Locating Subsurface Utilities with High Precision

Overview

- Locating the exact positions of the subsurface sewage, water and gas utilities at different depths.
- Stepped Frequency Continuous Wave (SFCW) was used as a solution
- Accurate location and mapping of utilities at various depths, with fast data processing.

A newly paved road in Hoehr-Grenzhausen, in Germany required subsurface utility location. The Stepped Frequency Continuous Wave (SFCW) Technology with the Proceq GS8000 allowed our Inspection Engineers to map, with a single antenna and a single pass, both near surface targets and deeper ones.

The Challenge

The customer asked for a subsurface map so that he would locate the exact position of different services, gas, sewer and water. All at different depths and made by different materials.

GPR data was collected in two directions, parallel and perpendicular to the traffic to create a 3D picture of the subsurface. GPR data was synchronized with the GNSS connected to the GS8000, with no additional set-up.

Our Inspection Engineers collected a total of 34 lines, 10 lines in parallel to the traffic with a length of 12m and 24 lines vertical, with a length of 4m. The spacing between the lines was 0.5m. Impressively, all 2D lines and 3D data processed on the spot and delivered the report to the customer in just under an hour. Whereas other GPR devices need hours for collection and post processing, the GS800 enabled us to deliver a full report to the customer without even going to the office.

With two encoders and the flexibility to adjust the cart handle we could collect data where other GPR units would stop. This way we make sure we do not miss any targets close to the edges.

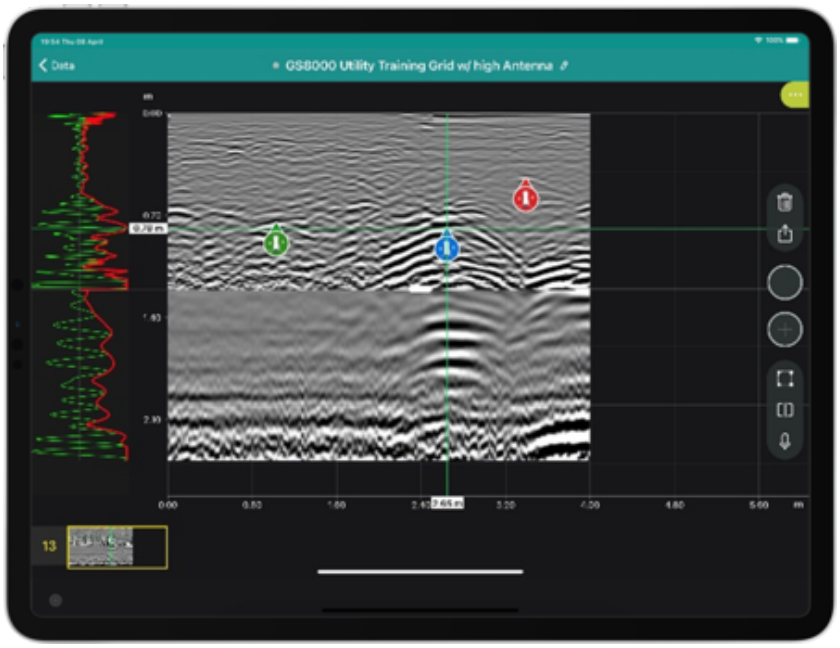

Fig.1: B+A scans of the three detected lines. Excellent resolution for both shallow and deep targets.

The Results

The GPR data was easily processed in no time with the GS application running on the iPad. No more wasted time with laborious post processing software in the office. The 3D map was produced, and we could share the results with the customer using cloud services.

Our Inspection Engineers mapped the different services, their direction, and their depth - these appear with different colors in our map.

Results can also be exported easily in GIS maps or Google maps from your iPad.

