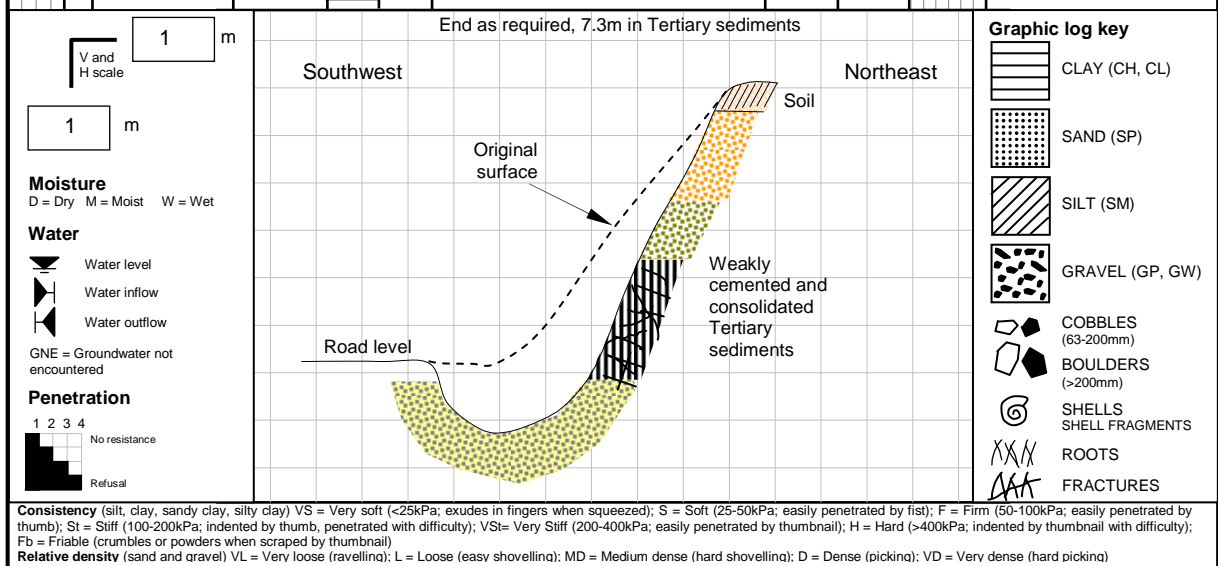


Attachment 10

(52 pages including this page)

Engineering logs and photographs of test pits A – Q

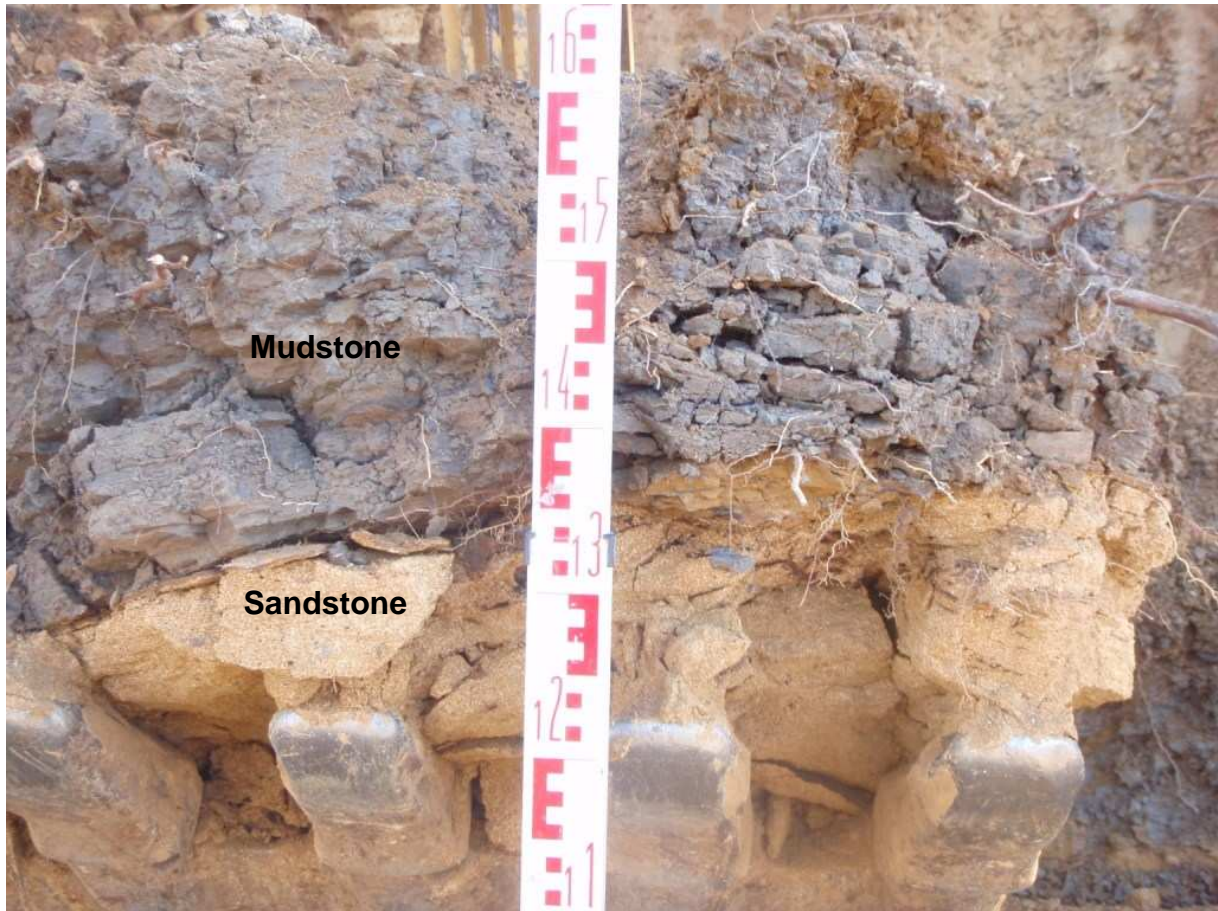
William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists										Pit A	
Excavation log										Sheet 1 of 1	
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead											
Coordinates			Exposure type			Date dug			Date logged		
514186mE, 5411064mN			Test pit			17 February 2009			17 February 2009		
Datum			Equipment								
GDA94			20t excavator								
RL			Operator			Logged by			Checked by		
Base approx. 11m AHD			Paul Richardson			W. C. Cromer			W. C. Cromer		
Dimensions (m)											
Depth 7.2 Length 5 Width 1.5											
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency	Hand penetrometer (kPa)	Structure, geology and interpretation	
			RL	Depth							
1		Photographs of full profile taken. See next pages.			SP	Silty SAND: pinkish orange brown; non plastic	D	Fb-D		Soil	
2			1			Lateritic CONGLOMERATE: orange brown and light yellow; with angular to subrounded light yellow siltstone and grey mudstone clasts to 5mm; weakly cemented	D-M	Fb-D		Tertiary sediments	
3			2			SANDSTONE and PEBBLE BED: light yellow; weakly cemented	D	St-VD		Leached laterite?	
			3								
			4			MUDSTONE/CLAYSTONE: dark grey; finely laminated; locally interbedded with thin siltstone horizons; weakly consolidated; strongly fractured with orange brown iron oxide staining on defect surfaces; horizontally bedded	D	VD		Tertiary sediments	
			5								
			6			SANDSTONE: brownish yellow; coarse grained (volcanogenic?); top 5mm is ironstone with ripple? marks; weakly cemented; horizontally bedded	D	D-VD			
		7									



Test pit A. General view of profile.



Test pit A. Detail of boundary between mudstone (top) and sandstone (below)



Test pit B. General view of surface 1.5m of profile.



Test pit B. General view of profile.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit C				
Excavation log							Sheet 1 of 1				
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead											
Coordinates		Exposure type		Date dug		17 February 2009					
514126mE, 5411107mN		Test pit		20t excavator		Date logged 17 February 2009					
Datum		Equipment		Date dug		Date logged					
GDA94		1.3m GP bucket with 6 teeth		17 February 2009		17 February 2009					
RL		Operator		Logged by		Checked by					
Base approx. 22m AHD		Paul Richardson		W. C. Cromer		W. C. Cromer					
Dimensions (m)		Operator		Logged by		Checked by					
Depth 3.7 Length 5 Width 1.5		Paul Richardson		W. C. Cromer		W. C. Cromer					
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency	Density index	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth							
1		Photographs of full profile taken. See next pages.			SP	Sandy SILT: pinkish orange brown; non plastic; trace clay; hard setting; cloddy	D	H			Soil
2					CH	CLAY/CLAYSTONE: mottled brown and yellowish brown; high plasticity; local patches of sandy clay; irregularly fractured; conformable base dips 17° to 180°M	M<PL	VSt			Tertiary sediments? or B soil horizon
3		D (bulk)	1			SANDSTONE: light yellowish brown; weakly cemented; dip 17° to 180°M; local ironstone wisps, especially near top; irregular blocky fracture.	D	D-VD			Tertiary sediments
4			2								
5			3								
6			4			End as required, 3.7m in Tertiary sediments					
7			5								
			6								
			7								

