

CASE STUDY

Ground investigation: Electronic capture of data on site



STRUCTURAL
SOILS LTD

Project background

Ground investigation field data such as driller's borehole logs and engineer's sampling or soil description records have conventionally been recorded on-site using pen and paper. These records are then retyped into specialist software for processing and sending to clients. This process is inefficient and prone to delays and occasional errors.

Recent developments in rugged and semi-rugged computers and other hand-held devices mean that it is now commercially effective to collect most forms of geotechnical and geoenvironmental data directly on-site using electronic methods.

RSK set its data management team, part of RSK company Structural Soils, the task of identifying and implementing the best electronic ground investigation field data gathering solution or solutions.

Project brief

RSK and Structural Soils undertakes a wide variety of ground investigation and testing work in many different environments. In addition to routine work in the UK, the company's staff operate internationally, including in harsh climates such as the Middle East where temperatures routinely exceed 40°C during normal working hours.

Any solution would need to work in such extreme hot and dry conditions and the often wet and muddy site conditions in the UK. Operators could range from staff drilling boreholes, engineers supervising ground investigation work or undertaking environmental sampling or monitoring, to technicians carrying out on-site testing. Solutions capable of meeting not only the requirements of UK clients working to British Standards, but also international clients working to other national standards such as the American Society for Testing and Material (ASTM) standards were also desirable.



Rotary core sample descriptions and mechanical log data being entered into the pLog software. A stylus is being used in this photograph, but the touch-sensitive screen can be used equally well with bare or gloved hands.

Compatibility with Structural Soils' primary geotechnical and geoenvironmental database tool, Bentley Systems gINT software, was also essential to enable the site data to be imported easily and quickly into the database. Eliminating time-consuming data entry typing tasks would enable computer-generated site records to be provided to clients almost instantaneously.

Options appraisal

The data management team completed option appraisals to identify what was required to support the different ground investigation services Structural Soils offers and to identify and test different software solutions, including in-house programming solutions.

Several rugged and semi-rugged computer hardware devices, including laptops, tablet PCs, handheld PDAs and smart phones, were reviewed. At the end of the review process, the data management team presented their findings to the directors.

The solutions

pLog software from Dataforensics was identified as the optimum solution to fulfil most of Structural Soils' site data capture requirements and as offering the best all-round efficiency.

The software operates on the Android operating system and works directly with the gINT database software Structural Soils uses. Data is entered into pLog on rugged tablets on-site using a combination of dropdown selection boxes and keypad entry. The tablets can be set up in advance remotely from the office with project information such as sampling plans or simply picked up and used on-site.

Site data are uploaded to a Cloud-based server on-site using either an inbuilt 3G connection or a wireless Internet connection. Data can include site photographs taken with the tablet's camera and location data from the inbuilt GPS receiver.

An office-based member of staff then imports the data into gINT with a few mouse clicks. The data may then be reviewed and issued to the client or used in Structural Soils reports.

pLog software is configurable by the user (as is gINT). The ability to configure the software in-house is particularly important to Structural Soils, as this flexibility is necessary to meet the company's wide and varied requirements and enables it to respond to clients' specific requirements. Through its data management team, Structural Soils can continue to develop and adapt its capabilities in-house.



This solution is used by many Structural Soils engineers and environmental consultants on routine projects; 15 units were also used on a major contract for site data and rock core logging applications.

The introduction of rugged tablet PCs on-site offers other benefits. Site staff can carry site documentation in electronic format, access email and project management systems, and obtain Internet-based information without relying on office-based support.

Although pLog offers Structural Soils the optimum solution for many geotechnical and geoenvironmental site data collection requirements, it is not the only solution. Devices such as gas analysers and water quality meters are being manufactured with increasingly sophisticated on-board data loggers. Structural Soils is standardising its stock of such devices. The data management team is engaging with suppliers to ensure the data collected by these meets the company's technical standards and is in a format suitable for direct import into the gINT database.

Information technology continues to evolve. RSK and Structural Soils recognises the importance of efficient and effective data collection and management in the delivery of their services, and the data management team is an important part of their strategy for remaining at the forefront of the industry.

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