ENGINEERING / CABLE ROUTE

THE NATIONAL GRID ELECTRICITY TRANSMISSION PLC (SCOTLAND TO ENGLAND GREEN LINK 1) COMPULSORY PURCHASE ORDER 2023

STATEMENT OF EVIDENCE

Faisal Karim CEng MIET
EPC Project Manager
National Grid Electricity Transmission plc

1. QUALIFICATIONS AND EXPERIENCE

1.1 My name is Faisal Karim and I am an EPC Project Manager with National Grid Electricity Transmission Plc (NGET). I have a BEng (Hons) in Mechanical Engineering with Management from The University of Manchester. I am also a chartered engineer and member of Institute of Engineering and Technology.

1.2 I have over 12 years of experience working within NGET, which I joined in 2011 as an Investment Delivery Engineer, where I was responsible for early stages of project development for overhead line replacements, customer connections, network reinforcements and asset refurbishment projects.

1.3 From 2014 to 2018 I held asset management roles within NGET where I was responsible for policy development and delivery to optimise NGET asset lifecycle in terms of health and safety performance, environment, and network resilience.

1.4 I have held the role of Project Manager with NGET since 2019 and am responsible for optimum project delivery with respect to scope, cost, time, quality, health and safety and environmental performance whilst delivering regulatory outputs.

1.5 I jointed the Scotland and England Green Link 1 (SEGL1) in August 2022 and in my role with NGET, I am project managing the pre-construction and delivery of High Voltage Direct Current (HVDC) cables from landfall at Seaham to the converter station at South Hetton. I am responsible for ensuring project is delivered as per outputs, whilst considering stakeholder requirements and impacts.

2. INTRODUCTION AND SCOPE OF EVIDENCE

2.1 The purpose of my evidence is to explain the engineering design and construction methodology of the Scotland to England Green Link 1 (the **Project**), specifically the cable corridor from landfall to the connection at the converter station (including access and construction compounds for the cable installation). My evidence does not address the wider need for the Project (addressed by Mr Law at section 4, Mr Smith at section 3 in respect of planning and Mr Chandler at section 4 in respect of the need for the Order land of their respective evidence) or the engineering design and construction methodology for the converter station onwards which is the responsibility of Mr Law and is dealt with in his evidence or the engineering design and construction methodology in respect of the substation and overhead line works which is the responsibility of Mr Omer and is dealt with in his evidence, save where there is overlap with the cable infrastructure.

2.2 My statement of evidence is structured as follows:

2.2.1 Section 3 provides an overview of the Project.

2.2.2 Section 4 describes the works and rights required for the Project cable (from landfall up to the point of connection).

2.2.3 Section 4.63 comments on objections made to the Order.

2.2.4 Section 6 contains my conclusions.

3. OVERVIEW OF THE PROJECT

3.1 NGET owns and maintains the high voltage electricity transmission network in England and Wales. In England and Wales, the high voltage electricity transmission system operates at 275,000 volts (275kV) and 400,000 volts (400kV), comprises some 7,000 route kilometres of overhead lines, over 600km of underground cable and over 320 substations. At the substations generation is connected to the system and the primary transmission voltage of 400kV or 275kV is transformed to lower voltages. The lower voltage electricity is taken by regional electricity companies who supply it to industrial, commercial and domestic users across the UK.

3.2 NGET is promoting and developing proposals for a subsea High Voltage Direct Current Link (**HVDC**) alongside Scottish Power Transmission (**SPT**). This will provide an HVDC link between Torness in East Lothian and Hawthorn Pit in County Durham (**Project**). The Project has been proposed in partnership with SPT, which is the transmission owner for southern Scotland and responsible for the onshore and offshore aspects of the Project in Scotland.

3.3 The primary objective of the Project is to reinforce the electricity network and increase transmission capacity across the B6 boundary between southern Scotland and northern England before 2030. The benefits of the Project are that it provides this reinforcement and provides resilience to the electricity network, addressing the current boundary constraints and transmitting renewable energy produced in Scotland to the English national electricity system.

3.4 The Project comprises the following components:

3.4.1 **Scottish Onshore Scheme:** A converter station to the east of the Dunbar Energy Recovery Facility at Oxwell Mains, Dunbar, and a substation at Branxton in East Lothian, Scotland, with approximately 6.5 km of buried HVDC cable to a landfall south-east of Thorntonloch beach. The converter station and substation will be connected by approximately 3.5 km of HVAC cable. The substation connects the Scottish Onshore Scheme to the existing transmission system.

3.4.2 **Marine Scheme**: Approximately 176 km of subsea HVDC cable from Thortonloch Beach, Torness on the east coast of Scotland to Seaham, County Durham, in the north-east of England. The Marine Scheme is being developed jointly by NGET and SPT who have submitted marine licence applications to the Marine Scotland Licensing Operations Team (MS-LOT) and the Marine Management Organisation (MMO).

3.4.3 **English Onshore Scheme**: Approximately 10 km of underground HVDC cable from the mean low water mark at Seaham, to a converter station at Hawthorn Pit in County Durham. The converter station will be connected to a new 400 kilovolt (kV) substation by approximately 1 km of underground of High Voltage Alternating Current (HVAC) cable. The new 400 kV substation will connect the project to the existing 275 / 400 kV Hawthorn Pit substation and the existing electricity transmission system.

3.5 The Project also includes works to existing overhead line electricity infrastructure and the installation of new overhead line electricity infrastructure, comprising the re-alignment of

existing overhead lines at Hawthorn Pit, the relocation of a pylon, the removal of two pylons and the removal of existing overhead lines.

