

25. The geology of pipeline routes at Port Arthur.

P.C. Stevenson

The work described in this report was done at the request of the National Parks & Wildlife Service through their consulting engineers Messrs Fowler England and Newton.

The work follows a previous report on the examination of a dam site at Nubeena Road (Stevenson, 1974) and was done on 10-11 December 1974.

The geology of the area covered by the engineers' drawing No. 2806 is not known in detail and the survey was done to reveal the presence of hard rock which would hinder the installation of water supply and sewer pipes.

The basement rocks are dolerite, which is hard and expensive to excavate, and Triassic sandstone, which although not so hard can require the use of explosives. Both rocks weather extensively particularly the sandstone, and with it are associated friable clay rocks.

The superficial rocks of the area are:

- (1) Talus and weathering products derived from the basement rocks.
- (2) Valley alluvium in the form of soft clay, sand and gravel.
- (3) Blown sands occurring as fossil and now immobile sand dunes and sheets.

Only the last-mentioned may cause any difficulties because the sand is sporadically cemented to form silcrete and this is a very hard though young rock.

The pipeline routes were sampled by 32 six-metre seismic spreads observed with a Bison hammer seismograph. This instrument was used because it offered no risk of vibration damage to buildings at Port Arthur, and it gave results down to 1.5-2 m below surface.

The positions of the observations are shown in Figure 80. Some interpolation of information is necessary in the built up areas of Port Arthur and isolated blocks of rock or brickwork forming old foundations may not have been detected.

The presence of hard rock is indicated by an increase in seismic velocity with depth. The normal seismic velocities recorded were found to be in the range 350-400 m/s representing easily excavated soil or deeply weathered or unconsolidated rock.

Velocities of 1500 m/s appear in some spreads and are thought to represent soft sandstone or similar material, which could be excavated by backhoe.

Velocities of 3600 m/s represent hard sandstone which could be excavated by heavy equipment, but above this value explosives become necessary.

The spreads which detected hard material within 2 m of surface were (fig. 80):

Spread	Seismic velocity (m/s)	Depth to hard material (m)	Rock type
3	1500	c.1	Soft sandstone
9		>2	

Spread	Seismic velocity (m/s)	Depth to hard material (m)	Rock type
13, 14	3600	<1	Hard sandstone.
16, 17	1500	2	Soft sandstone.
24		2?	Hard rock.
26	4000	<2	Very hard rock (dolerite).

Further spreads were observed at these chainages not shown on Figure 80.

Spread	Location	
27 Ch. 1390	Wedge Bay Road junction	No rock.
28 Ch. 1360		Some hard material possibly silcrete at one metre.
29 Ch. 1210		No rock.
30 Ch. 690	Farm entrance	Soft sandstone (V = 1500 m/s) at <1 m.
31 Ch. 260	Old orchard	No rock.
32 Ch. 120		Very hard rock (dolerite).

The spread positions were selected as those topographically likely to show near-surface rock.

SUMMARY

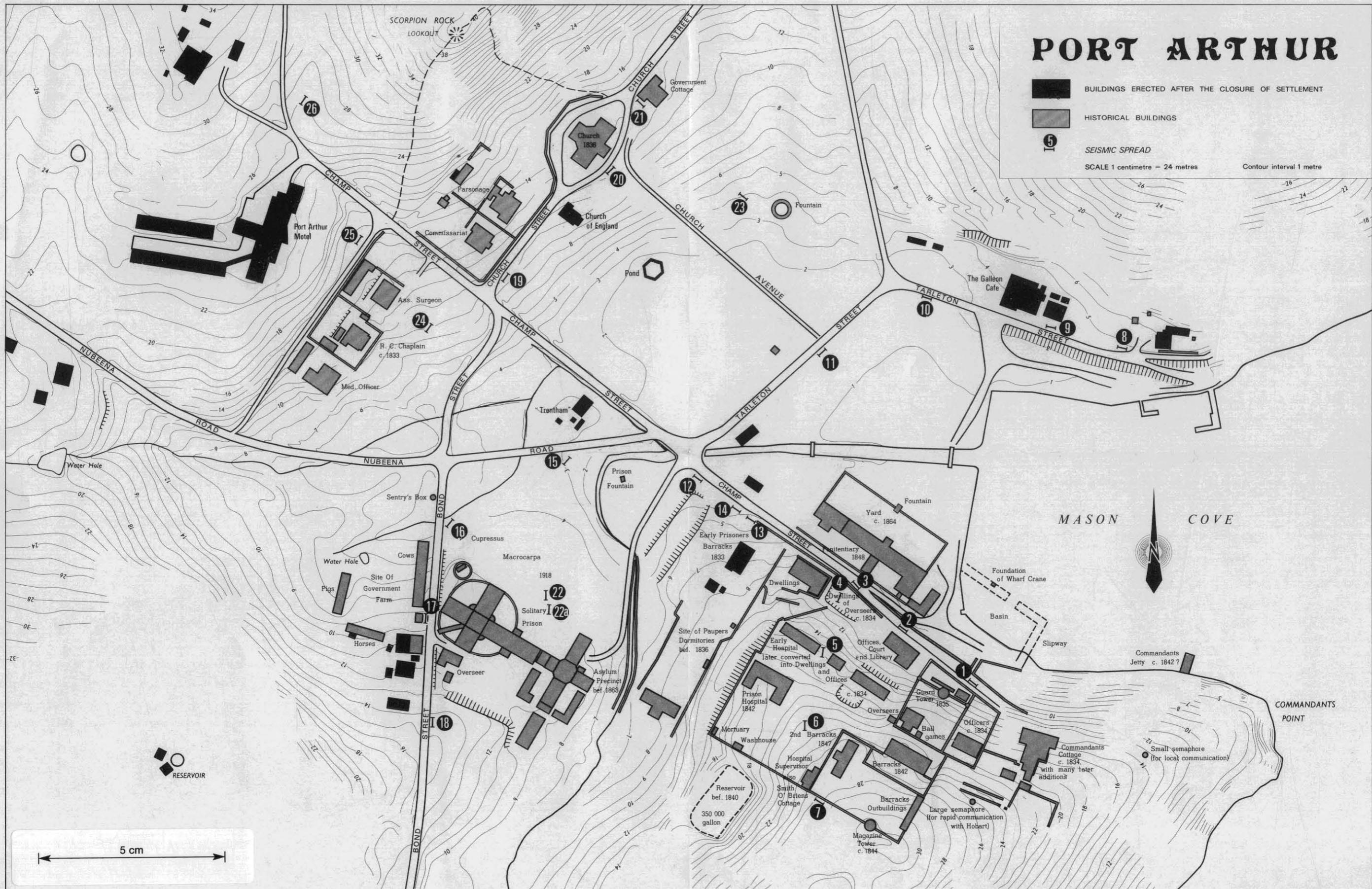
Hard rock was detected at pipeline depth only below Ch. 240, and in the area between Spread 26 and the workshop area where dolerite crops out.

Scattered lenses of silcrete may occur near Spread 28 (Ch. 1360) and sandstone occurs at Spreads 3, 13 and 14.

REFERENCE

STEVENSON, P.C. 1974. A geological and seismic survey of a dam site at Nubeena Road, Port Arthur. *Unpubl. Rep. Dep. Mines Tasm.* 1974/76.

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PORT ARTHUR

BUILDINGS ERECTED AFTER THE CLOSURE OF SETTLEMENT
 HISTORICAL BUILDINGS
5 SEISMIC SPREAD
 SCALE 1 centimetre = 24 metres Contour interval 1 metre

FIGURE 80

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