

UR1986-18

1986/18. Foundation conditions at a proposed flagpole site, Lower Macquarie Street, Hobart

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Abstract

A proposed flagpole site near the Old Gasworks, Lower Macquarie Street, Hobart, is underlain by soil and clayey sediments containing pebbles and boulders up to 0.4 m diameter. This material overlies dolerite bedrock at about 2.3 m from the ground surface.

INTRODUCTION

At the request of Plastic Fabrications Pty Ltd, foundation investigations were conducted at a site in Lower Macquarie Street adjacent to the Old Gasworks. It is proposed to erect a 45 m high free-standing aluminium flagpole on the site. The nature of the underlying materials and the depth to bedrock had to be determined.

GEOLOGY

Dolerite crops out at the BMG cement works and railway yards some 100 m to the north. Foundation investigations for the Hobart International Hotel have revealed dolerite bedrock at a depth of 5.5 m in a diamond drill hole at Evans Street approximately 100 m to the south of the flagpole site. It was therefore anticipated that the dolerite bedrock occurs at a depth of between two to three metres below the proposed site.

RESULTS OF INVESTIGATIONS

A Gemco diamond drill rig was used to core an investigation hole, close to the proposed site. The drill log is appended. Due to difficult drilling conditions resulting in high core loss, the top of the bedrock was difficult to determine. The drill log could indicate a 1.65 m to 2.5 m range in the depth to bedrock, depending on interpretation. The short section of dolerite core between 1.65 m and 1.95 m could be either a boulder or an unweathered corestone, as a trace of clay was present at 1.95 m and core loss occurred below this depth. The top of the dolerite bedrock was interpreted at 2.25 m from the ground surface.

To improve the confidence of the depth to bedrock interpretation a short seismic spread was fired, with a geophone spacing of one metre. This seismic spread indicated a first layer velocity of 350-470 m/sec and a second layer velocity of 900-950 m/sec. The second layer velocity is consistent with weathered and fractured dolerite bedrock. The interpreted layer boundary was calculated at 2.1-2.4 m from the ground surface. This confirms the interpretation from the diamond drill hole.

CONCLUSIONS

The site is underlain by sandy clay containing pebbles and boulders of quartzite, sandstone and dolerite, extending to a depth of about 2.3 m from the ground surface. Dolerite boulders above the bedrock may be of the order of 0.4 m in diameter. An alternative interpretation is that these boulders may be unweathered corestones surrounded by extremely weathered dolerite. This material should be easy to excavate.

The borehole information indicates that closely fractured and moderately weathered dolerite extends from 2.3 m to 2.75 m. This material

should be relatively easy to excavate.

Below 2.75 m, excavation may be more difficult as the bedrock is not as weathered and the joint spacing is wider. The seismic velocity of 900-950 m/sec indicates that the material is rippable but the size of the excavation and the type of machine used will affect the ease of excavation below this depth.

Dolerite bedrock is often variably weathered and jointed and therefore some variation in foundation conditions may occur over the site.

[16 May 1986]

