GUIDELINEGEO

ABEM | MALÅ

CASE STORY

Bedrock mapping South of Stockholm, Sweden

| GPR |

Bedrock mapping

Client

Structor Geoteknik Stockholm AB is a small consultant company in Stockholm, Sweden, who works with investigations and planning for geotechnical and geohydrological projects. They have a long experience of geotechnical investigations and use a number of different field investigation techniques to solve the underground conditions to understand the subsurface and suggest the most appropriate way of construction.

Challenge

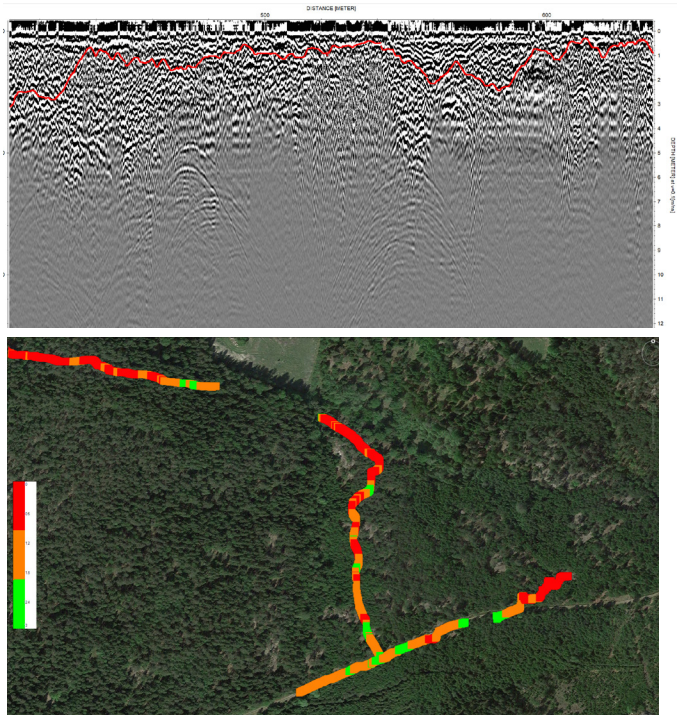
When planning a new residence area, with roads, utilities and houses, the knowledge of the underground conditions are essential prior to the construction, above or below ground surface. To map the depth to bedrock in an efficient way and get the best possible coverage of data, GPR measurements together with geotechnical drilling was chosen as the investigation technique. The GPR investigations were made stepwise, with a first interpretation without any other input data, to give a quick overview of the area. And then the GPR interpretation was up-dated as more geotechnical information was gained from the drillings.

Solution

The bedrock in the area was estimated to be rather shallow or at a maximum depth of 10 meters. So, the measurements were made with the MALÅ GX160 system, giving approx. 15 meters measurement depth in non-conductive conditions. The GX antenna was used together with a pulling kit for easy work in forested terrain. The measurements were done with a 3 cm trace interval and a time window of 350 ns. Data acquisition was made with the GX controller, with support of the internal GPS. Markers were set when passing positioned stakes to be used in the post-processing to correctly position the radar result. The data was interpreted in ReflexW and visualized with GPS Mapper and Google Earth for a quick way of showing the overview site conditions. The investigations comprised approximately 2900 meters and were carried out during one field day.

Result & Conclusion

The GPR investigation, together with the geotechnical drillings, could locate the bedrock level in large parts of the investigated area. The results show a mostly shallow, but rather undulating bedrock topography overlain by in parts clayey till, indicated in the radar data by rather bad depth penetration and plenty of air reflections. The MALÅ GX160 system from Guideline Geo has been used successfully to map the bedrock level together with geotechnical drilling. The measurements were done efficiently, and results presented in a user-friendly way.



The results were visualized in Google Earth in an easy colourscale showing the locations of shallow to deeper bedrock levels clearly.

PROJECT

- ▷ **Method:** Ground Penetrating Radar (GPR)
- ▷ **Solution:** MALÅ GroundExplorer (GX) 160 system
- ▷ **Measurement:** 3 cm trace interval and a time window of 350 ns
- ▷ **Inversion & Visualization SW:** ReflexW, GPS Mapper & Google Earth

Acknowledgement

We would like to thank *Structor Geoteknik Stockholm AB* (www.structor.se/bolag/structor-geoteknik-stockholm-ab/) for sharing this case.

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