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GPR in Ramboll

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The Ramboll Group is a large (10.000 employees worldwide) engineering and consultancy company, with offices in 21 countries. Ramboll has been working with geophysics for about 20 years and at the time of writing there are about 25 geophysicist employed in the group, 20 of these are employed in Ramboll Denmark. Ramboll offers an extensive range of geophysical methods: different types of seismic, borehole wireline logging, electric and electromagnetic surveys, magnetic resonance soundings and well as marine geophysical and hydrographic surveys. The geophysical group at Ramboll operates in different industries comprising: Infrastructure, environmental assessments, mineral exploration, energy and offshore constructions.

In the recent years our GPR activities has increased significantly. Today Ramboll Denmark owns three separate GPR systems: One GSSI SIR-3000 with antennas ranging from 16MHz to 2GHz, One Mala geoscience ProEx system with a 100MHz RTA antenna and one 3D-radar Geoscope MKIV system with two DX antennas of different size. The main services are geological mapping with our ProEx system from Malå Geoscience, road mapping with a GSSI system and different shallow mapping with our 3D system from 3D Radar.

With our 2D systems we have performed mapping of peat in different places in Norway, mapping of sediments at various places in the Nordic countries and mapping of glacier thickness in Greenland. In this type of investigations we often combine GPR with resistivity imaging (CVES) and refraction seismic to ensure a more reliable interpretation. We have performed occasional utility or UXO surveys where GPR has been used together with EM or magnetic measurements.

The mapping on roads with the GSSI system is performed by our RST (Road Surface Testing) department in Malmö, Sweden. The measurements on roads are often combined with laser scanning and photo registration of the surface. Various software have been developed to automatize the interpretation. The RST group has contributed to aninternational collaboration between several countries about preparation of guidelines for application of GPR on roads, the Mara Nord Project.

Our 3D system is used for various types of surveys. In airports mapping has been performed both on runways, taxiways and aprons with the aim of mapping layer thicknesses and delamination for planning of maintenance work. Acquisition has also been done on roads for control of asphalt works and mapping of the road bed. On bridges mapping of rebars and structure has been performed. The 3D system is also used for determination of space behind frost insulation walls in tunnels in Norway. This work is based on a pilot project made by SINTEF in Norway.

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