

UR1973-60

Stability of a proposed subdivision at Ellice Hill, Spreyton.

P.C. Stevenson

The area was examined on 8 August 1973 in response to a request from Messrs Lester, Franks and Co., acting for S.P. Holman and Sons Pty Ltd, the landowners.

Ellice Hill is the most southerly hill of the Kelceys Tier range. It is capped by a small dolerite sill which has shed a small aureole of talus, but the lower part of the hill is formed of the Kelcey Tier Mudstone in the lower part of the Permian succession.

The rocks have been described by Burns (1964) as 'mudstone, with bands of siltstone and sandstone'. He points out that the rocks are not well exposed, but it is plain that the mudstone forms the greater part of the sequence. The rocks have a thick weathered surface so that they often appear in the form of clay, or weathered non-plastic silt.

The beds dip toward the east at about 10° and numerous springs are apparent on the eastern side of the hill.

Burns (1957) pointed out in a report on reservoir sites on Kelceys Tier that extensive landslides existed to the north of the area described, and the writer's examination confirms that extensive landslides have occurred within this area also.

Three large slides are indicated on Figure 1. The slides are quite obvious on the ground and on aerial photographs, but the contours on the figure do not show them clearly.

The slides are now stable and are ancient, but owe their origin to the springs that are mentioned above. Groundwater issuing from them has weakened and loaded the weathered surface material which has failed in large deep rotational slices. That this must have occurred some time ago is plain from the subsequent downcutting that has been achieved by the streams draining the springs, and Burns' estimate of 1000 to 5000 years for the analogous slips further north is reasonable.

The direction of dip of the mudstone has ensured that the springs only occur on the eastern side of the hill, and it is only here that the slopes have failed. The rest of the hill appears quite stable with even slopes and no 'benching'.

The site is steep, with overall slopes of more than 15° in most parts. Slopes steeper than 25° are not uncommon particularly in the crown areas of the old landslides. The suggested scheme for clusters of building lots in suitable areas is therefore a realistic one.

No risk of landslip exists in the areas of more gentle slope on either the top of the hill or at its foot (marked A on fig. 1), although the discharge of stormwater sullage or effluent from the upper areas could bring about instability in the areas below. The lower 'A' area, is favoured as the construction of access will be easier but it is less well drained.

The landslide areas themselves are marked B. These are attractive as building sites, but if they are to be used then somewhat severe conditions must apply. In spite of the age of the slides, they could be reactivated by an excess of water making its way into the fractures on which the slide moved. A plentiful supply estimated as 1500 l/min from a total of about

ten springs is available, and this water would have to be rigidly controlled. Ideally the area of the slides and the hillsides above them should be dewatered by a line of deep bore holes so that the springs no longer run. The bore holes would have to be pumped continually to ensure continued stability. The drainage of houses in the area would also need to be strictly controlled. The design of such installations and an estimate of their effect on the stability of the slides would require the services of consulting engineers, but the writer is of the opinion that the stability of the 'B' areas could be made acceptable.

The remaining areas have been marked C. These are the steepest areas, either parts of the landslide structures, the remaining ridges between the slide hollows, the banks of the deeply incised creeks, or the stable southern and western slopes of Ellice Hill.