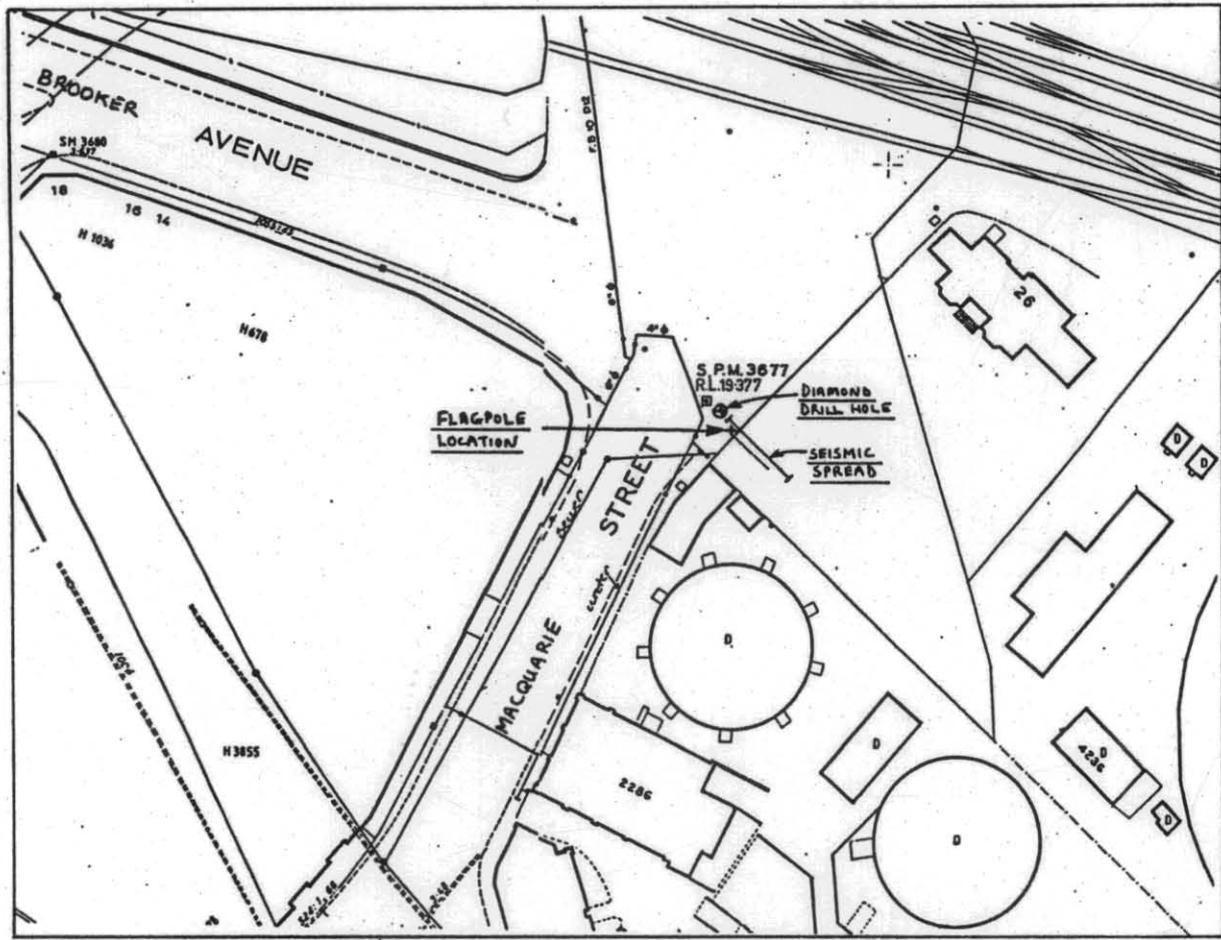


Figure 1. Diamond drill hole and seismic spread location.

# ENGINEERING LOG - CORED BOREHOLE

borehole no.  
**FP 1**  
sheet 1 of 1

3/3

project <b>FLAGPOLE</b>	location <b>OLD GASWORKS - MACQUARIE ST, HOBART</b>
co-ordinates R.L. <b>19.4m</b> inclination <b>VERTICAL</b> bearing	drill type <b>GEMCO</b> drill method <b>NQ BT</b> drill fluid <b>WATER</b>
	hole commenced <b>12/5/86</b> hole completed <b>12/5/86</b> drilled by <b>L. NEWMAN</b> logged by <b>I. SLOANE</b> checked by

drilling information				rock substance			rock mass defects					
case lift	fluid loss	water	notes	lugeons	metres	graphic log	substance description	weathering	strength	defect spacing	defect description	
			SEISMIC VELOCITY	0.3 1 3 10 30 100	R.L. depth		rock type: grain characteristics, colour, structure, minor components.	EL VL L M H FH EH	30 100 300 1000 3000	thickness, type, inclination, planarity, roughness, coating.	significant general	
			S ~400 m/sec		0.79		SANDY CLAY: Dark brown, moderate plasticity. Est. 30% boulders(?) and pebbles (core to 50mm dia) of dolerite, sandstone & mudstone.					
					1.30		DOLERITE: Grey-brown. Medium-fine grained.	SW-MW			DOLERITE BOULDER?	
			CALCAREOUS BROWN SANDS & GRAVEL		1.78		GRAVELLY CLAY - Grey-brown. Some MW dolerite. Trace organic?				TOP OF DOLERITE BEDROCK?	
			= 925 m/sec		2.14		DOLERITE: Grey brown - Medium coarse grained.	MW			Largely broken core - close joints ~ 30-50mm spacing. Some NW seams. Rough, irregular joints. Subvertical.	
					2.45		DOLERITE: Grey. Medium - coarse grained.	MW-SW			Joints. Generally subhorizontal, irregular rough, iron stained. Calcite filled to 2mm. Occasional 60°-70° to core axis.	
					2.64							
					2.75							
					2.91							
					3.20							
					3.43							
					3.88							