3.6 The English Onshore Scheme components of the infrastructure required to deliver the Project will comprise the following:

3.6.1 **Landfall**: A Transition Joint Pit (**TJP**), which will connect the marine HVDC cables forming part of the Marine Scheme to the onshore HVDC cables forming part of the English Onshore Scheme, at a landfall located to the north of Seaham Hall Beach, County Durham (the **Landfall**);

3.6.2 **HVDC Cables**: Approximately 10 km of two underground HVDC cables (and two fibre optic cables for cable system monitoring) between the TJP and the converter station at Hawthorn Pit (the **HVDC Cables**);

3.6.3 **Converter Station**: Converter station buildings and outdoor electrical equipment together with formation of internal roads and erection of security fencing and provision of landscaping (the **Converter Station**);

3.6.4 **Substation**: A new 400 kV substation to the south of the existing Hawthorn Pit substation (the **Substation**);

3.6.5 **HVAC Cables**: approximately 1km of six underground HVAC cables connecting the new converter station and new substation and approximately 600m of nine underground HVAC cables connecting the new Substation to the existing electricity substation at Hawthorn Pit (the **HVAC Cables**);

3.6.6 **New Permanent Access**: formation of a permanent converter station access road from Jade Business Park (the **New Access**);

3.6.7 **Temporary Compounds**: construction of associated temporary construction compounds, temporary work areas, and temporary vehicle access arrangements (the **Temporary Compounds**);

3.6.8 **Converter Station Compound**: construction of a construction compound for the converter station site (the **Converter Station Compound**);

3.6.9 **Removal of Overhead Lines**: the removal of existing overhead electricity lines, including three pylons, which currently connect to the existing electricity substation at Hawthorn Pit (the **Overhead Line Removal Works**); and

3.6.10 **New Overhead Lines**: the installation of new overhead electricity lines and one new pylon to connect to the new substation at Hawthorn Pit (the **New Overhead Line Works**).

4. PHYSICAL COMPONENTS AND WORKS REQUIRED TO CONSTRUCT THE CABLE INFRASTRUCTURE

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 cable components (from landfall to the converter station), including:

4.1.1 The infrastructure that will be constructed and installed;

4.1.2 The construction works and methodologies that are required for this infrastructure; and

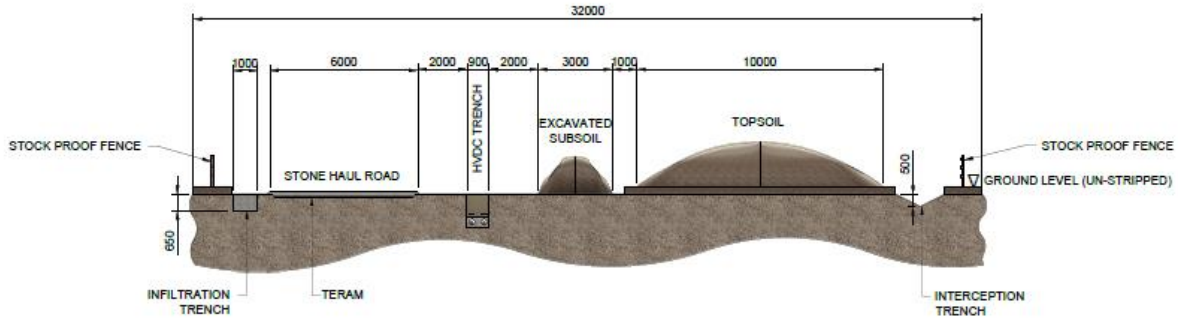
4.1.3 The spatial extent of the land and new rights that are needed to facilitate the construction, operation and maintenance of the infrastructure comprised in the Project by reference to the Order Maps (**CD D.2**).

4.2 NGET developed a design for the Project for the purposes of seeking planning permission and promoting the Order (**CD D.1**). 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 July 2023 (**CD C.4**) but this does not cover the cable infrastructure which is permitted development.

4.3 The cable and civil contractors will be responsible for further developing the detailed design, including matters such as route alignment, micro siting and identifying joint bay locations. The procurement process which will lead to the appointment of the cable contractor is ongoing. It is currently anticipated that contracts will be awarded in January 2024.

4.4 As a consequence, the final alignment and width of the corridor within which the HVDC Cables will be installed is not yet known. This will be influenced by a number of factors including: the varying ground conditions; topography and constraints which are anticipated to be encountered along the route; and the different construction/installation techniques which may need to be used.

4.5 After contract award, and prior to mobilisation, the cable contractor will initiate the detailed design and conduct pre-construction activities and surveys including but not limited construction environmental management plan, soil management plan, drainage management plan and landscape mitigation plan. The outputs of the surveys will aid in finalising the detailed design, whilst meeting technical and physical constraints, within the route corridor. The drawing below shows an illustration of a typical construction swathe:



4.6 The individual main components of cable infrastructure to be installed are highlighted below:

Cables

Two HVDC 525kV 2500mm2, 138mm outer diameter, XLPE (Cross-linked polyethylene) cables.

