As part of the BRE range of concrete services, we offer Petrographic examinations which are a powerful tool when testing and assessing a range of natural and cementitious construction materials.

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 a 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
- Stone/slate/rock

Examinations can be undertaken in accordance with several international standards and guidelines, including:

- ASTM C295
- ASTM C457
- ASTM C856
- BS 812-104
- BS 1881-211
- BS 5930
- EN 932-3
- EN 12326-2
- EN 12407

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

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. The examination uses site inspection, the unaided eye and low and high-powered microscopes.
Petrographic examinations of concrete and other cementitious material can determine:

**Constituents**
- Aggregate type
- Composition
- Characteristics
- Contaminants
- Matrix characteristics
- Mineral additives, eg PFA, GGBS and silica fume

**Quality and condition**
- Air void characteristic
- Water/binder ratio
- Degree of compaction
- Microporosity
- Carbonation depth
- Portlandite distribution

**Evidence of distress of 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

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, eg pores, cracks and fractures
- Minerals and grain details, including percentage by volume, dimensions, shape, distribution, orientation and evidence of weathering or alteration

**Contact Us**

If you want to find out more about BRE’s work in this area or discuss how we can support your project, please email enquiries@bregroup.com or call 0333 321 8811.