Method Statement

Proposed installation of a high voltage underground cable along Kirkgate Lane, Church Lane and Lund Hill Lane to link a proposed solar farm (23/01900/FUL) to Monckton substation, Cold Hiendley, Barnsley S71 4BG

Submitted to Wakefield Council

By Ethical Power Development Ltd.

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Overview

Kirkgate Solar Farm is proposed to be connected to the electricity distribution network owned by Northern Power Grid (NPG). The point of connection for the solar farm is at Monkton substation and it is proposed to connect at 11,000V.

There is a requirement to install an underground high voltage cable between the onsite substation at the solar farm and NPG's existing network at Monkton Substation. A route has been defined along the local road network with the cable to be situated in a mix of verge, footpath and public highway.

The cable route has a total distance of approximately 1.9km, and after installation will be adopted by the distribution network operator (DNO) who will own and maintain the cable in perpetuity. As such, the cable must be installed to the standards of the DNO, who will undertake prior approval to the detailed design arrangements and subsequent inspection and testing of the built equipment prior any adoption.

General Requirements

During the works, principal guidance and legislation will be followed including, but not limited to:

- Health and Safety at Work act 1974
- Electricity, Safety, Quality and Continuity Regulations 2002
- Electricity at Work Regulations 1989
- Controlled Waste Regulation 1991
- New Roads and Streetworks Act 1991
- Traffic Management Act 2004
- HSG47 Avoiding Danger from Underground Services
- Manual Handing Regulations 1992
- Construction (Design and Management) Regulations 2015

Before any work is carried out adequate preparation must have been completed, which includes

- Acquiring accurate plans showing existing buried services in any area of excavation
- Plan of proposed new cable route
- Acquisition of easements with landowners notified of works
- Coordination with Highways authority or other statutory undertakers to meet NRSWA requirements
- Awareness of site-specific Safe Systems of Work

Cable Installation

The requirements for the installation of the cable will be defined by NPG standards. The key criteria for installation is highlighted in this document.

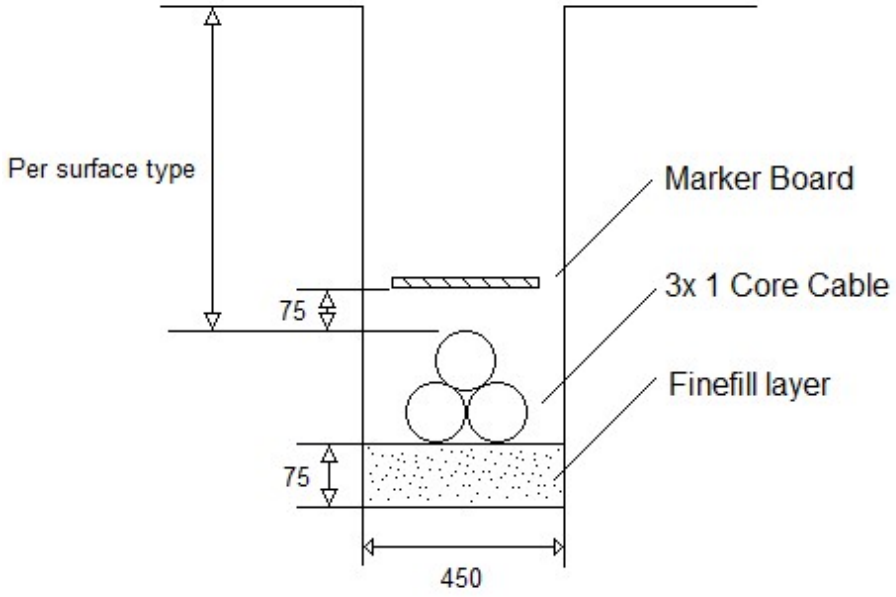
All cables will be bedded and blinded in soft fine-fill materials, that will not contain sharp stones or flints. After laying, the cable shall be backfilled and surrounded by a cover of soft fine-fill material or selected sand.

Trench Depths and Specifications

The table below defines the NPG standards for the minimum depth of underground cable installations to the top of the apparatus in various surface types (all units in millimetres):

Cable voltage	Unmade ground, verge and footpath	Carriageway	Agricultural
LV	450	600	1000
11kV	600	750	1000
33kV	800	900	1100

Below is a typical arrangement for a cable trench, depicted as a cross-sectional area for a single circuit.



Trenches

Trenches should have lines, levels and contours to suit continuous pulling of cable by winch; be as straight as possible (and where bends are necessary, care should be taken of the minimum bending radius of the cable specification); have a firm and smooth contoured base; be excavated with precaution as to prevent damage to ground surface; where depth levels change the gradient should be gradual; be cleared of water (by pumping if necessary); have provisions made during excavation to cater for access of persons and/or vehicles; in ground conditions where trench collapse is possible, be excavated in V formation to reduce this risk

Trench Excavations

Where it is known that route is clear from obstructions and other buried services, mechanical excavation shall be used. Where obstruction or other buried services may be present, trial holes shall be dug.

Where material is excavated the subsoil and topsoil shall be separately kept in graded heaps. Any material heaps excavated should not interfere with free access to the excavation and should not be placed where there is a risk that the material may re-enter or affect the stability of the excavation (taking care to the potential for ground conditions to change in adverse weather).

Cable Drums

HV cable typically is transported from the manufacturer on a large drum, of length 250m. When handling drums, suitable precautions should be taken to avoid damage to the cable and injury to persons. It is preferable for ease of handling to move drums by special cable drum tailers wherever possible, and for the cable to be laid directly from this drum via winch.

Care should be given to the drum mounting position, if stationary, considering accessibility, gradient, ducts and location of joints.

Cable drums should be sorted in an upright position and fixed with wedges.

Should drums need to be moved, effective methods to do so are via forklift, HIAB or crane.

Cable Pulling

The most common method of cable pulling is to use a cable winch should be used to pull the cable from the drum into the trench. The winch should be fitted with equipment to define the maximum pulling tension to ensure manufacturers guidelines are not exceeded.

When using the cable winch around corners a curved steel plate can be utilised to position the cable within the trench.

Section of pulled cable should overlap to ensure adequate excess for joining.

It may be a requirement to pull some sections of cable by hand. In this case, cable rollers should be utilised to assist the activity.

Cable Jointing

It will be a requirement to implement intermittent jointing pits to allow for an adequately sized working area in which separate lengths of cable can be jointed together. The minimum requirement for a jointing pit is 3m x 1.5m, although larger pits may be required depending on the conditions.

Reinstatement

Excavated materials can be reused in the reinstatement of trenches, unless they are of contaminated or hazardous nature.

The reinstated materials should be compacted with hand rammers if within 150mm, to ensure no damage to the underlying cable.

Highways reinstatement must meet the specification of the Department for Transport for the Reinstatement of Openings in Highways (2010). This also applies for reinstatement verges adjacent to highways. Reinstatement of footpaths should meet the specification of the local authority in which works are taking place. Reinstatement of open ground should leave the surface 'proud' after compacting, to allow for subsequent settlement.