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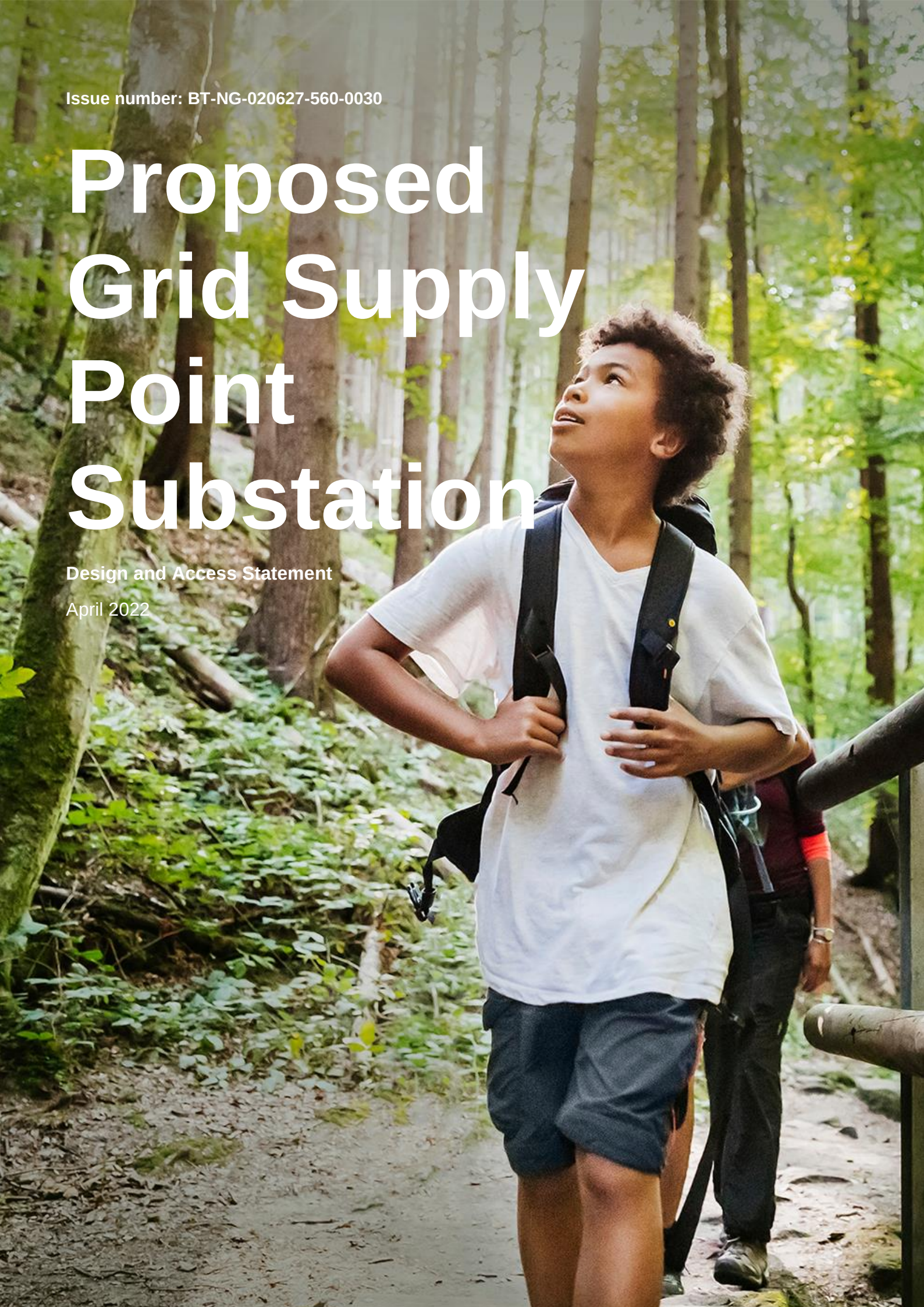
Proposed Grid Supply Point Substation

Design and Access Statement

April 2022



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Executive summary

This Design and Access Statement has been prepared to accompany an application by National Grid Electricity Transmission plc (NGET) for planning permission under The Town and Country Planning Act (TCPA) 1990 for the proposed development of *a new 400/132 kilovolt (kV) Grid Supply Point (GSP) substation including two supergrid transformers, associated buildings, equipment, and switchgear, a single circuit cable sealing end compound, a new permanent vehicular access to the public highway, associated landscaping (including boundary fencing, an area for Biodiversity Net Gain, and landscape mounding) and drainage*. The proposed development will hereafter be referred to as 'the proposed GSP substation'.

The proposed GSP substation falls within the administrative boundary of Braintree District Council (BDC), located west of the A131 and is required in connection with the proposed reinforcement of the 400kV transmission network between Bramford Substation in Suffolk and Twinstead Tee in Essex (hereafter referred to as 'the wider reinforcement').

Environmental, engineering, and economic considerations as well as several rounds of consultation and pre-application discussions with BDC, have all influenced the optioneering and design evolution process, as set out in this Design and Access Statement.

The design of the proposed GSP substation is functional in nature and appearance. That said, opportunities to positively shape the proposals, informed by the site's context and constraints, have been taken. The Design and Access Statement concludes with the consideration of the use, amount, layout, scale, appearance landscaping and access for the proposed GSP substation. This Design and Access Statement should be read in conjunction with the documents and plans submitted in support of this planning application.

