



Investigation of house cracking at 21 Cottesloe Street, Lindisfarne

by *W. R. MOORE*

A detailed inspection under a house at 21 Cottesloe Street, Lindisfarne, was undertaken on 27 October. Two hand auger holes were drilled on the northwest and southwest corners of the house. The lithological logs of these holes are attached, while the clay samples collected were submitted for testing in the Department of Mines soil laboratory.

A narrow strip of wet and very moist clay was observed by the foundations under the house along the western wall and down the slope along the foundations at the southern and northern walls. From the staining present it would appear that this wetting and drying has occurred frequently in the past. With the garden around this section of the house having been recently watered this wetness showed the lack of drainage in this area. Significantly the wet area coincided with the cracking along these three walls.

Because of the likelihood of damage to the driveway and gardens, the trailer drill was not used as planned, with a hand auger drill being used instead. Holes were drilled at the northwest and southwest corners of the house to depths of 1.8 m and 1.5 m in clay. A sequence of black organic soil was followed by dark brown clay subsoil with a transitional zone of orange clay, derived from the weathering of dolerite. All the clay above the extremely weathered dolerite was moist and highly plastic, and no doubt expansive, whereas the orange clay was dry and hard.

These black and brown dolerite-derived clays are known to be expansive and have caused house

cracking problems in both Hobart and Launceston. Even with the limited depth of 1.5 to 1.8 m at 27 Cottesloe Street, differential movements within the clay could cause the existing cracking, given the shallow strip foundations situated on the upper moist clay, although this does not explain why this cracking has occurred only within the last two to three years. The most obvious explanation for this is the neighbour's line of trees bordering the western boundary fence, particularly as roots were found throughout the moist clay in both holes drilled. Both drill holes were gravel packed and slotted casing inserted. If any excess water can be collected it will be chemically analysed which may indicate its source.

It would appear prudent to stop this seepage along the wall's foundation. A deep drain along the boundary fence back-filled with gravel and a suitable drainage pipe is recommended. This drain should have an adequate fall and outlet pipe away from the house, preferably to the road bank. When the walls are repaired the concrete path should be extended from the house to the fence, with a plastic liner along the western side of the house. The foundations of the cracked section of the walls may require some strengthening but underpinning of the entire cracked area does not appear warranted.

[11 November 1987]

ENGINEERING LOG - BOREHOLE

borehole no. 1
sheet 1 of 1

project		Cracked House - Mrs. Newitt 27 Cottlesloe St. Lindisfarne		location		N.W. Corner of House In middle of Pebble Garden.	
co-ordinates		5297-5254.		drill type		Syl Handdrill Machine	
R.L.		50m		drill method		Auger	
inclination		V.		drill fluid		None	
bearing		-		hole commenced		29-10-87	
				hole completed		
				drilled by		B. Cox & W. R. M.	
				logged by		W. R. M.	
				checked by		R.C.D.	

penetration 1 2 3	support	water	notes samples, tests	metres		graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetr- ometer kPa	structure, geology
				R.L.	depth							
	None	None		S1 -		CH	Clay Black Organic Highly Plastic with roots	M	F		Clay Soil	
	None	None		0.5		CH	Clay Dark Brown Highly Plastic. White Flecked with Ironstone Nodules Roots present.	M	F ST.		Clay	
				S2 -		CH	Clay Brown - mottled white Calcite zeolites etc. Few ironstone nodules No roots seen.	M	V ST		Transitional Zone.	
				S3		CH	Clay - Orange Brown with a few white nodules Med. Plasticity Sudden Transitional Interface	D	H		Extremely weathered Dolerite.	
				S4 -	1.5	Mh						
				S5								
Hole Stopped 1.8m. could not penetrate further.												
N.B. All Samples Disturbed collected from Augers.												

ENGINEERING LOG - BOREHOLE

borehole no. 2
sheet 1 of 1

penetration		support	water	notes samples, tests	metres		graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetr- ometer kPa	structure, geology	
1	2				R.L.	depth								25
project Cracked House Mrs. L. Newitt location S. W. Corner of House. 27 Cottlesloe St. Lindisfarne														
co-ordinates		5297 - 5254.		drill type	Styl Handdrilling Machine			hole commenced	29-10-87					
R.L.		50m.		drill method	Auger			hole completed	29-10-87					
inclination		V		drill fluid	None			drilled by	B.E. Cox & W.F.M.					
bearing		-						logged by	W.R.M.					
								checked by	R.C.D.					
		None	None	S1 -		OL		Organic Silts and Silty Clay. High % of organic material Leaves, roots & compost.	D	Fr			Clay soil	
				S2 - 0.5		CH		Clay - Black - Dark Brown. Highly Plastic. Some white nodules & Flecks Roots present.	H	F			Clay	
				S3 - 1.0		CH		Clay - Orange Brown - white Flecked & Nodules - Highly plastic - Roots	M	St			Transitional Zone	
				S4		Mh		Clay Orange Brown. Nodular. White Calcite Nodules Med-Plasticity	D	H.			Extremely weak dolerite	
				S5 - 1.5				Hole stopped 1.5m. Drill could not penetrate further.						
								N.B. All Samples Disturbed						