<p>0.5 m</p> <p>V and H scale</p> <p>0.5 m</p> <p>Moisture D = Dry M = Moist W = Wet</p> <p>Water</p> <p>Water level</p> <p>Water inflow</p> <p>Water outflow</p> <p>GNE = Groundwater not encountered</p> <p>Penetration</p> <p>1 2 3 4</p> <p>No resistance</p> <p>Refusal</p>	<p>East</p> <p>West</p> <p>Soil</p> <p>Weakly cemented and consolidated Tertiary sediments</p>	<p>Graphic log key</p> <p>CLAY (CH, CL)</p> <p>SAND (SP)</p> <p>SILT (SM)</p> <p>GRAVEL (GP, GW)</p> <p>COBBLES (63-200mm)</p> <p>BOULDERS (>200mm)</p> <p>SHELLS SHELL FRAGMENTS</p> <p>ROOTS</p> <p>FRACTURES</p>
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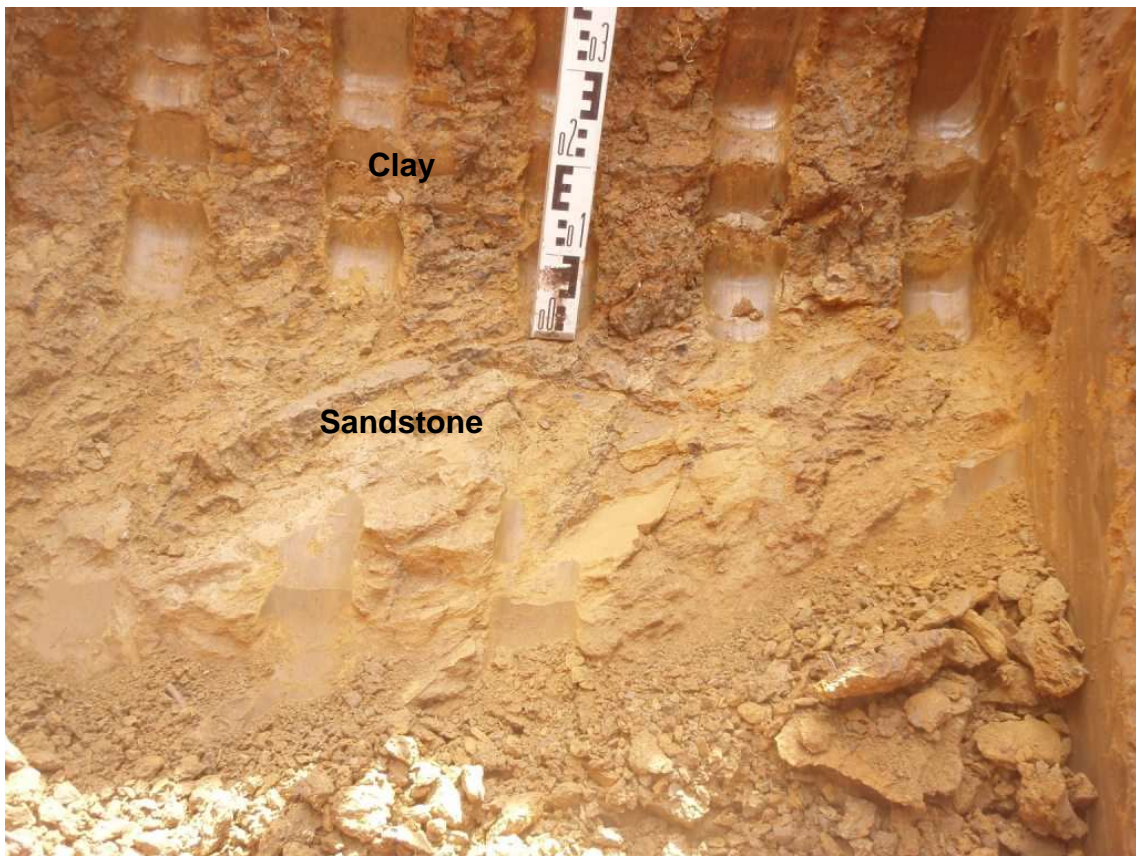
Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (pickling); VD = Very dense (hard pickling)

Test pit C. General view of profile.



Test pit C. Detail of boundary between clay/claystone (above) and sandstone (below)



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists						Pit D				
						Sheet 1 of 1				
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates 514081mE, 5411072mN			Exposure type Test pit			Date dug 17 February 2009				
Datum GDA94			Equipment 20t excavator			Date logged 17 February 2009				
RL Base approx. 23m AHD			1.3m GP bucket with 6 teeth							
Dimensions (m) Depth 2.5 Length 4 Width 1.5			Operator Paul Richardson			Logged by W. C. Cromer				
						Checked by W. C. Cromer				
Penetration 1 2 3	Support	Notes Samples and tests	metres		USCS	Materials Soil type, colour, plasticity or particle characteristics, secondary and minor components	Moisture condition	Consistency Density index	Hand penetrometer (kPa) 0-50 50-100 100-200 200-400	Structure, geology and interpretation
			RL	Depth						
		Photographs of full profile taken. See next pages.			SP	Sandy SILT: grey brown; non plastic; trace clay; hard setting; cloddy; variable thickness	D	H		Soil
			1		CH	Sandy CLAY: grey and pink; high plasticity; cloddy; some yellow brown sandstone patches; irregular thickness	D	H		Tertiary sediments? or B soil horizon
			2			SANDSTONE: light yellowish brown; weakly cemented; apparent dip 10° to 180°M; thinly bedded; irregular blocky fracture.	D	D-VD		Tertiary sediments
			3			End as required, 2.5m in Tertiary sediments				
			4							
			5							
			6							
			7							

<p>0.5 m</p> <p>V and H scale</p> <p>0.5 m</p> <p>Moisture D = Dry M = Moist W = Wet</p> <p>Water Water level Water inflow Water outflow GNE = Groundwater not encountered</p> <p>Penetration 1 2 3 4 No resistance Refusal</p>	<p>Southeast</p> <p>Soil</p> <p>Weakly cemented and consolidated Tertiary sediments</p> <p>Northwest</p>	<p>Graphic log key</p> <ul style="list-style-type: none"> CLAY (CH, CL) SAND (SP) SILT (SM) GRAVEL (GP, GW) COBBLES (63-200mm) BOULDERS (>200mm) SHELLS SHELL FRAGMENTS ROOTS FRACTURES
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Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VS= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Test pit D. General view of profile.



Test pit D. Detail of weakly cemented sandstone near 1.5m depth



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit E			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Test pit		Date dug		17 February 2009		
514047mE, 5411029mN		Equipment		20t excavator		Date logged		17 February 2009		
Datum GDA94		RL		Base approx. 14m AHD						
Dimensions (m)		Operator		Paul Richardson		Logged by		W. C. Cromer		
Depth 3.7 Length 5 Width 1.5		Checked by		W. C. Cromer						
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency Density index	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth						
		Photographs of full profile taken. See next pages.			CH	CLAY: black; silty; pedal, cloddy; high plasticity	D	Fb-H		Alluvium
			1		SP	Gravelly sandy SILT, silty GRAVEL: light grey; nonplastic; hardsetting	D	Fb-D		Topsoil
					CH	CLAY: dark grey with red/orange clayey sand patches and nodules; high plasticity; subvertical shrinkage cracks	M<PL	H		Subsoil/Tertiary sediments
						Lithic SANDSTONE: orange with black clay wisps; weakly cemented; dip 10° to 260°M; irregular blocky fracture; medium grained with occasional rounded to angular quartz granules, feldspar and ironstone/chalcedony?; little cement; trace clay; immature, volcanogenic?	D	D-VD		Tertiary sediments
			4			End as required, 3.7m in Tertiary sediments				
			5							
			6							
			7							

<p>0.5 m</p> <p>0.5 m</p> <p>Moisture D = Dry M = Moist W = Wet</p> <p>Water</p> <p>Water level</p> <p>Water inflow</p> <p>Water outflow</p> <p>GNE = Groundwater not encountered</p> <p>Penetration</p> <p>1 2 3 4</p> <p>No resistance</p> <p>Refusal</p>	<p>South</p> <p>North</p> <p>Soil</p> <p>Weakly cemented and consolidated Tertiary sediments</p>	<p>Graphic log key</p> <p>CLAY (CH, CL)</p> <p>SAND (SP)</p> <p>SILT (SM)</p> <p>GRAVEL (GP, GW)</p> <p>COBBLES (63-200mm)</p> <p>BOULDERS (>200mm)</p> <p>SHELLS SHELL FRAGMENTS</p> <p>ROOTS</p> <p>FRACTURES</p>
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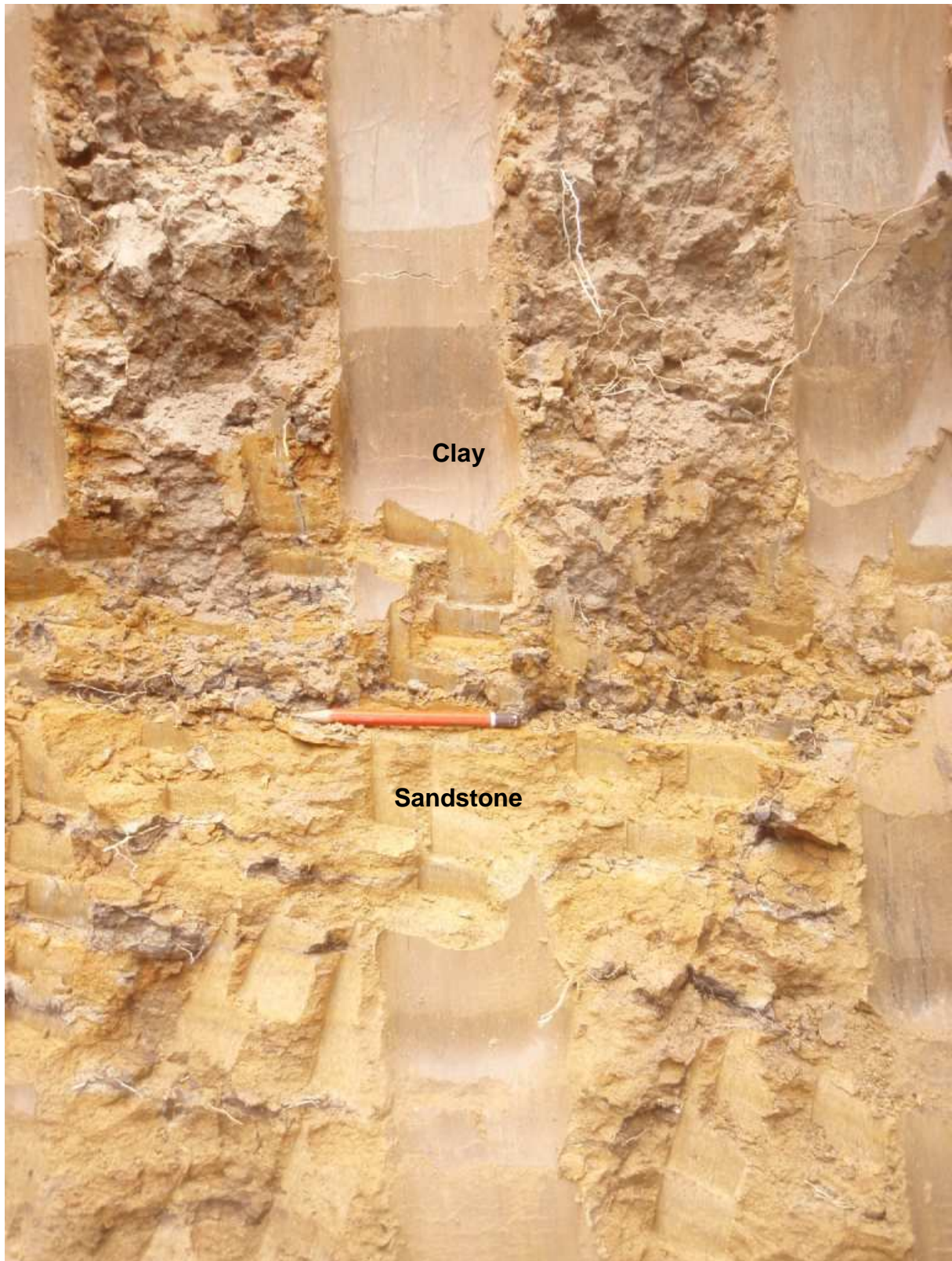
Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt = Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Test pit E. General view of profile.



