

Eliot Sinclair

surveyors | engineers | planners

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Monitoring services



Introduction

Typically a monitoring system measures displacement or movement of objects relative to a set of control positions. It can be carried out periodically and results may be post processed or presented live on site. But the latest tool in our toolbox allows for Real-Time monitoring of not only surveying equipment results but also from sensors capturing motion, direction or magnitude. These may include geotechnical sensors, strain meters, data loggers, tilt sensors, accelerometers as well as atmospheric sensors and web-cams. Results are processed on our centralised server and displayed in real-time over the internet where our clients can log in and analyse their data.

Applications

Earthquake damage – monitoring of structures, ground or objects to enable performance analysis during and after an earthquake event.

Construction – monitoring of construction effects on new and adjacent structures including environmental noise and vibration.

Deformation – monitoring of dams, bridges, embankments, slopes as well as buildings during and after construction.

Transport – monitoring of rails, roads, and tunnels to enable analysis in real time or periodically.

Geotechnical – monitoring of landslides, landfills with a variety of geotechnical sensors.

Types of monitoring

Periodic manual – monitoring long term changes - typically three-dimensional motion or individual horizontal and vertical shifts. Manual observations (Digital Level, Total Station, GNSS, 3D Laser Scanner) carried out by field crew mobilised multiple times over a long period.

Periodic automated – monitoring differs in the method of collection being obtained using a pre-programmed schedule and a robotic total station.

Real-Time – monitoring is an automated system that can incorporate multiple sensors, total stations, GNSS receivers, geotechnical and environmental sensors to carry out measurements and process information that is available over an internet connection for analysis within minutes of being collected.

Cost

Periodic manual monitoring is a cost effective way to collect data for analysis of long term change. The major cost of this type of monitoring is labour including mobilisation, reporting and management. With occasional site visits and mobilisation this may be an ideal solution for some jobs.

Periodic automated monitoring is more cost effective due to robotic technology and is ideal for jobs that don't require real time data output or manual equipment operation.

Real-time monitoring is ideal for intense monitoring applications. The setup cost for sensors and equipment may be greater but with little labour cost over a long period and enhanced real time data delivery this is fast becoming an ideal solution for long term projects.

Equipment

The Eliot Sinclair equipment fleet has a large number of specialised total stations (long/short range), digital levels and GNSS receivers with a redundancy ensuring that annual calibrations or equipment failure does not interrupt our monitoring operations. Our processing server runs on a virtual platform with a backup for data and power.

Future possibilities

Every job is tailored to specific requirements for the application. Our ability to provide clients with data processing for their own custom sensors to be displayed in web environment is a state of the art monitoring solution.