

**ENGINEERING**

**THE NATIONAL GRID ELECTRICITY TRANSMISSION  
(LITTLE HORSTED SUBSTATION CONNECTION)  
COMPULSORY PURCHASE ORDER 2022**

**STATEMENT OF EVIDENCE**

**David Cole  
Director  
DAC Power Limited**

1. **QUALIFICATIONS AND EXPERIENCE**

1.1 I am David Cole, Director of DAC Power Limited, a consultancy which specialises in providing engineering services to the electricity transmission and distribution industry.

1.2 I have worked in the High Voltage Electricity industry since 2003 when I started working part time for Balfour Beatty. After subsequently completing my BENG Hons in Mechanical Motorsport Engineering in 2007, I worked overseas for 2 years and returned to work for Balfour Beatty as a site engineer in 2009, working on major National Grid Electricity Transmission schemes.

1.3 I commenced working for DAC Power Limited in 2013, with the first contract I worked on being the defueling of the Nuclear Site at Oldbury B, for Magnox, following which I worked on a major civils contract for the MOD and a short project for the Environment Agency, carrying out flood defence work.

1.4 I commenced work on a National Grid contract in 2015, working on capital delivery schemes including major Overhead Line ("OHL") and substation schemes. These schemes included:

1.4.1 South Wales 400kv OHL refurbishment scheme from Ross on Wye to Tenby;

1.4.2 Rhigos new 400kv substation build;

1.4.3 275kv OHL diversion for Hansons quarry in Bristol;

1.4.4 Exeter to Cornwall 400kv OHL refurbishment scheme.

1.5 My day-to day role at DAC Power Limited includes responsibility for the day-to-day running of the business with particular emphasis on strategic business development and sales. I manage tenders for projects and manage the DAC Power Ltd work portfolio. My responsibilities include:

1.5.1 Allocation of resource within DAC Power Ltd;

1.5.2 Leading framework bids with clients;

1.5.3 High level programme review;

1.5.4 Financial forecasting and future company planning;

1.5.5 Driving recruitment.

1.6 The projects I have managed with DAC Power include:

1.6.1 Support with the development of the East Anglia Green new pylon route for National Grid from Norwich to Tilbury;

1.6.2 Support with the development and delivery of the 400kv OHL refurbishment scheme from Cottam to Stevenage;

1.6.3 Support with the development and delivery of the 400kv OHL refurbishment scheme from Bramford to Norwich;

1.6.4 Support with the development of the 275kv OHL uprating scheme from Waltham Cross to Hackney.

1.7 I have been working on the Little Horsted Substation Connection Project ("the Project") since September 2020. My role on the Project involves supporting the National Grid Project Manager with the development of the Project. This includes chairing co-ordination meetings with the scheme team, reviewing design proposals, reviewing construction methodologies and programmes and general day to day support with internal National Grid requirements.

2. **INTRODUCTION AND SCOPE OF EVIDENCE**

2.1 My evidence is structured as follows:-

2.1.1 **Section 3** provides an overview of the Project.

2.1.2 **Section 4** describes the works and rights required for the Project.

2.1.3 **Section 5** comments on objections made to the Order.

2.1.4 **Section 6** contains my conclusions.

2.1.5 **Section 7** contains my declaration.

3. **OVERVIEW OF THE PROJECT**

3.1 National Grid Electricity Transmission ("NGET") and South Eastern Power Networks Plc ("SEPN") have identified the need to establish a new grid supply point ("GSP") substation on the Bolney – Ninfield 400 kV OHL within the Little Horsted area.

3.2 SEPN made a connection request for a new GSP substation at Little Horsted, consisting of two Super Grid Transformers ("SGT"), for the reinforcement of its network.

3.3 SEPN subsequently submitted a modification application requesting additional network capacity due to increased forecast demand in the local area. NGET provided a connection offer in response to the modified application, which was accepted by SEPN. The Project is required to fulfil that offer.

3.4 The Project comprises the construction of a new 400kV NGET GSP substation, a 132kV SEPN substation and associated modification works (replacement of an existing pylon with two new pylons) to the existing 400kV Bolney to Ninfield 4VM to enable the new GSP substation to connect to the transmission network.

3.5 The new 400kV NGET GSP will lower the voltage of the electricity flowing through the existing 400kV Bolney to Ninfield 4VM OHL from 400kV (transmission) to 13kV (distribution). This will allow the new 132kV SEPN substation to connect to the network. The new SEPN substation will connect via 132kV underground cables to their Lewes substation, although this connection element is outside the scope of the Project.

