

1976/1. Rock conditions in the Lake Dobson area, Mount Field National Park.

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This report was requested by the Department of National Parks and Wildlife for their consulting engineers Messrs Gutteridge Haskins & Davey of Hobart. The work was done during the period 10 - 23 December, 1975.

Two questions were considered: the nature and condition of the rock foundation at the four positions marked on Figure 1, and the general stability of the rock slopes.

The bedrock of the area is everywhere dolerite. It is subvertically jointed into columns 2-7 m across which dip steeply westward, while each column is jointed across its axis producing irregular lengths of column. A mantle of sedimentary deposits derived from the bedrock are mainly the result of ice action during the Pleistocene glaciation. These deposits consist of mounds of coarse ill sorted gravel on the valley floor and of a more or less well defined mantling of dolerite blocks on the slopes. The steeper and more exposed faces have remained clear of the mantle but where it occurs the blocks appear to be randomly oriented and of joint-block size or smaller. Material of sand size is not common but the rock weathers readily to clay and this strongly cements the sediments.

FOUNDATION CONDITIONS

Seismic spreads were fired in the four positions indicated on Figure 1 to establish the nature and condition of the rock foundation. Results were as follows.

1. Plateau [DN660736]

Layer	Thickness (m)	Seismic velocity (m/s)	Interpretation
Surface	2-3	370	Mantle of dolerite blocks
Bedrock		4300	Tight-jointed dolerite

2. Golden Stairs [DN661740]

Layer	Thickness (m)	Seismic velocity (m/s)	Interpretation
Surface	2-4	600- 800	Dolerite blocks
	5	800-1400	Clay cemented blocks
		3400	Open jointed bedrock

3. Between Lake Dobson and Eagle Tarn [DN664743]

Layer	Thickness (m)	Seismic velocity (m/s)	Interpretation
Surface	2-3	800	Soil and dolerite blocks
	>25	2300	Dense well cemented coarse gravel

4. Track gate [DN666740]

Layer	Thickness (m)	Seismic velocity (m/s)	Interpretation
Surface	1-2	800	Soil and dolerite blocks
	>25	2300	Dense well cemented coarse gravel

SLOPE STABILITY

The general stability of the slopes cannot be established so directly.

Erosive disruption of the bedrock surfaces is seen for example around the summit of Mt Mawson. It has taken the form of a displacement of the dolerite columns leading towards toppling failure of the slopes. The tendency is resisted by the interlocking nature of the dolerite columns and the impersistence of the joints normal to the column axes, so that a bond similar

to that in brickwork is created. Ultimately the columns fracture and slip out and then break up to be added to the blocky mantle deposits.

The whole process is generally regarded as effected by an ice wedging action and was very much more active during the glacial period than at present. The fraying of rock slopes is not therefore thought to constitute a predictable threat. Some erosion must always be occurring but is less active than in the recent geological past.

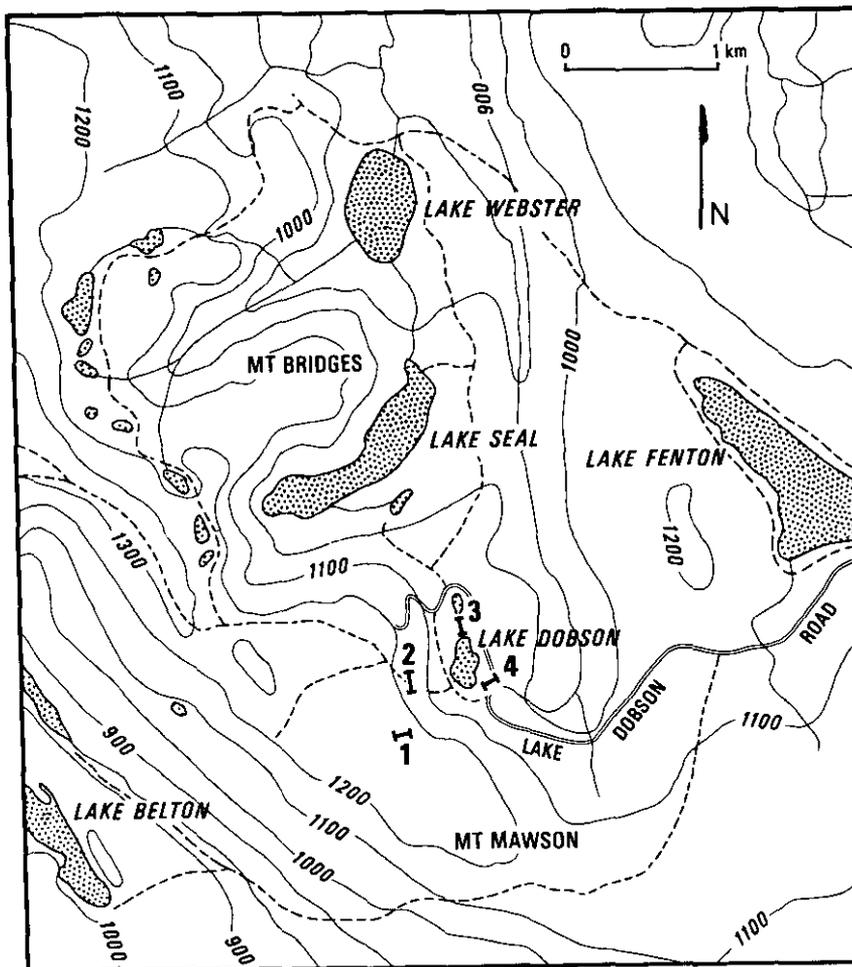
The chasm marked on the drawing appears also to have been caused by an ice wedging process, but here the activity was concentrated along a line of weakness, possibly a fault or master joint. Because of the accumulation of ice and associated groundwater the process became self-sustaining while the necessary climatic conditions prevailed, but the present climate is not cold enough to sustain the process.

Similar features are to be seen on the Mt Wellington massif at a more advanced stage but these too are not now very active. The process has facilitated the removal and supply to the blocky mantle of rock blocks and this movement is as individual pieces and not as a mass movement.

The blocky mantle itself owes its presence to an oversupply of blocks from the bedrock, as against a demand by downward slipping and is not therefore regarded as a finite threat.

SUMMARY

The foundation materials are as indicated above. There is not unacceptable threat of mass movement of the slopes.



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Figure 1. Location of spreads.

