Stability of land at Windermere, East Tamar.

P.C. Stevenson

An area [EQ010261], referred to the Department of Mines by the Town and Country Planning Commissioner as Proposal Plan Ld 179, and owned by Mr E.A. Hill was examined on 14 March 1974. It constitutes a building block of about 0.2 ha between Windermere Road and the River Tamar. An adjacent area of about 8 ha upslope on the north side of the road was examined at the same time. Both areas are dealt with in this report (fig. 1).

The whole region has been zoned as Zone III (Potential Landslip area) or Zone IV (Old Landslip area) on the Tamar Valley Landslip Zone Map. An extract of this map is appended as Figure 2.

The strong ridge of hills to the north of the area is formed of a layer of basalt. This is underlain by a series of soft sands and clays, and although they are rarely exposed they are known throughout the Tamar Valley as a cause of landslips. The action of rainfall percolating down through the basalt and softening the clays has produced some hundreds of landslips in the Valley and a major feature of this kind may be seen running down from the basalt ridge across the 8 ha area as far as the river (fig. 1).

The irregular contours, hummocky ground, the ponds and generally disturbed nature of the watercourses, the large transported basalt blocks and the high basalt scarp above all point to a major disturbance in the recent geological past. This may readily be sketched from aerial photographs as has been done in Figure 1.

Large landslips of this kind are active for periods of many decades and often develop earthflows from the toe region as has been suggested in the sketch. The activity of this earthflow may continue long after the main slip has been stabilised and this very late minor activity may account for some of the features seen in the house block.

Here the hummocky nature of the ground is evident and small ill-defined steps occur both in this block and the next block to the east where they have been retained by small walls. Some strong ground cracks give evidence of high shrinkage often associated with instability and a rock filled drain or similar structure has been found necessary to control groundwater. The road above the block appears to be stressed and has cracked extensively; soil has ridged up on the upper side of the power pole and fences appear to be disturbed by slight ground movement. Basalt boulders are evident on the block and soil creep around these is apparent.

All these features, taken together with the presence of white plastic clays cropping out on the shore, and the history of landslipping on the slope above indicate that any building on the block must be undertaken with full knowledge of the hazards and the greatest care taken in the construction of foundations and in the design of water supply pipes and drains. The generally low slope of the block is a hopeful character, but earthflowed material often has a strength considerably less than its original strength, and it is subject to further loss of strength in the presence of excess water.

[1 April 1974]