3.6 In addition to ensuring security of supply in the Lewes/Newhaven area, constructing the new substations will also increase the resilience of the wider electricity transmission network, by enabling the power flow to be diverted to where it is needed in the event of a fault, and increasing the security of supply to all customers.

3.7 The National Grid Electricity Transmission (Little Horsted Substation Connection) Compulsory Purchase Order 2022 ("the Order") (**CD D1**) is required to enable the delivery of the Project.

3.8 The Order (**CD D1**) has been made to acquire the land and new rights required for the construction, operation, and maintenance of the Project, the main components of which are:

3.8.1 The construction of a new 400kV NGET GSP substation;

3.8.2 The construction of a new 132kV SEPN substation;

3.8.3 Modifications to the existing 400kV Bolney to Ninfield 4VM OHL (comprising the replacement of an existing pylon with two new pylons and realignment of the OHL) to enable the new GSP substation to connect to it;

3.8.4 Works to create a new vehicular access to the NGET and SEPN substations from the Eastbourne Road;

3.8.5 Ecological mitigation and drainage works.

4. **PHYSICAL COMPONENTS AND WORKS REQUIRED TO CONSTRUCT THE PROJECT**

4.1 Section 3 above sets out the key components of the Project. This section of my statement of evidence provides further detail on the key components, including:

4.1.1 The infrastructure that will be constructed/installed;

4.1.2 The construction works that are required; and

4.1.3 The spatial extent of the land and new rights that are needed to facilitate the construction, operation and maintenance of the infrastructure comprised in the Project by reference to the Order Maps (**CD D2**).

4.2 NGET developed a design for the Project for the purposes of seeking planning permission and promoting the Order (**CD D1**). This was informed by a wide range of surveys and assessments, including ecological surveys, geophysical surveys, ground investigations (e.g. boreholes), soil surveys, and land drainage assessments. Planning permission was granted in November 2021 (**CD C5**).

4.3 The appointed principal contractor will be responsible for further developing the detailed design, including matters such as precise OHL alignment, substation micro-siting and identifying a suitable location for the low voltage power & communication multicore cabling within the GSP substation. As part of the procurement process NGET liaised with the proposed contractors to ensure that the works could be suitably constructed within the Order Land.

**400kV NGET GSP Substation (shown coloured light pink on the Order maps (CD D2) and coloured bright pink/magenta on the Substation Indicative Layout Plan at Appendix 1)**

***Physical components***

4.4 The NGET GSP substation layout is illustrated on the proposed 400kV substation drawing at Appendix 1 ("Substation Indicative Layout Plan"). The component parts are described in more detail below.

4.5 The majority of the equipment will be outdoor equipment which will be used to transmit the electricity throughout the substation.

Equipment	Substation Indicative Layout Plan colouring	Works required/construction methodology	Figure reference
<b>Main outdoor equipment</b>			
<p><b>Two SGT and noise enclosure</b></p> <p>The SGT will transform the OHL electricity voltage from 400kv to 132kv to allow the SEPN connection.</p> <p>A noise enclosure which comprises of a prefabricated steel frame and prefabricated</p>	<p>Within the area coloured bright pink/magenta</p>	<p>The SGT is a large heavy piece of equipment which requires specialist transport and lifting techniques to land it in position. It will be located on a concrete civil foundation (see below).</p> <p>A skid will be used to move the SGT from the</p>	<p><b>Appendix</b> Error! Reference source not found. (location within substation)</p> <p><b>Appendix</b> Error! Reference source not found. (example SGT)</p>