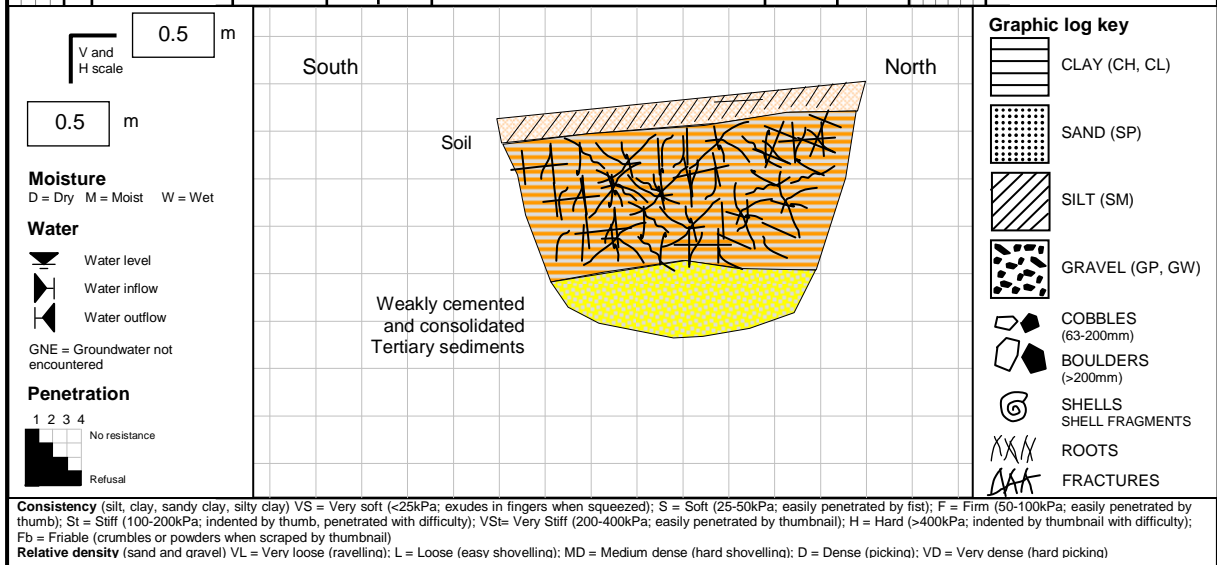
Test pit E. Detail of clay (above) sandstone (below) boundary near 1.5m depth.



Test pit E. Sandstone spoil from the pit.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists						Pit F				
Excavation log						Sheet 1 of 1				
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Date dug		Date logged				
514033mE, 5411062mN		Test pit		17 February 2009		17 February 2009				
Datum		Equipment		Date dug		Date logged				
GDA94		20t excavator		17 February 2009		17 February 2009				
RL		Operator		Logged by		Checked by				
Base approx. 23m AHD		Paul Richardson		W. C. Cromer		W. C. Cromer				
Dimensions (m)		Operator		Logged by		Checked by				
Depth 2.6 Length 4 Width 1.5		Paul Richardson		W. C. Cromer		W. C. Cromer				
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth						
1		Photographs of full profile taken. See next pages.			SP	Sandy SILT: grey; non plastic; trace clay; hard setting; cloddy; variable thickness	D	H		Soil
2					CH		CLAY and Sandy CLAY: mottled orange and grey, becoming more orange with depth; high plasticity; irregularly fractured, with dark grey CH clay coatings on defect surfaces (many dipping downslope) at c. 30° to 210°M, possibly parallel to bedding	M<<PL	H	
		U50	1				D	D-VD		
			2			Lithic SANDSTONE: orange with black clay wisps; weakly cemented; irregular blocky fracture; medium grained with occasional rounded to angular quartz granules, feldspar and ironstone/chalcedony?; little cement; trace clay; immature, volcanogenic?	D	D-VD		Tertiary sediments
			3							
			4			End as required, 2.6m in Tertiary sediments				
			5							
			6							
			7							



Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt = Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

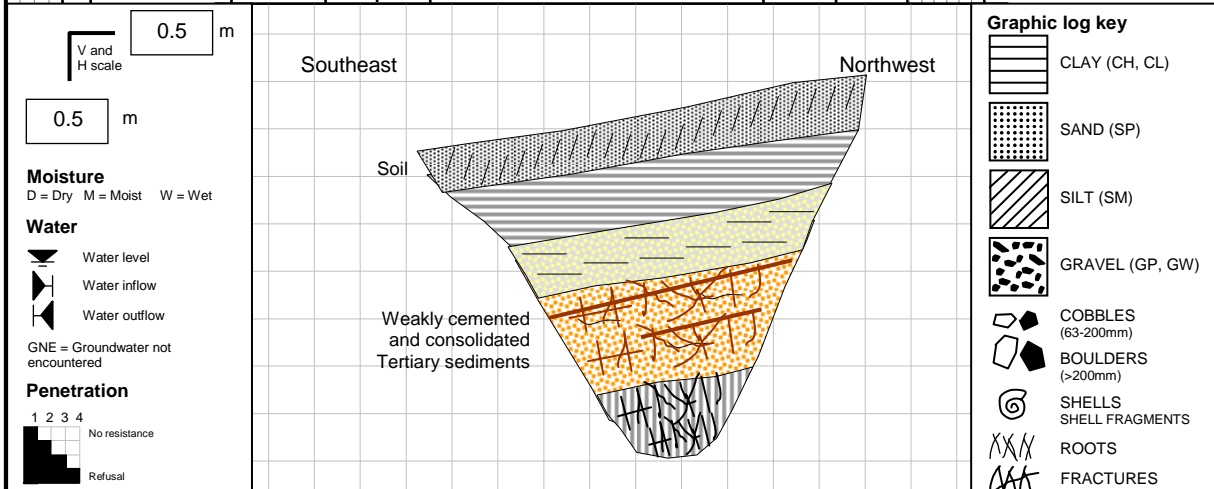
Test pit F. General view of profile.



Test pit F. Sandstone spoil from the pit.