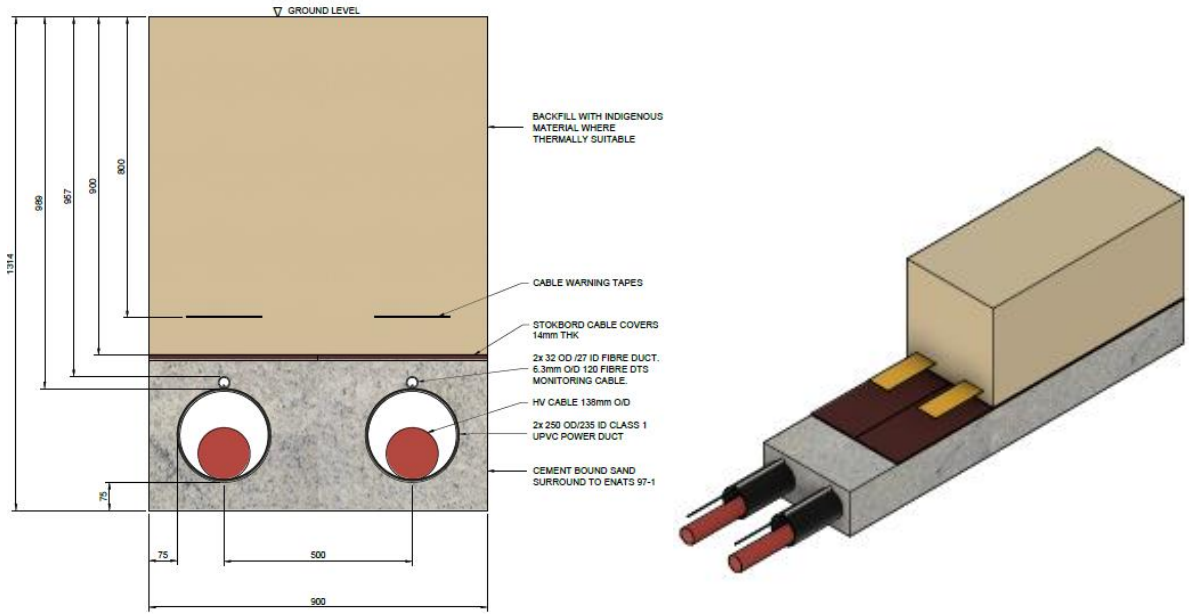
Fibre Optic cables

Two fibre optic cables for cable system monitoring. The outer diameter of these cables will be no more than 12mm.

Ducts

Four individual ducts, which will house the HVDC and fibre optic cables. The primary purpose of the ducts is to allow faster installation and re-instatement. The outer diameter of the main cable duct will be 250mm and for the fibre cable ducts it will be 32mm.

Typical trench cross-section illustrations for agricultural land are shown below:



Joints

Approximately twelve cable joints (subject to detailed design) including transition joint to join marine and onshore cable. Joints enable two adjacent sections of cable to be joined together.

Termination

Two terminations will be installed within the converter station. Terminations allow power from the cables to be transferred within the converter station.

Construction Phase

Transition Joint Pit which will connect the marine HVDC cables to the onshore HDVC cables at land located to the north of Seaham Hall Beach, County Durham Plot 1-05

Physical Components

4.7 At the landfall, the offshore HVDC cables will connect to the onshore HVDC Cables at a buried transition joint pit, which is located to the north of Seaham Hall Beach, County Durham. The transition joint pit will be set back from the coastline, beyond the coastal

erosion risk area to avoid future cable exposure, approximately 230 m inland from the mean low water mark. The offshore cables will make landfall via horizontal directional drill (**HDD**) under the intertidal zone and Seaham Hall beach. Like the onshore cables, the offshore cables will be installed in pre-installed ducts. The HDD entry will be from onshore and is subject to detailed design.

4.8 The transition joint pit is comprised of storage of plant and machinery, and for stockpiling materials, as well as 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) Regulations 2015 (CDM).

4.9 Subject to design, the permanent buried transition joint pit will occupy an area of up to 60m2 (based on an indicative footprint of 12m by 5m). However, a larger area will be required during installation to accommodate temporary construction equipment and storage areas. This temporary compound area (up to approximately 100m x 100m) will contain equipment and facilities as highlighted in paragraph 4.10.

4.10 The Order Land boundary is wider at the landfall point due to factors which include:

4.10.1 the criticality and high risk of the HDD operation for the Project;

4.10.2 complexity of the Landfall HDD operation, due to the depth and length of the HDD ducts (with the HDD length potentially extending to 1,200m);

4.10.3 unknown ground conditions that cannot be identified until the HDD operations take place;

4.10.4 size of the specialist equipment needed to complete the HDD operation; and

4.10.5 site establishment, storage of installation material, safe access and egress and the working area required to complete the HDD operation.

4.11 Once installation has been completed, no infrastructure will be visible on the surface (and the land will be fully reinstated).

Works required / construction methodology

Landfall Works

4.12 The landfall point is of critical importance because it is the point where two HVDC submarine cables and two subsea fibre optic cables come ashore and connect to the onshore HVDC cables. The submarine cables will be installed beneath the beach out with the Order Land pursuant to a marine licence and lease from The Crown Estate.

4.13 Whilst there are various methods of bringing a submarine cable onto land, in this location, the difference in topology has led to a decision to use a technique called Horizontal Directional Drilling ("HDD"). This technique avoids disruption to the surface of the land, and any structures on it, as all the installation work is below ground.

4.14 The two HVDC submarine cables and two fibre optic cables will be installed below the seabed in two ducts.

4.15 The ducts will be up to 30 metres apart, measured from their centre points.

4.16 Access to the transition joint bay will be from the A1018 by taking the B1287 southbound then access is on the left.

4.17 The duration for which the transition joint pit is required is likely to be around 8-10 months, subject to construction methodology of the cable and civil contractor.

Cable Installation

4.18 The HVDC cable route runs underground for approximately 10km from the landfall to the converter station at Hawthorn Pit.

4.19 The HVDC route will comprise of two HVDC cables, together with two fibre optic cables for the purpose of monitoring cable performance, all installed in a single trench. There will be cable joint bays at intervals along the route to connect the cable sections together. There will also be above ground cable marker posts installed to indicate the location of the cables.

4.20 With project such as this cable installation, it is not practical to start at one end of the route and work systematically towards the far end. The route will need to be split into smaller working areas, to allow simultaneous activities to be carried out along multiple areas, so as soon as the cables have been delivered, they can be installed, and jointing can commence on multiple fronts.

4.21 The HVDC route will comprise of two HVDC cables, together with two fibre optic cables for the purpose of monitoring cable performance, all installed in a single trench. There will be cable joint bays at intervals along the route to connect the cable sections together. There will also be above ground cable marker posts installed to indicate the location of the cables.

4.22 The construction swathe for the installation of the cables and joint bay works will be approximately 40 metres wide and will consist of 6 metres of stone haul road, 3.6 metres of cable trench, 3 metres excavated subsoil, 8 metres of top-soil, interception and infiltration trenches and fencing.

4.23 Haul road will be used during construction to allow movement of construction traffic, cable drums and other plant and equipment required for cable installation throughout the route. Turning points will be installed throughout the route within the construction swathe.

4.24 Following the setting out of the haul road within the swathe and installation of fencing, the topsoil will be stripped, and excavated topsoil will be stored within the construction swathe at a location to prevent cross contamination with sub-soils.

4.25 Two cable and two fibre ducts will be installed in the trench dug up to depth of approximately 1.3 metres. Ducts will be separated by approximately 0.5 metres from their centre points and will lay within cement based sand, which will then be covered with 14mm thick cable protection covers at a minimum depth of 0.9 metres.

