

TR 10-83

13. DAMAGE TO HOUSES, ST. JOHNS PARK, NEW TOWN

by I. B. Jennings

At the request of the Public Works Department three houses in Creek Road which have suffered structural damage due to settlement have been examined. The houses are situated on the S side of Creek Road opposite the steep-sided gully cut by New Town Creek.

Bedrock in the area consists of Jurassic dolerite which outcrops in the bed of New Town Creek. Along the S bank of the creek the dolerite is overlain by 20 to 30 feet of well compacted river gravel composed mostly of dolerite fragments, some partly weathered, together with a few fragments of sandstone and siltstone, in a matrix of sand derived largely from weathered dolerite. The gravel is well cemented and stands up as near vertical cliffs. Test pits alongside the foundations of the affected houses disclose a yellow brown clay similar to that derived from weathered dolerite.

The damage consists of cracks up to about 2 inches wide through the outside walls of the houses. Numerous cracks are also evident on the inside walls and particularly along the junction of the internal walls and ceilings. Generally the pattern of failure indicates settlement of the NE corners of the houses causing cracking and rotation of the upper portion of the houses. The uppermost house appears to have damage suggesting settlement of the front portion of the house. The roads and pavements in the surrounding area are relatively new and give no indication of movement apart from a crack in the kerbing which suggests settlement to the N.

Up till about 6 or 7 years ago the stormwater from St Johns Park was allowed to run to waste on the surface. This served to keep the clay under the houses in a saturated state. After improvements to the drainage at the Park the clay under the houses dried out and now shows a strong system of dehydration cracks.

Damage to the buildings was not observed until about 2 or 3 years ago. Since then the cracks have become prominent and are reported to be developing rapidly.

A careful examination of the houses and surroundings revealed no sign of a landslide which would have caused the damage. This inspection, however, was hindered considerably by the recent improvements to the roads in the vicinity, but if such movements were occurring it would be expected to be evident in the cliffs along New Town Creek and no evidence can be found there for such movement. A geological cause of this nature, therefore, seems to be unlikely.

It seems likely that the damage may be caused by alteration of the moisture content of the clay underlying the houses due to improved drainage. It is noticed that the settlement seems to be occurring along the N and NE sides of the houses. Those are the portions which receive the most sun and are most likely to be drying out more rapidly. It is therefore suggested that the cause may be revealed by a study of the moisture content of the clay in this area. Further study could best be carried out by officers of the Public Works Department equipped to study problems in soil mechanics.