MATERIALS ENGINEERING LABORATORY

CACOH*





For optimising the durability of structures and providing aid for decision-making in renovation works

Solid experience

Built from 1950 onwards, all together CNR's hydraulic structures include 22 hydropower plants, 19 dams, 25 locks and 400 km of dikes.

Reputed for their considerable durability, these structures were built with constant attention given to the quality of the materials used and their implementation.

The materials engineering laboratory has acquired solid experience in inspecting and monitoring the main structural components of these installations (concretes, soils, rockfill, etc.).

Efficient engineering

The tests developed are performed to assess the quality of the materials used in the structures. 70 tests are currently carried out according to the national and international standards in force.

In addition to standard tests (identification tests, PANDA tests, permeability and compression tests, etc.), CACOH also has reference test devices and procedures developed specifically by CNR such as:

- an abrasion test bench to qualify the wear of a particular concrete subjected to hydraulic abrasion and classify it in a reference system;
- an impact test bench to measure the resistance of materials subjected to the impacts of cobbles during floods;
- specific freezing/thawing and quality tests in quarries intended to determine the intrinsic resistance of the rockfill used for shells.





The laboratory is certified ISO 9001 and 14001

Analysing complex phenomena

The expertise of the materials engineering laboratory involves in particular the most sensitive and most intensively use structures. Recent references include:

- the resistance of earth structures to internal erosion, in close collaboration with the national research group ERINOH;
- monitoring the pathologies of concretes with studies carried out on alkali reaction, carbonation and support given to many sites;
- diagnostics and implementation of ultra-high performance fibre reinforced concrete (UHPFRC) following wear of dam aprons;
- maintenance of bank protections and weirs, with adapted design of rockfill, monitored by specific tests that have become a national reference;
- a global diagnosis relating to protections of all the banks of the Rhone.



Tests and measures, a multidisciplinary laboratory to respond to highly diversified needs



Soils

- Sampling by boring, penetrometer resistance tests, plate bearing tests
- Laboratory determination tests: determination of physical, intrinsic and mechanical characteristics of materials (specific gravity, grain size, water content, permeability, cohesion, clay content, etc.

Concrete and anti-wear

- Formulation of concretes, suitability for sites, test on fresh and hardened concretes.
- Abrasion tests, impact tests (resistance of materials to wear*).

*The specific abrasion and impact tests developed by CNR's laboratory have become the national reference.

Rock fill

- Resistance to frost, measures of continuity, compression, wear tests of granulates in the presence of water, etc.
- Quality tests in the quarry.
- Tests for EC marking.



CNR

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Energy is our future, so save it!



Moi

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Juin