



132kV DATA CENTRE CONNECTION

HEMEL HEMPSTEAD, HERTFORDSHIRE



Power

Value	Multi-million
Voltage	132kV
Market Segment	Data Centre
Duration	18 months



Project summary

JSM undertook the design and build of a 70MVA 132kV Data Centre connection

Pre-construction

JSM completed the detailed design which included cable schedules & calculations, protection drawings, Distribution Network Operator (DNO) and customer 132/33kV substation design, auxiliary transformer design, battery sizing calculations & equipment schedule.

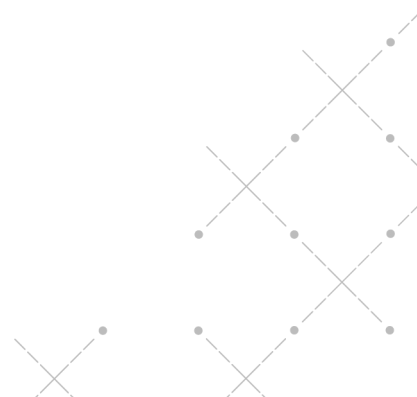
Construction

The works consisted of the construction of a 132/33kV DNO and customer substation and a 16km 132kV dual circuit in highly congested roads of which, four were major trunk road locations. The excavation works were completed over numerous weekends using 24 hour shift working to ensure that the road was open to traffic during the agreed times. As part of the route, 30 x 132kV joint bays and 60 x fibre chambers were also part of the build. In addition to this there was a horizontal directional drilling (HDD) direction drill (265m) under the M25 motorway and another HDD direction drill under the River Colne (170m). In total, 102,000km of 132kV cable was installed and 33km of 24 core fibre was installed.

Post-construction

Works included hot commissioning, energisation and providing As-Built records. Monitoring of the M25 for 4 weeks, post HDD.

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| <ul style="list-style-type: none">● Auxiliary transformer design● Principal Contractor● Compound construction● Compound earthing● Motorway monitoring | <ul style="list-style-type: none">● Civils● 132kV Cables & Duct installation● Horizontal directional drilling● Jointing & Terminations● Hot and cold commissioning with Energisation |
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PROJECT CHALLENGES

CHALLENGE



HDD underneath M25

Tight parameters set by National highways.

Plant installation

Installing ducts across the River Colne.

Duct installation

Installing ducts over petrol pipelines and high-pressure gas mains.

SOLUTION



After consideration, HDD was the preferred solution. Design approval with various surveys including pre and post monitoring of the motorway running surface levels, bore hole samples with loading/settlement calculations were conducted to satisfy the highways agency that the HDD would not cause any issues to the M25 during installation. The works area had to have ground reinforcement to accept a 100-ton drilling rig.

All options were considered including a cable bridge, damming the river and a HDD directional drill was the preferred solution. Various surveys including bore hole samples with loading/settlement calculations were conducted to satisfy the Environment Agency that the works would not cause any issues to the riverbed and no possible impact to the environment or wildlife in the locality. A temporary haul road had to be installed to get the drill rig into position to set up ready for the works.

Joint survey, pre-construction, carried out with asset owners and approved method of installation (hand excavation) agreed with watching brief in place at time of works.

