Controlling the "Big Build"

Known locally as "The Big Build," Sacramento County Airport's Central Terminal B project is the largest capital improvement project now underway in the Northern California area. Expected to be completed in 2012, the $1.3-billion project includes a new central terminal, a new automated people mover, new parking lots and access roads, and dozens of significant improvements to runways, taxiways, a 21-gate concourse and support areas. Andregg Geomatics has provided surveying and mapping for the project from its beginning stages in 2006, starting with control, aerial, topo and design surveys, and continuing with staking and as-built surveys. The firm is now working for the county and three main contractors, and has set or recorded many thousands of points. Working efficiently in a highly secure environment and keeping massive amounts of data organized has been a challenge, but the firm says that Trimble Access™ Software and the Trimble Connected Site solution have been keys to success.

Establishing an accurate control network was the first critical challenge. There are significant subsidence issues in and around the airport, and existing benchmarks were unreliable. The Andregg team performed simultaneous observations of three federal base network control stations and several stations in the proposed airport network. Using four Trimble 4000SSi dual-frequency GPS Receivers, Andregg crews performed 20- to 90-minute fast-static observations over three days, with each station occupied at least twice. All post processing was done using Trimble GPSurvey™ Software.

A two-person crew then performed level loops with a Trimble DiNi Digital Level. A total of 37 km (23 mi) of backwards and forward loops were run over three weeks, with balanced backsights and foresights and daily closing of loops. After more processing and least squares adjustments, Andregg achieved an average vertical precision for all lines to all stations of less than 0.991 ppm, an average horizontal error of 0.0037 m, and an average vertical error of 0.0023 m for leveled stations.

Airport security was another challenge. "The link between field and office was important," said Andregg Project Manager Michael Farrauto, "because security procedures make it time-consuming to enter and exit the airfield." But with the cellular link to the office via Trimble Connected Community™ Web Service and Trimble Business Center Software, Andregg crews could get needed data without leaving the jobsite. "For example," Farrauto noted, "to get new point calculations

crews would transmit points and measurements as needed to the office. After calcs were finished, the new points would be downloaded right into the party chief's controller without him even breaking down his instrument setup."

Robotic instruments with Direct Reflex (DR) capability, including Trimble's S6 Total Station and Trimble VX™ Spatial Station, have also helped to minimize trips in and out of secure areas. Since most survey work is accomplished with one-person crews, fewer Andregg employees have had to go through the lengthy security clearance procedures, which include background checks, extensive orientation, and issuance of SITA badges that have to be worn at all times.

Long-lasting projects are a boon in tough economic times, and Andregg Geomatics has made the most of this airport project by using advanced technology that keeps quality high and delivery times low.

See feature article in POB's August issue: www.pobonline.com