

WORKING WITH YOU

Geotechnical Laboratory

GROUNDWORK PLUS IN-HOUSE

GEOTECHNICAL LABORATORY



We provide our clients with fast, detailed, and confidential petrographic examinations and industry specific testing from our NATA accredited modern geotechnical laboratory.

The Brendale facility is fitted out with new equipment and a temperature-controlled laboratory which covers aggregate, soils dimensional stone specific testing and petrographic analysis.

The laboratory is managed by a professional team with over 40 years of combined experience in laboratory services, whilst our petrographic team comprises over 20 years of hands-on quarry resource evaluation and petrographic knowledge.

Our scope of work includes a range of testing and sampling to AS, QTMR, ASTM, AS/NZS, EN and in-house methods.

AGGREGATE TESTS SERVICES:

- Degree of precoat
- Organic impurities other than sugar
- Weak particles (including clay lumps, soft and friable particles) in coarse aggregates
- Clay and fine silt
- Wet/dry strength variation
- ACV
- Particle shape by proportional calliper
- Average least dimension
- Materials finer than 75 microns in aggregates (by washing)
- Flakiness index
- Bulk density of aggregate (unit mass)
- Particle size distribution
- Particle density and water absorption – fine/coarse aggregates
- Aggregate soundness – evaluation by exposure to sodium sulphate solution
- Crushed particles in coarse aggregate derived from gravel
- Degradation factor – source rock and coarse aggregate
- PAFV Polished aggregate friction value – vertical wheel
- Point Load
- Coarse Aggregate Quality by Visual Assessment
- Acid Solubility
- Caking
- Foreign Materials

SOIL TESTS SERVICES:

- California bearing ratio (CBR)
- Maximum density ratio compactions (MDR)
- Particle size distribution
- Fines Ratio
- Atterberg limits
- Moisture content
- Emerson Class

DIMENSIONAL STONE SERVICES:

- Water Absorption and Bulk Specific Gravity
- Modules of Rupture Compressive Strength
- Flexural Strength of Dimensional Stone
- Abrasion Resistance
- Strength of Individual Stone Anchorages in Dimensional Stone
- Potential to Effloresce / Rust from Free Iron
- Resistance to Salt Attack
- Impact Resistance / Rupture Energy
- Stain Resistance
- Change of Gloss
- Thermal Expansion
- Slip Resistance

PETROLOGY SERVICES:

- Thin section and polished thin section preparation of geological materials including concrete and quarry products.
- Petrographic investigation of natural rock and quarry materials including aggregates and manufactured sand.
- Petrographic consultancy services and expert technical advice on the compliance, performance and durability of construction materials, and assessment services, technical troubleshooting available upon request.
- Petrographic reports for Department of Transport and Main Roads quarry certification and recertification (QTMR Test method Q188).
- Petrology reports prepared to ASTM C1276
- Secondary Mineral content analysis conducted according to Australian Standard 1141.26.

Additional analysis using advanced microscopic techniques, including:

- X-ray diffraction (XRD)
- Scanning Electron Microscopy (SEM)
- Probe and X-ray Mapping with Energy Dispersive X-ray Spectroscopy
- X-ray Photoelectron Spectroscopy



All tests results are digitally managed online for your convenience on our **GPlus Live** platform. Scan to discover more.

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SCOPE OF TESTS



ISO 17025 (2017) Infrastructure and Asset Integrity				
Service	Product	Determination	Technique	Procedure
Evaluation of geotechnical and civil construction material - Aggregate binder adhesion	Aggregates	Degree of precoating	Not applicable	MR (Qld) Method Q216
Evaluation of geotechnical and civil construction material - Aggregate contaminants	Aggregates	Organic impurities	Colour test	AS 1141.34
		Weak particles contaminants	Sieve analysis	AS 1141.32
		Clay and fine silt	Settling	AS 1141.33
Evaluation of geotechnical and civil construction material - Aggregate polishing	Aggregates	Polished aggregate friction value	Pendulum friction test; Vertical wheel	AS 1141.40, AS 141.42, MR (Qld) Method Q203
Evaluation of geotechnical and civil construction material - Aggregate properties	Aggregates	Shape	Average least dimension; Crushed faces; Flakiness; Proportional calliper	AS 1141.14; AS 1141.15; AS 1141.18; AS 1141.20.3; MR (Qld) Method Q201
		Particle density of coarse aggregate	Weighing-in-water	AS 1141.6.1
		Particle density of fine aggregate	Weighing-in-water	AS 1141.5
		Particle size distribution	Sieve analysis; Sieve analysis of material finer than 75 µm	AS 1141.11.1; AS 1141.12
		Bulk density	Compacted; Uncompacted	AS 1141.4
Evaluation of geotechnical and civil construction material - Aggregate soundness	Aggregates	Soundness	Degradation factor on coarse aggregate; Degradation factor on fine aggregate; Exposure to sodium sulfate solution	AS 1141.24, AS 1141.25.1, AS 1141.25.2, MR (Qld) Method Q208B
Evaluation of geotechnical and civil construction material - Aggregate strength	Aggregates	Aggregate crushing value	Not applicable	AS 1141.21
		Wet/dry strength variation	Not applicable	AS 1141.22
Evaluation of geotechnical and civil construction material - Masonry, concrete and clay unit properties	Masonry, concrete and clay units	Resistance to salt attack	Not applicable	AS/NZS 4456.10
Evaluation of geotechnical and civil construction material - Rock Hardness	Rocks	Abrasion resistance	Abrasion resistance of dimension stone subjected to foot traffic	ASTM C1353
Evaluation of geotechnical and civil construction material - Rock properties	Rocks	Point load strength index	Laboratory measurement	AS 4133.4.1
		Absorption	Saturation	ASTM C97
Evaluation of geotechnical and civil construction material - Rock strength and deformation	Rocks	Flexural strength of dimension stone	Not applicable	ASTM C880
		Modulus of rupture for dimension stone	Not applicable	ASTM C99
		Compressive strength	Uniaxial load rate controlled	ASTM C170

