

Slope stability of two areas near Wynyard

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The Wynyard Council has requested an examination of the stability of two areas of land in order to determine if they are suitable for building purposes.

Area 1

The general geological succession in this area is as follows:

<i>Probable</i>	
<i>thickness</i>	
<i>(ft)</i>	
1 - 5	brown soil
0 - 5	sandy, clayey calcareous silt
10 - 35	fossiliferous calcareous pebbly siltstone or limestone and tillite
>2	shale

Minor movements have taken place in the soil where the slope is steep (>15°). The soil has either cracked and developed terracettes or else the grass cover has opened up and exposed it. Generally the soil is approximately 2 feet thick and has slipped on more solid material, usually calcareous siltstone. Seepage water is running out under the soil along the shore. The steepness of the slopes ranges from about 80° to 0°. Approximately 70% of the area is 0° to 15° steep and about 3% is steeper than 70°.

The most obvious reasons for the recent movements are that trees have probably been removed and also that the sea is undercutting the slopes in a few places. Because of the thinness of the soil in these areas, local cattle have a disturbing effect on the soil when it is wet.

In general the area will be stable assuming that buildings are to be erected on the more level parts of the area and away from steep slopes. There is an apparent danger from soil erosion and care should be exercised during the construction of drainage for buildings and roadways, in order to prevent the occurrence of washaways. Restoration of the vegetation would be a useful precaution to this end. Stormwater and other drainage should not be allowed to percolate into the soil, but should be piped away to an area where soil damage cannot occur.

Area 2

In this area reddish brown soil overlies basalt. The soil is not a typically sensitive soil and drains well, but this type of soil has been known to slip in areas where the slope is steep. One or two old slips occur at this locality and the soil is thinner than 3 feet in many places. Most of the area is very steep (>20°) and a quarry is situated between lots 6 and 5. Between the road and the quarry the land is fairly flat. The exposed basalt is more than 18 feet thick and has undergone little weathering. The basalt from the quarry is apparently continuous down to the basalt on the shore. It is possible that thin sediments are interbedded with the basalt, but these are not thought to constitute a danger. Some seepage water is present near the shoreline. A dam is situated on the other side of the road and this could be a source of water and consequent danger if overfull. No recent movements of any importance were observed.

The area is inherently stable as the basalt is a solid sound formation, but buildings must be based on basalt rock and not on fill, as the soil has moved to where there are steep slopes and an oversupply of water. In some places the basalt may be more fractured than is observed in the quarry, and a seismic survey to determine rock quality would be a reasonable precaution if building is intended on steep slopes.

REFERENCES

- JENNINGS, I. 1964. Landslides in the Burnie district. *Tech.Rep.Dep.Mines Tasm.* 8:107-112.
- MATTHEWS, W.L. 1964. The Geology of the Burnie area. *Tech.Rep.Dep.Mines Tasm.* 8:103-107.