

Test pit TP 10 - 2.5 m terminated, 2 soil horizons. TOPSOIL and ALLUVIUM; brown grey surficial top soil and white siltstone with minor red mottling.

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TEST PIT	LOG							
Job No:	P02-17		Date Started:	20/11/2017		$ \bigcirc$ $\top$	- ( )	$\Lambda \Pi = \Lambda \Pi$
Test Pit ID:	TP 11		Date Finished:	20/11/2017	MHAG		□ C H	NICAL
Contractor:	Gary		Bucket Width:	0.55m	]			Suite 2, 464 Murray St Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6885004	<u>.</u> 1			M: +61 4 1347 4515 ABN: 53 4043 898 19
					<u>.</u>		E	MHAGeotechnical.com.au : info@mhageotechnical.com.au
Logged By:	Harvey Morcor	m	Northing:	120.2113023		_		
Depths (From)	Depths (To)	Main material	ı	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2		sandy gravelly SIL with gravel, dry.	T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		TOPSOIL	mar graver, ary:			200		
		TOT GOIL				300		
						400		
						500		
0.2	2.8		SILT, [ML], stiff to moist.	very stiff, non-plastic, white, dry to	Clayey silt, less granular, excavated as rock.	600		Bulk X2
		ALLUVIUM				700		
						800		
						900		
			Г		1	1000		
2.8	EOH					1100		
		TERMINATION				1200		
						1300		
						1400		
					1	1500		
						1600		
						1700		
						1800		
						2000		
						2100		
						2200		
						2300		
						2400		
						2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES AN	ND COMMEN	NTS				I	ı	L
Groundwate	r recorded at _	m on the	1 1	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate	System: rigin	, Zoi	1	Consistency	Plasticity/Grain size	Calarii	With/Trace	Maiatres
	PSOIL	Primary Primary	<b>Group</b> Pt	Fine Grain:	Fine grain:	Colour	clay	Moisture dry
	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
BIT	UMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
	FILL	SILT	СН	firm	low - medium	brown	gravel	wet
	DEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
	M TAMALA LST ALA LST	GRAVEL COBBLES	MH ML	very stiff hard	medium to high high plasticity	green white	OM BR	saturated
	D FORMATION	BOULDERS	SW	nard Coarse Grain:	nign plasticity  Coarse Grain:	cream	Fines:	
	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLL	LUVIUM	clayey	sc	loose	Medium	black	15-30% "With"	
	OLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
	DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LAT	ERITE	gravelly cobbly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub	Can be modified using pale, dark	<=5% "Trace"	
		boulderv	GC GM		angular, angular, flaky, platy	and motled	5-12% "With" >12% "Secondary"	

>12% "Secondary"

bouldery



Test pit TP 11 - 2.8 m terminated, 2 soil horizons. TOPSOIL and ALLUVIUM; brown grey surficial top soil and white siltstone.

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TEST PIT	LOG							
Job No:	P02-17		Date Started:	20/11/2017		$- \cap T$	$-\bigcirc$	$\Lambda \Lambda \Lambda \Lambda$
Test Pit ID:	TP 12		Date Finished:	20/11/2017	MHAG			NICAL
					, 1			Suite 2, 464 Murray St Perth WA 6000 Australia
Contractor:	Gary		Bucket Width:	0.55m	J			T: +61 8 6110 4768 M: +61 4 1347 4515
Machine:	JCB		Easting:	-33.6877109	]			ABN: 53 4043 898 19 MHAGeotechnical.com.au
Logged By:	Harvey Morcor	m	Northing:	120.2112202	]		E	: info@mhageotechnical.com.au
Depths (From)	Depths (To)	Main material	ı	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.1			T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		T0000#	with gravel, dry.			200		
		TOPSOIL				300		
						400		
						500		
0.1	2.8		SILT, [ML], firm, no	on-plastic, white, with clay, dry to	Clayey silt, less granular, excavated as rock.	600		Bulk
		A11110/01/A	moist.		excavated as fock.	700		
		ALLUVIUM				800		
						900		
						1000		
2.8	EOH					1100		
		TERMINATION				1200		
		TERMINATION				1300		
						1400		
			_			1500		
						1600		
						1700		
						1800		
						1900		
			T		1	2000		
						2100		
						2200		
						2300		
						2400		
			1		<u> </u>	2500		
						2600		
						2700		
						2800		
						3000		
NOTES A	I ND COMMEN	170				3000		
Many small Groundwate	(1 - 2 mm) / me r recorded at _		/ /	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
-	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CON	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
BIT	UMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
	TILL	SILT	СН	firm	low - medium	brown	gravel	wet
	DEAN SAND M TAMALA LST	SAND GRAVEL	CL MH	Stiff	medium plasticity	purple	cobbles	moist to wet
	ALA LST	COBBLES	MH ML	very stiff hard	medium to high high plasticity	green white	OM BR	saturated
	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALL	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLI	LUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
	OLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
	DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LAI	ERITE	gravelly cobbly	GP GC	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub	Can be modified using pale, dark	<=5% "Trace" 5-12% "With"	
		bouldery	GM		angular, angular, flaky, platy	and motled	>12% "Secondary"	

>12% "Secondary"

bouldery



Test pit TP 12 - 2.8 m terminated, 2 soil horizons. TOPSOIL and ALLUVIUM; brown grey surficial top soil and white siltstone.

TEST PIT	LOG							
Job No:	P02-17		Date Started:	20/11/2017		$ \bigcirc$ $\top$	- ( )	$\Lambda \Pi = \Lambda \Pi$
Test Pit ID:	TP 13		Date Finished:	20/11/2017	MHAG		L C H	
Contractor:	Gary		Bucket Width:	0.55m	]			Suite 2, 464 Murray St Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6867749	]			M: +61 4 1347 4515 ABN: 53 4043 898 19
Loggod By:	Hanyoy Margar	m	Northing:	120.2111142	- ]		E	MHAGeotechnical.com.au : info@mhageotechnical.com.au
Logged By:	Harvey Morcor	n .	Northing:	120.2111142	]	DOD Dth	Ī	
Depths (From)	Depths (To)	Main material		Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.1		sandy gravelly SIL with gravel, dry.	.T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		TOPSOIL				200		
						300		
						400		
			OU T 0411 6		Total	500		
0.1	0.7		gravel and sand, o	on-plastic, grey white red motling, with dry.	Clayey silt, less granular, excavated as rock.	600		Bulk
		ALLUVIUM				700		
						800		
						900		
			SII T IMI 1 firm n	on-plastic, white, with clay, dry to	Clayey silt, less granular,	1000		
0.7	2.8		moist.	on-plastic, write, with day, dry to	excavated as rock.	1100		Bulk
		ALLUVIUM				1200		
						1300		
						1400		
	5011				1	1500		
2.8	EOH					1600		
		TERMINATION				1700		
						1800		
						1900		
					<u> </u>	2000		
						2100		
						2200		
						2300		
						2400 2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES AN	I COMMEN	l ure				3000		
,	` ′	edium (2 - 10 mm) / large (>10 m on the	,	m and few small (1 - 2 mm	i) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate				· 				
	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOF	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CON	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
	UMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
	TLL	SILT	CH	firm	low - medium	brown	gravel	wet
	DEAN SAND  I TAMALA LST	SAND GRAVEL	CL MH	stiff very stiff	medium plasticity medium to high	purple green	cobbles	moist to wet saturated
	ALA LST	COBBLES	ML	hard	high plasticity	white	BR	saturateu -
	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLI	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLL	LUVIUM	clayey	sc	loose	Medium	black	15-30% "With"	
	OLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
	DEPOSIT ERITE	sandy	GW	dense	Additional:	Additional:	Coarse:	
LAI	LIMIE	gravelly cobbly	GP GC	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub	Can be modified using pale, dark	<=5% "Trace" 5-12% "With"	
		bouldery	GM		angular, angular, flaky, platy	and motled	>12% "Secondary"	

>12% "Secondary"

bouldery



Test pit TP 13 - 2.9 m terminated, 3 soil horizons. TOPSOIL and ALLUVIUM; brown grey surficial top soil and white siltstone with some red mottling.

TEST PIT	LOG							
Job No:	P02-17		Date Started:	21/11/2017		$ \bigcirc$ $\top$	- ( )	$\Lambda \sqcup \Lambda \sqcup$
Test Pit ID:	TP 14		Date Finished:	21/11/2017	MHAG			
Contractor:	Gary		Bucket Width:	0.55m	]			Suite 2, 464 Murray St Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6861255	- ]			M: +61 4 1347 4515 ABN: 53 4043 898 19
					<u>.</u> 1		E	MHAGeotechnical.com.au :: info@mhageotechnical.com.au
Logged By:	Harvey Morcor	m	Northing:	120.2110391		1		T
Depths (From)	Depths (To)	Main material		Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2		sandy gravelly SIL with gravel, dry.	.T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		TOPSOIL				200		
						300		
						400		
			SILT [MI 1 yory s	tiff, non-plastic, white red motling, with	Cobbly, excavated as rock.	500		
0.2	1		gravel and sand, o		CODDIY, excavated as fock.	600		Bulk
		ALLUVIUM				700		
						800		
						900		
1	EOH				1	1000		
<u>'</u>	EOH					1200		
		REFUSAL				1300		
						1400		
						1500		
						1600		
						1700		
						1800		
						1900		
						2000		
						2100		
						2200		
						2300		
						2400		
						2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES AN	ND COMMEN	NTS						
Groundwate	r recorded at _	m on the	1 1	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate	rigin	, Zoi	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
ВІТ	UMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
	TILL	SILT	СН	firm	low - medium	brown	gravel	wet
	DEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
	M TAMALA LST ALA LST	GRAVEL COBBLES	MH ML	very stiff hard	medium to high high plasticity	green white	OM BR	saturated
	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLL	LUVIUM	clayey	sc	loose	Medium	black	15-30% "With"	
	OLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
	DEPOSIT ERITE	sandy	GW	dense	Additional:	Additional:	Coarse:	
LAI	LAHE	gravelly cobbly	GP GC	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub	Can be modified using pale, dark	<=5% "Trace" 5-12% "With"	
		bouldery	GM		angular, angular, flaky, platy	and motled	>12% "Secondary"	

>12% "Secondary"

bouldery



Test pit TP 14 - 1.0m refusal. TOPSOIL and gravelly ALLUVIUM; brown grey surficial top soil and white siltstone with some cobbles.

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TEST PIT	LOG							
Job No:	P02-17		Date Started:	21/11/2017		$-\bigcirc$ $\top$	$-\bigcirc$	$\Lambda \Lambda \Lambda \Lambda$
Test Pit ID:	TP 15		Date Finished:	21/11/2017	MHAGI			NICAL
					<u>,</u> 1			Suite 2, 464 Murray St Perth WA 6000 Australia
Contractor:	Gary		Bucket Width:	0.55m				T: +61 8 6110 4768 M: +61 4 1347 4515
Machine:	JCB		Easting:	-33.6856138	]			ABN: 53 4043 898 19 MHAGeotechnical.com.au
Logged By:	Harvey Morcon	m	Northing:	120.2109576	]		E	: info@mhageotechnical.com.au
Depths (From)	Depths (To)	Main material	ı	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2			T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		T0000#	with gravel, dry.			200		
		TOPSOIL				300		
						400		
						500		
0.2	2.7		SILT, [ML], very st sand, dry.	iff, non-plastic, white, with gravel and	Excavated as rock.	600		Bulk x2
		A11110/01/A	Sanu, dry.			700		
		ALLUVIUM				800		
						900		
						1000		
2.7	EOH					1100		
		REFUSAL				1200		
		REFUSAL				1300		
						1400		
						1500		
						1600		
						1700		
						1800		
						1900		
						2000		
						2100		
						2200		
						2300		
						2400		
			1		1	2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES A	ND COMMEN	NTS						
		edium (2 - 10 mm) / large (>10 mm) m on the		m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate		, Zoi						
0	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
ТО	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
	ICRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
	UMEN FILL	CLAY SILT	OL	soft	low plasticity	yellow	sand	moist
	TEAN SAND	SAND	CH CL	firm stiff	low - medium medium plasticity	brown purple	gravel cobbles	wet moist to wet
	M TAMALA LST	GRAVEL	мн	very stiff	medium to high	green	ОМ	saturated
	ALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFOR	D FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
	LUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
	OLIAN P DEPOSIT	silty sandy	SM GW	medium dense dense	Coarse Grain: Additional:	blue	>30% "Secondary" Coarse:	
	ERITE	gravelly	GW GP	dense very dense		Additional:	<=5% "Trace"	
		cobbly	GC	, donoo	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub	Can be modified using pale, dark	5-12% "With"	
		bouldery	GM		angular, angular, flaky, platy	and motled	>12% "Secondary"	

>12% "Secondary"

bouldery



**Test pit TP 15** - 2.7m refusal. TOPSOIL and gravelly ALLUVIUM; brown grey surficial top soil and white siltstone with some cobbles.

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TEST PIT	LOG							
Job No:	P02-17		Date Started:	21/11/2017	MHAG	FOT	Е C П	NICAI
Test Pit ID:	TP 16		Date Finished:	21/11/2017	MAA			Suite 2, 464 Murray St
Contractor:	Gary		Bucket Width:	0.55m	]			Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6852333	]			M: +61 4 1347 4515 ABN: 53 4043 898 19
Logged By:	Harvey Morco	m	Northing:	120.210323	]		E	MHAGeotechnical.com.au : info@mhageotechnical.com.au
Depths					, 	DCP Depth		
(From)	Depths (To)	Main material		Material Description	Comments	(mm)	DCP Blows/100m	Laboratory Samples
0	0.2	  -	with gravel, dry.	T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		TOPSOIL				200		
						300		
						400		
					1	500		
0.2	0.6	-	gravelly SIL1, [ML with gravel, dry.	], very stiff, low plasticity, red brown,	Excavated as rock. Lateritic formation.	600		Bulk
		ALLUVIUM				700		
						800		
						900		
						1000		
0.6	1		SILT, [ML], very st blend, with gravel,	tiff, low plasticity, red brown white drv.	transition phase between soil units above and below.	1100		Bulk
		ALLUVIUM	, , , ,			1200		
		ALLOVION				1300		
						1400		
						1500		
1	2.8		SILT, [ML], very st sand, dry.	tiff, non-plastic, white, with gravel and	Excavated as rock.	1600		Bulk
		A	Sanu, ury.			1700		
		- ALLUVIUM				1800		
		1				1900		
			ı		Į.	2000		
2.8	EOH					2100		
		-				2200		
		TERMINATED				2300		
						2400		
			I			2500		
						2600		
		=				2700		
						2800		
		1				2900		
			I		l	3000		
NOTES AN	ND COMME	NTS						
	, ,	edium (2 - 10 mm) / large (>10 mm) / m on the	*	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate			ne:	·				
-	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
	CRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
	UMEN FILL	CLAY SILT	OL CH	soft firm	low plasticity low - medium	yellow brown	sand	moist wet
	DEAN SAND	SAND	CL	stiff	medium plasticity	purple	gravel cobbles	moist to wet
	л тамаla LST		MH	very stiff	medium to high	green	OM	saturated
	ALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLI	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
	LUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
	OLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP	P DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	

very dense

Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy <=5% "Trace"

5-12% "With"

>12% "Secondary"

Can be modified using pale, dark and motled

LATERITE

gravelly

cobbly

bouldery

GP

GC



Test pit TP 16 - 2.8m termination. TOPSOIL and gravelly ALLUVIUM; red brown surficial top soil and white siltstone with some gravel.

TEST PIT I	LOG							
Job No:	P02-17		Date Started:	21/11/2017	MHAG	$= \cap \top$	FСН	NICAI
Test Pit ID:	TP 17		Date Finished:	21/11/2017		_		
Contractor:	Gary		Bucket Width:	0.55m	]			Suite 2, 464 Murray St Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6852913	]			M: +61 4 1347 4515 ABN: 53 4043 898 19 MHAGeotechnical.com.au
Logged By:	Harvey Morco	m	Northing:	120.2093694	]		E	: info@mhageotechnical.com.au
Depths	1				<u>,</u> 	DCP Depth	I	
(From)	Depths (To)	Main material		Material Description	Comments	(mm)	DCP Blows/100m	Laboratory Samples
0	0.2		sandy gravelly SIL with gravel, dry.	T, [ML], firm, non-plastic, brown grey	Roots and organics.	100		N/S
		TOPSOIL				200		
		-				300		
						400		
			t. OII T. IMI 1		N-II	500		
0.2	0.6	<u> </u>	with gravel, dry.	very stiff, low plasticity, yellow brown,	Yellow brown transition between topsoil and red brown silt	000		N/S
		ALLUVIUM			beneath.	700		
		<u> </u>				800		
						900		
			CILT IMI 1 years of	tiff, low plasticity, red brown, with	Cobbled conglementite	1000		
0.6	1.2	-	gravel, dry.	iii, iow plasticity, red brown, with	Cobbled, conglomertitc, contains large quartz clasts.	1100		Bulk
		ALLUVIUM				1200		
		  -				1300		
						1400		
			OUT BALL	iff and all of the with and all or a	Terresistad as and	1500		
1.2	2.7	  -	sand, dry.	tiff, non-plastic, white, with gravel and	Excavated as rock.	1600		Bulk
		ALLUVIUM				1700		
		-				1800		
						1900		
			1		1	2000		
2.7	EOH	-				2100		
		TERMINATED				2200		
		-				2300		
						2400		
			1		1	2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES AN	ID COMMEN	NTS						
		edium (2 - 10 mm) / large (>10 mm)	,	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>1	10 mm) roots to _	m.	
Co-ordinate		, Zoi		·				
Or	igin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOF	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CON	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
	JMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
	ILL	SILT	CH	firm	low - medium	brown	gravel	wet
	EAN SAND	SAND	CL	Stiff	medium plasticity	purple	cobbles	moist to wet
	I TAMALA LST LA LST	GRAVEL COBBLES	MH ML	very stiff hard	medium to high high plasticity	green white	OM BR	saturated
	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
	JVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLL	UVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEC	DLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP	DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	

LATERITE

gravelly

cobbly

bouldery

GP

GC

GM

very dense

Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy <=5% "Trace"

5-12% "With"

>12% "Secondary"

Can be modified using pale, dark and motled



**Test pit TP 17** – 2.7m termination. TOPSOIL (right) grading into ALLUVIUM, white siltstone (left).

TEST PIT	LOG							
Job No:	P02-17		Date Started:	21/11/2017		- O T		N
					MHAG	$\perp$ $\bigcirc$ $\mid$	$\Box$ $\Box$ $\Box$	NICAL
Test Pit ID:	TP 18		Date Finished:	21/11/2017				Suite 2, 464 Murray St
Contractor:	Gary		Bucket Width:	0.55m	]			Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6853516	]			M: +61 4 1347 4515 ABN: 53 4043 898 19 MHAGeotechnical.com.au
Logged By:	Harvey Morcor	m	Northing:	120.2085011	]		E	: info@mhageotechnical.com.au
Depths					<u>-</u> 	DCP Depth		
(From)	Depths (To)	Main material		Material Description	Comments	(mm)	DCP Blows/100m	Laboratory Samples
0	0.2		gravel and sand, o	firm, non-plastic, brown grey with lry.	Roots and organics.	100		N/S
		TOPSOIL				200		
						300		
						400		
			and CILT MALL	van stiff law alasticity vallaw knows	Vallau harres transition hatroon	500		
0.2	0.6		with gravel, dry.	very stiff, low plasticity, yellow brown,	Yellow brown transition between topsoil and red brown silt	000		Bulk
		ALLUVIUM			beneath.	700		
						800		
						900		
			la		Ta	1000		
0.6	1.2		SILT, [ML], very st gravel, dry.	iff, low plasticity, red brown, with	Cobbled, conglomertitc, contains large quartz clasts.	1100		Bulk
		ALLUVIUM				1200		
		7.220 7.0				1300		
						1400		
						1500		
1.2	2.8		SILT, [ML], very st gravel and sand, of	iff, non-plastic, yellow white, with	Excavated as rock.	1600		Bulk x2
		A1 1 1 1 7/1 1 1 A	graver and sand, o	ny.		1700		
		ALLUVIUM				1800		
						1900		
					J	2000		
2.8	EOH					2100		
						2200		
		TERMINATED				2300		
						2400		
			l			2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES AN	ND COMMEN	ITE				0000	ļ	
		edium (2 - 10 mm) / large (>10 m on the	,	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate		m on the , Zoi						
	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CON	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
BIT	UMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
F	FILL	SILT	СН	firm	low - medium	brown	gravel	wet
	DEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
	// TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	ОМ	saturated
	ALA LST	COBBLES	ML	hard	high plasticity	white	BR	
	D FORMATION UVIUM	BOULDERS Scondary:	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
	LUVIUM	clayey	SP SC	very loose loose	Fine Medium	grey black	<=15% "Trace" 15-30% "With"	
	OLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
	DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LAT	ERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded	Can be modified	<=5% "Trace"	

cobbly

bouldery

GC

GM

Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy

5-12% "With"

>12% "Secondary"

Can be modified using pale, dark and motled



**Test pit TP 18** – 2.7m termination. TOPSOIL (right) grading into ALLUVIUM, white siltstone (left).

TEST PIT	LOG							
Job No:	P02-17		Date Started:	21/11/2017		$ \bigcirc$ $\top$	- ( )	$\Lambda \sqcup \Lambda \sqcup$
Test Pit ID:	TP 19		Date Finished:	21/11/2017	MHAG		$\Box \cup H$	NICAL
Contractor:	Gary		Bucket Width:	0.55m	- ]			Suite 2, 464 Murray St Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6854116	<u>-</u> 1			M: +61 4 1347 4515 ABN: 53 4043 898 19
					<u>-</u>		E	MHAGeotechnical.com.au :: info@mhageotechnical.com.au
Logged By:	Harvey Morcor	m	Northing:	120.2077879		1	1	T
Depths (From)	Depths (To)	Main material		Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2		sandy SILT, [ML], gravel and sand, of	firm, non-plastic, brown grey with dry.	Roots and organics.	100		N/S
		TOPSOIL				200		
						300		
						400		
						500		
0.2	0.6		sandy SILT, [ML], brown, with gravel	very stiff, low plasticity, white and red , dry.	White and red brown transition.	600		Bulk
		ALLUVIUM				700		
						800		
						900		
			OUT BALL	ill and all of the with and and	Terroretados sosti	1000		
0.6	2.8		sand, dry.	tiff, non-plastic, white, with gravel and	Excavated as rock.	1100		Bulk
		ALLUVIUM				1200		
						1300		
						1400		
					1	1500		
2.8	EOH					1600		
		TERMINATED				1700		
						1800		
						1900		
			1			2000		
						2100		
						2200		
						2300		
						2400		
						2500		
						2600		
						2700		
						2800		
						2900		
						3000		
NOTES AN	ND COMMEN	NTS						
	. ,	edium (2 - 10 mm) / large (>10 mm) m on the	•	m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate	System:	, Zoi	ne:			_	_	
	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
	PSOIL CRETE	Primary PEAT	Pt	Fine Grain:	Fine grain:	red	clay	dry
	UMEN	CLAY	OH OL	very soft soft	non-plastic	orange yellow	silt sand	dry to moist moist
	TLL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSEN	DEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM	I TAMALA LST	GRAVEL	МН	very stiff	medium to high	green	ОМ	saturated
	ALA LST	COBBLES	ML	hard	high plasticity	white	BR	
	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
	LUVIUM OLIAN	clayey silty	SC SM	loose	Medium  Coarse Grain:	black blue	15-30% "With" >30% "Secondary"	
	DEPOSIT	sandy	GW	medium dense dense	Additional:	Additional:	>30% "Secondary" Coarse:	
	ERITE	gravelly	GP	very dense			<=5% "Trace"	
		cobbly	GC	•	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub	Can be modified using pale, dark	5-12% "With"	
		bouldery	GM		angular, angular, flaky, platy	and motled	>12% "Secondary"	

