Bramford to Twinstead Tee Connection Project

Western cable sealing end compound

Proposed siting

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FIGURES

1 INTRODUCTION

Purpose of document

1.1 National Grid is currently undertaking a comprehensive pre-application consultation programme on the Bramford to Twinstead Tee Connection Project.

1.2 The consultation from 29th May to 27th July 2012 focussed on the findings of the Connection Options Report[1] for the Project which recommended which connection options should be taken forward. The report recommended that the section through the Stour Valley should take the form of an underground cable and that a cable sealing end (CSE) compound should be located next to pylon 4YLA001[2] on the Twinstead Tee - Braintree overhead line south of Twinstead Tee.

1.3 A number of representations proposed that alternative locations for the CSE compound should be given further consideration. National Grid has responded to these representations and, having undertaken further studies, concluded that a CSE compound in the vicinity of pylon 4YLA004 should be preferred. Subject to consultation, this will be taken forward to detailed design.

1.4 This report sets out how this decision was reached.

[1] National Grid : Bramford to Twinstead Tee Connection – Connection Options Report : May 2012

[2] Pylon identification number

2 THE LOCATION PROPOSED IN THE CONNECTION OPTIONS REPORT

What is a cable sealing end compound?

2.1 Cable sealing end (CSE) compounds are required at the interface between overhead lines and underground cables. A CSE compound comprises an overhead line terminal tower (pylon) set within a relatively flat area (nominally 85m X 50m) surrounded by security fencing. The compound will contain cable terminations, electrical equipment, support structures and a small building for control equipment which can be monitored remotely. The overhead line terminal tower acts as a support for the conductor system and downleads, these downleads feed each circuit into the CSE compound. A connection is provided to the electrical equipment via landing structures designed to take the tension force. Figure 2 shows a typical cable sealing end compound.

2.2 CSE compounds need to be positioned on the line of the new overhead route and also be close to the local road network to minimise the requirement for new infrastructure. A permanent tarmac road 3m in width (with passing places) would be constructed from the local road network into the compounds to allow for installation and for maintenance purposes.

2.3 Wherever possible, sites are chosen which can take advantage of topography or natural screening which would allow the compounds to blend into the surrounding landscape. Where appropriate, screen planting can be undertaken alongside CSE compounds, provided that trees avoid the underground cables and potential interference with the compound fence and safe electrical clearances to overhead lines.

The proposal in the Connection Options Report

2.4 The Connection Options Report proposed that in the Stour Valley an underground cable option would run along the route of the existing 132kV overhead line as far west as the Twinstead Tee - Braintree overhead line at the 132kV overhead line diamond crossing (4YLA001), south of the Twinstead Tee. This option (shown on Figure 1) would allow for the removal of one span of the Twinstead Tee - Braintree overhead line south of Twinstead Tee.

2.5 At the western end of this section of the connection, it was anticipated that a CSE compound would be built in the vicinity of pylon 4YLA001 to allow the connection of

the underground cable route to the existing 400kV overhead line running between Twinstead Tee and Braintree.

2.6 The Connection Options Report noted that consideration had been given to an underground option which followed the route of the existing 132kV overhead line across the Stour Valley before running south from west of Moat Lane to meet the Twinstead Tee - Braintree overhead line at either pylon 4YLA004 or pylon 4YLA005 to maximise overhead line removal of the Twinstead Tee - Braintree overhead line to the north. This option had initially been discounted as it was considered that it could result in negative effects on County Wildlife Sites and woodland to the north of Alphamstone.

Effects of a CSE compound location at 4YLA001

2.7 The Connection Options Report explained that mature landscape features and topography would assist in accommodating a CSE compound within the landscape close to pylon 4YLA001. The presence of existing overhead lines in the landscape, including the diamond crossing arrangement where the existing 132kV overhead line passes beneath and around 4YLA001 (which would be removed as part of the project), meant that the landscape was considered to have capacity to accommodate a compound. However it was also recognised that a CSE compound at this location would introduce negative local landscape and visual effects in the vicinity of pylon 4YLA001. These could be minimised through careful siting and the addition of new hedgerow and woodland planting.

