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13. Examination of Proposed Subdivision, East Devonport

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PART 1. PRELIMINARY REPORT

Messrs Pitt and Sherry, consulting Engineers, of East Devonport, requested an examination of a proposed subdivision in the Ambleside suburb of East Devonport about 1.2 km south of the Bass Highway.

TOPOGRAPHY AND GEOLOGY

The proposed subdivision is situated on land sloping west towards the Mersey River estuary and lies between 15-55 m a.s.l. East of the subdivision, the land surface rises to c.60 m a.s.l to a dissected basalt plateau. Parts of the subdivision are steep and several small valleys extend through or into the area.

The geology of the area is difficult to determine exactly. East of the eastern boundary of the subdivision, the land is underlain by Tertiary basalt whereas along the shoreline there are outcrops of weathered Jurassic dolerite. Dolerite boulders occur at many places within the subdivision, from the highest to the lowest points, and although *in situ* dolerite probably underlies most of the area within the subdivision, there are no outcrops. The dolerite exposed in Public Works Department quarries near the foreshore is deeply weathered and has at least one shear zone due to faulting. Deep weathering could, therefore, explain the absence of dolerite outcrop in the subdivision. Dolerite can be seen intruding Permian sediments along the foreshore south of the subdivision. Dolerite exposed in part of the P.W.D. quarry, on the south-west edge of the subdivision, is very fine-grained and is also near the margin of the dolerite intrusion.

Some areas of the subdivision are underlain by sand and clay, some of which may represent Tertiary sediments underlying the basalt and overlying the dolerite. Other areas of clay are probably derived from the weathering of the dolerite.

Because of the nearness of Permian sediments and the fine-grained dolerite exposed on the margin of the subdivision, the possibility that some areas of the subdivision are underlain by Permian sediments should not be excluded.

Three 0.5 inch auger holes were drilled with a 6-foot auger in clay areas. Two holes indicated that clay extends to at least 2 m and the other struck hard rock at 1.4 m.

POSSIBILITY OF INSTABILITY

In some parts of this subdivision the land surface has a hummocky nature but it is difficult to determine whether this is due to old landslips or whether it is just a feature of weathering and erosion. A common cause of landslips in many parts of the north-west coast (*i.e.* deeply weathered basalt overlying Tertiary sediments with the contact between them on a steep portion of the topography) appears to be absent from this subdivision. This situation occurs about 800 m north of the subdivision, where numerous old slips can be seen.

Some material derived from the weathering of basalt occurs on the surface and is probably due to material slipping down from the area above the subdivision.