>12% "Secondary"

bouldery



**Test pit TP 19** – 2.8m termination. TOPSOIL grading into ALLUVIUM, white siltstone.

TEST PIT I	LOG							
Job No:	P02-17		Date Started:	21/11/2017	MHAGI	$= \cap \top$	F C H	NICAL
Test Pit ID:	TP 20		Date Finished:	21/11/2017				Suite 2, 464 Murray St
Contractor:	Gary		Bucket Width:	0.55m	]			Perth WA 6000 Australia T: +61 8 6110 4768
Machine:	JCB		Easting:	-33.6854699	]			M: +61 4 1347 4515 ABN: 53 4043 898 19
Logged By:	Harvey Morco	m	Northing:	120.206819	1		E	MHAGeotechnical.com.au : info@mhageotechnical.com.au
	Tiarvey Moreon	1	Trottining.	120.200010	1	DCP Depth	-	
Depths (From)	Depths (To)	Main material		Material Description	Comments	(mm)	DCP Blows/100m	Laboratory Samples
0	0.2		sandy SILT, [ML], gravel and sand, of	firm, non-plastic, brown grey with dry.	Roots and organics.	100		N/S
		TOPSOIL	<b>3</b> ,	,		200		
						300		
						400		
				e# 1	1	500		
0.2	0.4	<u> </u>	with gravel, dry.	very stiff, low plasticity, white brown,	Indurated, excavated as rock.	600		Bulk
		ALLUVIUM				700		
		  -				800		
						900		
	4.0		SILT [ML] very st	tiff, non-plastic, white yellow, with	Lateritic conglomerate.	1000		
0.4	1.3	-	gravel and sand, o		Laternic congiomerate.	1100		Bulk
		ALLUVIUM				1200		
		-				1300		
						1400 1500		
1.3	EOH					1600		
1.5	LOIT	-				1700		
		- REFUSAL				1800		
		-				1900		
						2000		
						2100		
		1				2200		
						2300		
		1				2400		
						2500		
						2600		
						2700		
		-				2800		
						2900		
						3000		
NOTES AN	ND COMMEN	NTS						
		edium (2 - 10 mm) / large (>1 _ m on the		m and few small (1 - 2 mm	n) / medium (2 - 10 mm) / large (>	10 mm) roots to _	m.	
Co-ordinate			ne:					
Or	rigin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOF	PSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
	CRETE	PEAT	ОН	very soft	non-plastic	orange	silt	dry to moist
	UMEN TILL	CLAY SILT	OL	soft	low plasticity	yellow	sand	moist
	DEAN SAND	SAND	CH CL	firm stiff	low - medium medium plasticity	brown purple	gravel cobbles	wet moist to wet
	I TAMALA LST		MH	very stiff	medium to high	green	OM	saturated
	ALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD	FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
	UVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
	LUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
	DLIAN P DEPOSIT	silty sandy	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAIN	PELOSII	saliuy	GW	dense	Additional:	Additional:	Coarse:	

LATERITE

gravelly

cobbly

bouldery

GP

GC

GM

very dense

Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy <=5% "Trace"

5-12% "With"

>12% "Secondary"

Can be modified using pale, dark and motled



Test pit TP 20 – 1.3m refusal. TOPSOIL into lateritic ALLUVIUM, gravelly and conglomeritic.



# **Appendix C**

**Field Permeability Test Results** 

		Site/Loca	tion: ACH Minerals - F	Ravensthorpe Gold Project - T	ailings St	orage Facility			
Number	Saturation		(Decimal Degrees)	. Date	Time	Time Interval	Water Level	h	k
Number	Saturation	Latitude (mE)	Longitude (mS)			(min)	(mbToC)	(m)	(m/s)
TP 03	Unsaturated	241073	6269009	Tuesday, 21 November 2017	12:42:00	0	-0.060	-0.060	-
				Temperature: 36°C	16:28:00	15240	-0.095	-0.0350	7.9E-06
		Test Column	Depth	0.600					
			Diameter Surface Area of base	0.110 0.0095					
			Surface Area of base	0.0055				Ave	7.94E-06
	Partially Saturated	241073	6269009	Tuesday, 21 November 2017	16:48:00	0	-0.036	-0.036	-
				Temperature: 36°C	18:22:00	5640	-0.065	-0.0290	
		Test Column	Depth	0.600	6:52:00	383400	-0.175	-0.1100	1.0E-07
			Diameter Surface Area of base	0.110 0.0095					ł
				5.555				Ave	1.30E-05
	Saturated	241073	6269009	Tuesday, 21 November 2017	6:59:00	0	-0.038	-0.038	-
				Temperature: 36°C	9:10:00	7860	-0.070	-0.0320	1.7E-05
		Test Column	Depth Diameter	0.600 0.110	10:27:00	476220	-0.075	-0.0050	1.8E-06
			Surface Area of base	0.0095					<b></b>
								Ave	9.32E-06
TP 07	Unsaturated	241292	268835	Tuesday, 21 November 2017	12:45:00	0	-0.100	-0.100	-
				Temperature: 36°C	16:31:00	12960	-0.425	-0.3250	1.0E-06
		Test Column	Depth Diameter	0.400 0.110					
			Surface Area of base	0.110					
			Curido / irod or baco	0.0033				Ave	1.01E-06
	Partially Saturated	241292	268835	Tuesday, 21 November 2017	16:31:00	0	-0.073	-0.073	-
				Temperature: 36°C	6:05:00	41640	-0.420	-0.3470	2.9E-07
		Test Column	Depth	0.400	7:03:00	45120	-0.425	-0.0050	2.4E-04
			Diameter Surface Area of base	0.110 0.0095					ļ
			Currace / rea or base	0.0055				Ave	1.22E-04
	Saturated	241292	268835	Tuesday, 21 November 2017	7:03:00	0	-0.114	-0.114	-
				Temperature: 36°C	8:55:00	6780	-0.410	-0.2960	2.1E-06
		Test Column	Depth	0.400	10:11:00	11340	-0.042	0.3685	4.5E-06
			Diameter Surface Area of base	0.110 0.0095					ļ
			Curiaco / iroa or baco	0.0033				Ave	3.33E-06
TP 12	Unsaturated			Tuesday, 21 November 2017	13:11:00	0	0.000	0.000	-
				Temperature: 36°C	13:19:00	480	-0.050	-0.0500	1.8E-04
		Test Column	Depth	0.600	13:34:00	1380	-0.080		1.6E-04
			Diameter	0.110	16:36:00	12300	-0.150		5.5E-06
			Surface Area of base	0.0095				Ave	1.13E-04
	Partially Saturated			Tuesday, 21 November 2017	16:36:00	0	-0.037	-0.037	-
				Temperature: 36°C	6:15:00	49140	-0.190	-0.1530	5.6E-07
		Test Column	Depth	0.600	7:22:00	53160	-0.210	-0.0200	5.3E-05
			Diameter Surface Area of base	0.110 0.0095					<b> </b>
			Currace Area or base	0.0053				Ave	2.66E-05
	Saturated			Tuesday, 21 November 2017	7:22:00	0	-0.075	-0.075	-
				Temperature: 36°C	8:58:00	5760	-0.175	-0.1000	7.4E-06
		Test Column	Depth	0.600	10:15:00	10380	-0.195	-0.0200	4.6E-05
			Diameter Surface Area of base	0.110 0.0095				<u></u>	<b>}</b>
			Cullace Alea of pase	0.0055				Ave	2.66E-05
TP 13	Unsaturated			Tuesday, 21 November 2017	13:46:00	0	-0.090	-0.090	-
				Temperature: 36°C	13:57:00	660	-0.110	-0.0200	3.2E-04
		Test Column	Depth	0.600	18:18:00	16320	-0.330		1.2E-06
		<b></b>	Diameter	0.110	7:19:00	55980	-0.045		
			Surface Area of base	0.0095				Ave	1.61E-04
	Partially Saturated			Tuesday, 21 November 2017				0.000	-
				Temperature: 36°C				#REF!	#REF!
		Test Column	Depth	0.600				#REF!	#REF!
			Diameter	0.110					<b> </b>
			Surface Area of base	0.0095				Ave	#REF!
	Saturated			Tuesday, 21 November 2017	7:19:00	0	-0.172	#REF!	#IXEF!
				Temperature: 36°C	9:00:00	6060	-0.220	#REF!	1.5E-05
		Test Column	Depth	0.600	10:17:00	10680	-0.240	#REF!	4.6E-05
		l	Diameter	0.110				I	1

			Curface Area of bace	0.0095				T	Τ
			Surface Area of base	0.0095				Ave	3.02E-05
TD 16-17	Uncaturated			Tuesday, 21 November 2017	12:51:00	0	-0.040	-0.040	3.02L-03
TP 19 Unsaturated  Test Column Depth Diameter Surface Area of bas  Partially Saturated  Test Column Depth Diameter Surface Area of bas  Saturated  Test Column Depth Diameter Test Column Depth Diameter Diameter Diameter	Olisaturateu			Temperature: 36°C	14:02:00	4260	-0.040	-0.040	1.4E-05
		Toot Column	Donth	0.600	14:15:00	5040	-0.110	-0.0700	3.6E-04
	0.110	16:40:00	14340	-0.123		6.0E-06			
				0.0095	10.40.00	14340	-0.201		0.02-00
			Surface Area of base	0.0095				Ave	1.27E-04
	Partially Saturated			Tuesday, 21 November 2017	16:40:00	0	-0.037	-0.037	1.27 - 04
	r artially Gataratoa			Temperature: 36°C	18:18:00	5880	-0.080	-0.0430	1.7E-05
		Test Column	Denth	0.600	7:15:00	52860	-0.290	-0.2100	
		Test Column		0.110	7.13.00	32000	0.230	-0.2100	4.51-07
				0.0095					<b></b>
			Curiaco / rica or bacc	0.0033			-	Ave	8.59E-06
	Saturated			Tuesday, 21 November 2017	7:15:00	0	-0.070	-0.070	-
				Temperature: 36°C	9:00:00	6300	-0.100	-0.0300	2.2E-05
		Test Column	Depth	0.600	10:20:00	11100	-0.130	-0.0300	
				0.110			0.200		
			Surface Area of base	0.0095					·
				,				Ave	2.59E-05
TP 19	Unsaturated			Tuesday, 21 November 2017	14:58:00	0	0.000	0.000	-
				Temperature: 36°C	15:22:00	1440	-0.065	-0.0650	4.5E-05
		Test Column	Depth	0.600	16:48:00	6600	-0.100		2.3E-05
			Diameter	0.110	18:20:00	12120	-0.110		7.7E-05
			Surface Area of base	0.0095	7:11:00	58380	-0.182		1.3E-06
								Ave	3.67E-05
	Partially Saturated			Tuesday, 21 November 2017	7:11:00	0	-0.052	-0.052	-
				Temperature: 36°C	9:06:00	6900	-0.080	-0.0280	2.2E-05
		Test Column	Depth	0.600	10:22:00	11460	-0.090	-0.0100	9.3E-05
			Diameter	0.110					
			Surface Area of base	0.0095					
								Ave	5.74E-05
	Saturated			Tuesday, 21 November 2017				0.000	-
				Temperature: 36°C				0.0000	2.2E-05
		Test Column	Depth	0.600				0.0000	9.3E-05
			Diameter	0.110					
			Surface Area of base	0.0095					
								Ave	5.74E-05



# **Appendix D**

**CPT Results** 

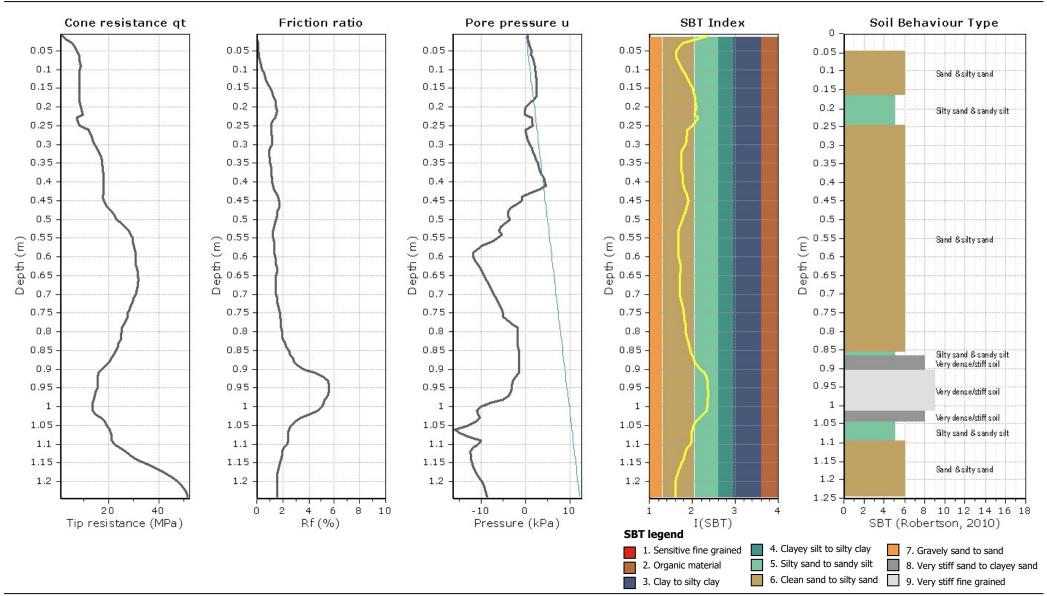
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 6

Total depth: 1.24 m, Date: 4/12/2017 Surface Elevation: 0.00 m

Coords: X:0.00, Y:0.00

Cone Type: Uknown Cone Operator: Uknown



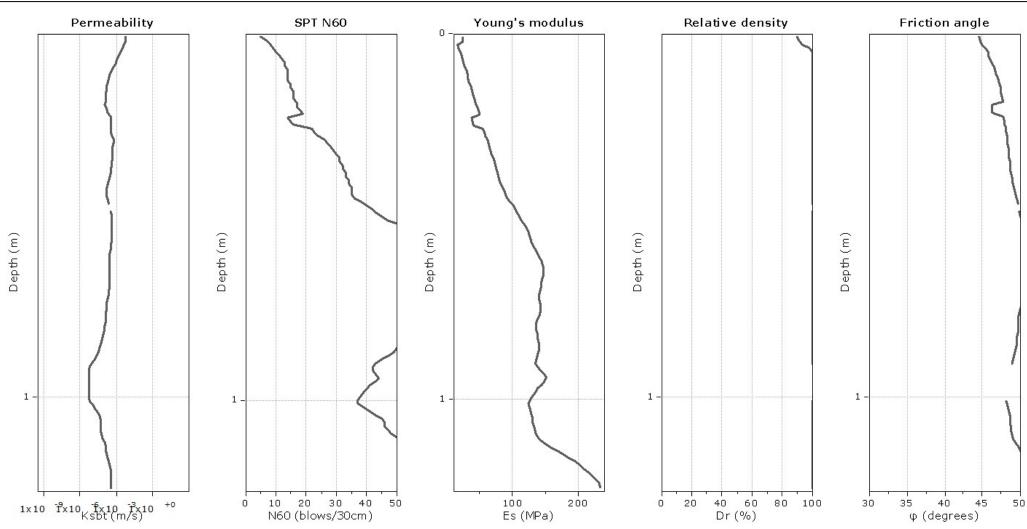
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 6

Total depth: 1.24 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown Cone Operator: Uknown



### **Calculation parameters**

Permeability: Based on SBT<sub>n</sub> SPT N<sub>60</sub>: Based on I<sub>c</sub> and q<sub>t</sub>

Young's modulus: Based on variable alpha using  $I_c$  (Robertson, 2009)

Relative desnisty constant,  $C_{Dr}$ : 350.0 Phi: Based on Kulhawy & Mayne (1990)

\_\_\_\_ User defined estimation data

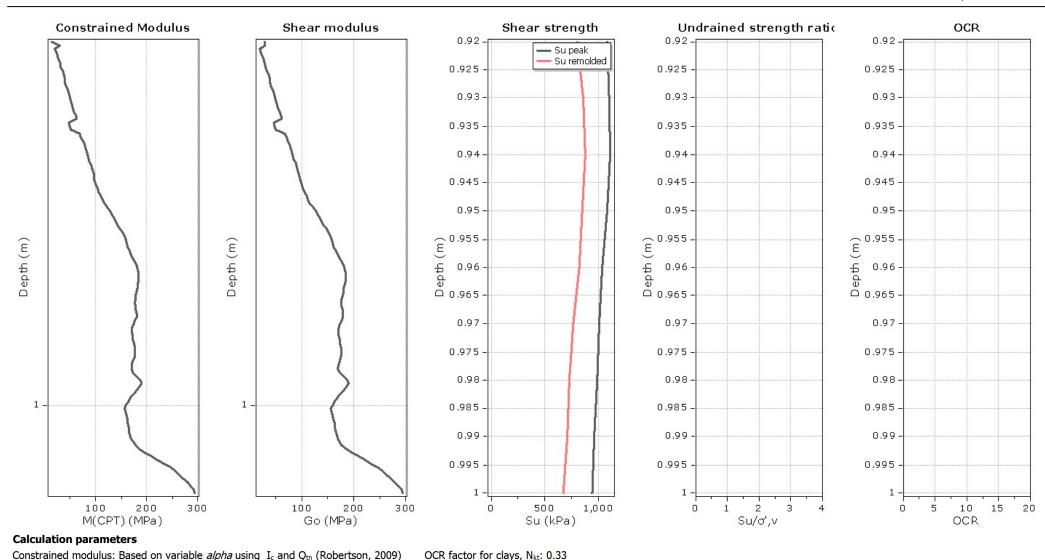
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location:

**CPT: CPT 6** Total depth: 1.24 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

> Cone Type: Uknown Cone Operator: Uknown



User defined estimation data

Flat Dilatometer Test data

Go: Based on variable *alpha* using I<sub>c</sub> (Robertson, 2009)

Undrained shear strength cone factor for clays, Nkt: 14

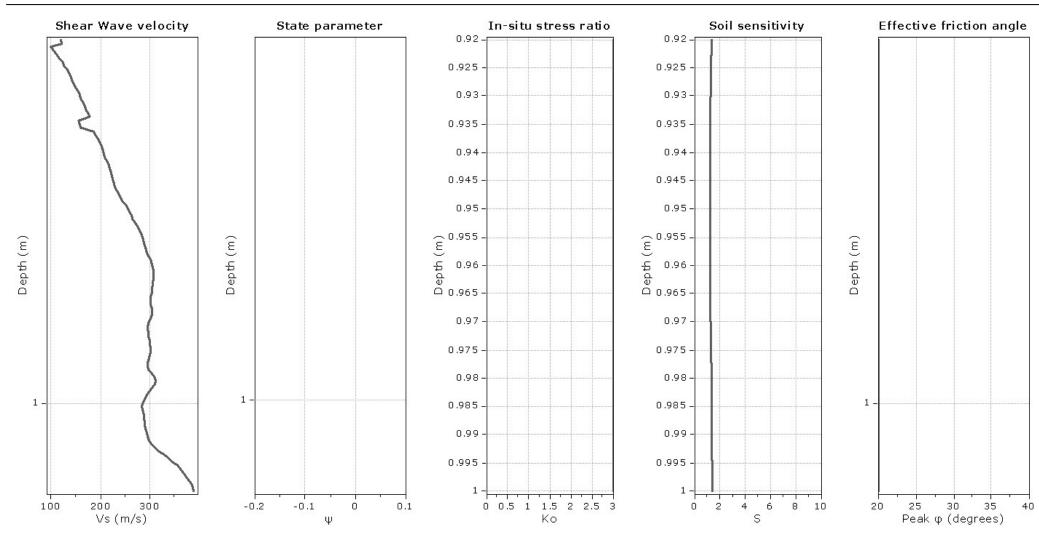
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 6

Total depth: 1.24 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown Cone Operator: Uknown



### **Calculation parameters**

Soil Sensitivity factor, N<sub>S</sub>: 7.00

User defined estimation data

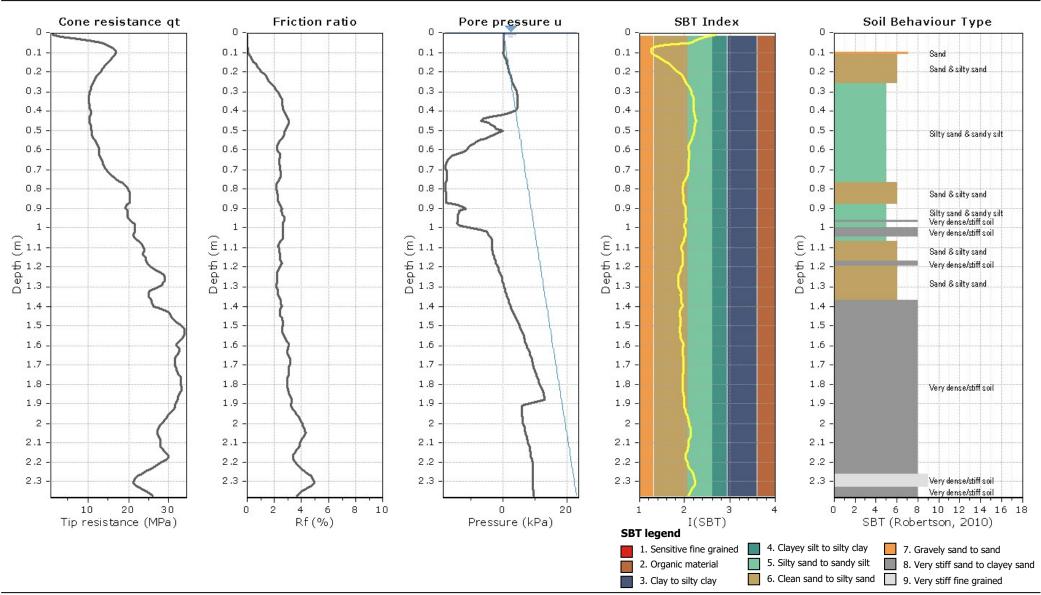
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 7

