

**OVERHEAD LINE AND HEADHOUSES /SEALING END COMPOUNDS
EVIDENCE**

**THE NATIONAL GRID ELECTRICITY TRANSMISSION PLC (GRAIN
TO TILBURY) COMPULSORY PURCHASE ORDER 2024**

**Summary Statement of Evidence of
David Rogerson
BENG
National Grid Electricity Transmission plc**

1. SUMMARY AND CONCLUSIONS

- 1.1 My name is David Rogerson and I am a Lead Transmission Engineer with National Grid Electricity Transmission Plc, specialising in Over Head Lines and High Voltage Cable Technology. I have eighteen years' design experience with twelve years in my role with NGET where I am authorised by National Grid's Business Procedure 141 for both OHL and cable design assurance.
- 1.2 I have been working on the Project since 2020 as an OHL design assurance engineer.
- 1.1 In my evidence I have described the works needed to carry out the SEC and OHL aspects of the Project with reference to the illustrative drawings embedded within/appended to my evidence. I have also described the land and rights that are needed to enable those works to be undertaken safely.
- 1.2 The Project will connect into two existing 400KV overhead lines known as Kingsnorth to Tilbury and Grain to Tilbury which are proposed to be refurbished as part of a separate package of works once the Project has completed.
- 1.3 The new Tilbury SEC is proposed to be developed on an area of existing hardstanding in Tilbury, Thurrock, on land owned by the Port of Tilbury London Limited, and which was formerly Tilbury Power Station.
- 1.4 The Tilbury SEC will contain new XLPE cables, new cable terminations (polymeric), 12 x new cable support steel structures with buried concrete foundations, concrete surface troughs for new cables, water tank for firefighting purposes, 6 x surge arresters for protection of underground cables, 6 earth switches and the Tilbury headhouse. The roads within the SEC will be tarmacked
- 1.5 The SEC will contain the headhouse and the purpose of the Tilbury headhouse is to allow controlled, safe and secure access into the

tunnel shafts; provide enclosure for ventilation fans and equipment to regulate the temperature in the tunnel; contain mechanical and electrical equipment and to house control equipment for the cable circuits.

- 1.6 The Tilbury headhouse will occupy an area of up to 481.75 m² and will accommodate ventilation plant for the tunnel and shafts, a control room, with tally room, communications control, panels, mechanical plant and control panels, low voltage switch Room, 110V Battery / Uninterruptible Power Supply Room, Main fans room, shaft access via a staircase (but with space allocation for a lift, and lift motor room (if required), changing and shower room; and water closet.
- 1.7 The proposed Gravesend SEC will be located within a vegetated area which is part of the Canal and Grazing Marsh, Higham Local Wildlife Site, designated for its grassland habitats and on land owned by National Grid.
- 1.8 To the north of the proposed SEC is the existing SEC serving the existing tunnel. The Gravesend SEC will occupy an area of approximately 6,328m² / 0.6328ha, however a larger area of approximately 37,000 m² / 3.7 ha will be required during construction to accommodate equipment and storage areas. The roads within the SEC will be tarmacked.
- 1.9 The Gravesend headhouse will be situated within the Gravesend SEC. It will occupy an area of approximately 230m². The new headhouse will accommodate a tunnel dampers room with access hatch for shaft hoist, an electric room containing Low Voltage switch gear, communication panels, Motor Control Centre panels, a Tally Room, a 110V Battery / Uninterruptible Power Supply Room, a Shaft access via a staircase, Changing and shower room and WC.
- 1.10 Once the tunnel is constructed and new cables installed, the cables will need to be connected into the new SECs and the wider OHL network. This activity will be carried out during system outages

which will allow the existing towers and OHL spans to be removed, and new towers and OHL conductors to be installed.

