

## 7. Survey of dolerite, Glenorchy Quarries Jackson Street quarry.

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The quarry is situated about 500 m north of the Jackson Street Hydro-Electric Commission substation in west Glenorchy [EN205571]. The total length of quarried face is about 450 m long, somewhat irregular in shape and has two or three benches up to 10-15 m high. The actual excavation of the quarry commenced in the Permian rocks which overlie the dolerite in this area and the contact between the dolerite and the often fossiliferous sandstone and siltstone can be seen clearly in the small southern faces of the quarry. The contact is irregular but dips to the south at about 25-30°. A number of small faults pass through the quarry, generally with a NNW trend. In each case such structures have acted as centres of decomposition. The dolerite near the contact is fine-grained but grades rapidly into upper zone dolerite of medium grain. It is generally and deeply weathered. The rock mass is also highly fractured and many fractures are filled with zeolites, clays and travertine. Apparently massive blue-grey dolerite occurs in only two parts of the quarry. The present evaluation sought to indicate the extent of the higher quality rock.

The hill spur quarried by Glenorchy Quarries is not noted for large outcrops in contrast with the slopes of Goat Hills and Mt Hull immediately to the north-west. In order to assess the potential of the present faces a series of seismic refraction spreads were fired across the hill face (trend approx. WSW-ENE) about halfway between the crest and the face of the highest cut. The spreads extended from the sandstone exposed near Elliott Road to the spur knob above the western limit of the quarry. The spreads, in the position fired, assessed material about 40-50 m behind the face. A summary of the seismic results is given in Figure 16. The discussion below refers to the lettered locations in the figure.

The seismic velocities recorded group distinctly and may be summarised.

750-1000 m/s	Soil.
1350-1500 m/s	Clay subsoil or totally decomposed dolerite.
~2000 m/s	Deeply weathered and intensely fractured dolerite.
2300-2900 m/s	Weathered and fractured dolerite.
3300-3900 m/s	Fractured dolerite. Significant weathering about fractures.
~4500 m/s	Fractured dolerite. Limited weathering about fractures.
~6000 m/s	Massive dolerite. Few fractures. Weathering virtually absent.

An examination of Figure 16 will show that the deeply weathered rock dominates the section and that high grade material is limited to two zones. This observation has been confirmed in the quarry operation.

A. *Spur knob.* A thin soil cover overlies weathered and fractured dolerite. High grade rock is at a depth of 20 m which agrees reasonably with the limited working in the west face.

B. *West of gully.* Quite massive rock is currently being worked in a limited zone about 20-30 m wide in this region. The seismic survey suggests that this material extends into the hill but as a restricted zone. A deeper excavation in this region would prove profitable.

