DEPARTMENT OF MINES

Ref No 14704

35 319

NEERING LOG – BOREHOLE

borehole no. 1

sheet 1 of 2

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST.

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210D.

drill method AUGER.

drill fluid

hole commenced 1 DEC 1986

hole completed

drilled by MINES DEPT.

logged by R. DONALDSON.

checked by

penetration 1 2 3	support	water	notes samples, tests	metres R.L / depth	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa 25 50 100 200 400	structure, geology
						GC	Clayey GRAVEL: fine-medium, brown, clay of medium-high plasticity, some sand.	D	L MD		FILL
				1		SP	SAND: fine, greenish grey, some shell fragments.		VL		ESTUARINE BEACH DEPOSIT
				2		CH	CLAY: high plasticity, yellow brown, some fine sand, trace medium-coarse.	M > PL	F to St.		
		▼	19/12 21/12.								
		▼	1/12/86	3							
				4							
				5		SC	Clayey SAND: fine, green grey, trace shell fragments, clay of medium to high plasticity.	W	L		
				6		CH	Sandy CLAY: high plasticity, yellow brown, sand fine.	M > PL	F to V St.		
			50mm PVC installed to 14.5m	7							
				8							
				9							
				10			Similar - mottled yellow brown/light grey, rock fabric preserved.	M < PL			E.W. BEDROCK

ARTMENT OF MINES Ref No 14704

EERING LOG – CORED BOREHOLE

borehole no. 1

sheet 2 of 2

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210

drill method NQ - TRIPLE TUBE

drill fluid

hole commenced 1 DEC 1986

hole completed

drilled by G. BAKER (MINES)

logged by R. DONALDSON

checked by

drilling information						rock substance				rock mass defects		
case-lift	fluid loss	water	notes	lugeons 0.3 3 10 30 100	metres R.L	metres depth	graphic log	substance description rock type: grain characteristics, colour, structure, minor components.	weathering	strength EL VL L M H VH EH	defect spacing mm. 30 100 300 1000 3000	defect description thickness, type, inclination, planarity, roughness, coating. significant / general
			R.Q.D.					SANDSTONE: fine-medium grained, light green grey, trace mica.	SW			
			0									
			0			11		MUDSTONE: yellow brown, some mica on bedding planes.	HW			
	●		0					SILTSTONE: coarse grained, green grey and brown, grading downward to SANDSTONE: very fine-fine grained, blue green grey and brown. Sequence is thinly bedded (x-bedded) to laminated. Laminae 5°-10° to horizontal. Mica on bedding planes	HW – SW			Most defects are joints parallel to bedding. Some steeply dipping joints occur. Joint surfaces rough, irregular, some iron stained, some with clay film, often micaceous, rarely crushed.
			65			12						
						13		Cyclic sequence @ 1-1.5m intervals.				
			40			14						
	●					15		HOLE TERMINATED @ 14.5m				

EPARTMENT OF MINES

Ref No 14705

INEERING LOG – BOREHOLE

35 320

borehole no. 2

sheet 1 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210 D.

drill method AUGER

drill fluid

hole commenced 2 DEC 1986

hole completed —"—"—

drilled by G. BAKER (MINES)

logged by R. DONALDSON

checked by

penetration 1 2 3	support	water	notes samples, tests	metres R.L / depth	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa 25 50 100 200 400	structure, geology
				1		GC	Clayey GRAVEL: fine to medium, brown, clay of medium to high plasticity, some sand.	D	L to MD		FILL
				2		SP	SAND: fine, (green) grey, some shells and shell fragments.	M	VL		ESTUARINE-BEACH DEPOSITS
		▽	2/12/86				similar to above – some clay.	W			
				3							
				4		SC	Clayey SAND: fine, yellow brown/green grey, clay of medium to high plasticity, some shells and shell fragments. Some sandy CLAY lenses (CH).				
				5		SP	SAND: fine, green grey, some shells and shell fragments.				
				6			similar to above – green brown, some clay.				
				7		CH	Sandy CLAY: high plasticity, red brown, sand fine.	M > PL	St to V.St		
				8							
							refer sheets 2+3 for cored section				

DEPARTMENT OF MINES

ENGINEERING LOG – CORED BOREHOLE

borehole 2
sheet 2 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST.