4.26 The cables and fibres will be pulled from the drums using a winch into the pre-installed ducts.

4.27 Once the cable system is tested, the trench will be backfilled with indigenous material where thermally suitable with special care to avoid cross-contamination of soils and return land to its original condition.

Joint Bays

4.28 To facilitate cable installation and jointing works a compound area will need to be established around the joint bays., this will include the installation of a hardstanding (stone

or trackway) to provide a lay down area for material storage, parking of vehicles and to facilitate cable drum offloading and installation.

4.29 Fencing will be installed around the area to clearly demarcate it and in addition to signs indicating the dangers would be erected.

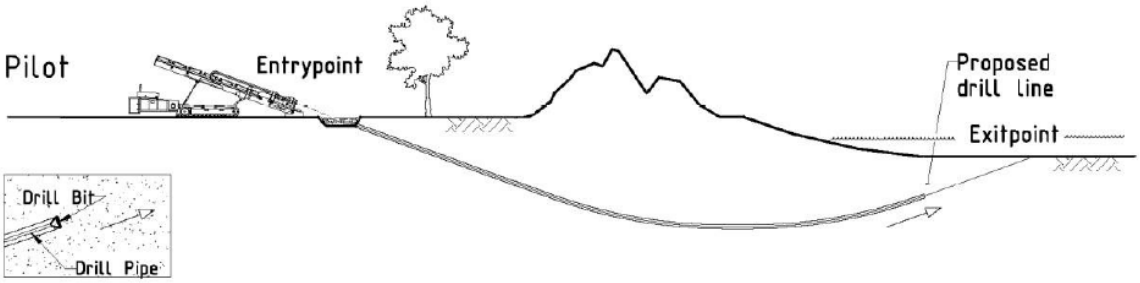
4.30 Typical joint bay would be 16 metres long and 3 metres wide. ***(CD Ref xx).***

4.31 Joints will be laid on a base slab and final position supported on a cement-based sand filled sandbags.

Horizontal Directional Drilling (HDD)

4.32 On the onshore cable route, a few physical features have been identified which require the use of trenchless no-dig technology to allow the cable to pass. These are the rail crossing, A1018 roundabout, A19 dual carriageway and disused railway.

4.33 Typical illustration of HDD operation is shown below:



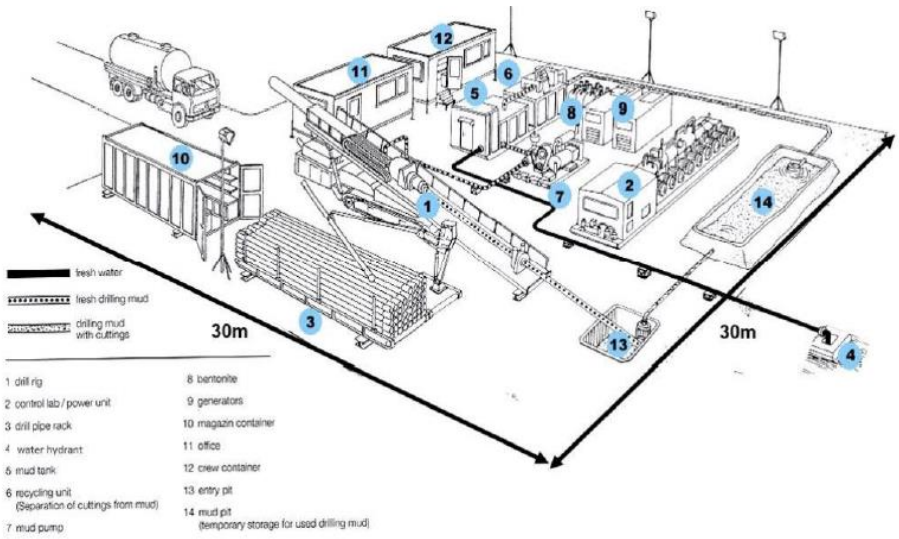
4.34 Entry and exit compound will be established for the HDD operation. ***().***

4.35 Typical launch pits would be 30x30m, and reception pits would be 20x20m.

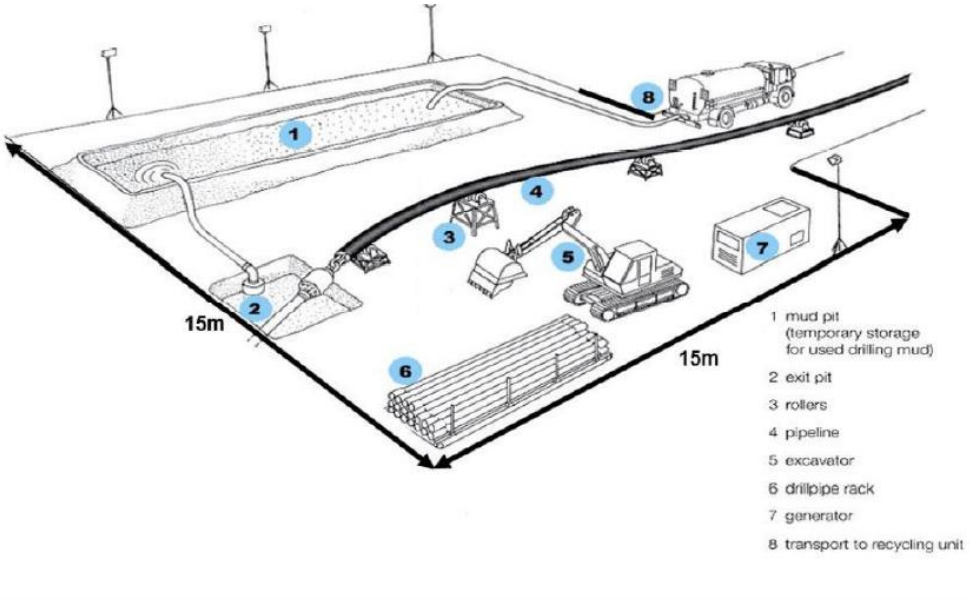
4.36 The launch and reception pits would be present for the duration of approximately 4 months.

