)**) states: '*A trenchless crossing is proposed to avoid habitats to the south of Ansell's Grove including Alphamstone Meadows LWS. Existing routes through the woods will be used where practicable by light good vehicles or tracked vehicles. Otherwise, pedestrian access will be maintained over the top of the trenchless crossing. There will be no temporary access route along the trenchless crossing*'.

2.1.5 The trenchless crossing, therefore, essentially acts as a barrier for construction traffic, with access to the east of the crossing coming from the east (Henny Road) and access to the west coming from the A131 via the local road network or a temporary access route to the works as described (see the Access, Rights of Way and Rights of Navigation Plans [APP-012]).

2.2 Local Road Network

2.2.1 The described works are located in the Braintree District where there are a number of narrow lanes, which in some locations are unsuitable for construction traffic, particularly the AIL vehicles. Some of the lanes within the Braintree District are also identified as 'Protected Lanes' under planning policy. These are typically single lane, and some

sections have historic hedgerows and banks along the roads that form part of their character. If the existing highway were to be used, the character of the Protected Lanes would be affected by any proposals to widen these roads and temporarily by the increased use of the roads by construction vehicles.

2.2.2 The nearest A road with capacity to accommodate two-way HGV flows to the described works without conflict is the A131, which connects the towns of Halstead in the south and Sudbury in the north. The A131 then provides connections to the south to the A120 and M11. Once leaving the A131, all routes in the vicinity of the works described above are characterised by widths of less than 5.5m, with extensive sections of much narrower width and tight bends. There are roads on which even LGVs could pass only with some difficulty, often requiring one vehicle to reverse. Examples of roads of this nature include Collins Road, Twinstead Road and Lorkins Lane.

2.2.3 Photos showing the typical local road network in the area are provided in Figure 2.1 and 2.2 below:

Figure 2.1: Cripple Corner OS Ref TL8604 3466



Figure 2.2: Unclassified Road OS Ref TL8508 3519



- 2.2.4 The network supports dispersed residential properties in villages and scattered other homes, agricultural businesses with large associated farm vehicles, and other businesses including a distribution depot. Traffic flows are low, so the poor road standards do not present daily issues and these local roads are reported by local stakeholders as largely operating acceptably in normal conditions.
- 2.2.5 With the narrow road widths, an AIL would not be able to pass a car or any other vehicle, so in practice the routes used would have to be widened extensively in cross section and over a long distance; converted to one-way operation; or closed for every time that an AIL vehicle movement occurs. Given that there are issues across most of the network after departing the A131, route closures would be numerous, potentially temporarily restricting access to properties.
- 2.2.6 Similar conflict between opposing vehicles would affect all other construction-related HGV, which are of a size that they too would be unable to pass another vehicle on the majority of roads between the A131 and the CSE compound. This scenario occurs already on the network, affecting agricultural or delivery vehicles, including those travelling to and from a distribution depot. However, with low flows on the network, the conflicts happen infrequently so vehicles waiting and/or reversing to pass one another can occur without it necessarily causing safety concerns or significant increases to journey times.
- 2.2.7 As explored in Section 3 of this Technical Note, the forecast numbers and types of construction vehicles are such that they would create a large increase in these occurrences, including occurrences where one or more construction vehicle interacts. Multiple vehicles in each direction meeting at a location where they cannot pass would

mean that many goods vehicles would be reversing on the network resulting in disruption to users, safety concerns for drivers and hazards to cyclists, motorcyclists and pedestrian routes which typically have no footway or flat verge to walk along. Equestrian users are also known to be present on the local road network. The more occurrences that vehicles meet other vehicles on the network, the greater the increase in journey times for all users and the greater the chance that it leads to vehicles blocking the highway entirely.

- 2.2.8 Junctions also reflect the rural character of the network, for example the A131 crossroads junction with Collins Road and Cock Road has no right-turn lane. If all construction vehicles including ALLs were turning right into Collins Road and left-out, those waiting to turn right into Collins Road would block the left-out manoeuvre for a large vehicle which would need to swing onto the northbound lane to turn. This may occur very occasionally at present, and result in one of the vehicles reversing to accommodate the other. When additional longer and wider vehicles are present, a blockage would be likely to occur more frequently, increasing the number of vehicles reversing within the junction or back along the narrow residential frontage in Collins Road. While the A131 could be widened to ease the turning movement, Collins Road is of a width that to accommodate two-way HGV flow it would be likely to require removal of hedges to residential properties and widening using land that is currently residential gardens.
- 2.2.9 Table 3.1 in Section 3 of this Technical Note shows that the monthly numbers of vehicles that would be travelling to and from the works outlined above. This number of vehicles would, without extensive widening, lead to very significant delays on the network and create potential safety issues due to the numbers of difficult manoeuvres required.
- 2.2.10 The alternative of a one-way system on the local road network would require less widening but would be in place for the duration of construction activities (up to four years) affecting every residential and commercial movement on the affected roads. It was, therefore, not pursued because the impact on all journey times for local communities for such a long period was considered unacceptable.

3. Traffic Movements

3.1 Vehicle Types

3.1.1 Vehicle classifications are given in the Design Manual for Roads and Bridges, in reference document CD 224 (Revision 0) Traffic Assessment (Highways England Et al, 2020). Goods vehicle falls into three categories:

- Light good vehicles (LGV) - Vehicles under 3.5 tonnes maximum gross weight.
- Those over 3.5 tonnes maximum gross weight are classified as 'Other Goods Vehicle' (OGV, referred to as HGVs in this report), and must be compliant with The Road Vehicles (Construction and Use) Regulations 1986:
 - OGV1 denotes a rigid vehicle with 2 or 3 axles; and
 - OGV2 denotes a 4-axle rigid or any articulated vehicle.

3.1.2 Any vehicles larger than categories OGV1 and OGV2 are categorised as AIL movements. The vehicles that bring the large drums carrying the cable to the site are AILs and must have a police escort to and from the site. Details of those vehicles are given in Section 4 of this Technical Note.

3.2 Vehicle Numbers

3.2.1 The total projected LGV, HGV and AIL flows on the temporary access route off the A131 between Access point H-AP20 on the A131 and the described works are shown in Table 3.1 below. The forecasted traffic flows combine diverse materials and site support (including welfare facilities) coming from different organisations and from multiple locations. This means that the dates and times of individual supply vehicles cannot reasonably be coordinated, and clusters of vehicles may arrive at once causing sudden congestion affecting operation (the effectiveness of scheme supply and of 'business as usual' use for local road users) and emergency access. This can easily be managed where a dedicated temporary access route is provided but would be challenging to manage using the rural local road network.

3.2.2 It should be noted that Table 3.1 includes vehicles carrying materials for the construction of a temporary access route itself, so flows would be marginally lower for an access option without a temporary access route. The number of HGV movements to import the materials for the temporary access route off the A131 would be approximately 1,050 vehicles depending on the detailed design and the appropriate depth of stone. Construction of the temporary access, therefore, represents less than 8% of the forecasted HGV flows.

3.2.3 If no temporary access route were provided off the A131, extensive widening works would be needed on the local roads, resulting in deliveries of goods and materials and road closures to execute the works (because very few of the affected roads are wide enough to maintain a clear 3m lane), a safety zone for workers and achieve sufficient working space to execute the works. Whilst the amount of material to widen the existing road network would be less than to build the temporary access route, the complexity would be much greater. Additional vehicles would be required for moving constraints from the working area such as existing utilities, street furniture/signage, traffic management, vegetation removal, installation of culverts, works to junctions and works to boundary treatments. Therefore, whilst there would be fewer vehicles required to deliver stone, the

1,050 vehicles to transport materials for construction of the temporary access route are unlikely to be substantially more than would be required for the works to the local network. Therefore, it can be assumed that the vehicle numbers in Table 3.1 would need to be routed along the local highway network if no temporary access route is provided.

- 3.2.4 The programmed construction vehicle numbers for the project set out in the Transport Assessment [APP-061] for travel between the A131 and the described works vary by month, and are given as figures for round trips e.g., 300 LGV and 600 HGV in the first month equates to 900 vehicles entering and 900 vehicles leaving site in the month, i.e. 1,800 vehicle movements per month.
- 3.2.5 The baseline daily flows on the A131 are given in Figure 12.4 in ES Volume 6 Figures Part 9 [APP-154]. The baseline daily flows are 3,622 light vehicles (including cars) and 606 HGVs northbound; and 3,795 light vehicles and 537 HGVs southbound, see Table 3.2 below. To increase the accuracy of construction information on the project, contractors experienced in delivering transmission projects were appointed by the Applicant to provide information such as the vehicle numbers presented in Table 3.1.
- 3.2.6 The overall indicative programme is set out in ES Appendix 4.2: Construction Schedule [APP-091]. The works as described, excluding the GSP, are anticipated to take up to four years however it has been assumed that the works as described in this location will only be required over a three year period as outlined in the numbers below.
- 3.2.7 The programme shows duct installation for the cable in the underground sections in June to August 2025 and cable installation within those ducts in September and October 2025. The estimated 50 AILs are, therefore, expected to travel through the temporary access route off the A131 in those latter months and have been shown equally across the two months. In reality, timings of these deliveries are subject to change and will depend on arrival and transfer arrangements including escort by police vehicles.

