16 PRELIMINARY REPORT ON LANDSLIPS ON THE BOAT HARBOUR ROAD

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ABSTRACT

Small landslips along the access road to Boat Harbour have been examined. They are related to a wide zone of unstable ground along the coastal escarpment. Remedial measures are suggested and it is recommended that an alternative route into the area should be sought.

The Wynyard Council requested that an examination be made of landslides affecting the access road to the settlement of Boat Harbour. Following heavy rainfall during the past winter the road has subsided and the council and local inhabitants are concerned that the only access route to the area could be dislocated by further movement.

The road passes from the basalt plateau to the shore platform diagonally across the face of a steep seaward facing escarpment composed of Tertiary basalt probably interbedded with and underlain by Tertiary sediments. The escarpment has been oversteepened by marine erosion and the abundant landslide scars, some ancient and some still active, testify to the instability of the slope. The surface material on the slope is a mixture of clay and basalt boulders with occasional outcrops of apparently solid basalt. The narrow marine platform at the base of the slope is composed of basalt talus. East and west of the Boat Harbour settlement bold crags of Precambrian quartzite outcrop to a considerable height above sea level. However, opposite the unstable area affecting the road, basalt outcrops along the sea shore. Much of the water supply for the resort is obtained from springs along the face of the escarpment which are reported to flow freely throughout the year.

The landslips are debris slides and mud flows, probably not deeply seated, in the basalt talus mantling the escarpment. They are related, as are the springs which promote them, to a pre-basalt topographic low area in the basement rocks.

The access road crosses an old major landslide and it is in this area that several failures of the road fill have occurred recently. The small road failures are symptomatic of a wider area of instability and it seems likely that the area will always cause trouble particularly after heavy rainfall. A major slide completely dislocating the road could occur rapidly and at any time, but it is most likely to occur during or following heavy rainfall. A few small seepages were noted in the unstable area but much of it, including areas of internal drainage, was quite dry. This seems to indicate that a good deal of the drainage is passing underground along the slip surface. Seepages and wet areas occur along the lower slope of the hillside below the road and the toe area of the slip is thoroughly saturated.

Some improvement to the stability could be made by installing a deep drainage system to drain the two depressed areas on the top side of the road near the present slip. The drains should be taken to a depth of 10 feet or so in order to try and drain off the water

along the slip plane. If possible exploratory drilling should be carried out to determine the depth and shape of the slip plane. Where possible the drains should be made to run straight down the slope so that they are less likely to be disrupted by small movements. The drains could probably be excavated with a back hoe and should be back filled with loose rock. They should be carried from the internally drained areas above the road, under the road to the foot of the slope. Some attention should also be paid to the small creek running down the eastern side of the main slip area which spreads out at the foot of the escarpment and continually saturates the toe area. At the same time the table drain should be restored to a workable condition.

These improvements to the drainage should help to arrest further movement for the immediate future unless further heavy rainfall is experienced before the work can be carried out. Corrective measures to the road fill present a rather more difficult problem. In order to design an effective retaining structure it would be necessary to carry out some drilling in order to determine the depth to the slip plane and the nature of the material above and below this plane. If the slip plane is close to the surface and the material beneath the plane is suitable, piling could be used. If rock is encountered close to the surface a retaining structure such as a block crib or mass concrete retaining wall could be used.

Such works would involve the Council in considerable capital cost and it is worth considering the economics of developing a new access route into the area. The present road crosses a wide unstable area and even if considerable corrective works are carried out the possibility of further slips will remain. It would seem that a reasonable approach to the problem would be to carry out drainage works and temporary repairs to the existing road together with some exploratory drilling in order to maintain the existing access. At the same time a study could be made of other possible access routes which would provide long term security. This Department would be prepared to make a study of the stability of any such proposed routes.

Attention is drawn to the encroachment of buildings onto unstable ground at the foot of the escarpment. Some houses have been built and other houses are being erected upon this unstable ground. The development of gardens, disposal of household drainage and the use of septic tanks is tending to aggravate an already dangerous situation. The Council should exercise extreme caution in issuing further permits to build in the area and strict attention to drainage is important.