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11. SEISMIC SURVEY – PROPOSED C.M.F. TRAINING CENTRE, WARRANE

by M. J. Longman

INTRODUCTION

At the request of the Commonwealth Department of Works a seismic survey was undertaken on the site of the proposed C.M.F. Training Centre at the junction of the Tasman Highway and Quarry Road, Warrane.

GEOLOGY

Four test pits on the site and outcrops in road cuttings adjacent to the Tasman Highway indicates that the following sequence would be expected:—

Rock Type	Depth
Soil	0″-3′0″
Clay	1′0″-4′6″+
Dolerite	2′0″-4′6″+

GEOPHYSICS

Method and Equipment

The seismic equipment used was a portable 12 channel refractor seismograph type G.T. 2 manufactured by Geospace Corporation, Houston, Texas and Hall Sears X2 model K Geophones with a natural frequency of 14 cycles/second.

Ten spreads composed of 12 geophones spaced 5 feet apart were used to cover the site except in spreads 7 and 8 where the shot holes encountered rock at shallow depth. Charges were detonated in shot holes, 3 feet deep and 5 feet from each end of the spread (see fig. 17).

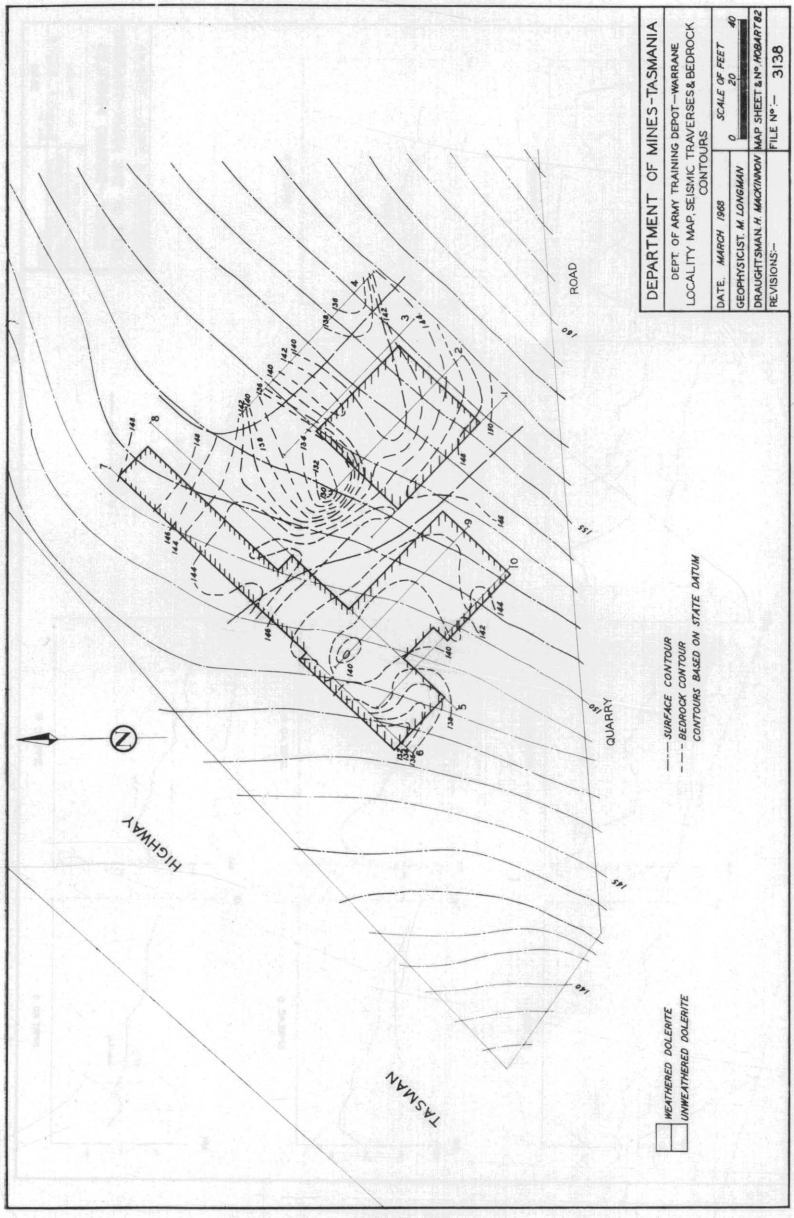

FIGURE 17.

