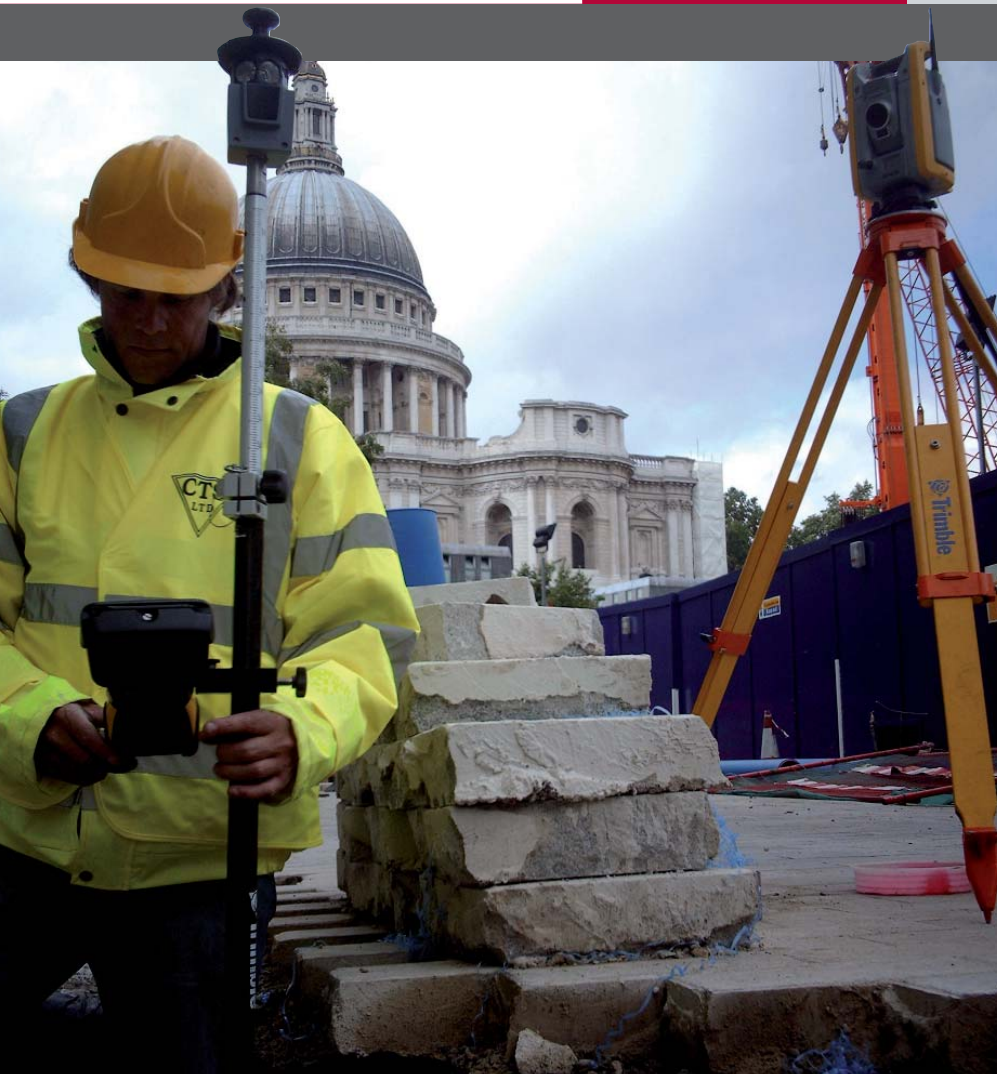


Customer:
Thames Water

Project:
Surveying London's Water Mains

Solution:
Trimble S6 Robotic Total Station &
R8 GNSS Receiver

Case Study



◀ Using an R8 GNSS receiver with the Trimble S6 Robotic Total Station.

network of over 1,100 miles of water mains in place that can be maintained and operated more efficiently.

However for this to be a reality, it is vital that Thames Water knows exactly where the new network is located. Principal Surveyor, Ben Darlow, explains. "A project of this scope will inevitably mean short term disruption to both road traffic and water supply. As well as recording accurately where the new network lies for maintenance, we also need to monitor our contractor's progress to keep disruption to a minimum and meet the Traffic Management Act's requirements. It was therefore vital that our contractors knew exactly what the job entailed and were equipped to meet our stringent specifications."