Table 3.1 Forecast Construction Traffic Journeys from the A131 Connection (Access Point H-AP20) to Oak Road Crossing (H-AP19/H-AP18) by Month

Month	LGV journeys/ month	HGV (OGV2) journeys/ month	AIL journeys/ month	Total Goods Vehicles journeys/ month
Oct-24	300	600		900
Nov-24	150	700		850
Dec-24	300	700		1000
Jan-25	300	600		900
Feb-25	300	600		900
Mar-25	300	600		900
Apr-25	300	400		700
May-25	600	500		1100
Jun-25	600	600		1200
Jul-25	600	400		1000
Aug-25	600	400		1000
Sep-25	600	400	25	1025

Month	LGV journeys/ month	HGV (OGV2) journeys/ month	AIL journeys/ month	Total Goods Vehicles journeys/ month
Oct-25	600	400	25	1025
Nov-25	600	400		1000
Dec-25	600	400		1000
Jan-26	600	400		1000
Feb-26	600	400		1000
Mar-26	600	400		1000
Apr-26	600	400		1000
May-26	600	400		1000
Jun-26	600	300		900
Jul-25	300	300		600
Aug-25	300	300		600
Sep-26	300	300		600
Oct-26	300	300		600
Nov-26	400	300		700
Dec-26	450	200		650
Jan-27	450	200		650
Feb-27	300	300		600
Mar-27	300	300		600
Apr-27	300	400		700
May-27	300	400		700
Jun-27	300	120		420
Jul-27	300	400		700
Aug-27	300	400		700
Sep-27	300	400		700
Total (round trips)	15250	14620	50	29920
Total (one-way movements)	30500	29240	100	59840

Table 3.2 Typical Daily Traffic Flow on A131: Baseline and Works Traffic from ES Figure 12.4 [APP-154].

Month	Baseline Daily Flow		Typical Daily Works Flow	
	A131 Northbound	A131 Southbound	A131 Northbound from Access Point H-AP20	A131 Southbound to Access Point H-AP20
Light vehicles (including LGVs, Cars, Minibuses)	3622	3795	74	74
HGV	606	537	17	17

3.2.8 Table 3.2 above shows that the numbers of works-related vehicles (see Table 3.1) are relatively small in comparison to current A131 traffic flows. The works related traffic would typically increase light vehicle and HGV traffic on the A131 by 2-3% during the construction period. Therefore, the impact on the A131, which is of a much higher standard than connecting affected roads to the east, is relatively modest. The A131 is of a route standard adequate to accommodate the number and scale of vehicles proposed.

3.2.9 By contrast, on the lower-standard roads between Access Point H-AP20 on the A131 and the described works, baseline light vehicle and HGV flows are approximately 10% of those on the A131. Construction flows would therefore be much higher relative to the baseline daily total and goods vehicle flows. Based on these roads carrying 10% of the HGV/ LGV traffic as the A131, the project would increase the number of light vehicles on the network by approximately 20% and the number of HGVs on the network by approximately 30% for a three-year period over which construction in this area is anticipated.

3.3 Conclusion

3.3.1 The assessment of the number of vehicles on the local road network and the construction traffic generated shows that the traffic numbers can be easily accommodated on the A131. However, other local roads are of a very different character to the A131 in terms of both design (see Section 2) and traffic numbers. On the smaller roads, the construction traffic would lead to a large percentage increase in traffic on the local roads, which are not designed for the amount of traffic that would be generated by the project.

4. Abnormal Indivisible Load Vehicles

4.1 Abnormal Indivisible Loads on the Project

- 4.1.1 An AIL is a vehicle larger than conventional HGV which carry goods on all roads, as defined in The Road Vehicles (Construction and Use) Regulations 1986. Abnormal loads larger than these Regulations allow are only permitted to use the network with specific route authorisation and, where necessary, a police escort when arriving with cable drums and when returning empty to their base.
- 4.1.2 The project would require the use of AILs for delivery of cable drums to the 400kV undergrounding sections. Undergrounding requires installation of cables to transmit 400kV electricity. The cables are of a large diameter and would be delivered to site in continuous lengths of approximately 1km. Therefore, the cables are transported on very large cable drums, on large AILs.
- 4.1.3 The required AIL delivery vehicles are of the following dimensions when loaded with a cable drum:
- Length 28.6m;
 - Width 4.5m; and
 - Height 4.8m.
- 4.1.4 Due to their scale, AILs have a restricted turning circle which affects both their route to the site from the road network and the space needed to safely accommodate the vehicles on arrival.
- 4.1.5 There would be approximately 200 two-way AIL traffic movements across the project, of which 50 would travel to the described works area (100 movements in total with 50 accessing and 50 leaving the site). Photos and illustrations on the following pages provide an indication of the scale of the AIL vehicles.

Figure 4.1: Indicative 60.0 te cable drum carried on 2 axle bed 4 axle modular reeling trailer

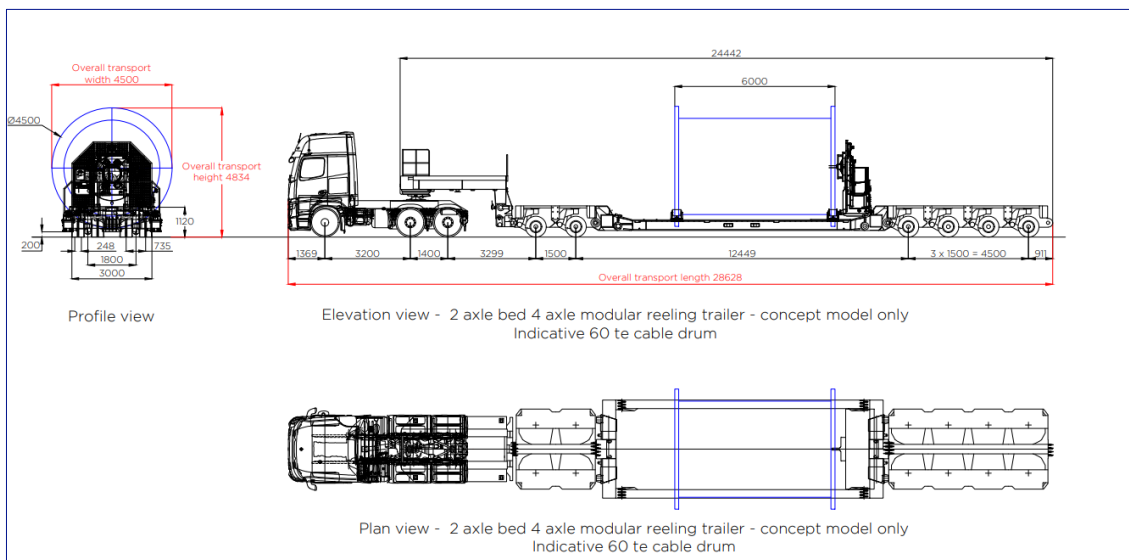


Figure 4.2: Example Cable Delivery AIL



Figure 4.3: Example Cable Delivery AIL



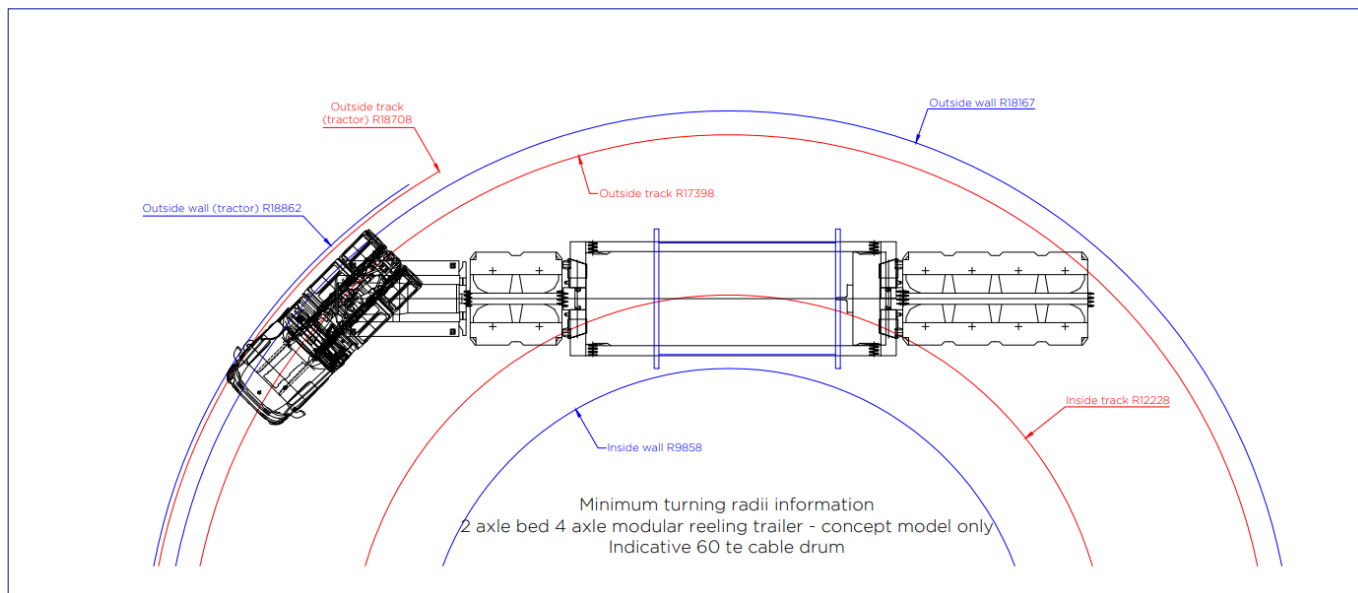
Figure 4.4: Example Cable Delivery AIL



Figure 4.5: Cable Drum Delivered to Site



Figure 4.6: Extract showing Minimum Turning Radii from indicative 60.0 to cable drum carried on 2 axle bed 4 axle modular reeling trailer showing minimum turning radii



5. Options Considered for Accessing the Stour Valley

5.1 Overview of Approaches Considered

5.1.1 A range of options were considered and evaluated for the works as described in the Stour Valley. The works-related traffic flows to be accommodated, as set out in Table 3.1, comprise:

- 29,240 movements by rigid HGVs with four or more axles, and articulated vehicles;
- 100 movements by AILs; and
- 30,500 movements by LGVs.

