

TR15-67-68

17. Seismic investigation of the proposed site of the Matriculation College, Newnham, Launceston

W.R. Moore

A seismic refraction survey was carried out on the proposed site on 7-8 October 1970 at the request of the Architectural Branch of the Public Works Department.

Five 90 m spreads with geophones spaced at 7.5 m intervals and two weathering spreads of 12 m each were fired. Three spreads were laid in an approximate E-W direction with two N-S cross spreads forming a box in the centre of the proposed site (fig. 16).

In the two weathering spreads a thin first layer of 270-300 m/s occurs above a 850-900 m/s layer. This top layer in the weathering spread is 0.6-1 m deep. No allowance for this layer was made when estimating the depths to the interfaces of the three layers found in the five extended spreads because their interface surfaces were very irregular and the errors involved would be small.

Three velocity layers were found in the five 90 m spreads:

- (1) A first or surface layer (750-900 m/s)
- (2) A second or middle layer (1500-1800 m/s)
- (3) A third layer with high but variable velocities (3400-5200 m/s). The most common velocity for this layer was 4900 m/s.

The three layers are well defined in all five spreads, but in the centre, E-W and the west N-S spread velocities of 2300-2400 m/s occurred. Only in the centre E-W spread do these velocities form a distinct layer with an interface that separates the overlying 1500-1800 m/s layer from this 2300-2400 m/s layer.

GEOLOGICAL INTERPRETATION

The surface (750-900 m/s velocity) layer is thought to be composed of soil, clays derived from the weathering of dolerite, and soft decomposed dolerite known frequently as rotten dolerite. These materials were encountered when the shot holes were drilled at the site.

It is anticipated that this material will be capable of being removed by mechanical diggers or similar machines.

The second layer (1500-1800 m/s velocity) is thought to be weathered dolerite rock with open and often deeply weathered joints. This material will require ripping for its removal and in areas where high velocities occur (2300-2400 m/s), air tools or explosives may be required.

The third layer must be completely unweathered and sparsely jointed dolerite because of the very high velocities recorded. This ideal quarry rock would require blasting for its removal.

The interface between the surface layer and the second layer has a very irregular surface varying in depth between 2.7 and 5 m with a general slope from 3 to 4.5 m, down the slope of the site to the west. The interface between the second and third layer varies from 12 to 18 m with no great slope on the interface.

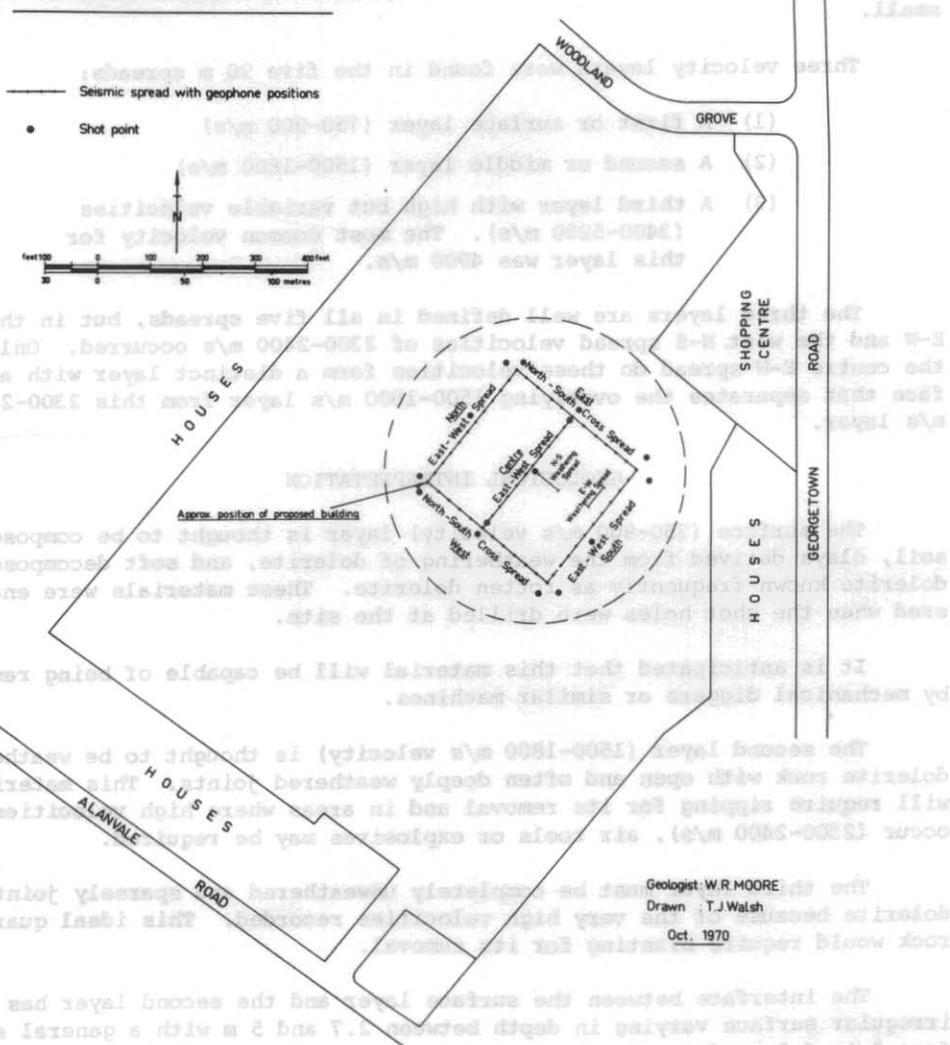
Because the change from fresh dolerite to weathered then decomposed dolerite and to clays derived from the weathering of dolerite is gradual, the velocity layers cannot be expected to coincide exactly with the lithological boundaries. In dolerite areas it has been found that the depth of weathering is irregular and this phenomenon accounts for the irregular interfaces between the seismic velocity layers.

RECOMMENDATIONS

Two Gemco auger drill holes to a maximum of 7.5 m would enable a check to be made on the seismic interfaces. Diamond drilling would be required if the design calls for investigation below this depth. At the same time the dolerite-derived clays could be samples as similar material has caused trouble from excessive shrinkage.

SEISMIC SURVEY

PROPOSED SITE MATRICULATION COLLEGE NEWNHAM LAUNCESTON



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 Drawn: T.J. Walsh
 Oct. 1970

Figure 16.