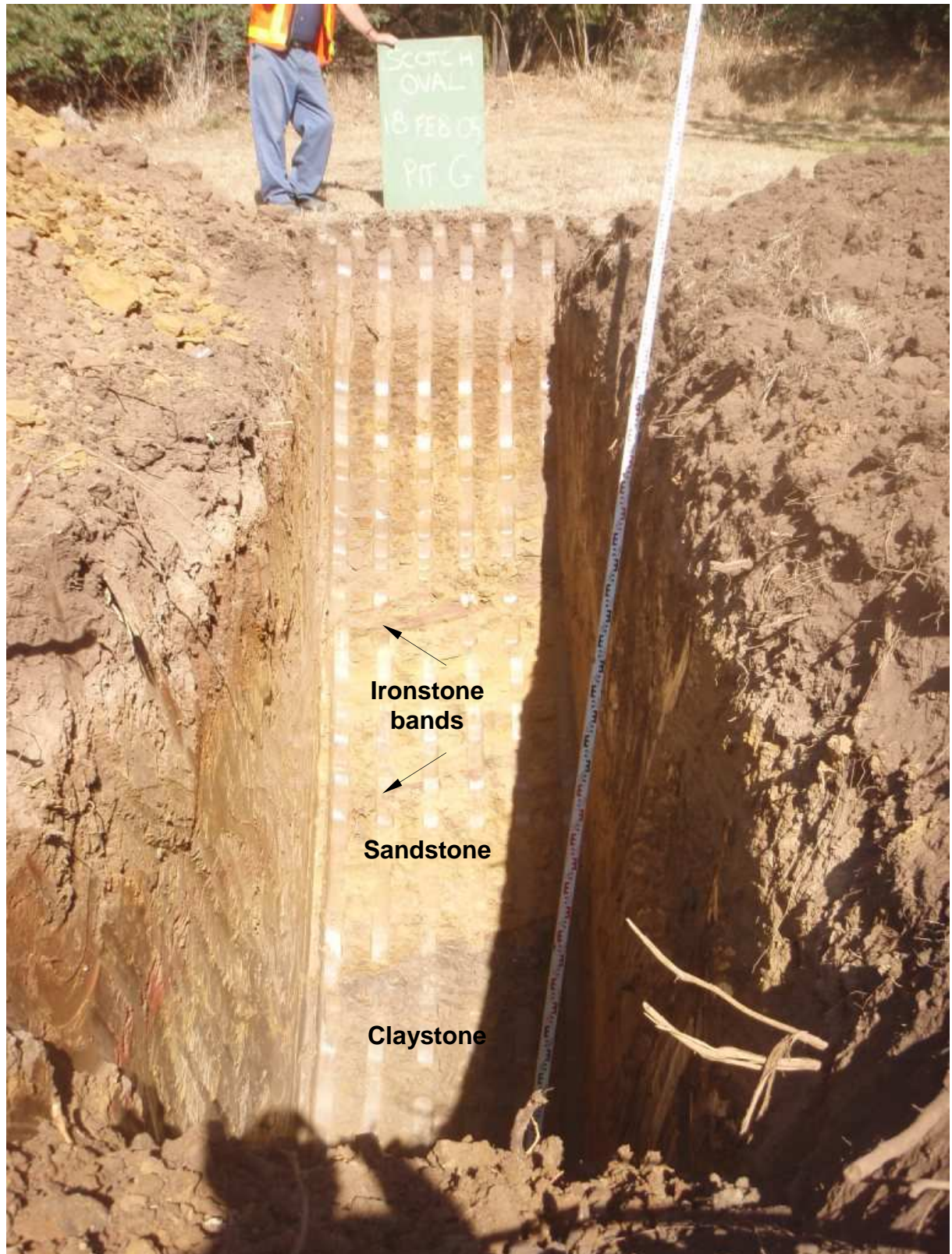
William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists						Pit G				
Excavation log						Sheet 1 of 1				
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Date dug		18 February 2009				
513936mE, 5411070mN		Test pit		Date logged		18 February 2009				
Datum		Equipment		Date dug		Date logged				
GDA94		20t excavator		18 February 2009		18 February 2009				
RL		Operator		Logged by		W. C. Cromer				
Base approx. 30m AHD		Paul Richardson		Checked by		W. C. Cromer				
Dimensions (m)		Operator		Logged by		W. C. Cromer				
Depth 4.0 Length 5 Width 1.5		Paul Richardson		Checked by		W. C. Cromer				
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency Density index	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth						
1 2 3		Photographs of full profile taken. See next pages.			SP	Sandy SILT: grey; nonplastic; hardsetting	D	Fb-H		Topsoil
		D (bulk)	1		CH	CLAY and Sandy CLAY: dark grey with orange clayey sand patches; mod-high plasticity; blocky irregular fractures	D	H		Subsoil/Tertiary sediments
		U50			SC	Clayey SAND: light yellow; nonplastic to low plasticity	D	D-VD		Tertiary sediments
			2			Lithic SANDSTONE: orange with black clay wisps; weakly cemented; irregular blocky fracture; medium grained with occasional rounded to angular quartz granules, feldspar and ironstone/chalcedony?; little cement; trace clay; immature, volcanogenic? Ironstone bands 0.1m thick dip c.15° to 180°M near 1.8m and 2.4m, conformable with bedding				
			3				D	H		
		D (bulk)	4		CH	CLAYSTONE: dark grey; blocky irregular fractures				
			5			End as required, 4.0m in Tertiary sediments				
			6							
			7							



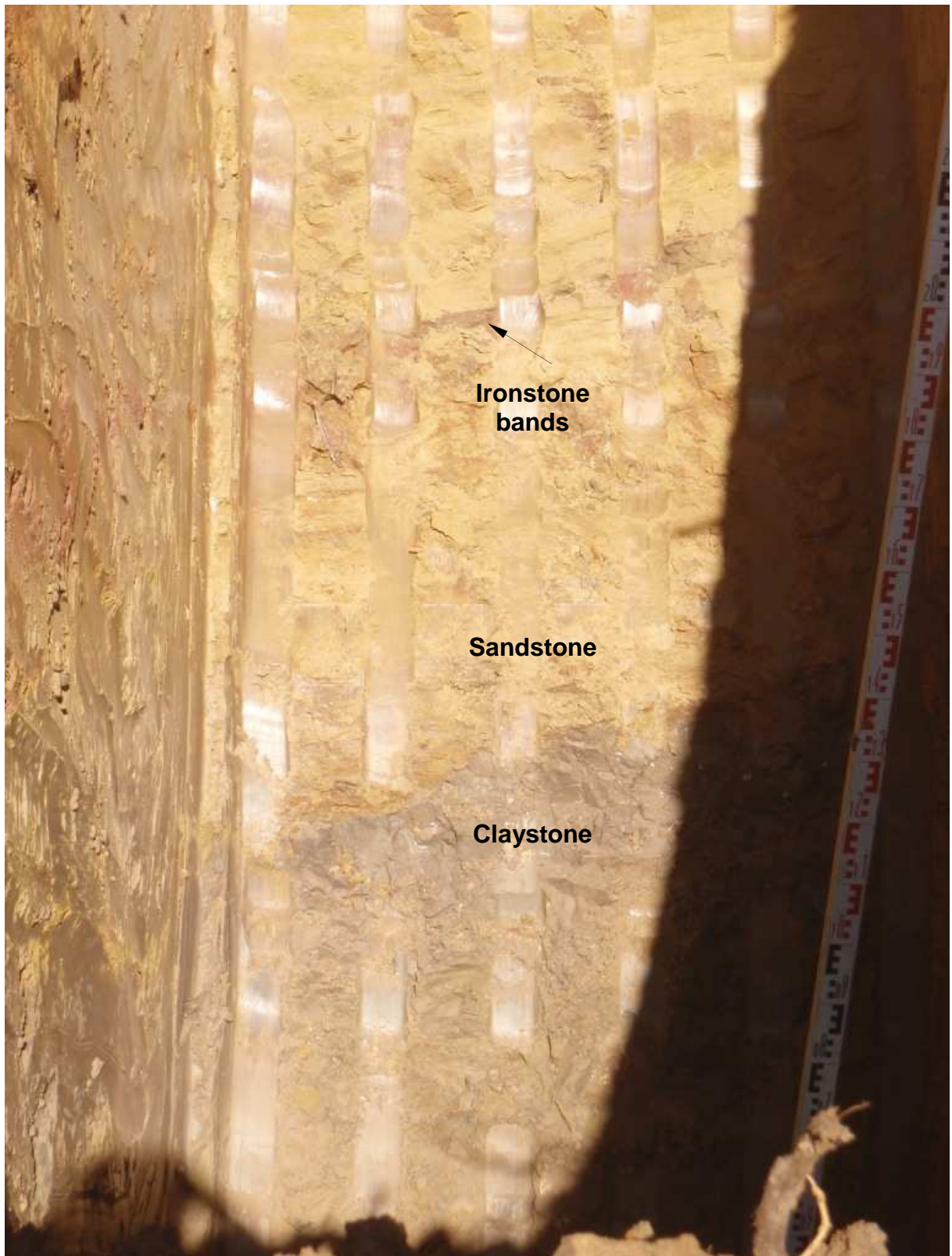
Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VS+ = Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Test pit G. General view of profile.



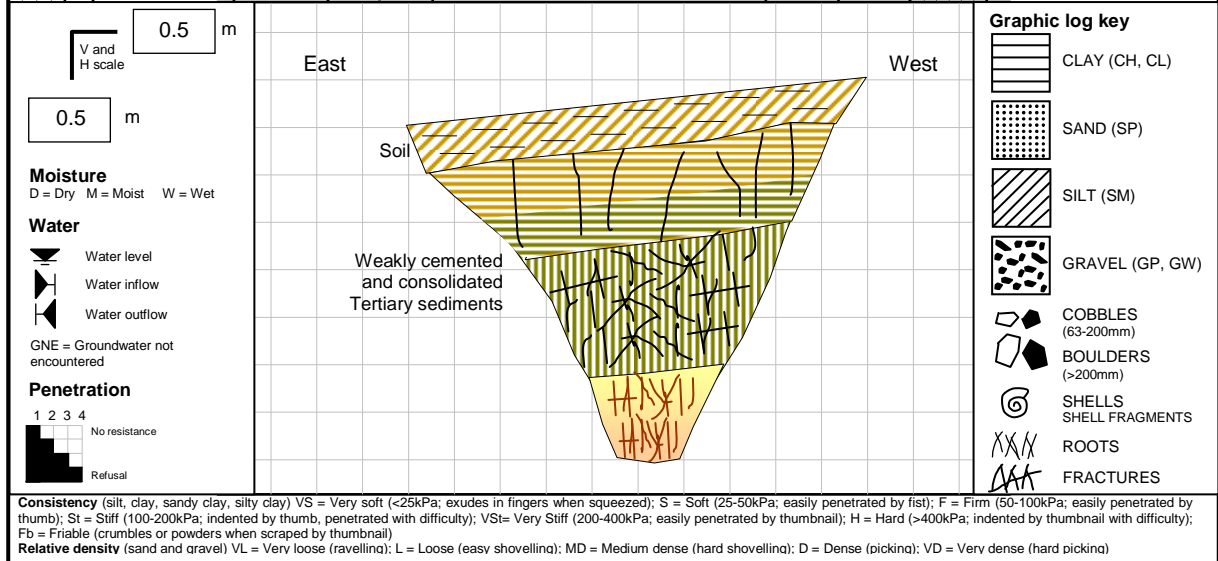
Test pit G. Detail of ironstone band and sandstone/claystone boundary



