

1976/32. Test pits on R. Ambrose's property at Windermere.

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Nine test pits have been dug on this property [EQ010261] to examine subsurface material and groundwater conditions. The logs of these holes are given in Appendix 1 and their positions shown on Figure 1.

The property consists of a series of flattish areas separated by steeper slopes and this feature continues to the top of Gaunts Hill, some 120 m above river level. The slopes and flat areas have been formed by large mass movements in the past. No recent movement can be seen in the area apart from the extreme west of the property. The land is underlain by basalt talus of variable thickness and the talus is underlain by Tertiary sediments consisting mainly of clay, silty clay and sand. The top of Gaunts Hill is underlain by *in situ* basalt and the talus on the slopes has been moved downslope by the action of the old landslips. Large blocks of basalt up to 3-4 m in diameter can be seen on the slopes.

DISCUSSION OF TEST PITS AND STABILITY

Most of the test pits extended through the basalt talus into the Tertiary sediments underneath. Hole 3 and possibly Hole 8 failed to penetrate the talus because of difficult digging conditions. The vane tests on the clay beds indicate a fairly high strength but also a fairly high sensitivity. A small amount of free water entered test pits 6 and 8 during digging, the others being relatively dry.

Most of the property has been placed in a Class IV area on the Landslip Zone Map of the Tamar Valley. The part which extends across the top of Gaunts Hill is in Class I while a strip along the road is in Class III. There are no problems in building on the Class I area except that drainage of water over the edge of the plateau should be avoided. Class III areas are zones where it is recommended a special building code be applied whereas in Class IV areas development is not usually recommended. The latter areas are zones where old slips can be seen and these have previously been described on this property by Stevenson (1974). On the western margin, part of a recently active slip extends on to the property. The land surface in this area is not particularly steep, indicating the relatively low slope angles on which slips can occur in the area. If houses are planned near any of the dams on the property, then they should be drained as they will keep the surrounding areas wet and the clay in a softened and weak state.

REFERENCE

STEVENSON, P.C. 1974. Stability of land at Windermere, East Tamar. *Unpubl. Rep. Dep. Mines Tasm.* 1974/28.

[2 June 1976]

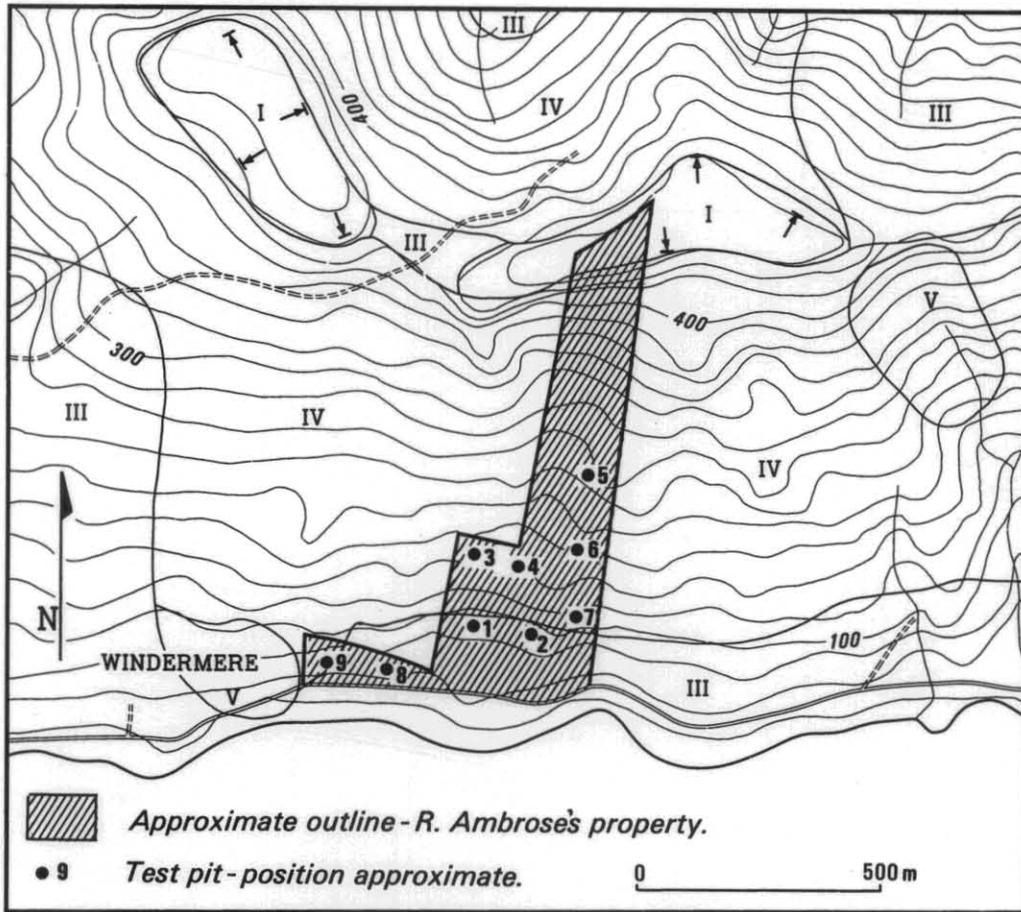
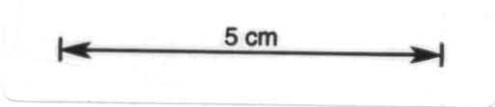


