DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

ENGINEERING AND SOILS GEOLOGY SECTION

REPORT ON SITE INVESTIGATION

PROPOSED PRIMARY SCHOOL - KIDMAN PARK

- Public Buildings Department -

by

S. Robson
Geologist

22nd July, 1965

D.M. 1640/64

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REPORT ON SITE INVESTIGATION
PROPOSED PRIMARY SCHOOL - KIDMAN PARK
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INTRODUCTION

A site investigation has been carried out for Public Buildings Department for a proposed two-storey Primary School at Kidman Park. The design is for a concrete building with load bearing walls seated everywhere upon piles. Point loadings on piles will be 30 tons, 50 tons and 80 tons, respectively.

The investigation was requested in a letter to the Director of Mines, dated the 28th August, 1964.

Two percussion drill holes were drilled at the site, Hole 1 to 90 feet and Hole 2 to 60 feet. Open tube samples were taken throughout both holes, apart from nine sealed tube samples obtained from selected intervals in Hole 2.

Standard Penetration Tests were made at five depths in Hole 2.

The holes have been logged on a scale of one inch to 10 feet and the soil materials have been classified according to the Unified Soils Classification System.

This report sets out the results of the drilling, and briefly discusses the foundation characteristics of the soils at the site.

OUTLINE OF REGIONAL GEOLOGY

The area is part of the low-lying, poorly-drained Lower Outwash Plain, lying to the west of Adelaide. Gradients across the Plain are low and surface topography is influenced mainly by the action of the River Torrens.

During the Quaternary Period alluvial sediments masked the

basement rocks (Permian) in this area, and attained thicknesses of at least 370 feet (Kooyonga Bore).

The Pleistocene deposits are mainly fluvial and are characterised throughout by dessication surfaces and limy soil profiles. Deposition during Recent times indicates a change to estuarine and deltaic conditions, the region being on the landward margins of successive marine transgressions. Finally, uplift was followed by the development of a thin soil profile.

GEOLOGICAL SUCCESSION SHOWN IN DRILL HOLES

Fill covers the Brown Soil profile in both drill holes. The soil horizon is only two feet thick across the site and grades into estuarine sands and silts containing plant remains. These deposits attain a maximum depth of 13 feet in Hole 2 and become clayey at their base.

Below approximately 8 feet in Hole 1 and 13 feet in Hole 2, is a sequence of varied alluvial clay and silty sands. Thin gravel lenses occur at various depths in these lower sections and limy fossil soil horizons are also common.

FOUNDATION CHARACTERISTICS

Groundwater is encountered at shallow depths throughout the year in this area and drainage is a problem. Its presence will also greatly influence foundation properties of soils.

The superficial clay soil down to 8 feet in Hole 1 and 6 feet in Hole 2 is well drained during the dry season, and is a very stiff material. However, in winter periods it will lose strength and be reactive to the varying moisture content. Shrinking and swelling movements might result in these horizons.

Below the clay soil, the sandy and silty materials are saturated and loose. Between four feet and 32 feet in Hole 2

penetration rates are very high, only 2 to 5 blows per foot being required.

However, lower rates of penetration are recorded below 32 feet in both drill holes and the sediments become more compact and in places dense and hard. Very high penetration readings of blows per foot can be correlated with the presence of hard limy patches and quartz gravel horizons. The partly cemented limy material is particularly noticeable below 53 feet in Hole 1.

The consistently compact to dense sands below 53 feet will probably be best suited as a foundation for piles at the site.

GROUNDWATER

Water was struck in both drill holes at 14' and static level remained at around 15'. The total saline matter in both holes was greater than 2,000 p.p.m.

S. Robson

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Geologist
ENGINEERING AND SOILS GEOLOGY SECTION

SR:SMA:AGK
22/7/65

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2. Subsurface Stratigraphy in the Western Suburbs of Adelaide", by Steel, T.M. Quarterly Geological Notes of Geological Survey, South Australia, April, 1962.

