

**TASMANIA DEPARTMENT OF MINES  
UNPUBLISHED REPORT 1985/83**

**Inspection of land at  
Beach Road, Legana**

*by W. R. Moore*

A block of land at 76 Beach Road, Legana, was re-examined on 12 November for prospective buyers of the land.

This block had previously been investigated for slope stability in 1984. During this investigation a small pit was dug to expose the clay underlying the surface silty sand soil. Two auger holes were then drilled on a proposed house site and several samples were tested for moisture content, Atterberg limits and linear shrinkage. One clay sample was shear box tested to obtain the angle of friction and effective cohesion.

The proposed house site was on the slope above the driveway between 12 and 18 m from the block's Beach Road boundary. On the block a wide driveway has been cut and a large double garage built along the northern boundary. This garage straddles the boundary between Zone III and IV potential and old landslide areas. No building is recommended in the Zone IV area of this block.

The previous work showed that a highly plastic expansive clay underlies the shallow surface silty sandy soil (ML). The clay is moist and soft to a depth of 1.5 m in hole 1 and 1.3 m in hole 2. The friction angle of the slope is low (19°) but the effective cohesion is high (11.5 kPa). Given that any house is to be sited on a slope of 8 to 10 degrees and built on clay with a high plasticity index (90–95) and low friction angle this slope, although considered not to have failed, is highly sensitive to potential slope failure.

In the Zone III area the slope is a high risk slope but this risk can be kept within acceptable limits provided that care with drainage and house design is maintained. It is considered to be correctly categorised as a Zone III potential landslide area on the Tamar regional landslip map whereas the 12° slope below the driveway is considered an old landslide with an adjacent active area along the shore frontage.

The potential purchasers wish to build on the wide driveway (2° slope area), as shown on the log sections. At the edge of the driveway a garage has been built over the scarp marking the Zone IV area where the slope steepens to 12–14°. The house should be set back 9–10 m from this break in slope or four metres back from the northwest corner of the garage. This provides a buffer zone to the Zone IV area. The house could be a light, two-storied structure as suggested by the purchaser or a split level house extending to the over-steepened 10° slope along the western side of the driveway.

Cutting further into the toe of this over-steepened slope should be resisted. Any cuts should be less than 1.5 m with well-drained and founded retaining walls supporting the bank. Any excess water should be removed off the slope, preferably by a surface drainage system to the river. Any swimming pool should be an above-the-ground type. Low shrubs or trees should be planted on the slope above the driveway and particularly on the Zone IV area below the driveway.

The clay, as well as having a high potential for failure, is also expansive as shown by the 20–25% linear shrinkage test. The house foundations should be designed to withstand or move with the seasonal movements in the clay, thus avoiding any future cracking of the house structure. It is recommended that a competent structural engineer be used to design the foundations of the house. It also appears prudent that building regulations pertaining to a 'B' landslide zone be followed.

*[22 November 1985]*

# ENGINEERING LOG – BOREHOLE

project		Whitney, house site location investigation			location		76 Beach Road, Legana, 9 m from boundary																						
co-ordinates		503900, 5422900		drill type		Triefus		hole commenced		11.7.1984																			
R.L.		23 m approx.		drill method		Auger		hole completed		11.7.1984																			
inclination		V		drill fluid		None		drilled by		B. Cox																			
bearing								logged by		WRM																			
								checked by		RCD																			
penetration	support	water	notes	metres	graphic log	classification	material	moisture	consistency	hand	structure, geology																		
1 2 3			samples, tests	R.L. depth		symbol	soil type: plasticity or particle characteristics, colour, secondary and minor components	condition	density index	penetrator kPa																			
	None	None				SM	Sand — very fine with silt, grey. Wood and root fragments. Loose and poorly graded	M	L		Soil																		
				S1 0.5		CH	Clay — sandy, yellow, highly plastic	M	S		Transition zone																		
				0.7		CH	Clay — yellow, highly plastic	M	S PL		Clay																		
				1.0																									
				S2 1.5																									
Hole stopped by M Whitney																													
<p>Beach Road, Hedge, Hole 1, 12 m, 8°, Slope angles, 10°, 12 m, 16 m, 2°, 12°, Zone 3 Potential landslide, Zone 4 Old landslide</p>																													
<b>Lab results:</b> <table border="1"> <thead> <tr> <th></th> <th>MC</th> <th>PL</th> <th>LL</th> <th>PI</th> <th>LS</th> </tr> </thead> <tbody> <tr> <td>S1</td> <td>36%</td> <td>30</td> <td>119</td> <td>89</td> <td>23%</td> </tr> <tr> <td>S2</td> <td>33%</td> <td>29</td> <td>124</td> <td>95</td> <td>25%</td> </tr> </tbody> </table> <p><math>\phi = 19^\circ, c' = 11.5 \text{ kPa}</math></p>													MC	PL	LL	PI	LS	S1	36%	30	119	89	23%	S2	33%	29	124	95	25%
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1	2				R.L.	depth																						
project Whitney, house site location investigation      location 76 Beach Road, Legana, 18 m from boundary																												
co-ordinates		503900, 5422900		drill type	Triefus		hole commenced	11.7.1984																				
R.L.		21 m approx.		drill method	Auger		hole completed	11.7.1984																				
inclination		V		drill fluid	None		drilled by	B. Cox																				
bearing							logged by	WRM																				
							checked by	RCD																				
1	2	3																										
			None			S1	0.3	SM	Sand — grey, very fine, sand with some silt, organic	W	V	L	Soil															
			None			S2	0.7	CH	Clay — sandy, brown, high plasticity	M	S		Transition zone															
						S3	1.0	CH	Clay — grey-brown, mottled, highly plastic	M			Moist clay															
							2.0	CH	Clay — brown, highly plastic	D	SL		Dry clay															
Hole stopped by M Whitney																												
<p>The diagram shows a plan view of the site. Beach Road is on the left, with a Hedge and Hole 2 nearby. A path leads from Hole 2 through a slope of 8° to a point 18 m away, then a slope of 10° for 12 m to a point 16 m away, and finally a slope of 2° to a point 12 m away. A vertical dashed line indicates a 12° slope. Zone 3 is labeled as a Potential landslide and Zone 4 as an Old landslide.</p>																												
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