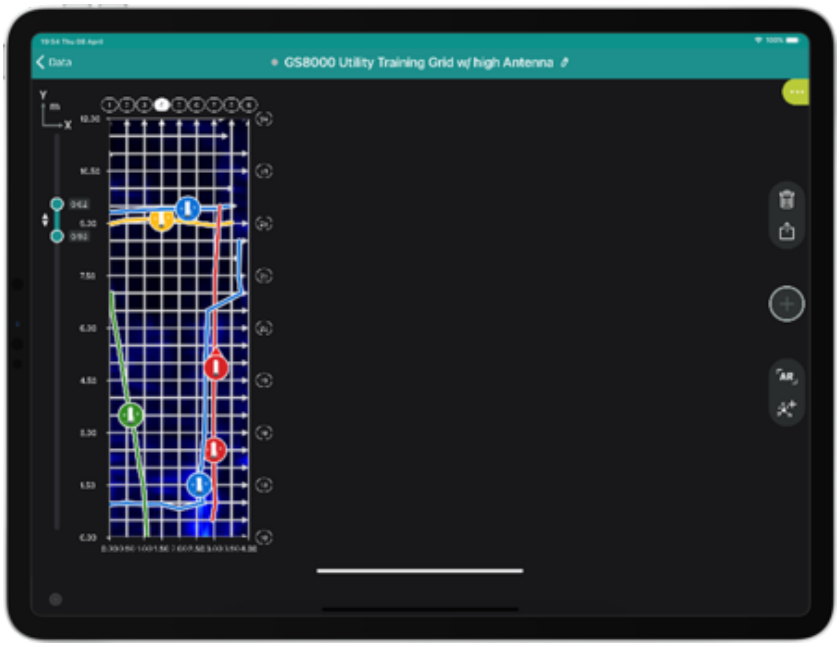

Fig.2: Depth slice of pipes on the grid.

Verification of the survey outcome

The outcome has been confirmed by the excavation on site and depths and positions of the utilities were highly accurate. Consequently, it was confirmed that the GS8000 is an excellent tool to locate and map utilities of different materials, at different depths and under different environmental conditions.

The easy and intuitive working environment offers the fastest data collection in 2D and 3D mode and shortest reporting time existing in market.

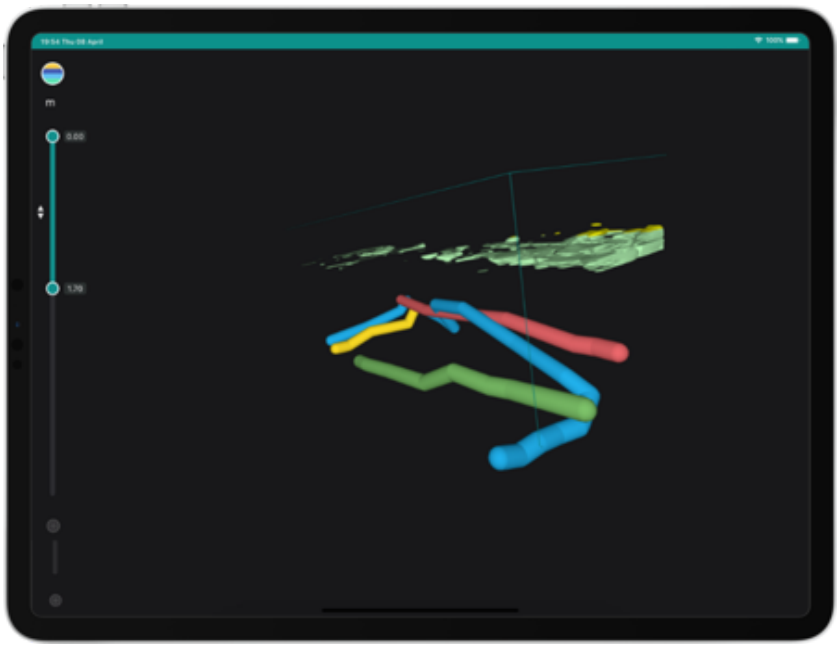

Fig.3: 3D representation of utilities with the software.

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