# Appendix A

**Results of Field Investigations** 



# Soil Description Explanation Sheet (1 of 2)

#### **DEFINITION:**

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

#### **CLASSIFICATION SYMBOL & SOIL NAME**

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

#### PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE		
Boulders		>200 mm		
Cobbles		63 mm to 200 mm		
Gravel	coarse	20 mm to 63 mm		
	medium	6 mm to 20 mm		
	fine	2.36 mm to 6 mm		
Sand	coarse	600 μm to 2.36 mm		
	medium	200 μm to 600 μm		
	fine	75 μm to 200 μm		

#### **MOISTURE CONDITION**

- Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.
- **Moist** Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.
- Wet As for moist but with free water forming on hands when handled.

#### CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH S <sub>U</sub> (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	_	Crumbles or powders when scraped by thumbnail.

#### DENSITY OF GRANULAR SOILS

<b>DENSITY INDEX (%)</b>
Less than 15
15 - 35
35 - 65
65 - 85
Greater than 85

#### MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

#### SOIL STRUCTURE

	ZONING	CE	MENTING
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN WEATHERED IN PLACE SOILS Extremely Structure and fabric of parent rock visible. weathered material								
Residual soil	Structure and fabric of parent rock not visible.							
TRANSPORTE								
Aeolian soil	Deposited by wind.							
Acollari Soli	Deposited by wind.							
Alluvial soil	Deposited by streams and rivers.							
Colluvial soil	Deposited on slopes (transported downslope by gravity).							
Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.							
Lacustrine soil	Deposited by lakes.							
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.							

# coffey **>**

# Soil Description Explanation Sheet (2 of 2)

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)							USC	PRIMARY NAME
Ø		arse 2.0 mm	CLEAN GRAVELS (Little or no fines)	Wide amou	range in grain size an Ints of all intermediat	nd substantial e particle sizes.	GW	GRAVEL
3 mm is		'ELS If of cc r than 2	CLE GRAN (Lit fine	Predo with r	ominantly one size or nore intermediate siz	a range of sizes es missing.	GP	GRAVEL
SOILS than 60	l eye)	GRAVELS More than half of coarse fraction is larger than 2.0 mm	GRAVELS WITH FINES (Appreciable amount of fines)		plastic fines (for identidures see ML below)		GM	SILTY GRAVEL
RAIINED rials less 0.075 m	e naked	More fraction	GRAN WITH   (Appre amc of fii		c fines (for identificat L below)	tion procedures	GC	CLAYEY GRAVEL
COARSE GRAIINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	about the smallest particle visible to the naked eye)	arse 2.0 mm	AN IDS IDS ttle or ss)	Wide amou	range in grain sizes a nts of all intermediat	and substantial e sizes	SW	SAND
CO/ an 50% larç	ticle visi	JDS If of coa	CLEAN SANDS (Little or no fines)		Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	SAND
More th	smallest particle visible SANDS More than half of coarse tion is smaller than 2.0 n		SANDS WITH FINES (Appreciable amount of fines)		plastic fines (for identidures see ML below)		SM	SILTY SAND
	the sma	SANDS More than half of coarse fraction is smaller than 2.0 mm	SAI WITH (Appre amo of fi		c fines (for identificat L below).	tion procedures	SC	CLAYEY SAND
	out		IDENTIFICAT	ION PF	ROCEDURES ON FRA	ACTIONS <0.2 mm.		
nan	s ak	0	DRY STREN	GTH	DILATANCY	TOUGHNESS		
ILS less tl 75 mi	rticle i	CLAYS limit In 50	None to Low		Quick to slow	None	ML	SILT
FINE GRAINED SOILS In 50% of material less is smaller than 0.075 i	лт ра	SILTS & CLAYS Liquid limit less than 50	Low to medium		None	Medium	CL	CLAY
aRAIN of ma aller th	(A 0.075 mm particle is	SIL L			Slow to very slow	Low	OL	ORGANIC SILT
FINE G n 50% is sma	(A 0	_AYS nit in 50	Low to medi	um	Slow to very slow Low to medium		MH	SILT
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm		SILTS & CLAYS Liquid limit greater than 50	Low to medi Low to medi High High Medium to H		None High		СН	CLAY
Mc 6		SILT Lic grea	Medium to H	ligh	None	ОН	ORGANIC CLAY	
HIGHL' SOILS	HIGHLY ORGANIC Readily identified by colour, odour, spongy feel and solls frequently by fibrous texture.						Pt	PEAT
• Low p	lastic	city – Liqu	id Limit W <sub>L</sub> les	s than	35%. • Medium plasti	icity – WL between 35%	% and 50%.	1

#### SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM	TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.		SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	AND STATES
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.		TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.		TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.		INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

72810-03/02/2009



# Rock Description Explanation Sheet (1 of 2)

The descriptive terms used by Coffey are given below. They are broadly consistent with Australian Standard AS1726-1993. DEFINITIONS: Rock substance, defect and mass are defined as follows: Rock Substance In engineering terms roch substance is any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Effectively homogenous material, may be isotropic or anisotropic. Defect Discontinuity or break in the continuity of a substance or substances. Any body of material which is not effectively homogeneous. It can consist of two or more substances without defects, or one or Mass more substances with one or more defects. SUBSTANCE DESCRIPTIVE TERMS: **ROCK SUBSTANCE STRENGTH TERMS ROCK NAME** Simple rock names are used rather than precise Abbrev- Point Load Field Guide Term Index, I<sub>S</sub>50 (MPa) geological classification. iation PARTICLE SIZE Grain size terms for sandstone are: Coarse grained Mainly 0.6mm to 2mm Mainly 0.2mm to 0.6mm Very Low VL Less than 0.1 Material crumbles under firm Medium grained blows with sharp end of pick; Mainly 0.06mm (just visible) to 0.2mm Fine grained can be peeled with a knife: pieces up to 30mm thick can FABRIC Terms for layering of penetrative fabric (eg. bedding, be broken by finger pressure. cleavage etc.) are: Massive No layering or penetrative fabric. 0.1 to 0.3 Easily scored with a knife: Low L Indistinct Lavering or fabric just visible. Little effect on properties. indentations 1mm to 3mm show with firm bows of a Layering or fabric is easily visible. Rock breaks more Distinct pick point; has a dull sound easily parallel to layering of fabric. under hammer. Pieces of core 150mm long by 50mm CLASSIFICATION OF WEATHERING PRODUCTS diameter may be broken by Term Abbreviation Definition hand. Sharp edges of core may be friable and break RS Soil derived from the weathering of rock; the during handling. Residual Soil mass structure and substance fabric are no longer evident; there is a large change in 0.3 to 1.0 volume but the soil has not been significantly Medium Μ Readily scored with a knife; a piece of core 150mm long by transported. , 50mm diameter can be broken by hand with difficulty. xw Extremely Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or Weathered can be remoulded in water. Original rock fabric Material Hiah н 1 to 3 A piece of core 150mm long still visible. by 50mm can not be broken by hand but can be broken нw Rock strength is changed by weathering. The Highly by a pick with a single firm whole of the rock substance is discoloured, Weathered blow; rock rings under usually by iron staining or bleaching to the Rock extent that the colour of the original rock is not hammer. recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by Very High VH 3 to 10 Hand specimen breaks after leaching or may be decreased due to the more than one blow of a deposition of minerals in pores pick: rock rings under Moderately MW The whole of the rock substance is discoloured, hammer. usually by iron staining or bleaching , to the Weathered extent that the colour of the fresh rock is no Rock Extremely EH More than 10 Specimen requires many longer recognisable. blows with geological pick to High Rock substance affected by weathering to the break; rock rings under Slightly SW extent that partial staining or partial hammer Weathered discolouration of the rock substance (usually by Rock limonite) has taken place. The colour and texture of the fresh rock is recognisable: strength properties are essentially those of the Notes on Rock Substance Strength: fresh rock substance. 1. In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may Fresh Rock FR Rock substance unaffected by weathering. break readily parallel to the planar anisotropy. The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein Notes on Weathering: 1. AS1726 suggests the term "Distinctly Weathered" (DW) to cover the range of makes it clear that materials in that strength range are soils in substance weathering conditions between XW and SW. For projects where it is engineering terms. not practical to delineate between HW and MW or it is judged that there is no 3. The unconfined compressive strength for isotropic rocks (and advantage in making such a distinction. DW may be used with the definition anisotropic rocks which fall across the planar anisotropy) is typically given in AS1726. 10 to 25 times the point load index (Is50). The ratio may vary for 2. Where physical and chemical changes were caused by hot gasses and liquids different rock types. Lower strength rocks often have lower ratios associated with igneous rocks, the term "altered" may be substituted for than higher strength rocks. "weathering" to give the abbreviations XA, HA, MA, SA and DA.



# Rock Description Explanation Sheet (2 of 2)

COMMON ROCK MA Term	I DEFECTS IN SSES Definition	Diagram	Map Symbol	Graphic Log (Note 1)	DEFECT SHAPE Planar	<b>TERMS</b> The defect does not vary in orientation
Parting	A surface or crack across which the rock has little or no tensile strength.		20		Curved	The defect has a gradual change in orientation
	Parallel or sub parallel to layering (eg bedding) or a planar anisotropy in the rock substance (eg, cleavage).	/	20 1	Iding vage (Note 2)	Undulating	The defect has a wavy surface
	May be open or closed.		Old	(Note 2)	Stepped	The defect has one or more well defined steps
Joint	A surface or crack across which the rock has little or no tensile strength.				Irregular	The defect has many sharp changes of orientation
	but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance.			(Note 2)		sment of defect shape is partly by the scale of the observation
	May be open or closed.			(14018-2)	ROUGHNESS Slickensided	TERMS Grooved or striated surface usually polished
<b>Sheared</b> <b>Zone</b> (Note 3)	Zone of rock substance with roughly parallel near planar, curved or				Polished	Shiny smooth surface
(NOLE 3)	undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of		35	1111	Smooth	Smooth to touch. Few or no surface irregularities
	the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.	. /		[*-]	Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.		40 	14 NOV	Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than ver coarse sand paper.
Crushed Seam	Seam with roughly parallel almost planar boundaries, composed of	in the	50		COATING TER Clean	<b>MS</b> No visible coating
(Note 3)	disoriented, usually angular fragments of the host rock substance which may be more	10 <b>1</b>		5	Stained	No visible coating but surfaces are discoloured
	weathered than the host rock. The seam has soil properties.			17.1	Veneer	A visible coating of soil or mineral, too thin to measure may be patchy
Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1 mm thick may be described as veneer or coating on joint surface.		Real Provide P	65	Coating	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (eg infilled seam). Thicker rock strength material is usually described as a vein.
Extremely	Seam of soil substance, often with		2		BLOCK SHAPI Blocky	E TERMS Approximately equidimensional
Weathered Seam	gradational boundaries. Formad by weathering of the rock substance in place.	***********	a The	III III	Tabular	Thickness much less than length or width
		Seam		1	Columnar	Height much greate than cross section

1. Usually borehole logs show the true dip of defects and face sketches and sections the apparent dip.

<sup>2.</sup> Partings and joints are not usually shown on the graphic log unless considered significant.

<sup>3.</sup> Sheared zones, sheared surfaces and crushed seams are faults in geological terms.



