CONSTRUCTION METHOD STATEMENT

KENNOXHEAD WINDFARM CONNECTION – 132KV CABLE INSTALLATION

1. PROJECT OVERVIEW

An application has been received from Brookfield Renewable UK Ltd, via NGESO, for a 132kV Point of Connection (PoC) for Kennoxhead Wind Farm (112MW) which is located approximately 14km south of Coalburn 132kV substation.

It is proposed to establish a new 132kV switchbay at Coalburn 132kV substation. From here approximately 0.2km of 800m2 AL XLPE underground cable will be installed before connecting to approximately 16km of Trident wood pole overhead line using Poplar conductor. Following this another cable section approximately 3.2km of 800m2 AL XLPE connecting to Kennoxhead Windfarm substation. At Kennoxhead Windfarm substation, a standard disconnector, circuit breaker, disconnector arrangement will be installed. All standard Protection & Control works associated shall be installed.

The connection date requested by the developer is 31st October 2023. The proposed connection date from SPEN is February 2024.

2. CONSTRUCTION METHODOLOGY

The process of construction for a 132KV underground cable involves several key areas.

This document will highlight the relevant key areas associated with the construction phase and will provide information on typical methodologies to be deployed by the construction teams.

The contractor will be responsible for the timing of all activities and will be required to take account of seasonal influences, such as but not limited to weather, environmental and ecological constraints which will be detailed in the Project Documentation. These include but are not limited to the Traffic Management Plan, The Environmental Management Plan, Peat Management Plan and all relevant Health & Safety Legislation.

Construction works shall be in compliance with all of the Planning Permissions.

3. ON-SITE CONSTRUCTION WORKS

3.1 Project Timeline

The cable works are expected to commence in Q2 2023. It is currently anticipated that this work will be completed by 31st October 2023.

3.2 Site Compound

Establishment of the main site compound preliminary activities include the setting up of the contractor's compounds and offices for the Contractor and Engineer. This also includes cabins, stores, welfare facilities and car park. For works within the Kennoxhead windfarm, the site establishment compound for Civil Contractor, BOP Contractor & Cable contractor is inside the Kennoxhead Windfarm welfare compound adjacent to the Kennoxhead 132KV substation. For cable works near the Coalburn substation, the welfare compound will be adjacent to the Coalburn substation within Scottish Power Transmission PLC Grounds.

Scottish Power Transmission PLC will determine the location of the main site compound and seek all necessary approvals for its design and construction. Due to the size of the scheme, other smaller mobile welfare units will be established along the route. The welfare platform near the Kennohead will be constructed by the windfarm developer and handed over to Scottish Power Transmission PLC

Services to the site cabins and offices will include electrical, communications, water and sewerage facilities.

The site compound will to be erected, maintained and subsequently removed in a manner that will have minimum impact on the locality and in accordance with the planning consent.

Project Management and Site Operatives will use the site establishments, on a daily basis when the facilities are significantly completed and access is available for personal vehicles and other forms of transport.

Construction plant and materials will be delivered to the site compound where appropriate directly to the working areas of the cable routes.

The cable & civil Contractor shall be responsible for all works associated with providing a secure site establishment and laydown hard standing area for the duration of the site works at a location agreed with SPEN and for complete removal and reinstatement of the area on completion of works.

The Site compound will have a fully segregated area for the location of cabins with permanent fencing provided between walkways and vehicle-parking/ trafficking areas, the walkways shall be built with compacted ground to facilitate ease of maintenance and clearing of ice and snow during winter months.

