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Landslip near the Marist Regional College, Burnie

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A landslip has occurred on a steep slope north-east of the college [DQ063552]. The material involved in the movement, has flowed downslope to the rear of a house in Bay Street. The principal of the college requested the area be examined before any remedial work is undertaken.

RELIEF AND GEOLOGY

A narrow strip of gently sloping land extends from the shoreline to a steep scarp which rises to about 75 m above sea level. The college is situated on a flatter area behind the scarp.

Precambrian quartzite and slate crop out along the shoreline and at various points around the scarp. An outcrop of this material occurs west of and a little uphill from where the material involved in the slip came to rest. The slate and quartzite beds are intruded by Precambrian dolerite along the shoreline north-east and north-west of the slip area. Overlying the Precambrian rocks, on an uneven surface, are Tertiary basalt flows and interbedded sediments consisting of fine gravel, sand and some clay. East of the slip area, the sand beds have been indurated to form quite a hard rock. The Tertiary basalt and sediments underlie the upper part of the scarp and the flatter area behind the scarp. The basalt tends to weather deeply and talus derived from this weathering has accumulated on the steep slopes and also on the more gently sloping land at the foot of the scarp. The landslip has occurred in this material.

DISCUSSION

The landslip has taken place about 10 m below the top of the scarp and has affected only a few cubic metres of material. Nearly all the material involved in the movement became liquified and moved about 25 m downslope as a mud flow along three slightly separated paths before coming to rest partly against a log extending across the direction of flow and partly against the back fence of 31 Bay Street. The section in the scarp (about 2.5 m high) left at the heel of the landslip indicates that the material involved in the slip consisted of loose talus and soil which has moved on much more compact material including plastic clay. A drain along the top of the slope appears to prevent most of the surface water from going down the slope. A small spring is issuing from the area where the slide occurred and from the slope shape, there appears to be a shallow re-entrant into the steep slope at this point suggesting movements may have taken place in the past. In fact, above the present slip there are small vertical drops in the landsurface of about 0.3 m at various points, again suggesting some previous movement. It is likely from the outcrop pattern that the area is on the edge of a low in the surface of the Precambrian rocks, a common site for the occurrence of landslips.

The movement has removed some support for material uphill from the slip and it is possible that further movements could occur after extended periods of rain. If the movements are small then the flat area formed behind the log should catch or slow down most of the material involved.

In an effort to increase the stability of the area, the college authorities planted a large number of radiata pines around the slope about three years ago. These have grown and established well. The slip material flowed around some and tore out two or three others. In such a slip, it is unlikely that the transpiration effects of the vegetation would have much effect on

the stability but the soil binding effect of the roots could have an important influence on the stability. A discussion with a silviculturist of the Forestry Department indicated that radiata pines would be as useful to supply this effect as any other trees where the ground is not permanently wet. Where the land is permanently wet, it is not possible to establish them, and he suggested willows, poplars or similar trees which can be established in wet conditions.

CONCLUSIONS AND RECOMMENDATIONS

It is apparent that rain water falling directly on the slope together with groundwater has saturated the area and caused the slip. Some support has been removed from the material uphill and periods of heavy rain could result in further movement. Further movements of this type will probably be small.

Tree planting is suggested as a means to aid stabilisation.

Free-draining conditions should be maintained for the spring coming from the slip to prevent a build up of water in the soil.

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