<p>acoustic panels will be installed around the SGT.</p>		<p>transport trailer to its final position on the foundation.</p>	
<p><b>Two new pylons</b></p> <p>Two new pylons will be erected within the NGET GSP substation.</p>	<p>Within the area coloured lime green and shown in orange</p>	<p>The new pylon foundations will be installed using standard pad and column foundations (see foundations section below). These will be installed using 20 tonne excavators and sheet piling for temporary support. The 'rebar' (bars in structural concrete to provide the strength) will be fitted in the excavation and concrete will be poured. The excavation size is roughly 4m x 4m.</p> <p>The new pylons will be assembled on the ground in sections that can be lifted using a crane. Due to the height of the pylons a 250t crane may be required which requires a crane pad and assembly area for the crane to lift the sections. This area will be roughly 40m x 40m.</p> <p>Once assembled the sections will then be lifted with the crane and landed into their final positions.</p> <p>Once erected the new conductor and fittings can be installed.</p>	<p><b>Appendix</b> Error! Reference source not found. (location within substation)</p> <p><b>Appendix</b> Error! Reference source not found. (example pylon)</p>
<p><b>Underground 132kV Cables</b></p> <p>Electricity from the OHL will be converted from 400kV to 132kV by the SGT. The electricity will then be transported from the NGET substation to the SEPN substation via a 132kV underground cable.</p>	<p>Within the area coloured bright pink/magenta shown as a dashed brown line</p>	<p>Ducting will be installed to allow the 132kV cable to be pulled into position. Some of the ducting may be installed in a pre-fabricated trough. Works to install the ducting and/or troughs will involve the use of an excavator and associated temporary works may be required such as shoring or battering of ditches.</p>	<p><b>Appendix</b> Error! Reference source not found. (location within substation)</p> <p><b>Appendix</b> Error! Reference source not found. (example cables in trench)</p>
<p><b>Other outdoor equipment</b></p>			
<p><b>Civil Installation</b></p>	<p><b>Foundation</b></p> <p>Within the area coloured bright pink/magenta</p>	<p>This will involve excavation and shuttering to pour concrete to the required foundation</p>	<p><b>Appendix</b> Error! Reference source not found.</p>

<p>Each item of equipment will need to be installed on a sufficient individual concrete foundation to enable it to operate safely for the required period.</p>		<p>parameters including re bar.</p> <p>A 'pad and column' foundation will be created to an estimated depth of circa 3m. An excavator will be used to dig out the hole with sheet piling used for temporary support. Concrete will be poured in and 'rebar' will be used to re-enforce the concrete.</p> <p>Part of this work will also include installation of suitable electrical earths for safety and operational requirements.</p>	<p>(example civil foundations)</p>
<p><b>Cables, ducting and troughs</b></p> <p>Fibre optic cables and Low Voltage cables will be installed to connect the internal elements of the substation.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>Ducting will be installed to allow cables to be pulled into position. The cables will be installed in prefabricated troughs as explained above.</p> <p>The work will be carried out using an excavator.</p>	<p><b>Appendix</b> Error! Reference source not found. (example cables in troughs)</p>
<p><b>Lighting</b></p> <p>Lighting will be installed to ensure safe access and egress around the substation to specific areas of operation such as buildings, pathways and key equipment.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>The lighting columns will be installed using telehandlers and cranes. Any smaller lighting will be installed using hand tools.</p>	
<p><b>Electric Bus Bar conductors</b></p> <p>These will transmit the electricity around the substation.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>The Bus Bars will be installed using telehandlers and cranes.</p>	<p><b>Appendix</b> Error! Reference source not found. (location within substation)</p> <p><b>Appendix</b> Error! Reference source not found. (example Bus Bar)</p>
<p><b>Post insulators</b></p> <p>This piece of equipment is to keep the Bus Bars and other electrical equipment at the required height and insulated from earth (i.e. off the ground)</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	<p><b>Appendix</b> Error! Reference source not found. (example Post insulator)</p>

<p><b>Four Gantries</b></p> <p>Each electricity circuit requires its own metal support gantry for entry and exit from the substation.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	<p><b>Appendix</b> Error! Reference source not found. (location within substation)</p> <p><b>Appendix</b> Error! Reference source not found. (example Gantry)</p>
<p><b>Voltage transformers</b></p> <p>This piece of equipment will measure and regulate operational voltage within the substation and connect on to other pieces of equipment.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	
<p><b>Current Transformers</b></p> <p>This piece of equipment is installed to measure operational voltage in the substation.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	
<p><b>Disconnectors</b></p> <p>This piece of equipment will enable NGET to isolate certain equipment as and when required.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	
<p><b>Circuit Breakers</b></p> <p>This piece of equipment is installed to protect the system from 'fault current'. It will break the circuit when required to protect the rest of the network.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	
<p><b>Earth Switches</b></p> <p>This piece of equipment will be installed to ensure that areas of the substation can be worked on safely when they are isolated.</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	
<p><b>Surge arrestors</b></p> <p>This piece of equipment is required to protect the primary equipment under 'fault current' conditions (i.e. unintended high current flow caused by a short circuit – essentially, this is a surge that the system is not designed to accommodate</p>	<p>Within the area coloured bright pink/magenta</p>	<p>These will be installed using telehandlers and cranes.</p>	

