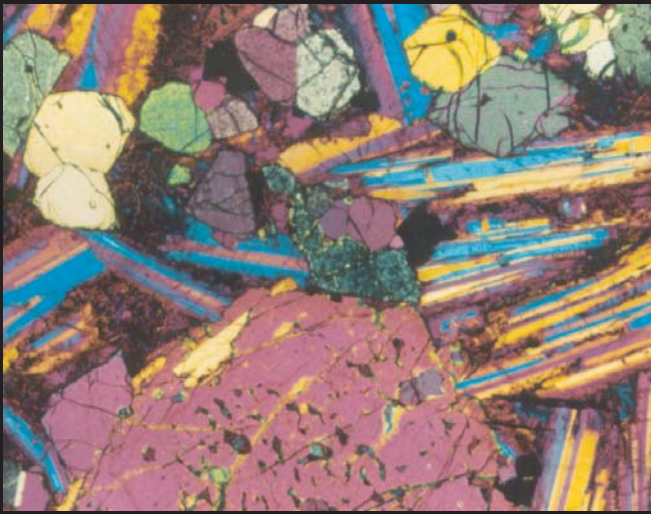


Materials in Construction

Independent, professional consultancy
Multi-disciplinary scientific & engineering skills
UKAS accredited testing services
A complete evaluation and advice service



"We are committed to providing our clients with tailored, pragmatic and environmentally sound engineering and scientific services and solutions, which are delivered both effectively and efficiently."

STATS

Specialist Engineering, Materials
and Environmental Consultants

www.stats.co.uk

Services for materials in construction

STATS provides professional materials consultancy with allied technical services that are relevant to all stages in the lifecycle of buildings and civil engineering structures worldwide.

We cover essentially all structural, constituent, fixing and finishing materials used in both modern projects and historic works.

Our strengths lie in a combination of:

- Fully integrated consulting and testing facilities.
- A consultancy-led approach.
- A broad multi-disciplinary skills base.
- Extensive project experience with both traditional and innovative materials in the UK and in around sixty countries worldwide.
- A wide range of UKAS-accredited analytical and testing techniques within the company, supplemented by resources at some of the UK's leading universities.



Resource and product evaluation

As many types of construction materials either comprise selected and processed natural soils and rock strata, or contain constituents derived from quarried or mined deposits, effective geological evaluation is critical to understanding and predicting material availability, properties and behaviour.

STATS is able to support landowners, producers, merchants and users with either a comprehensive investigation and report on a whole resource, or by inputting individual specialist services into a broader project team. The latter services include desk studies and remote sensing; geophysical surveying; field mapping; rope access quarry face stability assessment; sampling and drilling programmes; environmental monitoring and assessment; laboratory examination, analysis and testing; and 3-D data handling and ground modelling.

STATS works with quarry operators and product manufacturers to optimise working practices, product production and quality.



Value engineering and buildability

At the project feasibility and design stages the input of specialist expertise in the selection and specification of materials can yield substantial project cost and quality benefits. These can include monetary savings and programme reductions in construction and improved performance and reduced maintenance during the operational design life.

STATS brings an independent, scientifically rigorous perspective to value engineering for both materials and the related construction processes. We also advise on the scope, test methods and choice of acceptance criteria for materials specifications.



Construction quality assurance

Achieving consistent and high quality in any major construction project requires a combination of many factors, including both implementing effective quality management systems and obtaining actual test data from which to monitor trends and substantiate quality compliance. STATS can provide three key elements to achieving quality:

- Preparation, or independent auditing, of QA/QC documentation on policies, plans, procedures and method statements.
- Independent vendor assessment inspection and NDT of off-site manufacturing and fabrication and on-site erection, coating and finishing.
- Independent sampling and UKAS-accredited testing, including dedicated site laboratories and experienced project Materials Engineers.

Condition and performance surveying

STATS undertakes professional inspections or more detailed materials surveys of historic and heritage structures, including existing building envelopes, structural elements, fixings and internal finishes. Information gathered can be used for investment due diligence purposes and as part of planned or emergency maintenance operations.

For due diligence, the scope of surveys tends to encompass deleterious and hazardous materials as well as looking for actual or incipient defects.

For civil engineering asset managers we are able to provide statutory and routine structural inspections, asset condition registers and more specific performance investigations into parameters such as skid resistance, abrasion, corrosion and discolouration.



Special investigations

Concrete: STATS is an acknowledged international specialist in all aspects of concrete materials and construction, with particular expertise in identifying and dealing with deleterious mechanisms like alkali-aggregate reactivity, thaumasite and mundic attack.

Cladding and Floors: Probably the two most common areas of potential construction problems in buildings, where STATS has accumulated a vast array of knowledge and experience.

Defect and failure investigations

Materials and structures naturally deteriorate over time with exposure to environmental conditions such as ultra-violet light, thermal stresses, freeze/thaw cycles, moisture penetration, air and water-borne pollutants, working loads and abrasion.

Obtaining STATS' independent, authoritative advice when materials and any related structural deterioration problems arise is one of the best routes to finding a cost-effective solution that meets the needs of the stakeholders.