4.37 The illustration below highlights typical launch and reception pits:

Launch Pit



Reception Pit



Rights needed

4.38 In this area, a bespoke Landfall Right is required to enable the construction, maintenance and operation of the landfall infrastructure.

Two underground HVDC cables approximately 10km in length (and two fibre optic cables) between the TJP and the converter station Plot 1-01 to the Converter Station at Plot 7-19

Physical Components

Works required / construction methodology

4.39 Trenched installation techniques across open land, with the cables being installed within buried ducts, surrounded by a thermally suitable material.

4.40 Trenchless methods, such as HDD, to cross obstacles where appropriate, including (but not limited to) roads, railway lines, buried utilities and watercourses. More detail on HDD an where it is likely to be used is given in paragraph 4.34 above.

Rights needed

4.41 Electricity Infrastructure Construction rights are required to enable the construction of the HVDC cables.

Temporary Compounds including temporary work areas and temporary vehicle access arrangements

Physical Components

4.42 To facilitate the route construction and to minimise the impact to the local transport network of transporting materials, primary and secondary temporary construction compounds will be established along the route. For a cable route the size of this Project, multiple construction compounds are required to satisfy H&S and CDM regulations with regards to provision of welfare facilities for construction personnel. These compounds also enable efficient delivery of the project and minimises impact on the local transport network.

4.43 The primary compound will be established near Grange mount, near the A1018 roundabout with secondary compounds being established in Seaton and Murton. The transition joint bay compound will be established in Seaham at the location of the car boot sale.

4.44 Approximate sizes of the compounds are; primary compound (192 metres x 240 metres), Seaton compound (103 metres x 240 metres), Murton compound (137 metres x 109 metres) and transition joint bay compound (100 metres x 100 metres).

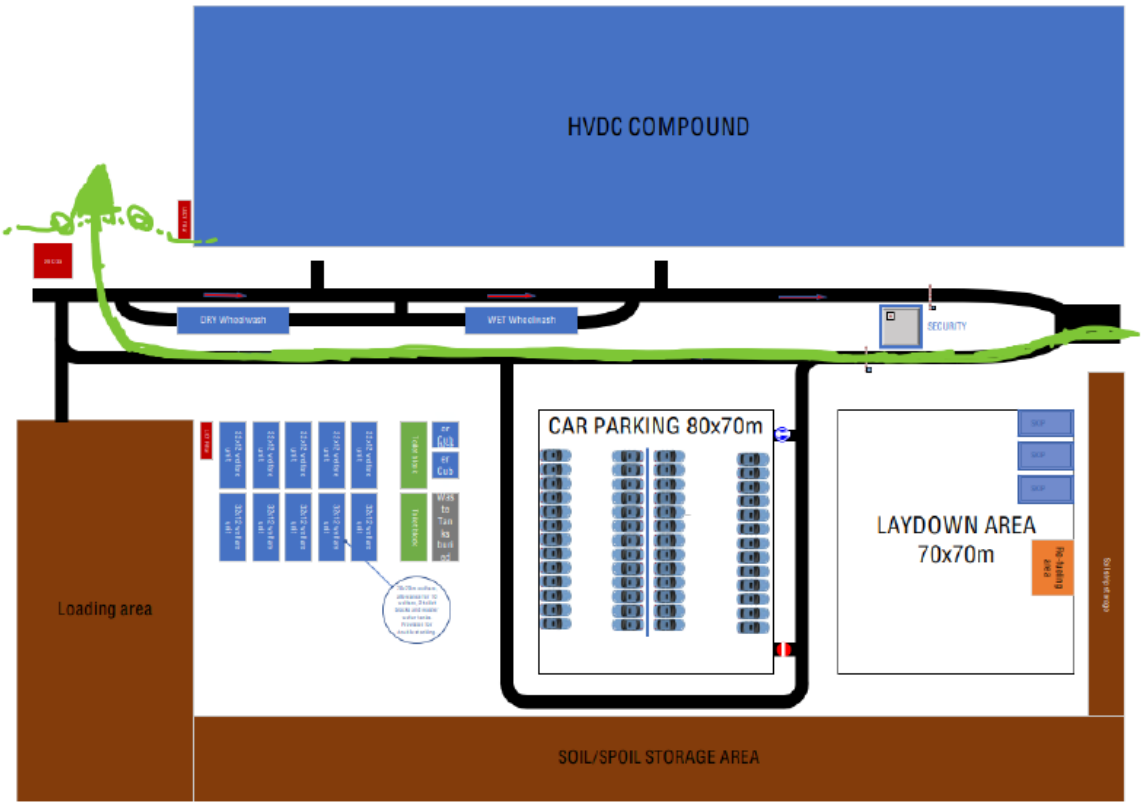
4.45 Following stripping of topsoil where required, a geotextile membrane or similar will be installed on the topsoil with stone spread over the top.

4.46 Suitable drainage will be installed where required in line with the land drainage design.

4.47 Each laydown area will have fencing installed around the perimeter with security along with suitable signage and access controls.

4.48 All compounds will be removed at the end of construction with land re-instated to its original condition.

4.49 Typical illustration of a primary compound is shown below:



4.50 Each construction compound will compromise 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

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

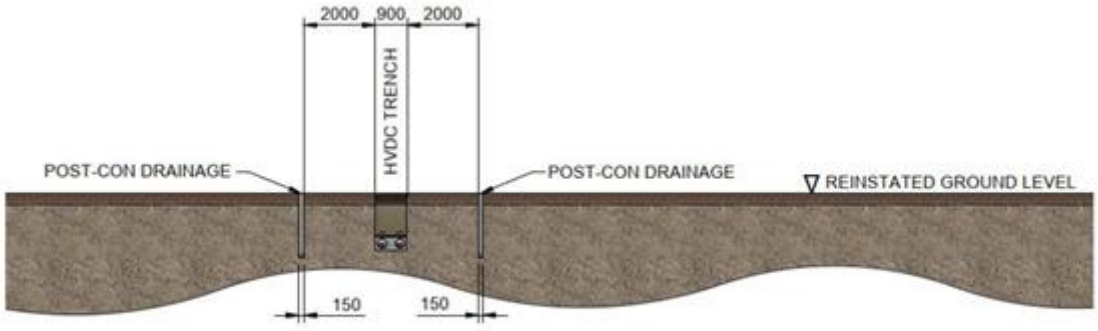
<u>Drainage Works</u>

4.52 Desk study of drainage has been conducted on the HVDC cable route which has highlighted that 90% of the land is artificially drained. Where land is artificially drained, mitigation drainage systems, also referred to as 'pre' and 'post construction' schemes will be required by the Project.