Total depth: 2.37 m, Date: 4/12/2017 Surface Elevation: 0.00 m

Coords: X:0.00, Y:0.00
Cone Type: Uknown

Cone Operator: Uknown



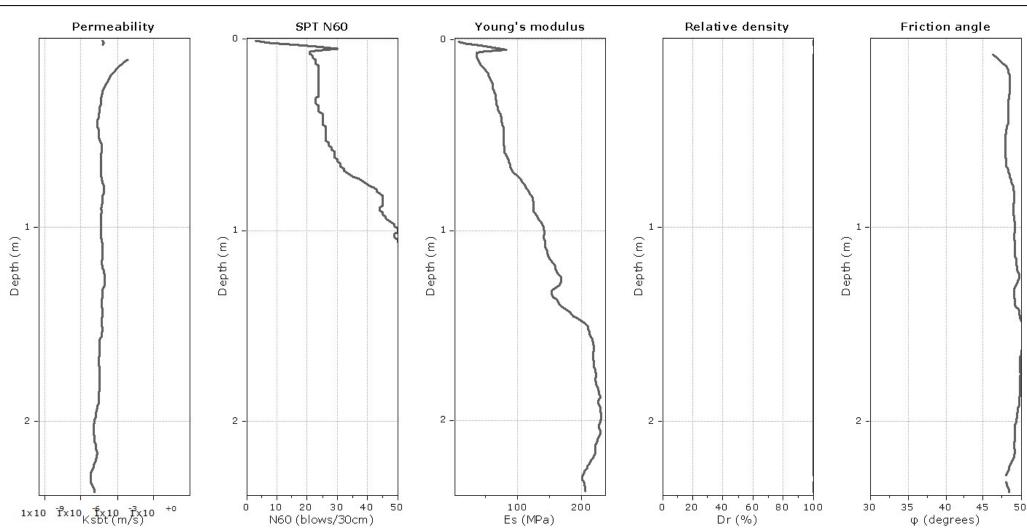
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 7

Total depth: 2.37 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown Cone Operator: Uknown



### **Calculation parameters**

Permeability: Based on  $SBT_n$  SPT  $N_{60}$ : Based on  $I_c$  and  $q_t$ 

Young's modulus: Based on variable alpha using  $I_c$  (Robertson, 2009)

Relative desnisty constant,  $C_{Dr}$ : 350.0 Phi: Based on Kulhawy & Mayne (1990)

\_\_\_\_ User defined estimation data

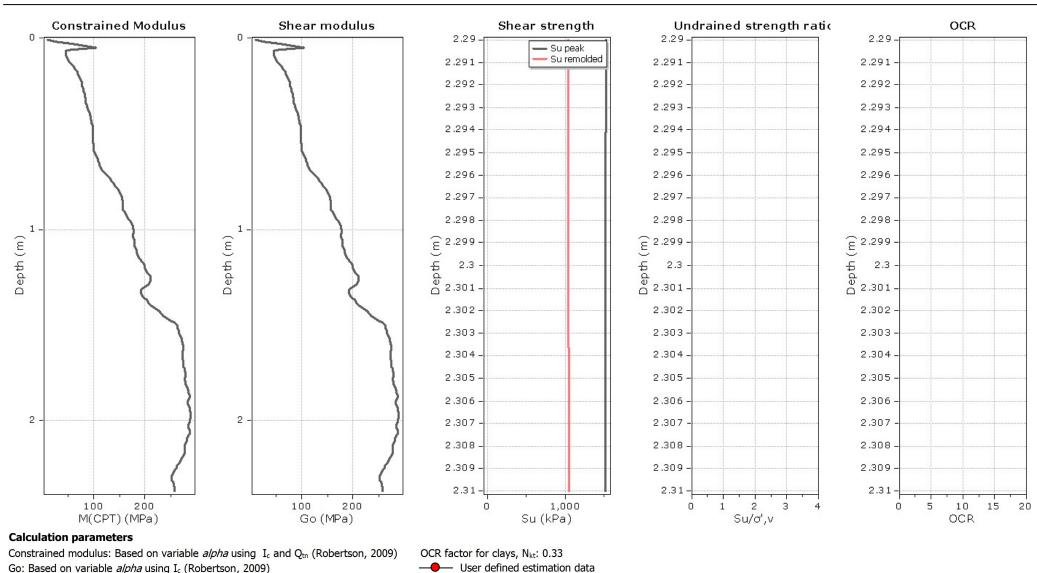
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: Total depth: 2.37 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

> Cone Type: Uknown Cone Operator: Uknown

CPT: CPT 7



Flat Dilatometer Test data

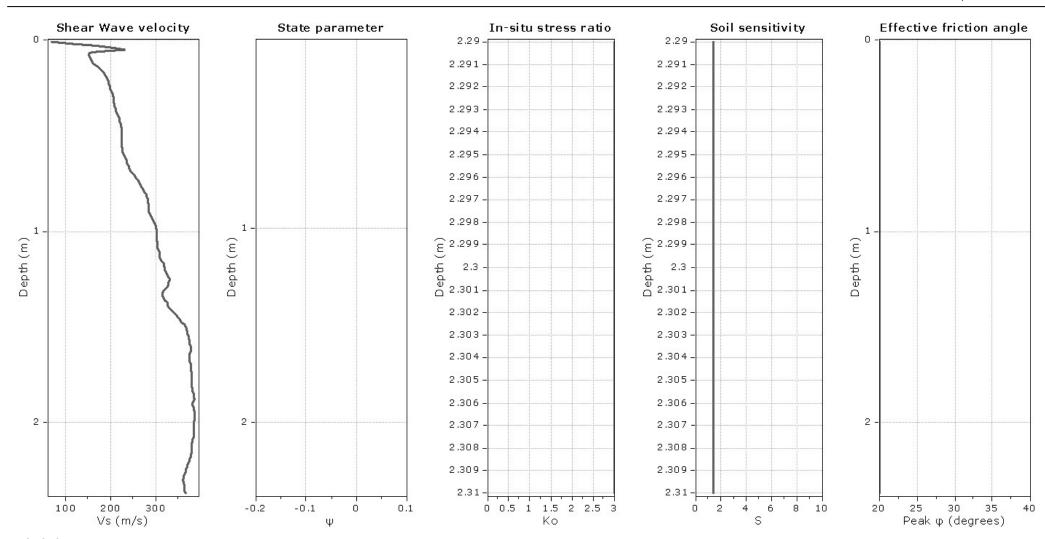
Undrained shear strength cone factor for clays, Nkt: 14

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 7

Total depth: 2.37 m, Date: 4/12/2017 Surface Elevation: 0.00 m

> Coords: X:0.00, Y:0.00 Cone Type: Uknown Cone Operator: Uknown



### **Calculation parameters**

Soil Sensitivity factor, N<sub>S</sub>: 7.00

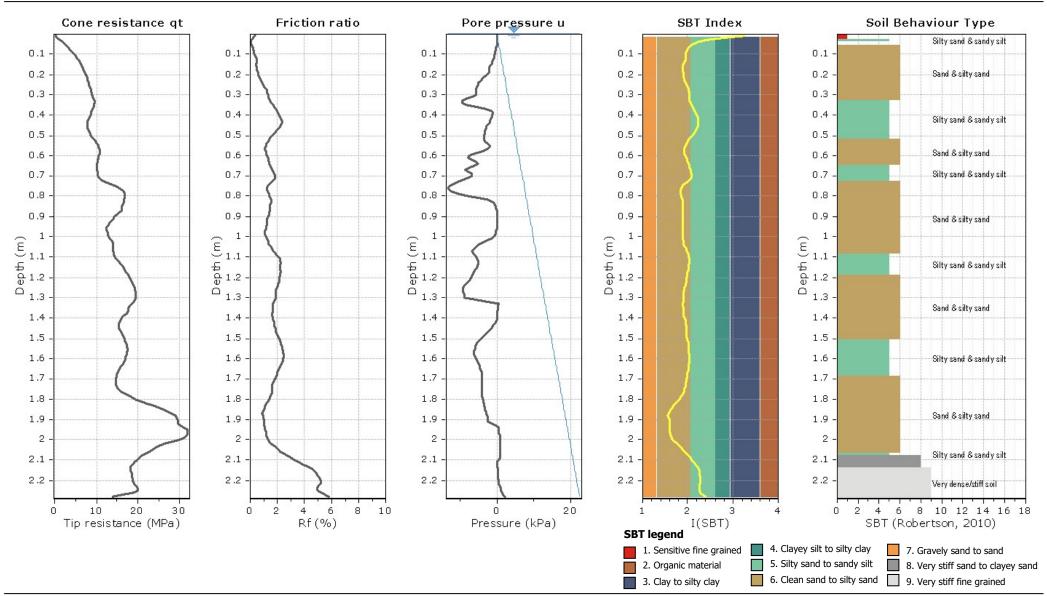
User defined estimation data

CPT: CPT 12

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: Total depth: 2.28 m, Date: 4/12/2017 Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

> Cone Type: Uknown Cone Operator: Uknown



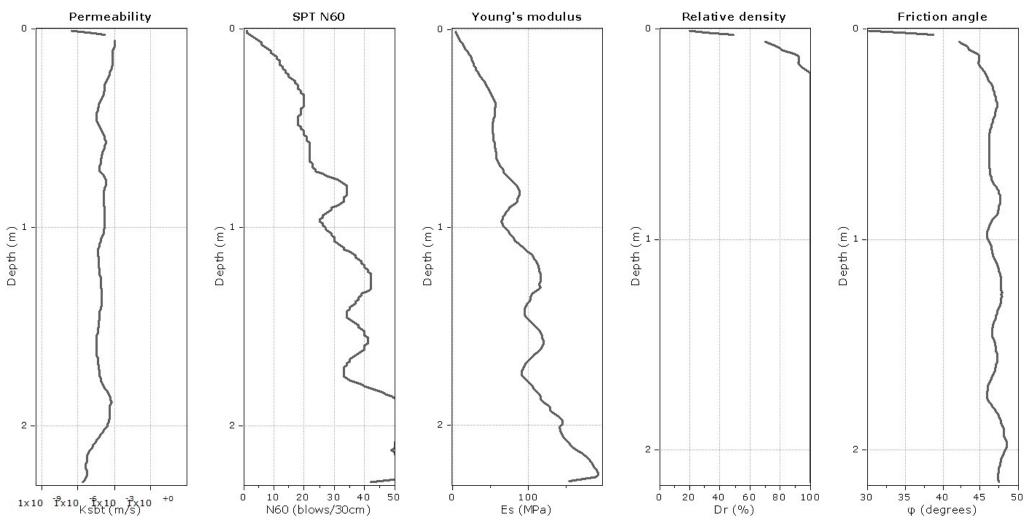
CPT: CPT 12 Suite 2, 464 Murray St PERTH Total depth: 2.28 m, Date: 4/12/2017

T: +61 8 6110 4768

www.mhageotechnical.com.au

Project: Location: Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00 Cone Type: Uknown

Cone Operator: Uknown



### **Calculation parameters**

Permeability: Based on SBT<sub>n</sub> SPT N<sub>60</sub>: Based on I<sub>c</sub> and q<sub>t</sub>

Young's modulus: Based on variable alpha using I<sub>c</sub> (Robertson, 2009)

Relative desnisty constant, C<sub>Dr</sub>: 350.0 Phi: Based on Kulhawy & Mayne (1990)

\_\_\_\_ User defined estimation data

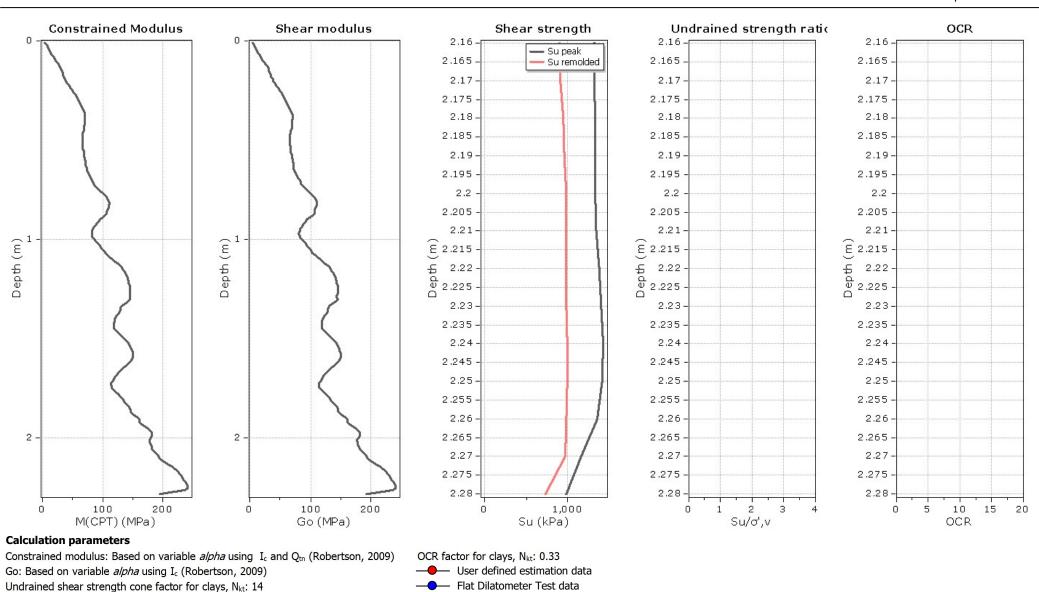
CPT: CPT 12

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Total depth: 2.28 m, Date: 4/12/2017 Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown
Cone Operator: Uknown

Project: Location:



Suite 2, 464 Murray St PERTH T: +61 8 6110 4768

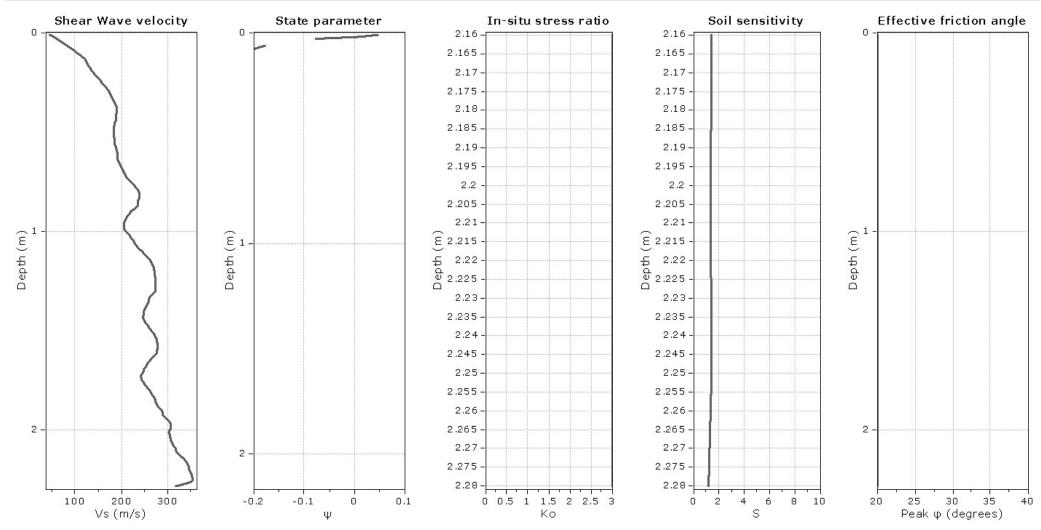
www.mhageotechnical.com.au

Project: Location: Total depth: 2.28 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown Cone Operator: Uknown

CPT: CPT 12



#### **Calculation parameters**

Soil Sensitivity factor, N<sub>S</sub>: 7.00

User defined estimation data

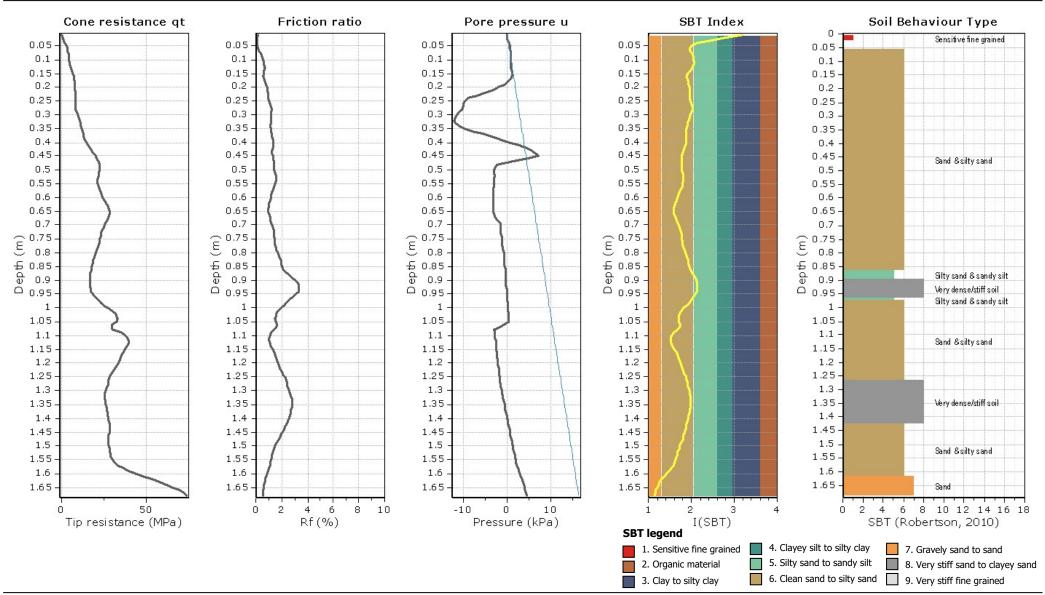
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 12B

Total depth: 1.68 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00 Cone Type: Uknown

Cone Operator: Uknown



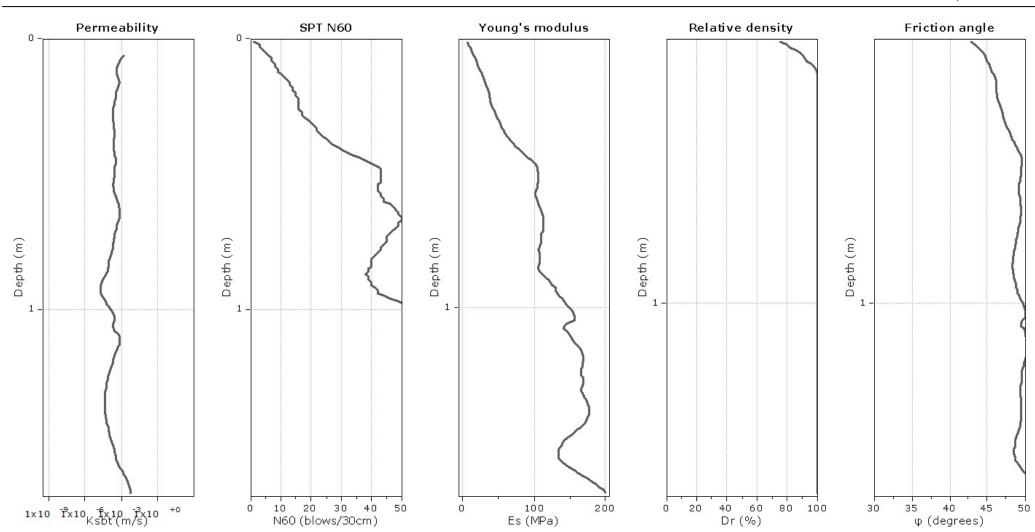
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 12B

Total depth: 1.68 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown
Cone Operator: Uknown



### **Calculation parameters**

Permeability: Based on  $SBT_n$  SPT  $N_{60}$ : Based on  $I_c$  and  $q_t$ 

Young's modulus: Based on variable alpha using  $I_c$  (Robertson, 2009)

Relative desnisty constant, C<sub>Dr</sub>: 350.0 Phi: Based on Kulhawy & Mayne (1990)

\_\_\_\_ User defined estimation data

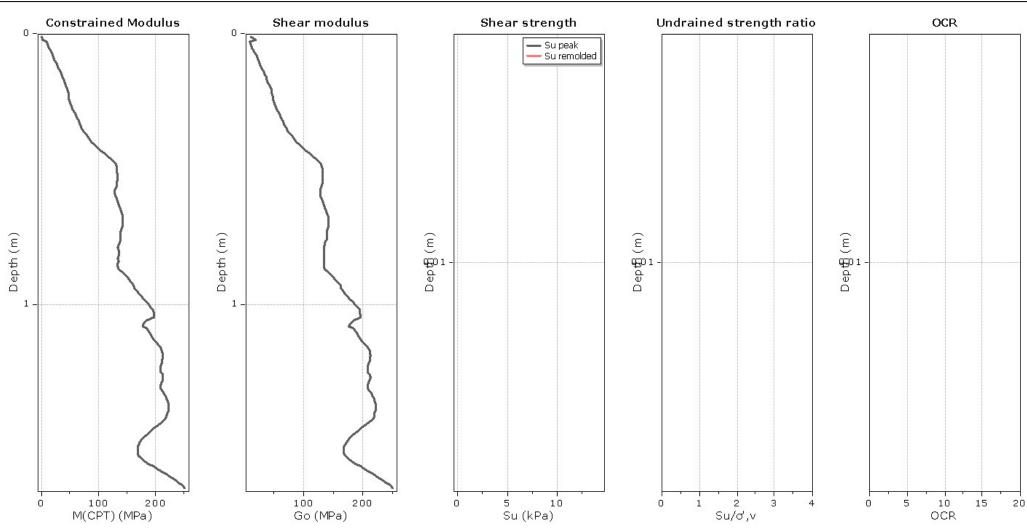
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 12B

Total depth: 1.68 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown
Cone Operator: Uknown



### **Calculation parameters**

Constrained modulus: Based on variable *alpha* using  $I_c$  and  $Q_{tn}$  (Robertson, 2009) Go: Based on variable *alpha* using  $I_c$  (Robertson, 2009) Undrained shear strength cone factor for clays,  $N_{kt}$ : 14

OCR factor for clays,  $N_{kt}$ : 0.33

User defined estimation data

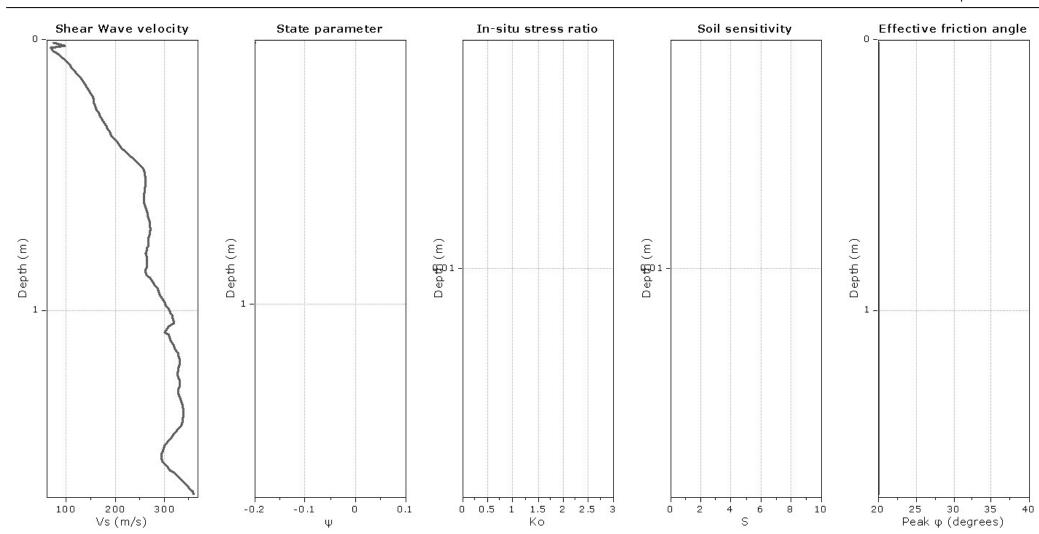
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 12B