1. Introduction

1.1 Overview

1.1.1 This Design and Access Statement has been prepared to accompany an application by National Grid Electricity Transmission plc (NGET) for planning permission under The Town and Country Planning Act (TCPA) 1990. The proposed development will hereafter be referred to as ‘the proposed GSP substation’.

1.2 Purpose and structure

1.2.1 This Design and Access Statement illustrates how the proposed GSP substation design has been informed by an iterative process of environmental, economic and engineering assessment and evaluation and design. This Design and Access Statement is structured as follows:

- Chapter 1 Introduction
- Chapter 2 The Site and Proposed Development
- Chapter 3 Design Policy
- Chapter 4 Design Evolution
- Chapter 5 The Application Design

1.3 The Applicant

1.3.1 National Grid Electricity Transmission owns, builds and maintains the electricity transmission network in England and Wales. Under the Electricity Act 1989, NGET holds a transmission licence, pursuant to which it is required to develop and maintain an efficient, coordinated and economical electricity transmission system; NGET is also required to consider ways to preserve amenity under Schedule 9 of the Act.

1.3.2 The key role of this transmission system is to connect the electricity generators' power stations with regional Distribution Network Operators (DNOs) who then supply businesses and homes. In return for the connection, users of the transmission network pay a tariff to NGET. This revenue is then used to maintain, improve, and invest in the transmission network.

1.3.3 NGET sits at the heart of Great Britain's energy system, connecting millions of people and businesses to the energy they use every day. NGET bring energy to life: in the heat, light and power NGET bring to their customer's homes and businesses; in the way that NGET support their communities and help them to grow; and in the way NGET show up in the world. It is their vision to be at the heart of a clean, fair, and affordable energy future.

2. The Site and Proposed Development

2.1 The Proposed Development

2.1.1 This application seeks planning permission for:

'…a new 400/132 kilovolt (kV) Grid Supply Point (GSP) substation including two supergrid transformers, associated buildings, equipment, and switchgear, a single circuit cable sealing end compound, a new permanent vehicular access to the public highway, associated landscaping (including boundary fencing, an area for Biodiversity Net Gain, and landscape mounding) and drainage.'

2.1.2 The proposed GSP substation works are described in detail in the Planning Statement submitted alongside the application.

2.2 The Site

2.2.1 The proposed development site is located within the administrative boundary of Braintree Disitrct Council (BDC) who would be the determining authority for the TCPA application. The northern and western extents of the proposed GSP substation site lie within the parish boundary of Bulmer Parish, meanwhile the southern and eastern extents lie within Twinstead Parish. The parish boundaries dissect the site.

2.2.2 The site is located between Butler's Wood and Waldegrave Wood measuring approximately 7ha, approximately 5km south of Sudbury and 1km northeast of Wickham St Paul. Both Butler's Wood and Waldegrave Wood are ancient woodlands and are identified by BDC as Local Wildlife Sites. The site is accessed via the A131 to the east.

2.2.3 There is currently an existing 400kV overhead line passing through the site boundary, which is owned and operated by NGET. There is also an existing 132kV overhead line to the south of the proposed GSP substation, that is operated by the DNO, UK Power Networks, who distribute electricity at lower voltages to industrial, commercial and domestic users.

3. Design Policy

3.1 Relevant Design Policy

3.1.1 Below details the relevant design policy that the proposed GSP substation has had regard to:

- National Planning Policy Framework (NPPF)
- National Planning Policy Guidance (NPPG)
- Braintree District Council, Local Plan Review (2005) (Saved Policies)
- Braintree District Council, Local Plan, Section 1 (2013-2033)
- Emerging Braintree District Council Local Plan, Section 2 (2013-2033)
- Essex Design Guide
- The Horlock Rules (National Grid)

4. Design Evolution

4.1 Evolution of proposals: options to maintain the security of local electricity supplies

4.1.1 The wider reinforcement incorporates the route of a 132kV overhead line comprising part of the electricity distribution system owned and operated by UK Power Networks. This 132kV overhead line runs from Burstall Bridge, 2.5km to the south of Bramford Substation, to the vicinity of Twinstead Tee. The wider reinforcement project would involve removing the existing 132kV overhead line in order to accommodate the 400kV network reinforcement. Following the removal of the 132kV overhead line, additional work would be required to maintain the local connection and the current security of supply to local homes and businesses.

4.1.2 An initial study was undertaken by UK Power Networks in July 2012, which identified eight options to maintain the security of local electricity supplies. These included options to replace the 132kV circuits between Twinstead and Burstall Bridge, extending the 132kV overhead line from Twinstead, reinforcing Braintree substation and strategic locations for a new GSP substation. The UK Power Networks report concluded that developing a proposed GSP substation in the vicinity of Twinstead Tee was the preferred option for replacing the capacity lost following the removal of the existing 132kV overhead line.

4.1.3 This UK Power Networks report was reviewed by NGET, who also carried out further analysis of the 132kV connection options in accordance with its own options appraisal methods, including assessing lifetime cost and environmental and socio-economic issues. NGET's work concurred with the work undertaken by UK Power Networks by confirming that the preferred option was to develop a new proposed GSP substation to the west of Twinstead Tee. The report concluded that this represented the most efficient, coordinated, and economical option, whilst giving rise to fewer overall environmental effects than the other options considered.

