

FinMeas



Case Skanska

Measurement saves on costs and improves safety



Case Skanska

Skanska has opted to trust in FinMeas measurement technology in several construction sites. One of the largest and most challenging of these was the IsoKristiina shopping centre in downtown Lappeenranta.

The renovation and expansion of the IsoKristiina shopping centre has been one of the largest projects in the history of construction management contractor Skanska Talonrakennus Oy. Skanska Infra Oy was responsible for providing the foundation pit support for the extension.

This was a challenging task. The pit was 12 metres deep, with the shopping centre just one metre away and a block of flats just three metres distant. The support wall was anchored up to levels 2-3, with a total of 328 anchors installed.

"FinMeas was responsible for the support wall anchor force and displacement measurements. These measurements enabled us to plan and monitor our work more effectively on this demanding site," say **Tarmo Tarkkio** and **Niko Asikainen** of the Skanska Infra foundation engineering unit.

Skanska has benefited hugely from this monitoring of the real-time behaviour of structures.

"For example, such measurements assure us that the support is adequate. This allows us to use lighter structures and reduce costs, which provides a competitive edge, while making construction sites safer for workers."

When other buildings are located near the foundation pit, the support walls are usually designed in static form. A little room for movement, say 15 millimetres, can be allowed if more space is available.

"Our investment in FinMeas' technology soon paid itself back, both in the form of direct cost savings and improved safety."



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”Measuring anchor forces and displacement has helped us to ensure that movement remains within the allowed limits, while using as few anchors as possible. In the absence of such measurements, the number of anchors required is usually overestimated – and even then there is no guarantee that the structures are safe.”

Use of measurements has allowed a reduction in the number of anchors used in the IsoKristiina support walls by one third – for a large contracting site, this easily means a saving of thousands of euros. ”Our investment in FinMeas’ technology soon paid itself back, both in the form of direct cost savings and improved safety. There is no point in compromising over displacement measurement . The investment is relatively small compared to the overall costs on a construction site.”

Automatic measurements save time and money

Skanska is delighted with FinMeas automated measurement systems. Subsidence measurement used to be based on mechanical strain gauges that had to be checked onsite. This form of manual measurement took time and cost money, with no way of knowing precisely when changes were occurring.

Displacements can now be measured using the FinMeas automatic inclinometer. The measuring rod is installed in the soil and the measurement data is automatically transmitted to a designated internet service. The user can set alarm limits: if the displacement limits are exceeded, the service will send an alarm message to the user’s mobile phone or e-mail. Automatic monitoring is more reliable and economic than traditional methods.

”FinMeas’ equipment is very easy to install and the results can be conveniently checked online. We save valuable working time and know exactly when a change has actually taken place. Due to real-time monitoring, we obtain an up-to-the minute snapshot of the status of structures. We can also easily monitor how forces change, based on which we can loosen or tighten the anchors.”

The project has gone smoothly at the IsoKristiina construction site – no hazardous situations have occurred related to structural durability. Measurements have also provided new, useful information on how structures behave: for example, how deepening the foundation pit affects upper level anchor forces.

An aerial photograph of a large-scale construction site. The central focus is a deep, rectangular foundation pit with high, reinforced concrete walls. Inside the pit, there are various construction materials, including wooden formwork, steel reinforcement, and concrete structures. Several yellow excavators and other heavy machinery are visible on the ground level around the pit. In the background, there are modern buildings and a clear sky. The overall scene depicts a complex and active construction project.

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Changes in anchor forces are caused by issues such as loads behind support walls and frost heaving of soil. In most cases, anchor forces begin to increase when soil frost increases the pressure on a pile wall. The wall is then heated to diminish soil frost pressure and to ensure that the forces remain within the anchoring capacity. With the help of measurements, such heating can be started at exactly the right time.

In general, support-wall frost protection and the heating they require represent a significant cost. By measuring anchor forces, the heating need can be easily optimised – in the case of projects, this can save up to tens of thousands of euros.

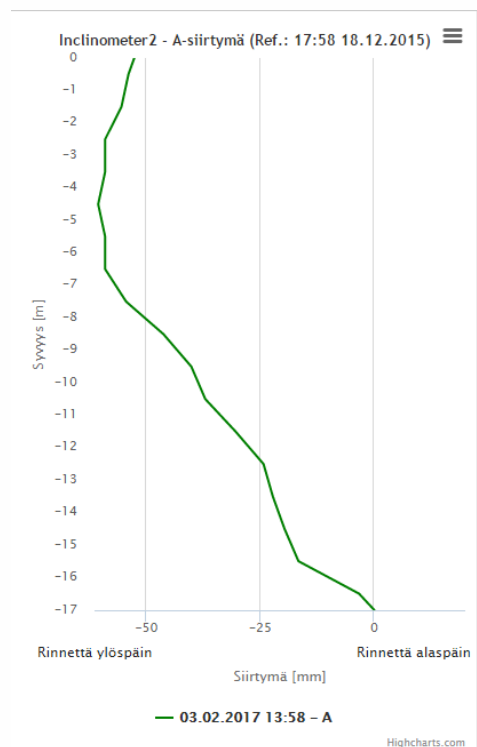
Progressive products, simple service

In addition to praising FinMeas' products and services, Skanska thanks the company's personnel. FinMeas' experts are always easy to reach and they keep their promises. "FinMeas is a highly proactive operation. They genuinely listen to our feedback, enabling us to take our cooperation to the next level."

Skanska has a highly positive experience of displacement measurements. Measurements of various kinds are set to play a greater role in its future projects. "In the absence of precise measurements, walls are typically over-secured. This makes no financial sense and does not provide real-time information on changes in structures. We plan to make greater use of measurement, due to the clear competitive edge it provides."

The fact that city areas are almost fully built over, with new construction sites typically located right beside other functions or structures, just makes measurement even more important. Construction is becoming denser, leaving practically no room whatsoever for displacement in excavation-pit supporting walls. The earlier the builders notice any changes in structures, the faster they can react to them. This enables the safest and most cost-efficient construction possible.

Movement since 30.09.14



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