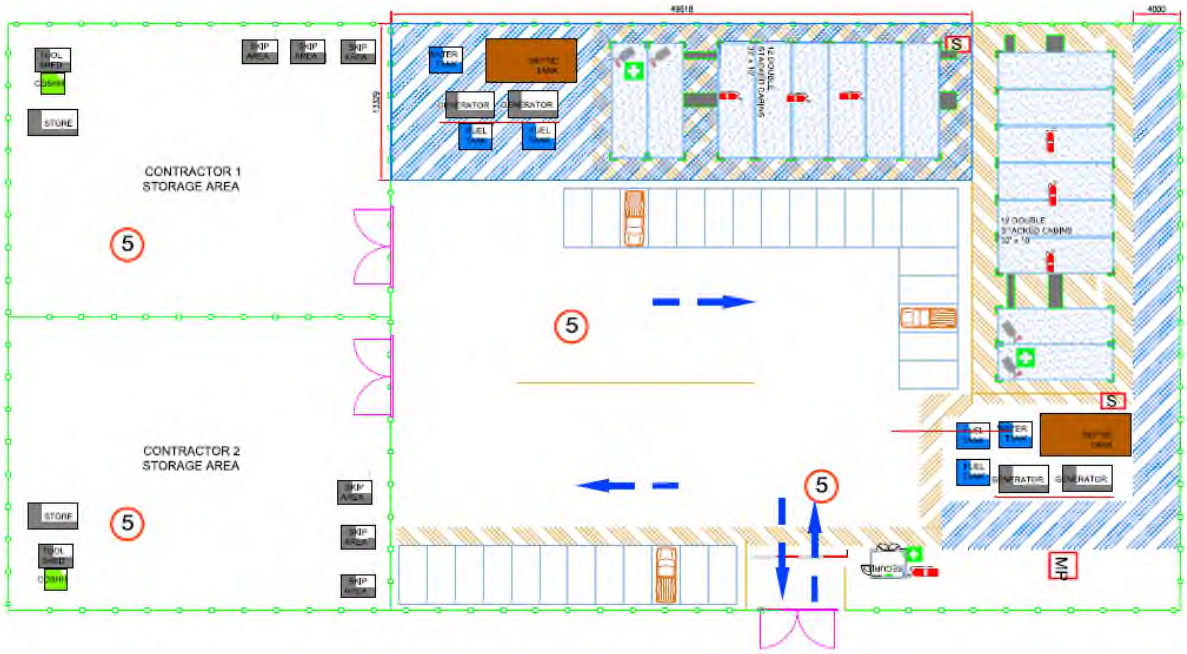
Flood lighting will be provided to all common areas and walkways within the site during the hours of darkness, the level of lighting can be reduced out with working hours to reduce the impact of light pollution.

We propose three different types of site establishments:
- Main Site compound: It shall be established on it the following elements:
O SPEN office, Contractor office and meeting room
O Toilets, canteens and drying rooms cabins
O Waste management area
O Outdoor storage area
- Remote compounds: This shall cover areas with storage of cables and their ancillaries
- Mobile compounds: Welfare vans to cover welfare requirements during works on site

Considerations for the site compound and accommodations will be as follow:

- The welfare area will be designed for an average number of workers
- The welfare facilities in Centralized site compound will be according to CDM Regulations
- The supplies will be distributed between Centralized site compound and Remote compounds.

3.2.1 Indicative Layout of Main Site Compound



A.- STOCKPILE AREA | B.- MACHINERY PARKING AND MAINTENANCE | C.- RECYCLING AREA

1.- SPEN OFFICE
2.- CONTRACTOR'S OFFICE
3.- MEETING ROOM
4.- CANTEEN
5.- CHANGING ROOM
6.- TOILET

3.2.2 Remote Compounds

In the puller/tensioner zones (equipotential zones), will need a basic establishment that will include:
- Equipotential zones
- Remote stockpile area (with the required cable drums, fittings and insulator strings)
- Perimeter fencing and gates to protect supplies and plant

Due to the length of the route, a small welfare service may be needed at each pole location. Because of that, Welfarevans or Groundhog Welfare Unit could be good alternatives.

3.2.3 Welfare vans & Groundhog Welfare Units

All in one Welfarevan 8T

SEATING AREA

1. OVERHEAD CAB LOCKER
2. M1 CRASH TESTED SEATS
3. TIP UP SEAT
4. TABLE
5. SLIDING WINDOWS
6. FIRST AID KIT

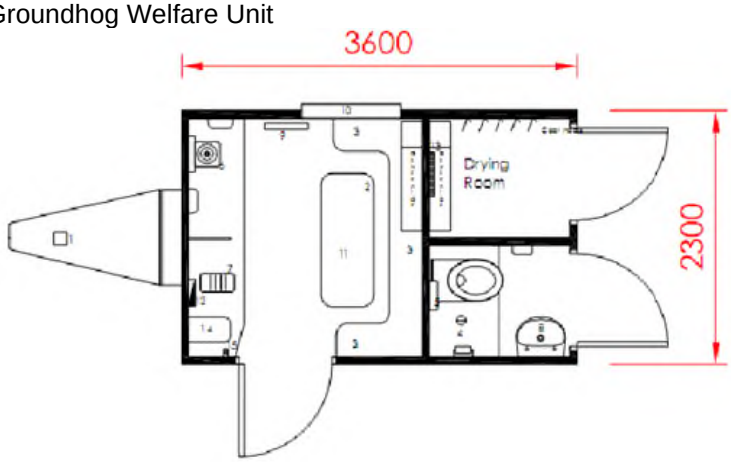
GALLEY AREA

7. MICROWAVE
   SINK UNIT WITH HOT AND COLD TAPS
   SOAP DISPENSER
   HOT DRINKS DISPENSER
   PAPER TOWEL DISPENSER
   EMERGENCY SMASH HAMMER
   FIRE EXTINGHUISHER
   STORAGE SHELVES