4.1.4 NGET was preparing for the statutory consultation in 2013, when changes to the planned dates of when new power generation would come online in East Anglia, including significant delays to the proposed Sizewell C nuclear power station, meant that the project was paused at the end of 2013.

4.1.5 Since restarting the project in 2020, NGET has recommenced discussions with UK Power Networks to ensure the previous proposals are still appropriate. UK Power Networks has now confirmed a requirement for two SGTs at the proposed GSP substation site (the original 2012 work assumed one SGT). This would require a larger footprint than previously assumed; however, after a thorough back check and review, both of this issue and more generally of any changes in circumstances since the original work, it was not considered that this altered the original assessment work.

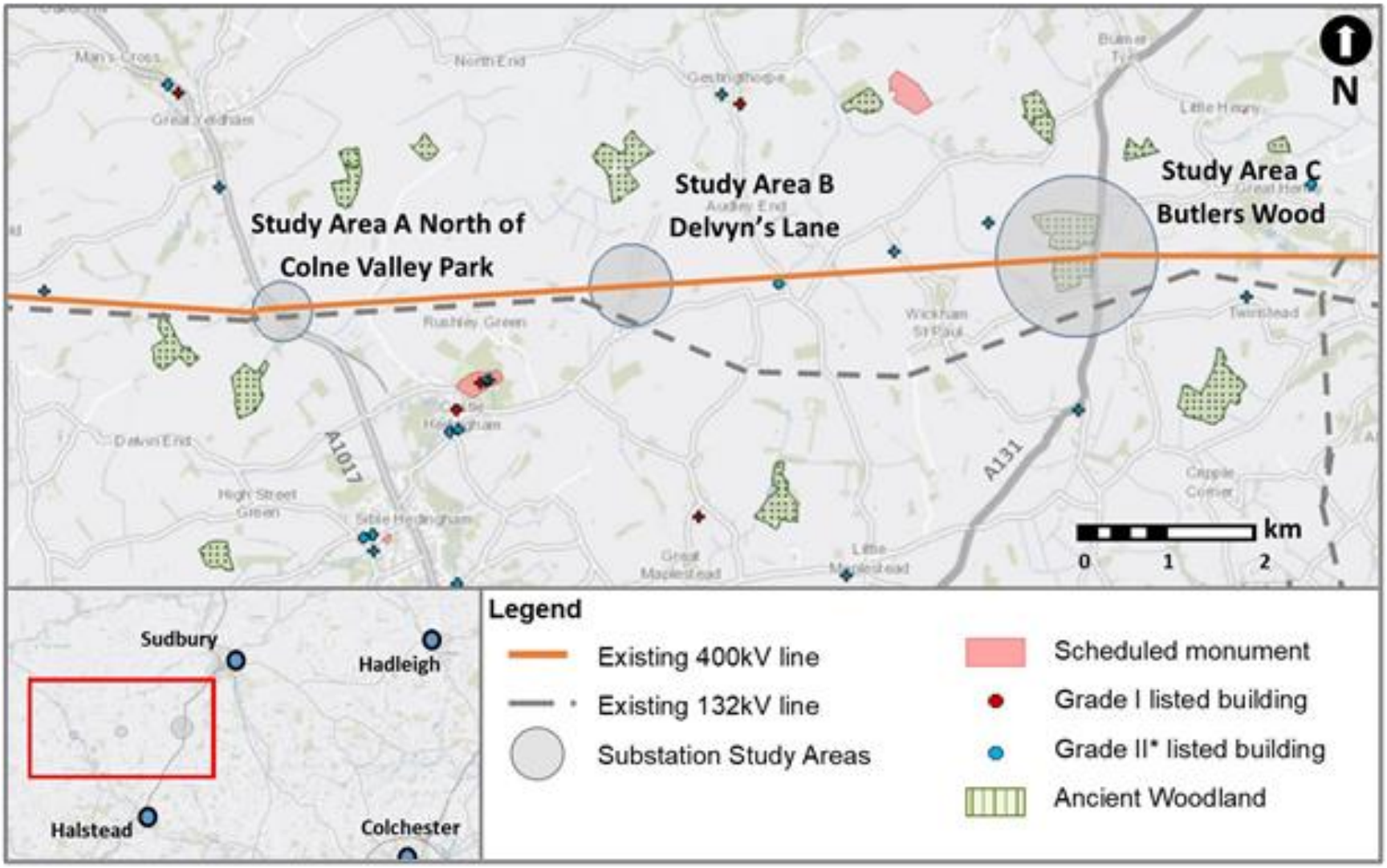
4.1.6 The backchecks confirmed that the proposed site at land off the A131 is both the most appropriate site and can accommodate the larger footprint associated with the two transformers between the existing woodlands.

