UR1979_43

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1979/43. Slope stability at Cape Grim.

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Abstract

The stability of slopes on the volcanic rocks at Cape Grim was examined to ensure the safety of the proposed Baseline Atmospheric Pollution Station of the Commonwealth Department of Science. Rock stability was deemed satisfactory but soil erosion already threatens the site and remedies are suggested.

INTRODUCTION

The proposed site of the Baseline Atmospheric Pollution Station at Cape Grim [CQ047937] was examined by the writer and R.C. Donaldson on 4 September at the request of the Commonwealth Department of Housing and Construction.

SOLID GEOLOGY

The geology of the area has been described by Sutherland and Corbett (1967). Slaughter Bluff, on which the station is to be built, is the type area of the Slaughter Bluff Volcanic Breccia. The above reference describes this as 'a crudely bedded darkish very rough textured rock consisting dominantly of angular basaltic fragments in a finer grained matrix, but contains numerous isolated pillow like bodies and some small flows of pillowy lava'.

The rock is fresh or moderately weathered in the cliffs, has few extensive discontinuities and is a high friction material. This character, combined with the general 30° dip inland and a medium strength, ensures a high degree of stability. The wave action at the cliff base is modified by a wave cut platform and little or no undercutting appears to be taking place.

SUPERFICIAL GEOLOGY

The Slaughter Bluff Breccia is overlain at the cliff top by the following sequence, observed in the soil erosion scars 30 m from the present station.

Modern organic soil OH	0.5 m
Brown clay CH	1 m
Calcareous sand, aeolianite, SP	1 m
Old soil horizon	0.5 m
Residual clay derived from weathering of breccia below CH	1 m
Slaughter Bluff Volcanic Breccia	100 m+

This section is sufficiently permeable that the rockhead of the breccia drives out minor springs, and the whole is vulnerable to rainwash and deep gullying where rills cut through the upper clay and wash out the sand. This has apparently been a problem for some years. Aerial photographs taken in 1952 show some activity at CQ045939, north of the present site, but by 1968 this had increased and erosion that was to destroy the Cape Grim trig point had become quite noticeable at CQ045937. This erosion has progressed and is, as noted above, within 30 m of the installations.

It is plain that the cliff top soil is vulnerable and in view of the climate, there is little need to search for a cause for the erosion. Effort would better be made suggesting remedies, for it is within its power to attack a building within a few years if it is not retarded, and from every consideration a cure is to be preferred.

The long slope down to Valley Bay to the south of the site is also vulnerable, but has not yet suffered badly. Access by cattle is beginning to disturb the slope, as they form tracks and their hoof marks effectively retain water that would otherwise run off. Additionally, any removal of the native vegetation will lessen the protection given to the soil. For the same reasons, pedestrian access except along protected walkways should be kept to a minimum.

RECOMMENDATIONS

It is recommended that attempts be made to re-establish some native species by planting, mulching and retaining by wire netting until established.

At the same time the greatest care should be taken to protect the slope to the south of the site from traffic and disturbance, and any storm-water or other effluents should not be discharged on it, but be disposed of down the slope to the north-east.

REFERENCE

SUTHERLAND, F.L.; CORBETT, K.D. 1967. The Tertiary volcanic rocks of far north-western Tasmania. *Pap.Proc.R.Soc.Tasm.* 101:71-90.

[10 September 1979]