Projects

Enabling UKPN to meet targets with a complete 132kV OHL diversion design

PROJECT AT A GLANCE

Project:	Location:	Client:	Duration:
132kV PPA OHL Diversion	**Guildford, Surrey**	**UK Power Networks (UKPN)**	**July 2024 – December 2024**

PROJECT BRIEF

Engineering a complete 132kV OHL diversion design, enabling UKPN to meet tight deadlines with full compliance and minimal disruption.

UK Power Networks' Major Connections team required the diversion of the existing 132kV PPA overhead line route to support upcoming land development.

The project scope included detailed design and analysis for both temporary and permanent overhead line systems under constrained single circuit outage conditions. LSTC Group was engaged to deliver full-service design, coordination, and engineering documentation.

OUR APPROACH

To begin, LSTC Group verified the client-provided LiDAR survey data and conducted a detailed unexploded ordnance (UXO/UXB) risk assessment. Third-party utility searches were also carried out to ensure safe and informed design planning.

For the overhead line design, we developed comprehensive PLS CADD and PLS tower models, including sealing end platform configurations. Structural assessments were undertaken in line with BS EN 50341 and UKPN standards, incorporating load and strength reporting, sag and tension calculations, and full structural detailing. This included wire clearance and proximity diagrams, as well as designs for insulator sets and OPGW arrangements. Material specifications and quantity estimates were also produced, and we contributed proactively to the client's project risk register (HEML).

The earthing scope included soil resistivity testing and the development of high-frequency earthing designs with supporting drawings tailored for sealing end platforms.

Our geotechnical team undertook ground investigations through borehole testing, leading to detailed foundation designs for towers and platforms.

Crucially, we provided end-to-end stakeholder coordination, managing communication and planning between the client, permitting authorities, contractors, and landowners. This enabled timely survey access, efficient scheduling, and seamless integration of on-site works.

CHALLENGES

- Challenging terrain and access: The team faced poor ground conditions, stream crossings, and limited access via private land, creating logistical constraints.
- Permit complexity: Overlapping jurisdictional and regulatory requirements demanded careful stakeholder engagement.
- Condensed programme: A fast-tracked schedule required rapid mobilisation of survey and design resources.
- Non-standard Line Design: Mixed conductor systems led to asymmetrical loading and complex structural considerations.
- Structural demands: Temporary and permanent loading scenarios required site-specific tower and foundation reinforcement.

PROJECT OUTCOME / DELIVERABLES

- We delivered a full design package for both temporary and permanent overhead line systems
- We achieved regulatory approvals without delay
- Our design documentation was delivered ahead of schedule
- We minimised the impact on the community through sensitive alignment adjustments
- Our technically robust tower and foundation reinforcements met temporary, permanent, and maintenance requirements

SERVICES USED

- Survey
- Overhead Line Design
- Earthing
- Geotechnical
- Stakeholder Coordination