AGS (HK)

香港岩土及岩土環境工程專業協會
ASSOCIATION OF GEOTECHNICAL & GEOENVIRONMENTAL SPECIALISTS (HONG KONG)

Website: www.ags-hk.org

GROUND INVESTIGATION GUIDELINES
04.5 – LANDSLIDES

What do we need to know?

General Information Needed

- Geological Model
- Rock or soil or mixed?
- Topographical & hydrogeological profiles
- Failure geometry
  Rock: Planar, wedge, toppling
  Soil: Shallow, deep seated, translational, flow, slide, liquefaction
- Presence of weak layers or planes & orientation
- Tension cracks, signs of progressive failure
- Groundwater & surface water (perched, transient, cleft water, infiltration)
- Underground water flow (erosion pipes, sub-surface streams etc.)

- Desk study/API
- Field surveys: Topographic & walkover survey
- Geological mapping of all relevant features & exposures
- Recording seepage, water initiation and/or disappearance
- Recording distribution & type of debris
- Available GI records

Investigation:
Trial pits, trial trenches
Drillholes
Piezometers
Geophysics
(see notes)

Sampling

Cohesive Soils : –
U100/U76/Mazier
(transported soils or saprolites)

Piston
(v.soft-soft soils)

Granular soils:
Bulk samples, SPT split spoon
U100/U76 & disturbed samples

Block samples across failure planes, clay rich zones etc.

Rock:
Double tube coring to prove rock air foam/mud flush (& triple tube drilling) through shear zones, fault gouge or hydrothermally altered rock

- Failed water carrying utilities?

Utilities plans

Manhole surveys and CCTV

Typical Properties to be Determined

- Continuous undisturbed samples for description in critical areas (i.e. behind back scarp, through debris to find failure surface.
- Check for signs of deterioration, erosion pipes, opening of joints/ discontinuities or weak zones slickensided surfaces

Careful sampling of critical areas
Rock joint mapping – scanlines (min. 3 orthogonal sets if possible)
Identification of individual critical joint orientations
Groundwater Profile – perched & transient water tables
Rupture surface characteristics and geometry
Rock joint stability

Others:
Design parameters for stabilisation works
– i.e. soil nails, ground anchors, retaining walls, raking drains etc.

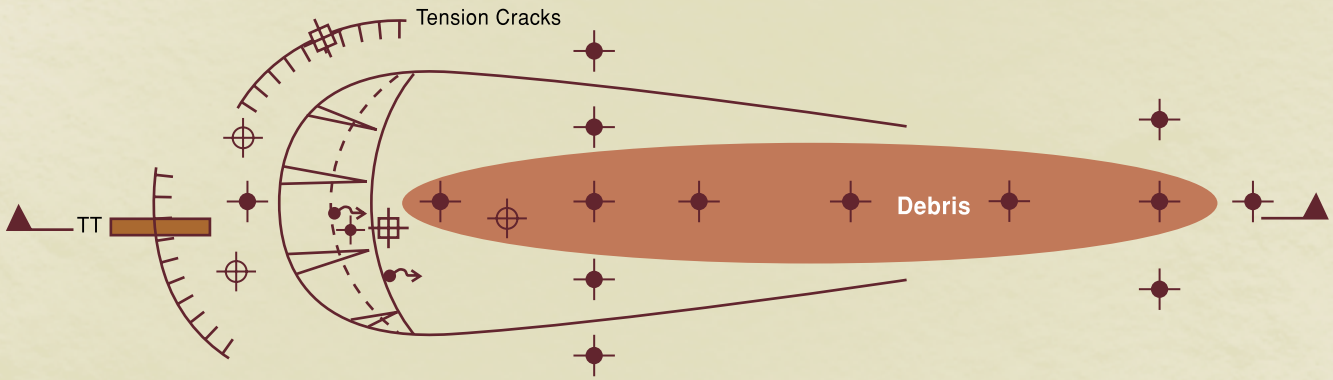
Typical Required Design Parameters

In situ tests:
SPT, In situ density, impresion packer BH televiewer
Rock joint measurements (orientation, roughness, waviness, infill, alteration, mineralisation)
GCO Probe profiles

Laboratory Tests:
PSD, PI, w%, shear strength along failure surface & rock joints
Residual and ring shear strength (Leeds shear box)
Triaxial effective stress shear strength

Notes: Investigation may also include remote sensing analysis and geophysical investigations (seismic, resistivity, microgravity, ground penetrating radar)

Typical Plan



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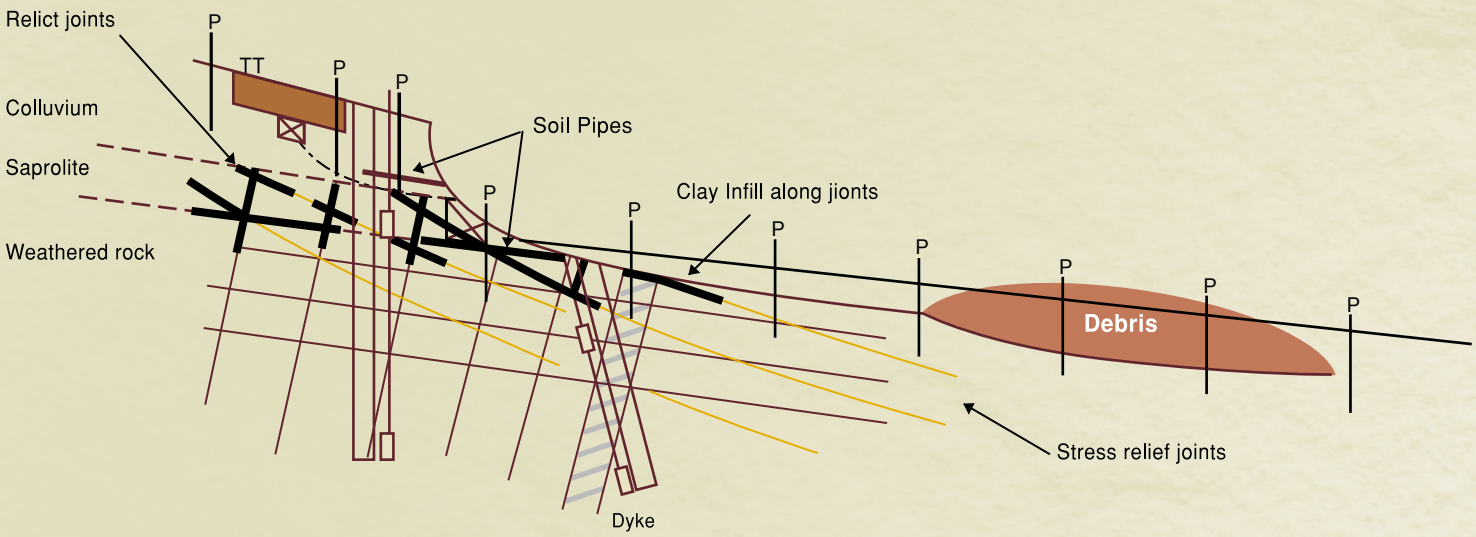
Typical Section



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Legend

- Water Samples (anthoroprogenic)
- Block Samples
- Drillhole (foam, continuous maziers)
- Trial Pit
- TT Trial Trench
- Piezometer
- Shear Surface
- P GCO probes