#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 4.4.2007 Date started:

**TP 1** 

4.4.2007

CW

Principal: Project:

### TATTERSALL SURVEYORS PTY LTD

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipmer	nt type	and	model: 4	1WD E	Backho	е		Pit Orientation: Eas	ting: m			,	. Surface:	2.586
excavatio	on dim	ensio	ons:	1.5m l	ong (	0.4m w	.4m wide North			hing: m datum: AHD				AHD
excava	ation	info	ormation			mat	erial s	ubstance						
method 7 T penetration	5	water	notes samples, tests, etc	RL 1	depth netres	graphic log	classification symbol	material soil type: plasticity or particle charact colour, secondary and minor compo	eristics, nents.	moisture condition	consistency/ density index	100 A pocket 200 A penetro- 400 meter		tructure and onal observations
Ha		04-04-07 8:54am	D	_2.5			CI	TOPSOIL: SAND, fine to medium grained brown with approximately 30% low plastic with 300mm of rootlets. Sandy CLAY: medium plasticity, dark brown-orange, sand fine to medium graine SAND: fine to medium grained, pale grey- Becoming pale grey-brown. Test pit TP 1 terminated at 1.9m	- — — — — ed.	- W	VD			- - - - - - - - - - - - - - - - - - -
Method N X BH B R E	natuu exist back bulld rippe	ng ex noe b ozer b	Dosure cavation ucket blade	S i pe	pport shoring 2 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	n ranging to refusal level e showr	)	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>53</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	r soil des based ou system <b>moistur</b> D dr M m W w Wp pl		classifica		consister VS S F St VSt H Fb VL L MD D VD	rcy/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007 Date completed: 4.4.2007

CW

**TP 2** 

#### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

Project:

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

equipmer	nt tur	a and			Backho			Pit Orientation:	Easting: m		JIECKE	-		. Surface: 2.433
excavatio							ido	Fit Onemation.	-					
			ormation	1.5m long 0.4m wide material s				ubstance	Northing: m				dati	um: AHD
method 7 T penetration	upport	water	notes samples, tests, etc	RL I	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and mino	characteristics, r components.	moisture condition	consistency/ density index	100 A pocket	а	structure and additional observations
		V 04-04-07 9:13am	D	_2.0			SP	TOPSOIL: Silty Clayey SAND, fin grained, dark brown with approxim plasticity fines, with approximately Sandy CLAY: medium plasticity, brown-orange, with some sand le SAND: fine to medium grained, br Test pit TP 2 terminated at 1.9m	e to medium nately 30% of low y 300mm of rootlets. dark dark nses.	М	St	x		TOPSOIL  Rapid inflow of groundwater and pit collapsing below 1.7m depth.
Sketc Sketc Sketc Sketc	natu exis bacl bulla rippo	ing ex hoe b lozer b		S pe 1	iter water	n no resista anging to efusal evel e showr nflow	)	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm         U <sub>63</sub> undisturbed sample 63mm         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter dia	ication sy scription on unified re try noist vet Jastic limit iquid limit	classifica			consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007

TP 3

4.4.2007

CW

Principal:

### TATTERSALL SURVEYORS PTY LTD

#### Principa Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

equipment type and model: 4	WD Backhoe	ting: m R.L. Surface: 2.571			
excavation dimensions: 1.	.5m long 0.4m wide	Ν	orthing: m	date	um: AHD
excavation information	material s	ubstance			
pout a transformed by the second seco	graphic log symbol symbol	material soil type: plasticity or particle chara colour, secondary and minor com	cteristics, ponents.	consistency/ density index <sup>100</sup> pocket <sup>200</sup> d penetro- <sup>300</sup> w meter	structure and additional observations
Harrison 1223 N	_2.0 0.5 SP 	TOPSOIL: Silty Clayey SAND, fine to ca grained, pale brown-brown, low plasticit some rootlets to 300mm. Clayey SAND: fine to medium grained, orange-brown / pale brown, low plasticit SAND: fine to coarse grained to fine to grained, pale grey-white. Becoming pale brown-white. Becoming white. Test pit TP 3 terminated at 1.8m	y fines with M	VD	TOPSOIL
Sketch         Sketch         N       natural exposure         x       existing excavation         BH       bulldozer blade         R       ripper         E       excavator	2.5 2.5 support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water water water level on date shown water inflow water outflow	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diame         U <sub>53</sub> undisturbed sample 63mm diame         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal		l classification	consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense



# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 5.4.2007 Date completed: 5.4.2007

CW

TP 4

#### Client: Principal:

# TATTERSALL SURVEYORS PTY LTD

Principa Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

equipment type and mo	odel: 4WD Backho	be	Pit Orientation:	Easting:	ng: m R.L			. Surface: 2.260
excavation dimensions: 1.5m long 0.4m wide				Northing:	m		dat	um: AHD
excavation inform	ation	material s	ubstance					
p te t sa	notes mples, sts, etc RL metres	graphic log classification symbol	material soil type: plasticity or particle colour, secondary and minor	characteristics,		moisture condition consistency/ density index	100 200 A pocket 300 b penetro- 400 meter	structure and additional observations
BH 05-04-07 12:12pm			TOPSOIL: Silty CLAY, medium pla grey-black, small percentage of sa some rootlets. CLAY: medium to high plasticity, of SAND: fine to coarse grained, pale Test pit TP 4 terminated at 2.1m	nd <10% with		M M>Wp St W	- x x x x x x	TOPSOIL
method         N       natural expost         X       existing excav         BH       backhoe buck         B       bulldozer blad         R       ripper         E       excavator	ation penetrati 1 2 3 4 water water ↓ water ↓ water	on no resistance ranging to refusal	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm         U <sub>63</sub> undisturbed sample 63mm         D       disturbed sample 63mm         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter soi diameter bas sys	il descr sed on stem bisture dry moi wet o plas	unified classific		consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



**REFER TO FIGURE 1** 

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 4.4.2007 Date started: 4.4.2007 Date completed:

CW

TP 5

#### Client: Principal:

# TATTERSALL SURVEYORS PTY LTD

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Project: Test pit location:

#### Checked by:

Excavation No.

equipment type a	and model:	4WD Backho	e	Pit Orientation:	Easting:	m			R.I	L. Surface: 2.765
			0.4m wide		Northing:	m			da	tum: AHD
excavation i	nformation	1	material s	ubstance						
method 5 benetration support	notes samples, tests, etc	depth RL metres	graphic log classification symbol	material soil type: plasticity or particle of colour, secondary and minor	characteristics, components.		moisture condition	consistency/ density index	<sup>100</sup> × pocket <sup>200</sup> Å penetro- <sup>300</sup> meter	
H	D 04-04-07 8:35am	_2.5	CI SP	TOPSOIL: SAND, fine to medium of brown, with low plasticity fines, app fines with some rootlets to approxin Sandy CLAY: medium plasticity, or sand fine to medium grained. SAND: fine to medium grained, pal Becoming pale grey-brown.	oroximately 30% mately 150mm.	ó   	W	VSt VD	*	TOPSOIL
X existing BH backho	exposure g excavation pe bucket ter blade	support S shoring penetratio 1 2 3 4 water ✓ water on dat	on no resistance ranging to refusal level e shown	notes, samples, tests         Us0       undisturbed sample 50mm of Us0         Us0       undisturbed sample 60mm of Us0         O       disturbed sample 80mm of Us0         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter soil diameter base syst	isture dry moi wet plas	ription unified c	<b>nbols a</b> Hassifica		consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



Engineering	Log -	Excavation
-------------	-------	------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 5.4.2007 Date completed: 5.4.2007

CW

TP 6

#### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

equipment type		4WD Backho		Pit Orientation: East	ing: m		JIECKE		Surface: 2.846
excavation dime			0.4m wide		hing: m			dati	
excavation		1.om long	material s		ing. in			uan	
method 1 8 penetration support	notes samples, tests, etc	depth RL metres	graphic log classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compo	eristics, hents.	moisture condition	consistency/ density index	100 × pocket 200 v penetro- 400 meter	structure and additional observations
	<ul> <li>● 05-04-07 12:33pm</li> <li>□ □</li> <li>□ □</li> </ul>	_2.5 - 	SM SP	<b>TOPSOIL:</b> Silty SAND, fine to medium gradark grey mottled white, with some rootlet to 150mm. <b>Silty SAND:</b> fine to medium graned, brow cemented sand nodules. <b>SAND:</b> fine to medium grained, pale brow with some cemented sand nodules.         Becoming pale grey-white.         Lenses of cemented sand nodules dark brow present.         Test pit TP 6 terminated at 2.1m	ined, s and roots	D M W	VD	- ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	TOPSOIL
X existin BH backh		support S shoring penetratic 1 2 3 4 water ₩ water water water water	no resistance ranging to refusal level e shown	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal		unified	classifica		consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

# TATTERSALL SURVEYORS PTY LTD

Principal:

Project:

#### Date completed: **RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENS**ogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

Sheet

Project No:

Date started:

**TP 7** 

13.4.2007

13.4.2007

JJT

GEOTSGTE20248AA

1 of 1

equipment type and model:	Pit Orientation: Easti			sting: m R.L. Surface: 2.388			
excavation dimensions: m long		Northing:	m		datu	m: AHD	
excavation information	material	substance					
po tau tau tau tau tau tau tau tau	graphic log classification symbol	materia soil type: plasticity or part colour, secondary and m		moisture	condition consistency/ density index	100 A pocket 200 A penetro- 400 meter	structure and additional observations
123     N	0.5 0.5 - - - - - - - - - - - - -	Sandy CLAY:high plasticity, of to medium grained.         Clayey SAND:fine to medium         Hole terminated at 1.0m, hole groundwater.         Test pit TP 7 terminated at 1m	grained, grey.	ne N	VD		
N natural exposure S X existing excavation BH backhoe bucket <b>pe</b>	horing N nil horing N nil a 4 no resistance ranging to refusal er water level on date shown water inflow water outflow	notes, samples, tests         U <sub>50</sub> undisturbed sample 50         D       disturbed sample 63         D       disturbed sample 63         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	omm diameter so smm diameter bas sys	il descript ised on uni stem oisture dry moist wet p plastic	ied classific		consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 13.4.2007 Date started: 13.4.2007 Date completed:

JJT

TP 8

#### Principal:

## TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Excavation No.

			and	I model:		101			Pit Orientation:	Easting:	m		JIECKE	,		. Surface:	3.184
excav					n long	a mv	vide		r it chontation.	Northing:	m				dat		AHD
				ormation		9 III V		erial s	ubstance	. torunny.					udi	urr1.	
hethod	5 penetration	upport	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minc	e characteristics, or components.		moisture condition	consistency/ density index	100 pocket	'a		ucture and nal observations
H		, N						SP	Clayey SAND: fine to medium gra			М	D		04		
			Not Measured	D	_3.0	- - - 0. <u>5</u> - 1. <u>0</u> -			Hole terminated at 0.6m, sand to Test pit TP 8 terminated at 0.6m	o dry to retrieve.							- - - - - - - - - - - - - - - - - -
					_1.5	- 1. <u>5</u> - 2.0 - - - - - - - - - - - - - - - - - - -											- - - - - - - - - - - - - - - - -
			alexp	Dosure		pport	N	nil	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm			ation sy	mbols a	nd		VS	y/density index very soft
N X BH B R E	X existing excavation BH backhoe bucket B bulldozer blade R ripper						n no resista anging to efusal evel e showr nflow	nce	Using the second sample softman       Using the second sample softman       D     disturbed sample form       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	n diameter bas syst	ed on tem isture dry mot wet plas	unified	classifica	ation		vs F St VSt Fb VL L D VD	very solt soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 4.4.2007 Date started:

TP 9

4.4.2007

CW

Principal: Project:

### TATTERSALL SURVEYORS PTY LTD

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment type and model: 4	WD Backhoe	Pit Orientation: Easti			. Surface: 2.735		
	.5m long 0.4m wide		rthing: m datum: AHD				
excavation information		substance	ing. In	Uall			
notes samples, tests, etc	depth Symbol Sym	material soil type: plasticity or particle characte colour, secondary and minor compon	istics, condition consistencv/	density index 100 pocket 200 d penetro- 400 meter	structure and additional observations		
	_2.5	TOPSOIL: Silty Clayey SAND, fine to medi grained, dark grey, low plasticity fines, with rootlets and thick roots to 100mm.         Clayey SAND: fine to medium grained, dar brown-black, low plasticity fines with some cemented sand nodules up to approximate diameter.         SAND: medium to coarse grained, pale gree         Becoming pale grey-brown.         Test pit TP 9 terminated at 2m	JM M some M black y 0.13m	VD	TOPSOIL		
Sketch         Sketch         N       natural exposure         X       existing excavation         BH       backhoe bucket         B       bulldozer blade         R       ripper         E       excavator	2.5 support S shoring N nil penetration 1 2 3 4 ranging to ranging to refusal water water water level on date shown	notes, samples, tests         Uso       undisturbed sample 50mm diameter         Us3       undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	classification symbol soil description based on unified clas system moisture D dry M moist W wet Wp plastic limit Wy plastic limit		consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense		



#### Sheet 1 of 1 GEOTSGTE20248AA Project No: 4.4.2007 Date started:

**TP10** 

4.4.2007

CW

Client: Principal: Project:

#### TATTERSALL SURVEYORS PTY LTD

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment t	equipment type and model: 4WD Backhoe Pit Orientation: Easting: m R.L. Surface: 2.585												
excavation	dime	nsior	ns: 1	.5m l	ong (	0.4m wide North			rthing: m datum: AHD				
excavati	ion i	nfor	mation			mat	erial s	ubstance					
method 5 c penetration	support		notes samples, tests, etc	RL r	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compo	eristics, nents.	moisture condition	consistency/ density index	100 A pocket 200 A penetro- 400 meter	
H8			D	_2.5 _2.0 _1.5 _1.0			SP	TOPSOIL: Clayey SAND, fine to medium of brown, low plasticity fines, with some root roots (10-30mm thick) to approximately 45 Clayey SAND: fine to medium grained, pa with some cemented sand nodules, low pl fines. SAND: fine to medium grained, pale grey- SAND: fine to medium grained, pale grey- One big, 0.7mm dia., cemented sand nodu Test pit TP10 terminated at 1.9m	e brown, asticity	W	MD D VD		TOPSOIL
X e BH b B b R ri	natural existing packhc ulldoz ipper excava	g exca be bud er bla	avation cket	S i	ter water l	n no resista anging to efusal evel e showr nflow	)	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample 63mm diameter         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	soil des based o system D di M m W w Wp pl		classifica		consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



#### Excavation No. **TP11** Sheet 1 of 1 Project No: **GEOTSGTE20248AA**

4.4.2007

4.4.2007

CW

Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Date started:

equipn	nent	type	and	model: 4	IWD F	Backho	e		Pit Orientation: Easti	ng: m		onconc		, 	Surface: 2	.732
1 · ·											HD					
				rmation					ubstance	<u>g</u>				uut		
8	c penetration	support	water	<b>notes</b> samples, tests, etc	RL 1	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compon	istics, ents.	moisture condition	consistency/ density index	kF	300 benetro- 400 meter		cture and al observations
BH		N		D	_2.5	0.5		SC SC	TOPSOIL: Silty SAND, fine to medium grai grey-brown, low plasticity fines? with some Clayey SAND:fine to medium grained, pal- grey-brown, low plasticity fines. Clayey SAND:fine to medium grained, orange-brown, dark brown-black, low plasti with cemented sand nodules up to approxi 0.13mm dia.	rootlets.	M	VD			TOPSOIL	- - - - - - - - - - - - - - - - - - -
				D	1.5	1. <u>0</u> - 1. <u>5</u> -		SP	SAND: fine to coarse grained, pale grey-br	Jwn.	W					- - - - - - - - - - - - - - 
			04-04-07 11:15am	D	_0.5	2.0			Test pit TP11 terminated at 1.9m							
Ske	etch															
E excavator water water water water water					S pe 1	shoring netratio 2 3 4 r r r ter water l	n no resista anging to efusal evel e showr nflow	)	Notes, samples, tests       U <sub>50</sub> undisturbed sample 50mm diameter       U <sub>83</sub> undisturbed sample 63mm diameter       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	soil des based o system D di M m W w Wp pl		classifica			consistency/ VS F St VSt H Fb VL L L D VL VL	density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



# Sheet1 of 1Project No:GEOTSGTE20248AADate started:4.4.2007

**TP12** 

4.4.2007

CW

Client: Principal:

### TATTERSALL SURVEYORS PTY LTD

Principa Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

equ	ipmen	nt type	and	l model:	1WD E	Backho	e		Pit Orientation:	Easting:	m				R.L	. Surface: 3.12	26
-	avatio				l.5m l	ong (	0.4m w			Northing:	m				datu	ım: AHI	2
ex		tion	info	ormation			mat		ubstance				<u> </u>	t ç	)		
method	5 penetration	support	water	notes samples, tests, etc	RL r	depth netres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minor	characteristics r components.	5,	moisture condition	consistency/ density index	100 × pocket	а		ure and observations
BH		N			_3.0	-			TOPSOIL: Silty Clayey SAND, fine grained, dark grey, low plasticity fi rootlets to approximately 350mm.	e to medium nes, with some	e	М				TOPSOIL	-
					2.5	0. <u>5</u>		SC	Clayey SAND / Sandy CLAY fine grained, dark grey-brown, medium	n plasticity fines	 s		St	× ×			- 
				D		-		CL	Sandy CLAY: low to medium plas orange-brown, sand fine to mediu	ticity, m grained.							-
				D	_2.0	1. <u>0</u> –		SP	SAND: fine to coarse grained, pale	e grey-white.			VD				
						_ 1. <u>5</u>			Becoming pale grey-brown.								-
					_1.5												
			•	D		2.0			Test pit TP12 terminated at 2m								
			)4-04-07 11:30am		_1.0												
S	ketcł	h	0		<u> </u>	2.5											
					i —					<b>;</b>							
N X	X existing excavation BH backhoe bucket B bulldozer blade R ripper				shoring netratio 2 3 4 r r ter water I on date	n no resista anging to efusal evel e showr		notes, samples, tests       U <sub>50</sub> undisturbed sample 50mm       U <sub>53</sub> undisturbed sample 63mm       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	diameter so diameter ba sy	oil desc ased on ystem noisture dry 1 mo / we /p pla	unified of	mbols a			S s F f St s VSt v H F Fb f VL v L k MD r	rery soft soft irm rery stiff rard riable rery loose sose nedium dense	
						water o											lense very dense



# Sheet1 of 1Project No:**GEOTSGTE20248AA**Date started:**4.4.2007**

CW

**TP13** 

4.4.2007

#### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

#### cipal:

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

equipment type and	model: 414	VD Backhoe	2	Pit Orientation: East	ng: m	Oneone	•	. Surface: 2.825
excavation dimension			).4m wide	North	-			
excavation info			material s		ing. In		datu	ani. And
nethod penetration upport /ater	notes samples, tests, etc	depth	graphic log classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compor	ristics, ents.	condition consistency/ density index	100 × pocket 200 v penetro- 400 meter	structure and additional observations
L 123 0 5 H 04-04-07 1151an mmetal	D 2		SM	<b>TOPSOIL:</b> Silty SAND, fine to medium gradark grey-black with some rootlets and root (10-30mm thick). <b>Silty SAND:</b> dark brown-dark red, fine to m grained, with cemented sand nodules to 0.         Becoming brown-pale brown cemented no sand still present.         Becoming dark brown-brown weakly cemendules present.         Test pit TP13 terminated at 2m	ned, D, ts D, edium 1 16mm dia.	M VD	10 20 20 20 20 20 20 20 20 20 20 20 20 20	TOPSOIL
Sketch Sketch N natural exp X existing ex BH backhoe bu B bulldozer b R ripper E excavator	cavation ucket	water water	o resistance anging to efusal evel e shown nflow	notes, samples, tests         Uso       undisturbed sample 50mm diameter         Uso       undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	soil descript	ified classifica		consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



#### Sheet 1 of 1 Project No: **GEOTSGTE20248AA**

**TP14** 

4.4.2007

4.4.2007

CW

Excavation No.

Date started:

Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

equipmer	nt typ		model: 4	IWD E	Backho	е		Pit Orientation:	Easting: n			- u by:	R.L. 9	Surface: 2.760	
excavatio				l.5m l					-						
	excavation information							ubstance							
method 7 T penetration	15	water	<b>notes</b> samples, tests, etc	RL 1	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minoi	characteristics, r components.	moisture condition	consistency/ density index	100 A pocket 200 A penetro- 300 Denetro-	a	structure and additional observation	IS
H	N		D	_2.5	0.5		СН	TOPSOIL: Silty CLAY, medium pl brown with some rootlets approxin CLAY: high plasticity, brown-dark	nately 400mm.		VSt	×		TOPSOIL	- - - - - - - - - - - - -
			D	1.5	- - 1. <u>5</u> -			Becoming dark grey-black with so Test pit TP14 terminated at 1.8m	me mottled orange			**	×××		- - - - - -
				_0.5	2.0										
	Sketch														
method N X BH B R E E	X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator water ✓ water ✓ water					n no resista anging to efusal evel e showr	)	notes, samples, tests       U <sub>50</sub> undisturbed sample 50mm       U <sub>63</sub> undisturbed sample 63mm       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	diameter diameter moistu D M W Wp		classifica			consistency/density index           VS         very soft           S         soft           F         firm           St         stiff           VSt         very stiff           H         hard           Fb         friable           VL         very loose           L         loose           D         dense           VD         very dense	)



#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 4.4.2007 Date started: 4.4.2007

CW

**TP15** 

Client: Principal: Project:

### TATTERSALL SURVEYORS PTY LTD

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment type and		1WD Backho		Pit Orientation:	Easting: m		HECKE		Surface: 2	255	
excavation dimens			0.4m wide	-	-						
excavation unlens		1.5m long	*	substance	Northing: m	ing. In úa			um: A	חט	
method 5 7 penetration support water	notes samples, tests, etc	depth RL metres	aphic log assification mbol		characteristics,	moisture condition	consistency/ density index	100 × pocket 200 × pocket 300 × penetro- 400 meter		cture and al observations	
	D	_2.0	SP	<b>TOPSOIL:</b> Silty (Clayey) SAND, fir         grained, dark grey-black, with som         rootlets to approximately 400mm. <b>SAND:</b> fine to coarse grained, pale         small percent of fines <20%.	grey-brown, — —	M/W	D/VD		Pit collapsing r observed.		
method         N       natural ex         X       existing e         BH       backhoe I         B       bulldozer         R       ripper         E       excention	xcavation bucket blade	water water water on dat	on no resistance ranging to refusal level te shown	notes, samples, tests         U <sub>60</sub> undisturbed sample 50mm of U <sub>63</sub> U 00       undisturbed sample 63mm of U <sub>63</sub> D       disturbed sample 63mm of U <sub>63</sub> V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter dia		classifica		consistency, VS S F St VSt H Fb VL L L MD D VD	density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense	