Test pit G. Detail of irregular blocky fracturing in sandy clay near 1m depth



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists										Pit H		
Excavation log										Sheet 1 of 1		
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead												
Coordinates			Exposure type			Date dug			18 February 2009			
513911mE, 5411016mN			Test pit			20t excavator			18 February 2009			
Datum			Equipment			Date logged			18 February 2009			
GDA94			1.3m GP bucket with 6 teeth									
RL			Operator			Logged by			W. C. Cromer			
Base approx. 38m AHD			Paul Richardson			Checked by			W. C. Cromer			
Dimensions (m)			Operator			Logged by			W. C. Cromer			
Depth 4.0 Length 5 Width 1.5			Paul Richardson			Checked by			W. C. Cromer			
Penetration	Support	Notes	metres		Graphic log	USCS	Materials	Moisture condition	Consistency	Density index	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth								
1												
2		D			[Diagonal lines]	SP	Clayey sandy SILT: grey; pedal; hardsetting; low-mod plasticity	D	H			Soil
3		U50		1	[Horizontal lines]	CH	CLAY: brown grading to olive brown; high plasticity; pedal at top; cloddy, subvertical fracturing to base; grading to	M<<PL	H			Subsoil/Tertiary sediments
		D (bulk)		2	[Vertical lines]		CLAYSTONE: olive grey (black and orange on defects) very strongly and conchoidally fractured; some manganese dioxide staining; locally interbedded and with wisps of clayey sandstone; dip c. 10° to 360°M	D	H			Tertiary sediments
		Photographs of full profile taken. See next pages.		3	[Cross-hatch]		SANDSTONE: light yellow grading to orange; weakly cemented	D-M	Fb-D			
				4			End as required, 4.0m in Tertiary sediments					
				5								
				6								
				7								



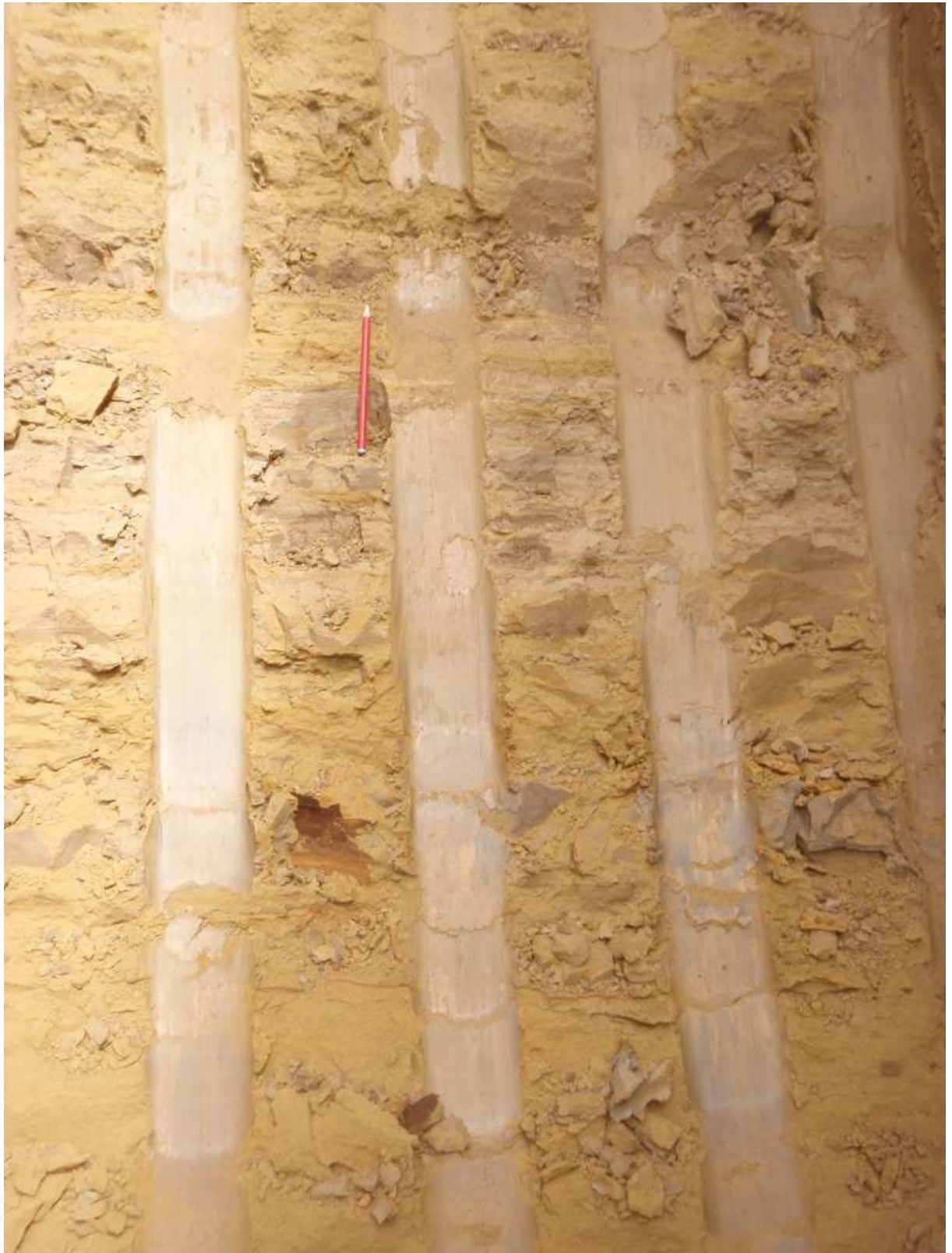
Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt = Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (pickling); VD = Very dense (hard pickling)

Test pit H. General view of profile.



Test pit H. Detail of weakly cemented sandstone at about 3m depth.

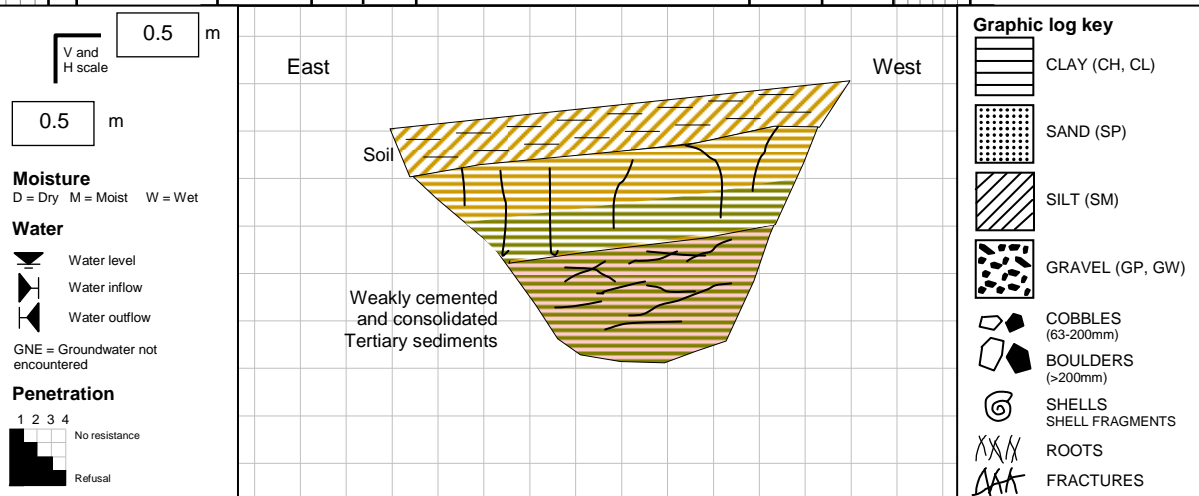


Test pit H. Sandstone spoil from the pit.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit I			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Test pit		Date dug		18 February 2009		
514017mE, 5410981mN		Equipment		20t excavator		Date logged		18 February 2009		
Datum GDA94		RL		Base approx. 19m AHD		Operator		Paul Richardson		
Dimensions (m)		Depth 2.8		Length 5		Width 1.5		Checked by W. C. Cromer		
Logged by		W. C. Cromer		Checked by		W. C. Cromer				
Penetration	Support	Notes	metres	Graphic log	USCS	Materials	Moisture condition	Consistency index	Hand penetrometer (kPa)	Structure, geology and interpretation
1 2 3		Samples and tests	RL Depth			Soil type, colour, plasticity or particle characteristics, secondary and minor components			25 50 100 200 400	
		D			SP SM	Sandy SILT grading to clayey SILT: grey; pedal; hardsetting; low-mod plasticity	D	H		Soil
		U50	1		CH	CLAY: grey brown and orange, and olive brown >0.8m; high plasticity; cloddy, subvertical fracturing to gradational base	M<<PL	H		Subsoil/Tertiary sediments
		D (bulk)	2			As above; pinkish brown streaked with olive grey; irregularly fractured with polished defect surfaces parallel to slope; trace to some sand	M<<PL	H		Tertiary sediments
		Photographs of full profile taken. See next page.	3			End as required, 2.8m in Tertiary sediments				
			4							
			5							
			6							
			7							