Total depth: 1.68 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

> Cone Type: Uknown Cone Operator: Uknown



### **Calculation parameters**

Soil Sensitivity factor, N<sub>s</sub>: 7.00

User defined estimation data

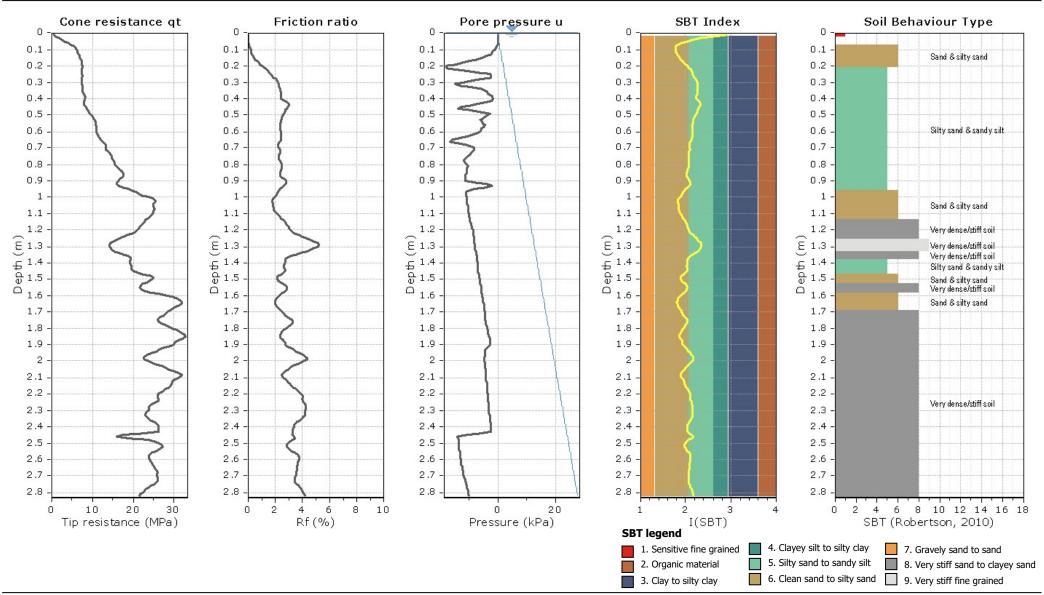
CPT: CPT 13

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00 Cone Type: Uknown

Total depth: 2.82 m, Date: 4/12/2017

Cone Operator: Uknown



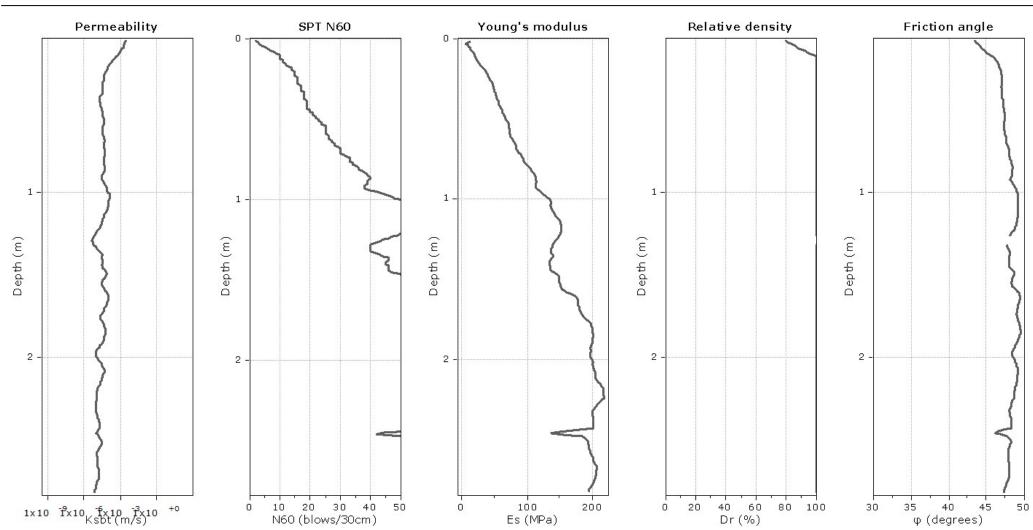
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: CPT: CPT 13

Total depth: 2.82 m, Date: 4/12/2017

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown
Cone Operator: Uknown



#### **Calculation parameters**

Permeability: Based on  $SBT_n$  SPT  $N_{60}$ : Based on  $I_c$  and  $q_t$ 

Young's modulus: Based on variable alpha using  $I_c$  (Robertson, 2009)

Relative desnisty constant,  $C_{Dr}$ : 350.0 Phi: Based on Kulhawy & Mayne (1990)

\_\_\_\_ User defined estimation data

CPT: CPT 13

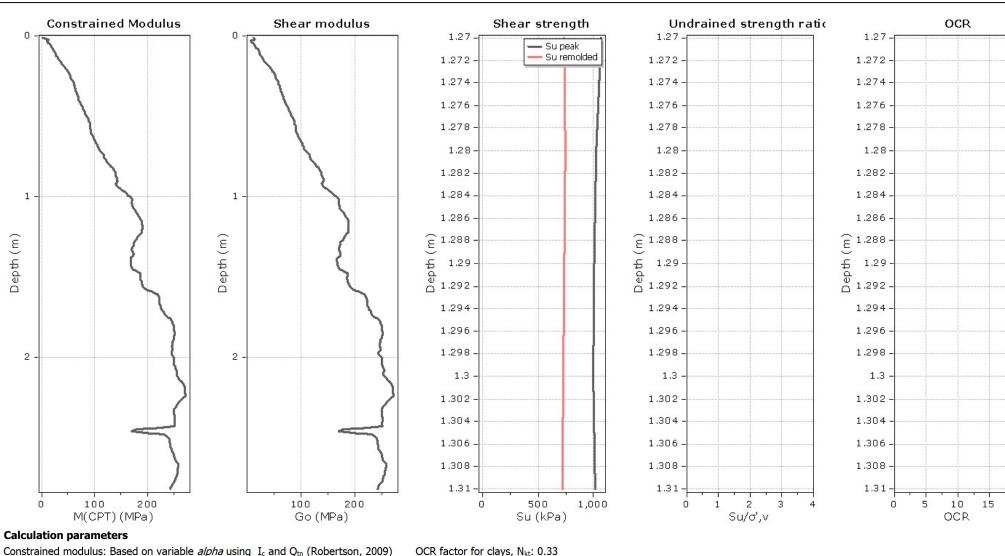
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Total depth: 2.82 m, Date: 4/12/2017

Project:
Location:

Cone Type: Uknown Cone Operator: Uknown



User defined estimation data

Flat Dilatometer Test data

Go: Based on variable *alpha* using I<sub>c</sub> (Robertson, 2009)

Undrained shear strength cone factor for clays, Nkt: 14

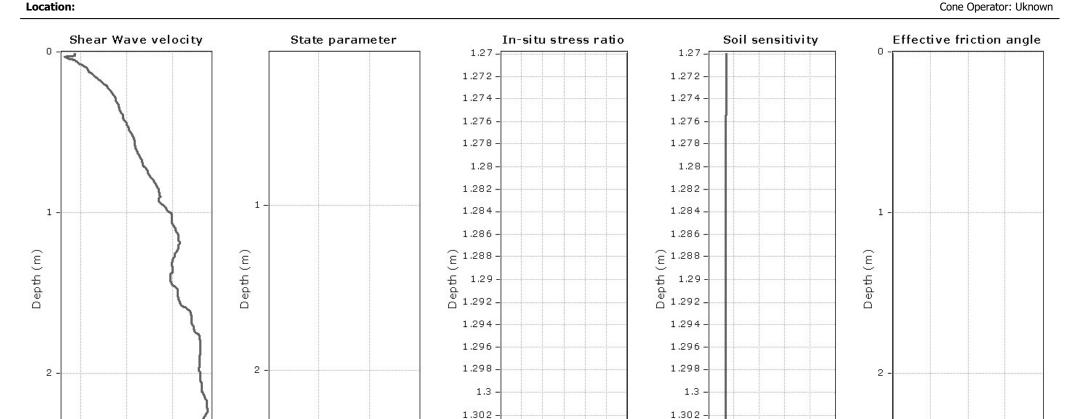
20

MHA Geotechnical CPT: CPT 13 Suite 2, 464 Murray St PERTH Total depth: 2.82 m, Date: 4/12/2017

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Project:



1.304

1.306 -

1.308

1.31

0

4 6 8 10

1.304

1.306 -

1.308

1.31

0 0.5 1 1.5 2 2.5 3

Κo

#### **Calculation parameters**

100

Soil Sensitivity factor, N<sub>S</sub>: 7.00

User defined estimation data

200

Vs (m/s)

300

-0.1

Ψ

0

0.1

-0.2

25

20

30

Peak φ (degrees)

35

Surface Elevation: 0.00 m

Coords: X:0.00, Y:0.00

Cone Type: Uknown

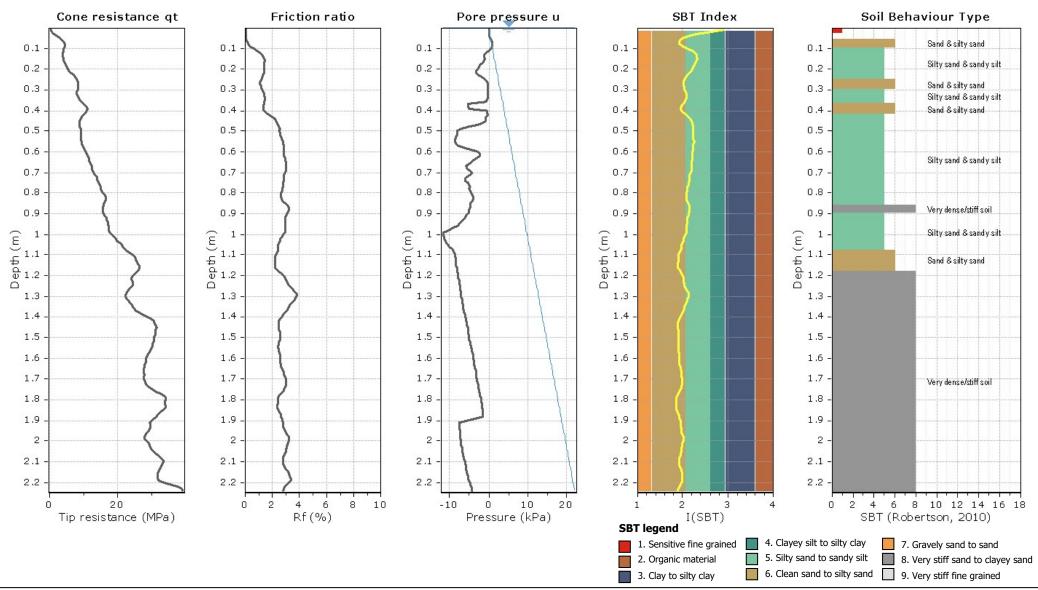
CPT: CPT 14

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00 Cone Type: Uknown

Total depth: 2.24 m, Date: 4/12/2017

Cone Operator: Uknown



CPT: CPT 14

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

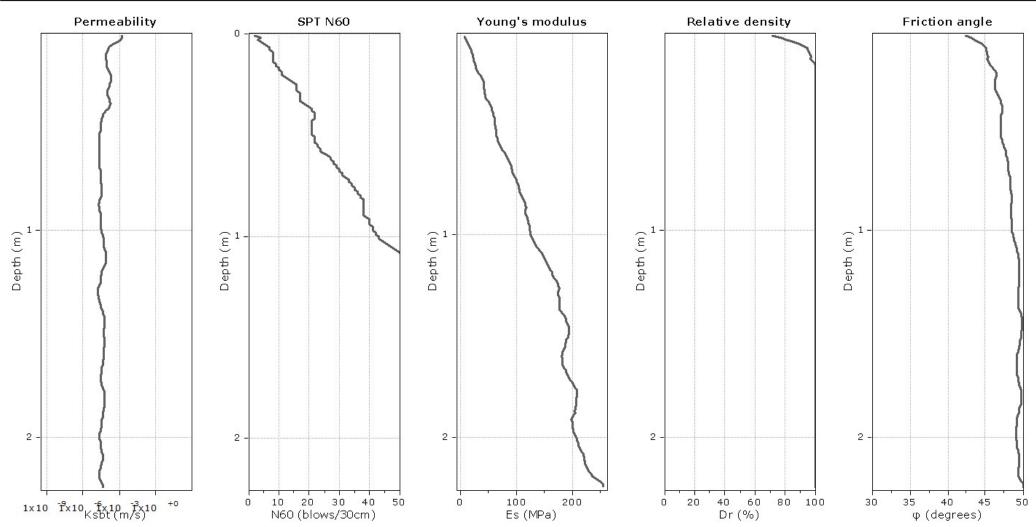
Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Total depth: 2.24 m, Date: 4/12/2017

Cone Type: Uknown
Cone Operator: Uknown

www.mhageotechnical. **Project:** 

Location:



### **Calculation parameters**

Permeability: Based on  $SBT_n$  SPT  $N_{60}$ : Based on  $I_c$  and  $q_t$ 

Young's modulus: Based on variable alpha using  $I_c$  (Robertson, 2009)

Relative desnisty constant, C<sub>Dr</sub>: 350.0 Phi: Based on Kulhawy & Mayne (1990)

\_\_\_\_ User defined estimation data

CPT: CPT 14

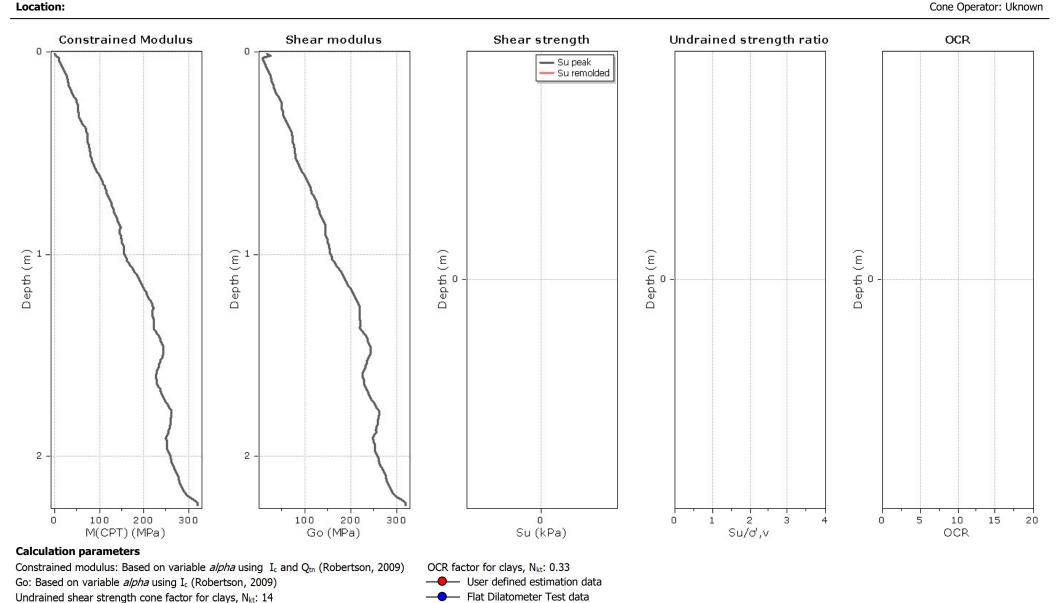
Suite 2, 464 Murray St PERTH T: +61 8 6110 4768

Total depth: 2.24 m, Date: 4/12/2017 Surface Elevation: 0.00 m

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Coords: X:0.00, Y:0.00 Cone Type: Uknown

Project: Location:



Suite 2, 464 Murray St PERTH T: +61 8 6110 4768

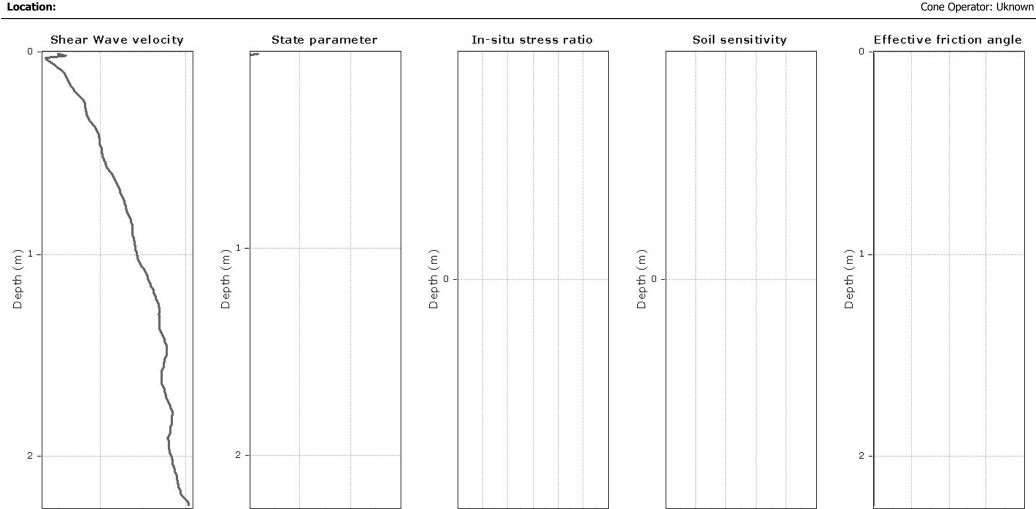
www.mhageotechnical.com.au

Project:

CPT: CPT 14 Total depth: 2.24 m, Date: 4/12/2017

Surface Elevation: 0.00 m

Coords: X:0.00, Y:0.00 Cone Type: Uknown



0 0.5 1 1.5 2 2.5 3

Κo

2

4

6

8 10

### **Calculation parameters**

Soil Sensitivity factor, N<sub>s</sub>: 7.00

User defined estimation data

200

Vs (m/s)

-0.1

Ψ

0.1

-0.2

25

20

30

Peak φ (degrees)

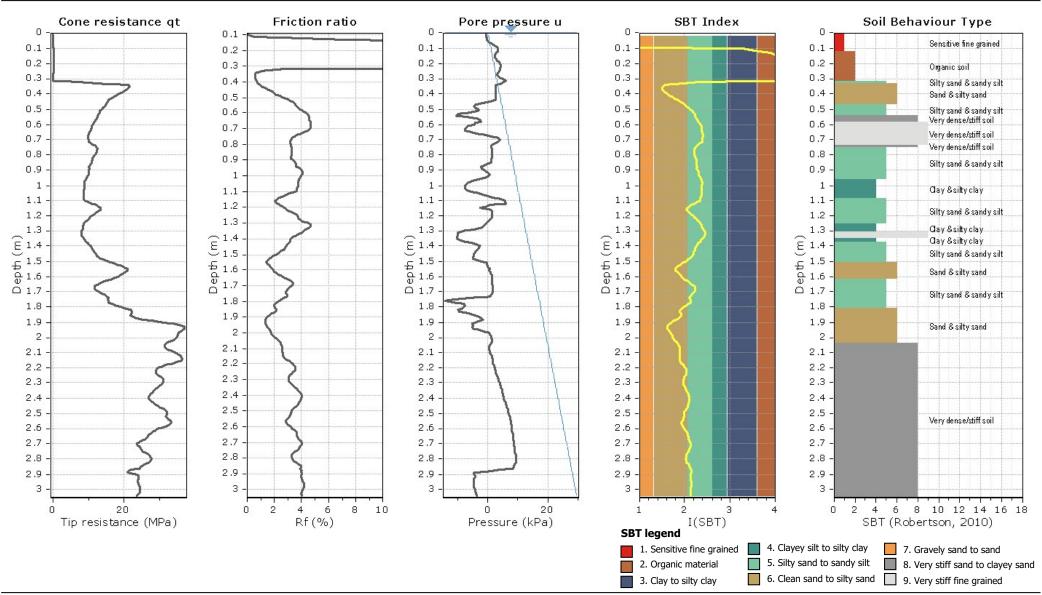
35

CPT: CPT 17

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location: Total depth: 3.04 m, Date: 4/12/2017
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type: Uknown

Cone Operator: Uknown



Suite 2, 464 Murray St PERTH Total depth: 3.04 m, Date: 4/12/2017

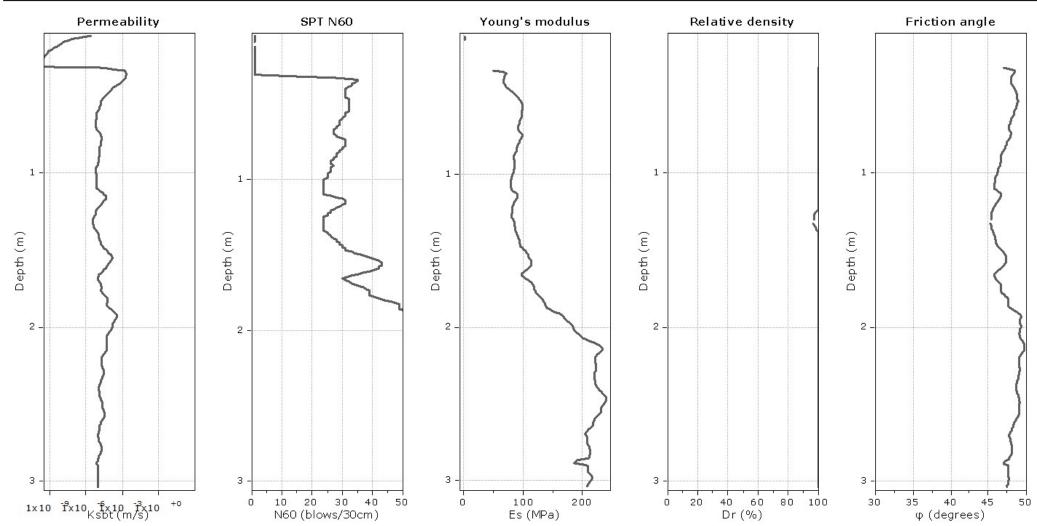
Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Cone Type: Uknown Cone Operator: Uknown

CPT: CPT 17

T: +61 8 6110 4768 www.mhageotechnical.com.au

Project: Location:



### **Calculation parameters**

Permeability: Based on SBT<sub>n</sub> SPT N<sub>60</sub>: Based on I<sub>c</sub> and q<sub>t</sub>

Young's modulus: Based on variable alpha using I<sub>c</sub> (Robertson, 2009)

Relative desnisty constant, C<sub>Dr</sub>: 350.0 Phi: Based on Kulhawy & Mayne (1990) \_\_\_\_ User defined estimation data