REAR AREA

8. HYGIENE DISPENSER
9. PAPER TOWEL DISPENSER
10. ELBOW TO WRIST SINK UNIT
11. CLOTHES DRYING AREA
12. STORAGE SHELF
13. MULTI-TOOL HOLDER
14. TIE DOWN POINTS
15. ROOF VENTILATION
16. ELECTRIC FLUSH TOILET
17. HAND RAIL WITH MODESTY PANEL
18. HEAVY DUTY REAR STEP

Groundhog Welfare Unit



Key Facts
Dimensions 7.2m x 2.7m
Anti-vandal steel construction
Built-in 11KvA super silenced generator
Self-contained water and effluent tank
WC and deep bowl basin
Canteen with hot and cold running water
Microwave oven and kettle
Separate drying area
Designed for internal hose cleaning
National water, diesel replenishment & effluent servicing
24 hour emergency callout

3.2.4 Site Services

3.2.4.1 Water Supply

We intend to choose one or more of the following options:

- Installing a temporary septic tank (removable)
- Chemical toilet (not discharging into a sewage network)
- Water supply in a bulk storage tanker
- Mineral water dispenser for drinking

3.2.4.2 Electric Supply

We intend to opt for one of the following solutions:

- Cabins with electrical generators built-in
- Separate power generators to supply the entire work site (external lighting, supplying work cabins and electric tools)

Generator / Charger

3.2.4.3 Telecommunications

We intend to opt for the following solutions:

- Communicate with cellphones (Smartphones with internet connection)
- Internet connection with a mobile USB modem
- Walkie-talkies for communication between managers and foremen in the working areas

3.2.4.4 Security services

Due to the high economic value of the supplies to be stored and the serious problem (and delay) that Would result from a possible theft, a security service will be hired by our appointed contractor to keep watch outside of working hours (nights, weekends and bank holidays). This shall be a combination of remotely monitored CCTV and patrolling security personnel.

3.2.4.5 Housekeeping services

The cabins and vans will have a weekly housekeeping service.

3.3 Service Diversions

It is possible that some service diversions will be undertaken in advance of the main construction works. Possible services will include BT Line, 11 kV, water pipes, drainage pipes etc.

3.4 Pre-Construction surveys

Prior to any work commencing on site, environmental, archaeological and topographical surveys will be undertaken to identify hazards and constraints.

The information gathered during these surveys will be used to develop the project environmental, quality and health & safety plans and associated documents. These documents are live documents and will be updated in accordance with the project requirements.

3.5 Project Management

The Project will have a management team who will be responsible for ensuring the project is delivered in line with the consents and permissions obtained to allow the construction to be undertaken. In addition, the management team will ensure that industry best practice standards and guidance is followed where practicable.

3.6 Construction Mitigation

In accordance with the Construction (Design and Management) Regulations 2015, construction of the project (and hence management of "construction mitigation") will be detailed in a Construction Phase Health and Safety Plan, prepared by the Principal Contractor. This Plan will then be reviewed by the Principal Designer prior to works commencing. As mentioned above Scottish Power Transmission PLC are the designated PC for Substations & Cable supply and installation works.

3.7 Pre-works Activities

Prior to the commencement of any construction activities, including tree felling, method statements detailing the particular activities, timetable and working method will be written by each contractor and submitted to SPEN for review and comment. This requirement is embedded within the management of health, safety and environmental risk.

3.8 General Best Practice

The following best practice measures (Table 3) in relation to the control of mud, noise, vibration, fire and dust are industry expected standards and will be monitored by SPEN.