5.1.2 The Applicant considered three main approaches to accessing the described works:

- Approach A: The use of the existing local road network by construction traffic;
- Approach B: A temporary access route from the A131; and
- Approach C: A hybrid approach using both the existing local road network and temporary access routes in the most constrained areas.

5.1.3 The key objectives, benefits and drawbacks for each of the approaches above are summarised in the sections below with examples of the options considered. A plan showing the constraints in this area of the project is presented in Figure 5.1 in Appendix B and a plan showing all nine options described in this report is provided in Figure 5.2 at Appendix C.

5.1.4 In addition, the Applicant also examined and discounted two other related possibilities:

- The use of smaller cable drums which could be transported on smaller vehicles. This was dismissed as although smaller, the transportation vehicles would still be large and considered to be AILs. This, therefore, would present the same constraints in using the local road network as using larger cable drums. Smaller cable drums also mean that smaller lengths of cable can be transported and, therefore, additional connection points and link pillars would be required. It would also mean a greater number of vehicles on the network; and
- The use of a holding bay for cable drums after leaving the A131 and transfer to a smaller vehicle. This was found to be impractical because the size of the cable drum would mean that the same size of AIL would then be required to transport the cable drum to where it is needed. A smaller vehicle could not be used to transport the cable drums further on the local road network. The cable drum is also typically used to dispense the cable to where it is required on arrival, so the AIL is returned only after the cable has been installed taking the redundant cable drum with it.

5.1.5 Neither of the options above would solve the issue of needing AILs for deliveries or the number of vehicles being large in the context of the local road design and baseline traffic. They were therefore discounted.

5.2 Approach A: Use of the Existing Local Road Network

- 5.2.1 The Applicant undertook a non-statutory consultation and a statutory consultation for the project where the Applicant proposed that construction traffic would use the local road network to access the works described. It was however acknowledged at this time that Cripple Corner is not considered negotiable by construction traffic without major remedial works and an access off the road network at that location would be needed to avoid this constraint.
- 5.2.2 Consultation feedback received expressed concern regarding the use of the local road network by construction traffic. This aligned with the Applicant's ongoing investigations which confirmed that the local road network would need to be modified to accommodate the type and number of construction vehicles anticipated.

Design Considerations

- 5.2.3 The Applicant appointed transportation specialists to investigate the ability of the local road network to accommodate AILs travelling from the A131 to the described works. This investigation included site visits, route inspections, lidar survey and swept path analysis to explore possible AIL accesses via Collins Road, Oak Road and Cripple Corner (noting that there are limited routing options in this location). The investigations assumed the vehicle shown in Section 4 of this Technical Note would be used.
- 5.2.4 The investigations concluded that whilst a route could possibly be made suitable for AIL delivery vehicles, significant remedial works would be required at various locations, some of which would involve the need to access third party land. In summary these remedial works would include:
- The pruning of hedges and trees (and to remain pruned while the route is in use) to enable 4.5m wide loads to use the route;
 - Temporary road widening (ground conditions would need to be investigated if any amendments were to be made to the road alignment on a temporary or permanent basis; land ownership would need to be investigated, tree and hedge removal would be required). Detailed topographical survey and swept path analysis would determine the extent of requirements and area required for remedial works;
 - Removal of boundary features placed by private landowners for example in Collins Road;
 - Removal of street furniture such as signposts and roadside railings protecting ditches such as at Twinstead Road;
 - Overrun of grass verges and triangular sections of grass at junctions between the sides of the carriageway;
 - Confirmation on the structural suitability of culverts would need to be examined before routing is confirmed;
 - Possible relocation of wooden pole supports for power lines and/or telecommunications needed and likely diversion of services. All of the affected routes have lines close to the carriageway;
 - Remedial works would be required to enable access at a number of junctions;
 - The verge of the road in a number of locations is approximately 0.5m above road level therefore there are a number of earth embankments that would need to be levelled;

- Cripple Corner is not considered negotiable without major remedial works; a temporary access road would be necessary here (the access road would need to be designed to avoid underground services/ old well pumps in this location); and
 - There is some evidence of road deterioration; a pre and post movement/construction survey would need to be undertaken to confirm the condition of the road.
- 5.2.5 The remedial works required to make the local road network suitable for AILs (or indeed two-way HGV movement) would have environmental consequences involve culverting ditches (from road widening/ creation of safe passing places), removing sections of hedgerows/ trees (landscape and visual and ecological effects), re-grading of earthbanks which are characteristic in the area and trafficking over grass verges. There is the possibility of other environmental effects associated with diverting existing services/ utilities.
- 5.2.6 The Applicants investigations also raised concerns relating to:
- The presence of wooden pole power lines/telegraph poles running immediately adjacent to the highway;
 - The presence of underground services along the route;
 - Horses and walkers regularly crossing/ using roads; and
 - The cost and design associated with major civil engineering works, third-party utilities and subsequent reinstatement.
- 5.2.7 Following the investigations, it was concluded that due to the overall status and alignment of the roads east from the A131 to the works, the preferred access option would be for a temporary access route rather than use of the local road network. It was noted that the temporary access route would need to be designed considerate of all turning circle and loading requirements.

Consideration of Effects

- 5.2.8 The existing local road network east of the A131 does accommodate HGVs, being currently used by farm machinery and a logistic depot sited at Cripple Corner. However, as described above, the vehicles required for the works as described would be much larger in size than those using the existing local road network and the works would generate a large number of movements during construction that would need to be accommodated in addition to existing traffic.
- 5.2.9 AIL movements would be transported in up to two vehicle movements at any one time. This is a stipulation of the local police escorts who have expressed concern in the event of three vehicles being moved and one breaking down blocking the local road network.
- 5.2.10 After exploring the local road network and through discussions with local affected persons, two routing options were considered for further investigation along the existing local road network, Option 1 (as presented in ES Chapter 3: Alternatives Considered [APP-071]) which routes from Catley Cross; and Option 1a, which routes from Collins Road. See Figure 5.2 in Appendix C for the routes of 1 and 1a on the local road network. The junctions from the A131 at Catley Cross and Collins Road are currently not suitable for the vehicles proposed and it would be challenging to upgrade them due to adjacent properties so that they were suitable. The access locations are also not ideal from a highway visibility perspective so additional measures would be required. Both routes have constraints.

5.2.11 There are various ways to accommodate the combined existing and construction traffic, which would include combinations of the following components:

- **Exclusion of existing traffic from some roads and accommodating only works traffic on those roads.** This is not practicable for links with accesses to residential or commercial premises or field accesses. All potential links include one or more of these features so this option cannot be pursued.
- **One-way operation on some local road network elements for construction traffic and existing users.** This might reduce the scale of widening required, but would require total adherence by all vehicles, with no intentional or unwitting wrong-way driving. This one-way approach is supported by some Relevant Representations received: for example Little Maplestead Parish Council [RR-017] requested: ‘*Use the Collins road junction, for traffic coming from the Halstead direction, and then joining the A131 at the Catley Cross junction for the return traffic.*’ This presumes two-way AIL and other HGV traffic on the rest of the route which is typically no wider than Collins Road, and with marked alignment constraints especially at Cripple Corner.

A one-way system could not be confined to the Collins-Road/Cattley Cross/A131 triangle of roads because the other affected links are of an equally poor width and alignment. One-way operation for all of the sections inadequate for two-way substantial HGV use would cause substantive diversions for existing vehicle users over the full construction period. It would also require large scale road sign and road marking installation to alert drivers to the changes, and many of the signs would require illumination with impact on the rural road character. Many two-way links would need to have turning restrictions introduced and these would also require illuminated road signs and road markings. The complexity of the network would be high and ‘muscle memory’ of familiar routes, or intentional wrong-way driving at quiet times would be likely. With seven-day working including bank holidays necessary to meet the programme requirements, such wrong-way driving would be likely to impact on construction traffic.

Such an extensive one-way route would also need to include Pebmarsh Road through Pebmarsh village with impact on all residents and businesses for the duration of the construction activities. Even with one-way operation, extensive haunching and other works would be required such as bend widening/straightening; ditch piping and tree and hedge removal. This option was, therefore, rejected on the grounds that it would have implications for highway safety and significant issues if the system was not adhered to. Whilst the scale of works to widen the road would be reduced by a one-way system, works would still be required to widen the road, and additional works required to implement and manage the one-way system and effects on existing road users. This option was therefore not considered to be a reasonable alternative given the presence of safer, more practical options.

