



**PENFOLD VERRALL**  
EARTHWORKS SPECIALISTS

# Little Horsted Substation

**Earthworks & Bulk Muck Shift**

**March to December 2024**





# Introduction

**51,500m<sup>3</sup>  
of cut  
7,000m<sup>3</sup>  
of fill**

**5,600  
loads of  
muck  
away**

**42,000  
tonnes of  
aggregate  
imported**

In March 2024, Penfold Verrall was awarded the earthworks contract by Joseph Gallagher Ltd, who had been engaged by Balfour Beatty PLC to carry out civil engineering works for a new substation near Uckfield, East Sussex, on behalf of National Grid. To meet the project's tight timelines, Penfold Verrall mobilised its team within just seven days of appointment.

The project presented several challenges, including tight timelines and wet winter conditions, but Penfold Verrall efficiently addressed these challenges.

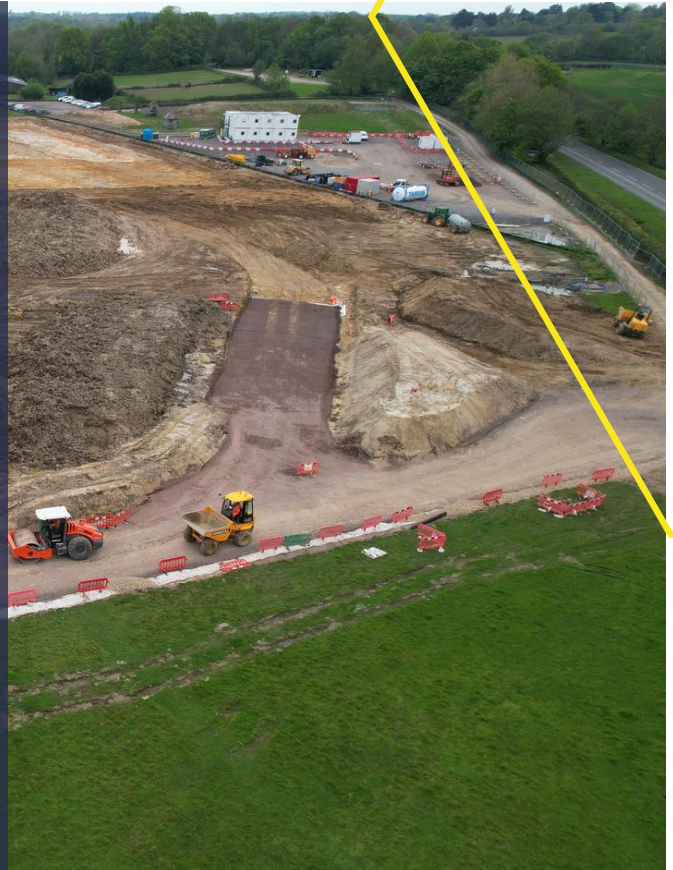
This case study highlights the company's expertise in handling large-scale earthworks projects while maintaining high environmental and safety standards.



# Project Scope & Scale

## Earthworks

The total site footprint spanned 84,000 square metres and required extensive earthworks, including topsoil stripping, excavation to formation, proof rolling, and the installation of geotextile fabric. These tasks were crucial in preparing the site for the subsequent importation of aggregate.



## Muck Away

Penfold Verrall effectively managed the muck away process, ensuring the removal of 45,000m<sup>3</sup> of surplus subsoil. This was carried out at a consistent rate of 80-plus loads per day, ensuring that the site remained clear and available for further development without delays.

## Aggregate Import

A total of 42,000 tonnes of Type 3 aggregate was imported to create a stable and durable substation base. The aggregate was laid in 300mm layers across the site, serving as an attenuation layer, and compacted in 150mm layers as the work progressed. This process facilitated the creation of a robust foundation for subsequent construction activities, such as the installation of drainage, ducts, and concrete structures by Joseph Gallagher Ltd during the winter months.

