













resistivity cable deployment in road verge

Electrical properties are among the most useful geophysical parameters in characterising Earth materials. Variations in electrical resistivity (or conversely, conductivity) typically correlate with variations in lithology, water saturation, fluid conductivity, porosity and permeability.

Resistivity Tomography can be used for the following applications:

-  Mapping geological features
-  Detection of buried structures
-  Karst & solution features
-  Groundwater exploration
-  Landfill waste mass studies

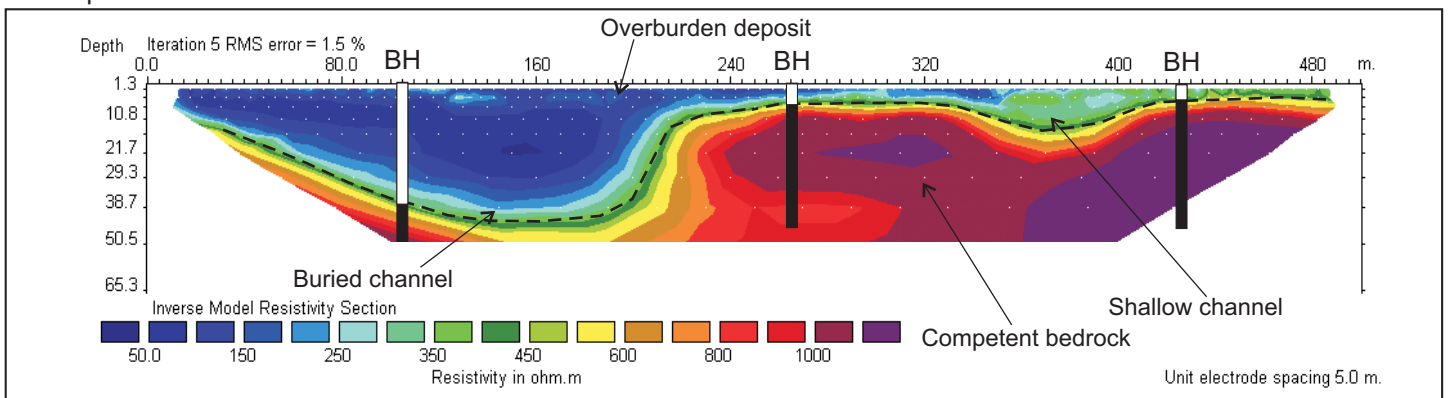
Benefits:

-  Up to 1.5 line km per day
-  Depths down to 60+ metres
-  Laterally continuous data
-  Non-invasive
-  Exceptional value

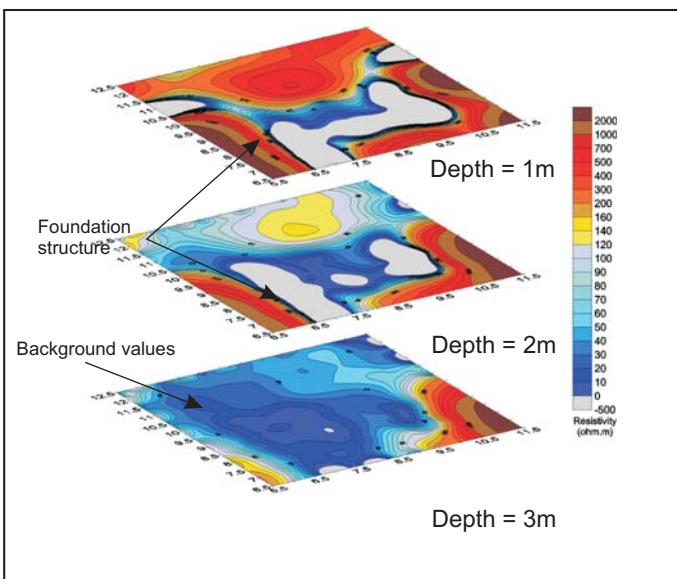
Acquisition of resistivity tomography data involves the deployment of an array of regularly-spaced electrodes which are connected to a central control unit via multi-core cables. Linear arrays are employed for 2D surveys while a square array is used for a 3D survey. Resistivity data are then recorded via complex combinations of current and potential electrode pairs to build up a pseudo cross-section of apparent resistivity beneath the survey line. The depth of investigation depends on the electrode separation and geometry, with greater electrode separations yielding bulk resistivity measurements to greater depths.

The modeled true subsurface resistivity image is then derived from finite-difference forward modeling via specialist software (RES2DINV). The true resistivity models are presented as colour-scaled contour plots of changes in sub-surface resistivity with depth.

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(ABOVE) As part of a hydrological study, a series of resistivity tomography profile lines were acquired to map variations within the overburden thickness. The example section above displays an extensive erosional channel feature together with more subtle overburden thickness variations.



(LEFT) A 3D resistivity survey was carried out to map the lateral and vertical extent of buried foundations. The grey zones represent noisy data due to buried services and the high resistivity values (red) reflect the foundation material. The resistivity suggest that the foundations extend to a maximum depth of 2m.