Section 3—Engineering Geology

TRS. 194. 196

LANDSLIPS AT BEAUTY POINT

by F. Blake.

At the request of the Chief Engineer, Public Works Department, a geological investigation was made to determine the cause and prevention of landslips affecting the West Tamar Highway at Beauty Point.

LOCATION AND ACCESS

Beauty Point is a township on the western shore of the estuary of Tamar River, in the vicinity of Port Dalrymple wharves, known as Beauty Point and Inspection Head. Between the wharves the highway parallels the shore line in an average distance of four chains.

TOPOGRAPHY

From the shore the land rises for about 10 chains with moderate steepness to a swampy water-logged platform, approximately 100 feet above sea level. Above the swamp the hill rises abruptly for a further 60 feet to the surface of a plateau extending inland.

GEOLOGY

Lower Tertiary Beds—The oldest rocks in the area consist of clays, sands and gravels extending from sea level to the swampy platform. These beds underlie the slide zone and are now largely covered by slip material.

Tertiary Basalt—A thin flow of basalt is exposed overlying the Lower Tertiary beds west of Inspection Head Wharf and this probably extends further south along the line of initial slips, although no outcrops are visible in that vicinity.

Upper Tertiary Beds—Fifty feet of loosely consolidated sands overlain by 10 feet of fine gravels succeed the basalt on the steep slope rising to the plateau.

THE LANDSLIPS

The initial slips were caused by rain water percolating from the plateau surface down through the gravels, sands and weathered basalt to an underlying impervious clay bed at the foot of the steep upper slope of the hill. Water accumulating on and lubricating the clay, formed a greasy head on which the overlying material slipped down the hill.

This process has continued at intervals over a long period and is accentuated following periods of excessive rain fall.

The greatest accumulation of slip material occurs along the toe of the steep upper hill slope and this has formed a dam behind which a large quantity of water is held in the swamp area.

Two active slips, now in progress below the swamp and adjacent to the highway, have extensively damaged the road surface over lengths of 100 yards and 80 yards respectively.

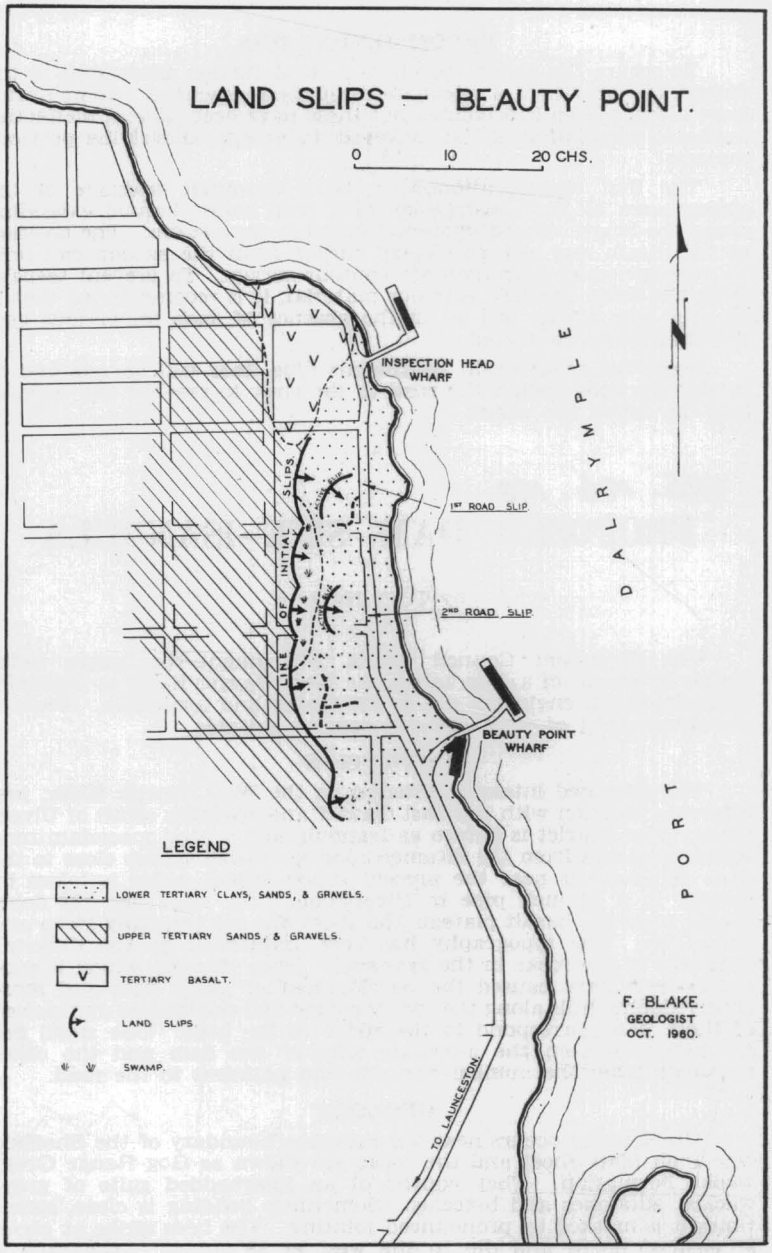

FIGURE 49.

5 cm

RECOMMENDATIONS

To secure the active slips and prevent further movement in the future, the provision of adequate drainage is essential. Some drains have already been constructed but these have been largely ineffective owing to percolation of the conveyed water into underlying pervious material.

The first consideration must be a thorough drainage of the swamp area by the construction of a deep main channel extending along the length of and immediately below the swamp. The position of this drain and any subsidiary outlets from the swamp can only be determined by a preliminary contour survey. To prevent seepage from the drain through pervious material, it is recommended that it be sunk into a clay bed or, in the absence of such impervious bed, the channel be concreted.

From the main drain continuous pipe lines will be required to convey the water below the road to the river to prevent any leakage into the active slip areas.