



CASE STUDY

ERROCHTY UNDERGROUND CABLE - CIVIL ENGINEERING WORKS

**CLIENT: UNITED
INFRASTRUCTURE**

LOCATION: ABERFELDY

HIGHLIGHTS:

- Civil Engineering Infrastructure Design
- Earthworks modelling and volume assessment
- Geotechnical Design
- Temporary Works Design
- Drainage and SuDS

THE CHALLENGE

Our Client, United Infrastructure, have been appointed by SSEN as the principal contractor for the construction of two new 132kV UGC (to be named KE1 and KE2), each of approximately 4.1km in length, connecting Errochty substation to the newly constructed Kinardochoy substation.

Arthian have fulfilled the role of lead designer; managing, coordinating, and delivering the multi-disciplinary project. Due to the nature of the high-hazard process environments that we work in, we play a lead role in the mitigation, management, and communication of project risks.



info@arthian.com



www.arthian.com



[+44 141 227 2300](tel:+441412272300)



THE CHALLENGE (CONT)

The following items provide a summary of the scope:

- Project and Contract Management
- Production of infrastructure layouts and 3D model
- Temporary access roads, passing places, and drainage systems along the cable route alignment.
- Horizontal alignment plans and vertical alignment long sections, cross sections and material schedules,
- Design of access bellmouths to local authority specification,
- General Arrangement, earthworks and drainage for new construction compounds,
- Detailed design of new and upgraded culverts for watercourse crossings,
- Development of a drainage strategy and trackside and greenfield drainage designs,
- Geotechnical Services;
 - Geotechnical Design Reports (Access Roads & Earthworks stability),
 - Peat Management Plan,
 - Peat Landslide Risk Assessment,
- 3D Ground modelling,
- Temporary Works Design

THE SOLUTION

Haul Roads

The proposed haul road route runs from the existing Errochty substation site to the newly constructed Kinardochoy substation, through the existing countryside. The haul road provides access for the construction, installation and maintenance of the cables and runs parallel with the proposed underground cable duct systems. The road will be a geogrid reinforced compacted granular track with a minimum thickness of 300mm, with a 100mm Type 1 running surface. Several typical details were provided to account for the varying ground conditions encountered on the site. Where possible, existing tracks will be upgraded to minimise the effect on the local environment.



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Access Junctions

3No. bellmouth access junctions will be formed, one from an unclassified road to the south of Kinardochoy Substation, and two from the B846. These include 1No. junction to the north, 1No. to the south, and 1No. providing access to the northern maintenance track. All junctions will be constructed to current DMRB and TSM standards, with geometry tailored to accommodate HGV turning movements and to minimise disruption to existing traffic flows.

Construction Compounds

2No. primary compound areas are proposed. The first will be located at the southern entrance to the haul road. The second will be positioned adjacent to the northern maintenance access, incorporating a laydown area. These will be geogrid reinforced granular platforms.

Joint Bay Hardstandings

5No. temporary hardstandings will be located at cable joint bay positions along the haul road. Each will be expected to be formed as a 20m x 20m compacted granular platform, providing a stable, level working surface for cable pulling operations, jointing activities, and the associated plant and equipment.

HDD Crossing

At the location where the cable route encounters a deep river valley, the haul road will terminate on each side. Cables will be installed across this section via Horizontal Directional Drilling (HDD), with ducts laid beneath the valley and river. Access to both HDD entry and exit points will be provided, including turning heads designed for HGV manoeuvres to ensure safe, efficient operations without reversing movements.



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