- **Widening of junctions** to accommodate the swept-path of large vehicles. At present, infrequent large vehicles may over-run a verge locally but the scale of works traffic would cause substantial verge damage leading to destabilisation of vehicles and dragging of soil and other debris onto the road, both which would be unsafe. Even if Collins Road were closed to all but construction traffic for this project, the constraints would cause substantial disruption. A131 junction with Collins Road would have to be remodelled to create sufficient space for a northbound AIL to wait to turn right at the same time that another HGV is exiting Collins Road and turning left. This in turn may require the closure of Cock Road; the purchase of properties fronting Cock Road and/or A131 to expand the junction and enable vehicles to exit Cock Road; or drivers

would have to wait for a protracted period for a right turning AIL or other HGV to gain access to Collins Road. The work required at junctions was significant and contributed to the decision not to proceed with Approach A.

- **Widening of highway links** to provide passing bays sufficient for all occasions when larger vehicles need to pass one another. These occasions are infrequent at present so can be accommodated with drivers waiting for an oncoming vehicle, and occasional reversing to a passing place, typically by the smaller vehicle involved. Such occasions would be numerous with construction traffic, with pairs of goods vehicles meeting without space to pass, and further vehicles behind them preventing reversing to a passing place. This would therefore require extensive sections of widening to enable multiple HGVs pass an AIL without reversing. Some locations, where roads are particularly narrow, especially on junction approaches, would require land-take for the duration of the works. Such widening would require excavation of verges and adjacent field margins; piping of ditches; and hedge and tree removal in highway land or field margins. This would also include removal of mature hedges and trees, and sections of private gardens fronting the road, for example at Collins Road if two-way HGV flow were to be accommodated.

- 5.2.12 Even with extensive widening and associated works and/or extensive one-way network, the impact on residential and commercial premises of a local road network solution to traffic routing is much greater for Approach A, than for a temporary access route approach (Approach B). In addition, the scale of goods vehicles, including reversing to pass each other, would present hazards to local road users in vehicles, and on foot, cycle motorcycle or ridden horse.
- 5.2.13 The measures described above, in any combination of one-way and widening, show that the AIL cable-drum delivery vehicle and two-way HGV could be accommodated on public roads but with substantial works and adverse impacts on road users.
- 5.2.14 The benefit of Approach A would be to reduce impact on agricultural or other private land; avoid the impacts on the limited environmental features affected by the temporary access route (e.g. temporary effects on the soil resource, existing hedgerows and impacts on public rights of way (PRoW)). The environmental impacts of the temporary access route can be limited through sensitive design, routing and reinstatement following construction. Approach A is not considered to be a reasonable alternative due to the works required to the highway, works required to move existing utilities and boundary treatments, impact on local road network users, impact on local communities and safety concerns described above.
- 5.2.15 Even if Approach A was a reasonable alternative, this option would still require acquisition of land outside the highway boundary for road widening and would also lead to environmental effects such as the removal of hedgerows and trees to accommodate widening (potentially on protected lanes). In contrast to the temporary access route, there would be limited options to avoid high value trees or hedgerows if widening works were required in that location and could require lengths of hedgerows to be removed alongside the highway rather than a section removed for the access to pass across. The works to widen the road could be more challenging to remediate following construction due to the need to again affect road users and would therefore temporarily or permanently change the character of the roads.

Approach A Conclusion

- 5.2.16 Approach A has been rejected for the reasons above. It is not considered to be a reasonable alternative in the context of the potential to construct a temporary access route.

5.3 Approach B: A Temporary Access Route from A131 to the Described Works (The Proposed Approach In The DCO)

Design Considerations

- 5.3.1 Approach B proposes the construction of a temporary access route from the A131 to the works as described at and around the Stour Valley West CSE compound. The A131 would be the starting point as this is the nearest part of the network to the works as described that can accommodate construction traffic without significant upgrade works being required.
- 5.3.2 The location of the access point off the A131 is a key consideration requiring a relatively straight section of road that is large enough for a right turn ghost island that can accommodate two AILs. Other key considerations are proximity to residential properties, visibility for safe access and egress, separation from other junctions and the road width or verges being sufficient for installation of the ghost lane.
- 5.3.3 The temporary access route would also need to be designed to accommodate two AIL delivery vehicles to park and wait once off the A131 until the construction site is ready for them to be delivered to a storage area or work site and to accommodate the turning circle of the proposed AILs.
- 5.3.4 To reduce the length of the temporary access route off the A131, minimise the land acquisition and the area of land affected, the temporary access route needs to start at a location along the A131 that is not too far north or south of the Stour Valley West CSE compound. This means that a maximum search area for the start of the temporary access route would be the section of the A131 between Old Road to the north and School Road to the south. Any route further north/south than these points would need to demonstrate great benefits over those of a shorter distance to justify the impact of a larger area of land, additional DCO powers including acquisition of rights, and increased costs of construction.
- 5.3.5 For all options, a temporary access route would require gating and security to ensure the temporary access route is not used by non-construction traffic or would otherwise present a security threat to the construction site or to private property. The proposed rights for any option would be predominantly for the construction and use of the temporary access route during the four-year construction period, or shorter three year period for construction of works in this area. After this period the temporary access route would be removed and the land reinstated. However, a permanent right of access over the extent of this temporary access route would be sought so that the access could be reinstated for exceptional deliveries, for example if the underground cabling needed to be replaced and drums carrying the replacement cable needed to be brought to site. In reality, this is not a likely occurrence but it is necessary that the Applicant has this option given the importance of retaining a reliable, secure and safe electricity network.
- 5.3.6 North of Catley Cross any temporary access route would need to be routed to avoid Twinsteadhall Wood Ancient Woodland, necessitating that routes either route around the wood to the north, or travel south of the wood leaving sufficient buffer to avoid affecting

trees and protected species within the wood (usually considered to be 15m). The routes would also seek to avoid assets recorded on the Historic Environment Record and Local Wildlife Sites (LWS) as far as possible.

- 5.3.7 Any route selected would need to meet the design requirements for AILs. All options within Approach B would deliver significant benefits over Approach A in terms of the impacts on the safety of motorised and non-motorised users of the local road network, reduction in works required to the local road network and the resultant impacts on both local road users and adjacent properties.
- 5.3.8 All Approach B options would be predominantly routed over agricultural land and would have a temporary impact on the productivity of agricultural land during the construction period. Compensation would be provided for these impacts and is delivered outside the planning process. Measures are also in place through the Management Plans to minimise impacts on soils and existing vegetation as far as possible and manage drainage during the construction period. All options can also be routed to avoid particularly important features, such as veteran trees, and the temporary access route itself would be removed after the construction period. This means that there would be no significant environmental effects beyond the construction period for any of the options considered. Therefore, the main factors influencing decision making are the need to minimise the amount of land to be affected (and the compulsory acquisition of rights over that land), minor differences in environmental impacts between options, ensuring access points and routes are suitable and safe for the vehicles proposed, addressing comments from interested parties and delivering a cost-effective solution.

Consideration of Effects

- 5.3.9 Four main options were considered for the routeing of the temporary access route, with minor modifications to routes also considered through the process. These options are explored below.

Option 2c: Access at Targeted Consultation (September 2022)

- 5.3.10 This option is approximately 3.5km in length and was consulted upon during Targeted Consultation in September and October 2022. This option was added to the project between Statutory Consultation and Targeted Consultation in response to assessments on the potential use of the local road network and concerns raised on the suitability of the network for construction traffic numbers and scale. Option 2c provides a relatively direct route, avoids passing in close proximity to designated sites and provides separation distances from existing properties as far as possible. Option 2c exits the A131 along a straight part of the A131, providing good visibility to both the north and the south from the new junction and good visibility along the A131 for vehicles not accessing the temporary access route. This is important given the number and size of vehicles using this access point and provides a contrast between this access point and accesses at other locations along the A131.
- 5.3.11 Option 2c would provide a fully off-road route except for four road crossings (including the access to Cobbs Farm), travelling from the A131 to Henny Back Road starting from a location north of Collins Road. The four locations where the temporary access route crosses over the local road network would require controls, possibly involving traffic signals, to operate safely.
- 5.3.12 This route is approximately 100m south of Twinsteadhall Wood and would not pass through any areas designated for ecological purposes. The route would affect existing

hedgerows and trees but routeing to avoid veteran and high value trees and utilise gaps in hedgerows would minimise impacts. Hedgerows could be replanted following construction. Option 2c lies within 160m of Collins Farm a Grade II listed building and 60m of the Grade II listed buildings at Dagworth Manor (although the existing highways falls between Option 2c and Dagworth Manor). Other Grade II listed buildings are at a greater distance from the temporary access route such as Magnolia House, Charity Cottage and Abbots (formerly Ivy Cottages) all of which are greater than 160m from Option 2c. Where Option 2c exits the A131, historic field boundaries are noted on the Historic Environment Record.

