



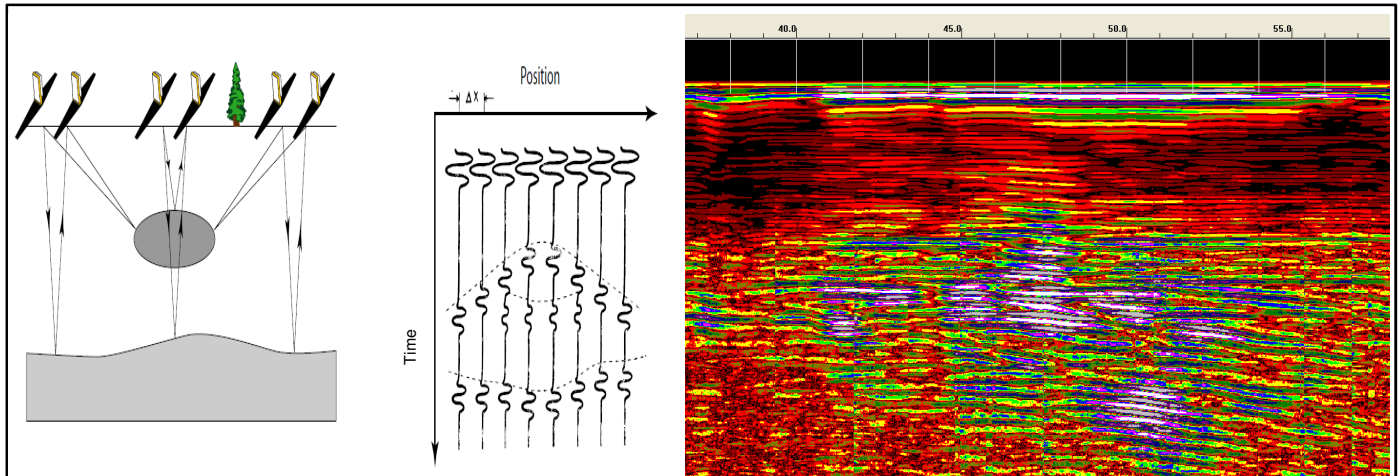
SOLDATA
GEOPHYSIC

GROUND PENETRATING RADAR (GPR)

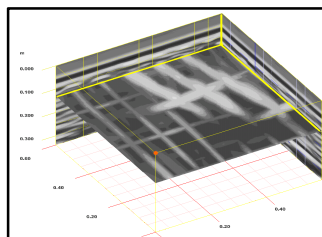
High resolution mapping of soils and structures



AGAP Approval of Quality: Ground Penetrating Radar
ASTM Standard D6432



2



3

Ground Penetrating Radar (GPR) is a non-destructive high resolution mapping technique for the subsurface and for structures. It is implemented for the detection of buried objects (natural or anthropogenic).

Applications

- Detection of anthropogenic or natural cavities, decompressions, hollows
- Detection of networks, underground structures, environmental pollution or pyrotechnic articles (2D and 3D mode)
- Concrete structures mapping: geometry of steel rebar and prestressed cables; locating faults or cracks; determining thicknesses
- Pavement condition evaluation: thickness of pavement layers, reinforcing steel, subsurface moisture, voids
- Qualification of potential impacts of borings, drillings, digging and micro-tunneling under railways
- From a borehole, for surveying a study area of approximately 3m radius around the drilling (stratigraphy, voids, buried structures)
- 3D Archaeology

The principle of GPR is based on the propagation of electromagnetic waves in the ground. A high frequency EM pulse is emitted by a transmitting antenna. This pulse induces an EM wave that propagates in the ground and is attenuated at each change of medium. The refracted and reflected energy is recorded by the receiving antenna. The measurement of the wave allows a time-distance section to be obtained (x, t). The interpretation of this enables a 2D section of the ground to be established, accurately locating existing anomalies.

GPR measurements are performed along longitudinal and transverse profiles according to a specific protocol for each project. At the end of the study, a map is established to locate anomalies that appear. The report of GPR mapping coupled with surveys or coring control allows precise location of the anomalies.



Legend

1. Principle of GPR and acquisition in the form of a 2D section
2. Implementation
3. 3D radar block

Key figures

- Depth of investigation from 30 cm (2.6 GHz antenna) to 30 m (16 MHz antenna)
- Horizontal resolution of approx. 1 cm (2.6 GHz antenna) to 1.6 m (16 MHz antenna)

SDG Equipment

- Radar antennae: 2,6GHz, 1,6GHz, 900MHz, 400MHz, 270MHz, 200MHz, 70MHz, 40MHz, 3200MLF(16-80 MHz)

- Radar antenna without contact (1GHz/ 2GHz)
- Borehole radar antenna (100MHz, 150MHz et 300MHz)
- Acquisition units: SIR 2000 / SIR 3000 / SIR 20