TAS/11



Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt = Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (pickling); VD = Very dense (hard pickling)

Test pit I. General view of profile.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit J			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Test pit		Date dug		18 February 2009		
514196mE, 5411004mN		Equipment		20t excavator		Date logged		18 February 2009		
Datum GDA94				1.3m GP bucket with 6 teeth						
RL Base approx. 7.5m AHD										
Dimensions (m)		Operator		Paul Richardson		Logged by		W. C. Cromer		
Depth 3.5 Length 4 Width 1.5		Checked by		W. C. Cromer						
Penetration	Support	Notes	metres	Graphic log	USCS	Materials	Moisture condition	Consistency	Hand penetrometer	Structure, geology and interpretation
1 2 3		Samples and tests	RL Depth			Soil type, colour, plasticity or particle characteristics, secondary and minor components		Density index	(kPa)	
		Photographs of full profile taken. See next page.			CL, CH	Silty CLAY: orange; mod plasticity	D	Fb-H	25 90 200 400	Fill
					CH	Silty CLAY: brown; mod plasticity	M<PL	Fb-St		Soil
			1			CLAY: black; high plasticity; organic	M<PL	H		Quaternary alluvium
		1L/min from 2.1m.	2			CLAY and silty CLAY: grey blue and orange; some gravel; high plasticity				
			3			SANDSTONE: orange brown; weakly cemented				Tertiary sediments
			4			End as required, 3.5m in Tertiary sediments				
			5							
			6							
			7							

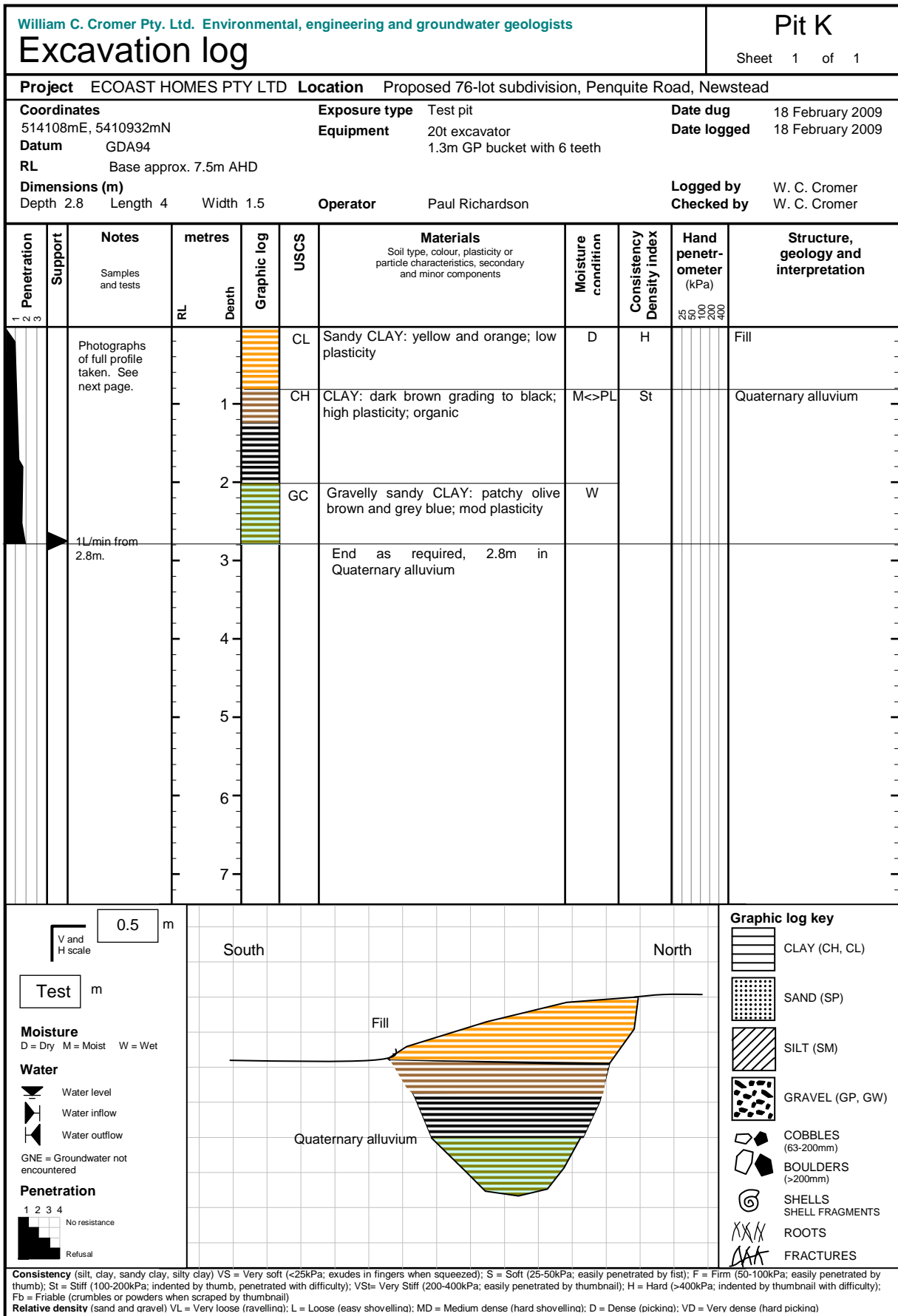
<p>V and H Scale</p> <p>0.5 m</p> <p>Moisture</p> <p>D = Dry M = Moist W = Wet</p> <p>Water</p> <p>Water level</p> <p>Water inflow</p> <p>Water outflow</p> <p>GNE = Groundwater not encountered</p> <p>Penetration</p> <p>1 2 3 4</p> <p>No resistance</p> <p>Refusal</p>	<p>West</p> <p>East</p>	<p>Graphic log key</p> <ul style="list-style-type: none"> CLAY (CH, CL) SAND (SP) SILT (SM) GRAVEL (GP, GW) COBBLES (63-200mm) BOULDERS (>200mm) SHELLS SHELL FRAGMENTS ROOTS FRACTURES
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Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Test pit J. General view of profile.

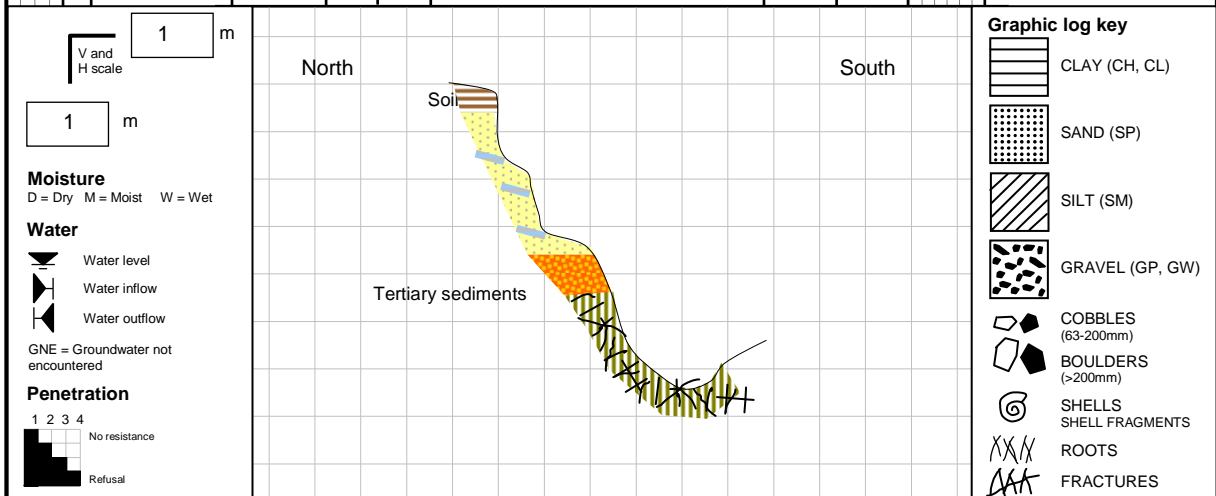




Test pit K. General view of profile.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit L			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Date dug		18 February 2009				
514062mE, 5410946mN		Test pit		25 February 2009						
Datum		Equipment		Date logged						
GDA94		20t excavator		25 February 2009						
RL		Operator		Logged by		W. C. Cromer				
Base approx. 11m AHD		Paul Richardson		Checked by		W. C. Cromer				
Dimensions (m)										
Depth 6.5 Length 6 Width 1.5										
Penetration	Support	Notes	metres	Graphic log	USCS	Materials	Moisture condition	Consistency Density index	Hand penetrometer (kPa)	Structure, geology and interpretation
1 2 3		Samples and tests	RL Depth			Soil type, colour, plasticity or particle characteristics, secondary and minor components			25 50 100 200 400	
		Photographs of full profile taken. See next pages.			CL	CLAY: brown; some silt; pedal; high plasticity	D	VSt		Soil
			1		SP and CH	SAND with interbedded CLAY: orange sand; blue grey clay; relict bedding dips 10 to 20° to 130°M; weakly cemented	D	Fb-Vd-VSt		Weathered Tertiary sediments
			2							
			3							
			4			CONGLOMERATE: reddish orange with grey clay pellets and some rounded siltstone to 10mm; weakly cemented	D	VD		Tertiary sediments
		Trace below 5m	5			CLAYSTONE: grey blue and yellow; blocky irregular fracture; bedding dips 13° to 130°M	W			
			6							
			7			End as required, 6.5m in Tertiary sediments				



Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (travelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Test pit L. General view of profile.



