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SUPPLEMENTARY REPORT

on

GROOMS SLIP

This report is intended to accompany the two attached geological sections of Groom's Slip, and to a slight extent to be supplementary to my first report.

SECTION ON LINE "B"

The section along line "B" is drawn with an exaggerated vertical scale of 20 feet to one inch compared with a horizontal one of 100 feet to one inch. The surface line is copied from the plan and sections drawn by the Public Works Department.

The geology is shown on the section as a result of observations made at various places over the area occupied by Groom's slip. Many of these places occur on other section lines. e.g. C,D, F etc., and the section from the geological viewpoint is, therefore, a composite one made up from information obtained from various section lines in addition to line "B".

The geological section is drawn to show the basalt flows and interbedded gravelly clays etc. The modifications due to soil and sub-soil, filling along road, recent alluvium etc., in swamply places and along creeks, detritus, are not shown. Only the major slips of ancient origin are shown, the presence of these being deduced from the characteristic hollows and shapes of the surface which are associated with land slips. Smaller slips occur but no effort has been made to show them.

It will be seen from the section that the formations from bottom to top are :-

(1) Bedrock of dolerite. As stated in the report the surface of this represents the floor of a pre-basaltic bay. It is shown with a gradual rise to the south, but the actual amount of slope is not known. Between low and high water levels this rock on the beach is completely decomposed to a clay-like body. Some of this decomposition probably occurred in pre-basaltic times and so will extend inland beyond present high water mark. In depth the effect of weathering will decrease and ultimately hard, unweathered dolerite will be met, but it is impossible to state at what depth the latter will be found.

(2) A layer of sea sand. This was deposited in the old bay and may have been partly of dune origin near the shores thereof. The uneven nature of its upper surface is due either to its duen formation or to erosion prior to the overlying basalt flow. It has a maximum thickness of 25 feet near the western side of the slip. It is expected that it will extend inland some distance but it is impossible to predict how far or where the southern shore of the old bay is situated. Generally it is not anticipated that the bay extended more than 20 chains inland.

(3) Lower layer of basalt. Completely weathered basalt occurs in the road and railway cuttings at the western side of the slip. In the railway cuttings it is seen to overlie the sand layer. Its thickness is apparently 20 to 30 feet and it should occur over the whole of the area occupied by the old bay.

(4) Lower layer of gravelly clay. Clays with numerous small water-worn pebbles occur at heights of 5 to 60 feet above H.W.M. They resemble similar clays and gravels occurring along the N.W. Coast especially west of Penguin, and are possibly of marine origin although no shells have been found in them. They probably form a layer overlying the lower layer of basalt. Their thickness is indeterminable due to lack of exposures, but it has a maximum of 30 feet.

(5) Upper layer of sand. Sand occurs in a small swamp on the "C" line some 80 feet above H.W.M. The general shape of the depression suggests that the sand forms a horizontal layer interbedded with the basalt, clays, etc. This layer, if present, is quite a different one from the one just above sea-level.

(6) Middle layer of basalt. Basalt occurs in the drains from the small swamp on the western side of the slip and about 90 feet above sea-level. This layer would overlie the sand and has a thickness of approximately 25 feet.

(7) Upper layer of gravelly clay. The presence of this layer is indicated at many places at a height of 130 to 140 feet above the sea. Just below the main fracture at the south-east corner of the slip, the gravelly clays are exposed below basalt. It can be traced westwards along the main fracture by the pebbles in the soil, and its presence at the south-west corner of the slip is indicated by a number of large water-worn pebbles. This layer has a maximum thickness of 30 feet.

(8) Upper layer of basalt. Basalt occurs in the upper part of the main fracture at the southeast corner of the slip. It overlies the upper layer of gravelly clays at a height of 140 feet above the sea. Its upper surface was not determined as its outcrops are non-existant to the south and it would be outside themain part of the slip This flow or a number together with interbedded clays will extend to the summit of the basalt covered hill which rises to the south.

SECTION ON LINE "D"

This section is drawn with horizontal and vertical scales of 100 feet to one inch and represents a natural section of the surface. The geological structure is shown as in the section on line "B".

The zone of main fracturing and those of the subsidiary fractures are also shown.

SLIP

The natural section on line "D" shows that the grade of the surface is not steep and that some such plane as that of the bedrock of dolerite is necessary to enable the large block that is involved in the slip, to move seawards. The upper part of the dolerite has weathered to a clay which when wet is slippery and offers less friction to a moving body. It would appear that a greater amount of water than usual percolated underground and saturated the weathered dolerite and overlying sand. That such greater percolation was due to extraordinary conditions of rainfall is evident from the following table in which it is seen that during May the rainfall was six inches above or three times the average and during June four inches above, or twice the average amount.

	ULVERSTONE		BURNIE	
	Rainfall	Above or below average.	Rainfall	Above or below average.
	Points	Points	Points	Points
April.....	210	90 below	339	19 above
May.....	979	627 above	979	620 "
June.....	932	435 "	981	406 "
July.....	555	81 "	561	90 "
August.....	378	28 below	376	57 below
September...	446	36 above	444	56 above

The block involved in the slip is composed mainly of gravelly clays and sand with two interbedded layers of basalt. While the block as a whole is reported as moving 14 feet seawards, numerous subsidiary zones of fracture also occur in the block. These are due no doubt to the weakness of the rocks (clays and sands) in the block. The two basalt layers should have had a reinforcing effect but have been weathered to a considerable extent which has greatly reduced their strength. To account for these fractures it appears necessary to assume that the earlier movement is in the front of the slip, thus removing support from the ground behind and enabling small blocks to fracture. On the other hand when resistance to movement is met with, parts of the ground are forced up by the pressure behind and thus the small elevations and some of the fractures are formed.

RECOMMENDATIONS

As stated in the previous report, little or nothing can be done until the slip ceases to move. In the meantime three bore-sites have been selected on Line "B" and at two or three of these sites, bore-holes will be sunk. These will serve to verify or not the structure shown on the geological sections particularly as regards the lower layer of sand, and the slope of the bedrock of weathered dolerite.

When the movement ceases, tunnels can then be driven to drain the surface of the bedrock and the overlying rocks (sand or clayey sand). The information obtained from the bore-holes will enable the tunnels to be sited to greater advantage particularly as regards the level.

Also when the movement ceases it will be necessary to complete the system of surface drainage already started. Further it will be advisable to minimise the possibility of surface water and rain water entering the main and subsidiary fractures in the slip by filling the cracks, levelling the surace in the vicinity, and perhaps turfing the broken surface. This procedure would tend to prevent further slips in the future.

The undertaking of further engineering work such as piling etc. to prevent future movement is a matter for the Public Works Department.

Signed (P.B. Nye)
GOVERNMENT GEOLOGIST.

Mines Department,
HOBART.

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