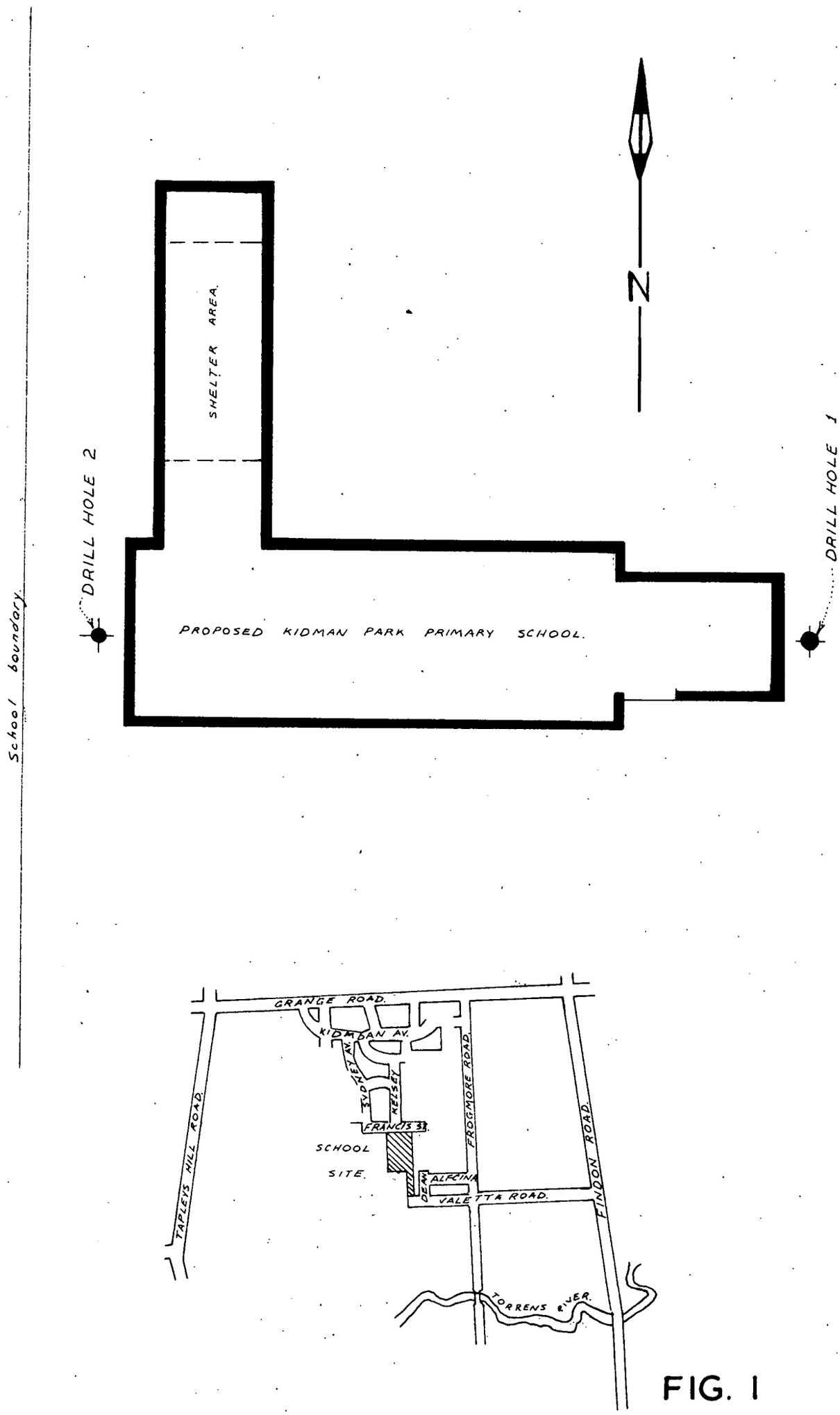

FIG. 1

DEPARTMENT OF MINES — SOUTH AUSTRALIA

	Drn.	SITE INVESTIGATION KIDMAN PARK SCHOOL LOCALITY PLAN	SCALE: 1in : 40ft.
	Tcd.		S4363 Ha5
	Ckd.		
	Exd.		DATE:

DEPARTMENT OF MINES - SOUTH AUSTRALIA

LOG OF PERCUSSION DRILL HOLE

HOLE NO. 1

SHEET 1 OF 1

PROJECT PROPOSED PRIMARY SCHOOL Hirer PUBLIC BLDGS. DEPT.

LOCATION KIDMAN PARK Sec.

FEATURE FOUNDATION Depth 90ft. R.L. Coords

SOIL TYPE GEOLOGICAL DESCRIPTION	CASING R.L. (FEET)	DEPTH (FEET)	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME	CONSISTENCY REL. DENSITY	MOISTURE CONTENT	WATER LEVELS	PENETRATION DATA BLOWS FOOT / SOIL TEST PENETROMETER 1 2 3 4 TONS/SQ FT
Fill: Mainly sand with clay and plant roots.				SP	SAND, poorly graded, coarse grained. Some clay patches and silt fines. Few gravel frags: > 0·1ft.	LOOSE			
RECENT Surface: Brown Soil				CL	CLAY SOIL, low plasticity. Fine sand and silt abundant in places.	V. STIFF	DAMP	23rd Feb '65	
Estuarine deposits				SP	dark brown, yellow mottled.				
				CH	CLAY SOIL medium plasticity. Red-brown and green mottled.				>4.5
Alluvial clayey and silty sands. Lime present at intervals throughout profile.		10		SP SM	SAND poorly graded, fine grained silty, clayey in top 3 ft. Red-brown and pale green mottled. Few gravel fragments up to 0·15 ft. down to 11 ft.	LOOSE TO FAIRLY COMPACT	SATURATED	26th Feb '65	
		20							
		30			becoming more clayey and pale yellow brown and green mottled.				
Fossil soil horizon slightly calcareous.				CL	CLAY SOIL, low plasticity, silty to sandy. Red-brown green mottled.	VSt	D		
		40		SM	SAND, fine grained, excess silt fines. Red-brown pale green mottled.	COMPACT			
				SP	SAND, poorly graded, coarse grained. Approx 75% grains up to 1 mm. size, few up to 0·05 feet.				
PLEISTOCENE (Equivalent) MOTTLED CLAYS Gravel mainly hard lime nodules.		50			SAND, fine grained, excess silt fines. Red-brown and pale green mottled. Locally up to 50% GRAVEL as shown.				
		60		SM	becoming very silty.	DENSE TO HARD	SATURATED		
Pockets of soft, earthy lime.									
Partially cemented by lime.		70			very clayey.				
		80		SP	SAND, poorly graded coarse grained. 75-80% grains > 2mm size. Few grains up to 0·05 ft.				
Few soft lime patches.				SM	SAND, fine grained, excess silt fines. Red-brown, pale green mottled.				
		90			END OF HOLE 90 FT.				