4.53 NGET has instructed a drainage consultant to conduct walkover drainage surveys which will provide conceptual pre and post construction drainage plans, supported by information gathered through meeting the landowners.

4.54 The final pre and post construction drainage strategy is to be determined by the cable and civil contractors due to intrusive survey requirements. Also, because exact location where the cables will be buried within 60 metre swathe, is to be determined during detailed design by the appointed contractors. Any intrusive drainage surveys carried out at this stage will not yield in conclusive drainage strategy.

4.55 During the construction works, if a land drain is identified, it's position shall be prominently marked by pegs and marked at the side of the working width and maintained until the drain has been reinstated. The land drain would be replaced over the trench width and into the undisturbed ground on each side of the trench width. Prior to replacing land drains, the excavation shall be backfilled to provide a good, firm, bed. Typical illustration is shown below:



4.56 Landowners will be given the opportunity to review and comment on proposed drainage plans before plans are issued for construction.

4.57 NGET will also appoint an independent drainage consultant to inspect and advise on contractor's drainage strategy and works.

Accesses

4.58 NGET needs to be able to take access from the public highway to the construction/rights corridor to facilitate construction, operation, maintenance, decommissioning of HVDC cables. Minor works, such as the creation of temporary bell mouths and turning areas to

allow construction vehicles to access temporary construction compounds, will need to be carried out to facilitate access during construction.

4.59 All access points will have temporary gates installed, set back from the highway, to assist with management of access to site. Manned security will be supplied during working hours at any access locations required for the planned works. When access locations are not in use, they will be secured with gates and padlocks with keys/codes provided to nominated persons as required. A ground hog welfare unit will be supplied at the access location for the use of the security guard.

4.60 Early works access is required for survey works such as archaeology investigations including drainage, soils, and cable depth assessment.

Rights needed

4.61 A package of Construction Compound Rights and Access Rights need to be acquired to enable the cable construction compounds to be created, used and removed following completion of construction. The land will then be reinstated.

Operational Phase

Landfall

4.62 There are no ongoing maintenance requirements for the landfall. However, non-intrusive routine visual surveys will be carried out on a yearly basis or as and when needed.

HVDC Cables

4.63 There are no ongoing maintenance requirements for the HVDC cables. However, non-intrusive routine visual surveys will be carried out on a yearly basis or as and when needed.

5. OBJECTIONS MADE TO THE ORDER

5.1 NGET's Statement of Case and the evidence of Mr Chandler outlines the 17 relevant objections remaining at the time of writing, NGET's response to them and the status of negotiations.

Cable Depth

5.2 Several objectors have raised the proposed cable depth provided in the Heads of Terms (**HoTs**), and the lack of confirmation on final burial depth, as grounds for objection to the scheme.

5.3 As discussed in sections 6 and 8 of Mr Chandler's evidence, and in section 12 of the Statement of Case (**CD D.10**), the HoTs identify a minimum cable burial depth (rather than an actual burial depth):

"The cables will generally be laid so as to avoid continued interference with normal agricultural operations as far as reasonably practicable. The cables shall be laid to contour with a depth of cover not less than 900mm from the original surface to the top of the protective tile above the cables."

5.4 Each set of HoTs that has been issued by NGET was accompanied by NGET's Construction best practice for underground cable installation version 1 (**CD F.6**). NGET's draft HoTs include confirmation that all project works will be carried out in adherence to NGET's Best

Practice Guide. None of the objections comment on NGET's Best Practice Guide or identify why NGET's Best Practice Guide is insufficient to regulate the construction of the English Onshore Scheme.

During detailed design phase of the project, various intrusive surveys will be carried out by the cable and civil contractor for any underground services and any constraints that would warrant burying the cable deeper than 0.9 metres. This cannot be determined at this stage as final location of the cable to be installed within the swathe will be determined by contractor subject to detailed design and any constraints.

Drainage and Soils

5.5 As set out in more detail in sections 6 and 8 of Mr Chandler's evidence, and in section 12 of the Statement of Case (**CD F.6**), several objectors have also queried drainage arrangements and soil management as part of the construction arrangements for the cable infrastructure.

5.6 NGET's Construction best practice for underground cable installation version 1 (**CD F.6**), which accompanies the individual HoTs issued by NGET, sets out the best practice for land drainage throughout construction. NGET's Best Practice Guide confirms that NGET will instruct a drainage consultant to provide pre and post construction drainage plans and sets out NGET's approach to drainage.

5.7 Independent drainage consultant has been appointment by NGET. They have carried out soil surveys and cable burial depth assessment in addition to the non-intrusive drainage surveys.

5.8 These surveys are usually under the scope of the cable and civil contractor. However, to address landowner concerns regarding drainage, soils and cable depth, these surveys are being carried out before contract award to provide confidence to the landowners with regards to how these will be managed during construction.

5.9 The drainage consultant has also already carried out desk study, met majority of landowners on the route to obtain information with regards to existing drainage, farming practices and soils.

5.10 The soil samples have been collected using hand held auger at every 100 metres on the cable route.

5.11 Soils are assessed to confirm; top soil and sub soil depts, textures, stone content. The type of soils encountered on the cable route is determined.

5.12 Topsoil samples from each plot have been collected by LDC and are being sent to accredited laboratory to be tested for pH, nutrient levels, organic matter content, etc.

5.13 Agricultural Land Classification (ALC) will also be carried out using the information obtained from the same survey and using information obtained from the lab testing.