- 1.11 At Tilbury, 3 existing towers will be removed and 1 new tower will be erected. At Gravesend, 1 tower will be removed and 1 new tower erected.
- 1.12 There will be two new terminal towers, one either side of the River Thames. To construct these, tower foundation installation would take place first, before any circuit outages on the existing overhead line. Temporary working areas around the proposed new tower locations would be prepared prior to foundation excavation.
- 1.13 To install the terminal tower foundations, an area of approximately 6m by 6m (four excavation areas will be needed for each tower leg) will be required to be excavated. Piled foundations will be required to an approximate depth of between 14-20m. The first 4m in depth will be concrete filled.
- 1.14 The steelwork required for the new terminal towers will either be erected by a crane, or with a derrick to erect the tower in small sections. Tower erection will require a large laydown and assembly area of approximately 50m x 50m for laying out and assembling the steelwork into the lifting sections. Steelwork will be delivered to site on trucks and assembled in sections around the tower base.
- 1.15 Once the towers are built, the new conductors are hung. This is known as 'stringing'. Stringing is the method of positioning and pulling the new conductors between towers. There are two different ways to carry out this operation.
- 1.16 The first is non-tension pulling. This involves pulling the new conductor from the required point A to B via a tractor winch at ground level.
- 1.17 The second stringing method is called tension stringing. This method keeps the conductor off the ground entirely. Working platforms are raised at each tower and a running wheel attached to the arms of each tower.

- 1.18 If this method is used, their positions will be discussed with the ecological clerk of works as to the most appropriate positions for the tension machines, in relation to the existing habitats.
- 1.19 A downlead connects the OHL to the substation equipment. The downleads are installed via two tractor winches
- 1.20 There may be a requirement to reinforce the foundations of existing tower 4GV041 at Gravesend. This will require excavating a pit approximately 6m by 6m at each foot to expose the foundation.
- 1.21 Existing towers 4VG043, 4VG044 and 4VG045A at Tilbury, and tower 4VG042 at Gravesend require removal.
- 1.22 Due to the location of these existing towers and their surrounding land uses and habitats, it is likely the towers will be dismantled via cranes. Before the tower structures can be removed, the conductor and fittings are removed. For safety reasons it may be necessary to 'backstay' the towers.
- 1.23 The localised placement of the backstay (concrete block) positions will be discussed with the ecological clerk of works as to their most appropriate positions in relation to the existing habitats.
- 1.24 The towers are then dismantled. A large crane is positioned on a crane pad at the tower location. The crane pad will be approximately 20m x 10m constructed from plastic or metal panelling. It will take approximately one day to dismantle a tower using a crane (following advanced site preparation i.e. installation of the crane pad and progressing of advanced works on the tower prior to commencement of works with the crane). The sections of the tower will be broken up as they are lowered to the ground using a steelwork breaker/mechanical shears fitted to an excavator.
- 1.25 As the tower is dismantled and laid down in sections, gas torches or a hydraulic shearer mounted on a 360-degree excavator will be used to break up the tower steelwork into small sections and load into skips for reuse or recycling.

- 1.26 Foundations are generally removed to a minimum depth of 1m below ground level, with excavation usually no more than 0.5m by 0.5m. This work is undertaken using a tracked excavator which digs around the concrete 'muff' to a depth of approximately 1m. The excavator is then be used to break the concrete around the steel 'raker' bar within the concrete before all concrete is then removed from the excavation and the remaining steel 'raker' bar cut to a depth of approximately 1m. This action would then be repeated for the remaining tower legs and the land reinstated.
- 1.27 The OHL diversions, from foundations, tower build, and stringing will be completed as the final phase of the Project in 2028 and be completed in under one year. The removal of the existing towers will be completed only once the new equipment is energised, and removal is expected to take approximately three months.
- 1.28 I am aware that there are now two outstanding objections to the Order. Neither raise any technical matters relating to the OHL works, the SEC or the headhouse works or suggest that the works that I have described in my evidence are unnecessary.
- 1.29 In summary, in my view 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.



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David Rogerson

13th May 2025