in standard operating conditions).			
<p><b>Cable Sealing End</b></p> <p>This piece of equipment is to transition the electricity from the OHL to a cable.</p>	Within the area coloured bright pink/magenta	These will be installed using telehandlers and cranes.	<b>Appendix</b> Error! Reference source not found. (location within substation)
<p><b>Generators</b></p> <p>In the event of loss of supply to the substation, the generator will kick-in to maintain security of supply in the substation for the short-term.</p>	Within the area coloured bright pink/magenta	These will be lifted in using a crane	<b>Appendix</b> Error! Reference source not found. (example Generator)
<b>Buildings</b>			
<p><b>Modular buildings</b></p> <p>Modular buildings will be used to house electrical protection and control relay panels, telecommunication systems, batteries and chargers and low voltage supplies and other auxiliary systems.</p>	Purple	These will be permanent prefabricated structures which will be lifted into position with a crane and installed on concrete foundations (see above).	<b>Appendix</b> Error! Reference source not found. (example Modular building)
<p><b>Offices and workshop</b></p> <p>These will be used for carrying out maintenance and will contain welfare facilities.</p>	Purple	These are permanent prefabricated structures which will be lifted into position with a crane and installed on concrete foundations (see above).	<b>Appendix</b> Error! Reference source not found. (example offices)
<b>Ancillary structures/works</b>			
<p><b>Security perimeter fence</b></p> <p>An electrified fence will be installed around the perimeter of the substation equipment to ensure security/prevent access by unauthorised persons and comply with health and safety requirements i.e. prevent injury to unauthorised persons.</p>	Solid black line with intermittent circles	This will be installed using a telehandler.	<b>Appendix</b> Error! Reference source not found. (location within substation)



<p><b>Perimeter walkway access</b></p> <p>To allow for maintenance and inspections to take place a zone outside the substation security fence will be created.</p>	Teal	This will be a stone walkway constructed using a small excavator.	<b>Appendix</b> Error! Reference source not found. (location within substation)
<p><b>Access roads</b></p> <p>A hard standing car park and access roads will be required for safe access and egress into the substation for NGET personnel.</p>	Grey	This will be a tarmac roadway installed using standard methods.	<b>Appendix</b> Error! Reference source not found. (location within substation)
<p><b>Landscaping and screening</b></p> <p>Under the planning consent there is a requirement to provide screening around the substation to mitigate visual impacts.</p>	Lime green	This will include planting suitable vegetation in areas around the substation.	<b>Appendix</b> Error! Reference source not found. (location within substation)
<p><b>External access roads</b></p> <p>A hard standing access roads will be required for safe access and egress for the new pylon</p>	Grey	This will be a type 1 road roadway using standard methods.	<b>Appendix</b> Error! Reference source not found. (location within substation)

**132kV SEPN Substation (shown coloured light pink on the Order maps (CD D2) and coloured orange on the Substation Indicative Layout Plan at Appendix 1)**

**Physical components**

Equipment	Substation Indicative Layout Plan colouring	Works required/construction methodology	Figure reference
<b>Outdoor equipment</b>			
<p><b>Underground 132kV Cables</b></p>	Within the orange area shown as a dashed line	<p>Ducting will be installed to allow the 132kV cable to be pulled into position. Some of the ducting may be installed in a pre-fabricated trough. Works to install the ducting and/or troughs will involve the use of an excavator and associated temporary works may be required such as shoring or battering of ditches.</p> <p>These cables will cross over from the NGET substation to the SEPN substation.</p>	<b>Appendix</b> Error! Reference source not found. (location within substation)
<p><b>Civil Foundations</b></p>	Within the orange area	This will involve excavation and shuttering to pour	

		<p>concrete to the required foundation parameters.</p> <p>Re bar will be used to re-enforce the concrete.</p> <p>Part of this work will also include installation of suitable electrical earths for safety and operational requirements.</p>	
<b>Lighting for safe access and egress around the sub station</b>	Within the orange area	The lighting columns will be installed using telehandlers and cranes. Any smaller lighting will be installed using hand tools.	
<b>Electric Bus Bar conductors</b>	Within the orange area	The Bus Bars will be installed using telehandlers and cranes.	<b>Appendix</b> Error! Reference source not found. (location within substation)
<b>Cable Sealing End</b>	Within the orange area	These will be installed using telehandlers and cranes.	<b>Appendix</b> Error! Reference source not found. (location within substation)
<b>Post insulators</b>	Within the orange area	These will be installed using telehandlers and cranes.	<b>Appendix</b> Error! Reference source not found.
<b>Buildings</b>			
Electrical protection and control relay panels	Within the orange area, shown as purple		<b>Appendix</b> Error! Reference source not found. (location within substation)
Telecommunication system	Within the orange area, shown as purple		<b>Appendix</b> Error! Reference source not found. (location within substation)
Battery and chargers	Within the orange area, shown as purple		<b>Appendix</b> Error! Reference source not found. (location within substation)
Low voltage power supply and other auxiliary systems	Within the orange area, shown as purple		<b>Appendix</b> <b>1</b> (location within substation)
<b>Ancillary structures/works</b>			
<b>Security perimeter fence</b>  An electrified fence will be installed around the perimeter of the	Within the orange area shown as solid brown line with intermittent circles	This will be installed using a telehandler.	<b>Appendix</b> Error! Reference source not found. (location within substation)

