

Tackling the Challenges of Road Construction

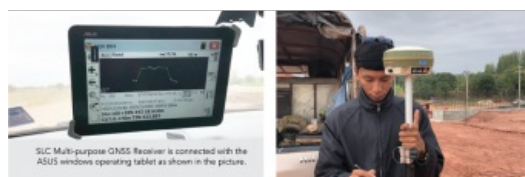


As new technologies emerge with the promise to increase productivity and efficiency, costing is one of the most important criteria in a project life cycle. Construction companies are seeking more effective and cost-efficient methods to complete their work as accurately as possible.

(This story is brought to you by Satlab Geosolutions; [Click here to download this case study](#))



Based in Korat, Thailand, Khunnon Construction, a subsidiary of S.P.T Construction, focuses on superhighways, road and bridge constructions. These projects require precise accuracy. With that in mind, Khunnon Construction purchased the Satlab Geosolutions SLC multi-purpose GNSS receiver after being appointed as the main contractor for the Bang Pa-in-Nakhon Ratchasima motorway in Sector 38, a 10km section of motorway that will be completed by the end of 2019. The 196km Bang Pa-in-Nakhon Ratchasima motorway project aims to alleviate the traffic congestion on Mittraphap Road, between Saraburi and Nakhon Ratchasima.



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The SLC multi-purpose GNSS receiver is a survey-grade piece of equipment with the centimetre accuracy that is required in construction works. Time and cost pressures have made it necessary for the team to invest in more productive

equipment in order to be more efficient on site. Khunnon Construction chose the SLC as it is easy to use without requiring more manpower; only one user is needed to collect the data on site.

Traditionally, they would have had to use a total station to survey the road area, and cross-reference the road level with an auto level to plot the cut and fill zones. This would have required surveyors to be on site full-time and also be very time-consuming as the surveying team would have to be on standby to confirm the road area during road construction.



Collecting data with the SLC to correct the road levels.

One of the key stages of this project is to do a quick road direction survey of the slope of the road to plot out the areas for filling and cutting. Khunnon Construction is required to correct the road direction, road level and the road width, all of which can be achieved using the SLC.



Satlab SLX-1NG Multi-application GNSS base station.

The setup of the SLC was completed quickly and accurately by Khunnon Construction. First, they set up the Satlab SLX-1NG multi-application GNSS base station to find a fixed positioning with the SLC to calibrate to the site. Once it has been calibrated, the SLC antenna is installed on the roof of the vehicle. It seamlessly connects with the tablet to provide real-time data values of N, E, Z and triangulated irregular network (TIN) model. For further cross-checking, the SL600 GNSS receiver checks the positioning edge of the road to ensure its consistency. The road drawings are then uploaded into the software for easy comparison with the actual level to plot out areas for cutting and filling.



Cross section drawing (left); Road with and road level (right).

Products used:

SLC Multi-purpose GNSS Receiver

- Installed in the project manager's truck for daily monitoring and cross-checking of the road construction progress

Satlab SL600 GNSS RTK Receiver

- Correct project area (boundary)
- Bridge positioning in project area
- Plotting the edge and boundaries from start to finish



SLC Multi-purpose GNSS receiver is connected with the ASUS Windows operating tablet as shown in the picture.

“This project required a solution that was user-friendly and easy to learn. The best part is that the SLC could connect with any device preferred by the team,” said Mr Surawut Wirohtjanapirom, president of Khunnon Construction.



Reduced the manpower required on the project to survey and cross-check the findings.

Through quantifying the productivity improvements, using the Satlab Geosolutions SLC multi-purpose GNSS receiver has saved Khunnon Construction 31-42% of the time previously needed and ultimately reduced the manpower required on the project to survey and cross-check the findings. The SLC's portability and intuitive user interface allows the operator to connect with a preferred device such as any smartphone to start collecting data. After a quick tutorial on using the SLC, Khunnon Construction can immediately start the project with precision and accuracy.



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