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SCOPE OF TESTS



ISO 17025 (2017)
Infrastructure and Asset Integrity

Service	Product	Determination	Technique	Procedure
Evaluation of geotechnical and civil construction material - Soil classification	Soils	Linear shrinkage	Not applicable	AS 1289.3.4.1; MR (Qld) Method Q106
		Plastic limit	Not applicable	AS 1289.3.2.1; MR (Qld) Method Q105
		Weighted plasticity index	Not applicable	MR (Qld) Method Q252
		Liquid limit	Casagrande four point; Casagrande one point; Cone four point; Cone one point	AS 1289.3.1.1; AS 1289.3.1.2; AS 1289.3.9.1; AS 1289.3.9.2; MR (Qld) Method Q104A; MR (Qld) Method Q104D
		Cone plasticity index	Not applicable	AS 1289.3.3.2
		Sieve analysis	Fines ratio	MR (Qld) Method Q253
		Sieve analysis	Not applicable	AS 1289.3.6.1; MR (Qld) Method Q103A
		Plasticity index	Casagrande	AS 1289.3.3.1
		Moisture content	Drying oven	AS 1289.2.1.1
Evaluation of geotechnical and civil construction material - Soil compaction characteristics	Soils	Dry density/moisture content relationship	Standard compactive effort	AS 1289.5.1.1; MR (Qld) Method Q142A
		Dry density/moisture content relationship	Modified compactive effort	AS 1289.5.2.1; MR (Qld) Method Q142B
Evaluation of geotechnical and civil construction material - Soil dispersion	Soils	Dispersion	Emerson class	AS 1289.3.8.1
Evaluation of geotechnical and civil construction material - Soil laboratory bearing properties	Soils	Bearing ratio	Remoulded specimens	AS 1289.6.1.1, MR (Qld) Method Q113A, MR (Qld) Method Q113B, MR (Qld) Method Q113C
Evaluation of geotechnical and civil construction material - Soil pre-treatment	Soils	Soil pretreatment	Not applicable	AS 1289.1.1; MR (Qld) Method Q101; MR (Qld) Method Q101A; MR (Qld) Method Q101B; MR (Qld) Method Q101D; MR (Qld) Method Q101F
Sample collection	Aggregates	Not applicable	Aggregate from a pavement; Aggregate from a stockpile; Aggregate from a truck	AS 1141.3.1; MR (Qld) Method Q060
	Soils	Not applicable	Disturbed sampling from earthwork	AS 1289.1.2.1; MR (Qld) Method Q060
		Not applicable	Site selection - Random stratified sampling	AS 1289.1.4.2; MR (Qld) Method Q050
		Not applicable	Site selection - Random sampling	AS 1289.1.4.1; MR (Qld) Method Q050



Phone: 1800 GW PLUS (1800 497 587)

Email: info@groundwork.com.au

Website: groundwork.com.au

Milton, Queensland

Address: 6 Mayneview Street, Milton Qld 4064
PO Box 1779, Milton BC Qld 406

Geotechnical Laboratory, Brendale, Queensland

Address: Unit 78/109 Leitchs Road, Brendale Qld 4500

Phone: 0417 615 217

ABN 13 609 422 791

Nuriootpa, South Australia

Address: 2/3 16 Second St, Nuriootpa SA 5355

Phone: (08) 8562 4158

ABN 93 642 089 683



To find out how the Groundwork Plus team can assist you in your next project, contact us via info@groundwork.com.au or call us on 1800 GW PLUS (1800 497 587).