4.2 Evolution of proposals: site selection

4.2.1 Potential sites were considered extending from Twinstead Tee to Thaxted and was focused along the 400kV overhead line. Three study areas were taken forward for further investigation (Figure 4.1). NGET identified a total of eight locations across the three substation study areas for more detailed options appraisal. These study areas were:

- Study Area A: Land north of Colne Valley Farm Park
- Study Area B: Land at Delvyn's Lane
- Study Area C: Land at Butlers Wood and Waldegrave Wood

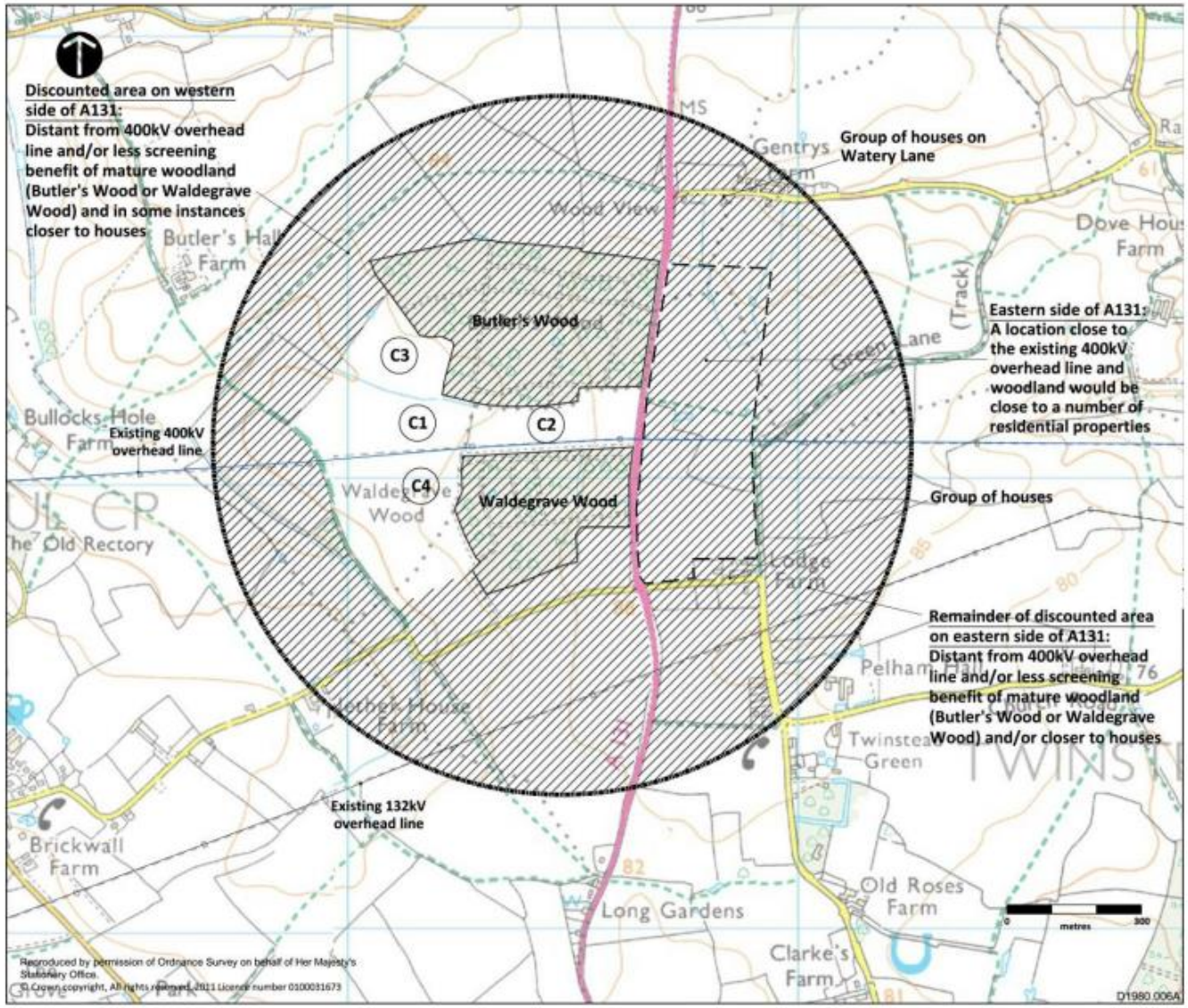
Figure 4.1: GSP Substation Study Areas



4.2.2 All options were assessed against the following criteria: technical implications; environmental effects; socio-economic impacts; and cost. The study concluded that a substation between Butler's Wood and Waldegrave Wood (Study Area C) was preferred, as it would have the least impact on the landscape character of the area, visual amenity, ecology and the historic environment. This option would also be the least constrained from a technical perspective and have the shortest access road.

4.2.3 NGET consulted on these options in early 2013. The majority of feedback agreed that Study Area C was the most suitable. Study area C comprised four potential siting location options. These areas are detailed below at Figure 4.2.

Figure 4.2: GSP Substation Study Area C – Hatching indicates land discounted



4.2.4 BDC are reported to say that, if a substation were the only option, Location C2 would be preferred.

4.2.5 In 2013, NGET considered BDCs representation alongside all the other stakeholders' representations and concluded that the selection of Location C2 was the most robust option in terms of the siting of the GSP Substation. Location C2 was preferred over other substation locations because, of all the potential locations considered:

- It was assessed as having the least impact overall on the landscape character of the area, visual amenity, ecology and the historic environment.
- In landscape and visual terms, the location benefits from the screening effect of adjacent woodland.
- Location C2 would have the least negative effect in terms of the historic environment, relating only to the effects of the cable route on archaeology.
- Has the potential to improve current habitat linkages between two ancient woodland wildlife sites.
- Least constrained from a technical perspective, with no major modifications being required to the 400kV transmission line.
- Requires a relatively short underground connection to the 132kV distribution network and only a short access road.
- In terms of capital cost, there was also a slight preference for location C2 over the other options as this was the lowest cost option.