<p>substation equipment to ensure security/prevent access by unauthorised persons and comply with health and safety requirements i.e. prevent injury to unauthorised persons.</p>			
<p><b>Perimeter walkway access</b></p> <p>To allow for maintenance and inspections to take place a zone outside the substation security fence will be created.</p>	<p>Teal</p>	<p>This will be a stone walkway constructed using a small excavator.</p>	<p><b>Appendix</b> Error! Reference source not found. (location within substation)</p>

**Land required (Order Plot 35 shown light pink on the Order Maps (CD D2))**

- 4.6 As explained in Mr Ingram’s evidence, NGET only seeks to acquire freehold title to parcels within the Order Land in two instances (1) for ecological mitigation (plots 58a and 58b) and (2) for above ground permanent infrastructure (plot 35). The reasons for seeking the freehold title of plots 58a and 58b are discussed in the evidence of Ms Copping. In the case of the NGET GSP and SEPN substations, freehold acquisition is justified for the following reasons:
- 4.6.1 A new substation constitutes significant above ground permanent infrastructure which effectively sterilises the land i.e. it cannot be used for any concurrent purpose.
  - 4.6.2 The NGET GSP and SEPN substations are vital to ensure the continuous flow of electricity from the National Grid to the Lewes area, and any unauthorised interference with them could adversely affect security of supply to the Lewes area.
  - 4.6.3 The substations will contain high voltage equipment that could cause significant or potentially fatal injury.
- 4.7 For the above reasons, NGET need exclusive possession and control of Plot 35. As explained in Mr Ingram’s evidence, NGET have now acquired the freehold of the land required for the substations (plot 35) through voluntary agreement. However, the land is retained in the Order (**CD D1**) to ensure that the Project is not impeded by subsequent discovery (despite diligent enquiries) of any third-party interests in the land.

**Replacement OHLs (land shown coloured green on the Order Maps (CD D2) and working areas coloured orange on the Order Maps)**

***Physical components***

- 4.8 It is necessary to realign a section of the existing Bolney- Ninfield OHL so that it can connect to the two new pylons to be installed within the NGET GSP substation. This will involve the removal of the existing sections of the Bolney-Ninfield OHL from pylons 71 to 69, and the installation new sections of OHL which will connect to two new pylons within the NGET GSP substation.

