



BATTERY ENERGY STORAGE SYSTEM (BESS)

DEVELOPMENT IN BROADDITCH, KENT, UK



Power

Value	Multi-million
Voltage	33kV
Capacity	21MVA
Client	Undisclosed
Duration	10 months



Project summary

This project involved the design, construction, and commissioning of a Battery Energy Storage System (BESS) compound. Works included detailed design and approvals, installation of civil and electrical infrastructure such as plinths for 6nr batteries and 3nr transformers, 460m of 33kV cabling, a 2-panel 33kV switchboard, and fibre connections.

Pre-construction

JSM employees completed the detailed design which included cable schedules & calculations, protection drawings, Distribution Network Operator (DNO) substation design, auxiliary transformer design, battery sizing calculations & equipment schedule. Design approval was granted from the DNO and Client.

Construction

The compound construction included site clearance, earth grid installation, and plinths to house 6nr batteries, 3nr transformers, and the DNO and Client switchrooms, along with internal roads, walkways, and full compound fencing. In total, 460m of 33kV cable was installed both on and off-site. In line with DNO standards, 1nr 2-panel 33kV switchboard and ancillary equipment was installed and commissioned within a GRP enclosure. The BESS infrastructure included the installation of 6nr batteries with associated cable installation and terminations, as well as fibre cable and inter-battery connections.

Post-construction

Works included hot commissioning, energisation and providing As-Built records.

- Principle designer
- Designer
- Compound construction
- Compound earthing
- DNO switchgear & substation
- Installation of 11nr Batteries

- Civils
- 33kV Cables & Duct installation
- LVAC supplies
- Jointing & Terminations
- Hot and cold commissioning with Energisation

PROJECT CHALLENGES

CHALLENGE



Site earthing

The Point of Connection (POC) was via a 33kV Over Head Line (OHL), however the site was also to receive a 11kV connection in the near future. Consideration had to be made for the entire fault contribution and difference in fault clearance times for both voltage levels.

Plant installation

Due to site constraints the 6nr batteries, each weighing 32ton, required a complex lift to their final resting position.

SOLUTION



With 100% ground return for both 33kV & 11kV faults and a restricted site area, the earthing design achieved a safe 'Hot' site based on ENA E.R S36

To ensure the ground was able to support the 300ton crane, JSM completed a temporary works design and constructed the ground reinforcement in accordance with the design.