#### Sheet 1 of 1 GEOTSGTE20248AA Project No: 4.4.2007 Date started: 4.4.2007

CW

**TP16** 

#### Client: Principal: Project:

## TATTERSALL SURVEYORS PTY LTD

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment type and model: 4WD Backho						Backho	e Pit Orientation: Easting:			: m R.L. Surface: 2.683							
	cavatio				1.5m l	ong	0.4m wide Northing:				m		datum: AHD				
e	excavation information						mat	erial s	ubstance								
method	5 penetration	support	water	<b>notes</b> samples, tests, etc	RL r	depth netres	graphic log	classification symbol	material soil type: plasticity or particle or colour, secondary and minor	characteristics, components.	,	moisture condition	consistency/ density index	200 A penetro-	a	structure and additional observations	
ВН	120	N			2.5	_			<b>TOPSOIL:</b> Silty SAND, fine to med dark grey-black mottled white, with	ium grained, some rootlets	i.	D		- 4 6		TOPSOIL	-
				D		- - 0. <u>5</u>	171171	SP	SAND: fine to medium grained, pa	le grey-brown.		М	D		-		 
					_2.0								VD				
			2:54pm	D	_1.5	1. <u>0</u> –						M/W					
			04-04-07 12:54pm		_1.0	1. <u>5</u>											
				D				SP	SAND: fine to medium grained, da cemented sand nodules, coffee roo			W				INDURATED SAND	
					_0.5	2. <u>0</u> - - - 2.5			Pit collapsing. Test pit TP16 terminated at 1.8m								-
mi N X		natur existi	ng ex	cavation	S	-		nil	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm ( U <sub>63</sub> undisturbed sample 63mm (	diameter <b>so</b> diameter bas	<b>il desc</b> ised on	ation sy cription				consistency/density index VS very soft S soft	
B <sup>I</sup> B B R E	N natural exposure S shoring X existing excavation							ince )	Ges     distatuted sample       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal		based on unified of system D dry M moist W wet Wp plastic limit W <sub>L</sub> liquid limit					F     firm       St     stiff       VSt     very stiff       H     hard       Fb     friable       VL     very loose       L     loose       MD     medium dense       D     dense       VD     very dense	



#### Excavation No. **TP17** Sheet 1 of 1 Project No: **GEOTSGTE20248AA**

4.4.2007

4.4.2007

CW

Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Date started:

					Backho			Dit Orientation: Eas	ting: m		JIECK	-		Surface 2.025		
									-	-				L. Surface: 2.635		
			ormation	1.5m1	ong	0.4m wide North material substance			thing: m				datı	ım: AHD		
method penetration 7 2 3	upport	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle charact colour, secondary and minor compo	eristics, nents.	moisture condition	consistency/ density index	100 A pocket	а	structure ar additional obser		
	N	I	D	_2.5	0. <u>5</u>    1. <u>0</u>             		SC SP	<b>TOPSOIL:</b> Silty Clayey SAND, fine to med         grained, dark grey-black mottled white, loc         fines, with some rootlets.         Silty Clayey SAND: fine to medium grained         brown / red, low to medium plasticity fines         cemented nodules of SAND.         Clayey SAND: fine to medium grained, br         brown, low plasticity fines, with weakly ce         nodules of sand.         SAND: fine to coarse grained, pale grey-p         brown.         Becoming grey-brown.         Pit collapsing.         Test pit TP17 terminated at 2m	dium w plasticity ed, dark s, with own-pale mented	М	VD	- ~ ~	2 A	Rapid inflow of grounds 1.7m depth.		
Sketch	)				2.5										-	
х	exist back bulld rippe	ng ex hoe b ozer b r	posure cavation ucket plade	S pe 1			nil	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>83</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	moistur D d	lry				consistency/density iVSvery solSsoftFfirmStstiffVStvery stifHhardFbfriable	ť	
BH B R E	E excavator water						ı		M moist W wet Wp plastic limit W <sub>L</sub> liquid limit					VL very loc L loose MD medium D dense VD very de	dense	



#### **TP18** Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started:

5.4.2007

CW

Client: Principal:

### TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment type and model: 4WD Backhoe					IWD E	Backho	Pit Orientation: Eastin			Easting:	ting: m R.I				L. Surface: 2.302		
					l.5m l	ong	0.4m wide Northing:				m	n datum: AHD					
	excavation information						mat		ubstance								
8	c penetration	support	water	<b>notes</b> samples, tests, etc	RL 1	depth netres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minor		,	moisture condition	consistency/ density index	100 × pocket 200 v penetro- 400 meter		tructure and onal observations	
H			05-04-07 10:35am	D	_2.0 _1.5 _1.0 _0.5			CI SC SP	TOPSOIL: Sandy CLAY, low to me dark brown-black, sand fine to me some rootlets to 100mm. CLAY: medium plasticity, dark gre with minor sand component appro Clayey SAND: fine to medium gra plasticity fines. SAND: fine to coarse grained, pale Becoming grey / brown. Sand becoming indurated and dar Pit collapsing due to inflow of grou collapsing from sides. Test pit TP18 terminated at 1.9m	y mottled orang ximately 10%. ined, grey, low e grey-white.	with ge,	W	VSt D VD	*		- - - - - - - - - - - - - - - - - - -	
method N X BH B R E	d na ez bb rip	xistin ackh	ig exi oe bi zer b	oosure cavation icket lade	S pe 1	pport shoring 2 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	n o resista anging to efusal evel e shown nflow		notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm         U <sub>63</sub> undisturbed sample 63mm         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter <b>so</b> diameter ba sys	oisture dry mo wer p plaa	ription unified o	mbols a		consisten VS S St VSt H Fb VL L MD D VD	cy/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense	



# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007

CW

**TP19** 

4.4.2007

#### Client: Principal: Project:

### TATTERSALL SURVEYORS PTY LTD

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

equipment type and model:	4WD Backhoe	Pit Orientation:	Easting: m	R.L. \$	Surface: 2.261			
excavation dimensions:	1.5m long 0.4m		Northing: m	datum: AHD				
excavation informatio	n ma	aterial substance		<u> </u>				
polytem transformed to the second sec	s, iii	material material set set set set soil type: plasticity or partic colour, secondary and min	le characteristics, nor components.	consistency/ density index 100 pocket 200 d penetro- 400 meter	structure and additional observations			
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		CH Sandy CLAY: medium to high p brown-black, low plasticity rootlets. CH Sandy CLAY: medium to high p brown-black, sand fine to coars Becoming dark grey-grey. SP SAND: fine to coarse grained, p Becoming pale brown / grey. Pit collapsing due to groundwat Test pit TP19 terminated at 1.8	fines with some lasticity, dark a grained. ale grey-white W		ropsoil			
Sketch           method           N         natural exposure           X         existing excavation           BH         backhoe bucket           B         bulldozer blade           R         ripper           E         excavator	support S shoring penetration 1 2 3 4 refusal water water level on date show water inflow water outflow	g to built sample E environmental sample R refusal		d classification	consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense			



#### **TP20** Sheet 1 of 1 Project No: GEOTSGTE20248AA 4.4.2007 Date started:

4.4.2007

CW

Client: Principal:

#### TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment type a	nd model:	4WD Backho	e	Pit Orientation:	Easting:	m R.L. Surface: 2.255					
excavation dimen		1.5m long	0.4m wide		Northing:	m			da	atum:	AHD
excavation in	formation		material s	ubstance							
method c penetration support	notes samples, tests, etc	depth RL metres	graphic log classification symbol	material soil type: plasticity or particle of colour, secondary and minor		,	moisture condition	consistency/ density index	<sup>100</sup> A pocket <sup>200</sup> A penetro-		structure and additional observations
T Sketch		_2.0	CL	TOPSOIL: Silty Clayey SAND, fine grained, dark grey-black mottled w rootlets. Sandy CLAY: low plasticity, dark b fine to medium grained, trace of ro cemented sand nodules. Sandy CLAY: low to medium plast grey-pale brown mottled orange, s grained. Becoming pale brown / grey. Pit collapsing due to groundwater. Test pit TP20 terminated at 1.7m	hite, with some	e d — / dium	D M/W				SOIL
method N natural X existing		water water water on dat	no resistance ranging to refusal level e shown	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm of U <sub>63</sub> U disturbed sample 63mm of D       disturbed sample 63mm of U <sub>63</sub> V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter <b>so</b> diameter ba sys	oil descr ased on stem oisture dry moi wet p plas	ription unified o	<b>nbols a</b>		VS S F S VS H F VS L MD D V VS S S S S S S S S S S S S S S S S	soft firm stiff t very stiff hard friable very loose loose medium dense dense



# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007

CW

**TP21** 

4.4.2007

Client: Principal: Project:

### TATTERSALL SURVEYORS PTY LTD

RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

equ	ipmen	it type	e and	l model:	4WD Ba	VD Backhoe Pit Orientation: Easting: m F						R.L	. Surface:	2.675		
	excavation dimensions: 1.5m long 0.4m wi					ig (			-	Northing:	m			dat	um:	AHD
ex	excavation information ma						mat	erial s	ubstance							
method	5 penetration	support	water	notes samples, tests, etc	dı RL me	epth	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and mine	characteristics, or components.	3	moisture condition	consistency/ density index	100 × pocket 200 × penetro- 400 meter		ructure and nal observations
Ha			04-04-07	D		- - - - - - - - - - - - - - - - - - -		SP	TOPSOIL: Silty Clayey SAND, fir grained, dark grey, low plasticity rootlets and some thick roots to 3 Clayey SAND: fine to medium gr brown, low plasticity fines with so sand nodules. SAND: fine to medium grained, p Becoming pale brown-pale grey. Test pit TP21 terminated at 2m	fines with some 300mm. ained, orange-pa me cemented re	ale	м 	VD		Rapid groun 1.7m depth.	dwater inflow below
						2.5										
	Sketch         method       support         notes, samples, tests       classification symbols and         consistency/density index															
		exist back	ng ex hoe b ozer b r	cosure coavation ucket olade	1 2 : water ↓ % • 0	tration 3 4 n r vater le vater in vater in	n o resista anging to efusal evel evel e showr	•	Using     Using     undisturbed sample 50mm       Using     undisturbed sample 63mm       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	n diameter ba	oisture dry mo we p pla	, vist	classifica	ition	VS F St VSt H Fb VL L D VD	very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007 Date completed: 4.4.2007

CW

**TP22** 

#### Client: Principal:

# TATTERSALL SURVEYORS PTY LTD

#### incipal.

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

equipment type and mo	del: 4WD Backho		Pit Orientation: East	ing: m	CHECK	-	. Surface: 2.332
excavation dimensions		0.4m wide	North	-			
excavation inform	-	*	substance	ning: m		datu	JM: AHD
bod Internation	notes mples, sts, etc depth RL metres	aphic log assification mbol	material soil type: plasticity or particle characte colour, secondary and minor compor	eristics, inents.	consistency/ density index	200 A pocket 300 b penetro- 400 meter	structure and additional observations
BH 04-04-07 2:50pm		CI SM SP	<b>TOPSOIL:</b> Sandy CLAY, low to medium pl         dark brown-black, sand fine to medium grasome rootlets. <b>CLAY:</b> medium plasticity, dark brown-black some sand component approximately 30% <b>Silty SAND:</b> fine to medium grained, brown brown, with some cemented sand nodules <b>SAND:</b> fine to medium grained, pale grey-weater to medium grained, pa	asticity, D ined, with , M s, with M n-pale	D	-	TOPSOIL
Sketch Method N natural expose X existing excav BH backhoe buck B bulldozer blad R ripper E excavator	ation t penetrati 1 2 3 4 water water water on da	on no resistance ranging to refusal	notes, samples, tests         U <sub>s0</sub> undisturbed sample 50mm diameter         U <sub>s3</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	classification         soil descriptic         based on unifie         system         moisture         D       dry         M       moist         W       wet         Wp       plastic lin         W_       liquid lin	n ed classifica		consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started: 5.4.2007