- 5.3.13 Option 2c crosses Lorkins Lane and terminates at Henny Back Road which are Protected Lanes under BDC local planning policy. However, the impact of crossing these lanes would be less than using them for access (Approach A).
- 5.3.14 Option 2c crosses three PRow and runs alongside a PRow south east of Twinsteadhall Wood for approximately 460m. It also crosses two minor watercourses, one of which has a 65m wide flood zone (Zones 2 and 3).
- 5.3.15 Option 2c crosses agricultural land and would have a temporary effect on agricultural production along the route of the temporary access route. This is true for all temporary access route options, although each affects different landowners.
- 5.3.16 Overall, Option 2c was designed to avoid site constraints and is considered a viable and reasonable temporary access route. Following Targeted Consultation, affected persons provided feedback on the routeing of this option and changes were made to the route particularly to reduce the impact on agricultural operations and drainage. Changes were made particularly in response to comments made by affected persons at the eastern and western ends of the temporary access route. The amended route is presented here as Option 2a below.
- 5.3.17 **Conclusion: Option 2c is a viable option but amended in response to consultation to form Option 2a.**

Option 2a: Amended Option 2c Following Consultation

- 5.3.18 Option 2a is broadly similar to Option 2c, with the same access point off the A131 but with the route modified in response to consultation feedback, particularly from affected persons. The western section was realigned north to reduce the impact on the agricultural holding by aligning more closely to field boundaries, and the eastern section has been aligned to in accordance with a request from the affected party. This is the route in the application for development consent.
- 5.3.19 Consultation was carried out on additional land affected by the change since Option 2c during an additional consultation in January 2023. The temporary access route for this option is longer than Option 2c and there would therefore be an increase in materials required for construction, area of the temporary access route and journey times. However, the change was proposed in response to comments from affected persons to reduce the impact on existing agricultural activities and the minor increases in costs and journey times was considered to be outweighed by the reduction in impact on affected persons and agricultural activities.
- 5.3.20 **Conclusion: This is the preferred option and the option included in the application for development consent.**

Option 2b: Temporary Access Route from Lodge Farm

- 5.3.21 Option 2b is a 3.5km route commencing at the junction between the A131 and Old Road. It then heads east along the existing local road network to Lodge Farm, before running south-east to cross Church Road west of Twinstead. The route avoids the ancient woodland at Twinsteadhall Wood, then crosses Lorkins Lane before entering the Stour Valley West CSE compound via a more southerly route. The route passes closer to the Twinsteadhall ancient woodland than the more southerly options and travels alongside it for its length. Impacts could potentially be reduced by moving the route further east at Twinsteadhall Wood, although this would then bring the route closer to the woodland to the east at Furzeground. This route also passes through an area identified on the Historic Environment Record (HER), which is unaffected by all other options. This route would cross the Protected Lane at Lorkin's Lane, which is also crossed by Options 2c and 2a.
- 5.3.22 Option 2b presents a reasonable alternative to the selected option but was not selected because it is worse than other options with regard to potential environmental effects by passing close to the ancient woodland and passes through a larger area listed on the HER. The shortest route between the described works and the strategic road network would be travelling between the A131 and the A131/A120 Marks Farm Roundabout outside Braintree. This means that construction traffic would predominantly travel north along the A131 to reach the described works. Therefore, option 2b would retain construction traffic on the A131 for a greater extent through Catley Cross compared to all other options. This route is therefore less efficient in getting construction traffic off the road network and means construction vehicles would travel a longer distance to get to the temporary access point as they need to travel north along the A131 and then double back to head south east towards the described works.
- 5.3.23 This option would create a shorter temporary access route than Option 2a, but not significantly so, and it would be longer in terms of the distance travelled by construction vehicles. It would affect agricultural land in a similar way to Option 2a and would be broadly similar in terms of the impact on existing activities.
- 5.3.24 **Conclusion: Overall this route is not preferred over Option 2c and Option 2a because it is located closer to the ecological receptors associated with Twinsteadhall Wood ancient woodland and would result in construction traffic travelling further on the local road network. It also passes through a larger area recorded on the HER than Options 2c and 2a. The shorter length of the road was not considered to outweigh these potential adverse impacts.**

Option 2d: Option South of Collins Road

- 5.3.25 Option 2d is approximately 4.5km in length so is the longest of the routes considered. This route starts south of Gallant's Farm, before travelling adjacent to Collins Road between the A131 and Oak Road. Between Oak Road and the described works the route is broadly the same as Options 2c and 2a, before deviating to run adjacent to Lorkin's Lane and south-east to the Stour Valley West CSE compound.
- 5.3.26 The access point proposed for this route is on a shorter, straight section of the A131, presenting worse visibility than would be available for Options 2c, 2a and 2b in both directions. This would be less preferred from a highways and safety perspective compared to the other options presented. The access point and the alignment would also be closer to existing residential properties along Collins Road, with the alignment running behind properties south of Collins Road. Therefore, this route is likely to have a greater impact on residential amenity than the other options.

- 5.3.27 In a number of locations, the route would need to be altered to avoid sharp turns that would be challenging for AIL vehicles to navigate. In particular, where the route turns on to the highway and then runs adjacent to Lorkin's Lane, this alignment shows two right angled turns, which would need to be amended to reflect the needs of vehicles using the route. This route also included vehicles travelling adjacent to Lorkin's Lane. Lorkin's Lane is a Protected Lane so this could temporarily affect the character of the Protected Lane to a greater extent than Options 2a and 2c. For both these reasons, it is suggested that the route would need to be amended near Lorkin's Lane to more closely reflect Option 2a if it had been selected. A similar change to the route alignment would need to be made as the route turns east towards Dagworth Manor to avoid the tight bend.
- 5.3.28 Where Option 2d approaches Dagworth Manor it passes closer to the Grade II listed buildings in this location, although the existing highway falls between the route and the two listed buildings. Option 2d is also located closer to the Grade II listed building at Collin's Farm than the other routes considered and within 60m of the Grade II listed buildings at Gallants Farmhouse.
- 5.3.29 **Conclusion: Overall, this route is similar to the selected Option 2a, but with changes incorporated that mean it performs worse than the selected option. The route starting point has worse highway visibility and is located closer to residential properties than all other options. The route would have a greater impact on Protected Lanes, is located closer to listed buildings and in places would need to be amended to cater for the planned use. Whilst not a determining factor, the route is also longer.**

Approach B Conclusion

- 5.3.30 All the options considered as part of Approach B are considered to be significantly better than Approaches A and C because they remove the majority of the construction traffic in this area from the rural roads that are not equipped to cater for that size or number of vehicles. AIL and HGV construction traffic would have minimal impact on local road users once it turns off A131 at Access Point H-AP20. The road crossings (Access Points H-AP-10 to 19) would all be staffed throughout working hours and access managed to provide road user protection. Staff would also support site security which is important to police, landowners and tenants as well as the main works contractor and the Applicant.
- 5.3.31 Approach B also removes the need for the significant works required to the existing local road network as part of Approach A, and the associated effects of those works on the environment, communities and road users. It is also considered to be a safer and more efficient approach both for construction vehicles and other road traffic.
- 5.3.32 All four of the Approach B options could be designed to be acceptable. However, Options 2b and 2d are considered less preferable than Options 2c and 2a. The access location for 2c and 2a is considered the best of the options considered due to its location on a straight part of the A131 with good visibility in both directions and a location away from properties. Options 2b and 2d are closer to bends in the road with worse visibility and consequently would have greater safety concerns. Option 2d also contains an alignment near Cripple Corner that would need to be amended to cater for AIL vehicles. Option 2a is an iteration of Option 2c, developed to respond to landowner comments, and is considered preferable to Option 2c.
- 5.3.33 All Approach B options pass mostly through agricultural land and would have a temporary impact on agricultural activities in these areas. Option 2a has been influenced by comments from affected persons to reduce the impact of the route on agricultural

activities and drainage. None of the options identified reduce the overall impact on agriculture or landowners to a significant extent compared to other options considered, although it is recognised that the affected persons are different for the different options.

- 5.3.34 Modern construction methods greatly reduce the likelihood of damage to field drains which are understood to have been the source of substantial investment by the affected farmers. Any damage would be repaired in full, leaving the reinstated land with minimal impact once work is complete.
- 5.3.35 Overall, Option 2a is considered to be the preferred option of the Approach B options considered.

5.4 Approach C: A Hybrid Approach (Combination of Shorter Temporary Access Route and Use of the Local Road Network)

- 5.4.1 Approach C aims to provide a temporary access route only for the most constrained sections of the local road network. The three hybrid options have been looked at in detail by the Applicant, all have a combination of temporary access route components at the A131 connection and the Stour Valley West CSE compound and a portion of local road use in between.
- 5.4.2 All hybrid options would necessitate the same types of alterations to those local road network elements of the route as described in Approach A, but they would apply over lesser extents. These works include loss of trees and hedges; ditch piping, levelling verges to accommodate widening of the road across the verge and potentially into private adjacent property, removal of telegraph poles and other street furniture/roadside features.
- 5.4.3 The lesser cost of the temporary access route elements would be offset by the greater on-highway works and management when compared to Approach B, so these may not have a lower out-turn cost and it retains many of the problems of Approach A such as opposing vehicles meeting head on and multiple large vehicles reversing, with delay and safety impacts.
- 5.4.4 A hybrid option would require careful traffic management with construction traffic moving on and off the local road network and would require multiple security points to ensure unpermitted use of the sections of temporary access routes.

Option 3: Hybrid Option A

- 5.4.5 Option 3 has a short temporary access route connecting south of Access Point H-AP20 to join Collins Road. A second section of temporary access route runs parallel to Lorkin's Lane, before crossing that road and crossing fields to the Stour Valley West CSE compound. The total temporary access route length would be approximately 1.7km. Long sections of narrow link between these ends would require widening and altering as described for Approach A in these sections, resulting in a less resilient and more impacted network than for any of the Approach B options. The risks associated with vehicles needing to reverse or interacting to cause blockages would be less than for Approach A, but far greater than for Approach B and are not considered reasonable in the context of options that avoid these risks.
- 5.4.6 The impacts on agricultural activities would conversely be less than for Approach B but greater than Approach A (although the extent of impacts of the widening the local road network should also be borne in mind).

