

Grade control package speeds progress on 1km bypass



Projects in Wales often have special features of engineering interest due to the difficult terrain and geology – anything from slate to hard rock. Engineers need to have, expertise in maritime works, tunnelling, river diversions, landscaping and environmental protection, mineral deposits and geology as well as the skills of a highways engineer.

In North Wales a 1km long by-pass around part of the historic town of Ruthin is an example. The road, 15km from Denbigh, links up with the important A55 trunk road connecting Denbigh and Rhyl. Here the earthworks contractor, Jones Bros, of Ruthin, has been faced with soil conditions described by senior site engineer Chris Roberts as demanding with the soft clay and peat and sand and gravel beneath requiring extensive excavation. The site, although generally flat, sits on a river flood plain with a 2m high embankment made up of granular fill. The road, which includes a new bridge over the River Clywd, will be of flexible construction with 150mm of sub-base, a 300mm top surfacing and an SMA wearing course.

Work started in October 2005, and the first phase has to be completed by the end of March 2006 to release some land for housing. July, 2006, is the final completion date.

With time at a premium, the company, already familiar with KOREC's systems over a number of years, opted to use a GPS-based Trimble® GCS900 Grade Control system for use on its Komatsu D61 dozer. This is the first time Jones Bros's has opted for GPS guidance on a road project, although it was used on a nearby landfill site as a trial.

Simplicity and flexibility Impress!

Chris Roberts says the purchase of a Trimble GCS900 Grade Control System has saved time and money. "There is no engineer setting out or putting stakes in the ground because everything required to grade is on board the dozer. The operator knows exactly where he is and knows exactly how much he needs to put in, and what sort of shape it has to be."

Roberts also makes the point that there is no need for a banksman to guide the driver of the dozer around the site, and the machine doesn't have to stop every 5-10 minutes to check positioning.

Following installation and a day's operator training by KOREC, the system was functioning real time. Roberts said it took the operator about a week to fully get the 'hang if it.' "And he now knows more about the system than I do!" says

Roberts, "which is the way it should be."

On this project there's a lot of fill as opposed to cut, with imported shale material being quarried and trucked in from a nearby site. The material is then consolidated in layers of approx 300mm, rolled and compacted to formation level. This provides the road base with a secure foundation, and thus avoiding settlement. Positioning sensors of the grade control system provide an exact position of the dozer's blade and the on-board computer then computes the information and compares it to the design elevation.

On this project the Trimble GCS900 is operating in indicate mode. Light bars and an in-cab computer use the project design information and 3D GPS position as well as cross slope to show the operator the precise elevation and cross-slope movement required to get to grade. The patented dual GPS antenna system indicates the exact position, slope and cutting edge orientation for faster grading of complex designs and maintaining accurate blade cuts.

The accompanying Trimble Site Positioning System which uses the SCS900 Site Controller Software enables contractors to complete site measurement. It supplies real-time coverage maps, which simplifies workflow and provides in-the-field feedback to speed up decision-making and validate 3D machine control operations.



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Application Report (cont...)

On this project, the contractor is using the the Site Positioning System to check the daily progress of the GCS900, to make sure it achieves the stakeless environment, and to monitor the cut and fill operation to see how close the operator is to final grade.

The Site Positioning System can be used either as a surveying pole or mounted on a site manager's vehicle. On this project, the contractor opted for both.

Another reason for Jones Bros. to select Trimble GPS technology was the flexibility to quickly transfer the core components of the technology from one project or site to another, instead of moving machines from site to site. In fact, the Trimble