CW

**TP23** 

#### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

#### Project:

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipme	nt typ	e and	d model:	IWD E	Backho	e		Pit Orientation: Easti	ng: m				R.L	. Surface: 2.090
excavatio				l.5m lo		0.4m w	ride	North	-					um: AHD
excavation information							ubstance							
method 7 penetration	15	water	notes samples, tests, etc	RL r	depth	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compor	ristics, ients.	moisture condition	consistency/ density index	100 A pocket 200 A penetro- 300 benetro-	ı	structure and additional observations
H	N	None Observed	D	_2.0			SC CL SC SP	TOPSOIL: Silty Clayey SAND, fine to medi grained, dark grey-black, low plasticity fine some rootlets to 300mm. Clayey SAND: fine to medium grained, dar grey-black, low to medium plasticity fines. Sandy CLAY: low to medium plasticity, pal orange, sand fine to medium grained. Clayey SAND: fine to medium grained, pal pale brown, low plasticity fines. SAND: fine to coarse grained, pale grey-wi Becoming grey / brown. Test pit TP23 terminated at 2m	k	W	VD			TOPSOIL
method N BH B R E	natu exis baci bullu ripp	ting ex choe b dozer l	posure ccavation pucket blade	S s per	ter water l	n no resista anging to efusal evel e showr nflow	)	notes, samples, tests         Us0       undisturbed sample 50mm diameter         Us0       undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	soil des based o system D di M m W w Wp pl		classifica			consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense

GEO 5.2 Issue 3 Rev.2 Form



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started:

**TP24** 

5.4.2007

CW

Client: Principal:

### TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment type	e and mo	odel: 4	WD Ba	ackhoe	e		Pit Orientation: East	ng: m		JICORC	,	Surface: 2.177	
excavation dim			.5m lor		).4m w	ide	Norti	-			datu		
excavation			÷				ubstance	<u>g</u>			duit		
method 5 penetration support	sa	n <b>otes</b> imples, sts, etc	c RL m	depth	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compor	ristics, ients.	moisture condition	consistency/ density index	100 × pocket 200 × pocket 300 vd penetro- 400 meter	structure and additional observa	
- 123 ··· N	05-04-07 11:44am ▼	D	_2.0 _1.5 _1.0 _0.5	- - - - - - - - - - - - - - - - - - -		CL	TOPSOIL: Sandy CLAY, low to medium pl sand fine to medium grained, with some ro 100mm. Sandy CLAY: low to medium plasticity, ora sand fine to coarse grained. SAND: fine to medium grained, pale grey-w mottled orange. Lenses of colour change to pale grey / bro some clay lenses. Pit collapsing from groundwater table. Test pit TP24 terminated at 2m	asticity, otlets to		D	X X 22	TOPSOIL	
X exist BH back B bullo R rippe	ral exposu ing excav hoe buck ozer blad r vator	ation et	supp S sh 1 2 ₩ wate	etration	n o resista anging to efusal evel e shown nflow	•	notes, samples, tests         Uso       undisturbed sample 50mm diameter         Uso       undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	soil des based ou system D dr M m W w Wp pl		classifica		consistency/density inVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery loosLlooseMDmedium oDdenseVDvery dense	e lense



# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 5.4.2007 Date completed: 5.4.2007

CW

**TP25** 

#### Client: Principal:

# TATTERSALL SURVEYORS PTY LTD

Project:

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

equipment type	and model.	4WD Backho		Pit Orientation: Easti	ing: m	Oneona		Surface: 2.611
					-			
excavation dim excavation		<u> </u>	0.4m wide	North Substance	ning: m		dati	um: AHD
method T 2 penetration support	notes samples tests, ef	,	aphic log assification mbol	material soil type: plasticity or particle characte colour, secondary and minor compor	ristics, condition eents.	consistency/ density index	100 A pocket 200 A penetro- 400 meter	structure and additional observations
표 N				<b>TOPSOIL:</b> Silty SAND, fine to medium grai	ined, D		- 0 C 4	TOPSOIL
ā	▼ 05-04-07 11:08am □ □ □ □	2.5   		Silty SAND: fine to medium grained, dark grey-black, cemented nodules of SAND.         100mm band of pale grey-pale brown and becoming grey-brown weakly cemented sa nodules.         Becoming dark brown / red weakly sand not sand sand sand sand sand sand sand sand	and roots M models M	VD		TNDURATED SAND
	D	2.0		Test pit TP25 terminated at 2m	dules.	_		1.9m depth.
Sketch								
X exist BH back		water water on da water	on no resistance ranging to refusal level te shown	notes, samples, tests       U <sub>s0</sub> undisturbed sample 50mm diameter       U <sub>63</sub> undisturbed sample 63mm diameter       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	classification :         soil descriptio         based on unifie         system         moisture         D       dry         M       moist         W       wet         Wp       plastic lin         WL       liquid lim	n d classifica		consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense



Engineering	Log -	Excavation
-------------	-------	------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007 Date completed: 4.4.2007

CW

**TP26** 

#### Client: Principal: Project:

# TATTERSALL SURVEYORS PTY LTD

### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Excavation No.

equipment type and model: 4	WD Backhoe	Pit Orientation: Eastin		onconce		Surface: 1.709
			-			
excavation dimensions: 1.	.5m long 0.4m wide material s	North	ing: m		datu	m: AHD
pottan d dn b t t t t t t t t t t t t t t t t t t	upto participation data particip	material	istics, ents.	nsi	00 A pocket 00 A penetro- 00 meter	structure and additional observations
	RL metres 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Colour, secondary and minor component TOPSOIL: Silty Sandy CLAY, medium plass dark grey-black, sand fine to medium grained some rootlets to 100mm. SAND: fine to coarse grained, pale grey-wf Becoming pale brown / grey. Pit collapsing due to groundwater. Test pit TP26 terminated at 1.5m	icity, M ed, with		200	TOPSOIL
Sketch         Method         N       natural exposure         X       existing excavation         BH       backhoe bucket         B       bulldozer blade         R       ripper         E       excavator	2.5 support S shoring N nil penetration 1.2.3.4 no resistance ranging to refusal water water level on date shown ► water inflow	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>e3</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	classification sy soil description based on unified system D dry M moist W wet Wp plastic lim W_ liquid limit	classificati		consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense



#### **TP27** Sheet 1 of 1 Project No: GEOTSGTE20248AA 4.4.2007 Date started:

4.4.2007

CW

Client: Principal:

### TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipmen	nt type	and	model: 4	WD E	Backho	е		Pit Orientation:	Easting: n		onconc		R.L. 8	Surface: 1	.536
excavation	n dim	ensio	ons: 1	.5m lo	ong (	0.4m v	/ide		Northing: n	ı		с	latur	n: A	AHD .
excava	tion	info	rmation			mat	erial s	ubstance		_					
method 5 7 penetration	support	water	notes samples, tests, etc	RL r	depth netres	graphic log	classification symbol	material soil type: plasticity or particle cha colour, secondary and minor co	aracteristics, mponents.	moisture condition	consistency/ density index	100 A pocket 200 A penetro- 300 b penetro-	۱ I		ucture and al observations
		A-04-07 3:46pm	D				SM	<ul> <li>TOPSOIL: Silty (Clayey) SAND, fine i grained, dark grey-black, with some r 200mm.</li> <li>Silty SAND: fine to medium grained, with some cemented sand nodules.</li> <li>SAND: fine to coarse grained, brown small percent of fines approximately i clay lenses or nodules.</li> <li>Becoming pale grey-white.</li> <li>Becoming pale grey / brown.</li> <li>Pit collapsing due to groundwater infl Test pit TP27 terminated at 1.8m</li> </ul>	dark brown, dark brown, / grey, with 20-30% possibly	D 	VD			TOPSOIL	- - - - - - - - - - - - - - - - - - -
Method N N BH B R E	natur existi	ng ex noe b ozer b	oosure cavation ucket olade	S s per	ter water I on date water i	no resista ranging t refusal level e shown	D	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diar         U <sub>83</sub> undisturbed sample 63mm diar         D       disturbed sample 63mm diar         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	neter neter based system D M W W P		classifica			consistency VS S F St VSt H Fb VL L MD D VD	/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 4.4.2007

**TP28** 

4.4.2007

CW

Principal:

## TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

equipment type and model: 4W	VD Backhoe	Pit Orientation: Easti	ıg: m	RI	Surface: 2.012	
	5m long 0.4m wide	North	-	datu		
excavation information	material s		ing. In	Gait		
notes samples, tests, etc 1 2 3 3 8 R	debth symbol symbol	material soil type: plasticity or particle characte colour, secondary and minor compon	istics, ents.	consistency/ density index 100 F pocket 200 T penetro- 400 meter	structure and additional observations	
T T T T T T T T T T T T T T T T T T T	1.0 0.5 SM	TOPSOIL: Silty SAND, fine to medium grai dark grey-black, with some rootlets. Silty SAND: fine to medium grained, dark brown-black / red, cemented sand nodules SAND: fine to coarse grained, pale brown / Becoming brown / grey mottled orange. Test pit TP28 terminated at 1.8m	ned, D	D	TOPSOIL	
method         Sketch         Sketch         N       natural exposure         X       existing excavation         BH       bulldozer blade         R       ripper         E       excavator	2.0 2.5 2.5 support S shoring N nil penetration ranging to ranging to ranging to	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample	classification sy soil description based on unified system moisture D dry		consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard	
   	water water level on date shown water inflow water outflow	R refusal	D         dry         H         hard           M         moist         Fb         friable           W         wet         VL         very loose           Wp         plastic limit         L         loose           W_L         iquid limit         MD         medium dense           D         dense         V         VP			



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

TESTPIT 20248AA LOGS.GPJ COFFEY.GDT 3.13.09

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started:

**TP29** 

5.4.2007

CW

Principal: Project:

# TATTERSALL SURVEYORS PTY LTD

# RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

· · ·	ient t		and		WD	Backho	е		Pit Orientation:	Easting: m		TIECKE		R.L		2.170
excavat				ns: 1 rmation	.5m l	ong			ubstance	Northing: m				datu	um: A	AHD
nethod	ration	ť	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minc	e characteristics, or components.	moisture condition	consistency/ density index	100 pocket			ucture and al observations
H	20	N	05-04-07 3:12pm	D	_2.0 _1.5 _1.0 _0.5	0. <u>5</u>    1. <u>0</u>             		SP	TOPSOIL: Silty SAND, fine to me dark brown-black, with some root Silty SAND: fine to medium grian pale brown. Clayey SAND: fine to medium gra low plasticity fines. SAND: fine to medium grained, p Pit collapsing. Test pit TP29 terminated at 1.7m	adium grained, tlets.	M W	D		<u>υ</u>	TOPSOIL	
Method N X BH B R E	d na ez b b rij	kisting	g exc be bu ter bl	osure cavation icket lade	S pe 1 wa wa	iter water	no resista anging to refusal level e showr	)	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm         U <sub>63</sub> undisturbed sample 63mm         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	n diameter n diameter n diameter	cation sy scription on unified of re ry noist ret lastic limit quid limit	classifica			consistency VS S F St VSt H Fb VL L L MD D VD	/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started: 5.4.2007

CW

**TP30** 

Client: Principal:

#### TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipmer	nt typ	e and	I model:	1WD E	Backho	е		Pit Orientation: East	ing: m			,		Surface: 1.159
excavatio				1.5m l		0.4m w	ride		hing: m					um: AHD
			ormation			mat	erial s	ubstance						
method 7 Denetration	15	water	notes samples, tests, etc	RL 1	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compo	ristics, nents.	moisture condition	consistency/ density index	100 × pocket	'a	structure and additional observations
		05-04-07	D		- 2. <u>0</u>		SP	TOPSOIL: Silty Clayey SAND, fine to med grained, dark grey-black mottled white, low fines, some rootlets 300mm and roots to 3 SAND: fine to coarse grained, pale grey-w Becoming pale brown-grey. Becoming dark brown-red, with some cem nodules. Pit collapsing. Test pit TP30 terminated at 1.7m	v plasticity 00mm. hite.	W	D			TOPSOIL
Sketc Sketc N N S BH B R E	natu exis balld rippo	ing ex hoe b lozer l	posure ccavation nucket olade	S pe	ter water on dat	no resista ranging to refusal level e showr	)	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	soil des based o system D di M m W w Wp pl		classifica			consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense

