

Having now adopted a resolution confirming the importance of geodesy in sustainable development, the United Nations is encouraging its member states to use a modern reference framework which is accurate and accessible to all.

The various GNSS systems now available allow us to achieve levels of accuracy of just a few millimeters. Thanks to these systems, geodesy (the mathematical calculation of the Earth's shape) now supplies cartographers and planners with reference points which become more accurate with each passing day.

The regeneration of a country's geodetic network is therefore absolutely fundamental for its development in view of the large range of sectors concerned: land administration, urban development, drainage and transport networks, but also the management of borders and therefore national security.

With support from the geodesy and leveling department (SGN) at IGN (national institute of geographic and forest information) which is internationally recognised for its scientific knowledge and practical experience, IGN FI offers its services in the fields of geodesy and metrology.

OUR AREAS OF EXPERTISE

Advise, design, execute or accompany projects in the fields of geodesy or metrology:

- Installation of permanent station networks
- Creation of a national geodetic reference system via a materialised network
- Metrological surveillance of structures and sensitive areas over timescales of between a few days to several years
- Dimensional measurements for scientific or industrial uses
- Geoid measurements and calculations with centimeter accuracy
- Calculation and actual marking of border demarcation
- Creation of tools for converting coordinates from old local or national systems to a system compatible with international references
- Transfer of technology
- Theoretical and practical training

OUR MEANS

IGN FI offers its teams of specialists to clients, working through local mapping entities whenever possible:

- Experts in creating geodetic networks, installing permanent measuring stations or calculating new national references: engineers, surveyors, specialists on the calculation software Bernese, geodesy theoreticians
- Experts in automatic metrological surveillance: surveyors, systems engineers
- Experienced project directors and managers

IGN FI advises its clients on the most suitable equipment to purchase and gives them access to the best equipment on the market:

- Dual frequency GPS, scientific GPS antenna
- High-precision digital level indicators, motorised automatic tachometers
- Gyroscopes (Gyromat 3000), relative gravimeters, absolute gravimeters (A10)

All of this equipment is regularly calibrated and checked in respect of international standards.

**LAND
PLANNING**

SOME OF OUR REFERENCES

SUDAN • Installation of a materialised geodetic network for the creation of dams along the Nile

The Dams Implementation Unit conferred IGN FI with the task of calculating 14 reference points, all linked to international geodetic references, and more than 1,000 detailed points along the 1,500 km section of the Nile running through Sudan. These points were calculated using GPS and levelling as well as gravimetry for some, and resulted in a set of identified points with centimeter accuracy as well as a geoid model, also of centimetric accuracy, for the entire area covered by the project.

SAUDI ARABIA • Implementation of an integrated land information system

This project consisted of implementing a geodetic infrastructure for the KACST (King Abdulaziz City for Science and Technology) made up of 16 permanent stations spread out over the entire country as well as a calculations centre used to disseminate data to users, monitor the stability of stations and define the reference system.

QATAR - SAUDI ARABIA • Saudi Arabian - Qatar border

IGN FI created a reference network all along the border, on both sides of it, and installed border markers according to their coordinates which had been pre-defined to sub-centimeter accuracy within an international reference system, independent from each country's national reference systems. The second part of the project involved calculating the parameters for converting coordinates to the national systems.

CAMEROON • Supervision of work to create a geodetic network

This project's objective was to create 25 reference pillars and to reconstruct a complementary network made up of 500 points spread over the entire country. IGN FI participated in the project to check and verify the procedures and methods for geodetic and topographic measurements in the field using GPS receivers, total stations and highly accurate level indicators.

SENEGAL • Creation of an urban map database

IGN FI worked within the framework of a European Union call for tender on the creation of an urban map database, to install a network of 200 geodetic points covering 7 towns and the creation of local geoids in urban areas. These geoids have enabled altimetric accuracy to be improved down to the centimeter. A large amount of technology transfer was also included in this project concerning the use of GPS and leveling work.

THE NETHERLANDS, HONG KONG, DENMARK • Continuous surveillance of structures during the construction of underground subway lines

IGN FI has worked on projects to create new transport infrastructures in urban environments, installing hundreds of automatic measuring stations to determine thousands of measurement points. This system enabled millimetric movements to be detected almost instantly and where necessary, the trigger of warning systems.

Find more references at www.ignfi.com

As major player in the field of geomatics, IGN FI offers its expertise in the following areas: geodesy, metrology, mapping / national spatial data infrastructures, databases, geographic information systems, portals.

IGN FI's work is entirely based abroad, using the company's know-how in various sectors: land administration, agriculture, forests, the environment, civil security, borders...



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