2.8 It was recognised that a CSE compound at 4YLA001 could have negative effects on buried archaeology and on the setting of listed buildings at Sparrow's Farm. The construction of the compound would result in the permanent loss of semi-improved pasture and access to the compound could result in potential negative impacts to the hedgerow and verge of a Protected Lane.

2.9 Filtered views of a CSE compound at 4YLA001 are likely from the public rights of way to the north and west and from parts of Loshes Meadow Nature Reserve, with open views of the termination pylon above intervening vegetation. There would be near private views of a compound from Sparrow's Farm with open views from windows on the southern gable end. More distant and filtered views are possible from Loshhouse Farm and properties on Lorkin's Lane to the south. Overall, and following the establishment of woodland and hedgerow planting, this would result in minor negative impacts which would be highly localised.

2.10 The selection of a CSE compound location at 4YLA001 was guided by the fact that the valley location has some merit in containing effects on landscape and views within a localised area and the route of the cable from the east is relatively unconstrained. Nevertheless some disadvantages of this location had been identified.

3 REPRESENTATIONS

3.1 During the consultation period a number of representations were received which commented on the location of the CSE compound.

3.2 Essex County Council's representation[3] considered that further work was required to ensure the most appropriate cable route is progressed. It also recommended that detailed consideration should be undertaken regarding the possible local implications of the proposed CSE compound in proximity to Pylon 4YLA001, with consideration of the impact on the landscape, biodiversity and cultural landscape, along with access issues for construction and maintenance from the local road network, many of which are protected lanes.

3.3 Braintree District Council[4] also considered that there was a need to set out the detailed alignment of the underground cable taking into account environmental and engineering constraints. It did not support the location of a CSE compound in the vicinity of 4YLA001 because of its effect on the Stour River Valley landscape and impact on public views from protected lanes, public rights of way, Loshes Meadow nature reserve and Sparrows Farm and access off a Protected Lane. It wished to promote a site 1.5km further south near pylon 4YLA005.

3.4 Natural England[5] considered that the location of a CSE compound (west of the River Stour) required careful consideration to minimise the impact on visual amenity.

3.5 The local community expressed concerns about the potential effect of a terminal tower and CSE compound at tower 4YLA001, including the effect on:

- visual amenity of Sparrow's Farm;
- the Stour River Valley landscape;
- public views from protected lanes and public rights of way (including Stour Valley Path and St. Edmund's Way);

[3] Representation endorsed by the Political Leadership Team on 16th July 2012

[4] Letter of representation : Braintree District Council 19th July 2012

[5] Letter of representation : Natural England: 27th July 2012

- the setting of Grade II* listed Sparrow's Hall and its listed barn;
- protected lanes as a result of construction traffic accessing the site and the reinforcement which may be required;
- the natural environment, adjacent to the Loshes Meadow Nature Reserve, including traditional, herb rich, grazing meadows with a great variety of plant species, including two varieties of orchids, as well as being important for nesting skylarks, grey partridges and nightjars;
- woodland, including the effect on ancient oak trees and an important habitat for Nightingales and dormice;
- agricultural practices and the farm business, including disruption and loss of farm land;
- health resulting from electromagnetic fields created by the cables which will pass close to Sparrows Farm House, Sparrows Cottage and Elm Cottage.

