



View into the hidden

Ground-penetrating radar: Exploring the
state of infrastructure in high resolution

DB Engineering & Consulting

Revealing the invisible

Non-destructive ground-penetrating radar (GPR) is how we inspect the condition of traffic routes and structures in high resolution.

The GPR method serves to investigate substrate for upcoming engineering works. In contrast to conventional investigations by drilling or probing, ground-penetrating radar provides continuous and comprehensive information about the terrain down to a depth of four meters.

It records and documents obstacles concealed in the subsoil (pipes, foundations, etc.) and risks in the composition of the subsoil (e.g. peat lenses or rock) in advance. This explorations can obviate the need for expensive follow-up studies, because exposures can be made at the specific sites of anomalies in the subsurface.

GPR investigations thus complement and optimize conventional exploration methods by providing additional findings. The outcome is a comprehensive image of the substrate. Geo-technical reports prepared this way are more meaningful and reliable, guarding against unpleasant surprises while construction is underway. This optimizes planning, bidding and implementation of projects in line with scheduling and budget requirements.

GPR can also examine the condition of structures. The focus, for instance, is on identifying the reinforcement layer and assessing the concrete cover. GPR can also detect features like honeycombs, moisture and cavities.



Ground-penetrating radar process

- Assessing and documenting the condition of terrain and structures
- Detecting cavities and determining the location of reinforcement, pipes and foundations
- Detecting anomalies and risks such as peat lenses, areas of mud, hard core, rock horizons, ballast fouling, moisture, etc.
- Can be used on rails, roads, platforms, tunnels, bridges, dikes, industrial areas, sewers and in buildings
- Can explore up to 4 m deep
- Can measure at a speed of up to 100 km/h with a resolution of 20 scans/m, i.e. one measuring point every 5 cm (higher resolutions are possible at lower speeds)

Advantages

- Minimizing risks: precise and extensive advance knowledge about building terrain enables optimal planning and bidding for construction services and ensures construction will proceed smoothly (lowering the risk of having to add to or pause work during the construction phase).
- Non-destructive use
- No operational restrictions of rail or road traffic, as measurements can be made during regular operation.
- Combining GPR with other methods (scanner systems and line scan cameras, etc.) and data (e.g. track geometry data) yields a complete 3D image of the object under investigation, which serves as the basis for the management of infrastructure facilities.





Areas of application

- Determining and providing the data that forms the basis for Building Information Modeling (BIM)
- Determining and providing the data that forms the basis for condition-based or predictive maintenance, e.g. for permanent way improvements
- Can be used in quality control: target-performance comparison to check whether structures conform to plans

Your contact at DB Engineering & Consulting on the ground-penetrating radar process: **Georadar@db-eco.com**



Imprint

DB Engineering & Consulting GmbH
Part of DB E.C.O. Group
EUREF-Campus 14
Torgauer Str. 12 – 15
10829 Berlin

www.db-engineering-consulting.com
www.db-eco.com

Subject to change
Stand 31.01.2023

Photography: Thomas Schütz (Title),
DB Engineering & Consulting