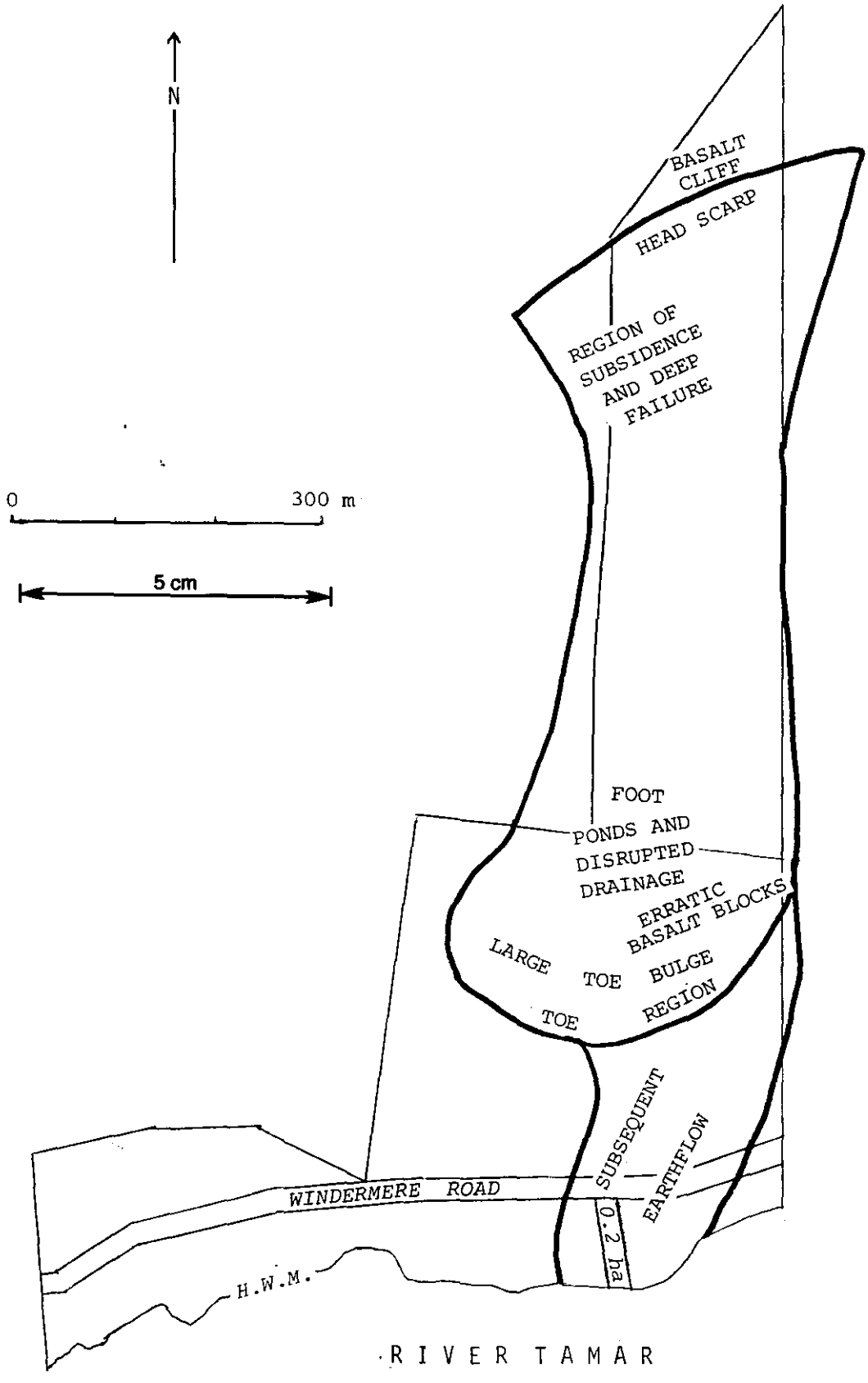

Figure 1. *Land at Windermere, showing evidence of landslip.*

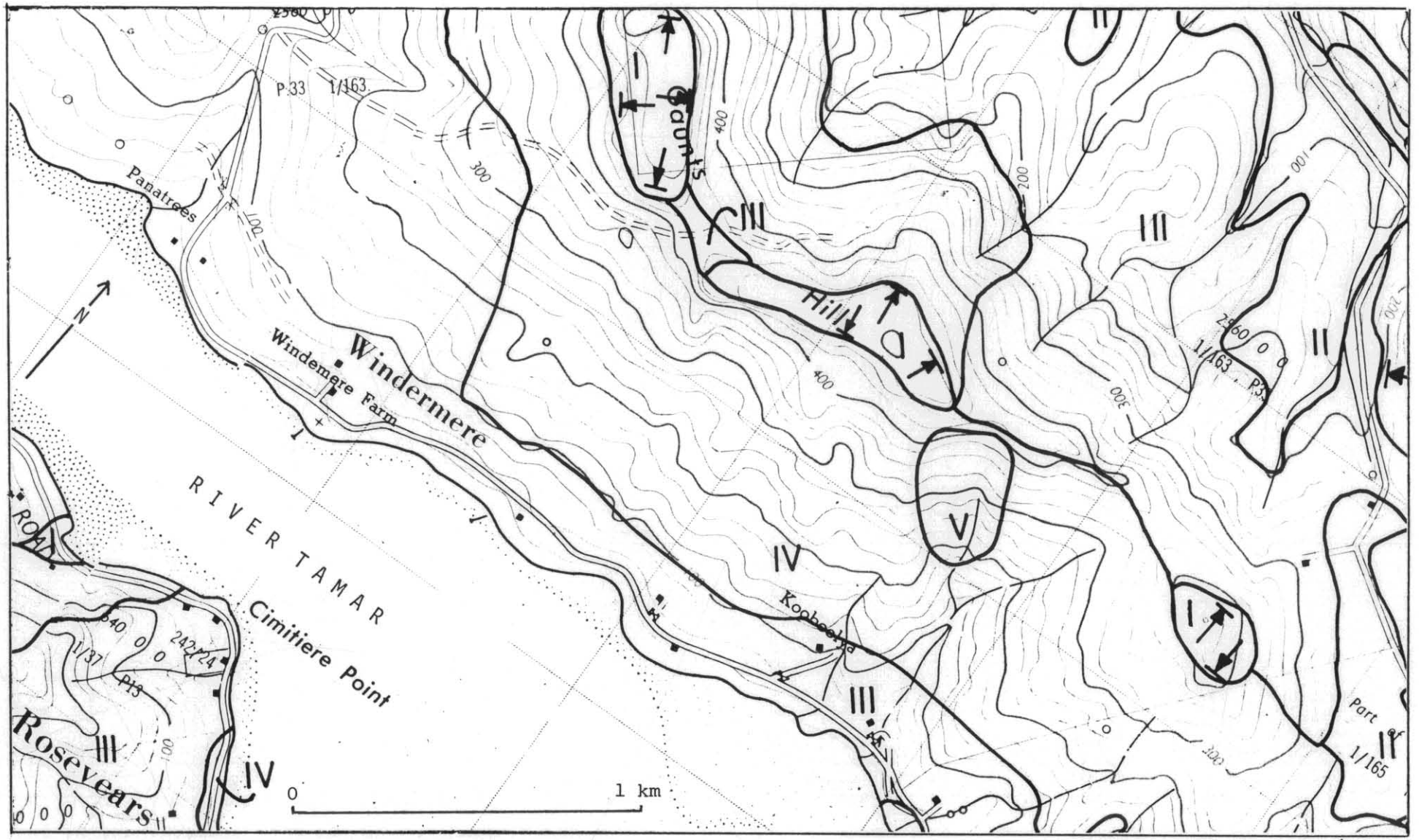

Figure 2. *Portion of Tamar Valley Landslip Zone Map.*