4.2.6 Option C2, therefore, aligned with NGETs responsibilities to deliver new efficient and coordinated electricity infrastructure but also to be responsible for the cost of projects which will ultimately be borne by electricity users. Hence, Study Area C2 was taken forward for detailed environmental, social and economic scrutiny and engineering design.

4.3 Evolution of proposals: the Horlock Rules

4.3.1 The Horlock Rules provide guidelines for the siting and design of new substations, or substation extensions; these rules have been an important consideration in the design and siting location of the proposed GSP substation.

4.3.2 Paragraph 2.11.11 of the Draft National Policy Statement for Electricity Networks Infrastructure (EN5), states, '*The Horlock Rules – guidelines for the design and siting of substations – were established by National Grid in 2009 in pursuance of its duties under Schedule 9 of the Electricity Act 1989. These principles should be embodied in Applicants' proposals for the infrastructure associated with new overhead lines.*'

4.3.3 The Draft NPS also states that '*In England and Wales this NPS may be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended)*.' Consequently, the Horlock Rules would carry some weight in the determination of the proposed GSP substation. As such, a summary of the Horlock Rules and how the design and siting of the proposed GSP substation has met them can be found in the table below.

Table 4.1: Application of the Horlock Rules

Overall System Options and Site Selection	
Horlock Rules	**How the proposal has met the Horlock Rules**
1 In the development of system options including new substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to	Environmental issues were a key driver in the selection process for the proposed GSP substation site and fundamental to decisions to take sites forward for more detailed analysis. The preferred GSP option (Location C2) was assessed as having the least impact overall on the landscape character of the area, visual amenity, ecology and the historic environment.

	keep adverse effects to a reasonably practicable minimum.	
Amenity, Cultural or Scientific Value of Sites		
2	The siting of new NGC substations, sealing end compounds and line entries should as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.	The proposed GSP substation site does not have any national or international designations. The site benefits from a countryside setting, bordered by sensitive ancient woodland habitat. As such, the proposals have been designed to be sympathetic to this countryside/woodland setting.
3	Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.	Butler's Wood and Waldegrave Wood are local wildlife sites and are designated for their ancient woodland habitats and the proposals preserve this. No vegetation clearance or modification of Butler's Wood or Waldegrave Wood is required during construction or operation, beyond the current wayleave for the existing 400kV overhead line. In addition, an arboricultural survey of the woodland edges has identified that the root protection zones of trees are not expected to extend into the arable field. A gap would be required in the hedgerow for the access road from the A131. The rest of the hedgerow would be enhanced by supplementary planting and a new habitat connection would be provided between Butler's and Waldegrave Wood to the west as part of proposals for BNG for the wider reinforcement project.
Local Context, Land Use and Site Planning		

4	The siting of substations, extensions and associated proposals should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.	A determining factor in the selection of the proposed GSP substation at Location C2 was the advantageous baseline situation, being located between two dense areas of woodland to the north and the south which provides significant screening in the wider landscape. Additional tree planting proposed as part of this application and the wider reinforcement will further strengthen this baseline situation.
5	The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum.	The proposals include landscape planting around the proposed GSP substation which is considered to be an embedded measure within the design to help soften and filter views from the surrounding areas. The design also includes noise enclosures which would be used around the two SGTs to reduce operational noise outside of the site.
6	The land use effects of the proposal should be considered when planning the siting of substations or extensions.	The proposed GSP substation site is currently privately owned land and is not publicly accessible. The site also contains existing NGET infrastructure in the form of an existing overhead line. The proposal does not, therefore, result in any severance to publicly accessible land or public rights of way.
Design		
7	In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum.	Due to the constrained nature of the site, the development proposes is the minimum amount of development to achieve an operational substation. The proposed GSP substation has been designed so that it benefits from the advantageous tree screening baseline, equipment such as the CSE are away from the road and the relocating of the site access limits the visibility of the proposed GSP substation from the site entrance. In addition, the existing 400kV line runs through the site which results in a co-located type of infrastructure development.

8	Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation.	The site is physically and environmentally constrained on all four boundaries; ancient woodland to the north and south, the A131 to the east and the open countryside to the west. Meanwhile, the site is not particularly large for this type of development. This has meant that the proposed GSP substation has had to be thoughtfully designed, having regard to these constraints. Therefore, it proposes the minimum amount of development to make the GSP operational as any more development would not be practicable at this site. It is also not envisaged that an extension to the proposed GSP substation would be required at a later date.
9	The design of access roads, perimeter fencing, earthshaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.	The proposed GSP substation design comprises a site set on a 1 in 60 gradient. Usually, NGET's preferred approach would be to have a single level site. However, the graded approach has circumvented the need for significant cut and fill levelling works which would have a greater visual impact. The substation design on which pre-application advice was sought included a fence to the north of the access road which is in closer proximity to the woodland. The proposal now provides an alternative solution in which the access road is external to the fenced substation, and this outer fence in close proximity to the trees is eliminated.
Line Entries		
10	In open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance.	The application site is not considered to be within the open landscape due to the existing tree screening, A131 and the existing 400kV line running through the site from east to west.

11	The inter-relationship between towers and substation structures and background and foreground features should be studied to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.	The proposed GSP substation design does not result in a net increase in permanent pylons at the site and is not located on any prominent ridges and benefits from the enclosed nature of the site, due to the two parcels of woodland screening the development.