Table 3: Best Practice Measures

	Source	Best Practice

	Source	Best Practice
Mud	Access tracks and haul roads – vehicle movements on wet days, excavation works in particular overburden, loading of wet material; Excavations – removal and loading of wet material; Restoration works – unloading of materials, placement of material.	Undertake the construction works such that the generation of mud is minimised at all times, by adopting methods of working that eliminate the potential for mud to be transferred offsite by vehicles leaving the Site.
		Road cleaning or sweeping measures will be implemented to remove any mud deposited on the public highway.
Vibration	Access tracks and haul roads – vehicle movements, excavation works in rock material; compaction of road construction materials; Excavations – removal and loading of rock material;	Undertake the construction works such that vibration will be minimised at all times, by adopting methods of working that eliminate the potential for vibration to be detected offsite.
		Disturbance from Vibration is considered to be a minimal risk due to the type of works and remote location.
Dust	The prime sources of dust on the site are: Haulage vehicles, both on-site and road licensed; Handling of soils; Overburden and stone; Overburden and site stockpiles; Un-seeded topsoil and subsoil stockpiles; Loading of vehicles (with soil, overburden or stone); Excavation areas;	Operatives should be especially watchful in dry conditions, and should either avoid actions likely to generate airborne dust, or alternatively ensure appropriate dust suppression measures are in place prior to commencing operations. The use of water bowsers is proposed as the method for dust suppression,
		Construction works will be undertaken in accordance with industry best practice standards and as such ensure that the generation of dust is minimised at all times.
Noise	During the construction works the main sources of noise are considered to be: Access tracks and haul roads – vehicle movements, excavation works in rock material; compaction of road construction materials Excavations – removal and loading of rock material; Restoration works – placement of rock material.	Undertake the construction works in accordance with The Control of Noise at Work Regulations 2005 such that the generation of noise is minimised at all times.
Fire	A fire caused by either a discarded cigarette or by hot works could result in smoke pollution being emitted from the site.	Implementation of a “no smoking” policy whilst in vulnerable areas of the site. Smoking will only be permitted within designated areas where all discarded cigarettes can be extinguished in a safe and proper manner.
		Hot works will only be permitted where a “Hot Works Permit” has been allocated for that specific task.
		An Emergency Response Procedure will be produced prior to construction commencing which will details the procedures to be carried out in the event of an emergency occurring, including a fire.

3.9 Activity Specific Environmental Controls

The environmental and ecological risks specific to the route and work activities have been identified by SPEN and particular control measures shall be developed and documented. Table 4 outlines the environmental risks associated with work activities and the documentation that outlines the approach/controls to be adopted by contractors. These documents are in addition to general best practice as outlined above and will include a constraints plan that will be produced for construction, identifying sensitivities and appropriate steps to be taken (fencing off/identifying on ground where necessary in liaison with ecologist).

Table 4: Summary of activities associated environmental risks and SPEN documentation.

Stage	Activities	Environmental Risks	SPEN Document
Felling & Construction	Felling & Construction	Protected and notable species (UK and EPS)	Environmental Appraisal
		Private Water Supplies	Environmental Appraisal
		Surface water	Environmental Appraisal
		Watercourse crossings	Environmental Appraisal & EMP
		Waste Management	EMP
		Peat Management	Environmental Appraisal & EMP
		Biosecurity	EMP
		Ground Water Dependent Terrestrial Ecosystem (GWDTE)	Environmental Appraisal
		Contractor handover - Environmental Handover	Environmental Site Information Handover
Construction	Excavation – Cable trench, access road	Surface water	Surface Water Monitoring Strategy.
		Ground Water Dependent Terrestrial Ecosystem (GWDTE)	Ground Water Dependant Terrestrial Ecosystems (GWDTE) Strategies.
		Peat Management	Method Statement for Temporary Peat Storage and Removal.

Stage	Activities	Environmental Risks	SPEN Document
		Protected and notable species (UK and EPS)	Ecological Management and Mitigation Plan. Breeding Bird Protection Plan.
		Private Water Supplies	Private Water Supply Risk Assessment.
		Watercourse crossings	Watercourse Assessment.
		Fisheries	Ecological Management and Mitigation Plan.
		Biosecurity	Environmental and Quality Management Plan. Biosecurity, American Signal Crayfish

3.10 Construction Activities

3.10.1.1 Excavation and Duct Installation

Pre-Excavation

Appropriate signage to be put in place before any works commence at the access/egress points of the access roads to warn the general public of the works.

Information on all known existing utilities and underground structures to be visually inspected. Multiple sweeps of the area are to be carried out with a calibrated Cable Avoidance Tool and identified locations marked out with marker spray paint / marker posts.

Plant/Vehicles must be parked in a suitable area within the work area and keys removed when not in use or unattended.