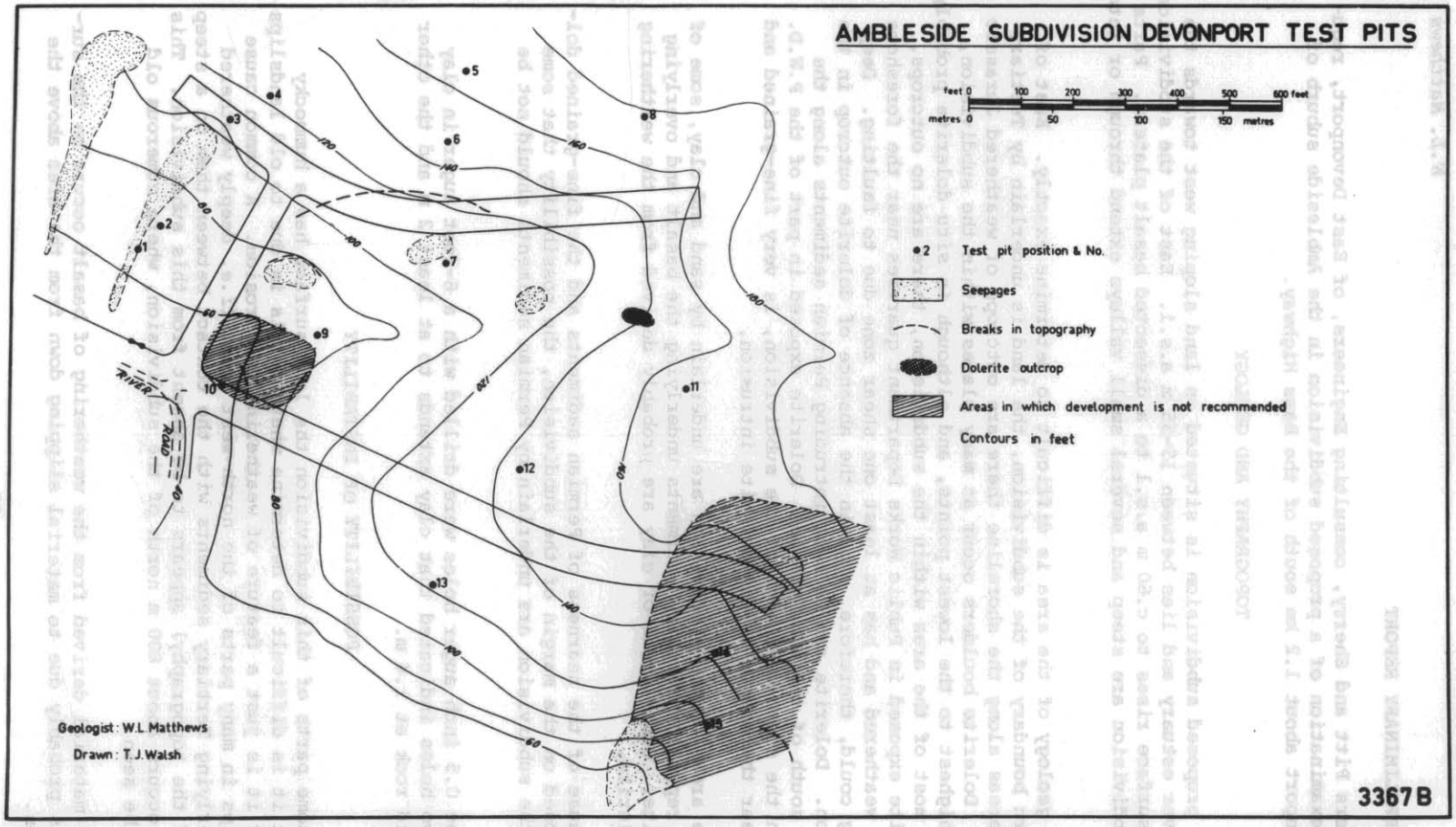

Figure 13.

5 cm

Seepages are a fairly common feature in and around the proposed subdivision. Many of them probably come from the base of the basalt or from permeable horizons below the basalt. One large seepage occurs near the northern margin of the subdivision and appears to be well below the base of the basalt.

Steep slopes, seepages and clay suggest that slips could develop in parts of the proposed subdivision. More should be known about the geology of the area before any useful statement on its likely stability can be made, especially in steeply sloping areas underlain by clay. Additional information could be obtained by drilling or from test pits dug with a back hoe. Some ideas of the thickness of clay and other unconsolidated material would be available from these holes.

The flatter areas are likely to be stable provided they are underlain by dolerite, as is suspected. Some drilling or test pitting could be carried out in some of these areas to prove what rock type occurs.

CONCLUSIONS

Parts of this proposed subdivision are steep and clay underlies some of these steep areas. These factors together with the occurrence of seepages indicated that further investigations should be carried out on this land before development proceeds. Drilling or test pitting with a back hoe is suggested. Areas where this work is recommended, are shown on the accompanying plan. This work would give information on the thickness of the unconsolidated materials and also allow more accurate interpretation of the subsurface geology.

PART 2. TEST PITS

Fifteen pits have been dug with a back hoe in the approximate positions shown in Figure 13. The pits indicate that deeply weathered dolerite underlies the whole area. Further surface investigation resulted in the discovery of a small dolerite outcrop (fig. 13). The fact that several holes were dug to 4-5 m gives an indication the degree of weathering in the dolerite. Pits 10, 14, 15 show that varying thicknesses of sandy clay and clay overlie the dolerite in these areas. These beds are probably an accumulation of Tertiary sediments, and areas where they occur on fairly steep slopes (10-15°) are potentially unstable. The soil in some of the higher areas is derived from the weathering of basalt which occurs further up the slopes.

A number of areas have been marked where there is a change in slope or break in relief (fig. 13). They could represent the heels of very old slips or could be the result of differential weathering in the dolerite. A number of seepages have been noted in the proposed subdivision and these are also shown (fig. 13).

RECOMMENDATIONS

The steepness of some of the land surface, the seepages, and the possible very old slips suggests that development should proceed only after suitable precautions have been taken. The seepage and streams throughout the area should be drained to prevent accumulations of water in the soil. These drains should have some built-in flexibility so that they would be unaffected by small movements. cuttings around steep portions of the land surface should be avoided or the batter should be low so as not to promote instability, particularly to the crescent-shaped road on the east side of the subdivision but also to portions of other roads and to excavations for houses. Because

of the thickness of sandy clay and clay and the steepness of areas around Pits 10, 14, 15, it is suggested that these areas are not developed as there is some chance of unstable conditions developing if disturbed.

The blocks in this proposed subdivision are large and allow a wide choice of sites for the houses. It is suggested that the houses, where possible, are built away from steeper portions of the land surface. The P.W.D. are creating quite steep high cliffs in their quarry face and although slips are not usually regarded as being associated with dolerite in most areas they are not unknown (Leaman, 1972). The depth of weathering in this locality suggests that some precautions should be taken. Houses should be built some distance back from the edge of the cliffs.

REFERENCE

LEAMAN, D.E. 1972. Landslips, Upper Plenty Road. *Tech.Rep.Dep.Mines Tasm.* 15:99-101.