5. The Application Design

5.1 Design Objectives

5.1.1 Naturally, due to engineering and safety requirements associated with electricity infrastructure; there is very little flexibility in terms of the design of the proposed GSP substation itself. The design of the proposed GSP substation, therefore, is functional in nature and appearance. That said, opportunities to positively shape the proposals, informed by the site's context and constraints, have been taken. Key design objectives include the following:

- Preserving the existing landscape and ecological features.
- Enhancing biodiversity.
- Propose lighting appropriate to the site's context.
- Result in no unacceptable impact on neighbouring amenity.
- Be climate change resilient.
- Avoid internationally and nationally designated areas of the highest amenity, cultural, heritage or scientific value.
- Maintaining suitable separation distances between built development and sensitive ecological features (trees/woodlands, ancient woodlands, ditches, hedgerows).
- Supplementing the existing habitats and promote connectivity of the existing and proposed habitats.

- Achieve an overall Biodiversity Net Gain (BNG).
- Provide a safe and suitable access to the proposed GSP substation.
- Conserve and enhance local features of historic and landscape importance.
- Proximity to existing 400/132kV connections.
- Co-location of existing infrastructure is preferred.

5.2 Use

5.2.1 The proposed use of the site is for the construction and operation of a GSP substation to transform the voltage from 400kV to 132kV, to connect the high voltage line to the local distribution network and to replace the existing electricity transmission capacity lost through the removal of the 132kV overhead line.

5.2.2 When considering suitable sites for the proposed GSP substation, eight locations within the area west of Twinstead were assessed against high level environmental and planning constraints with the aim of identifying the least environmentally constrained options. A key driver when considering the site location was also the proximity to the existing 400/132kV connections, layout parameters and access.

5.2.3 The site is not located in an area designated internationally or nationally for its environmental, amenity, cultural or scientific value. The site is also within close proximity to the existing 400/132kV transmission lines. Although the published landscape character area descriptions (please refer to the Environmental Appraisal for more details) state that that tranquillity is a key characteristic of the wider local character assessments, the site itself is heavily influenced by the proximity to the A131, which passes close to its eastern boundary, in addition to the existing 400kV overhead line which passes through the GSP substation site between the two parcels of woodland.

5.2.4 The justification for this site in planning policy terms is set out in detail in the Planning Statement. Overall, the development, by virtue of its required proximity to the existing 400/132kV transmission lines, necessitates a countryside location. Meanwhile, the site was considered the least environmentally constrained option of the eight locations assessed.

5.3 Layout

5.3.1 The proposed GSP substation has been positioned between Butler's Wood and Waldegrave Wood. The proposed GSP substation would include a fenced compound approximately 270m by 50m in size. The 400kV single circuit CSE enclosure would be approximately 33m by 30m in size and this is located to the south-west of the proposed GSP substation. An access road would link the two areas. Figure 5.1 below provides indicative 3D images of the GSP compound and single circuit CSE.

5.3.2 Following receipt of pre-application advice from BDC, the proposed GSP substation has been moved approximately 3m south and the perimeter fence, which requires foundations, has been moved south of the access road. As such, the distance at the nearest point between the perimeter fence and its foundations and the nearest edge of the ditch at Butler's Wood is 16.68m (based upon the topographical data). It is noted that the OS base mapping is less accurate and shows a greater distance between the fence and Butler's Wood at 24.58m. Meanwhile, the closest point of the overall development to Butler's Wood is the proposed access road at a distance of 3.38m at its nearest point (based upon the topographical data), whereas the OS base mapping shows a greater distance between the access road and Butler's Wood at 8.76m. Therefore, for assessment purposes, the more accurate topographical data has been used. This now represents the largest possible separation distance between Butler's Wood and the proposed development, having regard to the required electrical clearances between the existing tower (4YL80) and the gantry which the downleads from this tower connect to. The design change to relocate the proposed GSP substation reduces the risk of damage to tree roots and removes the need for trimming existing trees that are not currently subject to management under existing wayleaves.

5.3.3 Finally, the distance at the nearest point between the perimeter fence and the nearest edge of the ditch at Waldegrave Wood is 43.73m and the distance at the nearest point between the single circuit CSE enclosure and the western edge of Waldegrave Wood is 24.46m (based upon topographical data). No felling of trees is required within Butler's Wood or Waldegrave Wood to facilitate the construction or operation of the proposed GSP substation.

Figure 5.1: Indicative site images of the GSP compound and CSE compound[1]

[1] Images do not show the existing overhead lines and towers at the site. These have been removed for image clarity.

5.4 Amount

5.4.1 The site is physically and environmentally constrained on all four boundaries; ancient woodland to the north and south, the A131 to the east and the open countryside to the west. Meanwhile the site is not particularly large for this type of development. Due to the constrained nature of the site, the proposed GSP substation represents the minimum amount of built development necessary to achieve a functional substation.

5.4.2 Within the proposed GSP substation compound, alongside the two supergrid transformers, there would be ten small modular container type buildings installed on-site to house electrical equipment including office/welfare units for both NGET and UK Power Networks. Examples of typical modular buildings, images taken at Rhigos substation, are contained below at Figure 5.2. These buildings have been clustered together so they are read in context with one another. Other equipment and features inside the proposed GSP substation include a gantry to take downleads from tower 4YL80, protection isolation equipment, switching devices, cooler banks for each transformer, a diesel generator for emergency back-up power and a water tank for emergency firewater supply.

