

Geology helps define road expansion

Maptek™ I-Site™ technology defined the geology and stability of cliff faces, helping a road construction company to plan a safe expansion project.

Khasab, a city in the exclave of Oman, was isolated for a long time. Mountains rising from the plains of Ras al Khaimah made it virtually impossible to reach the city by land.

The development of a coastal road from the United Arab Emirates opened Khasab to the world.

Access challenges

The highway is built up against a sheer coastal cliff. Large overhanging rocks are susceptible to falling, particularly following rainfall. A planned upgrade prompted officials to commission a study to ensure the new design would prevent rock falls and improve road safety.

Due to the challenging geology of the region, the road construction company, STFA, required details of the geology and rock stability to gain a better understanding of the cliff faces.

Accurate solution

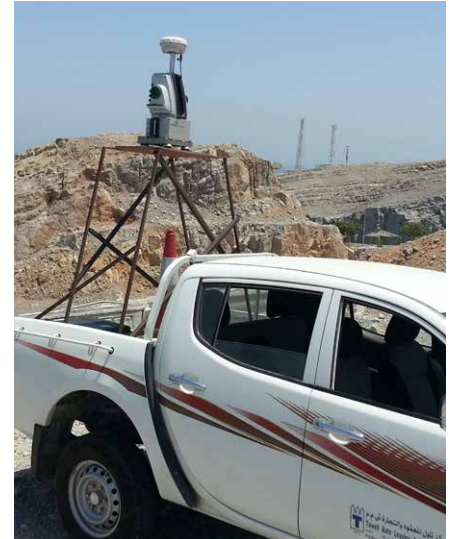
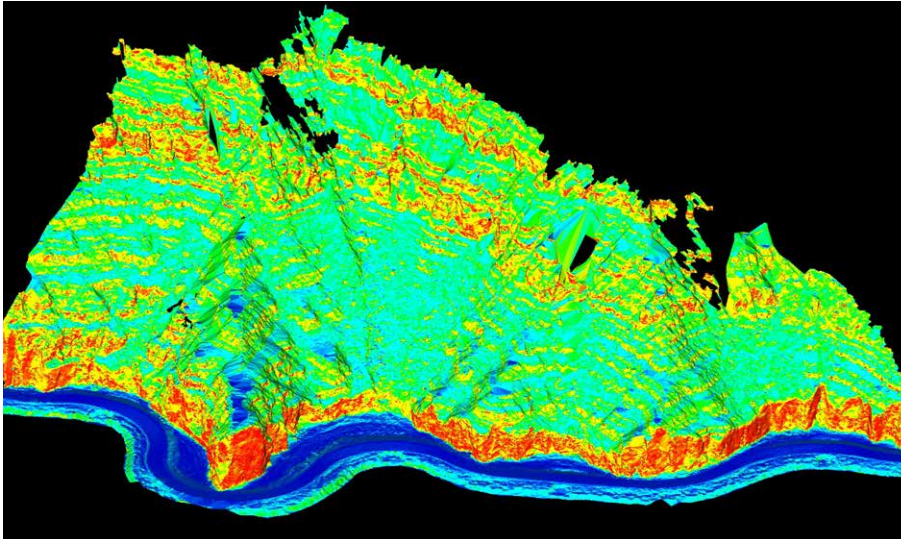
A Maptek™ I-Site™ 8810 laser scanner was used for geological mapping and geotechnical data acquisition. Surveying was fast and safe: 3 kilometres of road could be scanned each day. Cliff walls were up to 100 metres high.

Traditionally, workers would scale the cliffs and use a handheld compass to map the rock faces. This was neither fast nor safe.

Mounting the laser scanner on a vehicle allowed the survey crew to scan the walls from a safe distance, away from large overhangs.

Access was difficult with the road running right against the sea wall. The I-Site laser scanner was mounted on a crane to capture data on high faces where the offset was even tighter.





Detailed results

The original scope of the project required I-Site Studio software to generate rose diagrams for each of the thousands of rock faces along the cliff. This data was to be the basis for developing a regional geological report.

Topographic surfaces of the road and cliff face were generated to create a slope map for identifying steep areas.

After data collection finished, STFA asked for cross-sections of the walls and road, along with the volumes of particular rocks at high risk of coming loose. Traditionally, time consuming new surveys would have been required.

These deliverables were outside the initial scope. However, the comprehensive laser scan data was easily modelled and exported as cross-sections. This information helped determine where mesh or shotcrete would be required to stabilise surfaces.

Thanks to Destecs International