TASMANIA DEPARTMENT OF MINES
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Inspection of a property at George Town

by W. R. Moore

A property at 5 and 7 Esplanade South, George Town, was inspected following reports of cracking.

The single-storey brick house is situated on a flat, double block. On the foreshore, on the opposite side of the road, is a stony beach of basalt boulders and outcrops. The elevation of the block above the low tide level is estimated to be approximately five metres. With such a flat block, the cracking observed on the house has nothing to do with slope instability. The house is cracked on the southwest corner close to the foundation level and in the north wall of the front porch. In the latter area, the cement between the bricks had been repaired but has cracked again. There was also cracking in the northwest corner, with a small crack present beneath the window, and in the back porch wall near the electricity meter box. Only in the southwest section of the house is the cracking considered severe.

As the foundations are not exposed it was not possible to see if the cracks extended through the foundation footings.

A hand auger hole was drilled to a depth of one metre at the southwest corner. The clay became so sticky at this depth that the auger became very difficult to extract. In the auger hole dry surface loam (ML) changed to a black clay (CH) which felt moist. Three samples were collected at 0.1, 0.5 and 1.0 m depths. These samples were tested in the Department's soil laboratory for moisture content, linear shrinkage etc. to obtain the properties of the surface soil and underlying clay (Appendix 1).

It is hoped these laboratory results will give support to the theory that the cracking is due to shrinkage in the underlying clay as result of the last three year's summer drought and lack of winter rains. Several long surface cracks were seen on the lawn, particularly near the garage, indicating that soil shrinkage was occurring at this locality.

[18 April 1984]

APPENDIX 1
Soil laboratory results

The soil laboratory results from the three samples collected by Mr Moore from the cracked corner of the house at 7 Esplanade South, George Town, are attached.

These tests confirm that the underlying clay is highly plastic with a very high plastic index of 162 and 108, and a linear shrinkage of 27% and 28%. The clay is dominantly montmorillonite, of the expansive clay mineral family. The moisture varies from 37% at the surface to 47% at a depth of one metre.

With clays such as these underlying the house there is little doubt that the cracking is the result of movement in the clay causing excessive stress in the house foundations. The probable cause of this movement is the clay drying out from the house being unoccupied for a long period with no watering of the gardens and lawns, combined with the drought and lack of winter rains in 1982–1983. As the evaporation and drying is likely to be greater on the south and west side the movement is likely to be greater in these areas where the cracking was most severe.

SOIL LABORATORY RESULTS
7 ESPLANADE SOUTH, GEORGE TOWN

Sample No.	*Depth*	*Moisture Content (%)*	*Liquid Limit*	*Plastic Limit*	*Plastic Index*	*Linear Shrinkage*
1	0.1 m	37	-	-	-	-
2	0.5 m	41	136	34	102	27
3	1.0 m	47	143	35	108	28

XRD of clay showed montmorillonite presence to be very strong.

[15 May 1984]