Catastrophic events like fires, explosions, floods and earthquakes typically lead to more acute damage and often require initial rapid assessment followed up with very detailed scientific and engineering studies to determine what, if any, residual life remains and to advise on a repair strategy.



Expert witness services

STATS team members frequently act as expert witnesses, variously for claimants and defendants in civil litigation or arbitration, or as single joint experts, and occasionally in criminal cases.

Our materials consultancy services are provided by a multi-disciplinary team of highly-qualified scientists and engineers, with a collective experience across the full range of construction materials and their usage in building and civil engineering works. The full-time consultancy staff are supported by an extensive panel of eminent specialist consultants.



Centre for Stone and Slate Technology

After thirty years of providing consultancy and testing services for stone and slate producers, traders, designers, contractors and building owners and investors, STATS has consolidated these services into a dedicated skills team and facility, the Centre for Stone and Slate Technology (CSST). The CSST is able to provide a comprehensive service to all aspects in the selection, use and performance of natural stone and slate products in the built environment.

**The MetroCentre, Gateshead by Keith Paisley for Sir Robert McAlpine*

STATS' Key Skills and Services in Materials

Multi-disciplinary materials consultancy

- Applied geology and petrography
- Construction chemistry and chemicals
- Engineering geology and hydrogeology
- Environmental science and engineering
- Materials science and engineering
- Pavement and structural engineering

Site techniques and capabilities

- Abseil, roped access and confined space inspection and investigation
- Building investigation including defects, deterioration, and failure of materials and water ingress
- Catastrophe investigation of fire and blast damage
- Concrete investigation including crack mapping; dust, lump and core sampling; carbonation; covermeter; half-cell and Ultrasonic testing; and rebar mapping
- Floor finishes, adhesives, sub-strates and water ingress investigation including screed testing
- Geological mapping, field testing and sampling for quarry resource and product evaluation
- Geophysical surveying with radar and thermography
- Masonry inspection and investigation including endoscope surveys of cavity wall-ties
- On-site, UKAS-accredited materials testing laboratories
- Pavement investigation including radar surveys, core sampling, in situ CBR and stiffness testing
- Slip resistance and surface roughness testing
- Stone and slate condition and defect surveys
- Structural fixings, barriers, inspection and load testing
- Post-tensioned structures tendon and anchorage inspection
- Steelwork, cast/wrought iron inspection and testing
- Welding and coatings inspection and testing

Laboratory techniques and capabilities

- Abrasion and wear resistance testing
- Accelerated weathering and environmental control
- Alkali-aggregate reactivity assessment
- Analytical inorganic and organic chemistry
- Asbestos and deleterious materials testing
- Petrographic examination by transmitted and reflected optical and scanning electron microscopy
- Physical and mechanical materials testing
- Slip resistance pendulum test and surface roughness
- Soil and rock mechanics testing
- Staining resistance of flooring materials
- Stone and slate testing
- Assessment of sulfate attack, including thaumasite
- Rapid chemical analysis and durability assessment of HAC
- Universal testing machine facilities
- X-ray diffraction mineralogy

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Project Profiles

Historic, Period and Modern Buildings

- Basements and waterproofing
- Cladding in stone, pre-cast concrete, metal and ceramics
- Floors in various wearing surfaces and supporting layers, including under-floor heating systems
- Masonry in stone, brick and blockwork, with cement and lime mortars and other jointing/bedding materials
- Paints and protective coatings of various traditional and modern formulations and backgrounds
- Pedestrian paved areas, including shopping centres
- Plaster and render in external and interior environments of traditional and proprietary materials
- Roofing in slate; stone, clay and concrete tiles; metal and asphalt; and in pitched, flat and barrelled profiles

Civil Engineering

- Bridges, culverts, shafts and tunnels
- Dams, water supply and waste water treatment
- Docks, harbours and coastal defences
- Earthworks, fills, cuttings and retaining structures
- Nuclear, thermal and renewable power plants
- Pavements for highways, ports and airports
- Rock fill, rip-rap and armourstone
- Soil stabilisation and reinforced earth

Structural materials

- Asphalt and bituminous materials
- Bricks and other engineering ceramics
- Concrete: pre-cast, cast-in-situ, ready-mixed & blocks
- Metals: steel, cast/wrought iron, aluminium and alloys
- Soils in earthworks, pavements and earthen buildings
- Stone in traditional and modern masonry
- Timber in historic and new structures

Constituent, fixing and finishing materials

- Additions - including fly ash (pfa), ground slags, microsilica, metakaolin, pozzolana
- Adhesives - all polymeric and cementitious varieties
- Aggregates - natural, waste and synthetic aggregates, fills & fillers
- Cements - Portland-type, calcium aluminates, special blends
- Cementitious products - including fibre-cement roofing sheets & tiles
- Ceramics - bricks, wall, floor & roof tiles, terra cotta & faience, porcelain
- Mortars - jointing, screeds, levelling compounds, renders
- Plaster - gypsum, lime & cementitious
- Recycled materials - aggregates, recycled construction materials, incinerator waste

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