5.4.3 A full category 2 electric fence system will be installed around the perimeter of the substation with two separate double manual swing gates for access to the substation and to the CSE road. Within the substation, category 3 palisade fencing, and suitable gates will be installed to delineate the HV compound bays and the UKPN compound. The CSE compound will also have a separate category 2 electric fence system with a double swing gate.

5.4.4 Within the proposed single circuit CSE compound, there would be a gantry and mounted high voltage equipment, enclosed on all four boundaries with security fencing.

Figure 5.2: Example of small modular container type (left) and example welfare unit (right)

5.5 Scale

5.5.1 Within the proposed GSP substation, the majority of electrical equipment is mounted on steel posts fixed to concrete foundations. The top of the electrical equipment, and busbars connecting equipment, are typically up to 9m above ground level. There would be one taller steel line landing gantry structure within the GSP substation, which supports the downleads from the adjacent existing 400kV overhead line pylon to the southeast; this would be approximately 12m high. Example images of a gantry taking downleads from an adjacent tower, taken at Rhigos substation, are contained below at Figure 5.3.

5.5.2 The CSE would contain a gantry approximately 12.5m high and high voltage equipment approximately 8m high.

5.5.3 The proposed GSP substation would have a 2.4m high palisade security/safety fence and gate with 3.4m high electric pulse fence installed to the rear of the palisade to secure the site and avoid trespass. An example image of palisade security/safety fence and gate, taken at Rhigos substation, is contained below at Figure 5.4.

5.5.4 A 1:60 gradient across the site has been incorporated such that the western extent of the proposed GSP substation would not be as elevated and earthworks are reduced when compared to a flat design meaning the embankments required at the west of the access road are further from Butler's Wood.

5.5.5 The reduced elevation of the western extent of the proposed GSP substation reduces the potential landscape and visual impacts and required earthworks. Rather than increasing the height of embankments in the western part of the proposed GSP substation, the design incorporates a retaining wall whereby the eastern extent of the proposed GSP substation is approximately 1m below the surrounding ground level. The drop in ground level helps screen components of the GSP and soften views from the east. This also reduces the requirement for embankments so the western extent of the proposed GSP substation would not be as elevated.

Figure 5.3: Example of a gantry taking downleads from an adjacent tower

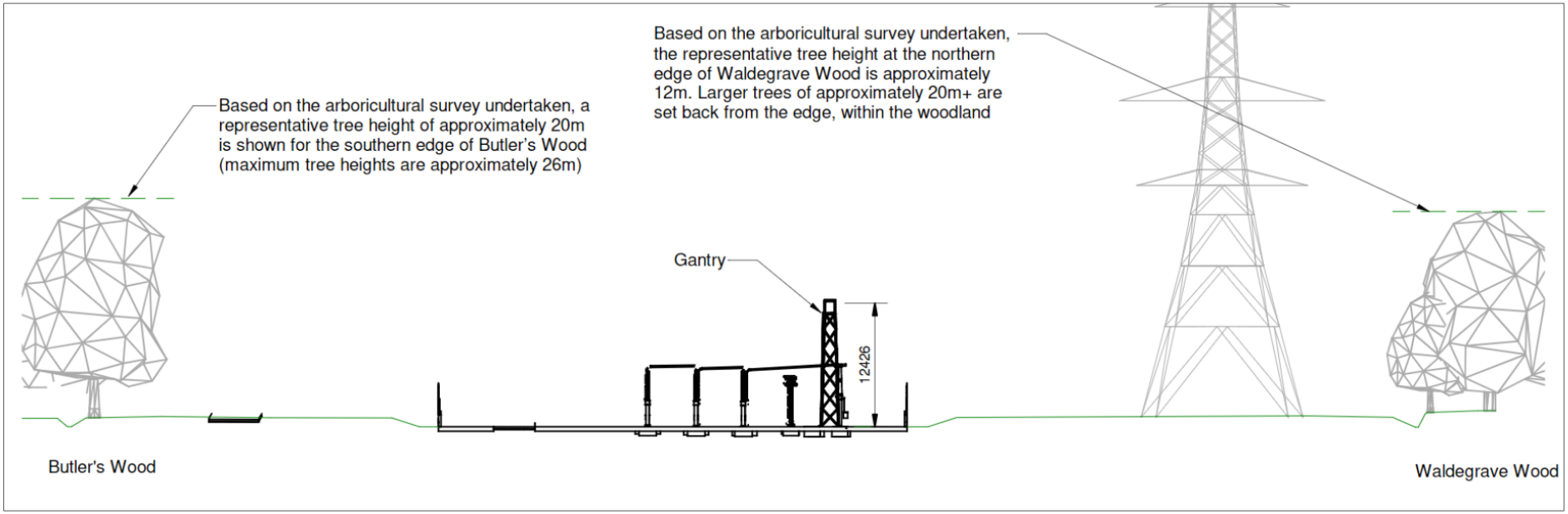
Figure 5.4: Example of palisade security/safety fence and gate

5.6 Appearance

5.6.1 As previously stated, due to engineering and safety requirements associated with electricity infrastructure; there is very little flexibility in terms of the appearance of the proposed GSP substation itself. However, the following embedded measures have been incorporated in the design:

- Landscape mounding is proposed within the design, and this will help integrate the proposed GSP substation into the landscape and soften views from the west. The western mound is approximately 2.5m tall with graded west facing slopes (approximately 1:11 gradient) while the eastern mound is approximately 1.5m tall with graded east facing slopes (approximately 1:4 gradient).
- The landscape planting would help to soften views towards the GSP substation and reconnect the two separate parcels of ancient woodland (see Section 5.7 below for more details).
- There will be low lux level light-emitting diode (LED) type luminaires with directable light output to minimise light pollution except at each access gate where individual passive infrared sensor motion activated lighting shall be provided to facilitate safe entry at night. The installation shall be designed to reduce visual intrusion outside the main substation periphery in accordance with the Chartered Institution of Building Services Engineers and the Institution of Lighting Professional's guidance note 08/18 on Bats and Artificial Lighting in the UK.
- The proposed GSP substation is located between two dense areas of woodland to the north and the south which provides significant screening in the wider landscape and the height of the new equipment is contained within the height of the tree canopies (see Figure 5.5 below). Additional tree planting proposed as part of this application and the wider reinforcement will further strengthen this baseline situation.

Figure 5.5: Site cross section



5.7 Landscaping

5.7.1 Standard landscape planting has been incorporated around the proposed GSP substation. The landscape planting would help to soften views towards the GSP substation and reconnect the two separate parcels of ancient woodland. A gap would be required in the hedgerow for the access road from the A131. The rest of the hedgerow would be enhanced by supplementary planting. Hedgerow tree planting and hedgerow reinforcement is also proposed on a parcel of land on the east side of the A131.

5.7.2 As part of the proposed GSP substation, an area for BNG using Biodiversity Metric 3.0 (Defra, 2021) has been identified and NGET has committed to achieving a 10% net improvement to biodiversity. Figure 4 of the Environmental Appraisal, outlines the area

included in the site boundary within which planting or land management for BNG is proposed (as well as embedded landscape planting) which, once established, also contributes to filtering and softening views of the proposed GSP substation.

5.7.3 In the development of the proposed GSP substation design, a previously curved shape of woodland planting has been modified to align with feedback provided by Natural England, Essex County Council and Essex Place Services. The alteration of the planting design reflects existing and historical field patterns where possible and provides woodland connectivity between Butler's Wood and Waldegrave Wood; two areas of ancient woodland that have historically been connected.

5.8 Access

5.8.1 A Transport Statement accompanies this application. A permanent bellmouth junction would be constructed with the A131. This will connect to a proposed Macadam surfaced access road (5m wide) and would provide access for the periodic maintenance activities at the proposed GSP substation. A Section 278/Section 38 agreement under the Highways Act 1980 would be required before modifications to the A131 for the proposed site access is carried out.

5.8.2 Once constructed, the proposed GSP substation and the new access will be seldom used for maintenance by authorised personnel only and would be unmanned during operation, albeit otherwise secure with security fencing and gates. As such, typically, one light good vehicle is expected to the visit the site per month, therefore, operation traffic movements would be very low, and this would remain the case in perpetuity.

5.8.3 The diameters used for the visibility splay have been agreed with the County Highway Authority during informal discussions (60mph 215 x 2.4). The visibility splay would be confined to the existing highway boundary and, therefore, there would be no tree felling or vegetation clearance required to implement the splays beyond that of the highway verge.

5.8.4 The new access road has been developed to reduce clear views of the proposed GSP substation from the A131 down the access road and avoid the need to fell trees within woodland designated as ancient woodland. The site access addresses the visibility restrictions of northbound traffic on the A131, while also limiting the visibility of the proposed GSP substation from the site entrance. While the location of the site access would involve the removal of a section of the roadside boundary hedgerow and may require some tree trimming, it avoids felling trees within Butler's Wood and Waldegrave Wood.

5.8.5 It is noted that BDC requested that the use of the existing access/field opening from the A131 should be explored due to the new access requiring some loss to the roadside boundary hedgerow. However, the utilisation of the existing access/field opening for a new access point, to meet highway safety standards, would likely require felling of trees within Waldegrave Wood for the visibility requirements for northbound traffic on the A131. It, therefore, cannot be used for the access into the proposed GSP substation and has been discounted.

6. Summary

6.1.1 The provision of a new substation to the west of Twinstead would represent the most efficient, co-ordinated, and economical means of providing replacement distribution capacity and that it would have limited environmental effects. Meanwhile, the proposed location off the A131 was preferred over other potential locations because, of all the potential locations considered it was assessed as having the least impact overall on the landscape character of the area, visual amenity, ecology and the historic environment, while also working from a technical perspective

6.1.2 Environmental, engineering, and economic considerations as well as several rounds of consultation and pre-application discussions with BDC, have all influenced the optioneering and design evolution process, as set out in this Design and Access Statement.

6.1.3 The proposed GSP substation would occupy a well screened position between Butler's Wood and Waldegrave Wood. The design of the proposed GSP substation is functional in nature and appearance. However, opportunities to positively shape the proposals, informed by the site's context and constraints, have been taken (where possible).

6.1.4 Overall, it is considered that the design of the proposed GSP substation; preserves the existing landscape and ecological features; enhances biodiversity; proposes lighting appropriate to the site's context; does not result in unacceptable impact on neighbouring amenity; is climate change resilient and not within an area designated for cultural, heritage or scientific value. In addition, the development maintains suitable separation distances between built development and sensitive ecological features; supplements the existing habitats to promote connectivity; achieves an overall BNG; provides means for a safe and suitable access; all while

being in relative proximity to the existing 400/132kV networks and associated infrastructure to maintain the security of local electricity supplies following the removal of the 132kV line.

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