Form GEO 5.2 Issue 3 Rev.2



Engineering	Log -	Excavation
-------------	-------	------------

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started:

**TP31** 

5.4.2007

CW

Client: Principal:

#### TATTERSALL SURVEYORS PTY LTD

Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipment	t type	and	model:		Backho			Pit Orientation: Ea	sting: m		JIECK		L. Surface: 0.732
excavation				1.5m l		0.4m w	ride		rthing: m				tum: AHD
			ormation		ong			ubstance	in ing.			uu	
method 5 7 penetration	support	water	notes samples, tests, etc	RL r	depth netres	graphic log	classification symbol	material soil type: plasticity or particle charac colour, secondary and minor comp	teristics, onents.	moisture condition	consistency/ density index	100 × pocket 200 × penetro- 400 meter	
Н	N	05-04-07 8:29am	D	0.5			SP	<ul> <li>TOPSOIL: Silty Clayey SAND, fine to me grained, dark grey-black mottled white, ic medium plasticity fines, with layer of mul- rootlets to 100mm.</li> <li>Clayey SAND: fine to medium grained, p pale brown, low plasticity fines.</li> <li>Becoming grey / brown.</li> <li>SAND: fine to medium grained, dark brow indurated cemented sand nodules.</li> <li>Silty Gravelly SAND: fine to coarse grain grey-black, gravel fine to medium grained. Pit collassing due to inflow of groundwate Test pit TP31 terminated at 1.8m</li> </ul>	w to ch and ale grey /	W	D		TOPSOIL (swampy area) organic odour7
X BH B R	natur existi back	ng ex hoe b ozer b r	posure cavation ucket plade	S i pe	ter water l	n no resista anging to efusal evel e showr nflow	)	notes, samples, tests         Us0       undisturbed sample 50mm diamete         Us3       undisturbed sample 63mm diamete         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	er soil des based o system D di M m W w Wp pi	cation sy scription on unified re ry noist ret lastic limit quid limit	classifica		consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 5.4.2007

**TP32** 

5.4.2007

CW

### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

#### .

## Project:

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

equipme	ent ty	pe and	d model: 4	1WD E	Backho	е		Pit Orientation: Easting:	m				R.L	Surface: 0.994
excavati	ion di	mensi	ons: 1	1.5m lo	ong	0.4m w	ride	Northing	j: m				dat	um: AHD
	_	n infe	ormation			mat	erial s	ubstance						1
method 5 penetration		water	notes samples, tests, etc	RL r	depth netres	graphic log	classification symbol	material soil type: plasticity or particle characterist colour, secondary and minor component	ics, is.	moisture condition	consistency/ density index	kF	300 benetro- 400 meter	structure and additional observations
ВН	1	1			-			TOPSOIL: Silty Clayey SAND, fine to medium grained, dark grey-black mottled white, low pla fines, with some rootlets and roots (10mm).	asticity	D				TOPSOIL (swampy area)
				_0.5	0. <u>5</u>		SC	<b>Clayey SAND</b> : fine to coarse grained, pale grey-pale brown, low plasticity fines maybe low percentage of fines approximately 30-40%.	N	M	D			Some inflow of water.
		8:47am	D	_0.0	- 1. <u>0</u>			Becoming grey-brown, some presence of cerr sand nodules.	ented	W				Moderate inflow of groundwater 8:47am.
		05-04-07	D		-									
			D	0.5	1. <u>5</u>			Becoming grey mottled brown / orange and pr of subrounded to rounded gravel (fine to medi grained) less than 10mm size.	esence um					-
				1.0	_ 2. <u>0</u> _			Pit continually collapsed due to water table. Test pit TP32 terminated at 1.7m	/					-
				1.5	2.5									
Sketc	ch													
method N X BH B B E E	N     natural exposure     S shoring     N       X     existing excavation     Penetration       BH     backhoe bucket     penetration       B     bulldozer blade     1 2 3 4					n no resista ranging to	nil	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample	classific soil des based or system moisture D dr	cription n unified e				consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard



# Sheet1of1Project No:GEOTSGTE20248AADate started:5.4.2007Date completed:5.4.2007

CW

**TP33** 

### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

ппсіраї.

### Project:

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

equipment type and model:     4WD Backhoe     Pit Orientation:     Easting:     m       excavation dimensions:     1.5m long     0.4m wide     Northing:     m											u by		Surface: 0.923 um: AHD		
_				ormation	.JIII I	ung			ubstance	y. 10				dati	
method	penetration	upport		notes samples, tests, etc	RL r	depth	graphic log	classification symbol	material soil type: plasticity or particle character colour, secondary and minor compone	istics, ents.	moisture condition	consistency/ density index	100 pocket	а	structure and additional observations
ВН		N				_			<b>TOPSOIL:</b> Silty Clayey SAND, fine to mediu grained, dark grey-black mottled white, low fines, with some rootlets to 250mm.	ım plasticity	D/M				TOPSOIL (swampy area)
				D	_0.5	0. <u>5</u>		SC	Clayey SAND: fine to coarse grained, pale grey-pale brown.		М	D			
			05-04-07 8:56am	U	_0.0	 1. <u>0</u>			Becoming grey / brown.		w				Very slow inflow of groundwater 8:56am, organic odour.
			02-0	D	0.5	  1. <u>5</u>									
				D	1.0	2.0		SP	SAND: fine to medium grained, dark brown- some cemented nodules of sand. Pit collapsing due to water table. Test pit TP33 terminated at 2m	-black,					
S	Sketch	 			1.5	2.5									
N X	X existing excavation BH backhoe bucket B bulldozer blade R ripper no resistance ranging to						n no resista anging to refusal level e showr	ince	notes, samples, tests       U <sub>s0</sub> undisturbed sample 50mm diameter       U <sub>s3</sub> undisturbed sample 63mm diameter       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	soil des based o system <b>moistur</b> D di M m W w Wp pl		classifica			consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

#### **TP34** Sheet 1 of 1 Project No: GEOTSGTE20248AA 5.4.2007 Date started:

5.4.2007

CW

Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

Project:

TESTPIT 20248AA LOGS.GPJ COFFEY.GDT 3.13.09

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

_	quipme				model: 4		Backho			Pit Orientation: Ea	sting: m		JIECK		-	Surface: 0.893	;
-	cavati					.5m l	ong	0.4m w			rthing: m	ı			da	tum: AHD	
method	nenetration	herieriariur	support	water	notes samples, tests, etc	RI r	depth	graphic log	classification symbol	ubstance material soil type: plasticity or particle charad colour, secondary and minor comp	teristics,	moisture condition	consistency/ density index	k	300 B penetro- 400 meter		
ВН	12		N	-			_			TOPSOIL: Silty Clayey SAND, fine to me grained, dark grey-black mottled white, I	edium	M		20 10	184	TOPSOIL	
			1	9:13am	D	_0.5	0. <u>5</u>		SC SP	medium plasticity fines. <b>Clayey SAND</b> :fine to coarse grained, pagrey-white, low plasticity fines. Becoming pale grey-pale brown. <b>SAND:</b> with some clayey lenses, fine to grained, low plasticity fines.			D			Very slow inflow of	 water, 9:13am.
				05-04-07 9:1	D	_0.0	- - 1. <u>0</u> -		SC	<b>Clayey SAND</b> fine to coarse grained, gr low to medium plasticity fines. Pit slowly collapsing due to water table.	∍y / brown,		MD				-
						0.5	1. <u>5</u> -						MD				-
						1.0	2.0		SM	Silty SAND: fine to medium grained, dar red. Pit collapsing due to groundwater. Test pit TP34 terminated at 2m	¢brown /						
	Sketi	ch															
	method     support       N     natural exposure       X     existing excavation       BH     backhoe bucket       B     bulldozer blade       R     ripper       E     excavator       water     water level       moter shown       moter shown       water inflow						shoring netratio 2 3 4 r r r ter water I on date	n no resista anging to refusal level e showr inflow	ince	notes, samples, tests       Uso     undisturbed sample 50mm diamet       Uesa     undisturbed sample 63mm diamet       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	er soil de: based d system		classifica			S sof F firm VSt ver H hau Fb fria VL ver L loo MD me D der	y soft it n f ry stiff rd uble ry loose



# Sheet1 of 1Project No:**GEOTSGTE20248AA**Date started:**1.6.2007**

**TP39** 

1.6.2007

RJP

Principal:

## TATTERSALL SURVEYORS PTY LTD

## Project:

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

Excavation No.

ec	equipment type and model: 4WD Backh								Pit Orientation:	Easting:	m			l	R.L	. Surface:	2.77
	cavatio				2m lor	ng 0				Northing:	m	n datum: AHD					
F	_	tior	inf	ormation			mat		ubstance					<u> </u>			
method	5 penetration	support	water	notes samples, tests, etc	RL 1	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and mino	r components.	,	moisture condition	consistency/ density index	200 A penetro-	а	additior	ucture and al observations
H		N				_			<b>TOPSOIL:</b> Sandy Silty CLAY, me dark grey, sand fine to medium gr	ained.		М				TOPSOIL Ro	ot affected.
				D	_2.5			CH CH SP	CLAY: high plasticity, grey-brown mottled, some sand. CLAY: high plasticity, grey-grey-b orange mottled with a trace of sar grained. SAND: fine to medium grained, w grey-brown. Moderate groundwater inflow belo Test pit TP39 terminated at 1.7m	nown, some		>Wp W	St	×		Pit collapsing odour.	
						-											-
N X	Н	natu exis bacl vipp	ting e thoe t lozer	posure xcavation bucket blade	S pei 1	ter water	no resista ranging to refusal	)	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm         U <sub>63</sub> undisturbed sample 63mm         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	diameter soi diameter bas sys	il desc ised on stem oisture dry mc we	ription unified	mbols a			consistenc VS S F St VSt H Fb VL L	y/density index very soft soft firm stiff very stiff hard friable very loose loose
						water water	inflow outflow			W	L liqu	uid limit				MD D VD	medium dense dense very dense

Form GEO 5.2 Issue 3 Rev.2



# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 1.6.2007

**TP40** 

1.6.2007

RJP

Pri

## TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

	equi	•	it typ		d model:		Backho				sting: m rthing: m	l	JIECKE		R.I		2.59 AHD
- 1-					ormation		.9	î		ubstance	g				du		
	method	5 penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle chara colour, secondary and minor comp	teristics, onents.	moisture condition	consistency/ density index	100 pocket	300 b penetro- 400 meter		ucture and al observations
ł	BH		N			_2.5	_			<b>TOPSOIL:</b> Silty Sandy CLAY, medium p dark grey, sand fine to medium grained.	asticity,	>Wp				TOPSOIL Roo	ot affected.
							-		СІ	Sandy CLAY: medium plasticity, grey-bi orange mottled, sand fine to medium gra	own and ined.		St				
					D	_2.0	0. <u>5</u> - -			Becoming grey-brown and sand content Sandy CLAY / Clayey SAND.	increasing to			×			
					D	1.5	1. <u>0</u> -		SP	SAND: fine to medium grained, grey-bro some clay.		W		*			-
					D	1.0	- 1. <u>5</u>		SP	SAND: fine to medium grained, light gre	 <sup>/-</sup> brown.					Rapid ground 1.4m. Organic	water inflow below odour.
┢										Pit collapsing below 1.1m. Test pit TP40 terminated at 1.7m					+		
						_0.5	2. <u>0</u> - - - 2.5										
	SI	ketch	1														
	method     support       N     natural exposure       X     existing excavation       BH     backhoe bucket       B     bulldozer blade       R     ripper       E     excavator       water       ✓     water level       on date shown       ✓     water inflow       ✓     water outflow					S pe 1 ₩ ₩ ₩	enetratic 2 3 4 ater water - on dat	on no resista ranging to refusal level re showr inflow	ance	notes, samples, tests       U <sub>50</sub> undisturbed sample 50mm diamet       U <sub>63</sub> undisturbed sample 63mm diamet       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	er soil des based o system D d M m W w Wp p		classifica			consistency VS S F St VSt H Fb VL L L MD D VD	/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 1.6.2007 Date started: 1.6.2007

