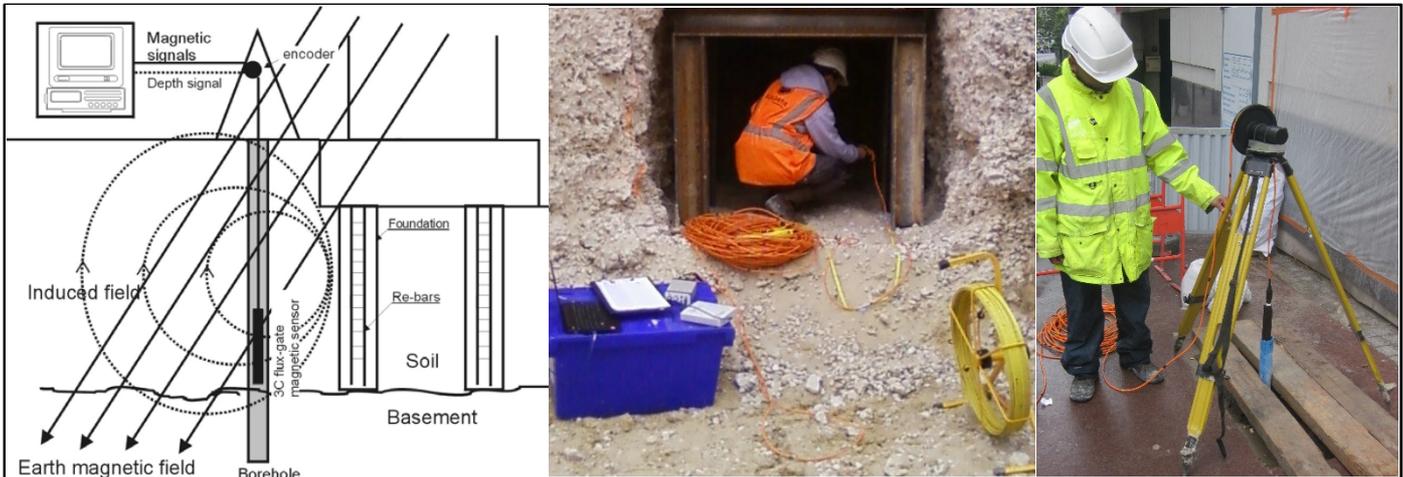




SOLDATA
GEOPHYSIC

BOREHOLE MAGNETOMETRY

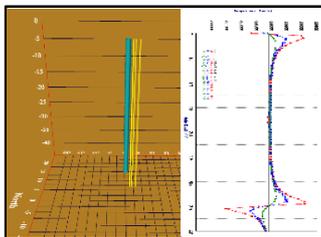


The borehole magnetometry method is implemented to detect and characterise buried metallic structures, from a measurement borehole that can be vertical, inclined or horizontal.

This is a passive method because it measures changes in the ambient magnetic field, without trying to change or amplify it.

Applications

- Geological prospecting: ferromagnetic ores
- Civil engineering: characterisation of steel or reinforced concrete structures, measurements of foundation length
- UXO detection



Steel rebar, foundations, certain cables and tunnel segments are ferromagnetic and generate relatively strong, and therefore measurable, induced magnetic fields in response to the earth's geomagnetic field. The surrounding soil is generally non-ferromagnetic.

The borehole magnetic logging tool uses a flux gate magnetic sensor to measure the three components of the magnetic field as it is raised in a borehole in immediate proximity to the structure.

For simple problems (for example, measurements of the length of sheet piling from a parallel borehole), there are methods of directly analysing the signal which allow the length of the neighbouring object to be quickly and reliably determined.

For the study of more complicated cases, a modelling software uses mathematical models integrating the 3D shapes to explain the variations in the measured field. This enables the complicated geometry of the investigated structures to be accurately estimated.

As a check, to complete the analysis or to overcome the possible absence of ferromagnetic rebar in the studied object, this method can be performed in conjunction with borehole GPR, Electrical Cylinder®, parallel seismic or other methods.



Legend

1. Operating principle and the method in use
2. Borehole magnetometer
3. Modelling of the effect of a cased concrete pile

Key figures

- Depth: up to 150m
- 3 components: X, Y, Z
- Total field calculated
- From -500 000 to +500 000nT

SDG Equipment

- Bartington probe
- 150m cable
- Pulley and encoder
- Acquisition device
- PC