5.4.7 The part of the route along Collins Road would still be accessing narrow lanes with tight corners, including the corner by Dagworth Manor to enter the temporary access route section. The section of local road network from Lorkin's Lane follows the same route as Option 2d and suffers from the same issues, particularly the sharp bends in the route around the agricultural field at the corner of Lorkin's Lane, which would need to be amended for AIL use. As explored in Option 2d above, Lorkin's Lane is a Protected Lane and the construction of a temporary access route adjacent to the lane would affect its character for the duration of the construction works. The final section of the route is the same as for the selected Option 2a.

5.4.8 **Conclusion: given that almost all roads to the east of the A131 that could be used for the project are not suitable for large vehicles or numerous HGVs, a hybrid route is still not considered to be a reasonable alternative. Whilst a hybrid route avoids some of the most challenging junctions, this traffic would all continue to be funnelled down rural roads in between the temporary access route sections. This is not considered to be a reasonable alternative in the context of Approach B options. The route would also have a greater impact on Lorkin's Lane during construction and be closer to the Grade II listed buildings at Dagworth Manor than Option 2a.**

Option 3a: Hybrid Option B

5.4.9 Option 3a is broadly similar to Option 3, with the same eastern component, but at the A131 connection it has a short temporary access route on the southern side of Collins Lane where Option 5 is on the north side. The total temporary access route length is approximately 2.2km. The extent of narrow links requiring widening and altering would be the same as for Option 3, and similarly resulting in a less resilient and more impacted network than for any of the Approach B options.

5.4.10 The additional temporary access route section south of Collins Lane is as proposed for Option 2d (Approach B) and suffers from the same issues: namely that the access is on a stretch of road with worse visibility and passes close to properties located along Collins Road. As for Option 2d, these are not necessarily show-stoppers but would make Option 3a less preferred than Option 3. The route along Lorkin's Lane has the same issues as Option 3 in terms of tight bends and the impact on the Protected Lane.

5.4.11 **Conclusion: overall this option is not a reasonable alternative for the same reasons as Option 3. Additionally, the route is considered worse than Option 3 because the access off the A131 is on a less straight part of the road and is closer to properties.**

Option 3b: Hybrid Option C

5.4.12 Option 3b proposes a connection at Catley Cross but using a new temporary access route section to the east rather than routing vehicles along the local road network. This would involve the creation of a complex four-arm junction, likely to require traffic signals and impacting traffic along the A131. The temporary access route section then connects east-west with Pebmash Road, from where the route is on-road until the same eastern section as Option 3a, being subject to the same constraints. The total temporary access route length would be approximately 2.7km. The extent of narrow link requiring widening and altering would be much shorter than for Option 3a but would similarly resulting in a less resilient and more impacted network than for any of the Approach B options.

5.4.13 This option has the benefit of the shortest on-road section but with the most complex A131 connection. The amended junction would include an acute-angled T-junction having a fourth arm added, which offsets the benefit of the having shortest on-road section.

5.4.14 **Conclusion: this option is considered not to be a reasonable alternative for the same reasons as the other hybrid options, with the additional complexity associated with the Catley Cross junction offsetting the shorter length of local road network impacted.**

Approach C Conclusion

5.4.15 All options considered under Approach C have been rejected because they still require routing of a large number of vehicles, including AILs, over roads that are not designed for the scale or number of vehicles required. The approach would continue to require sections of temporary access road and affect agricultural operations and would still require significant works to the existing highway. A hybrid solution would also have the added complication of managing shorter sections of temporary access route, with associated safety and security concerns. Approach C options are therefore not considered reasonable alternatives for this location given the Approach B options available.

5.5 Temporary Access Route Minor Modifications Considered

5.5.1 In addition to the above a large number of localised modifications to the route of the temporary access route have been put forward by interested parties and affected persons (and their agents) during the pre-application period and post-application. This has included during negotiations on voluntary land agreements (Heads of Terms).

5.5.2 The Applicant has considered these suggestions based on the considerations outlined above and changes were incorporated into the route prior to the DCO application submission. The Applicant does not consider that any other suggestions proposed offer a better overall solution albeit they may have benefits to individual affected persons. It should be noted that the temporary access route as proposed in the application has already taken account of a number of affected person suggestions as described in section 1.2.

6. Design of the Access Road

6.1 Temporary Access Route Design

6.1.1 The temporary access route (Option 2a) would be approximately 3.5km in length as shown on the plans in the application for development consent. It would be constructed using imported stone to a depth of approximately 300mm. Figure 6-1 shows images of typical access roads constructed with stone in similar contexts, although the lower figure shows a storage area along the full length of the road that would not be included on the temporary access route from the A131.

Figure 6.1: Typical temporary access roads constructed with stone



6.1.2 The design of the access point where the temporary access route adjoins the highway would be submitted and approved by ECC as the relevant highway authority under Requirement 11 on the draft DCO (**document 3.1 (C)**). Discussions on the form of this junction have been ongoing, with the design to include a bellmouth and ghost lane for vehicles to exit and enter the A131. It is anticipated that the bellmouth would be approximately 80m in size to accommodate the large vehicles. Figure 6.2 (left image) shows a bellmouth for a temporary access route, although this bellmouth in the image is approximately 50-60m so is smaller than would be created on the A131. Figure 6.2 (right image) shows a crossing point where vehicles travelling along a temporary access route cross an existing road, as would occur at four points on the route.

Figure 6.2: Illustrative bellmouth for a temporary access route and illustrative crossing point



6.1.3 Initial design work on the access point has demonstrated that the access point selected for Option 2a provides the ability to design a safe, accessible junction for the temporary access route.

6.2 Construction of the Temporary Access Route

6.2.1 The process to install the temporary access road would typically involve:

- the installation of traffic management along the A131 for construction of the bellmouth and ghost lane;
- vegetation clearance;
- excavation, installation of a membrane, including installation of curb stones where required and construction of the ghost lane;
- install compacted stone; and
- at bellmouth, where required, install black top layer, road markings, fencing and gates.

- 6.2.2 Where minor watercourses and ditches are anticipated to be crossed it is assumed that up to 10m of channel banks at each watercourse could be affected during installation of the culverts and that the culverts could be in place for the majority of construction (assumed to be four years). The original bank profile and bed levels would be reinstated when the culvert is removed at the end of construction as described in the Landscape and Ecological Management Plan (**document 7.8 (B)**). If water is present within the ditches requiring a culvert, a suitable method for collecting sediment would be installed downstream of the work area, where required, to avoid siltation.
- 6.2.3 For the purposes of the assessment in the ES, it was assumed that the relevant watercourse section would be dammed using sandbags and water over pumped through a filter to the next section of watercourse downstream to enable a dry working area for culvert installation. It is assumed that this would be for a short duration, for example two weeks during the installation of the temporary crossing. The culverts would be backfilled with clean stone or sandbags over the top of the box or pipe. A geotextile membrane would then be placed on the clean stone, and a layer of sub-base material placed and compacted on top of the geotextile. Barriers would be used on each side of the temporary access route crossing to prevent vehicles driving off the crossing point into the watercourse and to prevent debris such as mud from falling into the watercourse.
- 6.2.4 The temporary access route as proposed in the DCO application (including any temporary bridges, culverts and bellmouths) would be in place for the duration of construction (up to four years) to maintain access to the working area and to reduce the number of vehicles using the local road network. However, temporary access routes would be removed where these are no longer required. Any stripped topsoil would be reinstated, and the temporary working areas would generally be reinstated to their former use as described within the Construction Environmental Management Plan (**document 7.5 (B)**).
- 6.2.5 Testing would occur once the project was constructed and prior to operation. Land would be reinstated as soon as reasonably practicable and mitigation planting may continue beyond the construction phase, based on seasonal constraints. The target date for the project to be operational is late 2028.

6.3 Rights Required for the Temporary Access Route

- 6.3.1 In common with all temporary access routes on the project, the Applicant has sought permanent land rights for the Applicant to access the project in the unlikely event that major works should be required in the future. Re-use of the temporary access route off the A131 is not planned for future routine maintenance and repair of the project. Re-use of the temporary access route off the A131 would only be required for large scale replacement of cable infrastructure, an event that may not occur. However, given the importance of ensuring the integrity of the electricity transmission network, it is imperative that this right is retained to enable this access if required. Although the Applicant is seeking a permanent easement, the nature of the temporary access route off the A131 itself would be temporary land use, as the Applicant would still remove it at the end of the construction period and reinstate the land to its original condition. In the unlikely event that the temporary access route off the A131 was required during the operation of the project, the land would again be reinstated after works were complete.