3.6 Suggestions were made for an alternative site for the CSE compound:

- the underground cable should bear south to connect to the existing line at a less sensitive point at least as far south as pylon 4YLA004. The special landscape characteristics justify the CSE compound being located well south of Ansell's Grove;
- a preference for a CSE compound site south of Henny Back Road at pylon 4YLA005, thus removing 400kV pylons as well as the 132 kV diamond crossing from the Special Landscape Area;

3.7 Further details were sought of the various routeing options considered with respect to underground cable across the Stour Valley in the vicinity of Moat Lane ending at pylon 4YLA004 or 4YLA005, and also which County Wildlife Site(s) would have been affected;

3.8 It was queried whether positioning a CSE compound in the bottom of the valley in the vicinity of pylon 4YLA001 would mean that the height and volume of the CSE compound structure would be much greater than would be the case if it were sited at or between pylons 4YLA004 and 4YLA005.

4 NATIONAL GRID RESPONSE

4.1 In the light of representations received, further technical and environmental studies have been undertaken to investigate whether the previously identified constraints may be avoided by design and construction methods. The potential to achieve a connection at either pylon 4YLA004 or pylon 4YLA005 was investigated.

4.2 The use of directional drilling techniques on an alternative underground cable route to 4YLA004 or 4YLA005 would minimise effects on woodland and County Wildlife Sites but there would be some loss of hedgerow and hedgerow trees. A connection to 4YLA005 would result in more hedgerow crossings than a connection to 4YLA001. A connection to 4YLA004 would result in fewer hedgerow and Protected Lane crossings than a connection to 4YLA001. Despite this, impacts are likely to be greater than with the connection to 4YLA001 due to fragmentation effects on the habitat mosaic in the local landscape.

4.3 The landscape and visual effects of an alternative underground cable route to 4YLA004 or 4YLA005 would be minimised through the use of directional drilling techniques to cross the watercourse and associated woodland belts. There would be some loss of hedgerow and hedgerow trees as a result of the underground cable routes in this area and this would result in some localised negative effects on landscape character. The alternative underground cable route to 4YLA004 would cross fewer hedgerows and would therefore have a lesser negative effect on vegetation compared to the other options. It would also have a lesser effect, than a connection to 4YLA001, on the Protected Lanes which are an element of landscape character. For all underground options, although some tree losses are likely which could not be replaced in situ, the long-term effect on landscape and views would be broadly neutral with mitigation in place.

4.4 An underground cable route to 4YLA004 or 4YLA005 would result in an additional positive effect on landscape and views where the existing 400kV overhead line would be removed between Twinstead Tee and a CSE compound at 4YLA004 or 4YLA005.

4.5 Although undergrounding to 4YLA005 would allow the removal of an additional span of the existing 400kV overhead line, a CSE compound at 4YLA004 would benefit from a greater amount of mature vegetation screening, particularly in relation to the location of nearby visual receptors, compared to 4YLA005. This would better assist in accommodating the compound within the landscape at 4YLA004 and in limiting views of

the compound. Views of the CSE compound from private residential properties would be limited to those in closest proximity and would in the main be filtered and/or oblique. However views from these properties to the north would generally be improved as a result of the removal of the existing 400kV overhead line in nearer views. A CSE compound at 4YLA005 would have slightly greater negative effects on views than a CSE compound at 4YLA004 because of more open views from the public right of way and other visual receptors to the south.

4.6 In terms of cultural heritage, a cable route to 4YLA004 or 4YLA005 would have greater negative effects on buried archaeology than a route to 4YLA001, given that a larger area would be disturbed. While mitigation of negative effects on buried archaeology is achievable, preservation in situ is preferred. A CSE compound at either 4YLA004 or 4YLA005 would result in a negative effect on the setting of nearby listed buildings. However at 4YLA004 or 4YLA005 nearby listed buildings could also benefit from the removal of pylons to the north which would help to offset negative effects. In addition, a CSE compound at either 4YLA004 or 4YLA005 would result in positive effects on the setting of Grade II listed buildings at Sparrow's Farm.

4.7 From a biodiversity perspective, a preference for a connection to a CSE compound at 4YLA001 remains, as it would result in less loss and fragmentation of valuable habitat. The connection to 4YLA005 would be the least preferred as it would affect the greatest number of hedgerows and would run close to Alphamstone Complex Local Wildlife Site.

