

Unstable slopes at South Burnie

by K. L. Burns

At the request of the Engineer for the Burnie Council a brief examination was made of a landslide reported from Studholme Street, South Burnie. A small collapse of an embankment was seen, with no more than a yard of soil. This provides no cause for concern.

However examination of the surroundings reveals cause for considerable concern. The house at 36 Studholme Street, of a Mr Stubbs, shows evidence of serious structural damage due to earth movement. The north wall has subsided, with consequent rotational shearing of the eastern side of the house. This shearing is in a clockwise sense when the house is viewed from the east. Beams have rotated independently of the chimney and window frames show considerable distortion. As well as damage to the fabric of the house, the front steps and garden retaining walls are rotated, top downhill. Attempts at repair indicate that movement has been occurring for some time.

Three factors have obviously contributed to movement at 36 Studholme Street. First, the garden retaining walls have inadequate foundations, no drainage provisions, and contain much fill. Second, a driveway into No. 34 has been excavated by cutting of the bank perilously close to No. 36. Third, even despite the two previous factors, movements here suggest a low shear strength in the embankment and an inherently unstable slope.

The third factor finds confirmation in properties higher up Studholme Street. There is evidence of shallow earth movements, with damage to concrete structures in several other properties.

While poor methods of construction have contributed to these failures, it is emphasised that the methods are those normally used by householders and which are normally satisfactory. The failure of these structures indicates the existence of conditions with which normal household methods cannot cope. That is, there is an inherent instability of this slope, with the movement indicated by failure of the weakest structures first.

The geological conditions are similar to those previously described by Mr T. D. Hughes from the eastern end of Bay Street. The bedrock is a Tertiary arkosic sandstone, feldspathic and fairly permeable, similar to that underlying the Lawrence Vale area in Launceston. Over this is basalt talus. The whole area is part of a very large fossil landslide.

It is recommended that:

1. An adequate retaining wall be built to support the embankment behind the driveway at No. 34 Studholme Street. This recommendation is ignored at the peril of serious damage to No. 36.
2. Proper deep drainage be provided along the northern boundary of No. 36, to dry out the soil beneath the foundations.
3. Permission for subdivision at the Young Street extension, above and behind Studholme Street, be reconsidered, or at least made subject to provisions designed to keep stormwater from the slope down to Studholme Street.
4. That investigation be made of the stability of the bank at Studholme Street, with a view to design of preventative drainage measures.

The general similarities to the Lawrence Vale area are striking. The geology is similar, and the damage is similar to early damage in Meredith Crescent, on the landslide toe.

Investigations should consist of laboratory tests of the shear strength of undisturbed soil samples from about 20 feet depth, followed by computations of the factor of safety of the slope, with prediction of the position of the most likely slide. Preventative drainage measures can then be designed.

It is fortunate that advice on this area was obtained at this incipient stage. Effective corrective measures should be relatively simple and not costly, and possible disastrous effects of the new subdivision can be avoided.

It is requested that the substance of this brief report be transmitted to the Burnie Council, to enable them to assess their obligations in this matter.

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