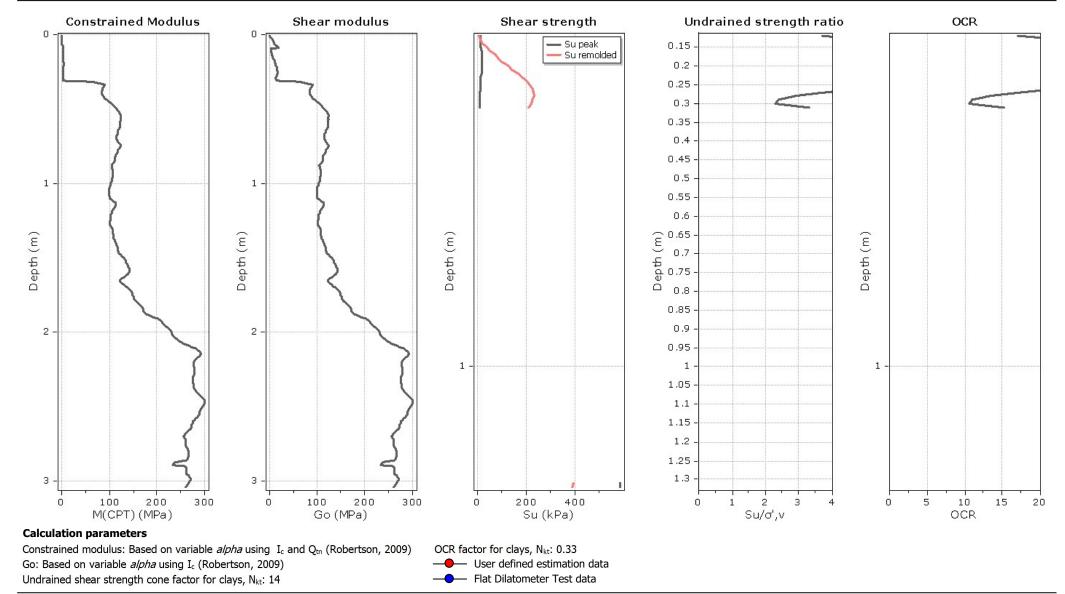
CPT: CPT 17 Suite 2, 464 Murray St PERTH Total depth: 3.04 m, Date: 4/12/2017

T: +61 8 6110 4768

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Project:

Coords: X:0.00, Y:0.00 Location: Cone Operator: Uknown



Surface Elevation: 0.00 m

Cone Type: Uknown

Suite 2, 464 Murray St PERTH T: +61 8 6110 4768

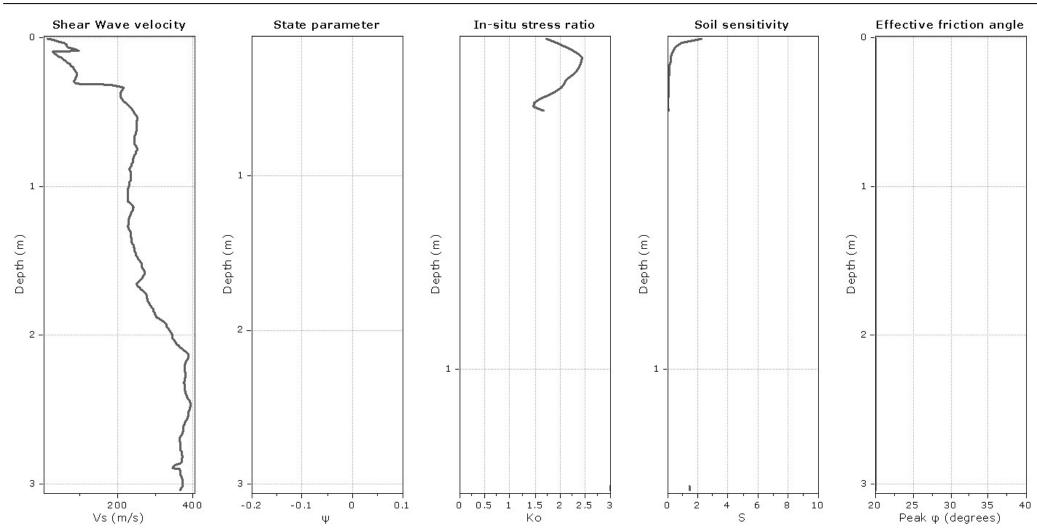
www.mhageotechnical.com.au

Project: Location: Surface Elevation: 0.00 m Coords: X:0.00, Y:0.00

Total depth: 3.04 m, Date: 4/12/2017

Cone Type: Uknown Cone Operator: Uknown

CPT: CPT 17



### **Calculation parameters**

Soil Sensitivity factor, N<sub>s</sub>: 7.00

User defined estimation data



# **Appendix E**

**Laboratory Test Schedule and Test Result Certificates** 

Analytical	Contificate Number(s)	Analysis			Sample		
Laboratory	Certificate Number(s)	Analytes	Number	Location	Easting	Northing	Description
Structerre	S865847-A-1	Grading	TP01_0.0-0.2m	TSF West	-33.685685	120.206652	TSF West Test Pit Bulk Sample
Structerre	S865847-A-2	Grading	TP01_0.2-0.75m	TSF West	-33.685685	120.206652	TSF West Test Pit Bulk Sample
Structerre	S865847-A-3	Grading	TP01_0.75-1.6m	TSF West	-33.685685	120.206652	TSF West Test Pit Bulk Sample
Structerre	S865847-A-4	Grading and Multistage UU Triaxial	TP02_0.1-0.5m	TSF West	-33.6864494	120.2067161	TSF West Test Pit Bulk Sample
Structerre	S865847-A-5	Grading, Permeability, Atterberg Limits, Modified Compaction and Emerson Class Number	TP02_0.5-1.1m	TSF West	-33.6864494	120.2067161	TSF West Test Pit Bulk Sample
Structerre	S865847-A-6	Grading	TP02_1.1-2.7m	TSF West	-33.6864494	120.2067161	TSF West Test Pit Bulk Sample
Structerre	S865847-A-7	Grading, Permeability, Atterberg Limits, Modified Compaction and Emerson Class Number	TP03_0.0-0.7m	TSF West	-33.6873212	120.2068039	TSF West Test Pit Bulk Sample
Structerre	S865847-A-8	Grading	TP03_0.7-3.0m	TSF West	-33.6873212	120.2068039	TSF West Test Pit Bulk Sample
Structerre	S865847-A-9	Grading	TP04_0.0-0.25m	TSF West	-33.6883154	120.2069192	TSF West Test Pit Bulk Sample
Structerre	S865847-A-10	Grading	TP04_0.25-1.0m	TSF West	-33.6883154	120.2069192	TSF West Test Pit Bulk Sample
Structerre	S865847-A-11	Grading	TP04_1.0-3.1m	TSF West	-33.6883154	120.2069192	TSF West Test Pit Bulk Sample
Structerre	S865847-A-12	Grading	TP05_0.1-0.8m	TSF West	-33.688971	120.2069675	TSF West Test Pit Bulk Sample
Structerre	S865847-A-13	Grading	TP05_0.8-1.8m	TSF West	-33.688971	120.2069675	TSF West Test Pit Bulk Sample
Structerre	S865847-A-14	Grading	TP05_1.8-2.9m	TSF West	-33.688971	120.2069675	TSF West Test Pit Bulk Sample
Structerre	S865847-A-15	Grading	TP06_0.0-0.6m	TSF South	-33.6889939	120.2084628	TSF South Test Pit Bulk Sample
Structerre	S865847-A-16	Grading, Permeability, Atterberg Limits, Modified Compaction and Emerson Class Number	TP06_0.6-2.7m	TSF South	-33.6889939	120.2084628	TSF South Test Pit Bulk Sample
Structerre	S865847-A-17	Grading	TP07_0.1-0.2m	TSF South	-33.6889501	120.2091173	TSF South Test Pit Bulk Sample
Structerre	S865847-A-18	Grading	TP07_0.2-2.5m	TSF South	-33.6889501	120.2091173	TSF South Test Pit Bulk Sample
Structerre	S865847-A-19	Grading	TP08_0.1-0.4m	TSF South	-33.6889116	120.2096444	TSF South Test Pit Bulk Sample
Structerre	S865847-A-20	Grading	TP08_0.4-2.2m	TSF South	-33.6889116	120.2096444	TSF South Test Pit Bulk Sample
Structerre	S865847-A-21	Grading	TP09_0.1-0.2m	TSF South	-33.6888324	120.2104839	TSF South Test Pit Bulk Sample
Structerre	S865847-A-22	Grading	TP09_0.2-2.2m	TSF South	-33.6888324	120.2104839	TSF South Test Pit Bulk Sample
Structerre	S865847-A-23	Grading	TP10_0.1-2.5m	TSF South	-33.6888137	120.2109811	TSF South Test Pit Bulk Sample
Structerre	S865847-A-24	Grading	TP11_0.2-2.8m	TSF East	-33.6885004	120.2113023	TSF East Test Pit Bulk Sample

Structerre	S865847-A-25	Grading	TP12_0.1-2.8m	TSF East	-33.6877109	120.2112202	TSF East Test Pit Bulk Sample
Structerre	S865847-A-26	Grading and Multistage UU Triaxial	TP13_0.1-0.7m	TSF East	-33.6867749	120.2111142	TSF East Test Pit Bulk Sample
Structerre	S865847-A-27	Grading, Permeability, Atterberg Limits, Modified Compaction and Emerson Class Number	TP13_0.7-2.8m	TSF East	-33.6867749	120.2111142	TSF East Test Pit Bulk Sample
Structerre	S865847-A-28	Grading	TP14_0.2-1.0m	TSF East	-33.6861255	120.2110391	TSF East Test Pit Bulk Sample
Structerre	S865847-A-29	Grading	TP15_0.2-2.7m	TSF East	-33.6856138	120.2109576	TSF East Test Pit Bulk Sample
Structerre	S865847-A-30	Grading	TP16_0.2-0.6m	TSF North	-33.6852333	120.210323	TSF North Test Pit Bulk Sample
Structerre	S865847-A-31	Grading	TP16_0.6-1.0m	TSF North	-33.6852333	120.210323	TSF North Test Pit Bulk Sample
Structerre	S865847-A-32	Grading, Permeability, Atterberg Limits, Modified Compaction and Emerson Class Number	TP16_1.0-2.8m	TSF North	-33.6852333	120.210323	TSF North Test Pit Bulk Sample
Structerre	S865847-A-33	Grading	TP17_0.6-1.2m	TSF North	-33.6852913	120.2093694	TSF North Test Pit Bulk Sample
Structerre	S865847-A-34	Grading	TP17_1.2-2.7m	TSF North	-33.6852913	120.2093694	TSF North Test Pit Bulk Sample
Structerre	S865847-A-35	Grading	TP18_0.2-0.6m	TSF North	-33.6853516	120.2085011	TSF North Test Pit Bulk Sample
Structerre	S865847-A-36	Grading	TP18_0.6-1.2m	TSF North	-33.6853516	120.2085011	TSF North Test Pit Bulk Sample
Structerre	S865847-A-37	Grading	TP18_1.2-2.8m	TSF North	-33.6853516	120.2085011	TSF North Test Pit Bulk Sample
Structerre	S865847-A-38	Grading	TP19_0.2-0.6m	TSF North	-33.6854116	120.2077879	TSF North Test Pit Bulk Sample
Structerre	S865847-A-39	Grading	TP19_0.6-2.8m	TSF North	-33.6854116	120.2077879	TSF North Test Pit Bulk Sample
Structerre	S865847-A-40	Grading	TP20_0.2-0.4m	TSF North	-33.6854699	120.206819	TSF North Test Pit Bulk Sample
Structerre	S865847-A-41	Grading	TP20_0.4-1.0m	TSF North	-33.6854699	120.206819	TSF North Test Pit Bulk Sample
Structerre	S865847-B-1	Grading, Atterberg Limits, Modified Compaction and Emerson Class Number and Multistage UU Triaxial	B1	Stockpile	-	-	Stockpile Bulk Sample
Structerre	S865847-B-2	Grading, Atterberg Limits, Modified Compaction and Emerson Class Number	B2	Stockpile	-	-	Stockpile Bulk Sample
Structerre	S865847-B-3	Grading, Atterberg Limits, Modified Compaction and Emerson Class Number	ВЗ	Stockpile	-	•	Stockpile Bulk Sample

									Sieve A	nalysis	3					Cla	Soil ssifica	tion
R	avensthorpe Gold Partic	cle Size Distributions	mu37+		+300m	+425µm	md009+	+1180µm	+2.36mm	+4.75mm	+9.5mm	+19.0mm	+26.5mm	+37.5mm	+75.0mm	Fines (<75 μm)	Sand (>75 µm)	Gravel (>2mm)
	% Passing	Units			Sa	nd					Gra	avel			Cobble		%	
	LoR																	
Sample Number	Sample Location	Sample Description																
TP01_0.0-0.2m	TSF West	TSF West Test Pit Bulk Sample	35	47	56	58	60	64	74	87	95	99	-	100	100	35	39	26
TP01_0.2-0.75m	TSF West	TSF West Test Pit Bulk Sample	58	66	72	74	76	81	88	93	96	99	-	100	100	58	30	12
TP01_0.75-1.6m	TSF West	TSF West Test Pit Bulk Sample	34	42	53	57	59	66	76	83	88	89	-	100	97	34	42	24
TP02_0.1-0.5m	TSF West	TSF West Test Pit Bulk Sample	36	52	62	65	67	70	76	87	97	100	-	100	100	36	40	24
TP02_0.5-1.1m	TSF West	TSF West Test Pit Bulk Sample	44	49	57	59	61	66	72	81	89	93	97	100	-	44	28	28
TP02_1.1-2.7m	TSF West	TSF West Test Pit Bulk Sample	56	61	67	71	74	84	94	98	100	100	-	100	100	56	38	6
TP03_0.0-0.7m	TSF West	TSF West Test Pit Bulk Sample	41	45	51	53	55	61	68	82	92	98	99	100	-	41	27	32
TP03_0.7-3.0m	TSF West	TSF West Test Pit Bulk Sample	41	45	52	56	61	75	90	97	100	100	-	100	100	41	49	10
TP04_0.0-0.25m	TSF West	TSF West Test Pit Bulk Sample	63	66	69	71	73	77	82	89	97	100	-	100	100	63	19	18
TP04_0.25-1.0m	TSF West	TSF West Test Pit Bulk Sample	50	53	58	61	64	72	73	89	95	96	-	100	100	50	23	27
TP04_1.0-3.1m	TSF West	TSF West Test Pit Bulk Sample	55	59	66	70	73	83	93	97	99	100	-	100	100	55	38	7
TP05_0.1-0.8m	TSF West	TSF West Test Pit Bulk Sample	57	81	89	90	91	93	94	98	100	100	-	100	100	57	37	6
TP05_0.8-1.8m	TSF West	TSF West Test Pit Bulk Sample	51	70	75	76	77	82	91	99	100	100	-	100	100	51	40	9
TP05_1.8-2.9m	TSF West	TSF West Test Pit Bulk Sample	40	50	60	64	67	75	85	93	96	99	-	100	100	40	45	15
TP06_0.0-0.6m	TSF South	TSF South Test Pit Bulk Sample	52	58	63	66	69	77	87	96	98	99	-	100	100	52	35	13
TP06_0.6-2.7m	TSF South	TSF South Test Pit Bulk Sample	56	59	63	66	70	80	91	96	100	-	-	-	-	56	35	9
TP07_0.1-0.2m	TSF South	TSF South Test Pit Bulk Sample	30	40	49	53	56	63	73	84	98	100	-	100	100	30	43	27
TP07_0.2-2.5m	TSF South	TSF South Test Pit Bulk Sample	53	57	63	68	72	84	98	99	100	100	-	100	100	53	45	2
TP08_0.1-0.4m	TSF South	TSF South Test Pit Bulk Sample	62	68	74	76	78	84	90	93	96	97	-	100	100	62	28	10
TP08_0.4-2.2m	TSF South	TSF South Test Pit Bulk Sample	50	54	59	63	66	75	89	93	95	96	-	100	97	50	39	11
TP09_0.1-0.2m	TSF South	TSF South Test Pit Bulk Sample	56	63	69	72	74	80	84	92	96	99	-	100	100	56	28	16

TP09_0.2-2.2m	TSF South	TSF South Test Pit Bulk Sample	45	49	56	59	62	70	79	90	98	100	-	100	100	45	34	21
TP10_0.1-2.5m	TSF South	TSF South Test Pit Bulk Sample	38	40	44	46	49	55	64	75	80	81	-	100	85	38	26	36
TP11_0.2-2.8m	TSF East	TSF East Test Pit Bulk Sample	45	49	54	57	60	68	85	87	94	98	-	100	100	45	40	15
TP12_0.1-2.8m	TSF East	TSF East Test Pit Bulk Sample	47	50	54	56	58	64	72	89	95	96	-	100	100	47	25	28
TP13_0.1-0.7m	TSF East	TSF East Test Pit Bulk Sample	54	57	58	59	60	63	65	83	90	90	-	100	90	54	11	35
TP13_0.7-2.8	TSF East	TSF East Test Pit Bulk Sample	64	65	67	68	70	76	81	86	91	97	98	99	100	64	17	19
TP14_0.2-1.0m	TSF East	TSF East Test Pit Bulk Sample	12	19	36	44	47	53	59	71	84	94	-	100	96	12	47	41
TP15_0.2-2.7m	TSF East	TSF East Test Pit Bulk Sample	43	46	52	57	61	72	84	95	99	99	-	100	100	43	41	16
TP16_0.2-0.6m	TSF North	TSF North Test Pit Bulk Sample	54	59	64	66	67	69	73	93	98	98	-	100	100	54	19	27
TP16_0.6-1.0m	TSF North	TSF North Test Pit Bulk Sample	57	60	66	70	74	82	90	98	100	100	-	100	100	57	33	10
TP16_1.0-2.8m	TSF North	TSF North Test Pit Bulk Sample	55	57	60	62	64	70	77	84	90	99	100	-	-	55	22	23
TP17_0.6-1.2m	TSF North	TSF North Test Pit Bulk Sample	28	30	36	42	44	49	54	75	91	98	-	100	100	28	26	46
TP17_1.2-2.7m	TSF North	TSF North Test Pit Bulk Sample	40	44	52	56	62	74	86	97	100	100	-	100	100	40	46	14
TP18_0.2-0.6m	TSF North	TSF North Test Pit Bulk Sample	56	59	64	66	68	73	80	92	96	100	1	100	100	56	24	20
TP18_0.6-1.2m	TSF North	TSF North Test Pit Bulk Sample	60	64	70	74	7	85	93	99	100	100	-	100	100	60	33	7
TP18_1.2-2.8m	TSF North	TSF North Test Pit Bulk Sample	43	44	49	53	56	64	74	81	93	98	1	100	100	43	31	26
TP19_0.2-0.6m	TSF North	TSF North Test Pit Bulk Sample	55	60	66	68	69	72	76	92	97	100	1	100	100	55	21	24
TP19_0.6-2.8m	TSF North	TSF North Test Pit Bulk Sample	54	58	63	66	68	73	77	94	99	100	1	100	100	54	23	23
TP20_0.2-0.4m	TSF North	TSF North Test Pit Bulk Sample	59	67	75	78	80	85	92	96	97	99	1	100	100	59	33	8
TP20_0.4-1.0m	TSF North	TSF North Test Pit Bulk Sample	32	38	43	45	47	53	64	84	98	100	1	100	100	32	32	36
B1	Stockpile	Stockpile Bulk Sample	60	69	76	80	84	88	91	92	94	96	97	98	100	60	31	9
B2	Stockpile	Stockpile Bulk Sample	48	57	67	76	87	98	100	-	-	-	-	-	-	48	52	0
В3	Stockpile	Stockpile Bulk Sample	46	56	67	76	87	95	96	96	98	99	100	-	-	46	50	4
		Minimum	12	19	36	42	7	49	54	71	80	81	97	98	85	12	11	0
		Maximum	64	81	89	90	91	98	100	99	100	100	100	100	100	64	52	46

								Нус	dromete	er Analy	sis					
	Ravensthorpe Gold Parti	cle Size Distributions	+1µm	+2µm	mus+	mul£+	+4µm	+4µm	md9+	mul8+	+11µm	+16μm	+21µm	+30µm	+42µm	+59μm
		% Passing Units	CI	ay						S	ilt			•		
		LoR														
Sample Number	Sample Location	Sample Description														
TP02_0.5-1.1m	TSF West	TSF West Test Pit Bulk Sample	36	36	36	36	36	37	37	38	39	40	41	43	43	44
TP03_0.0-0.7m	TSF West	TSF West Test Pit Bulk Sample	22	25	26	27	29	31	33	36	37	37	38	39	39	41
TP06_0.6-2.7m	TSF South	TSF South Test Pit Bulk Sample	8	10	11	16	21	29	40	44	48	50	52	53	54	55
TP13_0.7-2.8	TSF East	TSF East Test Pit Bulk Sample	7	8	10	15	23	32	40	48	53	56	60	61	62	63
TP16_1.0-2.8m	TSF North	TSF North Test Pit Bulk Sample	10	13	14	18	23	28	36	40	44	47	50	51	52	54
B1	Stockpile	Stockpile Bulk Sample	9	10	12	14	16	21	28	32	37	42	46	50	55	59
B2	Stockpile	Stockpile Bulk Sample	6	7	7	8	11	12	15	19	24	30	32	39	42	47
B3	Stockpile	Stockpile Bulk Sample	5	6	7	8	9	11	16	19	24	29	34	37	41	44
		Minimum	5	6	7	8	9	11	15	19	24	29	32	37	41	44
		Maximum	36	36	36	36	36	37	40	48	53	56	60	61	62	63

				MD	D and CB	IR .			Atterber	g Limits	s	Permeal	bility	Dispe	rsivity
	Ravensthorpe Gold Soil	Physical Parameters	Maximum Dry Density (Standard)	Optimum Moisture Content (Standard)	Maximum Dry Density (Modified)	Optimum Moisture Content (Modified)	CBR	Liquid Limit	Plastic Limit	Plastic Index	Linear Shrinkage	Coeff. Of Permeability (Remoulded Falling Head)	Coeff. Of Permeability (Core Constant Head)	Emerson Class Number	Pinhole Dispersion Classification
	Unit	s	(t/m <sup>3</sup> )	(%)	(t/m³)	(%)	(%)	(%)	(%)	(%)	(%)	(m/s)	(m/s)	(No.)	(No)
Sample Number	Sample Location	Sample Description													
TP02_0.5-1.1m	TSF West	TSF West Test Pit Bulk Sample	2.05	9.00	-	-	-	38	18	20	7.0	6.50E-09	-	3	-
TP03_0.0-0.7m	TSF West	TSF West Test Pit Bulk Sample	1.88	14.00	-	-	-	28	15	13	5.6	1.60E-08	-	2	-
TP06_0.6-2.7m	TSF South	TSF South Test Pit Bulk Sample	1.84	14.50	-	-	-	32	23	9	2.4	5.20E-09	-	2	-
TP13_0.7-2.8m	TSF East	TSF East Test Pit Bulk Sample	1.69	16.00	-	-	-	N.O	N.O	N.P	2.0	4.10E-09	-	2	-
TP16_1.0-2.8m	TSF North	TSF North Test Pit Bulk Sample	1.72	15.50	-	-	-	N.O	N.O	N.P	1.6	6.20E-09	-	6	-
B1	Stockpile	Stockpile Bulk Sample	1.69	15.50	1.82	12.00	-	N.O	N.O	N.P	2.0	-	-	5	D1
B2	Stockpile	Stockpile Bulk Sample	1.74	14.00	1.82	11.50	-	N.O	N.O	N.P	1.6	-	-	6	D1
B3	Stockpile	Stockpile Bulk Sample	1.77	12.50	1.83	12.00	-	N.O	N.O	N.P	1.6	-	-	6	D2
Notes:	N.O denotes Non Obta	ainable and N.P denotes Non Plastic.	-	•	!	•	•		•	i	•	1	•		•