4.8 On balance it was considered that there would be benefits in siting a CSE compound in the vicinity of 4YLA004 and that a route for an underground cable could be developed to connect this location to the connection across the Stour Valley to the east. As with the siting of CSE compounds elsewhere on the project, further studies will need to be undertaken to establish the most appropriate site for the compound in this general location.

4.9 The underground section in the Stour Valley, in common with the remainder of the connection, also needs to be designed in detail. The design will be influenced by the results of detailed surveys, including ecological and archaeological investigations to ensure that the appropriate alignment is selected and, where necessary, mitigation measures are defined. Discussions with land owners and occupiers will also take place as part of the design process.

5 CONCLUSIONS AND NEXT STEPS

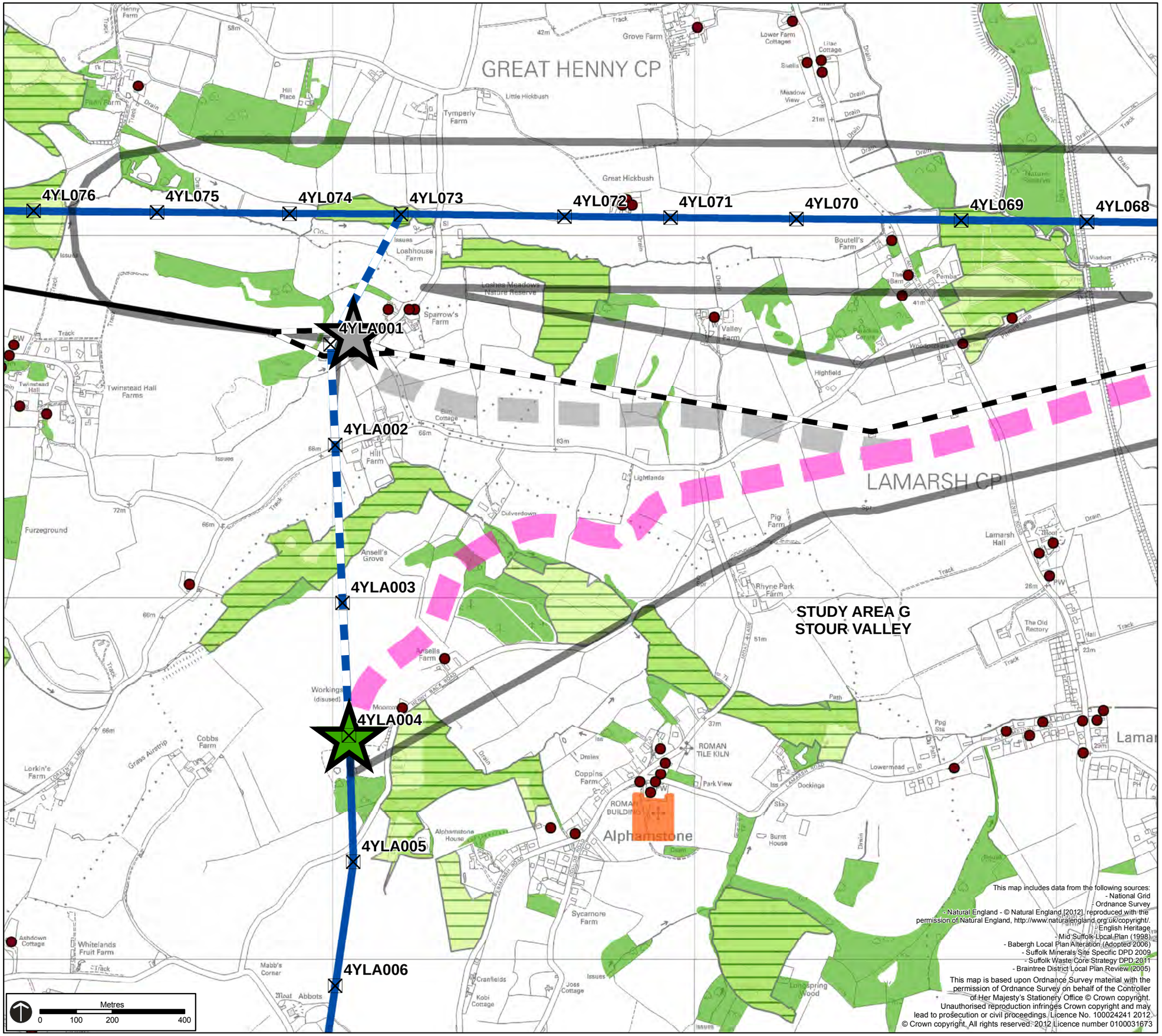
5.1 Subject to consultation with affected parties, the interim alignment at the western end of Study Area G is to be amended to include an underground cable connection with a CSE compound in the vicinity of pylon 4YLA004 to effect a connection to the Twinstead Tee - Braintree 400kV overhead line. Selective use of directional drilling would enable initial concerns about the effects of such a cable route on local habitats to be allayed. The benefits of this arrangement are that, in addition to the removal of the 132kV overhead line east of the Twinstead Tee - Braintree 400kV overhead line, it would result in the removal of a section of the latter line between the connection point and Twinstead Tee. Both of these modifications would result in an enhancement of the environment in the vicinity of Sparrow's Farm and Hill Farm. Those adverse effects identified in representations would be avoided.

