CASE STUDY

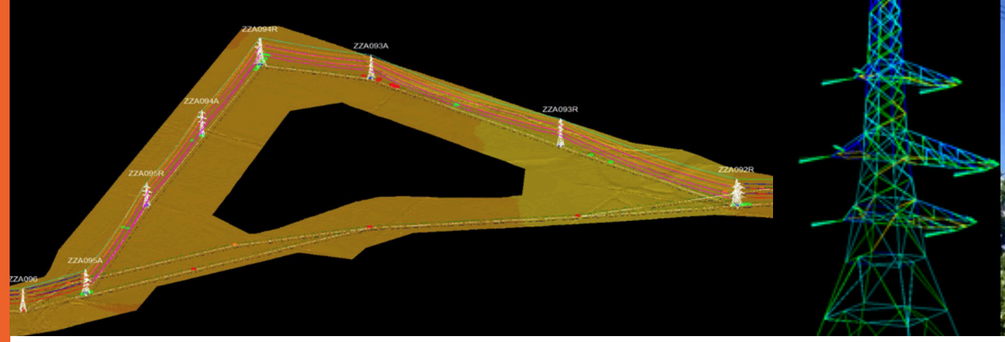
SUNDERLAND 275KV - 400KV DIVERSION

PROJECT TYPE & VOLTAGE
Transmission Diversion Design incc Contractor Works; 275kV - 400kV

SERVICES
Line Route Design, Overhead Line Design, Foundation Design & Drafting

ASSET OWNER
National Grid Electricity

WORKS SUBCONTRACTED
All design and engineering work completed in-house



CHALLENGE

Diverting a live 275kV overhead line — future-rated to 400kV — to free land for a major manufacturing development, with works carried out under single-circuit outages and requiring temporary mast infrastructure throughout construction.

Sunderland City Council's International Advanced Manufacturing Park required the diversion of the existing ZZA 275kV overhead line occupying the development site. Three existing L2 towers needed removal and replacement with seven new L8c towers, with the conductor system upgraded to 2x500mm² AAAC Rubus and a Keziah-equivalent OPGW earthwire. Because works had to be carried out under single-circuit outages on a line that remained partially energised, a temporary mast solution was required to maintain the live circuit throughout construction, adding significant complexity to both design and programme management.

SOLUTION

Groundline delivered the full detailed design and temporary works package, including drone LiDAR survey, PLS-CADD and PLS-TOWER modelling, foundation design, stage-by-stage construction sequencing, and Design Assurance Engineer roles for the lead contractor.

The scope covered structural analysis and strengthening, sag and tension calculations, clearance reporting and mitigation, geotechnical analysis, foundation design, insulator and wire clearance drawings, profiles, line schedules, setting level diagrams, material ordering schedules, and construction design and rigging studies. During the project, a potential future point of connection was identified near the line, and a planned angle tower was proactively replaced with a DJT type tower to accommodate it, futureproofing the diversion and avoiding the need for future structural intervention. Groundline also provided both the Lead Contractor's Design Assurance Engineer and the Contractor's Design Assurance Engineer, working closely with National Grid to ensure all designs were delivered within the required assurance periods and programme milestones.

IMPACT

A complex live-line diversion delivered under single-circuit outage conditions, with proactive futureproofing built into the design and full design assurance coverage maintained throughout.

The decision to substitute a DJT tower for the planned angle tower during delivery, rather than wait for a future project, reduced long-term construction risk, minimised future environmental impact, and offered a more competitive solution for the client. By embedding Design Assurance Engineers within the contractor team and aligning all programming with National Grid's assurance processes, Groundline ensured a timely, safe delivery on a project with tight outage windows and significant stakeholder coordination requirements.