

Specialists in non-destructive investigation and engineering geophysics

ground



- Mineworkings
- Shafts
- Buried Structures
- Layer profiling
- Utility mapping
- Contamination
- Foundations

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   **OVERVIEW**

WHY BUILD A GEOPHYSICAL SURVEY INTO YOUR CONSTRUCTION PROJECT?

Investment in a thorough ground investigation will pay dividends through the life of a typical project. Geophysics is an essential part of the site investigation mix, particularly on brownfield sites.

AVOID UNFORESEEN GROUND CONDITIONS

Unforeseen ground conditions are the perhaps the most common cause of construction programme and cost overrun. For contracts which reimburse contractor's costs in the case of 'unforeseen ground conditions' (ICE and JCT standard forms, for example) a poor site investigation will often lead to delays, claims and poor control of costs.

GET THE FULL PICTURE

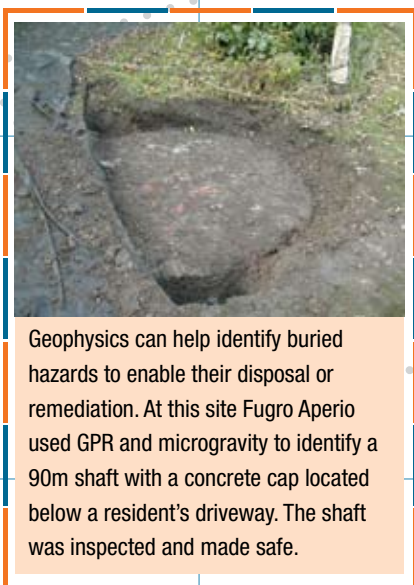
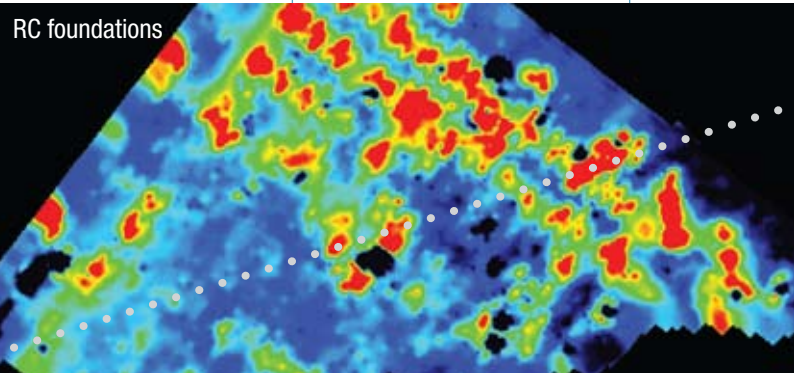
Fugro Aperio geophysical surveys can help you get far more from your 'conventional' ground investigation, often with a lower total spend. Use rapid scanning geophysical methods such as conductivity or magnetometry at the start of a site investigation to target more expensive point sampling methods like boreholes or CPT. Or use precision techniques like resistivity and microgravity to find targets and determine ground characteristics.



Utility project



EM61 survey



Geophysics can help identify buried hazards to enable their disposal or remediation. At this site Fugro Aperio used GPR and microgravity to identify a 90m shaft with a concrete cap located below a resident's driveway. The shaft was inspected and made safe.

LOW IMPACT

Geophysical surveying is inherently safer and more environmentally benign than intrusive methods. Not only does it map potential hazards such as buried cavities and cables, but it does so without heavy plant and without disturbing potentially sensitive sites.

TECHNOLOGY - IN EXPERT HANDS

You will benefit from leading edge technology, including the most up to date and productive instruments - meaning your findings will be based on a bigger and more reliable dataset. Your survey will be professionally managed and conducted by well trained geophysicists and geologists working within an ISO9002 quality assured environment.



METHOD

HOW IT WORKS

TYPICAL COVERAGE

TYPICAL USE

Ground Resistivity	Builds cross section profiles through the ground to identify features with differing electrical properties. Effective to 15m in engineering applications. Can resolve the vertical and plan extent of features.	2-3000 linear metres per day	Ground layer profiling, man-made and natural voids, buried structures.
Ground Conductivity	Range of electromagnetic methods for use in ground and on structures: EM38 for shallow (sub metre) ground and structural use; EM31 for deeper (to 3m) ground use; EM61 is a related method for identification of metallic targets at depth	1 Ha per day	Natural and man-made voids, buried structures, ground water, metallic features, contamination
Ground Penetrating Radar	Electromagnetic method for a wide range of applications. Low frequency radar for use to 10m in favourable conditions, high frequencies give better target resolution, but have depth range of only 1-2m.	1 Ha per day	Natural and man-made voids, buried structures and utilities, ground layer profiling
Magnetometry	Detection of man made objects with iron content and geological features containing magnetite to depths of 10 to 100m depending on target.	1 Ha per day	Metallic features, buried structure, natural and man-made voids, landfill.
Microgravity	Detects subsurface features with differing density to host ground. Depth range of tens of metres for large scale (geological) features, more typically used to c.5m in engineering geophysics. Measurements taken as individual points therefore slower than other methods.	60 points per day, or 1 Ha per 60 days	Locating and characterizing voids



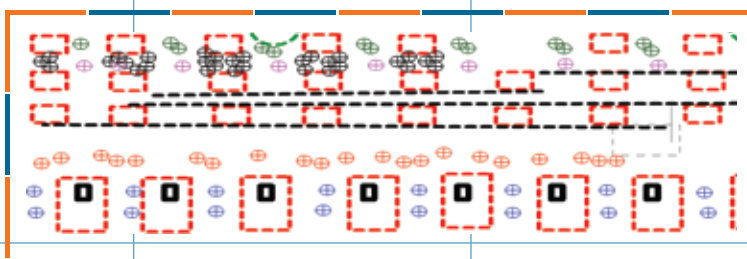
Collapsed shaft



Subsidence damage



Contamination survey



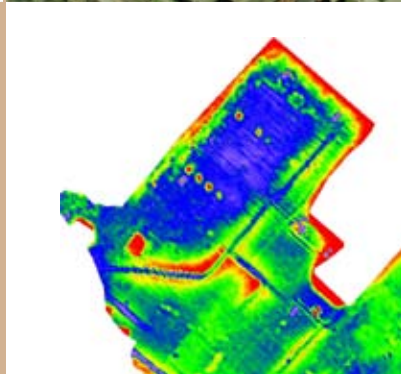
Fugro Aperio can help to identify elements of a site that are suitable for re-use. At the former Battersea power station Fugro Aperio mapped 138 reinforced concrete piles and other buried foundations so they could be assessed for re-use in a redevelopment scheme.

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Prior to redevelopment of a 6.5 Ha site adjacent to the River Clyde, Fugro Aperio was commissioned to investigate remnants of heavy industrial buildings.

The site was surveyed in just four days using ground conductivity and magnetic methods, with precision positioning achieved using DGPS. Findings showed that most buildings had been fully removed, but remnants of foundations, drainage and railways remained.



Ground Investigation clients:

- Atomic Energy Authority
- Arup
- Balfour Beatty
- British Waterways
- Brown & Mason
- Dean & Dyball
- Donaldson Associates
- Edinburgh Trams
- Faber Maunsell
- Highways Agency
- Jacobs
- Kier
- London Underground
- May Gurney
- Mott MacDonald
- Network Rail
- Parsons Brinckerhoff
- Scott Wilson
- Thames Water
- Transport for London
- Willmott Dixon

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