

CUSTOMER

Costain/Jacobs JV

PROJECT

A30 dual carriageway

SOLUTIONTrimble SiteVision,
R12i GNSS and SX10
Scanning Total Station

The Power of Three

The strategic planning of the A30 Costain/Jacobs JV survey portfolio, which utilised a focused Trimble hire fleet and the acquisition of three core instruments—Trimble SiteVision, an R12i GNSS, and an SX10 Scanning Total Station—was crucial to the project's success, particularly in overcoming the dual challenges of the COVID pandemic and Cornwall's unpredictable weather.

The project

From 2020 to 2024, Costain, in a joint venture with Jacobs, completed the £330 million A30 dual carriageway project between Chiverton and Carland Cross for the client, National Highways. This critical upgrade will significantly reduce congestion on this section of the A30, where travel times were previously up to four times longer than on other sections, impacting residents, tourists, and the Cornish economy. The project involved building 8.7 miles of dual carriageway removing the last single-lane stretch of the A30 between Camborne and the M5 at Exeter.

Responsible for the survey work, along with David Warren, Senior Engineering Survey Manager for Costain, was Engineering Survey Manager, Jamie Lewis. With over 13 years at Costain and extensive experience using KOREC and Trimble instruments, Jamie was well-equipped to provide the seven strong survey team and the thirteen site engineers with everything necessary for the efficient delivery of the survey work and in particular the control and setting out for the scheme.

After identifying specific project demands, Jamie covered their needs by drawing on Costain's existing systems, KOREC's hire fleet (including multiple S7 Total Station and R10 GNSS kits), and the strategic purchase of several key instruments, including Trimble SiteVision, an R12i GNSS and base station, and an SX10 Scanning Total Station.

Using Trimble SiteVision (AR) for visualisation of design

The first challenge that Jamie faced was how to ensure that good communication was maintained during the project's initial stages when COVID restrictions still applied. Faced with the task of ensuring all stakeholders (including the client, all home-based teams and affected landowners), had a clear vision of how the site would look, he knew that images of set out pegs simply wouldn't deliver. Instead, he opted to use Trimble SiteVision, an advanced augmented reality (AR) tool that overlays precise 3D digital models onto real-world sites. Working in conjunction with Trimble Catalyst's centimetre-precision GPS, SiteVision enables the project's stakeholders to visualise and interact with data on location with 50mm accuracy.

Equipped with SiteVision, Jamie could either show people actually on the site how the design would take shape, or he could use the SiteVision system to capture and store data from the field that could be accessed remotely for review or posted on social media for reference by the local community:

"Undoubtedly, Trimble SiteVision was key to smoothing communication during the early stages of the project when it was just a green field site. It's an extremely visual tool and one that enabled us to keep our teams informed and also post information on select social media to allow the local community to comment and track progress."



Safe surveying with the Trimble SX10

Stand out survey benefits on this project

- Reliability of the Trimble base station which provided corrections for all on site construction equipment, irrespective of the manufacturer.
- Early use of Trimble SiteVision (AR) for enabling key stakeholders to visualise the project.
- Safety benefits and time saved on traffic management with the SX10 Scanning Total Station.
- The impeccable service from the KOREC Hire team.
- The R12i's ProPoint technology for improved signal reliability in difficult conditions.



Trimble SiteVision was key to the project's early stages



Progress shot of the A30 scheme

Using the Trimble SX10 Scanning Total Station for safe 'live traffic' surveys

For Jamie, one of the obvious challenges that the Costain survey team faced was how to work safely and effectively alongside live traffic when gathering data for the design team, especially when requests for traffic management were taking the council around a month to process.

By using the SX10, Jamie was able to minimise the team's exposure to any traffic by setting up safely on verges and still capturing the extremely rich topographical detail he needed for the design team. In effect, it allowed him to survey 'on demand' with the flexibility to complete three or four surveys on each site visit from his home in South Wales:

"There's no doubt that the flexibility provided by the SX10 enabled us to work faster and more effectively. Its range and accuracy meant that we could set up safely 50m away from live traffic and still capture all the data we needed. It's such a versatile instrument, we used it in all its iterations including tying in scans to the control. Without a doubt, this is the way to handle highway schemes—it was a lifesaver in terms of the delays we avoided by not having to rely on traffic management."

Using the Trimble R12i GNSS to combat weather delays

In the latter stages of the project, the team worked through an unprecedented fourteen Met Office-classified storms to ensure the road's opening in June 2024. This perseverance was aided by the rain resistant Trimble S5 Total Station (IP65) and the time savings provided by the R12i GNSS. The R12i supported various tasks including establishing ground control points for aerial progress reporting, conducting general survey work including site clearance and the setting out of temporary fences, and during the later stages, the recording of curb lines and columns etc.

Specifically for this project, the R12i was also instrumental in setting out Cornish hedges along the new

"The performance of the Trimble R12i under tree cover was second to none, everyone was amazed at how far you could go in.

On one clearance survey, it would have taken 4-5 hours with a total station but took just 1.5 hours with the R12i."

Jamie Lewis, Costain

“Which of these instruments will we be using on the next road scheme? All three!”

Jamie Lewis,
Engineering Survey Manager, Costain



The R12i was used extensively across the project for topo, control and setting out the Cornish hedges

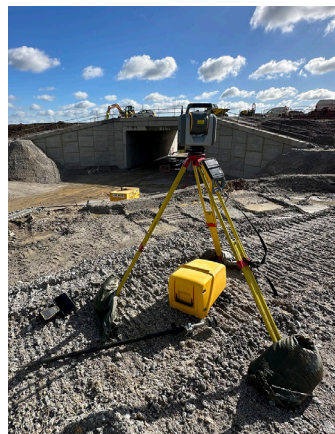
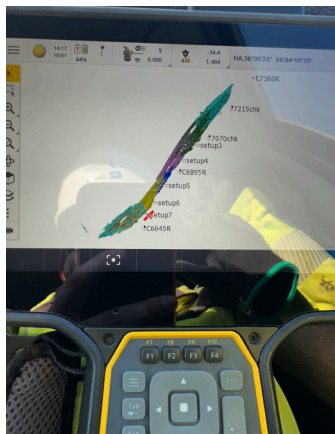
route which were built using traditional, sustainable methods and locally quarried slate. Jamie highlights the R12i's TIP Technology, which captures data points without needing to level the pole, and its ProPoint technology, which delivers superior performance in challenging GNSS environments, as key time-savers. Together, these features reduced clearance survey time by up to three hours a day compared to using a total station.

Reliability from Trimble and KOREC

Following the scheme's completion in June, Jamie acknowledged the reliability of the Trimble instruments in helping to achieve this milestone. The Trimble base station, which provided corrections across the site for all equipment—regardless of manufacturer—operated flawlessly throughout the entire four-year project. The steady performance of the Trimble Total Stations, even in the wettest weather, was also noted; so much so that they were even loaned to subcontractors whose instruments from other manufacturers struggled with the conditions. Jamie concludes:

"This project has been one that's highlighted how important it is to have both reliable equipment and a reliable distributor. In this respect, the KOREC hire team has been incredibly responsive with equipment always arriving on time, fully prepped and ready to go, even when there have been some tight deadlines. On occasions, I've been on the phone on a Friday afternoon and equipment has never arrived later than first thing Monday."

It's impossible to say what has contributed most to this project out of the SiteVision, SX10 and R12i, but without doubt our next scheme will include all three."



From left: scan data from the SX10, the SX10 on site and control work with the R12i

CONTACT US

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

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