Test pit L. Detail of surface 2m



Test pit L. Detail of 2 – 4m depth



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists										Pit M	
Excavation log										Sheet 1 of 1	
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead											
Coordinates			Exposure type			Date dug			25 February 2009		
514095mE, 5411005mN			Test pit			25 February 2009					
Datum			Equipment			Date logged			25 February 2009		
GDA94			20t excavator			25 February 2009					
RL			Operator			Logged by			W. C. Cromer		
Base approx. 11m AHD			Paul Richardson			W. C. Cromer					
Dimensions (m)			Operator			Checked by			W. C. Cromer		
Depth 5 Length 5 Width 1.5			Paul Richardson			W. C. Cromer					
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency Density index	Hand penetrometer (kPa)	Structure, geology and interpretation	
			RL	Depth							
1		Photographs of full profile taken. See next pages.			CL	CLAY: brown; some silt; pedal; high plasticity	D	VSt		Soil	
2			1			SANDSTONE and GRANULE CONGLOMERATE: yellowish orange; lateritic; weakly cemented; base dips 5° to 120°M; granules of clay, weathered sandstone; chalcedony, etc	D	VD		Tertiary sediments	
3			2			CLAYSTONE: reddish brown and olive brown (grey brown on defects); well developed blocky fracture	M<<PL	H			
4			3								
5			4								
6			5								
7			6								
			5			End as required, 5.0m in Tertiary sediments					
			6								
			7								

Moisture
D = Dry M = Moist W = Wet

Water

Water level

Water inflow

Water outflow

GNE = Groundwater not encountered

Penetration

1 2 3 4

No resistance

Refusal

Northwest

Soil

Tertiary sediments

Fill

Southeast

Graphic log key

- CLAY (CH, CL)
- SAND (SP)
- SILT (SM)
- GRAVEL (GP, GW)
- COBBLES (63-200mm)
- BOULDERS (>200mm)
- SHELLS SHELL FRAGMENTS
- ROOTS
- FRACTURES

Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented with difficulty); VSt = Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easv shovelling); MD = Medium dense (hard shovelling); D = Dense (pickling); VD = Very dense (hard pickling)

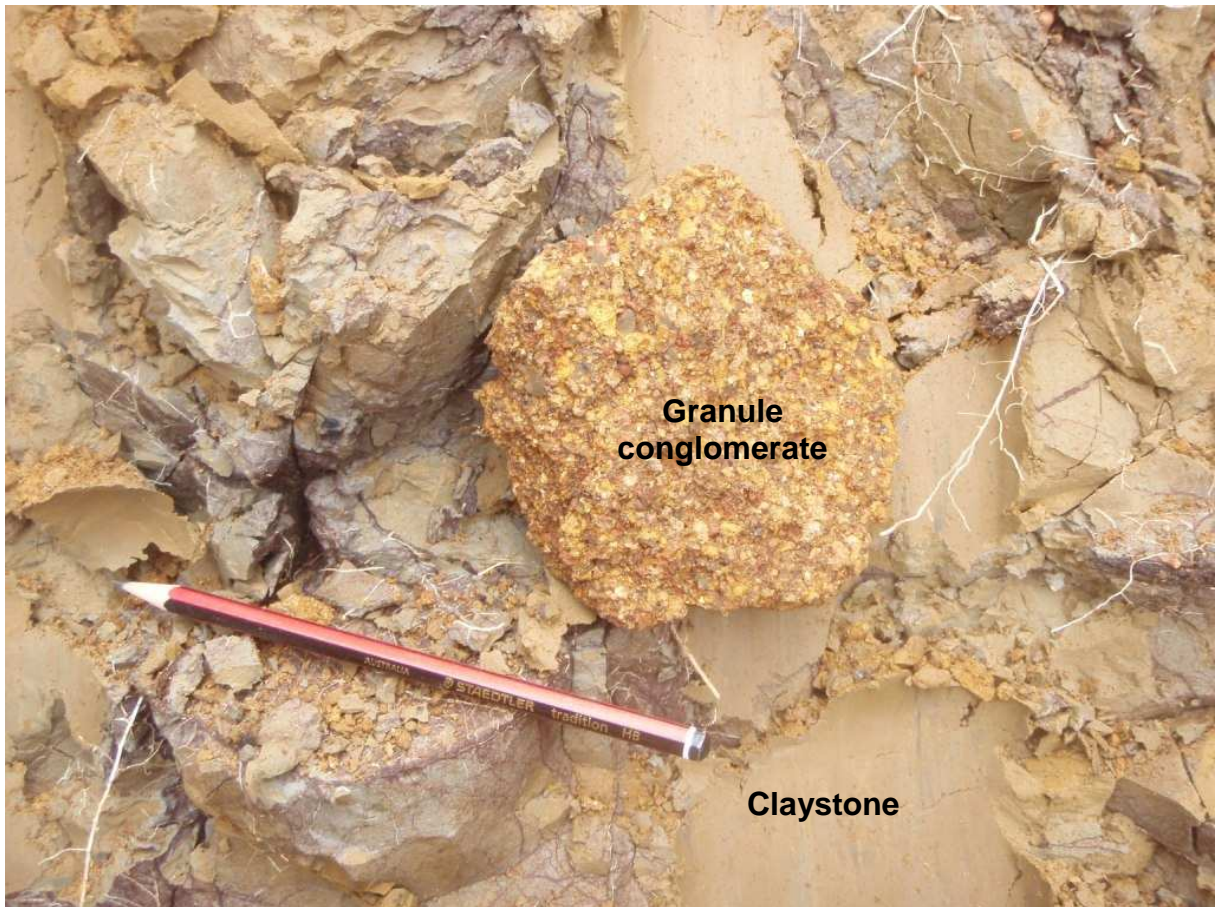
Test pit M. General view of profile.



Test pit M. Detail of northeast face; claystone with blocky fracture dips about 5° to 120°M.



Test pit M. Example of Tertiary granule conglomerate and claystone



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit N				
Excavation log							Sheet 1 of 1				
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead											
Coordinates		Exposure type		Date dug		25 February 2009					
514137mE, 5411049mN		Test pit		Date logged		25 February 2009					
Datum		Equipment									
GDA94		20t excavator		1.3m GP bucket with 6 teeth							
RL		Operator		Logged by		W. C. Cromer					
Base approx. 18m AHD		Paul Richardson		Checked by		W. C. Cromer					
Dimensions (m)											
Depth 6 Length 5 Width 1.5											
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency	Hand penetrometer (kPa)	Structure, geology and interpretation	
			RL	Depth							
1		Photographs of full profile taken. See next page.			CL	Silty CLAY: brown; pedal; high plasticity	D	VSt		Soil	
2			1			SANDSTONE: yellowish brown; weakly cemented; base dips 5° to 190°M; irregular blocky fracture	D	VD		Tertiary sediments	
3			2								
4			3								
5			4								
6			5			CLAYSTONE: reddish brown and olive brown (grey brown on defects); well developed blocky fracture	M<<PL	H			
7			6			End as required, 6m in Tertiary sediments					

<p>1 m</p> <p>V and H scale</p> <p>1 m</p> <p>Moisture D = Dry M = Moist W = Wet</p> <p>Water Water level Water inflow Water outflow GNE = Groundwater not encountered</p> <p>Penetration 1 2 3 4 No resistance Refusal</p>	<p>Northwest</p> <p>Soil</p> <p>Tertiary sediments</p> <p>Road</p> <p>Southeast</p>	<p>Graphic log key</p> <p>CLAY (CH, CL)</p> <p>SAND (SP)</p> <p>SILT (SM)</p> <p>GRAVEL (GP, GW)</p> <p>COBBLES (63-200mm)</p> <p>BOULDERS (>200mm)</p> <p>SHELLS SHELL FRAGMENTS</p> <p>ROOTS</p> <p>FRACTURES</p>
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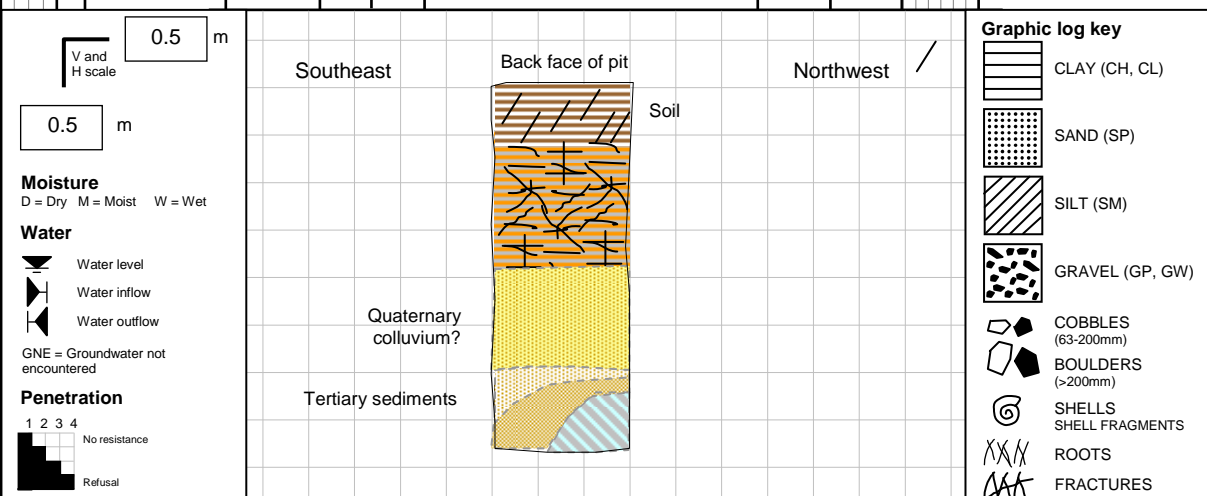
Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravellina); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (pickling); VD = Very dense (hard pickling)