5.14 The consultant has undertaken site walkover surveys (where access has been provided) and has met with some (but not all) landowners to understand drainage systems across the Order Land. Landowners have been unable to provide the consultant with details of site drainage systems, but some landowners have been able to provide sketches or verbal descriptions of their drainage systems. Based on the site walkover surveys undertaken by the consultant, the farming systems in place on the Order Land and the lack of information regarding drainage

systems, The consultant's initial view is that a minimum depth of 0.9m remains appropriate and that there is no justification for a cable depth of 1.2m depth across the Project.

5.15 The consultant's initial view is that installing the HVDC cable at a depth of 0.9m is not expected to affect drainage across the Order Land The consultant has also advised that, generally speaking, a cable depth of 0.9m should have no bearing on the ability of the Order Land to be drained at the post-construction stage of the Project (as post-construction drains run parallel with the cables).

5.16 The consultant have not been afforded access to all parcels of land to complete their work to date.

5.17 A detailed soil report will be provided to NGET which will provide details of soils along the route and comprehensive recommendations on soil handling, specific to the Project.

5.18 NGET's Construction best practice for underground cable installation version 1 (**CD F.6**), which accompanies the individual HoTs issued by NGET, sets out the best practice for soil management throughout construction.

5.19 Prior to stripping of topsoil, a topographical survey will be undertaken of the construction swathe to establish a pre-topsoil strip level. Following this, the topsoil will be stripped across the required construction swathe. At joint bay locations sufficient topsoil will be stripped to facilitate the excavation of the joint bay and required hardstanding's for cable installation including the turning of the cable drum trailers.

5.20 The topsoil will be kept separate and stacked at one side of the construction swathe. It will be kept free from the passage of vehicles and plant. The topsoil shall be stripped and stored in such a manner to avoid contamination with subsoil and other foreign materials. There will be no movement of topsoil between fields. No soil, spoil or construction materials will be stored within 5 metres of trees or hedges which are to be retained.

Compound

5.21 One objector (Obj6) (**CD D.17**) has submitted a request for the construction compound to be re-sited (which relates to Plot 5-04).

5.22 NGET has undertaken a detailed optioneering exercise as part of the English Onshore Scheme. The request for the construction compound to be re-sited was made by the relevant landowners in November 2022, following the design freeze in submission of the English Onshore Scheme and the consultation and optioneering process undertaken.

5.23 NGET has considered potential alternative locations for the siting of the construction compound. NGET has undertaken an initial assessment of adjacent land owned by the relevant landowner to assess the potential for relocating the compound. However, due to topographical challenges with adjacent land (comprising significant variation in ground levels and which would necessitate significant cut and fill) and the technical requirement for a compound in this location it is not possible to move the location of this compound. Therefore, NGET is continuing to engage with the relevant landowner as to how the impact of the compound on its landholding can be managed during the construction process. In particular, NGET is in discussions with the relevant landowner to identify alternative arrangements in terms of relocating the ponies that currently use the paddock.

5.24 The compound is located at its present location due to being connected with the cable swathe (which has been located close to the bridleway to avoid sterilising land) as it allows efficient mobilisation and transportation of plant and equipment onto the haul road.

5.25 The ground is relatively flat and this results in ease of constructability with minimal cut and fill requirement.

5.26 The landowner initially proposed alternative compound location to the Northwest of the swathe from existing compound location. This wasn't feasible due to proximity to residential properties to the west being adversely affected by noise.

5.27 An alternative location immediately to the North was proposed but initial assessment suggested that due to the gradient of the ground, Significant cut and fill exercise would have been required, resulting in challenging constructability with significantly higher costs and time.

5.28 Discussions are ongoing with the landowners with regards to re-locating the ponies to alternative like for like location to any suitable location in the vicinity.