# Key Challenges

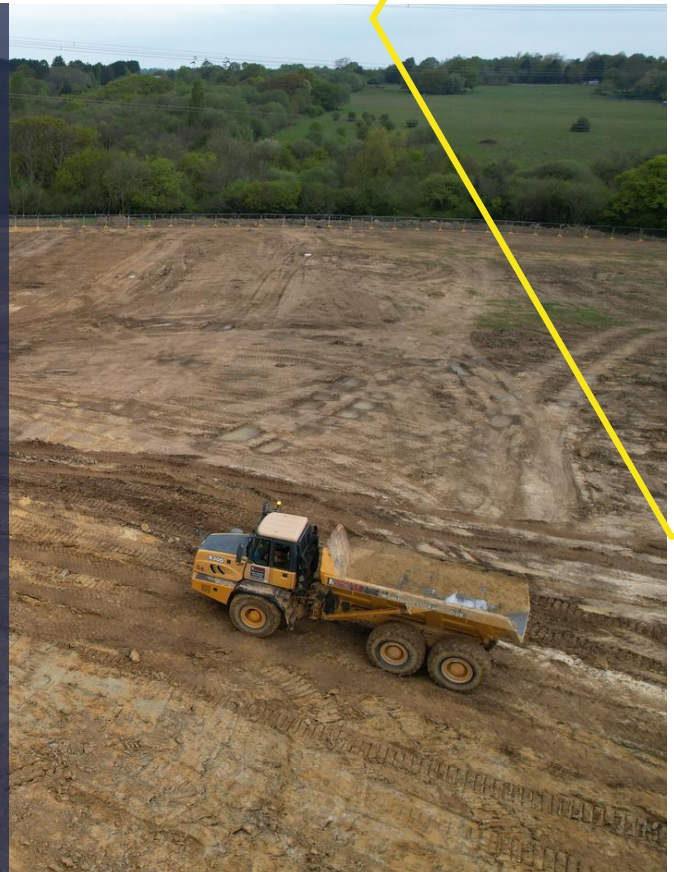
## Facing the Obstacles.....

### Rapid Mobilisation

With the project timeline tight, Penfold Verrall mobilised its earthworks team swiftly, ensuring that all necessary resources and equipment were on-site and operational within seven days to meet program deadlines.

### Site Conditions

The contract began in March following an especially wet winter, presenting immediate challenges. The first task was a large-scale topsoil strip across the site, which was complicated by the saturated ground conditions. With a tight schedule ahead, the task seemed daunting, but we remained confident in our ability to successfully complete it.



### Soil Management

Throughout the project, Penfold Verrall successfully managed the removal and transportation of over 5,600 soil loads to licensed disposal sites. This process demanded careful planning to meet a strict timeline, with an average of 80 loads removed daily. The smooth coordination between our earthworks and muck away divisions was key to maintaining this impressive pace and ensuring efficiency.



# Project Progression

The initial task involved stripping the topsoil, which was complicated by exceptionally wet winter conditions. However, it was essential to remove the topsoil to expose the subsoil beneath, especially in priority areas, to allow for drying.

Once these areas were adequately prepared, work commenced to bring them down to formation level, enabling Joseph Gallagher Ltd. to begin constructing two large concrete bunds that would house the new transformers.

Upon completion of the bunds, Penfold Verrall's earthworks team continued on the eastern side of the site, methodically progressing across the entire site to bring it down to formation. Soils were transported using 30-tonne ADT's to a designated stockpiling area, from where they were loaded onto our fleet of eight-wheeled tippers.

A muck away operation of this scale can present some logistical challenges, not only on the source site but also on the tips receiving the soils; our teams rose to the challenge, regularly exceeding 100 loads per day and successfully completed the operation ahead of schedule, whilst retaining full control of the project operations from source to end use.



Once a significant portion of the site was prepared to formation level, the surface was compacted, and a separation fabric was installed. The team then began importing Type 3 aggregate at a rate of 1,000 tons per day.

This material was levelled and compacted in two equal layers before trimming and proof rolling. Once the formation was complete, areas were handed over to Joseph Gallagher Ltd for the installation of drainage, ducts, and concrete structures.

# Execution & Efficiency

## Delivering on Time

Despite the challenges posed by wet site conditions and tight timelines, Penfold Verrall executed the earthworks with precision. The project team ensured that soil and aggregate were efficiently moved, maintaining a focus on meeting deadlines without compromising on quality.

Penfold Verrall also prioritised responsible soil management practices, adhering to a Materials Management Plan and ensuring that all soil was transported to licensed disposal sites in compliance with environmental regulations. This approach demonstrated the company's commitment to sustainability and regulatory compliance while ensuring project success.

This commitment to sustainability and regulatory compliance ensured project success while demonstrating Penfold Verrall's strong environmental ethics and operational standards.





# Successful Completion

Penfold Verrall successfully completed the earthworks for the Uckfield substation, ensuring the project remained on schedule despite the challenges. The efficient and effective execution of the earthworks and muck away operations simultaneously demonstrated Penfold Verrall's capabilities in handling large-scale projects. The project also highlighted the company's ability to manage complex operations while maintaining high environmental, operational and safety standards.

The collaboration with Joseph Gallagher Ltd and Balfour Beatty PLC was a great success, underscoring the value of pooling resources and expertise for the efficient delivery of complex projects. This partnership has paved the way for future joint ventures, reinforcing Penfold Verrall's reputation as a trusted and reliable partner in the civil engineering sector.