Test pit N. General view of profile.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit O			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates			Exposure type		Test pit		Date dug		25 February 2009	
Datum			Equipment		20t excavator		Date logged		25 February 2009	
RL			Operator		Paul Richardson		Logged by		W. C. Cromer	
Dimensions (m)			Checked by		W. C. Cromer					
Depth 3.8 Length 4 Width 1.5										
Penetration	Support	Notes	metres	Graphic log	USCS	Materials	Moisture condition	Consistency	Hand penetrometer (kPa)	Structure, geology and interpretation
1 2 3		Samples and tests	RL Depth			Soil type, colour, plasticity or particle characteristics, secondary and minor components			25 50 100 200 400	
		Photographs of full profile taken. See next pages.			CL	Silty CLAY: brown; some sand; pedal; mod-high plasticity	D	VSt		Soil
			1		CH	CLAY: patchy red/orange and grey; high plasticity; irregular blocky fracture; occasional red ironstone clasts	M<<PL	H		Subsoil on Quaternary colluvium?
			2		SP	Silty SAND: yellowish brown, with angular ironstone fragments	D	VD		Quaternary colluvium
			3			SANDSTONE: light brown	D	VD		Tertiary sediments
						SANDSTONE: brown and cream with clay pellets	D	VD		
						Clayey SILTSTONE, yellow, grey blue: light brown	D	VD		
			4			End as required, 3.8m in Tertiary sediments				
			5							
			6							
			7							



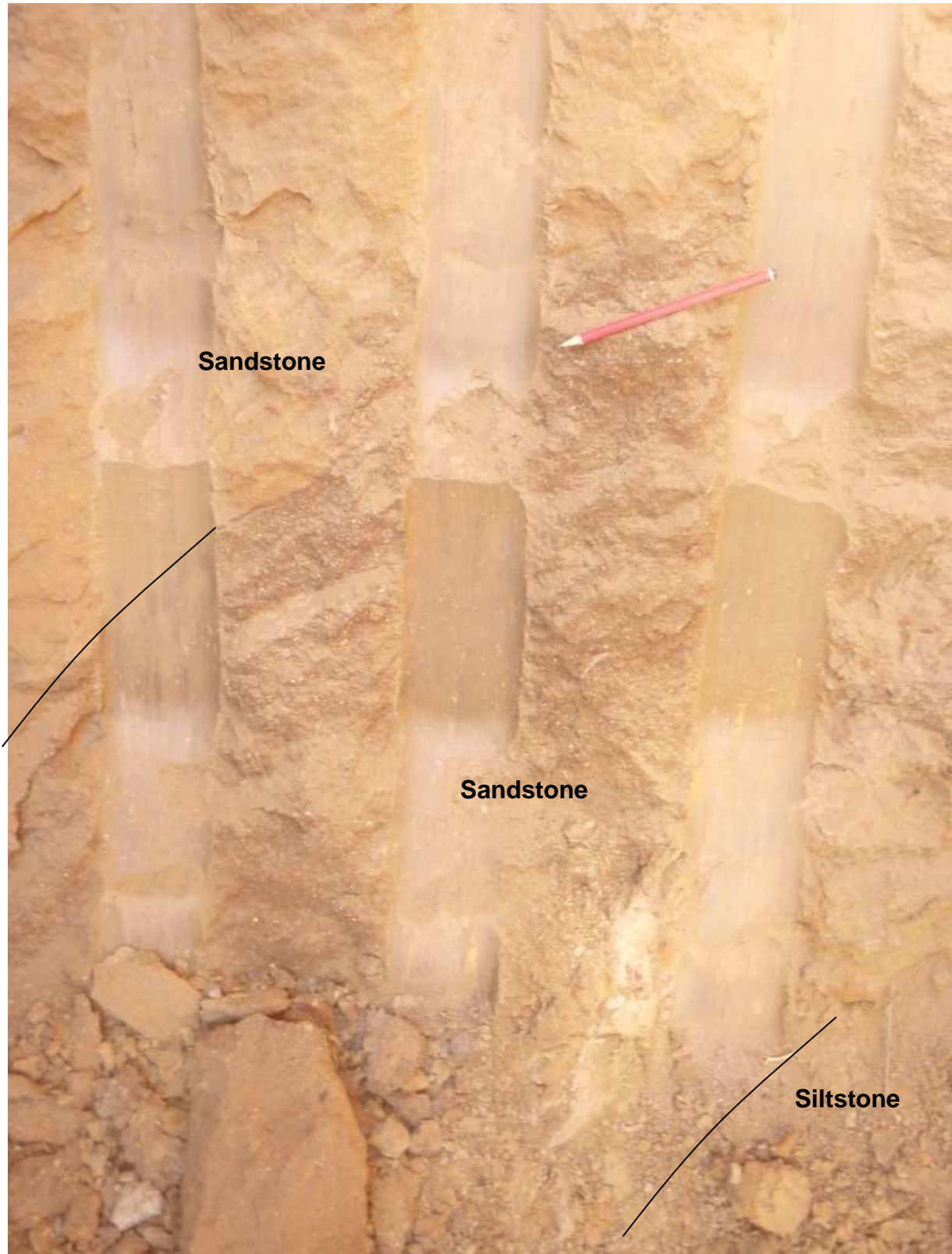
Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Test pit O. General view of profile.



Test pit O. Detail of Tertiary sediments at base of pit showing dipping beds



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit P			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates			Exposure type		Test pit		Date dug			
514024mE, 5410903mN			Equipment		20t excavator		25 February 2009			
Datum GDA94					1.3m GP bucket with 6 teeth		Date logged 25 February 2009			
RL Base approx. 22m AHD			Operator		Paul Richardson		Logged by W. C. Cromer			
Dimensions (m)			Checked by		W. C. Cromer					
Depth 3.1 Length 5 Width 1.5										
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency Density index	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth						
1					CH	CLAY: greyish brown grading to orange brown; silty; pedal, cloddy; high plasticity	M<<PL	H		Soil
2		D		1	CH	Sandy CLAY: orange and yellow flecked with red; mod plasticity; irregular blocky fracture	M<PL	VSt-H		Subsoil/Tertiary sediments
3		U50		2		Clayey SANDSTONE: orange and yellow flecked with red; low plasticity; irregular blocky fracture; weakly cemented	D	D-VD		Tertiary sediments
4		Photographs of full profile taken. See next page.		3		End as required, 3.1m in Tertiary sediments				
5				4						
6				5						
7				6						
				7						

<p>0.5 m</p> <p>V and H scale</p> <p>0.5 m</p> <p>Moisture D = Dry M = Moist W = Wet</p> <p>Water Water level Water inflow Water outflow</p> <p>GNE = Groundwater not encountered</p> <p>Penetration 1 2 3 4 No resistance Refusal</p>	<p>Southeast</p> <p>Northwest</p>	<p>Graphic log key</p> <p>CLAY (CH, CL)</p> <p>SAND (SP)</p> <p>SILT (SM)</p> <p>GRAVEL (GP, GW)</p> <p>COBBLES (63-200mm)</p> <p>BOULDERS (>200mm)</p> <p>SHELLS SHELL FRAGMENTS</p> <p>ROOTS</p> <p>FRACTURES</p>
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Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (pickling); VD = Very dense (hard pickling)

Test pit P. General view of profile.



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists							Pit Q			
Excavation log							Sheet 1 of 1			
Project ECOAST HOMES PTY LTD Location Proposed 76-lot subdivision, Penquite Road, Newstead										
Coordinates		Exposure type		Test pit		Date dug		25 February 2009		
513948mE, 5410877mN		Equipment		20t excavator		Date logged		25 February 2009		
Datum GDA94				1.3m GP bucket with 6 teeth						
RL Base approx. 36m AHD										
Dimensions (m)		Operator		Paul Richardson		Logged by		W. C. Cromer		
Depth 2.7 Length 5 Width 1.5		Checked by		W. C. Cromer						
Penetration	Support	Notes	metres		USCS	Materials	Moisture condition	Consistency	Hand penetrometer (kPa)	Structure, geology and interpretation
			RL	Depth						
1					CH	Sandy SILT: light grey; hardsetting; nonplastic	D	H		Soil
2		D			CH	CLAY: patchy orange and grey; high plasticity; irregular blocky fracture; with patches of ferruginous sandstone and siltstone	M<>PL	H		Subsoil/Tertiary sediments
3		U50	1							
			2							
		D (bulk)								
		Photographs of full profile taken. See next page.	3			End as required, 2.7m in Tertiary sediments				
			4							
			5							
			6							
			7							

<p>0.5 m</p> <p>V and H scale</p> <p>0.5 m</p> <p>Moisture D = Dry M = Moist W = Wet</p> <p>Water</p> <p>Water level</p> <p>Water inflow</p> <p>Water outflow</p> <p>GNE = Groundwater not encountered</p> <p>Penetration</p> <p>1 2 3 4</p> <p>No resistance</p> <p>Refusal</p>	<p>Southeast</p> <p>Northwest</p>	<p>Graphic log key</p> <p>CLAY (CH, CL)</p> <p>SAND (SP)</p> <p>SILT (SM)</p> <p>GRAVEL (GP, GW)</p> <p>COBBLES (63-200mm)</p> <p>BOULDERS (>200mm)</p> <p>SHELLS SHELL FRAGMENTS</p> <p>ROOTS</p> <p>FRACTURES</p>
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Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)

Relative density (sand and gravel) VL = Very loose (ravellinq); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (pickinq); VD = Very dense (hard pickinq)

Test pit Q. General view of profile before deepening.



Test pit Q. View of base of pit