Trialling GPS

During 2005, as a member of the National Underground Assets Group*, Ben assessed a number of survey methods for the job. "If we were to deliver accurate and efficient data, the obvious contender was always going to be a predominantly GPS based system. Previously we had been using off set measurements from buildings

"The way we are surveying on this project means that data is handled considerably less which cuts down on errors and expensive rework."

but this could only be as accurate as the OS map data we took the building corner from which was 0.2m. For maintenance purposes and the fast location of leaks and blockages in the future, we required 0.1m accuracy. Photogrammetry was also

rejected. Trials showed it to be too time consuming and we were constantly troubled by parked cars obscuring points. Survey grade GPS was therefore the obvious way forward. We have a long standing relationship with Trimble and their distributor **KOREC** and over a period of several weeks we carried out a series of

Continued overleaf ▶

Old and Leaky!

Faced with multiple contractors surveying in a built up area, Thames Water has been quick to adopt the latest Trimble GPS technology

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Old and Leaky

Although they've served us well, many of London's Victorian water mains are simply no longer up to the job. Faced with drier summers, the capital's growing population and antiquated cast iron pipes that are

unable to withstand the stresses put on them by modern day traffic, renewing the network has become a matter of urgency for Thames Water.

Targeting the areas where the mains are oldest and leakiest – a third are over 150 years old – Thames Water has already replaced over 800 miles of old iron pipes with new more durable plastic ones. By 2010 Thames Water aim to have a new

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field trials surveying 200 hydrants across London using Trimble R6 GPS receivers. Although the systems performed well, working in a built up area reduced our satellite coverage, which meant that we could only survey 66 of the hydrants. To overcome this problem, we supplemented our GPS with a Trimble S6 Robotic Total Station and this combination was eventually selected by the majority of our contractors who later upgraded to the R8 GNSS receiver when it was launched last year. Having five extra satellites available has certainly improved coverage and we are now achieving about 80% of our data with GPS”

Base station technology

A Trimble NetR5 base station was set up at Murphy’s depot in Kentish Town which was central to the area of work and will remain there

“Our collected data is exported as ESRI Shape files into Thames Water’s GIS”

permanently underlining Thames Water’s commitment to improving and maintaining data asset quality. The NetR5 has the ability to send an RTK correction

message directly over the internet logging into an internet IP address at the rover allowing users to work up to 20km away without repeater radios.

Ben continues, “Using the Trimble NetR5 base station has changed the way we work - we can now post process data in the



▲ Having five extra satellites means that Thames water are achieving about 80% of data with GPS in the Greater London area

▼ Thames Water supplemented the GPS with a Trimble S6 Robotic Total Station

office without ever having to visit the site as well as view its data or settings without needing physical access. It can also track the satellite constellation which means longer working times with less down time due to lack of satellites. There is no limit to the number of people who can log in and we can keep track of contractors on the ground.”

Ben concludes, “Our collected data is exported as ESRI Shape files into Thames Water’s GIS. Future problems in the network will be easier to locate which in turn means smaller excavations and less disruption all round. We’re currently talking to **KOREC** about Trimble’s hand held GPS, the GeoXH, which offers 0.1m accuracy. This would allow us to navigate back to assets and even locate them under water as well as differentiate between specific valves which are often close together.

The way we are surveying on this project means that data is handled considerably less which cuts down on errors and expensive rework. Without doubt this is a cheaper, more efficient, more flexible way of working. The hardware has all been brilliant and it’s a real bonus being able to check the quality of contractor’s work through the NetR5. The only real problems we’ve had have been connected with our server, but **KOREC’s** Technical Support team has always been on hand to sort out any minor hardware niggles or send someone on site if required.”



*NUAG is a group of relevant stakeholders, including utilities and local Authorities, established to support the Department for Transport in achieving the relevant TMA targets. ■ ■ ■

Contact us:

Please do get in touch for further information on any of the products or services mentioned in Synchronize, a demonstration, support or just a chat about your requirements.

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