All relevant PPE to be worn before entering the site.

Trench Excavation with Excavators

A banksman must be present at all times when machinery is in use. All personnel on site must not work in the vicinity of the operating boom and the tail swing, unless coordinated by the banksman.

Banksmen must always face the excavating machinery and be within sight of the operator. If more than one person is working with the excavator, agree with the driver on who will be responsible for signals and instructions. Any personnel required to work within the operational radius of the excavator's boom must wear a safety helmet at all times.

Trench work must not commence until it has been declared safe by the sites competent and experienced person. As far as practicable hand excavated techniques shall be utilised to uncover existing services on site.

The excavated material will be placed in to a dumper for removal to a safe location where it will be legally disposed. Dumper/lorry drivers must leave the vehicle while it is to be loaded up in a safe place away from the trench and clearly visible to the machine operator. Keys must be removed from plant/vehicles when not in use or unattended.

For works in fields ground conditions must be assessed and bog mats / trakways or similar shall be utilised where appropriate.

Top soils and sub soils must be separated when excavated for subsequent reinstatement.

Trench Excavation

No persons to enter an unsupported excavation without it first being assessed by a competent person.

Trench excavation shall progress in layers with constant use of the CAT and Genny as to check for services. Excavations require regular assessment as they progress and decisions will be required as to the best method for support and safe access whether it is the use of supports or battering back/stepping the trench.
All Utilities and Services crossing the Trench are to be appropriately supported. Ladders used for access/egress must extend at least 1.0m above the step off point, be secured at the top and be positioned at an angle of no greater than 1 in 4.

Barriers are to be provided on all excavations for edge protection. Excavation to be inspected at the start of each shift and a written report produced weekly, after any event likely to affect the stability and strength of the excavation and after the accidental fall of debris into the excavation. Exhausts from plant and equipment shall be kept away from trenches. For excavations deeper than the water table, a suitable soakaway or sump is to be provided in the excavation. No person shall enter a water/slurry filled excavation.

Duct Installation

The trench bed should be free from stones or extraneous material and blinded with a 75mm layer of appropriate surround material – CBS or selected sand.

Ducts will be supplied in lengths with a spigot and socket design. Before use, clean the area of the spigot that will be inserted into the socket and clean the socket. Carefully inspect for any signs of damage which might affect the effectiveness of the completed seal. Report any signs of defective components to the supervisor do not use until instructed to do so.

The spigot insertion depth is predetermined by the design of the collar and spigot coupling system.

When ready to make the connection, coat the mating surfaces with the lubricant. This should be applied over the entire length of the area to be inserted. The spigot shall be carefully inserted into the socket until and then tapped home fully until the flanges meet using a rubber mallet.

When a change in direction is required, select the degree of bend required to achieve the correct radius to suit the previously excavated trench. Carefully install the bend section into the trench ensuring that the connections are not subjected to undue strain. It is important to use correct number and type of bends to ensure the ducts are installed to meet the profile of the excavated trench. Under no circumstances must the joints in the duct be strained to match up with the line of the trench.

The final installation of the ducts and the number of bends required will vary and shall be installed into the excavated trench according to site conditions and obstructions. The ducts will be installed to

occupy the excavated trench and shall be laid into formation as detailed on trench section drawing. Cable ties shall be utilised at approximately 1m intervals along the length of the ducts where ducts are to be laid in a trefoil formation.

Where it is necessary to lay the pipes deeper due to the position of existing services or pipes a gradual chamfer of the trench bottom shall be made. The pipes will be jointed in the trench, ensuring both the collar and spigot are level when mated together. Once enough pipe length has been joined to clear the obstruction the pipes will allowed to bend slightly to occupy its final resting-place in the trench. If at any point the duct is not in contact with the sand bedding extra sand or sand bags shall be placed under the duct for support.

Duct ends are exposed to the ingress of foreign matter and should be fitted with temporary end caps at the end of each installed section. Ducts shall be surrounded with a thermally selected backfill material in accordance with the standard detail drawing and marker tiles installed above.

Reinstatement should then be completed in accordance with the HAUC specification for reinstatement of openings in the Highway and SPEN's standard detail drawing.

3.10.1.2 Cable Installation

Method Statement to be reviewed and signed-off by all involved. Safe Plan of Action (SPA) carried out daily, understood and signed by all. Routes for cable pulling will be briefed prior to work commencing by contractor's supervisor as part of pre-job brief and as daily risk assessment.