RJP

**TP41** 

### Client: Principal:

## TATTERSALL SURVEYORS PTY LTD

## Project:

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

Excavation No.

equipmer	nt typ	and	model:	4W/D I	Backho			Pit Orientation: East	ing: m		oncond			Surface: 3.63
1							مام		-					
excavatio			ons: 2	2m lor	ng 0.4	45m wi		ubstance	hing: m				dat	ium: AHD
			mation			mat		ubstalle					<u>ц</u>	
method 5 penetration	5	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compo	eristics, nents.	moisture condition	consistency/ density index	<sup>100</sup> A pocket		
	N							TOPSOIL: Sandy CLAY, medium plasticity	',	M				TOPSOIL Root affected.
BH			D	3.5			CI	SAND: fine to medium grained, light grey- some orange mottled, cemented.	-brown grained. orange and orange	>Wp	St	×	×	
		►		_1.5			SP	SAND: fine to medium grained, white-light grey-brown.		w				Slow groundwater inflow below 2.2m. Organic odour.
					_			grey brown.						2.2m. Organic odour.
			D		2.5			Test pit TP41 terminated at 2.5m						
method N X BH B R E	N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator water ✓ water ✓ water				shoring netratio 2 3 4 r r ter water l	n no resista anging to efusal evel e showr nflow	0	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         V       vane shear (kPa)         Bs       bulk sample         E       environmental sample         R       refusal	soil des based o system <b>moistu</b> D d M n W w Wp p		classifica			consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense

Form GEO 5.2 Issue 3 Rev.2



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

# Sheet 1 of 1 Project No: GEOTSGTE20248AA Date started: 1.6.2007

Excavation No.

**TP42** 

1.6.2007

RJP

# TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Test pit location: **REFER TO FIGURE 1** 

Checked by:

Date completed:

equipme		pe an			Backho			Pit Orientation: East	ing: m			-		. Surface: 2.82
excavati				2m loi	ng 0.	45m w			hing: m				datu	um: AHD
	_	n inf	ormation			mat		ubstance						
method 5 penetration		water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compo	eristics,	moisture condition	consistency/ density index	100 A pocket 200 A penetro-	a	structure and additional observations
Ha	1	<b>-</b>	D	_2.5	0. <u>5</u> - - 1. <u>0</u> -		CI	TOPSOIL: Silty Sandy CLAY, low to medii plasticity, sand fine to medium grained, da grey-brown. Sandy CLAY: medium plasticity, grey-brow orange mottled, sand fine to medium grain Sandy CLAY: medium plasticity, grey-grey some orange mottled, sand fine to medium sand content increasing. SAND: fine to medium grained, white. Becoming grey-grey-brown, with a trace to clay. Test pit TP42 terminated at 1.7m	vn and led. /-brown n grained,	M >Wp	St	×		TOPSOIL Root affected.
Sketc	ch			_1.0	2. <u>0</u> -									
method N X BH B R E	nat exi ba bul ripj	sting e		S pe 1 ₩ ₩ ₩	ater water	on no resista ranging tr refusal level te shown inflow	0	notes, samples, tests       U <sub>50</sub> undisturbed sample 50mm diameter       U <sub>63</sub> undisturbed sample 63mm diameter       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	soil des based o system D di M m W w Wp pl	cation sy scription on unified re re ry noist vet lastic limit quid limit	classifica			consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense



Engineering	Log -	<b>Excavation</b>
-------------	-------	-------------------

**REFER TO FIGURE 1** 

#### Client:

#### Sheet 1 of 1 GEOTSGTE20248AA Project No: 1.6.2007 Date started:

**TP43** 

1.6.2007

RJP

Principal:

## TATTERSALL SURVEYORS PTY LTD

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Project:

Test pit location:

## Checked by:

Date completed:

Excavation No.

equipmen	nt type	and	model: 4		Backho			Pit Orientation: Ea	asting: m		JICORC		Surface: 4.75	
excavation				2m lon		45m wi	de		orthing: m				um: AHD	
excava	tion	info	rmation			mat	erial s	ubstance	-			-		
method 5 T penetration	support	water	<b>notes</b> samples, tests, etc	RL r	depth netres	graphic log	classification symbol	material soil type: plasticity or particle charac colour, secondary and minor comp	cteristics, ponents.	moisture condition	consistency/ density index	100 A pocket 200 A penetro- 400 meter	structure and additional observations	
Ha			D	_4.5 _4.0 _3.5 _3.0 _2.5			SP	SAND: fine to medium grained, grey-bro Becoming light grey-brown. SAND: fine to medium grained, grey-bro orange mottled, trace to some clay. SAND: fine to medium grained, light gre some weakly cemented nodules, grey-br Test pit TP43 terminated at 1.85m	wn and	W			AEOLIAN Root affected to 0.15m. 	
<mark>method</mark> N X BH	method       support       notes, samples, tests       classification symbols and soil description       consistency/density index         N       natural exposure       S shoring       N nil       U <sub>so</sub> undisturbed sample 50mm diameter       based on unified classification       VS       very soft         N       natural exposure       S shoring       N nil       U <sub>so</sub> undisturbed sample 50mm diameter       based on unified classification       VS       very soft         B       buildozer blade       2.3 4       no resistance       No       based on unified classification       St soft         B       buildozer blade       2.3 4       no resistance       No       No       St stiff         B       buildozer blade       2.3 4       no resistance       No       No       St stiff         B       buildozer blade       VS       very stiff       No       Vs very stiff       St stiff													

Form GEO 5.2 Issue 3 Rev.2



#### Sheet 1 of 1 Project No: GEOTSGTE20248AA 1.6.2007 Date started:

**TP44** 

1.6.2007

RJP

## TATTERSALL SURVEYORS PTY LTD

## Principal:

Project:

### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

**REFER TO FIGURE 1** Test pit location:

Checked by:

Date completed:

			nLI modeli					Dit Oriontation.	Ecotio	~		песке	-		Cumbe	4.40	
equipmen					Backho			Pit Orientation:	Easting:	m						4.46	
excavation			ons: 2	2m lor	ig 0.4	45m wi		ubstance	Northing:	m			C	latu	m:	AHD	
method penetration	upport	water	notes samples, tests, etc	RL 1	depth	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and mino	characteristics, r components.	-	moisture condition	consistency/ density index	100 × pocket 200 × penetro- 300 × penetro-	1		ucture and nal observatio	ons
120	N	_					SP	SAND: fine to medium grained, da	ark grey-brown.		М		- 48		AEOLIAN Ro	ot affected to (	).3m.
BH		None Observed	D	_4.0 _3.5 _3.0 _2.5	- - - - - - - - - - - - - - - - - - -		SP	SAND: fine to medium grained, di Becoming light grey-brown. SAND: fine to medium grained, di silt / Silty SAND. Becoming cleaner and less ceme Test pit TP44 terminated at 1.8m	ark brown, some		Μ				INDURATED		).3m
				_2.0	2.5												-
Sketch	1																
method N X B H B B C C C C C C C C C C C C C C C C	existi back	ng ex noe b ozer b r	oosure cavation ucket Ilade	S pe 1	ter water l	n no resista anging to efusal evel e showr nflow	)	Notes, samples, tests       U <sub>50</sub> undisturbed sample 50mm       U <sub>63</sub> undisturbed sample 63mm       D     disturbed sample       V     vane shear (kPa)       Bs     bulk sample       E     environmental sample       R     refusal	diameter soil diameter base syste	descri ed on u em sture dry mois wet plast	ption nified	mbols a			consistenc VS F St VSt Fb VL L L MD D VD	y/density index very soft soft firm stiff very stiff hard friable very loose loose medium dens dense very dense	



Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

Date completed:

Borehole No.

Project No:

Date started:

Sheet

**BH35** 

11.4.2007

11.4.2007

GEOTSGTE20248AA

1 of 1

JJT

dri	ll mode	l and	mou	nting: N	MD20				Easting:	slope:	-90°				R.L.	Surface: 1.006
	le diam				100 m	m	·		Northing	bearing:					datu	im: AHD
d	rilling	info	orma	ition			mate	erial s	ubstance							
method	5 penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	materi soil type: plasticity or par colour, secondary and r	ticle characterist	ics, ts.	moisture condition	consistency/ density index	100 x pocket 200 x penetro-	a	structure and additional observations
Ш. mm AS			↓ Uger s		0 1 2 4 5 6	metress			colour, secondary and i SAND: fine to medium graine Borehole BH35 terminated at Borehole BH35 terminated at	ninor component d, grey.	classifica soil desc	M W	MD D	nd		
GEO 5.3 Issue 3 Rev.2 M AL T V B T V A T V	S auger screwing* M D auger drilling* C R roller/tricone per T cable tool A hand auger T diatube wat blank bit V bit TC bit it shown by suffix					casing netratio 2 3 4 ter 10/1/9 on dat	n no resista anging to efusal 8 water e showr nflow	ance o	Us3         undisturbed sample 5           Us3         undisturbed sample 6           D         disturbed sample 6           N         standard penetration 1           N*         SPT - sample recover           Nc         SPT with solid cone           V         vane shear (kPa)           P         pressuremeter           Bs         bulk sample           E         environmental sample           R         refusal	3mm diameter test (SPT) red	based on system D dry M moi W wet Wp plas	unified		ation		Vol     Very solt       S     soft       F     firm       St     stiff       VSt     very stiff       H     hard       Fb     friable       VL     very loose       L     loose       MD     medium dense       D     dense       VD     very dense

BOREHOLE 20248AA LOGS.GPJ COFFEY.GDT 3.13.09



Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

Date completed:

Borehole No.

Project No:

Date started:

Sheet

**BH36** 

11.4.2007

11.4.2007

GEOTSGTE20248AA

1 of 1

JJT

drill	model and mounting: MD20									Easting:	slope:	-90°				R.L	Surface: 2.361
hole	e dian	nete	er:		1	100 m	m			Northing	bearing:					dat	um: AHD
dr	illing	g in	fo	ma	tion			mate	erial s	ubstance							
method	2 penetration		support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or partic colour, secondary and mi	cle characteristi	CS, S.	moisture condition	consistency/ density index	100 A pocket	Pa	structure and additional observations
보			С			_2	-		SC	Clayey SAND:fine to medium of low plasticity.	grained, black, o	clay	М				-
			-	⊻	SPT 4,4,5		-		SP	SAND: fine grained, white.			W	D			-
					N*=9	_1	<u>1</u> –		SP	SAND: fine to medium grained,	black (coffee r	ock).					
						-			SP	SAND: fine grained, white.							-
				-	SPT 2,9,11	_0	2										-
				-	N*=20		-			Becoming grey.							-
						1	3							VD			
					SPT 6,13,24 N*=37		-										-
						2	<u>4</u> 		SP	SAND: fine to medium grained,	black (coffee r	ock).					-
							5			Becoming softer.							-
					SPT 6,9,23 N*=32	3	-										
							6										-
						4											-
					SPT 8,16,14 N*=30		7										-
						5	-			Borehole BH36 terminated at 7	m						-
							8										-
GEO 5.3 Issue 3 Rev.2 T < a TD W TD	S auger screwing* D auger drilling* R roller/tricone / washbore T cable tool A hand auger T diatube blank bit V bit TC bit bit shown by suffix					M C <b>pe</b> 1	iter 10/1/9	n no resista anging to refusal 8 water e showr inflow	level	notes, samples, tests       U <sub>50</sub> undisturbed sample 50n       U <sub>63</sub> undisturbed sample 63n       D     disturbed sample       N     standard penetration tes       N*     SPT - sample recovered       Nc     SPT with solid cone       V     vane shear (kPa)       P     pressuremeter       Bs     bulk sample       E     environmental sample       R     refusal	nm diameter st (SPT)	W we Wp pla	cription a unified of e y poist	classifica			consistency/density index       VS     very soft       S     soft       F     firm       St     stiff       VSt     very stiff       H     hard       Fb     friable       VL     very loose       L     loose       MD     medium dense       D     dense       VD     very dense



Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

### Date completed: RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

Borehole No.