**Works required/construction methodology**

**Current Pylon Arrangement**



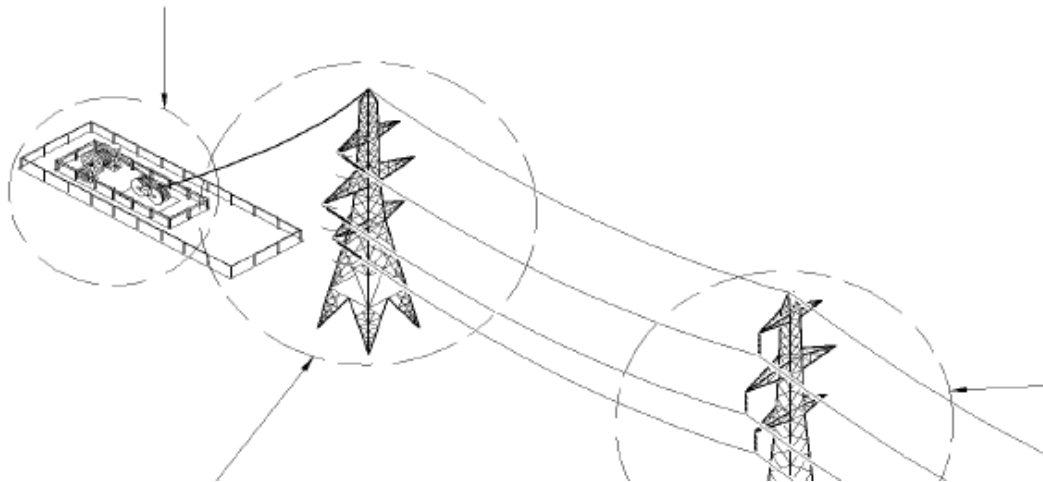
**Final Pylon Arrangement**



- 4.9 Due to the ecological constraints in the area it is important that an appropriate method is used to carry out the overhead line works to minimise any impact on protected species and vegetation removal. This is because species such as grey long eared bats, dormice, badgers and great crested newts have all been identified in these areas. The standard method would be to install a temporary diversion pylon to allow one circuit to be moved over. The other circuit can then be lowered to the ground and the new pylons built. Once in place the existing conductor can be used to land back on the new pylons. This would require significant vegetation removal in areas know to have high biodiversity interest and protected species. In order to minimise the impact on the protected species in the area, overhead line work will be carried out after the substation is built. This will allow for light ropes to be lowered onto the vegetation and new conductor pulled thought the section from pylon 71 to 64.
- 4.10 In summary, the existing OHL will first be lowered, the new pylons will then be erected in the new substation, and the new OHL will be pulled up from the new pylons through to pylon 71 and pylon 64 respectively using a winch (which is located at each end of the line).
- 4.11 To remove the existing sections of OHL from pylons 64 to 71, pulling positions (working areas shown orange on the Order Maps (**CD D2**)) will need to be established at those pylons. This is because it is at these pylons that there is a physical break in the OHL.
- 4.12 Equi potential zones ("EPZ") (i.e. safe working areas- example shown in the photo below) will be set up at pylons 64 and 71 to control the risks of having one circuit live during operations. The EPZ must be located at a distance 1.5 times the pylon height from the base of the pylon, to ensure that the structure is not put under too much vertical load. As the pylons are c.50m high, the EPZ needs to be positioned at least 75m back from the base of the pylon.
- 4.13 The EPZ will comprise of a base of aluminium tracking panels which are earthed for safety and plastic breaker panels. It will contain a 20-tonne puller/tensioner and a number of empty conductor drums to hold the old, lowered, OHL and drums containing the OHL to be installed. This equipment is shown in the photograph below:



Layout of an Equipotential Zone (Ensure Positioned to Maximise Clearance to Adjacent Live Circuit)



- 4.14 The EPZ zones will be established before system outages in March 2024. Once the EPZ zones have been established and the OHL circuit is under outage, the existing OHL will be pulled out with ropes and lowered onto the vegetation, minimising any damage to vegetation and habitat that has been identified to contain protected species such as grey long eared bats, great crested newts, dormice and badgers. Scaffolds will be erected to protect features such as roads and vegetation.
- 4.15 The existing pylon to the north of the NGET GSP substation is being replaced by two new ones within the substation. It will therefore be redundant and will be removed using a crane and its foundations removed using an excavator.

***Rights needed***

- 4.16 To carry out the work on the pylons, a sufficient area is required to complete the work safely. When the work is carried out one circuit will remain live at all times so it is important to ensure suitable work area is allowed so as to not constrain the methodology which could increase the risk of a serious incident. Each pylon has been assessed for the work area

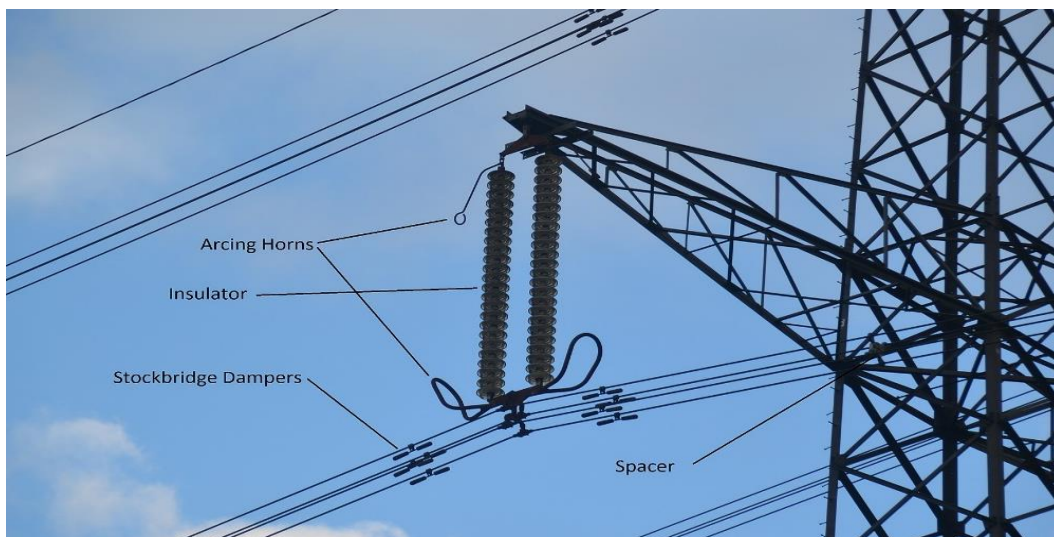
required to carry out the activities safely. This includes storage, lifting areas and emergency rescue requirements.

