

**TASMANIA DEPARTMENT OF MINES  
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**Examination of a proposed house site,  
Ambrose Subdivision, Windermere**

*by W. R. Moore*

The slow shear box test on the last of the clay samples collected on 24 October from trench 3 at house site 3 at Windermere (Moore, 1985) has been completed. In view of these results, the proposed house site was re-examined on 21 February and a hand auger clay sample was collected from an alternative house site some 80 m upslope from the original site.

As was previously suggested the shear box sample (sample 7), as with previous samples tested, gave a low friction angle as well as low cohesion value. This sample was collected from below the suspected shear zone exposed in the trench.

As a result of these tests and re-examination of the proposed site at Windermere, it remains likely that the proposed house site 3 is located on a younger small parasitic slide on the larger older landslide. This site cannot be recommended as a proposed house site and the author recommends that the proposed site be moved some 80 m upslope to just within the tree line.

The reasons for rejecting the original third proposed site are:

1. The flat area is thought to be formed from a shallow secondary or parasitic slide and is considered to be younger than the large slide mapped by Stevenson in 1974 on which the existing zone IV area of the enclosed plan is based.
2. This flat area has a slope of 6–7° and is a very small area for even one house site.
3. No fissuring in the clay was seen in the transition zone in the investigation trench. The presence of shear polish in this zone cannot be ignored and appears to indicate that some translational movement has occurred in the clay at this depth.
4. The slope angle of the site approximates closely to the critical angle for slope failure derived from the angle of friction of the clay samples tested in the shear box.

The alternative site has a slope of only 2–3° and its area is far more extensive, so that a house can be sited far enough back from the break in slope at the front. This site is some distance away and at a lower level to what is considered to be the heel area of the large old landslide. This old landslide is so large that the load of one house at this location is not considered likely to affect this structure's stability. Any excess water, as from the overflow from the septic tank, can be piped into the gully north of the proposed site.

The major disadvantage of the alternative site is the extra cost of the 80 m of access road upslope to within the tree line area. The greater stability of the site is likely to far outweigh this extra cost.

The clay sample collected at this alternative site appears to have similar properties to the clay exposed in the other three pits. The clay is highly plastic and probably expansive, as are the other samples. The sample will be tested in the shear box when this equipment is available, which will not be for at least a month. These results are not considered as critical at this site as the original site because the slopes here are low (2–3°) whereas at the original site the slope was 6 to 7 degrees. This slope is very close to half the friction angle of 14–15° of the three samples tested, an approximation used for finding the critical angle for slope failure. (This approximation

had to be used because of the unavailability of the calculator used for slope stability analyses. The use of manual methods for slope stability analyses on such a complex two-generation landslide, as is thought to occur on this site, is considered too difficult and time consuming).

It appears unnecessary and unwarranted to withhold any further the building permit for a single house on this third block provided the alternative preferred and recommended site is accepted by the subdivider and his potential buyer.

The recommendations for this block are as follows:

1. That no house be built on the previously proposed location 3 on this third and upper level block as it is considered to be at too high a risk from slope failure.
2. That the proposed house site be moved approximately 80 m upslope on to the lower sloping, more extensive flat area within the tree line.
3. That only one house site is accepted for this block and that it is situated in the area as above.
4. This house site and most of this block, except at its highest level where basalt is in situ, must by definition remain a zone IV landslide area. It is an old landslip as shown on the original proposal plan. One house and its associated buildings are not likely to affect the stability of such a large structure as this old landslide, particularly so far up on its back slope, yet at a lower level and a considerable distance away from where the heel of the slide is located.
5. The greatest potential danger appears to be development of a smaller secondary failure near the break in slope in front of the proposed house site. This is the reason why the house is placed within the tree area back away from this break in slope.
6. The septic tank overflow should be piped away from this front slope, preferably towards the gully north of the house site.
7. Care should be taken in building the access road to this proposed site. Deep cuts and high banks should be avoided, particularly cuts into the toe of lower slopes. The access road should be adequately drained.
8. With any landslide risk area the risk of failure can be reduced by adequate drainage reducing excess water accumulating on the site. Despite the objections of the owners of land in this part of Windermere, it is still considered desirable that existing water holes on this proposed subdivision, as well as those on the neighbouring areas, be drained. Water holes can only add to the overall instability of what is considered to be very sensitive slopes above Windermere Road.
9. As some of the existing trees will have to be cut to allow for building on the site their replacement by shrubs and smaller trees is recommended.
10. As this is a zone IV landslide area it would be prudent to follow the special building code of 1978 (Part II, Division 5) for building in such potential landslide area.

## References

MOORE, W. R. 1985. Inspection of Ambrose's subdivision at Windermere. *Unpublished Report Department of Mines Tasmania* 1985/74.

STEVENSON, P. C. 1974. Stability of land at Windermere. *Unpublished Report Department of Mines Tasmania* 1974/28.

[21 January 1985]

**Table 1***Soil tests of clay samples, Trench 3, Site 3*

<i>Sample No.</i>	<i>Depth (m)</i>	<i>Moisture content (%)</i>	<i>Plastic limit</i>	<i>Liquid limit</i>	<i>Plastic index</i>	<i>Linear shrinkage</i>	<i>Angle of friction <math>\phi</math> (°)</i>	<i>Cohesion <math>e'</math> kpA</i>	<i>XRD</i>
1	0.3	40	-	101	-	-	-	-	
2	0.6	44	29	120	99	25	-	-	
3	0.9	41	30	118	88	24	14°	9	
4	1.2	40	-	-	-	-	-	-	
5	1.5	39	26	105	79	22	14.5°	7.5	Montmorillonite (moderate) Kaolinite (moderate)
6	1.7	36	-	87	-	-	-	-	
7	2.4	37	27	99	72	22	15.5	8	Montmorillonite (moderate) Kaolinite (moderate)
8	2.7	36	26	97	71	21	-	-	