

CASE STUDY

REMOTE MONITORING OF CONSTRUCTION SHORING STRUTS

THE APPLICATION

Mantracourt's innovative wireless telemetry system is breaking new ground in many industry sectors.

This application outlines how British company Groundforce, a division of Vp plc are embracing new remote monitoring technology for the construction and civil engineering industry.



KEY BENEFITS

- ▶ Enabled quicker installation and vastly reduced the time taken to access load data safely on the ground.
- ▶ Remote monitoring provided early warning changes in data from anywhere in the world via dedicated portal. Key personnel can also be informed via text or email.
- ▶ Contractors were able to significantly reduce the number of props on site. Competitive advantages were gained via technology.

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THE PROJECT:

REMOTE MONITORING OF CONSTRUCTION SHORING STRUTS

THE APPLICATION

Groundforce are suppliers of specialised equipment to the construction industry, supplying shoring, formwork and piling. Their shoring division, Groundforce Shorco, immediately recognised the benefits of radio telemetry for the monitoring of loads on construction sites, especially in the use of heavy duty hydraulic bracing and strutting in constructions pits and excavations.

THE CHALLENGE

Although monitoring loads in struts or ground anchors is by no means a new concept, Groundforce Shorco could see how wireless telemetry technology could offer their customers a cost effective and safety critical service.

The excavations Groundforce were supporting were becoming larger and more heavily loaded and the demands on both product and design support information increases. By incorporating Mantracourt's technology into pre-calibrated load pins, Groundforce's clients are offered a more convenient and accurate means of measuring the actual load in specific props whilst in the ground, and all without leaving the comfort of the site office.

"Being able to use wireless telemetry technology for strain and load measurement is enabling many new applications" said Kelly Voysey of Mantracourt. "It's proving ideal for applications within the construction and civil engineering industries, where access and cabling is limited or indeed, impossible."

THE SOLUTION

At the heart of the system is a load sensing pin located within the end swivel connection of the prop. Each of these load pins is connected to a Mantracourt wireless telemetry acquisition module via a short length of cable, which is then housed away from potential damage within the strut casing, adjacent to the hydraulic ram.

The battery powered telemetry acquisition module draws data on demand from the pin and transmits the live load data to one of two available viewable receiving sources. Groundforce Shorco offered two options to their customers for the collection and viewing of the load data. In its simplest form the receiver is a Mantracourt wireless hand held display which will pick up data from any of the struts. The handhelds have line of sight distances of up to 800m and enable the user to scroll through and manually record the data on each prop. Groundforce Shorco configure the handhelds to display in tonnes, meaning that no further conversion calculations are necessary for their customers.

The second option introduces a more comprehensive and fully automated remote monitoring service that can be tailor made to suit specific customer requirements. Mantracourt's GPRS sampling device and battery pack are located conveniently onsite and within range of the pins. The unit automatically gathers data at pre-set intervals, and transfers this via the GPRS network. There is the potential to set the destination for the data as text message, e-mailed data file, or both, which then enables the information to be easily compiled in graphical format for simple comparative purposes.



"The Mantracourt system is proving to be a valuable addition to our product range, offering a progressive means of information gathering for construction companies," said Tony Gould, Technical Director of Groundforce.

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THE RESULTS: REMOTE MONITORING OF CONSTRUCTION SHORING STRUTS

THE RESULTS

There is a warning trigger system that runs in parallel with this general data collection system, which uses up to 20 pre-programmed warnings keeping the user up to date with any substantial load increases without having to continuously keep an eye on the data. If measured loads in any of the props exceed any of these pre-set levels, the unit will in turn trigger either an automatic email or a text message to be sent to the nominated recipients.

The Mantracourt system is proving to be a valuable addition to Groundforce Shorco's product range and offers a progressive means of information gathering for construction companies. The technology has been deployed at sites for the Olympic Games for London 2012 and the high profile Tyne Tunnel 2 Crossing project in Newcastle and had found its way as far a field at sites in Stockholm, Sweden and Trondheim in Norway.

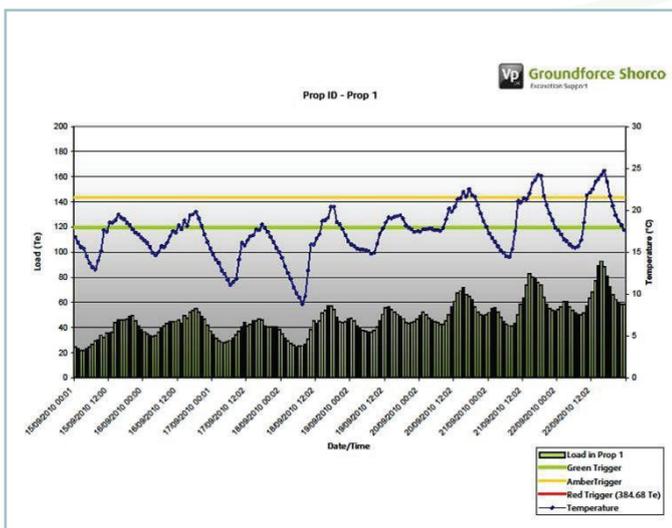


Figure 1 - Example of remote data of strut load, temperature and load warning trigger

PRODUCTS USED



T24-BSU

Wireless radio telemetry
USB base station



T24-HR

Handheld for multiple
transmitter modules



T24-SA

Strain gauge to wireless
telemetry converter



T24-RDC

Remote telemetry receiver
system for data logging