Project No:

Date started:

Sheet

**BH37** 

11.4.2007

11.4.2007

GEOTSGTE20248AA

1 of 1

JJT

drill	mode	el an	d mou	nting: I	MD20				Easting: slope:	-90°		JIECKC			L. Surface: Not Measured
hole	e diam	neter	:		100 m	m			Northing bearing	ıg:					itum: AHD
dr	illing	ı inf	orma	ation			mate	erial s	ubstance						
method	5 penetration	support	water	<b>notes</b> samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compor	ristics, nents.	moisture condition	consistency/ density index	100 pocket	Ра	
ΗH		C					/	SC	Clayey SAND: fine to medium grained, bla	ck, clay	М				
			<b>⊻</b> .	SPT 4,6,10 N*=16				SP	Low plasticity. SAND: fine to medium grained, white.			D			
				SPT 1,7,8 N*=15		- 2 - - 3			Becoming dark brown, with some organic	naterial.					
				SPT 6,18,R N*=R		4		SP	SAND: fine to medium grained, black (coff	e rock).		VD			- - - - 
				SPT 5,7,R N*=R		5			Becoming brown.						
				SPT 6,7,R N*=R		- - 7			Borehole BH37 terminated at 7m						
AS AD RR W CT HA DT B V T	thod	a r v t t t t t t s by s	uger coller/tri vashbc able to and au liatube blank b / bit TC bit	cone pre pol uger	M C <b>pe</b> 1	iter 10/1/9	n no resista anging to efusal 8 water e showr nflow	level	notes, samples, tests         Us0       undisturbed sample 50mm diameter         Us1       undisturbed sample 63mm diameter         D       disturbed sample         N       standard penetration test (SPT)         N*       SPT - sample recovered         Nc       SPT with solid cone         V       vane shear (kPa)         P       pressuremeter         Bs       bulk sample         E       environmental sample         R       refusal	soil des based o system D dr M m W w Wp pl		classifica			Consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense



Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal:

Project:

## RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

Date completed:

Borehole No.

Project No:

Date started:

Sheet

**BH38** 

11.4.2007

11.4.2007

GEOTSGTE20248AA

1 of 1

JJT

drill	mode	el an	d m	ounting:	M	020				Easting:	slope:	-90°				R.L.	Surface: 2.303	
	e dian				10	0 mi	m			Northing	bearing:					datu	m: AHD	
dr	_	_	orr	nation				mate	erial s	ubstance								
method	<ul><li>T</li><li>N</li><li>Denetration</li></ul>		water	note samp tests,	es, etc	RL	depth metres	graphic log	classification symbol	materia soil type: plasticity or part colour, secondary and m	icle characteristi	s.	moisture condition	consistency/ density index	200 A penetro-	a	structure a additional obser	
эн				SP 2,2, N*= SP 4,5, N*= SP 12,18 N*= SP 4,8, N*=					CL	<b>TOPSOIL:</b> Clayey SAND, fine         Clay low plasticity.         Sandy CLAY:medium to high         fine grained.         Sandy CLAY:low to medium plasticity.         Becoming black.         Becoming black.         Borehole BH38 terminated at 1	plasticity, grey, plasticity, dark bi	sand	M >Wp	D				
GEO 5.3 Issue 3 Rev.2 A A B A C H A C A A C A C A C A C A C A C A C	S auger screwing* D auger drilling* R roller/tricone V washbore T cable tool A hand auger T diatube blank bit V bit TC bit TC bit						ter 10/1/9	n no resista ranging to refusal 8 water e showr inflow	level	notes, samples, tests         U <sub>50</sub> undisturbed sample 50         U <sub>63</sub> undisturbed sample 63         D       disturbed sample         N       standard penetration te         N*       SPT - sample recovere         Nc       SPT with solid cone         V       vane shear (kPa)         P       pressuremeter         Bs       bulk sample         E       environmental sample         R       refusal	est (SPT)	W we Wp pla	cription n unified e y pist	classifica			consistency/densityVSvery soSsoftFfirmStstiffVStvery stiHhardFbfriableVLvery looseMDmediurDdenseVDvery de	ft ff ose n dense



Client:

BOREHOLE 20248AA LOGS.GPJ COFFEY.GDT 3.13.09

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

dr	ill model	and	mou	nting:					Easting: slope:	-90°	>			R.I	L. Surface: 3.20
	le diame				mm				Northing bearing	g:				da	tum: AHD
Ľ	Irilling	info	orma	ation			mate	erial s	ubstance						
method	5 penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compor	ristics, ients.	moisture condition	consistency/ density index	100 A pocket	Ра	
Ψ		С			_3			SP	SAND: fine to medium grained, grey-brown	1.	М	D		T	AEOLIAN SAND
				SPT 2,5,7 N*=12	_2				Becoming light grey-brown.						
			<b>_</b>	SPT 5,6,8 N*=14	1	2 - - 3 - - - - - - -			Becoming dark grey-brown.		W				
				SPT 3,15,21 N*=36	1	<u>4</u> - - -		SP	SAND: fine to coarse grained, dark brown, gravel fine grained and silt.	trace of		VD	-		
				SPT 9,21,20 N*=41	2	5 - - 6 -			With a trace fine grained gravel.						20 blows for 100mm penetration.
				SPT 8,18,21 N*=39	4	- - 7 - - - - 8			Becoming fine to medium grained, light bro brown.	wn and					- - 21 blows for 100mm penetration. - - - -
GEO 5.3 Issue 3 Rev.2 — <	D R T A T	auger screwing* auger drilling* roller/tricone washbore cable tool hand auger diatube blank bit V bit TC bit shown by suffix						level	notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         N       standard penetration test (SPT)         N*       SPT - sample recovered         Nc       SPT with solid cone         V       vane shear (kPa)         P       pressuremeter         Bs       bulk sample         E       environmental sample         R       refusal	soil des based o system D d M m W w Wp p	re re voist voist vet quid limit	classifica		<u> </u>	consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense

**BH45** Sheet 1 of 2 Project No: GEOTSGTE20248AA 5.6.2007 Date started: 5.6.2007

Date completed: RJP

Borehole No.



Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### -----

### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

Date completed:

Borehole No.

Project No:

Date started:

Sheet

**BH45** 

2 of 2

5.6.2007

5.6.2007

RJP

GEOTSGTE20248AA

	drill	mode	el ar	d mo	unting:					Easting:	slope:	-90°				R.L	Surface: 3.20
		diam				mm				Northing	bearing:					dat	ium: AHD
	dri	_	l in	orm	ation			mat	erial s	ubstance							
	method	Denetration	3	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	materi soil type: plasticity or par colour, secondary and i	rticle characteris		moisture condition	consistency/ density index	200 H pocket	Pa	
	HH I I I I I I I I I I I I I I I I I I			Collapsed back to 2.3mi	SPT 5,13,17 N*=30 SPT 1,6,15 N*=21	5 6 7 7 8 9 10 11	1 <u>4</u> 		SP	SAND: fine to coarse grained gravel fine grained and silt. (a Borehole BH45 terminated at	continued)	ace of	W				
Form GEO 5.3 Issue 3 Rev.2	met AS AD RR W CT HA DT B V T *bit s e.g.	shown	by	auger roller/f washt cable hand diatub blank V bit TC bit	tool auger e bit		iter 10/1/9	n no resista ranging t refusal 8 water e shown	level	notes, samples, tests           Uso         undisturbed sample 5           Uso         undisturbed sample 6           D         disturbed sample 7           N         standard penetration           N*         SPT - sample recover           Nc         SPT with solid cone           V         vane shear (kPa)           P         pressuremeter           Bs         bulk sample           E         environmental sample           R         refusal	i3mm diameter test (SPT) red	W we Wp pla	cription a unified of e y poist	classifica			consistency/density indexVSvery softSsoftFfirmStstiffVStvery stiffHhardFbfriableVLvery looseLlooseMDmedium denseDdenseVDvery dense

BOREHOLE 20248AA LOGS.GPJ COFFEY.GDT 3.13.09



Client:

#### TATTERSALL SURVEYORS PTY LTD

Principal: Project:

#### RIVERSIDE ESTATE PROJECT APPLICATION, TEA GARDENSogged by:

Borehole Location: REFER TO FIGURE 1

Checked by:

Date completed:

Borehole No.

Project No:

Date started:

Sheet

**BH46** 

6.6.2007

6.6.2007

RJP

GEOTSGTE20248AA

1 of 1

drill	drill model and mounting:     Easting:     slope: -90°     R.L													Surface: 1.07	
hole diameter: mm															
· · · · · · · · · · · · · · · · · · ·							mate	orial s	substance			datu	im: AHD		
method	5 penetration	support	water	notes samples, tests, etc	RL	depth	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compon	ristics, ients.	moisture condition	consistency/ density index	100 × pocket 200 × penetro-	a	structure and additional observations
H		c		SPT 3,2,2 N*=4 SPT 7,12,14 N*=26 SPT 5,16,23 N*=39 SPT 2,9,18 N*=27 SPT 3,10,18 N*=28				SP SP SP	<ul> <li>TOPSOIL: Sandy CLAY / Clayey SAND, lo plasticity, dark grey, sand fine to medium grained, grey-brown</li> <li>SAND: fine to medium grained, grey-brown.</li> <li>SAND: fine to medium grained, dark brown silt.</li> <li>SAND: fine to medium grained, dark brown silt.</li> <li>SAND: fine to medium grained, some clay, and dark brown, trace fine grained gravel.</li> <li>SAND: fine to medium grained, light brown</li> <li>Becoming fine to coarse grained, trace fine gravel, light grey-brown.</li> </ul>	rained, 	M	VD			TOPSOIL
GEO 5.3 Issue 3 Rev.2 A B B C M B C M C M C M C M C M C M C M C	AD auger drilling*			M C <b>pe</b> 1	B Support M mud N nil C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow			notes, samples, tests         U <sub>50</sub> undisturbed sample 50mm diameter         U <sub>63</sub> undisturbed sample 63mm diameter         D       disturbed sample         N       standard penetration test (SPT)         N*       SPT - sample recovered         Nc       SPT with solid cone         V       vane shear (kPa)         P       pressuremeter         Bs       bulk sample         E       environmental sample         R       refusal	n diameter based on unified system		n d classification			consistency/density index         VS       very soft         S       soft         F       firm         St       stiff         VSt       very stiff         H       hard         Fb       friable         VL       very loose         L       loose         MD       medium dense         D       dense         VD       very dense	

BOREHOLE 20248AA LOGS.GPJ COFFEY.GDT 3.13.09