RIPRAP EXPERTISE

THE CACOH* MATERIALS ENGINEERING LABORATORY

CNR's materials engineering laboratory, certified ISO 9001 and 14001, places its experience in controlling the quality of riprap at your service. We offer three types of service:

- *Certification of the riprap supply using the CNR method.*
- *Control on site and laboratory tests if necessary for "CE" marking of the supplies.*
- *Acceptance testing of the supplies on site.*

*Center for the behavioural analysis of hydraulic structures

Certification of supply

In the quarry

Survey by a geologist of the quarry face for an assessment of the durability of the blocks extracted and on the capacity of the vein in terms of block size distribution.

Verification of riprap quality according to the operating procedure CNR no. 6.5-1208 using ultrasonic continuity index measurements, impact tests and shape factor determination performed by the laboratory's technicians.

If the results are insufficient, the certification procedure is stopped and the client is advised to re-examine the fabrication procedure.

If the quarry results are acceptable, laboratory tests are then performed.

In the laboratory

Representative samples are chosen on the basis of the ultrasound tests and by carrying out the following tests:masse volumique

- specific gravity
- resistance to wear (wet Micro-Deval test)
- resistance to compression/fragmentation
- absorption and liability to frost damage as per CNR operating procedure.

A test analysis report will be produced and will provide an opinion on the durability, quality and maximum size of the blocks that can be extracted.

Acceptance testing of goods and tests for EC marking as per standard NF EN 13383

Block size distribution

Using a large sample, block size will be verified by weighing and then plotting a block size curve to check the conformity of the delivery with the specifications (reference range).

Shape factor

The length/width ratio of the blocks will be verified on the basis of a large sample.

Set of laboratory tests identified in the standard

- Specific gravity
- Wet Micro-Deval abrasion resistance test
- Resistance to fragmentation
- Sunburn (Sonnenbrand) effect test
- Absorption as screening test for liability to frost damage
- Resistance to freezing/thawing method NF EN 13383
- Percentage of surface damaged

Les méthodes d'essais proposées figurent dans la norme européenne enrochements **NF-EN-13383** ou dans le **guide enrochement du CETMEF**

Price and terms

Quarry certification

- In the quarry
  - €990 ex tax for the verification of riprap quality as per CNR operating procedure No.6.5-1208 (without addition within 100 km of Lyon).
  - Quotation for surveying the quarry face by a geologist + report.
  - The results are supplied within 7 days after the mission lasting 1 to 2 days.
- In the laboratory
  - Flat rate of €2,860 ex tax for all the laboratory tests.
  - The results and the report are supplied within 4 weeks.

Acceptance test and EC marking

- In the quarry
  - flat rate of €1,430 ex tax for acceptance on the work site (block size + continuity + drop test, without additional cost within 100 km of Lyon)
  - €900 ex tax for block size measurement (no additional cost if within 100 km of Lyon)
  - the results are supplied within 7 days after the mission lasting 1 to 2 days.
- In the laboratory
  - specific gravity €220 ex tax
  - wet Micro Deval wear resistance test €145 ex tax
  - resistance to fragmentation €450 ex tax
  - absorption as screening test for frost damage €500 ex tax
  - resistance to freezing/thawing, NF method, €1,100 ex tax per unit.

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Energy is our future, so save it!

Moi

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Juin