TYPE OF SAMPLE	HYDROLOGY	CONSISTENCY	REL. DENSITY	MOISTURE
Open Tube	Water cut 14 ft.	VS-Very Soft	VL-Very Loose	H-Humid
Sealed Tube	Static level 15½ ft.	S-Soft	L-Loose	D-Damp
Auger barrel	Supply	F-Firm	C-Compact	M-Moist
Slush pump	Analysis (p.p.m)	St-Stiff	D-Dense	W-Wet
Casing	← Water level (Date)	VSt-Very Stiff	VD-Very Dense	S-Saturated
		H-Hard		

Plant No. 9	Logged S.R.	PLAN No. S4269 Ha5	Vertical Scale 10 ft. to 1 inch
Type Ruston	Date 22·3·65		
Driller Phillips	Drawn S.R.		
Started 23·2·65	Traced R.G.H.		
Finished 26·2·65	Checked		

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LOG OF PERCUSSION DRILL HOLE

HOLE NO. 2

SHEET 1 OF 1

PROJECT PROPOSED PRIMARY SCHOOL Hirer PUBLIC BLDGS. DEPT.

LOCATION KIDMAN PARK Sec. Hd

FEATURE FOUNDATION Depth 60 ft. R.L. Coords

SOIL TYPE GEOLOGICAL DESCRIPTION	CASING R.L. (FEET)	DEPTH (FEET)	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME	CONSISTENCY REL. DENSITY	MOISTURE CONTENT	WATER LEVELS
Fill: CLAY AND SAND with stone rubble.				CL SP	CLAY SOIL, low plasticity. Abundant coarse sand and gravel frags.	VS.	DAMP	
Brown Soil				CL	CLAY SOIL, low plasticity, sandy, dark brown, yellow-brown mottled			
RECENT Estuarine Deposit. Micaceous sands with decomposed plant matter		10		SP	SAND, poorly graded, fine grained. Grey-brown, yellow mottled. Few plant remains up to 0.2ft. Becoming clayey at base		MOIST	
PLEISTOCENE (Equivalent) MOTTLED CLAYS Alluvial clayey and silty sands with lime present throughout.		20		ML CL	SILTY SOIL low plasticity, excess clay fines in part. Few sandy patches. Dark grey-brown, yellow mottled near top.	LOOSE		Water Cut 14th Mar. 65
Lime present as soft earthy patches and hard nodules.		30						
		40			SAND, poorly graded, excess silt fines. Red brown pale green mottled 5-10% $CaCO_3$	LOOSE TO DENSE IN PART	SATURATED	
Gravel: mainly sub-rounded quartz and quartzite.				SP-GP	SAND, poorly graded, coarse grained. Abundant gravel up to 0.05ft. Few fragments up to .02ft. Few silty fines			
		50		SP SM	SAND poorly graded, fine grained, excess silty fines in part. Red-brown and green mottled in part. Few fragments up to 0.1 feet.			
		60			END OF HOLE 60 FEET			

PENETRATION DATA

BLOWS PER FOOT 10 20 30 40 50 60 SOIL TEST PENETROMETER 1 2 3 4

TONS / SQ FT. 1/2 1 >4.5

TYPE OF SAMPLE	HYDROLOGY	CONSISTENCY	REL. DENSITY	MOISTURE
Open Tube	Water cut 14	VS-Very Soft	VL-Very Loose	H-Humid
Sealed Tube	Static level	S-Soft	L-Loose	D-Damp
Auger barrel	Supply	F-Firm	C-Compact	M-Moist
Slush pump	Analysis (p.p.m.)	St-Stiff	D-Dense	W-Wet
Casing	← Water level (Date)	VSt-Very Stiff H-Hard	VD-Very Dense	S-Saturated

Plant No. 9 Type Ruston Driller Phillips Started 1.3.65 Finished 4.3.65

Logged S.R. Date 29-3-65 Drawn S.R. Traced P.G.H. Checked

PLAN No. S 4270 Ha5

Vertical Scale 10 ft. to 1 inch