

# Soil parameters and ground types

Penetrometer	Soil Parameters													Ground type				
	Soil type	Profile	$u$	$*\phi'$	$S_u$	$m_v$	$c_v$	$k$	$G_o$	$\sigma_h$	OCR	Hard rock	Soft rock	Gravel	Sand	Silt	Clay	Peat
Dynamic	C	B	-	C	C	-	-	C	-	C	-	-	C	B	A	B	B	B
Mechanical	B	A/B	-	C	C	C	-	C	C	C	-	-	C	C	A	A	A	A
Electric (CPT)	B	A	-	C	B	C	-	B	B/C	B	-	-	C	C	A	A	A	A
Piezocene (CPTU)	A	A	A	B	B	B	A/B	B	B	B/C	B	-	C	-	A	A	A	A
Seismic (SCPT/SCPTU)	A	A	A	B	A/B	B	A/B	B	A	B	B	-	C	-	A	A	A	A
Standard penetration test (SPT)	A	B	-	C	C	-	-	C	-	C	-	-	C	B	A	A	A	A
Vane testing	B	C	-	A	-	-	-	-	-	B/C	-	-	-	-	-	-	A	B

## The applicability and usefulness of in-situ tests

### Applicability:

A = high; B = moderate; C = low; - = none

\* $\phi$  = will depend on soil type

### Soil parameter definitions:

$u$  = in-situ static pore pressure

$\phi'$  = effective internal friction angle

$S_u$  = undrained shear strength

$m_v$  = coefficient of compressibility

$c_v$  = coefficient of consolidation

$k$  = coefficient of permeability

$G_o$  = shear modulus at small strains

$\sigma_h$  = horizontal stress

OCR = overconsolidation ratio

### CPT cone penetration testing:

- 120 – 150m per day
- Continuous profile
- Soil characterised in-situ
- Instantaneous results
- Minimal soil disturbance
- High quality, repeatable results
- Electronic – fast, flexible data transfer