co-ordinates
R.L.
inclination VERTICAL
bearing

drill type GEMCO 210D
drill method NQ TRIPLE TUBE
drill fluid

hole commenced 2 DEC 1986
hole completed
drilled by G. BAKER (MINES)
logged by R. DONALDSON
checked by

drilling information							rock substance				rock mass defects		
case-ing	fluid loss	water	notes	lugeons 0.3 1 3 10 30 100	metres R.L	metres depth	graphic log	substance description rock type: grain characteristics, *colour, structure, minor components.*	weathering	strength EL VL L M H VH EH	defect spacing mm. 30 100 300 1000 3000	defect description thickness, type, inclination, planarity, roughness, coating. significant	general
						1							
						2							
						3							
						4							
						5							
						6							
						7							
						8							
						9		Sandy CLAY: high plasticity, mottled yellow/brown, light grey and red. Some fine gravel (ironstone nodules) trace coarse (angular quartz sandstone). [M>PL ; St-V.St]					
						10							

DEPARTMENT OF MINES

NEERING LOG – CORED BOREHOLE

35 321

borehole no. 2

sheet 3 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORAISON/ARGYLE ST

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210

drill method NQ TRIPLE TUBE

drill fluid

hole commenced 2 DEC 1986

hole completed —"—"—

drilled by G.BAKER (MINES)

logged by R DONALDSON

checked by

drilling information						rock substance				rock mass defects	
case-lift	fluid loss	water	notes	lugeons 0.3 1 3 10 30 100	metres R.L. / depth	graphic log	substance description: rock type: grain characteristics, colour, structure, minor components.	weathering	strength EL VL L M H VH EH	defect spacing mm. 30 100 300 1000 3000	defect description: thickness, type, inclination, planarity, roughness, coating. significant / general
			RQD		11		as above.				
			62		12						
			43		13		SANDSTONE: fine-(medium) grained, yellow brown/light green grey. Bedding massive to laminated ~10° to 15° & horizontal. Mica on bedding planes.	EW - HW			
			0		14						
			40		15						
			75		16			HW			← Joints x2, 60-90°
			65		17						← Fractured
			62		18			HW - SW			
			70		19		MUDSTONE: brown to yellow/ brown, with some thinly interbedded sandstone!				← Joint 30°
					20		HOLE TERMINATED @ 19.1m				

Most defects are joints parallel to bedding, some steeply dipping joint occur. Joint surfaces rough, irregular, some iron stained, some with clay film, often micaceous, rarely cemented.

DEPARTMENT OF MINES

GINEERING LOG – BOREHOLE

Ref No 14706

borehole no 3

sheet 1 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST.

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210 D

drill method AUGER

drill fluid

hole commenced 3 DEC 1986

hole completed — " — h —

drilled by G. BAKER (MINES)

logged by R. DONALDSON.

checked by

penetration 1 2 3	support	water	notes samples, tests	metres R.L	metres depth	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa 25 50 100 200 400	structure, geology
					1		SW-GW	SAND: fine-medium, red (crushed brick) GRAVEL: fine-medium, some timber	D	L-MD		FILL
					2		SP	SAND: fine, (green) grey, some shell fragments.	M	VL		ESTUARINE-BEACH DEPOSITS
		▼	3/12/86.						W			
		▼	19/12 21/12		3							
							SC	Clayey SAND: fine, grey green, clay of medium to high plasticity, some shells and shell fragments.				
					4		CH	Sandy CLAY: high plasticity, yellow brown, sand fine to medium, trace fine gravel.	M > PL	St to V.St		
			50 mm PVC installed to 19.0m.		5							
							SP	SAND: fine, green grey, some shells and shell fragments.	W	L to VL		
					6							
					7			Similar to above – green brown, some clay.				
					8			Similar – trace clay.				
					9		CH	Sandy CLAY: high plasticity, brown, sand fine.	M PL	St to V.St		
					10							

DEPARTMENT OF MINES

INEERING LOG – BOREHOLE

35 322

borehole no. 3

sheet 2 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210 D

drill method AUGER

drill fluid

hole commenced 3 DEC 1986

hole completed

drilled by G. BAKER (MINES)

logged by R. DONALDSON

checked by

penetration 1 2 3	support	water	notes samples, tests	metres R.L	metres depth	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa 25 50 100 200 400	structure, geology
								as above				
								refer sheet 3 for cored section.				
					11							

A DEPARTMENT OF MINES

GINEERING LOG – CORED BOREHOLE

borehole no. 3

sheet 3 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST.