5.2 Because of this proposed change to the alignment set out in the Connection Options Report, National Grid will consult further with those parties most likely to be affected by the change, including local residents in close proximity to the proposed site near pylon 4YLA004 and representatives of Alphamstone Parish Council. Any further representations will be taken into account before finalising the preferred alignment. National Grid will then commence the development of a detailed connection design, including the siting and design of the CSE compound, which will also be influenced by technical considerations, environmental and geo-technical surveys and discussions with affected landowners and occupiers.

5.3 During Stage 3 of the process, the detailed connection design will be subject to environmental impact assessment (EIA) and further public consultation.

5.4 It is anticipated that National Grid's formal consultation[6] on the detailed connection design and preliminary environmental information will be undertaken in Summer 2013. The proposal will then be finalised and it is anticipated that a submission will be made to the Planning Inspectorate in late 2013, seeking consent for the connection and associated development. Timescales and activities may be subject to alteration as the project progresses.

[6] In accordance with s42 Planning Act 2008



Key

Preferred Route Corridor

Existing Infrastructure

- Existing 400kV Overhead Line
- Existing 400kV Overhead Line to be Removed
- Existing 132kV Overhead Line
- Existing 132kV Overhead Line to be Removed
- Existing Tower Positions

Overhead and Underground Alignment Options

- Preferred Underground Cable Route
- Preferred Cable Sealing End (CSE) Compound in vicinity of 4YLA004
- Underground Cable Route originally presented in the Connection Options Report (now discounted)
- CSE Compound originally presented in the Connection Options Report (now discounted)

Environmental Constraints

- Listed Building (Grade I, II* or II)
- Woodland
- Local Wildlife Site
- Scheduled Monument

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Project: **Bramford to Twinstead Tee Connection**

Title: **Preferred Underground Cable Route and CSE Compound Location in Western part of Study Area G**

Drawing No: **G1980.925**

Date:	TEP Ref No:
20-11-2012	G1980.925

Drawn:	Checked:	Approved:
CB	CH	CH

Photograph indicative only and final design of cable sealing end compounds may be different

nationalgrid	Title: Figure 2: Photograph of a Cable Sealing End Compound
Project: Bramford to Twinstead Tee Connection Project	Drwg Number: C1980.009
	Scale: N/A
	Drawn by: CH; Checked by: CH; Date: 05/11/12