Collecting A Blizzard of Data

A British surveyor uses flexible technology to tame a powerful winter storm.

Trimble SX10 provides timely data when other technologies are grounded.

Solution

- Trimble® SX10 Scanning Total Station
- Trimble R10 GNSS Receiver
- Trimble Business Center Software
Ted Harland’s company, Tri-Tech, had worked at the Dunliland quarry near Glasgow for several months prior to that snowy day. Their client, an earthwork contractor handling removal of overburden that covered the quarry’s valuable stone, needed regular measurements on volume of overburden stripped and moved in the quarry. Tri-Tech crews had previously used a quad copter UAV to capture aerial images of the quarry. On this day, however, aerial imaging was out of the question. The client still needed accurate data and Harland was prepared to provide it.

CAPTURING A SNOWBOUND QUARRY

When Ted Harland loaded his vehicle earlier that morning, he knew he was headed into some very bad weather. As he stowed the UAV into his van, he recalled earlier instances when efforts to use their UAV were stymied by weather or other constraints. Months earlier, when he was shopping for a new instrument, Harland had thought that the SX10 might be useful in those situations. “I had the UAV in the van and I looked at the SX10 and thought well, it’s not going out on other jobs today so I’ll take it just in case.” The van also carried a Trimble R10 GNSS receiver and foul weather clothing.

The weather forecast was accurate; the quarry was blasted with high winds and driving snow. Not only was the UAV grounded; walking on the site would be slow and hazardous. So Harland turned to the scanning capabilities of the SX10. He identified 10 stations that provided a complete view of the area. Using a Trimble R10 and Integrated Surveying, he tied each setup of the SX10 into the mine’s coordinate system. At each location, he used a polygon to define the area to be scanned. The SX10 completed the measurements at each station in just a few minutes.

TIMELY RESULTS

Harland needed roughly three hours to complete the scanning on the 55,000 sq meter (13 ac) site. While it took about an hour longer than flying the site with the UAV, Harland could make up the time in the office. “With the UAV it’s 12 hours of computer time processing the photos to generate the point clouds,” he explained. “By contrast, the SX10 data is already registered to the grid and the point cloud is basically completed in the field. So while it took an hour or so longer on site, the deliverables were actually a lot faster than the drone.”

After downloading the data to Trimble Business Center software, Tri-Tech technicians quickly combined the individual scans into a single point cloud. From there they created a digital terrain model of the site and prepared deliverable data. The results included analysis of how much material had been moved to date, a drawing with a volumetric report and a height-shaded drawing.
The SX10 collects scanning data during the blizzard. Tri-Tech used polygon-defined scanning regions to reduce time in the field.

Rugged weather at the quarry grounded the UAV.
THE FLEXIBLE CONSULTANT

Tri-Tech uses its SX10 for more conventional applications as well. For example, on a building construction site they used the instrument to guide installation of anchor bolt jigs and boxes into the building foundation. As concrete was poured, the Tri-Tech surveyors needed to ensure that the anchor bolts were on the correct line and level and that the finished concrete was at the proper grade.

“Normally we would just use a standard robotic instrument,” Harland said. “But that day we didn’t have one available, so the SX10 went out and performed well as a setting out tool. That’s the beauty of it—we can use it as a day-to-day tool for setting out and topography. It gives us the flexibility to save money for our clients.”

“As technology advances, we take a hard look at what it can do for our clients. This really sets us apart from other surveyors.”

— Ted Harland, Owner, Tri-Tech Ltd.