



FIELD

MONITORING SYSTEM ENGINEERING



About us

FIELD, a Sisgeo Group member company, provides Geotechnical, Civil and Structural Engineering Services.

Established in 1999 with head office in Lallio (BG), FIELD is renowned both in Italy and internationally for measuring and monitoring systems for civil, hydraulic and geotechnical engineering applications.

FIELD offers an extensive range of complete, innovative and specialised Services and Solutions designed to meet every demand and need in terms of measuring systems.

Our core SERVICES include:

- design and engineering of measuring and monitoring systems;
- supply and installation of measuring instruments and systems;
- data management via a proprietary Web Monitoring System (WMS) platform;
- performance of load tests and field measurements;
- automated dynamic, vibration, environmental and topographic monitoring.

FIELD has established and maintains a certified Quality System that complies with standard ISO 9001-2015.



DESIGN



SUPPLIES



ONSITE ASSISTANCE



DATA MANAGEMENT



TELT - Tunnel Euralpin Lione-Torino

Dam monitoring

Dams rank as engineering works presenting a high danger potential.

During their life span, they are exposed to variations in stress caused by the surrounding environment. As such stress affects their structural behaviour, it is of the utmost importance to ensure continuous control, both during construction and operation.

Control of the structural evolution of a dam is implemented by analysing several physical parameters that describe its actual behaviour. Along with effective environmental and dynamic monitoring, it can provide useful information for maintenance purposes.

FIELD supports General Contractors and engineering firms in designing monitoring systems aimed at verifying engineering parameters.

FIELD provides, installs and manages static and dynamic systems, and offers authorised surveillance agencies access to said data.



Colombia - Sogamoso Dam

Tunnelling and underground works

The safety and reliability of tunnels and of underground works, broadly speaking, requires constant monitoring, both in the short and long term, to gain information about the actual structural behaviour and of the interaction between the structure and the surrounding rocky mass.

Geostructural Monitoring assists Geotechnical Engineering in reducing the risk associated with reaching critical conditions for collapse or with limitations to the structure's use.

Benefits of Geostructural Monitoring:

- running a construction method efficacy check;
- selecting parameters to be measured during the construction phase, and calculating expected values based on project assumptions;
- evaluating and interpreting the chosen project parameter measurements in real life conditions, during tunnel construction;
- checking and improving the project's design based on the actual behaviour of the soil during construction;
- changing and adjusting project features based on the actual working conditions.



Monitoring bridges and viaducts

Continuous monitoring of elevated structures is increasingly used in management and control applications to ensure safety during construction and operation, and to allow effective scheduling of maintenance interventions.

Within structures, evolving phenomena may lead to a local reduction of resistance, impairing the structural safety of the entire work in the long term.

To ensure safety and long lasting durability, structures need to be monitored automatically and continuously with relevant data analysis and validation.

To this end structural monitoring is an essential management tool, especially in the case of structures designed for long-term functional duration, due to developing conditions as compared to project forecasts.

FIELD exploits its experience to design and implement static and dynamic monitoring systems that control and run diagnostics on key geotechnical and structural parameters in order to ensure the structure's long life.

FIELD also performs static tests both with traditional geotechnical instruments and with topographic and interferometric instruments.



Piacenza - Bridge on river Po

Monitoring landslide movements

FIELD designs, implements, manages and services geotechnical, structural and hydrometeorological monitoring systems.

The most common parameters that must be measured are interstitial pressure values, water table levels, soil permeability, mechanical resistance, total pressure levels, deformations and movements of landslide bodies. Interactions with any structures and infrastructures involved must also be evaluated.

Monitoring instruments must allow users to control the behaviour of the instability, both in terms of absolute width and in terms of evolution velocity in time, besides the effect on the safety and integrity of the structures and places involved, to define:

- surfaces, volumes and depth of landslide events;
- movements in progress and their variation in space and time;
- impact on movements under changing meteorological and hydraulic conditions;
- the influence of external factors that cannot be directly traced to the landslide movement;
- based on the information collected, define risk management and safeguarding procedures for the purposes of Civil Defence and Early Warning.



Monte Pizzo - Landslide monitoring

Topographic monitoring

High precision topographic monitoring is based on the study and analysis, in time, of angular and spatial variations in structural areas and parts using targets.

The civil engineering sector widely uses diagnostic topographic monitoring to control stability and safeguard highly sensitive structures, both during construction site activities and after completion of the works.

For topographic monitoring, FIELD uses highly advanced instruments, such as total stations and high precision optical levels, to take measurements over time. Moreover, the Global Positioning System (GPS) can be used to complement the information acquired by traditional topographic surveys.

FIELD performs the following measurements:

- high precision levelling;
- planimetric and altimetric monitoring with high precision total stations;
- planimetric and altimetric monitoring with GPS instruments;
- convergence measurements with a topographic method for underground works;
- automatic monitoring with servo-assisted robotic total stations in a fixed location.



Genova - Monitoring viale Brigata Bisagno

Piping stress monitoring for oil & gas systems

The Stress Deformation System (SDM) monitors Stress and Deformation values of pipelines, both static and dynamic, and finds its most extensive application in Oil & Gas processing industrial systems and in LNG regassification.

The SDM System will be a supportive tool for designers and system directors, for the following activities:

- identifying stress caused by project loads and assisting process managers during system monitoring activities with sensors outside the control process;
- simulating and controlling situations of potentially dangerous “out of service” loads, such as drifts or deformations of pipeline supports both in conditions of service and of rest;
- simulating and controlling dynamic stress, the effects of resonance on the structures with very rapid variations in stress.

SDM System architecture consists of two mutually interactive levels:

- sensors and field connections (System)
- control and centralisation unit (Control Room).



Measurements, tests and start-up tests for structures

FIELD performs geotechnical, geomechanical and structural measuring campaigns on land, works and structures, both in real life scale and on models.

FIELD performs structural tests to determine deformations and strain of structure elements exposed to various induced or natural stress conditions. Load tests either on structures or on parts of them (foundation poles, elevated structures, scaffolding decks) are planned and performed.

FIELD performs monitoring and measurement campaigns with dynamic and vibrational systems on structures, infrastructures, steel parts, pipelines and refineries.

All testing activities are designed and performed in compliance with reference regulations in force or according to the Client's specific needs.

Data obtained from field measurements are collected, validated and processed according to established standards by using statistical software, and returned with reports, technical reports of measurements or by using our WMS data management platform.



Lecco - Static load test on foundation pole

AIDA IoT

FIELD has developed AIDA IoT an innovative, web-based platform for the real-time management, processing and visualization of monitoring data from all sensor types.

Through its web pages, the data are at any time available to the user in graphical and tabular formats.

AIDA IoT is based on an SQL Server database, the most common query language to create, edit and manage data in a relational database.

BENEFITS:

- Flexibility and customization
- Ease of use
- Increased safety for infrastructure managers
- Management of a plurality of devices
- Automatic alerts configurable by the user





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