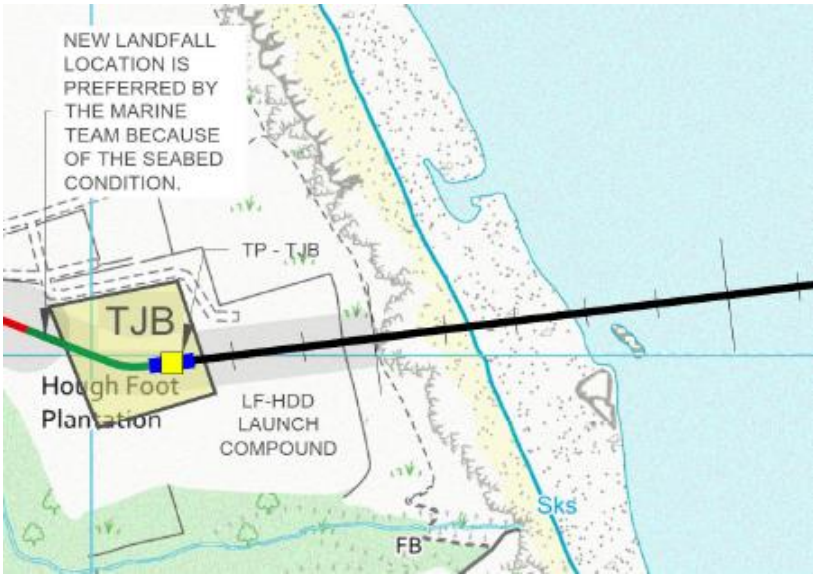
Landfall

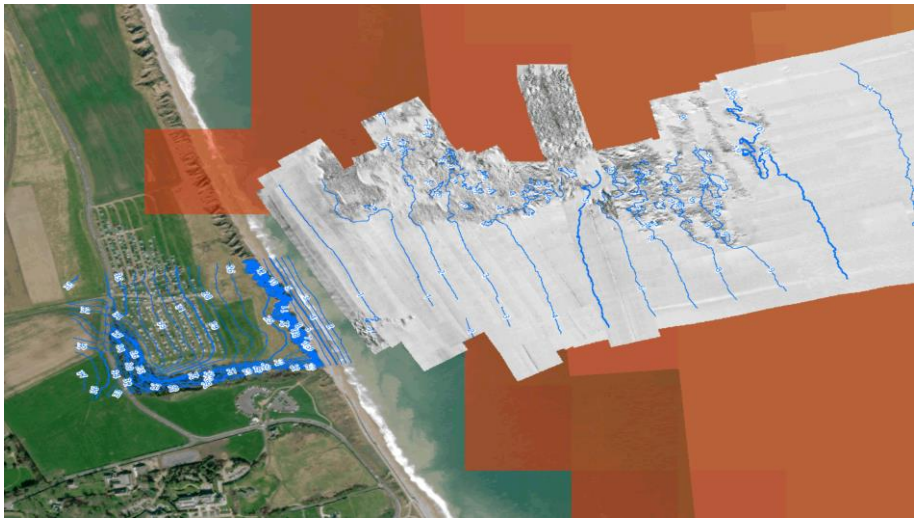
5.29 Several objections (Obj14 to Obj17) (**CD D.25 to CD D.28**) have raised objections in relation to the siting of the Landfall and the associated temporary compound. The technical requirements for the Landfall are discussed at section 4 of this proof of evidence.

5.30 Section 2.9.2.1 of the Alternatives Report (**CD D.6**) summarises the assessment of alternatives that was undertaken in respect of the Landfall. This demonstrates that a number of factors were taken into account in selecting the Landfall site, including the car boot sale.

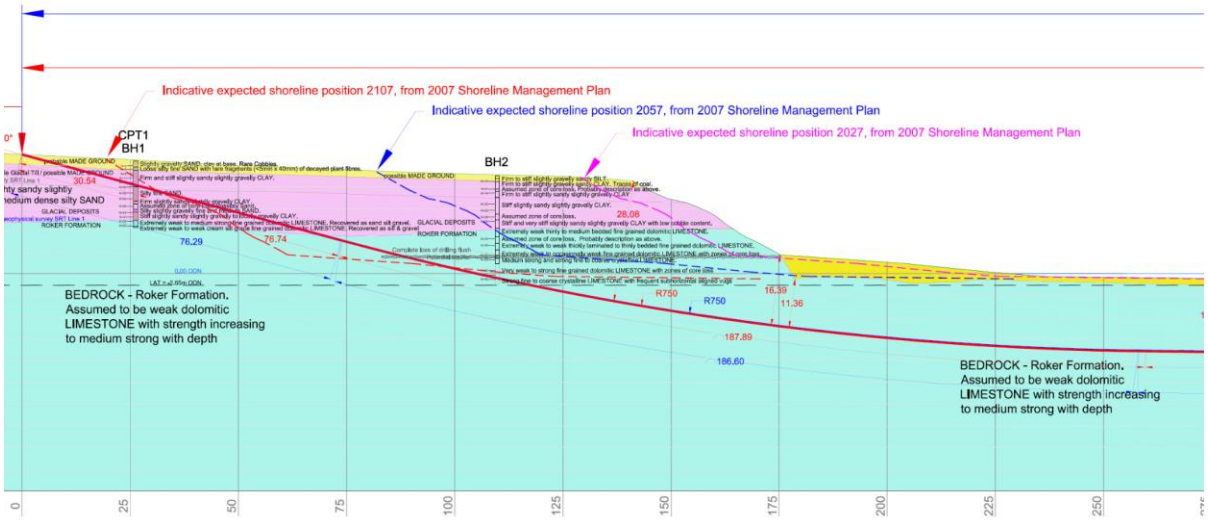
5.31 In respect of the car boot sale site, NGET has considered this and has considered whether the landfall could be moved further inland. This is not feasible.

5.32 The offshore alignment of the Landfall was chosen to avoid seabed element/rocky outcrops. The location of the Landfall and the transition joint bay cannot be moved further inland due to limitations of the length of HDD. This is due to the shallow coastal waters. In the shallow coastal waters the grounds are outcropping bedrock with a highly mobile sediment layer. The mobility of sediment due to storms etc is particularly an issue in the first 10m of water depth. These ground conditions would make it very difficult to protect the cable in the shallow waters of the marine environment. This would also represent a health and safety risk due to vessels and divers operating in shallow waters. The illustrations below show the offshore alignment and rocky outcrops:





5.33 Due to the expected erosion of the shoreline, the transition joint bay at the Landfall cannot be located closer to the cliffs as this would increase the risk of exposure of the cable before end of its asset life. The below illustration highlights the erosion of the cliffs near the landfall.



5.34 The proposed location of the landfall was selected after feasibility of various options regarding alternative locations. This is set out in the Alternatives Report (**CD D.6**).

5.35 The cliffs around the landfall are susceptible to erosion, hence the TJP couldn't be located nearer the cliffs due to high risk of cable exposure during its lifetime.

5.36 The length of the HDD is limited and if the TJP was to be moved further inland this would require the exit HDD to be moved closer to the shore and due to rocky outcrops, near the shore. This presents a risk for cable installation as well as H&S risk due to vessels and divers operating in shallow waters during HDD operation.

5.37 The cable couldn't be installed immediately to the north of the proposed entry due to rocky outcrops as this would have resulted in a highly risky HDD operation.

5.38 The discussions are ongoing with the landowner with regards to moving the car boot sale affected by TJP location to temporary move the business in the vicinity. NGET is supporting the landowner with planning application for this.

5.39 It is not possible for this Temporary Compound to be located anywhere other than in this plot as it is an essential compound and is intrinsically linked to the Landfall.

6. SUMMARY AND CONCLUSION

6.1 In my statement of evidence I have described the physical components of the Project, namely the Transition Joint Bay at landfall, the c. 10km of HVDC underground cable from landfall to the converter station and the associated temporary construction compounds, together with the works that are required to construct and/or install those physical components, with reference to the illustrative drawings and photographs embedded within it. I have also described the rights that are needed to enable those works to be undertaken safely.

6.2 I consider that the engineering design and construction methodology of the above elements of the Project is appropriate, feasible, and compliant with the relevant standards, codes, and guidance.

6.3 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 D.1 and CD D.2**).]

7. DECLARATION

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

Faisal Karim

5 September 2023