							Lab	oratory Mea	surement	s					
							Mult	i Stage Tria	xial Testir	ng					
			Stage	e 1			Stag	ge 2			Stag	je 3		Res	sults
Ravensthor	pe Gold Project Triaxial Testing	Sigma 1	Sigma 3	Effective Stress	Shear Stress	Sigma 1	Sigma 3	Effective Stress	Shear Stress	Sigma 1	Sigma 3	Effective Stress	Shear Stress	Effective Cohesion	Effective Angle of Friction
	Units	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(°)
Sample Location	Sample Description														
Sample 1	Multistage UU TP02 0.5m	519.0	75.0	444.0	11.5	672.0	150.0	522.0	19.3	-	-	-	-	120.0	20.0
Sample 2	Multistage UU TP13 0.7m	195.0	75.0	120.0	5.4	341.0	150.0	191.0	9.8	601.0	300.0	301.0	15.1	24.1	16.5
Sample 3	Multistage UU Borrow Material	283.0	75.0	208.0	5.8	443.0	150.0	293.0	10.2	746.0	300.0	446.0	15.2	46.1	21.0
Sample 4	Single Stage CU TP02 0.5m			477	7.36										
Sample 5	Single Stage CU TP13 0.5m			484	7.68										
Sample 6	Single Stage CU Borrow Material			578	10.46										
Notes: NO den	otes not obtainable														



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Client	Structerre C	onsulting Eng	gineers							Rep	ort	No.				Ρ.	171	201	38-	G	
Address		BALCATTA		4																	
Project		e Gold Proje			nvest	igatior	1			Tes	t D	ate				20	/12	/201	7		
•		& Borrow Sai				Ū												2018			
<u> </u>									-			Date						2010	)		
Client ID	A5 TP02									D	ept	h (m	)		0.5	0-1.	10				
Sieve Size	Passing	100 —														П					_
(mm)	%																	/			
150.0																	/	<b>'</b>			
75.0		90		+++			Н			+	₩					$\forall$	$\dashv$		+	Н	1
53.0															И						
37.5	100	80 -			Ш			$\parallel \parallel$						$\lfloor \rfloor /$			_				
26.5	97	80 +		$\prod$																	
19.0	93												1	$ \cdot $							
9.5	89	70		++			$\square$			+	$\mathbb{H}$		$\times$	$\vdash$	Щ	-	$\dashv$	+	+	Ш	-
4.75	81																				
2.36	72											1									
1.18	66	60 +		++	$\parallel$	++	++	+++		<b>+</b>	$\parallel$			$\vdash$	H		+		+	$\parallel \parallel$	1
0.600	61	Passing (%)																			
0.425	59	jussing 50 +																			
0.300	57	P as						$    _{\mathscr{L}}$	/												
0.150	49							$\mathbb{H}$													
0.075	44	40				4					Ш									Н	_
0.057	44		+	$+\!\!\!\!+\!\!\!\!\!+$	1																
0.041	43																				
0.029	43	30 +					Ш	Ш		$\dagger$	Ш										1
0.021	41																				
0.015	40	20																			
0.011	39																				
0.008	38																				
0.006	37	10		++			$\mathbb{H}$	+++		+	$\mathbb{H}$			$\vdash$	$\mathbb{H}$		+	$\parallel$	+	Ш	-
0.004	37																				
0.003	36	_																			
0.003	36	0.00 0.00	1		0.01		1	0.1				1				10			1 1	1	վ 00
0.002	36							Par	ticle S	Size (n	nm)										
0.002	36										,										
0.001	36																				_

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

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Authorised Signatory

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C. Channon



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Client	Structerre C	onsulting Eng	ineers		Report No.	P 17120139	9-G
Address	PO Box 792	BALCATTA V	VA 6914				
Project			ct - Geotech Investiga	tion	Test Date	21/12/2017	
-		& Borrow Sam			Report Date	8/01/2018	
Oli t ID	4.7.TD00						
Client ID Sieve Size	A7 TP03				Depth (m)	0.00-0.70	
	Passing %	100 —					
(mm)	70						
150.0							
75.0		90 —				<del>                                     </del>	
53.0	400						
37.5	100	80 -					
26.5	99	00				<i> </i>	
19.0	98					/	
9.5	92	70 —			<del>                                     </del>		++++++
4.75	82						
2.36	68						
1.18	61	60					
0.600	55	%) 6					
0.425	53	Passing (%)					
0.300	51	Ъ			/		
0.150	45						
0.075	41	40 —					
0.059	41						
0.042	39						
0.03	39	30	<u> </u>				
	38						
0.016	37	20 —					
0.011	37						
0.008	36						
0.006	33	10			+		++++
0.004	1						
0.003	29 27	0					
0.003	26	0.001	0.01	0.1	1	10	100
0.003	25			Particle	e Size (mm)		
0.002	25						
0.001	22						
DTES/REMARKS:							

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	Structerre Co	onsulting E	nginee	rs							F	Report	No.			P 1	7120	140	-G	
Address	PO Box 792	BALCATT	A WA	6914																
Project	Ravensthorp				ch Inv	est	igation				1	Test Da	ite			21/	12/20	17		
	Foundation 8	& Borrow S	Samples	3								Report					1/201			
Client ID	A16 TP06										-	Depth			0.4	60-2.7				
Sieve Size	Passing											Бери	1 (111)		0.0	50-2.7	U			
(mm)	%	100	1		П	П			П	П	ПП							П		1
150.0	70																		11	
75.0																	$\times$			
53.0		90	1			Ħ				$\top$	Ш									T
37.5																				
26.5		80	<u> </u>		$\coprod$	$\coprod$				$\parallel$	Щ			$\perp$	$\parallel \parallel$					$\parallel$
19.0															$\  \ $					
9.5	100																			
4.75	96	70			++	+			+	+	$\mathbb{H}$			$\forall$	+++			+	H	$\parallel$
2.36	91																			
1.18	80	60																		
0.600	70																			
0.425	66	ng (°							+	11										
0.300	63	Passing (%)	-		++	+		+	+	+	Ш		+	+	H	_		$\vdash$	$\mathbb{H}$	$\parallel$
0.150	59	<b>△</b>																		
0.075	56				$ \cdot $															
0.056	55	40				$\parallel$			$\parallel$	$\parallel$	Ш							$\parallel$	$\parallel$	Ħ
0.04	54																			
0.028	53	30			$\parallel \parallel$	$\coprod$					Щ			$\perp$					Ш	Ц
0.02	52				/															
0.015	50			/	$ \cdot $															
0.011	48	20	+	<del>                                     </del>	++	+			+	+	$\mathbb{H}$		+	+	++	+			H	H
0.008	44																			
0.006	40	10																		
0.004	29	10		$\top$		П			П	П										
0.004	21																			
0.003	16	0	<u></u>		Ш		<u> </u>				Щ				Щ					Ц
0.003	11	0.	.001			0	.01				0.				1					10
0.002	10								Parti	icle	Siz	ze (mm)								
	8																		_	

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PO Box 792	BALCATT		14														
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				Ū													
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53	20	<del>                                     </del>		$\parallel \parallel$	+H	+			H	$\parallel$		+	$\parallel \parallel$			H	+++
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40	10	<del>                                     </del>				Щ			Щ	1		Ш	Ш			Ш	Щ
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23																	
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8							rai ticie	Size (I	)								
7																	
	A27 TP13  Passing %  100 99 98 97 91 86 81 76 70 68 67 65 64 63 62 61 60 56 53 48 40 32 23 15 10	Foundation & Borrow S  A27 TP13  Passing % 100  90 100 99 98 98 97 91 70 86 81 76 60 70 68 67 65 64 64 63 62 61 30 60 56 56 53 48 40 32 23 15 00	Foundation & Borrow Samples  A27 TP13  Passing %  100 90 100 99 98 97 91 86 81 76 70 68 67 65 64 63 62 61 60 56 53 48 40 32 23 15 10 0.001	Foundation & Borrow Samples  A27 TP13  Passing %  100 90 100 99 98 97 91 86 81 76 70 68 67 65 64 63 62 61 60 56 53 48 40 32 23 15 10 0.001	Foundation & Borrow Samples  A27 TP13  Passing % 100 90 100 99 98 98 97 91 86 81 76 70 68 67 65 64 63 62 61 60 56 53 48 40 32 23 15 10 0.001 0.01	A27 TP13  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  67  65  64  63  62  61  60  56  53  48  40  32  23  15  10  0.001  0.01	Foundation & Borrow Samples  A27 TP13  Passing % 90 100 99 98 97 91 86 81 76 70 68 81 76 65 65 64 63 62 61 60 56 53 48 40 32 23 15 10 0.001 0.01	Foundation & Borrow Samples  A27 TP13  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  67  65  64  63  62  61  60  56  53  48  40  32  23  15  0 0.001  0.01  Particle	Foundation & Borrow Samples  Re  A27 TP13  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  67  65  64  63  62  61  60  56  53  48  40  32  30  10  Particle Size(	Foundation & Borrow Samples  Report  A27 TP13  Dept  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  81  76  67  65  64  63  62  61  60  56  53  48  40  32  23  15  10  00001  0.01  Particle Size (mp)	Foundation & Borrow Samples  Report Date  Report Date  Depth (m)  Passing % 100 90 100 99 98 98 97 91 86 81 76 70 68 81 76 60 65 64 63 62 61 60 56 53 48 40 40 32 23 15 0 0.001 0.01 0.1 1  Particle Size (mm)	Foundation & Borrow Samples  Report Date  A27 TP13  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  67  65  64  63  62  61  60  56  53  48  40  32  23  15  10  0.001  0.01  0.11  1  Particle Size (mg)	Foundation & Borrow Samples  Report Date  A27 TP13  Depth (m)  0.  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  81  76  67  65  64  63  62  61  60  56  64  40  32  23  15  10  0.001  0.01  0.1  1  Particle Size (mp)	Foundation & Borrow Samples  Report Date 5  A27 TP13  Depth (m) 0.70-2  Passing %  100  90  100  99  98  97  91  86  81  76  70  68  67  65  64  40  63  62  61  60  56  53  48  40  32  23  15  10  0.001  0.01  0.1  1 1  10	Foundation & Borrow Samples  Report Date 5/01//  A27 TP13  Passing %  100  90  100  99  98  97  91  86  81  70  68  68  67  65  64  63  62  61  60  56  53  48  40  32  23  15  10  0,001  0,01  0,1  1 10  Particle Size (mm)	Foundation & Borrow Samples  Report Date  5/01/2018  A27 TP13  Depth (m)  0.70-2.80  Passing %  90  90  99  98  97  91  86  81  76  70  68  67  65  65  64  63  62  61  60  56  53  40  32  23  15  0,0001  0.01  0.11  1 10  Particle Size (mp)	Foundation & Borrow Samples  Report Date  5/01/2018  A27 TP13  Depth (m)  0.70-2.80  Passing %  100 90 98 99 98 99 98 80 81 70 68 81 76 67 65 65 64 40 63 62 61 60 56 53 40 32 23 15 0,0001 0.01 0.01 0.01 0.01 0.01 0.01 0.

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Structerre Co PO Box 792 Ravensthorpe Foundation 8 A32 TP16 Passing	BALCATT e Gold Pro	A WA 69 oject - Geo		vestig	-4: - ·-												
Ravensthorpo Foundation & A32 TP16	e Gold Pro	oject - Geo		vestia	-1:												
Foundation 8 A32 TP16					ation			Tes	st Da	ıte.			21	/12/2	n17		
										Date				1/20			
												4.0			10		
Passing								L	epti	n (m)		1.0	0-2.	80			
%	100	1		П		П	Ш		ш	П		П	Ш			П	Ш
70													Ш,				
	90					Ш			Ш			$\parallel \parallel$	$H^-$		П	$^{\dagger\dagger}$	Н
												И					
100	80					Ш			Ш		$\square$	$'\!$				Щ	Щ
										$\parallel$ /	1						
	70	+++				++						+++	H		++	H	$\mathbb{H}$
										1							
	60																
	<sub>ပ်</sub> ) gu																
	assi 50			-	$\overline{}$	Ш			Ш						+	Н	Н
	<b>△</b>			$\ /\ $													
				K I													
54	40		H						Ш						П	Ш	
52			M														
51	30		-//			Ш			Ш						Ш	Ш	Щ
50			/														
47			/														
44	20	+ + /				++		+	+++			+		+	+	H	H
40		/															
36	10					Ш			Ш							Ш	
28	.0																
23																	
18						Ш	Щ <u></u>			1			10			Ш	Щ 100
14	U.	.001	U	.01				. C:- '		1			10				100
13							Particle	Size (i	mm)								
10																	
	52 51 50 47 44 40 36 28 23 18 14 13	100 80 99 90 70 84 77 70 60 64 62 60 57 55 40 52 51 30 47 44 40 36 10 28 23 18 0 0 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 60 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 10 0.001 0.01 0.1 Particle Size (c	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 44 40 36 28 23 18 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13 Particle Size (mm)	100 99 90 84 77 70 60 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 13 Particle Size (mm)	100 99 90 84 77 70 64 62 60 57 55 54 52 51 50 47 44 40 36 28 23 18 14 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 30 47 44 44 40 36 28 23 18 14 14 13	100 99 90 84 77 70 64 62 60 57 55 54 52 51 30 40 47 44 40 36 28 23 18 14 14 13	100 99 90 84 77 70 64 62 60 67 55 54 52 51 50 47 44 44 40 36 28 23 18 14 13 Particle Size (mm)

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Client	Structerre C	onsulting En	gineers							R	еро	rt N	0.				P 17	7120	)143	3-G	
Address	PO Box 792										-										
Project	Ravensthorp				vesti	gatior	า			Т	est	Date					20/1	2/2	າ17		
•	Foundation 6					-						rt D					5/01				
Client ID	D4																				
Client ID Sieve Size	B1 Passing										υе	pth (	<u>(m)</u>		IN	iot s	Supp	ollec	1		
	%	100 T		ПП	П			ПП			П	Ш				П		_			П
(mm) 150.0	70																	-			
75.0															$\perp$	#					
53.0	400	90 +						Ш				111		$\uparrow$		$\parallel$					H
	100											Ж									
37.5	98	80 -		Ш			Ш	Ш			$\mathbb{Z}$	Ш			Ш	Ш		$\perp$	Ш	Ш	Ш
26.5	97																				
19.0	96 94																				
9.5 4.75	94	70	++	+++		+	++	₩	-/	$\vdash$	$\mathbb{H}$	+++		-	$\mathbb{H}$	+		+	$\vdash$	$\mathbb{H}$	$\parallel$
2.36	92																				
1.18	88							Ш	•												
0.600	84	60 +						1111			$\parallel \parallel$				Ш	$\parallel \parallel$					T
0.600	80	Passing (%)				$ \  $	/														
0.423	76	is 50 +				$\perp /$		Ш				Ш									
0.150	69	ä																			
0.075	60				$\parallel$ /	1															
0.055	59	40					Ш	Ш			+	Ш				$\parallel$					+
0.039	55				/																
0.029	50	30 -		ШИ				Ш				Ш				Ш					
0.021	46			I																	
0.015	42			/																	
0.012	37	20	-++			+	+++	$\mathbb{H}$			H	+++			H	+		+	+	$\mathbb{H}$	$\parallel$
0.008	32																				
0.006	28																				
0.004	21	10	711				$\parallel \parallel$				$\parallel \parallel$					$\parallel$				Ш	T
0.004	16																				
0.003	14	0 +						Ш				Щ				Ш					Щ
0.003	12	0.00	1	0	.01			0.				1				1	0				100
0.002	10							P	article	e Size	(mn	n)									
0.001	9																				
	,																				

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Client	Structerre C	onsulting E	ngineers							Report N	lo.		P 171	20144	l-G
Address	PO Box 792			14						•					
Project	Ravensthorp				nves	tigation			Τ.	Test Dat	<u> </u>		21/12	/2017	
-	Foundation 8					•				Report D			8/01/2		
Client ID	B2											Not			
Sieve Size	Passing									Depth	(m)	NOT	Suppl	iea	
	%	100 -	1			П			П	1 1			_		
(mm) 150.0	/0														
75.0												$ \mathcal{N} $			
53.0		90 -			++			Ш	$\parallel$			/			+++
37.5											/				
26.5		80 -		$\perp \perp \downarrow$	$\coprod$			Ш	Щ		$\perp \mid \mid \mid \mid \mid \mid \mid$				Ш
19.0											/				
9.5											/				
4.75		70 -			++			++	+		1/11				+++
2.36	100										/				
1.18	98	60 -													Ш
0.600	87														
0.425	76	ng (°													
0.300	67	Passing (%)		++	++			H	+}	1					+++
0.150	57	<u> </u>						$    \rangle$							
0.075	48							I							
0.063	47	40 -			$\parallel \parallel$			$\square$							$\parallel \parallel$
0.046	42						/								
0.033	39	30 -		+	+++		$ \mathcal{L} $		$\parallel$						$\coprod$
0.024	32					$\parallel / \parallel$									
0.017	30					$\parallel/\parallel$									
0.013	24	20 -		+++	+++	/		H	+						++
0.009	19				$\mathbb{M}$										
0.007	15	10 -						Ш	Ш						Ш
0.005	12	.3		$ \mathcal{Y} $											
0.004	11														
0.003	8	0 -	004		Ш	\ \ \			Ш.	\					
0.003	7	0.0	001		(	0.01	_			).1 ()		1			
0.002	7						P	artic	ie Si	ze (mm)					
0.001	6														
										()					

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Client	Structerre C	onsulting Eng	gineers				Report	l No.		P 171	20145	5-G	
Address	PO Box 792	BALCATTA	WA 6914										
Project			ct - Geotech Ir	vestigat	ion		Test D	ate		21/12/	/2018		_
	Foundation 6	& Borrow Sar	mples				Report			8/01/2			
Client ID	B3							th (m)	No	ot Suppli			
Sieve Size	Passing						Бср	()	INC	л Оиррп	cu		_
(mm)	%	100 ⊤				ПП						ПП	П
150.0	74								+++				
75.0								$\mathbb{X}$					
53.0		90											Ī
37.5							/						
26.5	100	80					<del>                                     </del>				+	+++	$\parallel$
19.0	99						/						
9.5	98						/						
4.75	96	70					<del>                                     </del>				$\top$		$\dagger$
2.36	96						/						
1.18	95	60 -				Ш.,	/						
0.600	87					$\parallel\parallel$ /							
0.425	76	) gui											
0.300	67	Passing (%)				$\parallel \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$							Ħ
0.150	56					VII .							
0.075	46	40											
0.064	44	40			$/\!\!\!/$								Ī
0.046	41			$\parallel \parallel /$	1								
0.033	37	30 -											$\parallel$
0.023	34			$\parallel / \parallel$									
0.017	29			$\parallel/\parallel$									
0.013	24	20 -									+	$\dagger \dagger \dagger \dagger$	$\dagger$
0.009	19												
0.007	16	10	$\parallel \parallel $								$\perp \! \! \perp$	Ш	$\prod$
0.005	11												
0.004	9												
0.003	8	0 +	1 1	01		0.1		1		10	$\perp \perp$	Ш.	Ц 100
0.003	7	0.00		.01			o Ciro ( `			10			ıUl
0.002	6					Partici	e Size (mm)						
0.001	5												
0.003 0.002	7 6	0.00	1 0	.01		0.1 Particl	e Size (mm)	1		10			

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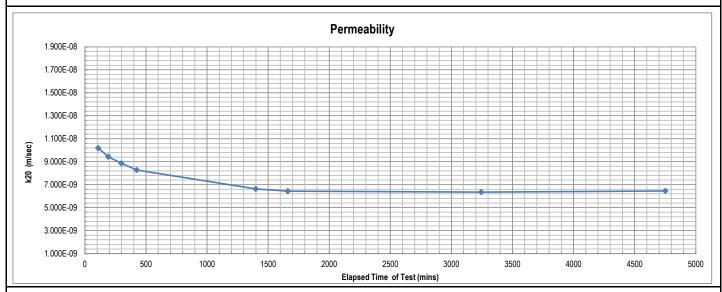
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	PERMEA	BILITY BY F	ALLING HEAD TE	ST REPORT				
	Test Method AS 1289	9 6.7.2, 5.1.1 , KH2 (Bas	ed on K H Head (1988) Manual c	of Laboratory Testing,10.7	")			
Client	Structerre Consulting Engineers			Report No.	P 1712013	8-FHPT		
Address	PO Box 792 BALCATTA WA 69	14						
Project	Ravensthorpe Gold Project - Geo	tech Investigation	Foundation & Borrow	Test Date	3/01/2018			
	Samples			Report Date	9/01/2018	8		
Client ID	A5 TP02	Depth (m)	0.50-1.10					
Description	GRAVELLY SANDY SILT - pale	brown		Remoulded	Remoulded Soil Specimer			
		RESI	JLTS OF TESTING					
Compaction Method		AS1289.5.1.1 - St	andard Compaction					
Maximum Dry Densi	ity (t/m³)	2.05	Hydraulic Gradient	Hydraulic Gradient				
Optimum Moisture C	Content (%)	9.0	Surcharge (kPa)	Surcharge (kPa)				
Placement Moisture	Content (%)	9.4	Head Pressure Applied (k	Head Pressure Applied (kPa)				
Moisture Ratio (%)		104.2	Water Type	Water Type				
Placement Wet Den	sity (t/m³)	2.12	Percentage Material Reta	Percentage Material Retained/Sieve Size (mm)				
Density Ratio (%)		94.7	Sample Height and Diame	eter (mm)		116.6 / 101.1		
	PERMEABILITY	l,	- 01	5 <b>E-09</b> (m	/sec)			



Remarks: The above specimen was remoulded to a target of 95% of Standard Dry Density and at Optimum Moisture Content.

Sample/s supplied by client The compaction data was supplied by the client.