7. Conclusion

- 7.1.1 This Technical Note has been produced to explain the need for the temporary access route off the A131 (referred hereafter as ‘the temporary access route’ in this document) in the application for development consent connecting the A131 at Access Point H-AP20, near Little Maplestead to the Stour Valley West CSE compound. It was prepared in response to various questions from interested parties, affected persons and the ExA regarding the proposed temporary access route off the A131.
- 7.1.2 The existing road network at the western end of the project is characterised by very narrow roads with tight bends and a lack of passing places. In its current form it is not suitable for either the number or the size of vehicles required to construct the project.
- 7.1.3 There is a need to access the location of the Stour Valley West CSE compound for the construction activities required as described in Section 2.1 of this Technical Note. The access options to this location do not include an access along the cable route from the west due to constraints that have similarly led to an approach of installing the underground cable using trenchless crossing rather than open cut installation.
- 7.1.4 Over the construction period 30,000 LGV movements and 29,000 HGV movements are forecasted to access the works in this area. These vehicles include fifty AIL vehicles, which are over 28m in length when carrying a cable drum.
- 7.1.5 The Applicant has considered a number of different options, including using the local road network with closures, works to widen the road and one-way systems. These options are known as ‘Approach A’. All options have been rejected due to the scale of works required to the local road network, the environmental impacts of those works and impacts on adjacent properties and the impacts of the works and the movements on existing road users. Given the extensive nature of works required, Approach A options are not considered to be reasonable alternatives in the context of options to temporarily create an access road off the local road network. There are a large number of roads where two HGVs could not pass one another, therefore one-way systems were also rejected due to the area over which a one-way system would be required, the impact on local communities, the risks associated with drivers not adhering to the system and the impacts of the signage and illumination required to indicate routes.
- 7.1.6 To avoid the extensive impacts associated with Approach A, the Applicant investigated four options to develop a temporary access route (referred to as ‘Approach B’). These routes have been analysed by multi-disciplinary teams, who have concluded that with modifications, all four routes could be acceptable from a highways, land acquisition, environmental and practical perspective. However, Options 2c and 2a had advantages over the others in terms of highway safety, reducing impacts on properties and reducing environmental impacts; with Option 2a emerging as the preferred option due to it also responding to comments received from affected persons. The access point proposed for Options 2c and 2a was also considered to be the preferred location of those assessed from a highways design perspective.
- 7.1.7 Approaches to investigate a hybrid option were also considered (referred to as ‘Approach C’), using temporary access route sections for more challenging areas and then utilising some of the local road network. All these options continued to raise significant issues for the local road network, with significant improvements required. This is due to both the number and size of vehicles required to construct the project. Vehicles moving on and off the local road network at numerous points would also create safety and security concerns

that were not present with other options. Each route also continued to cross agricultural land as per Approach B options. The need to continue to use sections of very rural highway or implement significant improvements meant that these options were also rejected in favour of Option 2a (Approach B).

7.1.8 The selection of an Approach B option and the precise alignment selected (2a) has emerged through iterative stages of consultation and assessment. Whilst there remains interested parties and affected persons who would prefer to see another option implemented, it is the Applicant's position that the option selected (that is included in the application for development consent) is considered to be the most appropriate taking account of the assessment undertaken including: environmental impact; engineering requirements; highway design, access and safety; and consultation feedback.

References

The Road Vehicles (Construction and Use) Regulations 1986

Highways England Et al. (2020), Design Manual for Roads and Bridges CD 224 Traffic Assessment (March 2020)

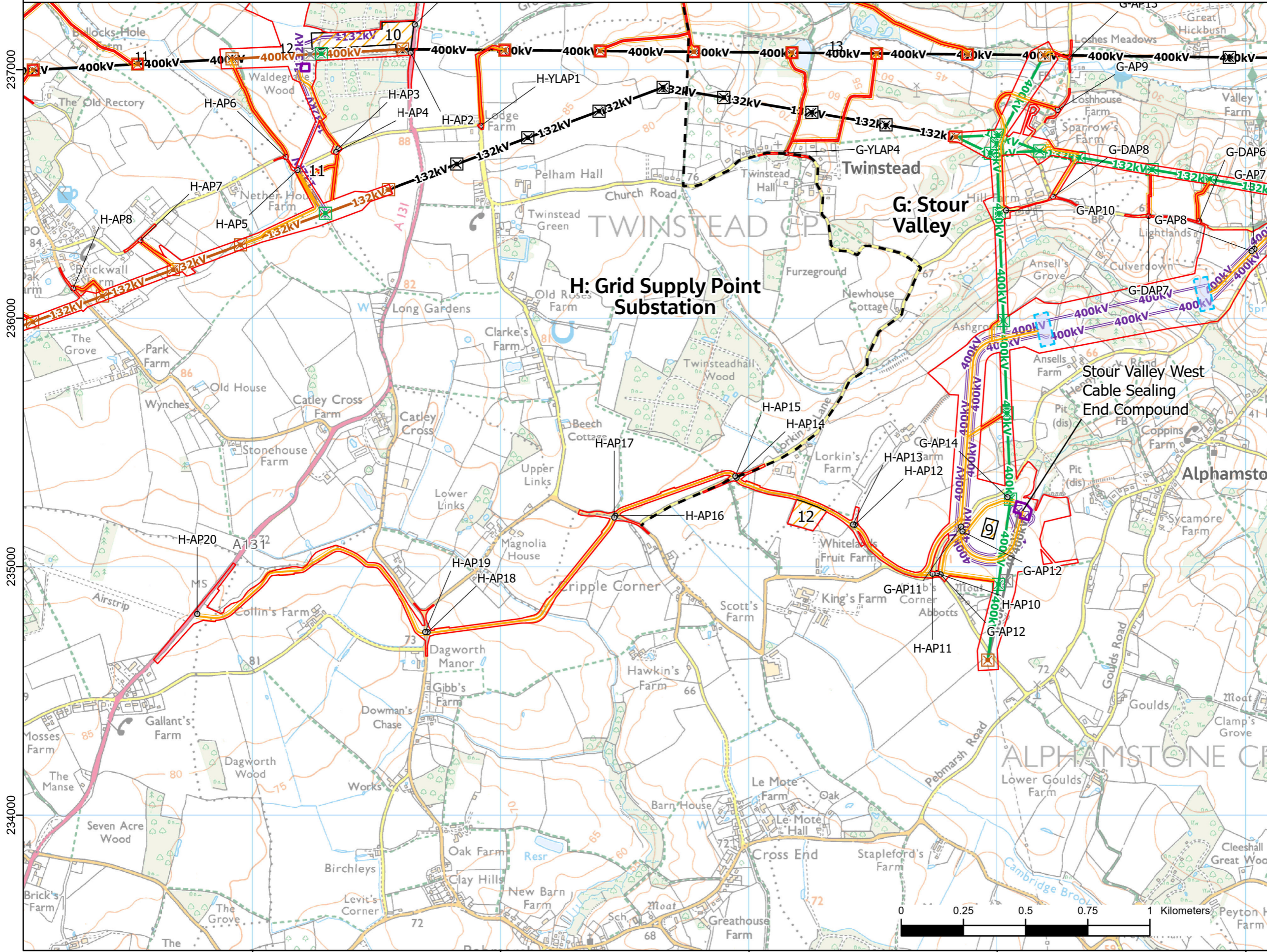
Appendix A: Figure 1.1 Technical Note on Temporary Access Route off the A131 – As Proposed Design and Local Context

Appendix A: Figure 1.1, Proposed Design and Local Context

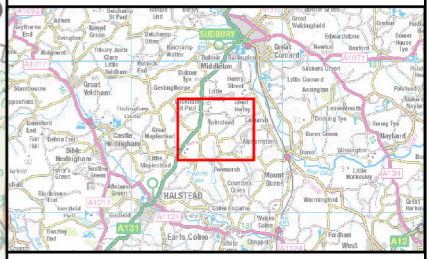


Figure 1.1

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- Legend**
- Section boundaries
 - Order Limits
 - ⊠ Existing pylon
 - ⊠ Existing gantry
 - ⊠ Proposed pylon modification works
 - ⊠ Proposed pylon realignment
 - ⊠ Proposed pylon removal
 - ⊠ Proposed gantry realignment
 - Existing overhead line
 - Proposed modification to overhead line
 - Proposed realignment of existing overhead line
 - Proposed removal of overhead line
 - Proposed underground cable
 - ⊠ Cable sealing end compound
 - ⊠ Assumed horizontal directional drilling pits
 - ⊠ Temporary construction compound
 - Temporary access route
 - Access points



NG Investment No. ETX/01142

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ISSUE	DATE	REMARKS	DRWN	CHKD	APPD

PROJECT: **Bramford to Twinstead Reinforcement**



TITLE: **Figure 1.1
 Technical Note on Temporary Access
 Route off the A131
 – As Proposed Design and Local Context**