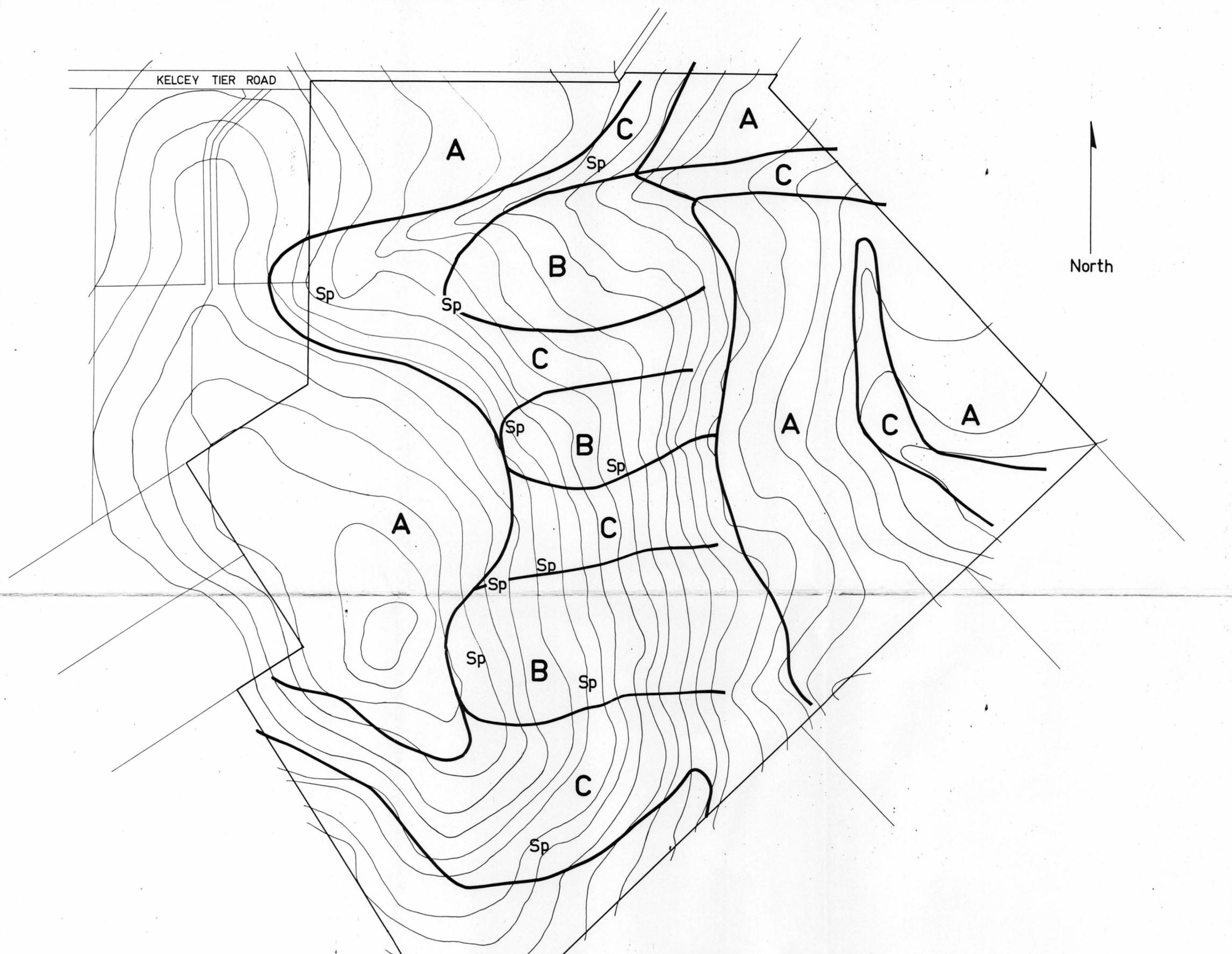
The areas have been distinguished by inspection on the ground, from aerial photographs and from the contours, but as the accuracy of the contours is not high, for instance in the area immediately to the south-east of the old homestead, the areas could no doubt be refined after a more precise survey.

REFERENCES

- BURNS, K.L. 1957. Reservoir sites near Kelcie's Tier. *Tech.Rept.Dep.Mines Tasm.* 1:41-49.
- BURNS, K.L. 1964. One mile geological map series. K/55-6-29. Devonport. *Explan.Rep.geol.Surv.Tasm.*

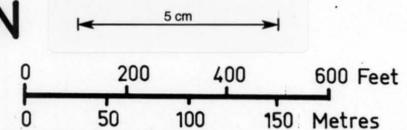
[20 August 1973]

KELCEY TIER ROAD



STABILITY ASSESSMENT at ELLICE HILL SPREYTON

GEOLOGIST : PC. STEVENSON , August 1973



- A** AREAS STABLE AND SUITABLE FOR DEVELOPMENT
- B** AREAS OF OLD LANDSLIP REQUIRING PRECAUTIONS TO ENSURE STABILITY
- C** AREAS APPARENTLY TOO STEEP FOR EASY DEVELOPMENT
- Sp** SPRING

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