

Stability of subdivision at Penguin

by W. L. Matthews

Mr J. Owens owns some land at the southern end of Seaside Crescent in the eastern part of Penguin. A survey in 1963 (Matthews, 1965) indicated that this area was part of an unstable zone. Mr Owens requested that the area be re-examined as a drain had been installed.

GEOLOGY

A narrow marine terrace occurs in this part of Penguin and from this, the land surface rises sharply for about 200 feet to a basalt plateau further inland. Behind the area in question, there is a sharp rise of about 100 feet then a bench and then another rise. Cambrian rocks outcrop along the foreshore, and basalt soil and talus cover the inner part of the marine terrace and the slopes towards the basalt plateau. Some gravel occurs on top of the basalt.

FACTORS AFFECTING STABILITY

The two remaining blocks in the subdivision have strong seepages coming out on them or from behind them, and the drain collects some of this water. The drain was installed about the time of the original survey and consists of a trench with a 9 inch diameter concrete pipe which has gaps between the lengths so that water can enter the pipe along its length. At the moment the drain is partially successful but it does not extend across the whole seepage area and probably only collects some of the water from the seepages it crosses, as parts of the walls of the trench have collapsed. It is probable that some of the entrances to the pipe will be closed to water because of this.

The slope behind the marine terrace has a concave (inland) shape in the vicinity of the subdivision which could represent an old slide scar. Behind the subdivision there is an old slide which has affected an area which includes the subdivision in question. An area of internal drainage occurs along the depression of the heel of this slip. Because of the wide seepage zone around the subdivision, this appears to be an area where drainage from inland is concentrated. Types of slips which could occur in the area include shallow slides down the face of the slope or reactivation of the deep seated rotational slip behind the subdivision. The first type could probably be prevented to a large extent by effective drainage of all the seepage zones, although prevention of reactivation of the rotational slip or the formation of another such slip plane would be difficult because much of the water arriving at the slip plane would be coming from inland, underground.

With heavy rains it could be possible for either type of slide to occur.

CONCLUSION

Because of the extensive seepage zone, steepness of the area, some fast mass movements in the area, and the deeply weathered basalt, any development of the area should take the possible instability into account.

REFERENCE

MATTHEWS, W. L. 1965. Geology of the Penguin area. *Tech. Rep. Dep. Mines Tasm.* 9:96–101.

[22 January 1968]