Figure 1. Location of test pits.



APPENDIX 1

Logs of test pits at Windermere

HOLE 1

Depth (m)

0-0.2	Dark brown, dry and fractured silty clay soil, some basalt boulders.
0.2-0.5	Porous silty and pisolitic (iron oxide) soil.
0.5-2.3	Mixture of plastic clay and basalt boulders, some basalt weathered, some unweathered. Vane tests: Peak strength (kPa) 69.3 86.0 59.8 Residual strength (kPa) 21.5 38.2 16.7
2.3-3.2	Light grey-brown medium hard plastic clay, fissured with shiny surfaces. Vane tests: Peak strength (kPa) 88.4 124.3 101.3 Residual strength (kPa) 20.1 15.3 24.9

HOLE 2

0-0.6	Dark brown clay and basalt boulders grading into dark brown soil.
0.6-1.5	Light brown clay with basalt boulders.
1.5-1.8	On north side of pit grey silty clay; a thin fine, even-grained quartz sand bed; some wood fragments. Zones of clay extending into basalt boulder zone. Other parts of pit consist of clay and basalt boulders which proved too difficult to excavate.

HOLE 3

0-0.3	Dark brown soil and sandy silty clay, dry and fractured.
0.3-1.8	Hard brown plastic clay and basalt boulders. Towards bottom light grey and brown mottled silty and sandy clay with plastic clay and basalt boulders intermixed. Unable to dig any deeper.

HOLE 4

0-0.8	Dark brown to black silty clay, a little fractured and dry, a few small basalt fragments.
0.8-2.6	Fragmental grey brown clay (derived from basalt?) with basalt boulders, occasional limonite nodules. Vane tests: Peak strength (kPa) 66.9 90.8 98.0 83.7 69.3 Residual strength (kPa) 9.6 16.7 23.9 19.1 8.1

HOLE 5

0-0.6	Dark brown crumbly soil overlying clay, some basalt boulders.
0.6-2.7	Brown plastic to fragmental clay with occasional basalt boulders, shiny slip surfaces on clay. Vane tests: Peak strength (kPa) 98 62.1 Residual strength (kPa) 23.9 16.7
2.7-3.1	Light grey and brown mottled clay, hard, plastic, some thin travertine seams. Vane tests: Peak strength (kPa) 109.9 124.3 Residual strength (kPa) 22 22

HOLE 6

Depth (m)

0-0.6	Dry fractured dark brown clay soil becoming damp towards base, angular limonite fragments.
0.6-1.8	Fragmental to plastic brown clay and basalt boulders. Vane tests: Peak strength (kPa) 60.2 43 47.8 Residual strength (kPa) 22 15.3 20.6
1.8-3.1	Light grey and brown mottled clay and silty clay, fairly hard, massive. Iron oxide band across floor of pit about 15 mm wide carries a little water. Vane tests: Peak strength (kPa) 99.0 126.7 Residual strength (kPa) 8.1 29.2

HOLE 7

0-0.5	Dry and fractured soil over light brown silty clay.
0.5-1.5	Mainly brown, a little grey fragmental to plastic hard clay, some limonite nodules. Vane tests: Peak strength (kPa) 129 Residual strength (kPa) 19.6
1.5-2.7	Light grey and brown mottled plastic clay, fissured. Some travertine near top. Vane tests: Peak strength (kPa) 143.4 107.6 Residual strength (kPa) 22.9 25.8

HOLE 8

0-0.6	Dark brown soil overlying pisolitic (iron oxide) clay with basalt boulders.
0.6-1.5	Light grey brown fragmental clay with basalt boulders.
1.5-2.1	Fissured grey clay with shiny slip surface on one side of pit. In other parts of pit are weathered basalt debris and boulders with some moisture.

HOLE 9

0-0.3	Dark brown soil, fractured and dry, occasional basalt boulders.
0.3-0.9	Basalt-derived light brown fragmental material with large basalt boulders.
0.9-1.7	Fine even-grained brown sand (mainly quartz).
1.7	Blue clay.