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210D

drill method NQ TRIPLE TUBE

drill fluid

hole commenced 2 DEC 1986

hole completed —"— "—

drilled by G. BAKER (MINES)

logged by R. DONALDSON.

checked by

drilling information						rock substance				rock mass defects	
case-iift / fluid loss / water	notes	lugeons 0.3 1 10 30 100	metres R.L / depth	graphic log	substance description rock type: grain characteristics, colour, structure, minor components.	weathering	strength EL VL L M H VH EH	defect spacing mm. 30 100 300 1000 3000	defect description thickness, type, inclination, planarity, roughness, coating. significant / general
	RQD		11		Sandy CLAY: high plasticity, mottled yellow brown/green grey. [M>PL ; St-V.St.]				
			12						
			13						
	67		14		SANDSTONE: fine-medium grained, yellow brown/light green grey, trace mica. Bedding massive and laminated (10°-20° to hor.)	EW – HW / HW – SW / HW / HW – SW			← Joint 80°
	70		15						
			16						← Joint 75°
	40		17		MUDSTONE: brown to yellow brown, with some thinly interbedded sandstone	HW			
	100		18		SANDSTONE: fine grained, yellow brown/light green grey, trace mica. Bedding massive to laminated.	HW – SW			
			19						
					HOLE TERMINATED @ 19.0m				

Most defects are joints parallel to bedding. Some steeply dipping joints occur. Joints are rough, irregular, locally ironstained. Some with clay film, often micaceous, rarely cemented.

IA DEPARTMENT OF MINES

GINEERING LOG – BOREHOLE

35 323

Ref No 14707

borehole no. 4

sheet 1 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST.

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210 D

drill method AUGER

drill fluid

hole commenced 4 DEC 1986

hole completed 8 DEC 1986

drilled by G. BAKER (MINES)

logged by R. DONALDSON.

checked by

penetration 1 2 3	support	water	notes samples, tests	metres R.L / depth	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa 25 50 100 200 400	structure, geology
				1		SW GW	SAND: fine to medium, (crushed brick), red. GRAVEL: (at base) fine to medium, blue grey (dolerite), some painted timber.	D	MD - VD		FILL
				2 3		SC SP	Clayey SAND: fine, yellow brown and green. clay of medium to high plasticity. Lenses of SAND (S.P) - fine	M	L		ESTUARINE - BEACH DEPOSITS
		▼	4/12/86	4		CH	Sandy CLAY: high plasticity, brown, sand fine.	M > PL	F		
		▼	19/12 21/12			SC	Clayey SAND: fine, green grey, some shells.	W	L		
				5 6		CH	Sandy CLAY: high plasticity, grey green, sand fine.	M > PL	F St.		
			1 3 4 N* 7	7			Similar to above - mottled yellow brown/ grey green colour.		St.		
							refer sheets 2+3 for cored section				

IA DEPARTMENT OF MINES

GINEERING LOG – CORED BOREHOLE

borehole no. 4

sheet 2 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST

co-ordinates

R.L.

inclination VERTICAL

bearing

drill type GEMCO 210D

drill method NQ TRIPLE TUBE

drill fluid

hole commenced 4 DEC 1986

hole completed 8 DEC 1986

drilled by G. BAKER (MINES)

logged by R DONALDSON.

checked by

drilling information							rock substance				rock mass defects	
case-lift	fluid loss	water	notes	lugeons 0.3 1 3 10 30 100	metres R.L	metres depth	graphic log	substance description rock type: grain characteristics, colour, structure, minor components.	weathering	strength EL VL L M H VH EH	defect spacing mm. 30 100 300 1000 3000	defect description thickness, type, inclination, planarity, roughness, coating. significant / general
			RQD			1						
						2						
						3						
						4						
						5						
						6						
						7						
			RQD			8		Sandy CLAY: high plasticity, mottled green grey/yellow brown, sand fine. [M > PL ; St – V. St.]				
			58			9		SILTSTONE: coarse grained, green grey/yellow brown, gradng down wards into SANDSTONE: fine-medium grained, yellow brown/light green grey, trace mica. Finely bedded & laminated. (5°–15° to horiz.)	Ew – Hw / Hw – Sw			← Crush seam 3-5mm, dip 70°
						10						

DEPARTMENT OF MINES

ENGINEERING LOG – CORED BOREHOLE

35 324

borehole no. 4

sheet 3 of 3

project PROPOSED CIVIC SQUARE location ELIZABETH/DAVEY/MORRISON/ARGYLE ST.