Cable jacks and cable drums will be set up and secured using the Telehandler / Cable trailer. Lift plan for use of the telehandler will be communicated to all personnel prior to lift .

The Cable trailer will be secured using the locking device. Cable drums will be set up in a safe location and barriered off to prevent unauthorised access. Smaller drums can be manually lifted onto cable jacks using the correct manual handling techniques. The manual handling assessment will be completed at the worksite to determine which drums can be safely lifted manually.

Cables will be labelled using white insulating tape and a black permanent marker at either end of the cable. Cable ducts will be brushed out before any cables enter to remove any potential objects that could damage the cable. A fibre reel / cobra will then be used to feed through the duct. Once through it will be taped onto the cable and pulled back through the cable duct. This step will be repeated for all of the cables.
Cables will then be coiled up and left in a safe manner so as not to create a trip hazard. Once all cables are pulled and coiled in a safe manner the area will then be cleared. Cable jacks will be removed
and any debris lifted. 33kV cables will be tie wrapped together in trefoil and inspected by SPEN and the respective contractor before backfill commences.

Exclusion zones will be implemented where necessary to avoid injuries in the event of cables being dropped from a height.

3.10.1.3 Isolated cable cut for water crossing

Works will involve isolated open cut of water crossings for the purpose of installing cable ducts. Mechanical excavation will be used to ramp the river banks, excavate and reinstate the river bed and banks.

Temporary dams to be installed upstream of works to allow over pumping, temporary dam to be constructed downstream of works as a pollution prevention control measure. The works shall be reviewed by an environmental clerk of works and installed in line with the pollution prevention plan.

3.10.1.4 Tree Clearance

Tree clearance may be undertaken along the route of the OHL & cable route to create the necessary land agreement corridor width for operational resilience purposes. Landowner agreement has to be reached for this and in most cases private felling licenses are already in place.

This will be a mixture of commercial mechanical harvesting and hand felling. Mulching may be employed but would be discussed with SEPA prior to taking place, if required.

Temporary works

Temporary works are generally described as the parts of a construction project that are needed to enable the permanent works to be built. Usually the temporary works are removed after use, however items such as environmental mitigation or drainage may be required to be left permanently, particularly where they result in betterment.

Temporary traffic management will be in place during construction at works on private and public roads and at site access and egress points.

Such measures will include combinations of the following:

Traffic cones
Traffic signals
Temporary signs
Temporary lighting
Temporary speed restrictions
Temporary diversions
Narrow lanes
Lane closures
Partial or full road closures (to be agreed with the relevant authority) with appropriate diversion signing in place.

It is recognised that temporary works involving traffic management can be disruptive to the local road network if not managed properly. The approved Traffic Management Plan for the project contains specific restrictions regarding traffic management and routeing of vehicles to and from the site.

The contractor will prepare their own programme for the construction of the works, which will require approval by the Project Manager. This programme will take into account the requirements of the approved Traffic Management Plans.

It is unlikely that any lane closures of the main trunk or A class roads will be permitted during peak hours except by agreement with the appropriate authority and as a consequence it is anticipated that much of the off line works will be completed without affecting the trunk road traffic directly.

Temporary Fencing

The land area occupied by the works will be identified accurately on the ground by surveying and installing appropriate pegs and posts, prior to the works commencing. The area defined will be the area of land acquired through the consent process and any other areas the contractor has acquired by agreement to facilitate construction of the works due to their own method of working.

This will involve the installation of temporary fencing erected where it is necessary by project needs, for example at areas where land will be returned to agriculture following completion of the works, or if the contractor considers that there is a safety issue or risk of damage to the permanent works during construction.

Temporary fencing will generally be a post and wire type or HERAS fencing.

Other specific fencing that may be required temporarily will include silt/sediment fences to prevent sediment from reaching watercourses and higher security fences at compounds or where additional security of the works is required.

Typically, materials will be transported along the site by tractor and trailer mounted with hydraulic plant for driving the fence posts. Some fences may require a concrete foundation, or the ground may be too hard for driven fence posts. In this instance a small excavator will be used. Following fence post installation, the wires and mesh will be attached manually.

4 HIGH LEVEL TRAFFIC MOVEMENT FOR CABLE AND SUBSTATION \

The following is the estimated daily vehicle per quarter.

	2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Cable			25	25	25			
Substation	30	25	30	30	20	20		

5. PAPPENDIX 1 - INDICATIVE LAYOUT OF WELFARE COMPOUND