

Appendix 3A

NZ Geomechanics Society terminology for description of soils in the field

1.1 Soil name

For coarse grained soils (>65% sand and gravel) the soil name is based on the particle sizes present. For fine grained soils (>35% silt and clay sizes) it is based on behavioural characteristics.

1.1.1 Particle sizes

boulders		>200 mm	very coarse gravel		60-200 mm
	coarse	20-60 mm		coarse	0.6-2.0 mm
gravel	medium	6-20 mm	sand	medium	0.2-0.6 mm
	fine	2-6 mm		fine	0.06-0.2 mm
silt		2-60 µm	clay		<2 µm

1.1.2 Proportions

	Term	% of soil mass	Example
Subordinate fraction	(....)y	20-50	sandy
Major fraction-....	35-50 major constituent	sand - gravel gravel
Minor fraction	with trace of with minor with some	<5 5-12 12-20	with trace of sand with minor sand with some sand

1.2. Strength

1.2.1 Fine-grained soils (cohesive)

Term	Diagnostic features	Undrained compressive strength (kPa)
Very soft	Exudes between fingers when squeezed	<25
Soft	Easily indented by fingers	25-50
Firm	Indented only by strong finger pressure	50-100
Stiff	Indented by thumb pressure	100-200
Very stiff	Indented by thumb nail	200-400
Hard	Difficult to indent by thumbnail	400-1000

1.2.2 Coarse-grained soils

A visual assessment is based on:

Loosely packed	Can be removed from exposure by hand or removed easily by shovel
Tightly packed	Requires pick for removal, either as lumps or as disaggregated material

1.3 Moisture condition

Dry	Soil looks and feels dry: cohesive soils usually hard, powdery or friable while granular soils run freely through hands.
Moist	Soil feels cool, darkened in colour: granular soils tend to cohere while cohesive soils usually weakened by moisture presence, but one gets no free water on hands when remoulding.
Wet	Soil feels cool, darkened in colour: granular soils tend to cohere while cohesive soils usually weakened and free water forms on hands when handling.
Saturated	Soil feels cool, darkened in colour and free water is present in the sample. Fully saturated refers to the case where the soil is below the water table.

1.4 Plasticity

Plasticity of clays and silts is determined from the results of Atterburg limit tests. In the field the characteristics of fine grained soils are identified using dilatancy (reaction to shaking), dry strength (crushing), and toughness (consistency near the plastic limit) behaviour. The most characteristic test of plasticity in a soil is dilatancy where on rapid shaking water appears and similar shaking gives no reaction for a plastic soil.

1.5 Grading qualifications

The grading of gravels and sands may be qualified in the field as *well graded* (i.e. good representation of all particle sizes from largest to smallest). Poorly graded materials may be further divided into *uniformly graded* (i.e. most particles about the same size) and *gap graded* (i.e. absence of one or more intermediate sizes).

1.6 Weathering

Weathering of soils is more relevant to coarse grained soils and where weathering does not have an influence on the properties of a soil the term may be omitted.

1.7 Bedding

Term	Inclination (from the horizontal)	Term	Bed thickness
Sub horizontal	0-10°	Very thick	>2 m
Gently inclined	10-30°	Thick	600 mm -2 m
Moderately inclined	30-60°	Moderately thick	200-600 mm
Steeply inclined	80-90°	Moderately thin	60-200 mm
Sub vertical	80-90°	Thin	20-60 mm
		Very thin	6-20 mm
		Laminated	2-6 mm
		Thinly laminated	<2 mm

1.8. Particle shape