CIRCUIT / SITE: **Bramford – Pelham & Bramford
 – Braintree – Bulls Lodge**

ORIGINATOR DRAWING NO. **AAA_BTT_TAR_TN_Fig1_1_Rev0**

NG DRAWING No. XX	SHEET NO. 1	NO. OF SHEETS 1	ISSUE: A
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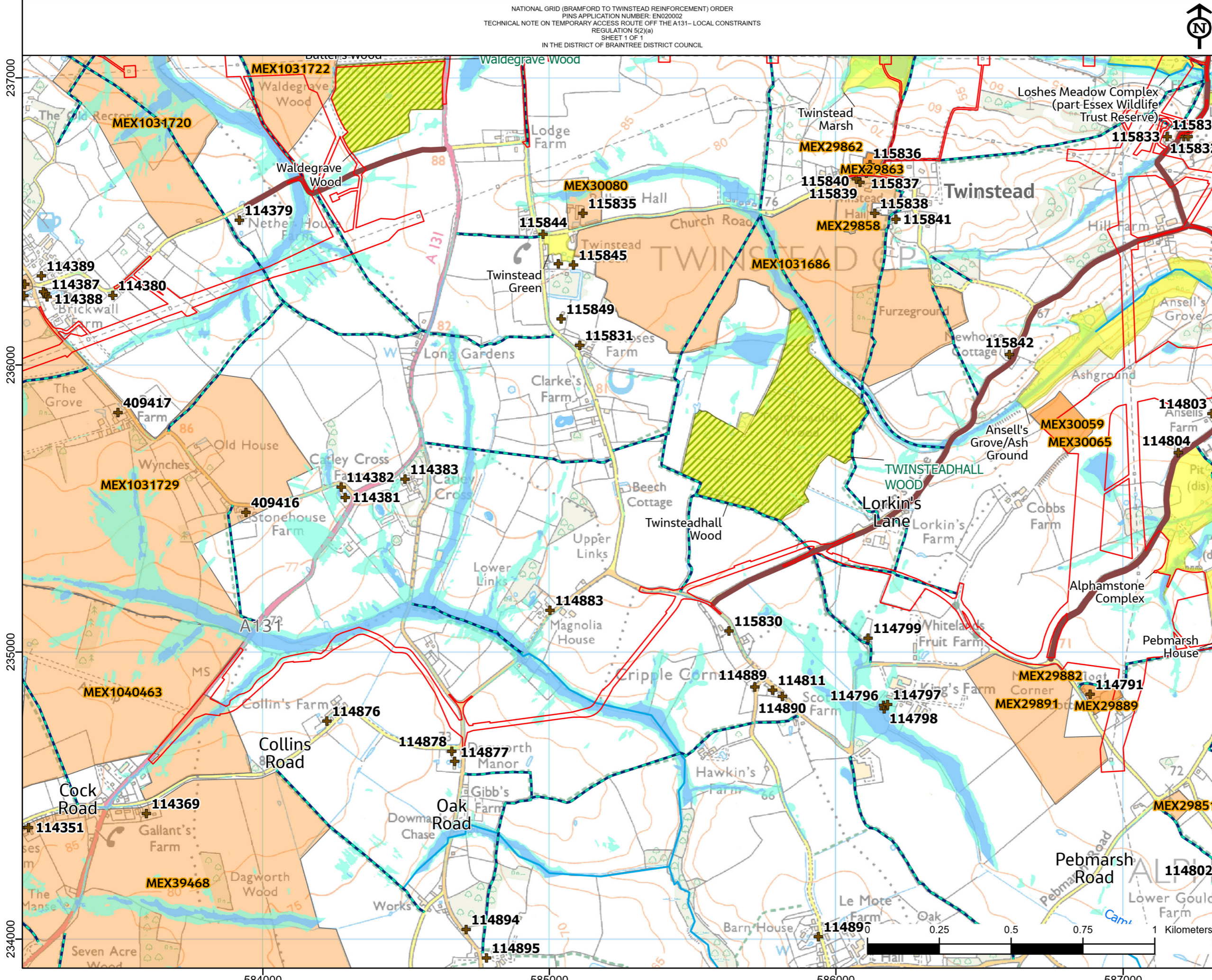


Appendix B: Figure 5.1, Local Constraints

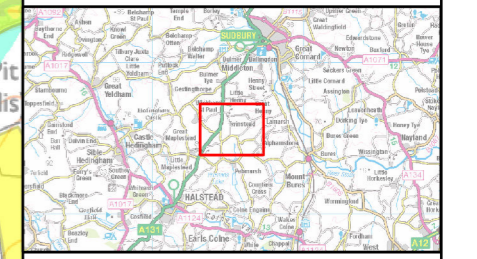


Figure 5.1

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- Legend**
- Order Limits
 - Ancient Woodland Inventory Site
 - Local Wildlife Sites
 - Protected Lanes
 - Public Rights of Way
 - Historic Environment Record
 - + Listed Buildings
 - Ordinary watercourse
 - Risk of flooding from surface water 0.1%
 - Risk of flooding from surface water 1%



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ISSUE	DATE	REMARKS	DRWN	CHKD	APPD				

PROJECT: Bramford to Twinstead Reinforcement

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TITLE: Figure 5.1
 Technical Note on Temporary Access Route off the A131 - Local Constraints

CIRCUIT / SITE: Bramford - Pelham & Bramford - Braintree - Bulls Lodge	GIS
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	ISSUE: A

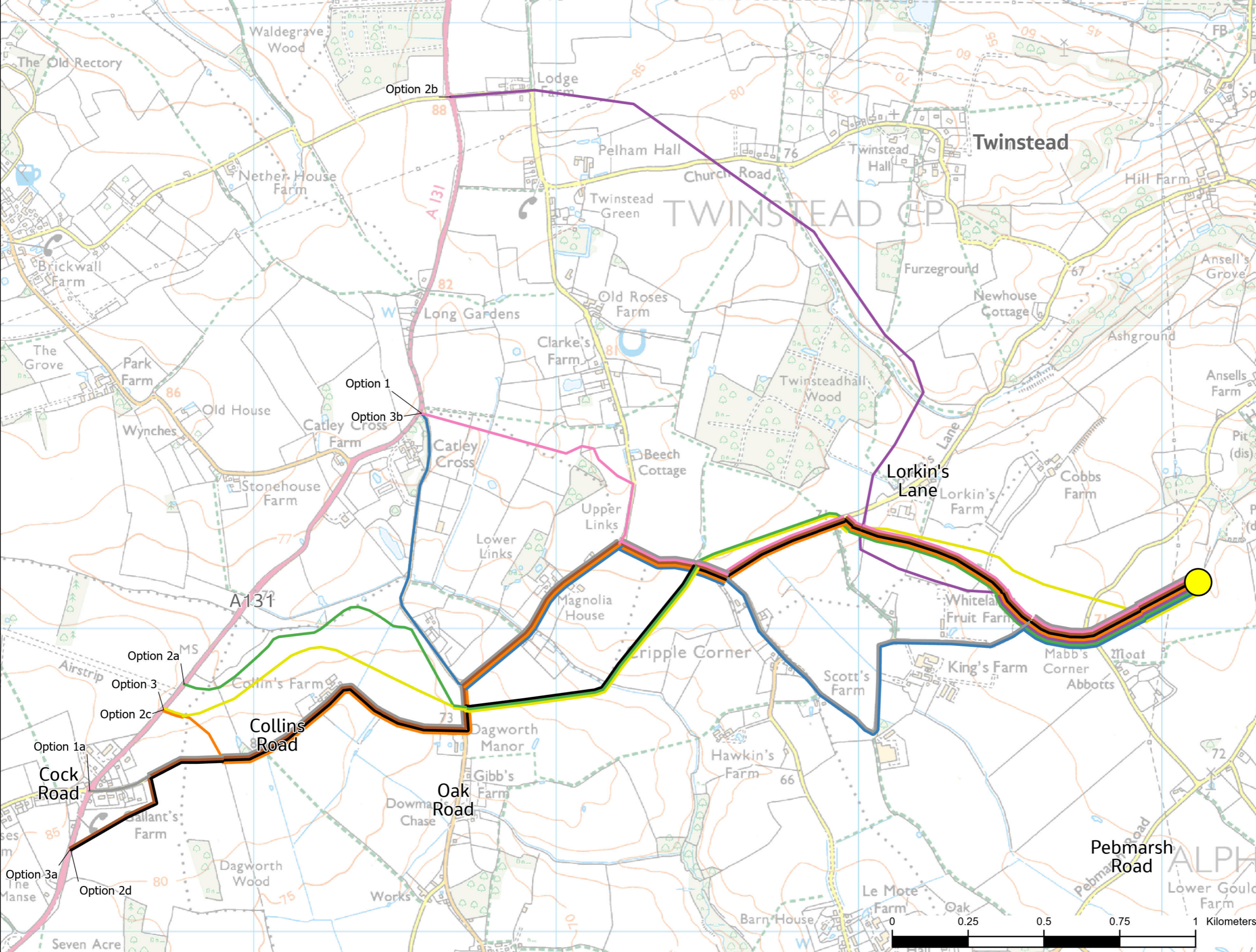
Appendix C: Figure 5.2, Options Appraisal



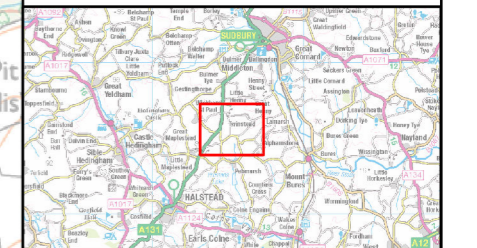
Figure 5.2

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- Legend**
- Stour Valley West cable sealing end compound
 - Option 1
 - Option 1a
 - Option 2a
 - Option 2b
 - Option 2c
 - Option 2d
 - Option 3
 - Option 3a
 - Option 3b



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PROJECT: **Bramford to Twinstead Reinforcement**

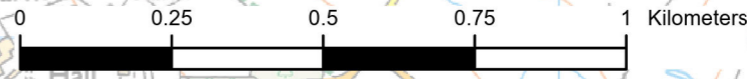


TITLE: **Figure 5.2
 Technical Note on Temporary Access
 Route off the A131
 - Options Appraisal**

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 - Braintree - Bulls Lodge** **GIS**

ORIGINATOR DRAWING NO. **AAA_BTT_TAR_TN_Fig5_2_Rev0** **A3**

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