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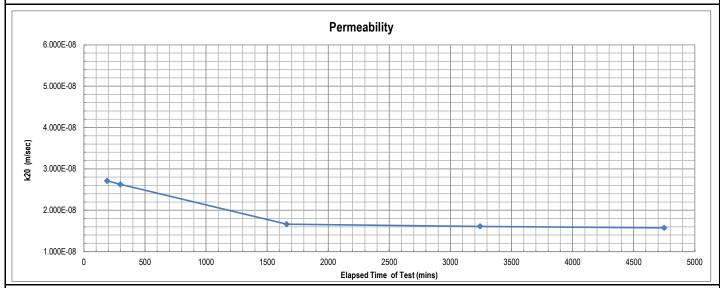
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REP36301



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	PERMEA	BILITY BY F	ALLING HEAD TE	ST REPORT				
	Test Method AS 1289	6.7.2, 5.1.1 , KH2 (Bas	sed on K H Head (1988) Manual o	of Laboratory Testing,10.7	")			
Client	Structerre Consulting Engineers			Report No.	P 1712013	9-FHPT		
Address	PO Box 792 BALCATTA WA 69 <sup>-</sup>	14						
Project	Ravensthorpe Gold Project - Geo	tech Investigation	Foundation & Borrow	Test Date	3/01/2018			
	Samples			Report Date	11/01/2018			
Client ID	A7 TP03			Depth (m)	0.00-0.70			
Description	SILTY CLAYEY GRAVEL - grey			Sample Type	Remoulded	led Soil Specimen		
		RESI	ULTS OF TESTING					
Compaction Method	1	AS1289.5.1.1 - St	tandard Compaction					
Maximum Dry Dens	ity (t/m³)	1.88	Hydraulic Gradient	Hydraulic Gradient				
Optimum Moisture (	Content (%)	14.0	Surcharge (kPa)	Surcharge (kPa)				
Placement Moisture	Content (%)	14.1	Head Pressure Applied (k	Head Pressure Applied (kPa)				
Moisture Ratio (%)		100.8	Water Type	Water Type				
Placement Wet Der	nsity (t/m³)	2.04	Percentage Material Reta		8 / 9.5			
Density Ratio (%)		94.9	Sample Height and Diame	eter (mm)		116.6 / 101		
	PERMEABILITY	k	= 10	6 <b>E-0</b> 8 (m	/sec)			



Remarks: The above specimen was remoulded to a target of 95% of Standard Dry Density and at Optimum Moisture Content.

Sample/s supplied by client The compaction data was supplied by the client.

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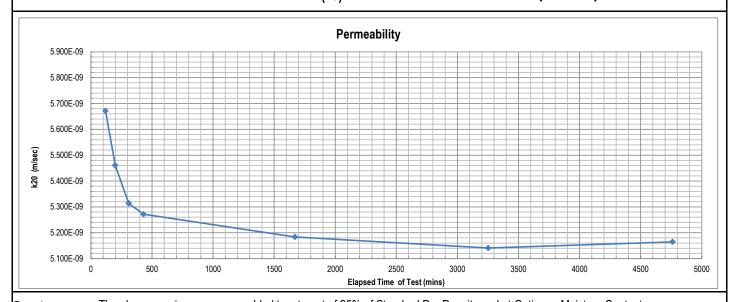
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	PERMEA	BILITY BY F	ALLING HEAD TE	ST REPORT			
	Test Method AS 1289	9 6.7.2, 5.1.1 , KH2 (Bas	sed on K H Head (1988) Manual o	f Laboratory Testing,10.7	")		
Client	Structerre Consulting Engineers			Report No.	P 1712014	0-FHPT	
Address	PO Box 792 BALCATTA WA 69	14					
Project	Ravensthorpe Gold Project - Geo	tech Investigation	Foundation & Borrow	Test Date	3/01/2018		
	Samples			Report Date	11/01/2018	11/01/2018	
Client ID	A16 TP06		Depth (m)	0.60-2.70			
Description	SANDY CLAYEY SILT - pale bro		Sample Type	Remoulded	d Soil Specimen		
		DES	III TO OF TESTING				
		<u>KESI</u>	ULTS OF TESTING				
Compaction Method	1	AS1289.5.1.1 - St	tandard Compaction				
Maximum Dry Densi	ity (t/m³)	1.84	Hydraulic Gradient	Hydraulic Gradient			
Optimum Moisture (	Content (%)	14.5	Surcharge (kPa)	(kPa)			
Placement Moisture	Content (%)	15.2	Head Pressure Applied (k	Head Pressure Applied (kPa)			
Moisture Ratio (%)		104.8	Water Type	Water Type			
Placement Wet Den	nsity (t/m³)	2.01	Percentage Material Reta	Percentage Material Retained/Sieve Size (mm)			
Density Ratio (%)		94.7	Sample Height and Diame		116.4 / 101.3		
	PERMEABILITY	k <sub>(20)</sub>	= 5.4	2E-09 (m/	/sec)		



Remarks: The above specimen was remoulded to a target of 95% of Standard Dry Density and at Optimum Moisture Content.

The compaction data was supplied by the client.

Accredited for compliance with ISO/IEC 17025.

Sample/s supplied by client

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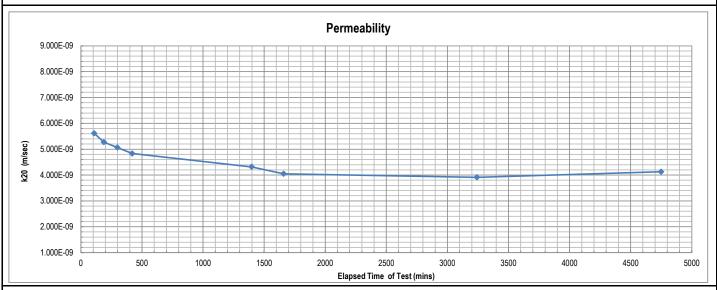
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**Brisbane** 10/104 Newmarket Rd, Windsor QLD 4030 Ph: +61 7 3357 5535

Perth 2 Kimmer Place, Queens Park WA 6107 Ph: +61 8 9258 8323

			ALLING HEAD TES sed on K H Head (1988) Manual o		n	
Client		U.7.2, U.1.1 , IXII2 (DUU	eu on K ii riedu (1900) manda o	Report No.	P 1712014	 1-FHPT
Address	Structerre Consulting Engineers PO Box 792 BAI CATTA WA 69	4.4				
Project	Ravensthorpe Gold Project - Geo	• •	Foundation & Borrow	To at Data	2/04/0040	
riojest	Samples	tech investigation	Touridation & Borrow	Test Date	3/01/2018	
	·			Report Date	11/01/2018	
Client ID	A27 TP13			Depth (m)	0.70-2.80	
Description	GRAVELLY SANDY SILT - white			Sample Type	Remoulded	d Soil Specimen
		RESL	ULTS OF TESTING			
Compaction Method	1	AS1289.5.1.1 - St	tandard Compaction			
Maximum Dry Densi	ity (t/m³)	1.69	Hydraulic Gradient			10.1
Optimum Moisture C	Content (%)	16.0	Surcharge (kPa)			3.0
Placement Moisture	Content (%)	16.1	Head Pressure Applied (k	Head Pressure Applied (kPa)		11.58
Moisture Ratio (%)		100.8	Water Type	Water Type		Distilled
Placement Wet Den	nsity (t/m³)	1.87	Percentage Material Reta	Percentage Material Retained/Sieve Size (mm)		9 / 9.5
Density Ratio (%)		95.1	Sample Height and Diame	eter (mm)		116.5 / 101.1
	PERMEABILITY	k	= 11	1E-09 (m/	/sec)	



The above specimen was remoulded to a target of 95% of Standard Dry Density and at Optimum Moisture Content. Remarks:

Sample/s supplied by client The compaction data was supplied by the client.

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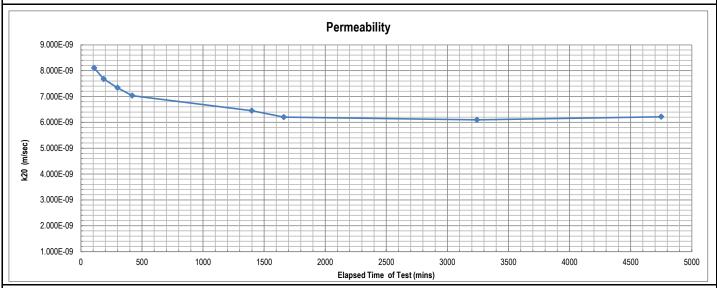
**Brisbane** 10/104 Newmarket Rd, Windsor QLD 4030 Ph: +61 7 3357 5535 Perth 2 Kimmer Place, Queens Park WA 6107 Ph: +61 8 9258 8323

	PERMEA	ABILITY BY F	ALLING HEAD TE	ST REPORT		
	Test Method AS 128	9 6.7.2, 5.1.1 , KH2 (Bas	ed on K H Head (1988) Manual c	of Laboratory Testing,10.7	")	
Client	Structerre Consulting Engineers			Report No.	P 1712014	2-FHPT
Address	PO Box 792 BALCATTA WA 69	14				
Project	Ravensthorpe Gold Project - Ge	otech Investigation	Foundation & Borrow	Test Date	3/01/2018	
	Samples			Report Date	11/01/2018	}
Client ID	A32 TP16			Depth (m)	1.00-2.80	
Description	GRAVELLY SILT - pale brown			Sample Type	Remoulded	d Soil Specimen
		RESI	ULTS OF TESTING			
Compaction Method	d	AS1289.5.1.1 - St	andard Compaction			
Maximum Dry Dens	sity (t/m³)	1.72	Hydraulic Gradient	Hydraulic Gradient		10.1
Optimum Moisture	Content (%)	15.5	Surcharge (kPa)			3.0
Placement Moisture	e Content (%)	15.6	Head Pressure Applied (k	Head Pressure Applied (kPa)		11.58
Moisture Ratio (%)		100.8	Water Type			Distilled
Placement Wet Density (t/m³)		1.89	Percentage Material Reta	Percentage Material Retained/Sieve Size (mm)		0 / 9.5
Placement wet bei	Density Ratio (%)		Sample Height and Diameter (mm)			



 $k_{(20)} =$ 

6.2E-09 (m/sec)



Remarks: The above specimen was remoulded to a target of 95% of Standard Dry Density and at Optimum Moisture Content.

Authorised Signatory

C. Channon

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Page: 1 of 1

REP36301

this document are traceable to Australian/National Standards.

Tested at Trilab Perth Laboratory

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The results of the tests, calibrations, and/or measurements included in



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Client	Structerre Consulting Enginee	ers	Report No.	P 17120143-PHD
Address	PO Box 792 BALCATTA WA		<u>'</u>	
Project	Ravensthorpe Gold Project - (	Geotech Investigation	Test Date 2/01/20	018
	Foundation & Borrow Sample	S	Report Date 5/01/20	018
Sample No.		17120143	17120143	
Client ID		B1	B1	
Depth (m)		Not Supplied	Not Supplied	
Description		SILTY GRAVEL - white	SILTY GRAVEL - white	
Method of Moistu	ure Determination for Remoulding	Optimum Moisture Content	Optimum Moisture Content	
Initial Moisture C	ontent (%)	8.2	8.2	
Placement Wet D	ensity (t/m³)	1.866	1.922	
Placement Moist	ure Content (%)	15.9	15.9	
Density Ratio (%	)	95.7	98.1	
Variation from O	ptimum Moisture Content (%)	Nil	Nil	
Curing Time (Day	<b>/s</b> )	2	2	
Source of Water		Distilled	Distilled	
Hole Reformed a	t 50mm Head Height	Yes	Yes	
PINHOLE DI CLASSIFICA DESIGNATION		D1	D1	
DESCRIPTION		Highly dispersive	Highly dispersive	

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	PINHO	LE DISPERSION TEST Test Method: AS 1289 3.8.3	T REPORT	
Client Address	Structerre Consulting Engineers PO Box 792 BALCATTA WA 6914		Report No.	P 17120144-PHD
Project		Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples		2018 2018
Sample No.		17120144	17120144	
Client ID		B2	B2	
Depth (m)		Not Supplied	Not Supplied	
Description		GRAVELLY SILT - white	GRAVELLY SILT - white	
Method of Moistu	re Determination for Remoulding	Optimum Moisture Content	Optimum Moisture Content	1
Initial Moisture Co	ontent (%)	4.0	4.0	
Placement Wet De	ensity (t/m³)	1.96	2.02	
Placement Moistu	re Content (%)	13.6	13.6	
Density Ratio (%)		95.2	98.1	
Variation from Op	timum Moisture Content (%)	Nil	Nil	
Curing Time (Day	s)	2	2	
Source of Water		Distilled	Distilled	
Hole Reformed at	50mm Head Height	No	No	
PINHOLE DIS CLASSIFICA DESIGNATION		D1	D1	
		Highly dispersive	Highly dispersive	

Accredited for compliance with ISO/IES 17025.

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Tested at Trilab Perth Laboratory.

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	PINHO	LE DISPERSION TEST Test Method: AS 1289 3.8.3	T REPORT	
Client Address	Structerre Consulting Engine	ers	Report No.	P 17120145-PHD
Project	Ravensthorpe Gold Project -	PO Box 792 BALCATTA WA 6914 Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples		/2018 /2018
Sample No.		17120145	17120145	
Client ID		B3	В3	
Depth (m)		Not Supplied	Not Supplied	
Description		SANDY SILT- yellow	SANDY SILT- yellow	
Method of Moistu	re Determination for Remoulding	Optimum Moisture Content	Optimum Moisture Conter	nt
Initial Moisture Co	ontent (%)	7.0	7.0	
Placement Wet De	ensity (t/m³)	1.89	1.96	
Placement Moistu	re Content (%)	12.7	12.7	
Density Ratio (%)		94.9	98.1	
Variation from Op	timum Moisture Content (%)	Nil	Nil	
Curing Time (Day	s)	2	2	
Source of Water		Distilled	Distilled	
Hole Reformed at	50mm Head Height	No	No	
PINHOLE DIS CLASSIFICA DESIGNATION		D2	D2	
		Dispersive	Dispersive	

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The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

Tested at Trilab Perth Laboratory.

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# AS 1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (standard method)

S865847-A Client MHA GEOTECHNICAL **Report Number** 

Issue 1

**Job Number** S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory **PERTH** 

1 Erindale Rd Balcatta WA 6021

### **Sample Details**

Lab No	S865847-A		Date to	ested	1 December 20	007
Sample ID	-		Time T	ested	-	
Proposed Use	Foundation		Layer	Thickne	ess mm	-
Material Description	Various		Test D	epth m	m	-
Sampling Method	Client	Site Selection Method		Client		

Sample No.	Sample ID	Moisture Content %
S865847-A-1	TP01_0.0-0.2m	6.4
S865847-A-2	TP01_0.2-0.75m	11.5
S865847-A-3	TP01_0.75-1.6m	8.9
S865847-A-4	TP02_0.1-0.5m	6.7
S865847-A-5	TP02_0.5-1.1m	5.5
S865847-A-6	TP02_1.2-2.7m	13.2
S865847-A-7	TP03_0.0-0.7m	8.8
S865847-A-8	TP03_0.7-3.0m	9.4
S865847-A-9	TP04_0.0-0.25m	12.2
S865847-A-10	TP04_0.25-1.0m	13.5

Remarks



Moisture Content

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Wayne Rozmianiec Laboratory Manager

**Date** 16 January 2018

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AS 1289.5.4.1 Rep1 Rev. 2.0 Feb-16











### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

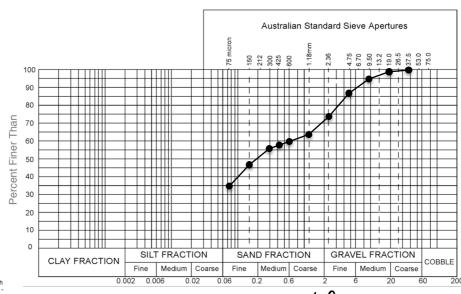
Sample Details

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Laboratory Number	S865847-A-1	Date tested	05 De	05 Dec 2017	
Sample ID	TP01 0.0-0.2m		-	Tested by	JWS
Proposed Use	Foundation		Layer	Thickness	ı
Material Description	AS 1726 - 2017 Sandy	AS 1726 - 2017 Sandy FINES with gravel Tes		Test Depth	
Sampling Method	AS 1289.1.4.1	Drying Method	Dried 1	to constant ma	ass

Particle Size Distribution & Atterberg Limits of a Soil

Particl	e Size Distrik	oution AS 128	Atterberg Limits (A	AS 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3	.3.1,AS 1289.3.4.1)
75 mm		1.18 mm	64	Liquid Limit %	
37.5 mm	100	0.6 mm	60	Plastic Limit %	
19 mm	99	0.425 mm	58	Plasticity Index %	
9.5 mm	95	0.3 mm	56	Linear Shrinkage %	
4.75 mm	87	0.15 mm	47	Nature Of Shrinkage	
2.36 mm	74	0.075 mm	35	Sample History	Dried at 50 °C

### **Particle Size Distribution Graph**



Accredited for compliance wit ISO/IEC 17025
Testing

Remarks

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BACCREDITATION NUMBER 18742

Date 16 January 2018

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Wayne Rozmianiec Laboratory Manager

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AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

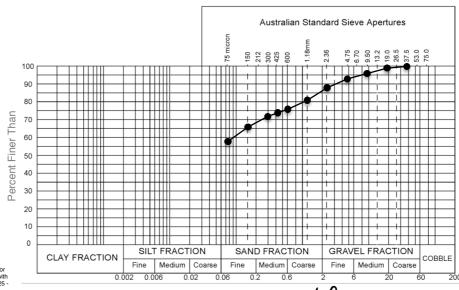
### **Sample Details**

Laboratory Number	S865847-A-2	Date tested	05 Dec 2017		
Sample ID	TP01 0.2-0.75m	•		Tested by	JWS
Proposed Use	Foundation Layer Thickr			Thickness	-
Material Description	AS 1726 - 2017 FINES t	AS 1726 - 2017 FINES trace gravel, with sand			-
Sampling Method	AS 1289.1.4.1	Drying Method	Dried to constant mas		iss

### Particle Size Distribution & Atterberg Limits of a Soil

Particl	Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (AS 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1		
75 mm		1.18 mm	81	Liquid Limit %		
37.5 mm	100	0.6 mm	76	Plastic Limit %		
19 mm	99	0.425 mm	74	Plasticity Index %		
9.5 mm	96	0.3 mm	72	Linear Shrinkage %		
4.75 mm	93	0.15 mm	66	Nature Of Shrinkage		
2.36 mm	88	0.075 mm	58	Sample History	Dried at 50 °C	

#### **Particle Size Distribution Graph**



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Testing

Remarks

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Date 16 January 2018

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PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A

Issue 1

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Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

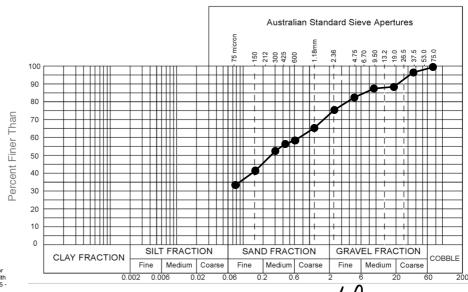
Sample Details

	• • • • • • • • • • • • • • • • • • • •	ipio Dotailo			
Laboratory Number	S865847-A-3	Date tested	05 Dec	2017	
Sample ID	TP01 0.75-1.6m	-		Tested by	JWS
Proposed Use	Foundation		Layer	Thickness	-
Material Description	AS 1726 - 2017 SM Silty	y or clayey SAND with gravel	Test D	epth	-
Sampling Method	AS 1289.1.4.1	Drying Method	Dried t	o constant ma	ass

Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (AS 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)
75 mm	100	1.18 mm	66	Liquid Limit %
37.5 mm	97	0.6 mm	59	Plastic Limit %
19 mm	89	0.425 mm	57	Plasticity Index %
9.5 mm	88	0.3 mm	53	Linear Shrinkage %
4.75 mm	83	0.15 mm	42	Nature Of Shrinkage
2.36 mm	76	0.075 mm	34	Sample History

### **Particle Size Distribution Graph**



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Testing

Remarks

STRUCTERRE CONSULTING ENGINEERS
BALCATTA LABORATORY
ACCREDITATION NUMBER 18742

Date 16 January 2018

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

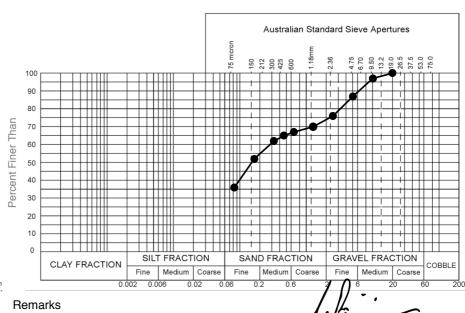
#### Sample Details

ounpio Dotano							
Laboratory Number	S865847-A-4 <b>Date tested</b> 05 l			05 Dec 2017			
Sample ID	TP02 0.1-0.5m	-		Tested by	JWS		
Proposed Use	Foundation	Foundation			-		
Material Description	AS 1726 - 2017 Sandy	AS 1726 - 2017 Sandy FINES with gravel			-		
Sampling Method	AS 1289.1.4.1 Drying Method Dried to constain		o constant ma	ass			

Particle Size Distribution & Atterberg Limits of a Soil

<u> </u>							
Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (AS 1289.3.1.2,AS				
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)			
75 mm		1.18 mm	70	Liquid Limit %			
37.5 mm		0.6 mm	67	Plastic Limit %			
19 mm	100	0.425 mm	65	Plasticity Index %			
9.5 mm	97	0.3 mm	62	Linear Shrinkage %			
4.75 mm	87	0.15 mm	52	Nature Of Shrinkage			
2.36 mm	76	0.075 mm	36	Sample History			
				·			

### **Particle Size Distribution Graph**



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Date 16 January 2018

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### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

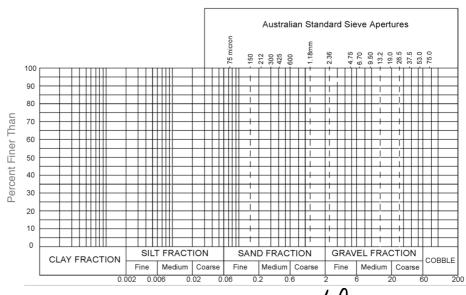
### Sample Details

Laboratory Number	S865847-A-5	S865847-A-5 <b>Date tested</b> 7 December 2017						
Sample ID	TP02 0.5-1.1m	-	-	Tested by	CF			
Proposed Use	Foundation		Layer	Thickness	-			
Material Description	Clay or Silt		Test D	epth (	0.5-1.1r			
Sampling Method	AS 1289.1.4.1	Drying Method	Dried t	o constant ma	ass			

### Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (A	S 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm		Liquid Limit %	38	
37.5 mm		0.6 mm		Plastic Limit %	18	
19 mm		0.425 mm		Plasticity Index %	20	
9.5 mm		0.3 mm		Linear Shrinkage %	7.0	
4.75 mm		0.15 mm		Nature Of Shrinkage	Normal	
2.36 mm		0.075 mm		Sample History	Dried at 50 °C	
	***************************************					

#### **Particle Size Distribution Graph**



Remarks

Date 16 January 2018

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PSD Atterberg Report

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

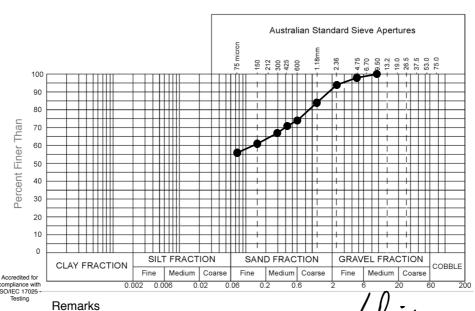
#### **Sample Details**

Laboratory Number	S865847-A-6 Date tested			07 Dec 2017	
Sample ID	TP02 1.1-2.7m	-		Tested by	JWS
Proposed Use	Foundation			Layer Thickness -	
Material Description	AS 1726 - 2017 Sandy F	AS 1726 - 2017 Sandy FINES trace gravel			-
Sampling Method	AS 1289.1.4.1 Drying Method			Dried to constant mass	