C. *Gully.* Good quality rock is absent at shallow depth and there is

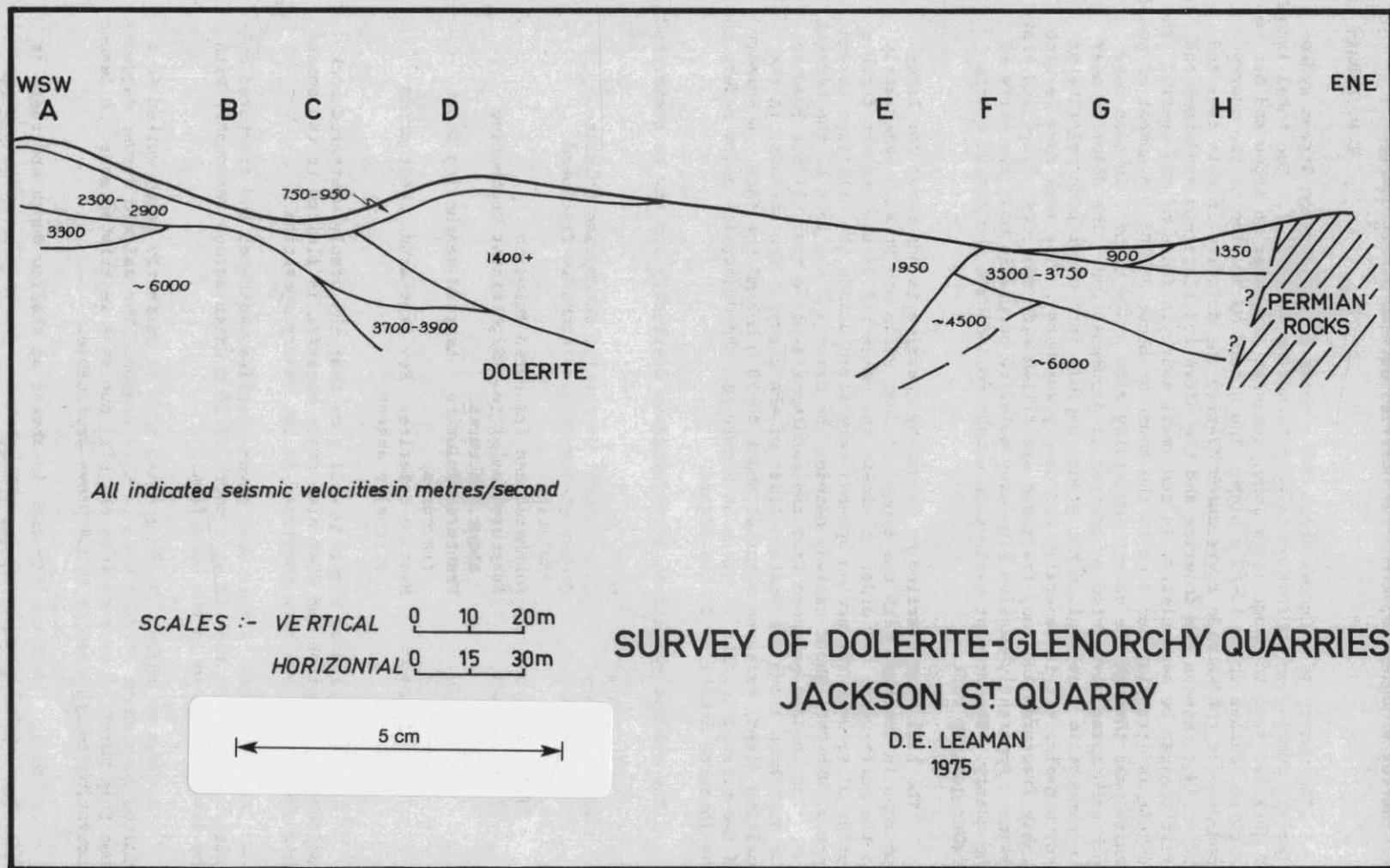


Figure 16.

an increasing thickness of weathered rock to the east.

Additional information was obtained in this region (A-C) by firing along the small spur from A across the hill top and onto the slope to Montrose Road. It was found that a situation similar to that at A persisted to near the hill crest and that the thickness of soil and weathered rock increased slightly down the northern slope. The band of high velocity rock extends back into the hill on the western side of the gully at a depth of 10-15 m. Massive dolerite is also present east of the gully near the crest and the quarry operation should aim to deepen the base of the operation near B and then move northward into the hill.

*D-E. Quarry centre.* The dolerite exposed in this region is very weathered, fractured and faulted and the refraction results reflect these facts and show that the weathering is very deep.

*F. East side of quarry.* The east face of the quarry has exposed apparently massive dark blue dolerite. However, the seismic velocity recorded does not exceed 3750 m/s in this material which suggests that it is somewhat altered. Indeed close examination shows that the material is significantly weathered and chloritised. The pyroxenes are most affected. However, massive dolerite does occur at shallow depth.

*G-H.* Significant weathering persists eastward to the dolerite-Permian contact.

#### CONCLUSIONS

The survey has shown that the reserves of high quality rock are relatively low. The operational reserve is lower since it is not possible to properly work the rock east of F due to the nearness of dwellings in Elliott Road. The massive dolerite encountered in the upper western face near B can be followed to the north but at depths of less than 20 m it will be present only in a narrow zone little more than 30 m wide. This situation could only be improved by lowering the base of operation by 10 m in this section of the quarry before attempting to work northward beside the gully. The seismic results also confirm a useful mix of dolerite weathering products which should allow a reasonable life for the quarry in providing lower grade materials.

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