UR1974_20

# Stability of a block of land at Kayena, West Tamar.

*P.C. Stevenson*

A sloping block of land [DQ919388] to the south-east of the church at Kayena was examined on 12 March 1974 at the request of the owner P.J. Bender.

## RESULTS OF TRIAL PITS

Three trial pits were dug by back-hoe and logged as follows. Measurements of shear strength were made using a Vane tester.

*PIT 1.* North-west corner of block, uphill, below crest of slope; angle of slope 12°; pit dry.

| *Depth (m)* | *Description* | *Shear strength* |
|---|---|---|
| 0-0.3 | Topsoil. | |
| 0.3-1.50 | Stiff yellow brown clay. | 35-72 kPa (peak)<br>8-26 kPa (residual) |
| 1.50-2.75 | Red and grey mottled clay. | 75-95 kPa (peak)<br>24-34 kPa (residual) |

*PIT 2.* Middle of south side of block; angle of slope 13°; pit dry.

| *Depth (m)* | *Description* | *Shear strength* |
|---|---|---|
| 0-0.3 | Brown topsoil. | |
| 0.3-2.4 | Fractured and jointed brown clay. | 72-86 kPa (peak)<br>26-34 kPa (residual) |
| 2.4-3.0 | Grey-red mottled clay, fissured. | 66-82 kPa (peak)<br>17-34 kPa (residual) |

*PIT 3.* North-east corner of block, foot of slope; angle of slope 9°; pit dry.

| *Depth (m)* | *Description* | *Shear strength* |
|---|---|---|
| 0-0.45 | Brown topsoil. | |
| 0.45-1.5 | Yellow brown clay | 66-72 kPa (peak)<br>22-32 kPa (residual) |
| 1.5-2.7 | Grey brown and red mottled clay, finely fissured and with fractures and plume-marked joints. | 66-72 kPa (peak)<br>17-22 kPa (residual) |

## DISCUSSION

This area has been zoned provisionally on the Tamar Valley Landslip Map as being in a region of dormant or potential landslips and requiring special investigation and building construction.

The results from the trial pits confirms this zoning. The clays are not particularly soft but of course are at the time of testing in the driest condition in the annual cycle. Thus sensitivity to disturbance represented by the difference between peak and residual strengths is high, and their shrinkage and plasticity is known also to be high. The clay is fissured and this not only weakens it and allows ready access of water, but also indicates possible past movement.

The angle of slope is steep for this material and many active slip zones exist nearby on similar or even shallower slopes.

## CONCLUSIONS

In view of the above results, it is considered that the area should not be developed without further soil investigation and specialised foundation design by a qualified engineer. Conventional building methods are likely to be inadequate to cope with the hazards of the site.

[18 March 1974]