

		Abrasive (of Rock Substances)								
		Excavability (of Rock Masses)								
		Stability (of Rock Structures)-Short-Term								
		Stability (of Rock Structures)-Long-Term								
		SOILS/Aggregates								
<b>Bamford Rock Properties Definition</b>	<b>Applicable &amp; Available Test Procedures</b>									
Physical (determined non-destructively)	Slerograf/Shore Hardness (Brinell & Rockwell Hardness)								X	
	Schmidt Rebound Hammer Hardness								X	
	P-Wave and S-Wave Ultrasonic Pulse Velocities (inc Bulk Modulus, Shear Modulus Dynamic Elastic Modulus and Poisson's Ratio)						X	X		
	Moisture Content (rock)					X	X			
	Porosity					X	X	X		
	Petrographic Determination					X	X	X	X	
	X-Ray Diffraction					X	X	X	X	
	Fracture Toughness/Cracked Chevron-Notch Brazilian Disc method (CCNBD)							X	X	
	Indirect ("Brazilian") Tensile Strength (STS)							X	X	
	Axial and diametrical Point-Load Strength Index							X	X	
Mechanical Strength (determined destructively)	Flexural Strength							X	X	
	Modulus of Rupture					X	X			
	Punch Shear Strength of rock substance							X	X	
	Direct Shear of cemented or un-cemented joints (Box Test)							X	X	
	Unconfined Compressive Strength (UCS) - Simple							X	X	
	Uniaxial Compressive Strength (UCS) Stress/Strain curves, Young's Modulus, Secant Modulus, Poisson's Ratio, Specific Energy, Rock Toughness Index							X	X	
	Undrained Triaxial Strength - Hoek cell (single stage)							X	X	
	Undrained Triaxial Strength - Hoek cell (3 stages) + Stress/Strain curve, Young's Modulus, Secant Modulus, Failure envelopes (1 vs $\sigma_3$ , $\tau$ vs $\sigma_3$ ), Peak and residual $c$ & $\phi$ , deduced UCS								X	X
	Undrained Triaxial Strength - SBEL cell (100mm diameter core)					X	X			
	N.C.B. Cone Indenter Test								X	
Penetration Resistance (Toughness)	Morris, Dresser, Tamrock Rbi - Punch Indentation Test/Handwith Drillability								X	
	Stamp Test								X	
	Goodrich Drillability Test								X	
	Sievers J-value Test								X	
	Swedish Brittleness Number (SBN)								X	
Shatter Strength (Brittleness)	Coefficient of Rock Strength (CRS)/Tregon impact Value of Aggregate								X	
	Rock Impact Hardness Number (RHN)								X	
									X	
Abrasive	CERCHAR Abrasivity Index								X	
	Taber Abrasiveness								X	
	Paddle Abrasiveness Test								X	
	Abroy (LCPC) Abrasimètre								X	
	Norwegian Abrasion Value (NAV)								X	
	Abrasion Value Cutter Steel (AVS)								X	
	Soil Abrasion Test value (SAT)								X	
	Soft Ground Abrasion Test (SGAT) (conducted at 5 different moisture contents : recommended)								X	
	Soft Ground Abrasion Test (SGAT) (conducted at a single moisture content)								X	
									X	
Time Dependent Properties	Falling-Head Permeability Test (Rock)							X	X	
	Unconfined swelling strain (Duncan Free-Swell Test)					X				
	Confined Swelling Strain or Swelling Pressure Test					X				
	Deformation rate and time to failure under constant axial load, Inferred rheology and viscosity					X				
	Slake Durability Test					X				
	Sodium Sulphate Soundness					X				
									X	
									X	
									X	
									X	
Predictions	Rotary Drilling Performance Predictions								X	
	Percussive (DTH) Drilling Performance Predictions								X	
	Percussive (Top Hammer) Drilling Performance Predictions								X	
	Roadheader Performance Predictions								X	
	Tunnel Boring Machine Performance Predictions								X	
	Raise Borer Performance Prediction								X	
	Strain Burst Proneness Calculations					X	X	X		
	Rippability Prediction								X	
	Blastability Prediction								X	
	Drilling Rate Index (DRI)								X	
Risk Assessment	Drilling Rate Index (DRI) & Cutter Life Index (CLI)								X	
	Landslide Risk Assessment					X	X	X		
Soils Physical (determined non-destructively)	Moisture Content (soil)					X				
	Particle Density & Water Absorption (fine)					X				
	Particle Density & Water Absorption (coarse)					X				
	Particle Size Distribution (fine)					X				
	Particle Size Distribution (coarse)					X				
	Hydrometer Analysis					X				
	Flakiness Index					X				
	pH Value					X				
	Organic Content					X				
									X	
Soils Mechanical Strength (determined destructively)	Plasticity Index (Atterberg limits) & Linear Shrinkage (1 point)					X				
	Plasticity Index (using cone method)					X				
	Shrink-Swell Index					X				
	Standard Compaction					X				
	Modified Compaction					X				
	California Bearing Capacity (CBR)-excl compaction					X				
	Unconfined Compressive Strength (UCS) (Soil)					X				
	Sample Preparation for Triaxial (Remoulded samples)					X				
	CD Triaxial (Single stage)					X				
	CU Triaxial (Single stage)					X				
	UU Triaxial (Single stage)					X				
	Repeated Load Triaxial (inc sample preparation)					X				
	Large Direct Shear Test (3 normal stress levels)					X				
	Small Direct Shear Test (3 normal stress levels)					X				
	Lab Vane Shear					X				
	1D Oedometer Consolidation test (7stages)					X				
	Large Rowe Cell Consolidation (150mm)-Sstage loading					X				
	Large Rowe Cell Consolidation (150mm)-Sstage unloading					X				
Small Rowe Cell Consolidation (75mm)-Sstage loading					X					
Small Rowe Cell Consolidation (75mm)-Sstage unloading					X					
Soils Shatter Strength (Brittleness)	Aggregate Crushing Value					X				
									X	
Soils Abrasiveness	Los Angeles Abrasion					X				
									X	
Soils Time Dependent Properties	Constant Head Permeability					X				
	Falling Head Permeability (Soil)					X				