co-ordinates

R.L

inclination VERTICAL

bearing

drill type GEMCO 210

drill method NQ TRIPLE TUBE

drill fluid

hole commenced 4 DEC 1986

hole completed 8 DEC 1986

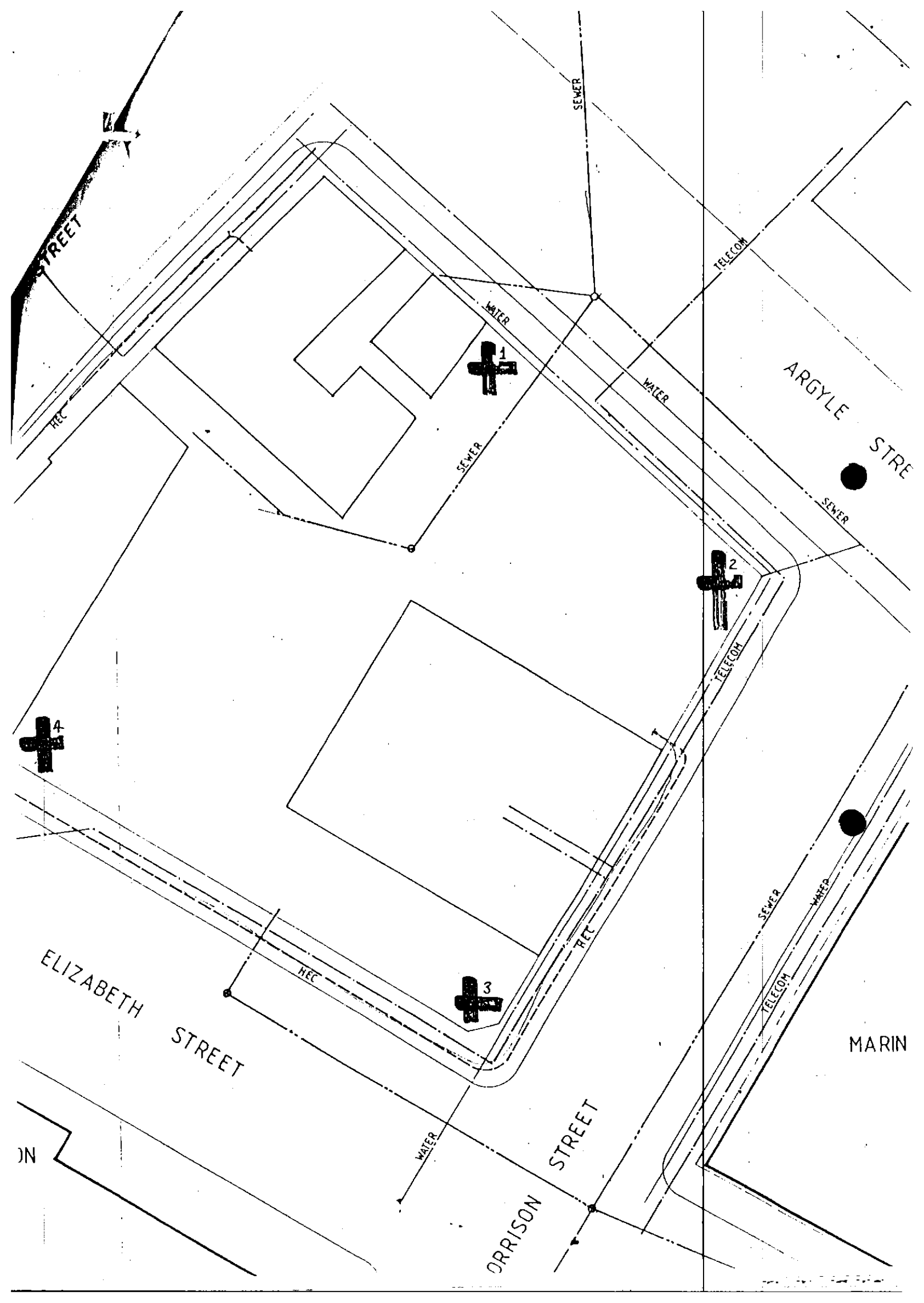
drilled by G. BAKER (MINES)

logged by R. DONALDSON

checked by

drilling information						rock substance					rock mass defects	
case-lift	fluid loss	water	notes	lugeons 0.3 1 3 10 30 100	metres R.L	depth	graphic log	substance description (rock type: grain characteristics, colour, structure, minor components)	weathering	strength EL VL L M H VH EH	defect spacing mm. 30 100 300 1000 3000	defect description (thickness, type, inclination, planarity, roughness, coating) significant / general
			RQD					as above				
			15			11		MUDSTONE: yellow brown.				← Joint 30°
			47			12		SILTSTONE: coarse grained, brown and green grey, grading downwards into SANDSTONE: (very) fine - fine grained, light blue green grey brown and red,				← EW seam (CH), 50 mm ← Numerous EW (clay) seams (CH) 3-5 mm parallel to bedding
						13		Sequence thinly bedded to laminated. X-bedding evident in sandy units. Bedding 5-10° to horizontal. Mica on bedding planes.				← EW (clay) seam 3 mm
			10			14		Sandstone/siltstone sequence as described is cyclic over 1-2 m intervals.				← Joint 70°
			23			15						
						16			SW.			
			60			17						← Joint 80°
								HOLE TERMINATED @ 17.5m				

Most defects are joints parallel to bedding. Some stepped dipping joints occur. Joint surfaces rough, irregular, some iron stained, some with clay film, often slickensided, rarely cemented.


STREET
SEWER
TELECOM
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1
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ELIZABETH
STREET
SEWER
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