- 4.17 The new sections of OHL will oversail the land shown coloured green on the Order Maps (**CD D2**). Permanent rights, referred to as 'Overhead Line Rights' are needed over this land to enable the OHL to be installed, and then to be retained, used, maintained and protected from interference thereafter. The plots of land shown coloured green on the Order Maps (**CD D2**) collectively allow enough width for the natural 'swing and sway' of the OHL once installed, and to enable NGET to establish a 'protective zone' within which certain activities are prevented in order to protect the OHL from interference (e.g. vegetation growing up to the OHL).
- 4.18 The areas of land shown coloured orange on the Order Maps (**CD D2**) are the working areas around existing pylons. The working area to the north of the NGET GSP substation site is needed to facilitate removal of an existing redundant pylon as described above. The other working areas are required to enable EPZ's (safe working areas) to be created and works to replace existing sections of OHL to be carried out as described above. A bespoke package of 'Working Area Rights' will be acquired over this land to enable the works to be undertaken during the construction phase of the Project.

**Arcing horn replacement (land shown coloured light blue and light green on the Order Maps (CD D2))**

***Physical components***

- 4.19 The electrical arcing gap (i.e. the gap across which electricity is required to jump) on the pylons within a mile either side of the new NGET GSP substation will need to be changed to maintain security of supply.
- 4.20 To allow for this the arcing horns on those existing pylons will need to be changed during the powers outages for the main substation works.
- 4.21 A photograph of an example of an arcing horn is provided below:



***Works required/construction methodology***

- 4.22 Replacement of the arcing horns will require a small working party to access each pylon and climb the structure to replace the equipment. This will involve disconnecting the existing equipment and lowering it to the ground and lifting the new equipment. This will all be carried out with ropes and winches. To carry this out safely, a work zone needs to be established around each pylon. This is to ensure the following:
  - 4.22.1 if anything falls to the ground during the operation there is no risk to members of the public.

4.22.2 there is a sufficient lifting and lowering area.

4.22.3 to enable emergency rescue.

***Rights needed***

4.23 To enable NGET to establish a safe working area to carry out the arcing horn replacement works during the construction phase of the Project, a package of 'Arcing Horn Rights' will be acquired over the land shown coloured light blue on the Order Maps (**CD D2**).

4.24 In order to ensure that access can lawfully be taken from the nearest public highway to the working areas, 'Arcing Horn Access Rights' will be acquired over the land shown coloured light green on the Order Maps (**CD D2**).

**Colour plate replacement (land shown coloured grey dark pink/magenta on the Order Maps (CD D2))**

***Physical components***

4.25 Each electrical circuit on a pylon has a circuit identification plate (known as a 'colour plate') which ensures that the correct circuit can always be identified. Before the Little Horsted GSP substation becomes operational the electrical circuits will require a new identification. For safety reasons, the colour plates on all pylons from Little Horsted to Ninfield Substation will need to be changed during the power outages for the main substation works in line with how the new equipment is commissioned.

***Works required/construction methodology***

4.26 Replacement of the colour plates will require a small work party to access each pylon and climb the structure to replace the plate. To carry this out safely a work zone needs to be established around the pylon. This is to ensure the following:

4.26.1 if anything falls to the ground during the operation there is no risk to members of the public;

4.26.2 to enable emergency rescue.



***Rights needed***

- 4.27 To enable NGET to establish a safe working area to carry out the colour plate replacement works during the construction phase of the Project, a package of 'Colour Plate Rights' will be acquired over the land shown coloured grey on the Order Maps (**CD D2**).
- 4.28 In order to ensure that access can lawfully be taken from the nearest public highway to the working areas, 'Colour Plate Access Rights' will be acquired over the land shown coloured dark pink/magenta on the Order Maps (**CD D2**).

