FUGRO-SUHAIMI
PETROGRAPHIC EXAMINATION

Petrographic examination is a useful and powerful tool when testing and assessing a range of natural and cementitious construction materials. An examination uses site inspection, the unaided eye & low and high-powerd microscopes to determine the detailed features of a construction material.

Examinations of either natural, man-made or composite materials can be part of a regular quality assurance scheme to assess compliance or continuity in production. It may also be part of a detailed distress and deterioration investigation determining why a material failed in its current environment. Materials that can be examined include:

- concrete
- mortar
- render
- screed
- aggregate
- rock
- dimension stone
- slate

Examinations can be undertaken in accordance with a number of international standards and guidelines, including:

- ASTM C295
- ASTM C457
- ASTM C856
- BS 812-104
- BS 5930
- EN 932-3
- EN 12326-2
- EN 12407

These examinations can be complemented by physical testing, chemical analysis and specialist analytical techniques.

Core sample, as received, showing a crack running through the full depth.

Portion of a coarse aggregate sample that has been petrographically examined.

Petrographic examinations are conducted by experienced geologists trained in optical microscopy, materials science and a range of analytical techniques. We work closely with the client to provide a cost effective and efficient assessment of a material.

PETROGRAPHIC EXAMINATIONS OF CONCRETE AND OTHER CEMENTITIOUS MATERIALS CAN DETERMINE:

Constituents

- aggregate type
- composition
- characteristics
- contaminents
- matrix characteristics
- mineral additives, e.g. PFA, GGBS and silica fume
- cement type

Quality and condition

- air void characteristics
- water/binder ratio
- degree of compaction
- microporosity
- carbonation depth
- portlandite distribution

Evidence of distress or deterioration

- reinforcement corrosion
- cracking, including plastic and drying shrinkage
- sulfate attack (ettringite and thaumasite)
- alkali-silica reaction (ASR)
- chemical attack, including acid attack
- fire damage
- construction errors
- freeze/thaw

Analysis of the volumetric proportions of individual concrete constituents.

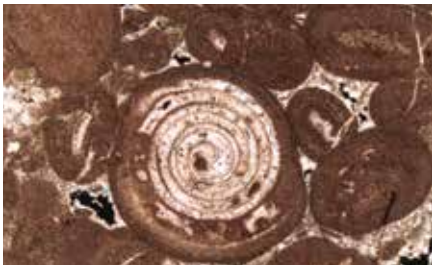
PETROGRAPHIC EXAMINATIONS OF ROCK AND AGGREGATE CAN DETERMINE:

Macroscopic features:

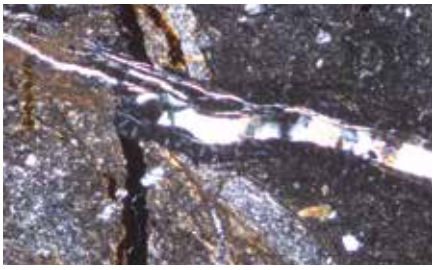
- colour, fabric, grain size
- presence of cracks, joints and pores
- evidence of weathering and alteration
- presence of macrofossils, xenoliths and mafic intrusions

Microscopic features:

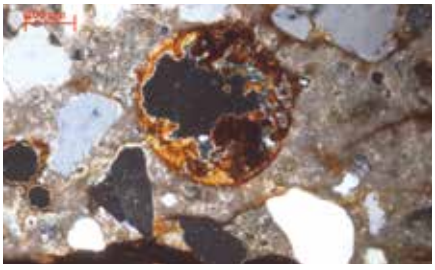
- fabric, constituents and composition
- discontinuities, e.g. pores, cracks and fractures
- minerals and grains detail, including percentage by volume, dimensions, shape, distribution, orientation and evidence of weathering or alteration



A limestone particle showing ooids within a sparite matrix.



Concrete suffering from cracking induced by ASR.



Concrete showing cracking induced by reinforcement corrosion.

Fugro-Suhaimi Ltd.
P.O. Box 2165
Dammam 31451
Saudi Arabia
Telephone: +966 13 857 4200
Email: materials@fugro-suhaimi.com
www.fugro-suhaimi.com