



## EXCAVATOR MOUNTED PROBING

**Client**  
National Grid

**Team**  
Murphy Eltel JV

**Sector**  
M4

**Project start**  
10/2017

**Project end**  
11/2018

**Value**  
£80 Million

**Date**  
20/03/19

**Author**  
Charlie Gomer

**Innovation Reference**  
SI-00060

### PROJECT OUTLINE

The Richborough Connection Project enabled the connection of a 1GW subsea DC cable linking Belgium to the UK's super grid via 60 400kV pylons.

The project included temporary haul roads, bellmouths, minor ditch crossings, two major river bridges and three 132kV line diversions.

### TESTIMONY

“Better access to remote areas, while performing faster”

- **Lloyd Stothard,**  
**J. Murphy & Sons**

### KEY CHALLENGES

The Richborough Connection Project was located between Canterbury and Richborough in a high-risk zone for unexploded ordnance (UXO). This required every pile location on site to be probed prior to piling. With vertical piling this is a simple operation, where the probe has a scan radius of 2m and the whole pile location has been scanned in one go.

The diversion of an existing 132kV line required over 100 raked piles between 15 to 45 degrees. To probe these using a traditional truck mounted rig would require 3 vertical probes spaced every 4m to cover the horizontal distance of the pile.

This increased the time and cost of the probe by 3x compared to vertical piles, see figure 1.

Truck Mounted UXO Probing



## SOLUTION / INNOVATION

An excavator mounted unexploded ordnance (UXO) probe rig for probing raked piles prior to installation as a quicker and cheaper method than using a traditional truck mounted rig.

After talking to the sub-contractor Lankelma, they explained that they had built a probing rig which attached to the front of a 13T excavator arm which could probe raked piles between 0 and 90 degrees. They had built this rig to do one probe at 90 degrees and hadn't found another use for it, until the project team suggested trying out of the 45 degree stay piles on the diversion

## KEY BENEFITS

- £1700 day rate (excluding excavator) vs £1900 for a truck rig.
- 3x faster at clearing raked piles
- Tracked excavator can reach areas without haul roads
- Excavators can probe inside an excavation, while a truck mounted rig can only operate on flat ground.

## COSTS / SAVINGS / ROI

The main benefit with this system is a reduction in probing time per pile. This allows the rig to stay far ahead of the piling team, removing UXO probing a potential blocker to the programme.

£1700 day rate (excluding excavator) vs £1900 for a truck rig.





Raked probes

## IDEA ORIGINATOR

Lankelma came up with original design, Charlie Gomer investigated the idea and presented it as a solution to an early warning on a slipping programme. Donny Ngu helped push the idea up the chain and organised the sub contract.

## CHAMPIONS

Charlie Gomer, Engineer, contributed to the development and implementation of this solution on the Richborough Project.

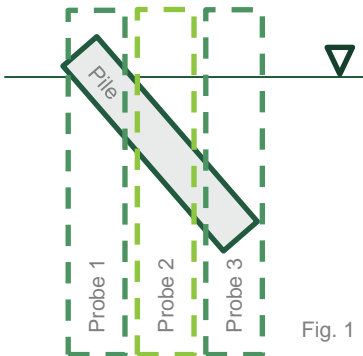


Fig. 1



## FUTURE OPPORTUNITY

On a project with many raked piles, the use of an excavator mounted rig will save time and reach more location that a truck mounted rig. The attachment can be transported in a flatbed truck and if developed further can have its size reduced to fit in a pickup truck. This could be an opportunity to for Murphy Plant to take up, develop and manage, adding UXO probing to their portfolio.