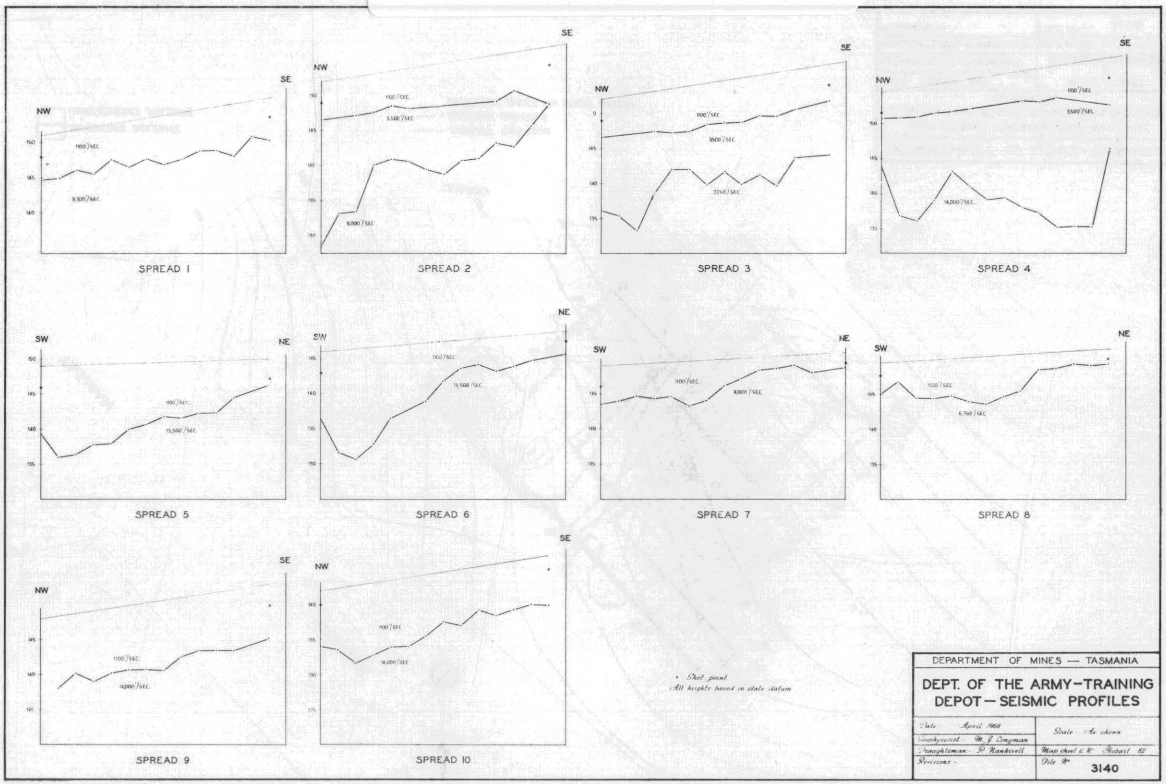
SPREAD 1
SPREAD 2
SPREAD 3
SPREAD 4
SPREAD 5
SPREAD 6
SPREAD 7
SPREAD 8
SPREAD 9
SPREAD 10
NW
SE
SW
NE
• Shot point
All heights based on state datum
DEPARTMENT OF MINES — TASMANIA
DEPT. OF THE ARMY-TRAINING DEPOT—SEISMIC PROFILES
Date - April 1968
Geophysicist - M. J. Longman
Draughtsman - P. Hankevell
Revisions -
Scale - As shown
Map sheet 6 N - Hobart 82
File No
3140

FIGURE 18.

Results

The velocites of longitudinal seismic waves observed from the different layers are:—

ROCK TYPE	SEISMIC VELOCITY (feet/second)
Soil (mainly clay)	1,100
Clay with dolerite boulders	3,500
Dolerite (weathered)	6,750-9,300
Dolerite (unweathered)	14,000

The seismic results are shown as profiles on cross sections 1 to 10 inclusive (fig. 18) and as bed rock contours on the site plan (fig. 17). All heights shown are based on state datum.

Dolerite, varying in depth from 1.5 feet to 24 feet, with a central weathered zone under spreads 1, 2, 3, 7 and 8 underlies the area. The surface soil is approximately 5 feet deep with a deeper zone in the NW corner on spreads, 5, 6, 9 and 10. Underlying the soil on spreads 2, 3 and 4 is dolerite clay from 6 to 18 feet deep with the deepest area overlying the more weathered dolerite.

CONCLUSIONS

All buildings in the area will be partly on weathered dolerite and partly on clay. It is suggested that joints be incorporated in the main building to allow for the differential settlement that will occur and that the foundations of the E margin of the drill hall be located on the 3,500 feet/second layer to reduce differential settling to a minimum.