

## CASE STUDY

# Battery Storage Facility, Thurrock



## INFRASTRUCTURE

### CLIENT

Jones Bros

### TECHNIQUES

Driven Precast Concrete Piles  
Precast Caps  
RBeam

### ACHIEVEMENTS

Successful installation of precast foundation solution whilst working to tight schedules.

## Project Brief

Roger Bullivant Limited provided a comprehensive foundation solution to support a battery storage housing project involving 234 Battery Energy Storage System (BESS) units and 78 Power Conversion System (PCS) units. These units have been supported by over 1,400 Driven Precast Concrete Piles, Caps and RBeam. This project underscores the growing demand for battery systems and their crucial role in enhancing power grid networks. BESS units efficiently store energy from renewable sources and significantly improve power quality, while PCS units convert utility grid power to DC for battery charging and vice versa.

RBL installed probe piles and conducted Preliminary Static Load tests to further understand the variable ground conditions, which included gravel layers overlying a chalk sub-stratum. Based on these findings, RBL designed a foundation package with more cost certainty including 250 x 250 mm Driven Precast Concrete Piles installed to depths of up to 25m, complemented by precast caps and precast RBeams. This ensured robust support for the BESS and PCS units, with installation tolerances maintained within 0mm to -10mm.

Jones Bros said,

*"Pleasure working with Roger Bullivant Limited during the tendering stage to make this possible! They look tidy don't they!?"*



**ROGER BULLIVANT**

T. 0845 838 1801 [roger-bullivant.co.uk](http://roger-bullivant.co.uk) [info@roger-bullivant.co.uk](mailto:info@roger-bullivant.co.uk)

# INFRASTRUCTURE



## Key Issues/Requirements

- **Speed of Installation:** Achieving rapid installation was crucial, with an average of 9 BESS units completed per day. This efficiency was essential to meet tight project deadlines.
- **Use of Specialised Equipment:** RBL utilised two Quiet Hammer 5500 series rigs, which minimised noise and disruption during pile driving, an important consideration for maintaining site conditions and adhering to regulations.
- **No Spoil Arising:** The displacement piling method ensured that no spoil was generated during the installation process, ensuring a clean site, and removing the need for spoil disposal and associated vehicle movements.
- **Precision Tolerances:** The tolerance for piling was maintained within the standard, ensuring precision in the foundation work. Additionally, the precast RBeams achieved installation tolerances of 0mm to -10mm, ensuring exact alignment and structural integrity.
- **Innovative Solutions:** The project incorporated an innovative alternative to insitu ground beams, using precast RBeams. This approach reduced program time and costs, showcasing RBL's commitment to efficiency and innovation.
- **Safety Near High Voltage:** Working in proximity to high voltage overhead pylons required planning and adherence to safety protocols to ensure the safety of all personnel and the integrity of the existing infrastructure.

## Solutions

- **Foundation Package:** The foundation system consisted of Driven Precast Segmental Piles (250 x 250 mm) installed up to 25.0 meters deep. Precast caps and precast RBeams were used to provide robust and precise support for the BESS and PCS units.
- **Efficient Installation:** Over 34,500 linear meters of Driven Precast Concrete Piles were installed within a 12-week period. This was followed by the installation of more than 1,400 precast HD caps and 4,200 linear meters of RBeam, demonstrating the efficiency and speed of the construction process.
- **Adaptation to Ground Conditions:** The variable ground conditions, with some piles founding in gravel strata and others in underlying chalk, were effectively managed using the specialised piling rigs. The in-house designed and purpose-built Quiet Hammer 5500 series rigs were crucial for meeting specific site requirements.
- **Offsite Products (MMC):** Precast RBeams, Piles and Caps were produced in RBL's own manufacturing facility, ensuring factory quality control and timely availability of materials to reduce site storage.
- **Minimal Spoil and Fast Installation:** The foundation package was constructed above ground without formwork, resulting in minimal spoil arisings and greater installation speed. This method also facilitated the installation of the BESS and PCS units with high precision.



**ROGER BULLIVANT**