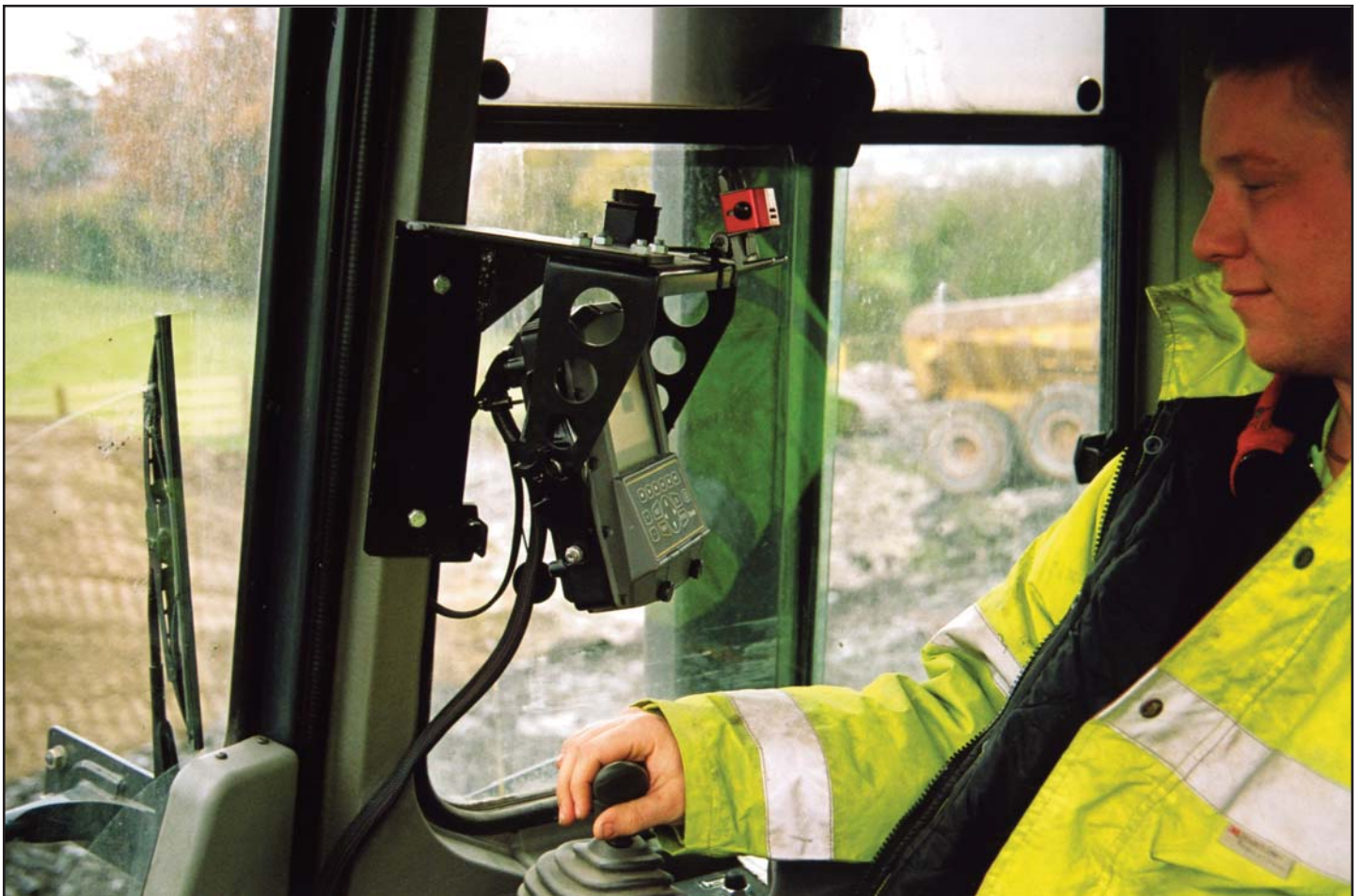
GCS900 Grade Control System will shortly head to nearby Bangor for work on an industrial estate.

KOREC's Peter Brooks, states, "Jones Bros has been a customer for some time, and was an ideal candidate for GPS technology. Initially they used some of the surveying technologies side by side to validate the work. The Site Positioning System was also used to validate material output. Consequently the degree of accuracy has gone up. Exact cut and fill measurements are taken along the entire length of the job and not as traditionally done at peg out positions, which are normally 20m apart."

Brooks also points out that GPS machine control guidance is a growth market and

one reason for that is simplicity. "A lot of people seem to think that because GPS uses satellites, it must be complicated. It is not an Einstein thing or a piece of wizardry. And it's getting easier, and contractors are happy to move away from stringlines and pegs."

Jones Bros is a medium sized company with an estimated turnover of 37 million euros and operates across the UK and provides a total road construction service, including paving as well as earthworks. They believe GPS will help win contracts in the future.



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