Test pits on R. Harris' property at Kelcey Tier, Spreyton.

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Abstract

Five test pits were dug on R. Harris' property at Kelcey Tier; these encountered a surface layer of landslip debris made up of clay and boulders with possible *in situ* Permian sediments near the house. No seepages occurred in the test pits and the clay was fairly stiff, although moist. Signs of ancient landslips are common, but there are no recent movements on the property. With particular care with drainage and avoidance of earthworks on steep slopes near the house, the land could remain stable for a considerable time. Small scale extensions to the house are unlikely to affect the stability of the land to any great extent.

INTRODUCTION

Five test pits dug on the property of R. Harris at Kelcey Tier [DQ437366] were examined at the request of the owner. The property is situated on the eastern slopes of Kelcey Tier and is within an area that has been subject to movement in the past. The owner desires to make a small extension to his house.

RELIEF AND GEOLOGY

The property consists of areas of steep slopes, flat land and undulating land. The house is situated on a flat portion of land just behind a steep slope about 15 m high. The land is flat for about 40 m behind the house, then undulating for about 70 m before rising steeply again. A small valley occurs just south of the house and a channel running north-east occurs between the undulating land and the rear steep slope to the north of the house.

The slopes of Kelcey Tier are underlain at depth by almost flat lying interbedded siltstone and sandstone of Permian age. At the top of the range is a sill-like body of Jurassic dolerite with occasional dykes of dolerite occurring lower down the slopes.

Large scale landslips have occurred over much of the eastern side of Kelcey Tier and debris, which includes dolerite boulders from the top, cover much of the slopes. These large movements are ancient, and recent movements affecting only small areas occur at only a few points along the slope.

RESULTS OF TEST PITS

Five test pits were dug in the approximate positions shown in Figure 1. Holes 1, 2 and 3 encountered a thin layer of material containing dolerite boulders, the lower parts of the pits being dug in mainly Permian derived material. It is not known whether this material has been involved in landslip movements or whether it is weathered *in situ*. Certainly in the upper sections of this material, flat pieces of relatively unweathered Permian rock have an irregular orientation suggesting movement. The lower parts, particularly in Holes 1 and 2, may have *in situ* weathered rock in them. Holes 4 and 5 are situated at slightly higher levels and have dolerite boulders from the top of the pit to the base, indicating that all the material has moved to these points from higher levels.

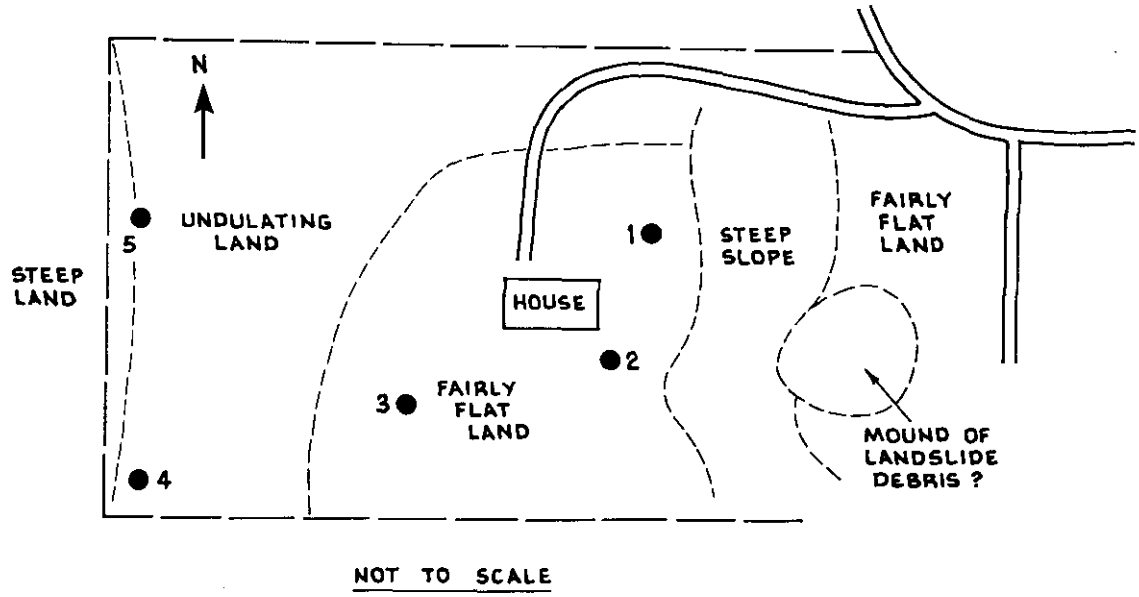

Figure 1. *Location of test pits*

CONCLUSIONS

No definite *in situ* rock was located in any of the test pits, although the lower parts of Holes 1 and 2 could be *in situ* weathered rock. The clay and silty clay in the test pits are relatively stiff and no seepages were observed in any of the pits, although the whole section was moist in all pits. The flat area on which the house is situated is well drained by nearby naturally occurring valleys.

Small extensions to the house are unlikely to affect the stability of the area. There are no signs of recent landslip movements on the property, the only slips being ancient. It may be safer to extend on the western or northern sides of the present house, as extensions on the east as proposed will put the building nearer to the steep slope. If any movement takes place near the house in the future, the most likely place is on the steep slope east of the flat where the house is situated.

Ensuring good surface drainage near the house will be an aid to the maintenance of stable conditions. It may be advisable to conduct sullage in a closed pipe north or south of the house and then disperse it in the soil, rather than allowing it to seep into the soil directly to the east of the house on top of the steep slope. Excavation or large scale disturbance on the slope east of the house should be avoided.

Observance of the above will help in promoting continuing stability in the area. The possibility of a slip affecting the house in the foreseeable future seems fairly small provided care in the above matters is exercised. A more definite opinion of the likely stability of the area could probably be expressed with more extensive subsurface investigations, but the cost of employing a consultant engineer and drilling costs would probably be prohibitive.

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APPENDIX 1

Logs of test pits

Hole 1

Depth (m)	*Description*
0 - 0.5	Dark brown soil with large dolerite boulders.
0.5 - 2.3	Light grey-brown mottled clayey silt with boulders of sandstone.
2.3 - 2.6	Clayey silt and siltstone. Could be *in situ* Permian rock or large boulder.
	No seepages but material in pit moist throughout.

Hole 2

0 - 0.5	Dark brown soil and dolerite boulders.
0.5 - 0.6	Dark clay and light brown clay intermixed.
0.6 - 1.8	Light grey and brown mottled clay and silty clay, some siltstone boulders.
1.8 - 2.7	Permian siltstone boulders becoming more common in clay.
	No seepages but material in pit moist throughout.

Hole 3

0 - 0.3	Dark brown soil and small dolerite boulders.
0.3 - 0.9	Brown and blue mottled clayey silt, fairly plastic, occasional small dolerite boulders.
0.9 - 2.6	Mainly blue plastic silty clay, some small dolerite fragments near the top. Material is more fragmentary rather than plastic towards base.
	Hole is free from seepages but the whole profile is moist.

Hole 4

0 - 1.7	Dolerite boulders in soil and brown fragmentary but plastic clay.
1.7 - 2.1	Blue clay with some brown mottling containing a few small dolerite boulders.
	No seepage but material moist over whole section.

Hole 5

0 - 0.3	Dark brown soil with dolerite boulders.
0.3 - 2.3	Mottled grey and brown silty clay with dolerite boulders decreasing in size towards base.
	No seepages but whole profile is moist.