

MOVING WITH THE TIMES



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Adding deformation monitoring to your survey portfolio can be highly profitable - and it's easier than you think, says **Chris Harris**

Our world is changing and we are constructing more than ever before. The impact of such projects on surrounding buildings and land is inevitable and people, understandably, want to know how it will affect them.

Because of this, the need for deformation monitoring – the systematic measurement of alteration in the shape or dimensions of an object - is growing apace. This monitoring of stress-induced loads was once conducted by specialist companies with a very high level of geotechnical or geodetic expertise.

That said, a growing number of companies are realising that this type of business is not only lucrative, it is also relatively straightforward – after all, every surveyor can potentially monitor something – it is simply taking a number of measurements over time to calculate movement or trend.

Everyone thinks of monitoring as a Total Station that is bolted to a wall, measuring prisms every hour 24/7, or as dozens of crack sensors strapped to a crumbling bridge. This is true, of course, but it is so much more. Monitoring can be performed by laser scanning a wall once a year to see if it moves; It can be done by measuring some retro targets on a listed building face each month; or it can be achieved by simply measuring something more than once and then checking to see if there is a difference over time.

Manual/campaign monitoring

Yearly, monthly, weekly, and sometimes daily measurement cycles are normally monitored manually. A surveyor or geotechnical engineer will go on-site to measure or record information at source and then bring it back to the office to process.

Any surveyor with a Total Station can monitor something. The important thing (as in any survey) is control, and if you're not returning to the site for a month or a year, then the control should be fit for purpose.

Deliverables here are normally basic, with Excel reports probably being the most common. But they don't have to be. For example, I work with Trimble's 4D Control software. This easily implemented package, can take a simple Excel spreadsheet and turn it into graphs, scatterplots, bar charts or maps. It is possible to take a photo and populate it with information to give the client rich deliverables. All this information can be viewed on the web, by anyone, and brings a professional look to a project.

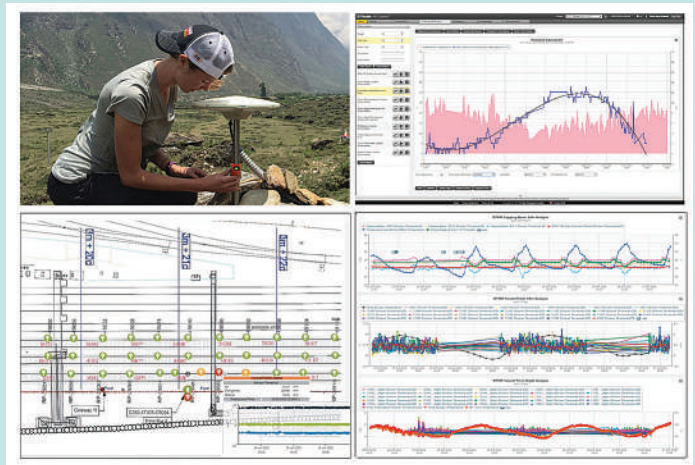
Automated monitoring

For measurements that are required daily, hourly, or even more

frequently, automated monitoring is the preferred approach. The equipment cost is normally higher, but no labour is needed after installation, just a team in an office to view the data. No one needs to go back to site once the equipment is installed, as dataloggers will relay the required information back to base via your preferred communication method (3G, radio etc..).

It is this aspect of monitoring that can worry newcomers, but equipment providers can generally assist in setup and software installation. (In fact, we have a fully operational monitoring system installed at KOREC's Huntingdon office for demonstrations and training purposes). With this approach, software can analyse, interpret and present the data in even more graphical ways. Alarms can be triggered to alert the surveyor and/or client of any movement that occurs beyond set parameters. The stakes are high on these projects; so too is the urgency and need for reliable, repeatable data, but it certainly isn't as complicated as people first think. As long as the same, good survey principles have been applied, then the system can be as simple, detailed or as forward-thinking as you can make it!

So next time you get an enquiry for monitoring, stop and ask yourself; Do we have the equipment to do this? Do we have the skills? – you may find the answer to both is yes. If not, please reach out to your equipment manufacturer/supplier as they will be happy to help out.



Using software such as Trimble's 4D Control package, deformation measurements stored in Excel can be turned into graphs, scatterplots, bar charts or maps to give a professional look to project deliverables