**Temporary Construction Compound ("TCC") (shown coloured red on the Order maps (CD D2))**

***Physical components***

- 4.29 In order to facilitate construction of the substations, a construction compound is required. It will comprise of hardstanding and a perimeter fence and will be used for the storage of plant and machinery and the stockpiling of materials, as well as for the provision of site management offices, parking, and welfare facilities for construction personnel (kitchen facilities, storerooms, toilets) in accordance with Health and Safety and Construction Design and Management requirements.

***Works required/construction methodology***

- 4.30 Works will be required to create the compound and to remove it and reinstate the land following completion of construction.

***Rights needed***

- 4.31 A package of 'Construction Compound Rights' needs to be acquired over the land shown coloured red on the Order Maps (**CD D2**) to enable a construction compound to be created, used and removed following completion of construction. The land will then be reinstated.

**Drainage corridor (shown coloured brown on the Order maps (CD D2))**

***Physical components***

- 4.32 Once the NGET GSP substation is operational, water run-off from the SGT bunds will need to be discharged. A drainage system therefore needs to be installed which will consist of a plastic pipe with sufficient fall to discharge into the Ridgewood Stream watercourse to the east of the substation. Walkway access will be required from the substation to inspect the manholes and the outfall headwalls. A hardstanding will be required at the headwall to allow inspection and sampling of the water to monitor the outfall water contents.

***Works required/construction methodology***

- 4.33 The drainage will be installed using an excavator to dig to the required depth. Excavated material will be placed next to the dig far enough away to avoid an excavation collapse risk. Temporary shoring using a trench box or sheet piles may be used depending on the depth of the excavation. Plastic pipe can then be installed on top of suitable material such as sand or shingle. The excavation can then be back filled and reinstated. Where the drainage meets the outfall point a head wall needs to be installed.





***Rights required***

- 4.34 A package of 'Drainage Rights' is needed over the land shown coloured brown on the Order Maps (**CD D2**) in order to enable the drainage system to be installed, retained, used and maintained for the lifetime of the NGET GSP substation.

**Ecological Mitigation (Plots 58a and 58b shown coloured light pink on the Order Maps (CD D2) and the land shown coloured purple, turquoise and cross-hatched green on the Order Maps)**

***Physical components***

- 4.35 The evidence of Ms Amy Copping explains the need to provide replacement habitat on Plots 58a and 58b to mitigate the impact on protected species habitat resulting from construction of the NGETV GSP and SEPN substations. There are other areas where works are required to mitigate impacts on protected species.

***Works required/construction methodology***

- 4.36 Minor works are required to install mitigation measures such as ecology fences/gates and dormouse boxes.

***Rights required***

- 4.37 Rights are required over the land shown coloured purple, turquoise and cross-hatched green on the Order Maps (**CD D2**) to install mitigation measures, such as dormice boxes, and to keep them in situ and monitor them.

**Substation Visibility Splay (land shown yellow on the Order Maps (CD D2))**

***Physical components/Works required/construction methodology***

- 4.38 It is necessary to ensure that safe vehicular access can be taken to/from the NGET GSP substation to/from the adjoining public highway. In order to achieve that visibility splays must be maintained which allow sufficient sightlines along the public highway. In the event that vegetation, structures or equipment are located on the designated visibility splays, NGET will need to be able to remove it, which may involve physical works, such as vegetation clearance.

***Rights required***

- 4.39 Rights, known as 'Substation visibility Splay Rights' are required over the land shown coloured yellow on the Order Maps (**CD D2**) to enable NGET to prevent the erection of buildings or structures, the placing or storage of equipment or materials, the parking of vehicles or the growing of shrubs, trees, or an increase in the level of the land which would restrict viability, and to carry out works to remove any such obstacles, such as vegetation clearance.

**5. OBJECTIONS MADE TO THE ORDER**

- 5.1 The schedule at Appendix B of the statement of the evidence of Mr Ingram, outlines the 4 objections remaining at the time of writing, NGET's response to them and the status of negotiations.

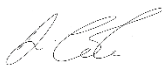
**6. SUMMARY AND CONCLUSIONS**

- 6.1 In my statement of evidence I have described the physical components of the Project and the works that are required to construct/install those physical components, with reference to the illustrative drawings and photographs embedded within/appended to it. I have also described the land and rights that are needed to enable those works to be undertaken safely.

- 6.2 No more land than is necessary for the purposes of the safe construction, operation and maintenance of the Project has been included in the Order (**CD D2**).

**7. DECLARATION**

I confirm that the opinions expressed in this proof of evidence are my true and professional opinions.



David Cole

17 November 2022