Particle Size Distribution & Atterberg Limits of a Soil

· · · · · · · · · · · · · · · · · · ·						
Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (A	S 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	84	Liquid Limit %		
37.5 mm		0.6 mm	74	Plastic Limit %		
19 mm		0.425 mm	71	Plasticity Index %		
9.5 mm	100	0.3 mm	67	Linear Shrinkage %		
4.75 mm	98	0.15 mm	61	Nature Of Shrinkage		
2.36 mm	94	0.075 mm	56	Sample History	Dried at 50 °C	

#### **Particle Size Distribution Graph**



NATA

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Date 16 January 2018

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Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

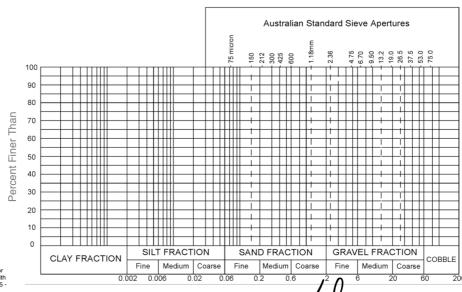
### Sample Details

Laboratory Number	S865847-A-7	S865847-A-7 Date tested						
Sample ID	TP03_0.0-0.7m		-	Tested by	JWS			
Proposed Use	Foundation		Layer	Thickness	-			
Material Description	AS 1726 - 2017		Test D	epth	-			
Sampling Method	AS 1289.1.4.1	AS 1289.1.4.1 Drying Method Dried to consta		to constant ma	ass			

### Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (AS 1289.3.1.2,AS			
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm		Liquid Limit %	28	
37.5 mm		0.6 mm		Plastic Limit %	15	
19 mm		0.425 mm		Plasticity Index %	13	
9.5 mm		0.3 mm		Linear Shrinkage %	5.5	
4.75 mm		0.15 mm		Nature Of Shrinkage	Normal	
2.36 mm		0.075 mm		Sample History	Dried at 50 °C	

#### **Particle Size Distribution Graph**



Remarks

Date 16 January 2018

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Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

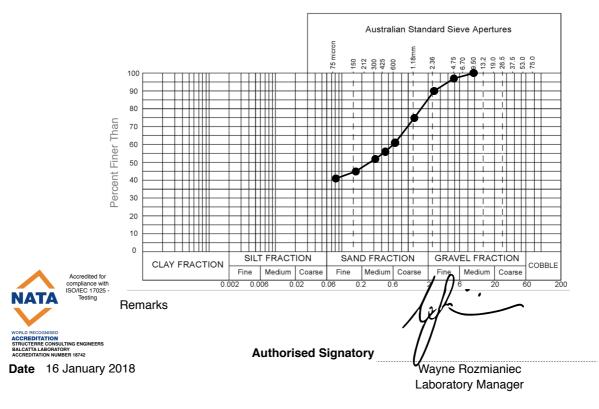
#### **Sample Details**

Laboratory Number	S865847-A-8 <b>Date tested</b> 0			07 Dec 2017		
Sample ID	TP03_0.7-3.0m	-		Tested by	JWS	
Proposed Use	Foundation			Layer Thickness -		
Material Description	AS 1726 - 2017 Sandy FINES trace gravel			epth	-	
Sampling Method	AS 1289.1.4.1 Drying Method			Dried to constant mass		

Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (AS 1289.3.1.2,AS			
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	75	Liquid Limit %		
37.5 mm		0.6 mm	61	Plastic Limit %		
19 mm		0.425 mm	56	Plasticity Index %		
9.5 mm	100	0.3 mm	52	Linear Shrinkage %		
4.75 mm	97	0.15 mm	45	Nature Of Shrinkage		
2.36 mm	90	0.075 mm	41	Sample History	Dried at 50 °C	

### **Particle Size Distribution Graph**



PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

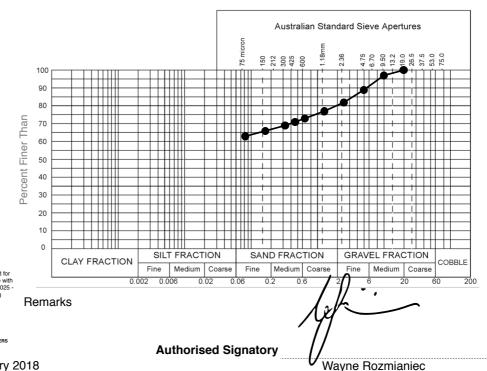
#### **Sample Details**

Laboratory Number	S865847-A-9 <b>Date tested</b> 11 De			11 Dec 2017		
Sample ID	TP04_0.0-0.25m	-		Tested by	JWS	
Proposed Use	Foundation			Layer Thickness -		
Material Description	AS 1726 - 2017 FINES \	AS 1726 - 2017 FINES with gravel, with sand			-	
Sampling Method	AS 1289.1.4.1 Drying Method			Dried to constant mass		

### Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (A	AS 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	77	Liquid Limit %		
37.5 mm		0.6 mm	73	Plastic Limit %		
19 mm	100	0.425 mm	71	Plasticity Index %		
9.5 mm	97	0.3 mm	69	Linear Shrinkage %		
4.75 mm	89	0.15 mm	66	Nature Of Shrinkage		
2.36 mm	82	0.075 mm	63	Sample History	Dried at 50 °C	
	***************************************					

# Particle Size Distribution Graph



Date 16 January 2018

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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of

Laboratory Manager











### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

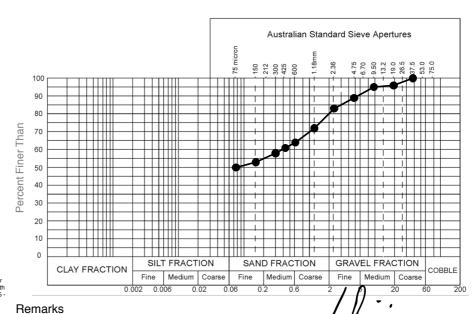
### **Sample Details**

Laboratory Number	S865847-A-10 <b>Date tested</b> 11 Dec 2017		2017		
Sample ID	TP04_0.25-1.0m			Tested by	JWS
Proposed Use	Foundation		Layer Thickness		-
Material Description	AS 1726 - 2017 Sandy FINES with gravel		Test D	epth	-
Sampling Method	AS 1289.1.4.1 Drying Method Dried to const		o constant ma	ass	

### Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (A	S 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	72	Liquid Limit %		
37.5 mm	100	0.6 mm	64	Plastic Limit %		
19 mm	96	0.425 mm	61	Plasticity Index %		
9.5 mm	95	0.3 mm	58	Linear Shrinkage %		
4.75 mm	89	0.15 mm	53	Nature Of Shrinkage		
2.36 mm	83	0.075 mm	50	Sample History	Dried at 50 °C	
	***************************************					

# Particle Size Distribution Graph



Accredited for compliance win ISO/IEC 17028
Testing

Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### AS 1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort

Client MHA GEOTECHNICAL **Report Number** S865847-A

Issue 1

**Job Number** S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

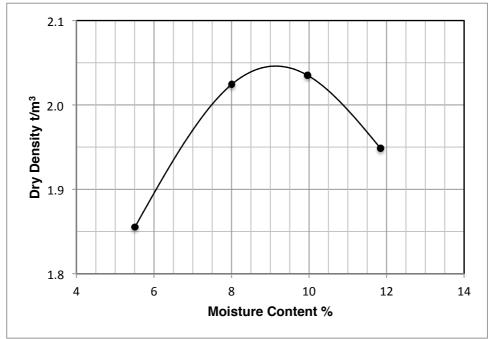
1 Erindale Rd Balcatta WA 6021

#### Sample Details

Laboratory Number	S865847-A-5	Date tested	Friday, 1 December 2017				
Sample ID	TP02 0.5-1.1m						
Proposed Use	Foundation						
Material Description	Gravelly Clay						
Sampling Method	Client	Site Selection Method	Client				

AS 1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (standard method)

Maximum Dry Density t/m <sup>3</sup>	2.05	Optimum Moisture Content %	9.0
% Retained 19mm Sieve	1	% Retained 37.5mm Sieve	0
Curing Time (hrs)	2	Method used to determine LL	Visual/Tactile



Remarks



Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

WA 132.2 R Rev. 1.1 Feb-15 MDD Report

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# AS 1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

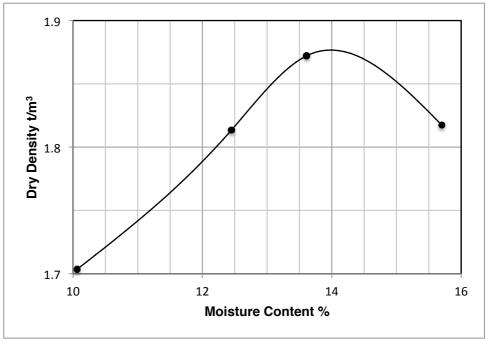
1 Erindale Rd Balcatta WA 6021

#### **Sample Details**

Laboratory Number	S865847-A-7	865847-A-7 Date tested Monday, 11 December 2017					
Sample ID	TP03 0.0-0.7m	·					
Proposed Use	Foundation						
Material Description	Clay						
Sampling Method	Client	Site Selection Method	Client				

AS 1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (standard method)

Maximum Dry Density t/m <sup>3</sup>	1.88	Optimum Moisture Content %	14.0
% Retained 19mm Sieve	2	% Retained 37.5mm Sieve	0
Curing Time (hrs)	2	Method used to determine LL	Visual/Tactile



Remarks



Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

MDD Report AS 1289.5.1.1 R Rev. 2.0 Feb-16

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#### AS 1289.3.8.1 Determination of the Emerson class number of a soil

Client MHA GEOTECHNICAL **Report Number** S865847-A

Issue 1

**Job Number** S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

PERTH Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

### **Sample Details**

Lab No	S865847-A		Date to	ested	12 December	2017
Sample ID	-		Time 1	<b>Tested</b>	-	
Proposed Use	Foundation		Layer	Thickr	ness mm	-
Material Description	Various		Test D	epth n	nm	-
Sampling Method	Client	Site Selection Met	hod	Client		

Sample No.	Sample ID	Emerson Class No.
S865847-A-5	TP02_0.5-1.1m	3
S865847-A-7	TP03 0.0-0.7m	3

**Authorised Signatory** 

Date 16 January 2018

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Emerson

AS 1289.5.4.3 Rep2 Rev. 2.0 Feb-16

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# AS 1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (standard method)

S865847-A Client MHA GEOTECHNICAL **Report Number** 

Issue 1

**Job Number** S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory **PERTH** 

1 Erindale Rd Balcatta WA 6021

### **Sample Details**

Lab No	S865847-A [		Date te	ested	1 December 20	007
Sample ID	-		Time T	ested	-	
Proposed Use	Foundation I		Layer Thickness mm		-	
Material Description	Various	Various		Test Depth mm		-
Sampling Method	Client	lient Site Selection Metho		Client	-	

Sample No.	Sample ID	Moisture Content %
S865847-A-11	TP04_1.0-3.1m	9.5
S865847-A-12	TP05_0.1-0.8m	9.7
S865847-A-13	TP05_0.8-1.8m	9.2
S865847-A-14	TP05_1.8-2.9m	8.6
S865847-A-15	TP06_0.0-0.6m	8.5
S865847-A-16	TP06_0.6-2.7m	7.4
S865847-A-17	TP07_0.1-0.2m	3.3
S865847-A-18	TP07_0.2-2.5m	10.4
S865847-A-19	TP08_0.1-0.4m	9.4
S865847-A-20	TP08_0.4-2.2m	10.2

Remarks



16 January 2018

**Date** 

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

AS 1289.5.4.1 Rep1 Rev. 2.0 Feb-16 Moisture Content

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### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

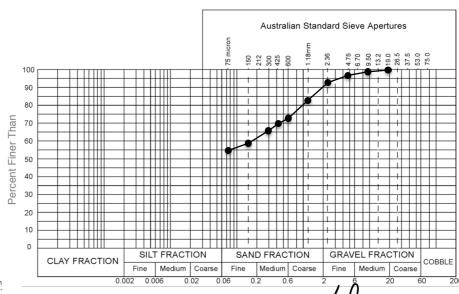
#### **Sample Details**

Laboratory Number	S865847-A-11 <b>Date tested</b> 11 Dec 2017			2017	
Sample ID	TP04_1.0-3.1m	-		Tested by	JWS
Proposed Use	Foundation		Layer Thickness		-
Material Description	AS 1726 - 2017 Sandy FINES trace gravel		Test D	epth	-
Sampling Method	AS 1289.1.4.1 Drying Method Dried to constant		o constant ma	iss	

Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1				Atterberg Limits (A	\S 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	83	Liquid Limit %		
37.5 mm		0.6 mm	73	Plastic Limit %		
19 mm	100	0.425 mm	70	Plasticity Index %		
9.5 mm	99	0.3 mm	66	Linear Shrinkage %		
4.75 mm	97	0.15 mm	59	Nature Of Shrinkage		
2.36 mm	93	0.075 mm	55	Sample History	Dried at 50 °C	

### **Particle Size Distribution Graph**



Remarks

Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

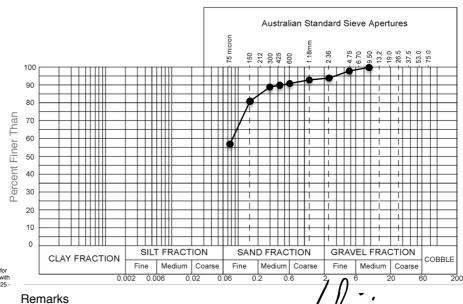
#### **Sample Details**

Laboratory Number	S865847-A-12 <b>Date tested</b> 11 Dec 2017			2017	
Sample ID	TP05_0.1-0.8m	-		Tested by	JWS
Proposed Use	Foundation	Foundation			-
Material Description	AS 1726 - 2017 Sandy F	AS 1726 - 2017 Sandy FINES trace gravel			-
Sampling Method	AS 1289.1.4.1 Drying Method		Dried t	o constant ma	iss

Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1				Atterberg Limits (A	NS 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	93	Liquid Limit %		
37.5 mm		0.6 mm	91	Plastic Limit %		
19 mm		0.425 mm	90	Plasticity Index %		
9.5 mm	100	0.3 mm	89	Linear Shrinkage %		
4.75 mm	98	0.15 mm	81	Nature Of Shrinkage		
2.36 mm	94	0.075 mm	57	Sample History	Dried at 50 °C	

#### **Particle Size Distribution Graph**



Accredited for compliance with ISO/IEC 17025
Testing

Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

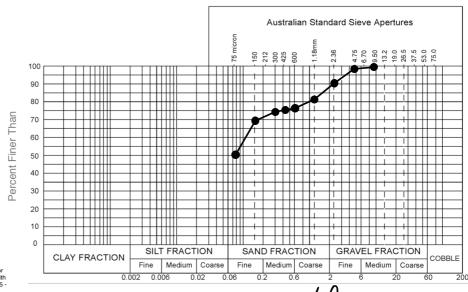
#### Sample Details

Laboratory Number	S865847-A-13 <b>Date tested</b> 11 Dec 2017			2017	
Sample ID	TP05_0.8-1.8m	-		Tested by	JWS
Proposed Use	Foundation	Foundation			-
Material Description	AS 1726 - 2017 Sandy F	AS 1726 - 2017 Sandy FINES trace gravel			-
Sampling Method	AS 1289.1.4.1 Drying Method		Dried to constant mass		iss

Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1				Atterberg Limits (A	AS 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	82	Liquid Limit %		
37.5 mm		0.6 mm	77	Plastic Limit %		
19 mm		0.425 mm	76	Plasticity Index %		
9.5 mm	100	0.3 mm	75	Linear Shrinkage %		
4.75 mm	99	0.15 mm	70	Nature Of Shrinkage		
2.36 mm	91	0.075 mm	51	Sample History	Dried at 50 °C	

### **Particle Size Distribution Graph**



Remarks

Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

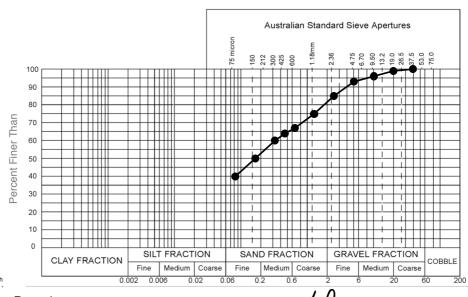
### **Sample Details**

Laboratory Number	S865847-A-14 <b>Date tested</b> 11 Dec 2017			2017	
Sample ID	TP05_1.8-2.9m		-	Tested by	JWS
Proposed Use	Foundation	Foundation			-
Material Description	AS 1726 - 2017 Sandy F	AS 1726 - 2017 Sandy FINES trace gravel			
Sampling Method	AS 1289.1.4.1 Drying Method		Dried t	o constant ma	เรร

### Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1				Atterberg Limits (A	NS 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	75	Liquid Limit %		
37.5 mm	100	0.6 mm	67	Plastic Limit %		
19 mm	99	0.425 mm	64	Plasticity Index %		
9.5 mm	96	0.3 mm	60	Linear Shrinkage %		
4.75 mm	93	0.15 mm	50	Nature Of Shrinkage		
2.36 mm	85	0.075 mm	40	Sample History	Dried at 50 °C	

### **Particle Size Distribution Graph**



Accredited for compliance wit ISO/IEC 17025
Testing

Remarks

Date 16 January 2018

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PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

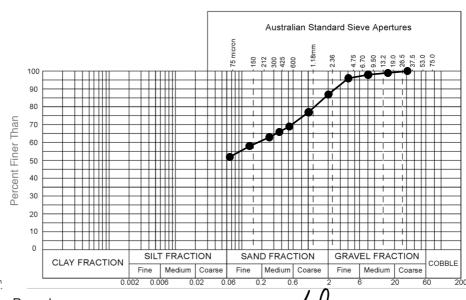
#### Sample Details

ounpio Dotano									
Laboratory Number	S865847-A-15 <b>Date tested</b> 12 D			c 2017					
Sample ID	TP06_0.0-0.6m	-		Tested by	JWS				
Proposed Use	Foundation	Foundation			-				
Material Description	AS 1726 - 2017 Sand	AS 1726 - 2017 Sandy FINES trace gravel			-				
Sampling Method	AS 1289.1.4.1	AS 1289.1.4.1 Drying Method Dried to constar		to constant ma	ass				

Particle Size Distribution & Atterberg Limits of a Soil

<u> </u>						
Particle Size Distribution AS 1289.3.6.1				Atterberg Limits (A	S 1289.3.1.2,AS	
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm	77	Liquid Limit %		
37.5 mm	100	0.6 mm	69	Plastic Limit %		
19 mm	99	0.425 mm	66	Plasticity Index %		
9.5 mm	98	0.3 mm	63	Linear Shrinkage %		
4.75 mm	96	0.15 mm	58	Nature Of Shrinkage		
2.36 mm	87	0.075 mm	52	Sample History	Dried at 50 °C	

### **Particle Size Distribution Graph**



Remarks

Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16 WA | QLD | NSW | VIC Page

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1 Erindale Road, Balcatta, Western Australia 6021 | PO Box 792, Balcatta, Western Australia 6914











### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 **Project** Ravensthorpe Gold Project - MURRAY ST

**PERTH** Tests carried out at Balcatta Laboratory

1 Erindale Rd Balcatta WA 6021

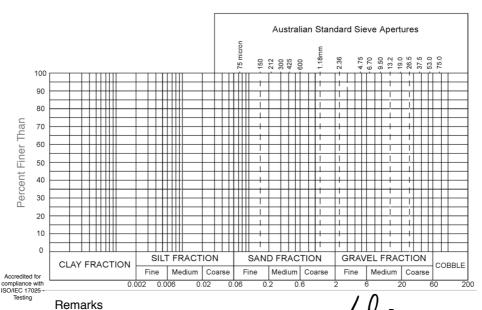
#### Sample Details

Laboratory Number	S865847-A-16	Date tested			
Sample ID	TP06 0.6-2.7m	•	•	Tested by	CF
Proposed Use	Foundation		Layer	Thickness	-
Material Description	Clayey Silt		Test D	epth (	).6-2.7n
Sampling Method	AS 1289.1.4.1	AS 1289.1.4.1 Drying Method		o constant ma	ass

### Particle Size Distribution & Atterberg Limits of a Soil

Particle Size Distribution AS 1289.3.6.1			Atterberg Limits (	AS 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)		
75 mm		1.18 mm		Liquid Limit %	32	
37.5 mm		0.6 mm		Plastic Limit %	23	
19 mm		0.425 mm		Plasticity Index %	9	
9.5 mm		0.3 mm		Linear Shrinkage %	2.5	
4.75 mm		0.15 mm		Nature Of Shrinkage	Normal	
2.36 mm		0.075 mm		Sample History	Dried at 50 °C	
h		<u></u>		<del>-</del>		

# **Particle Size Distribution Graph**



Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Client MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

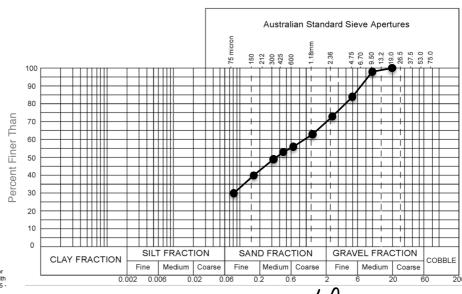
### **Sample Details**

Laboratory Number	S865847-A-17	S865847-A-17 <b>Date tested</b> 12 Dec 2017							
Sample ID	TP07_0.1-0.2m		-	Tested by	JSO				
Proposed Use	Foundation	Foundation			-				
Material Description	AS 1726 - 2017 SM Silt	AS 1726 - 2017 SM Silty or clayey SAND with gravel			-				
Sampling Method	AS 1289.1.4.1	Drying Method	Dried to constant mass		ass				

### Particle Size Distribution & Atterberg Limits of a Soil

				3	
Particl	e Size Distrib	oution AS 128	Atterberg Limits (AS 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
75 mm		1.18 mm	63	Liquid Limit %	
37.5 mm		0.6 mm	56	Plastic Limit %	
19 mm	100	0.425 mm	53	Plasticity Index %	
9.5 mm	98	0.3 mm	49	Linear Shrinkage %	
4.75 mm	84	0.15 mm	40	Nature Of Shrinkage	
2.36 mm	73	0.075 mm	30	Sample History	

### **Particle Size Distribution Graph**



Accredited for compliance will ISO/IEC 17025 Testing

Remarks

STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

Date 16 January 2018

**Authorised Signatory** 

Wayne Rozmianiec Laboratory Manager

PSD Atterberg Report

AS 1289.3.6.1/AS 1289.3.1.2 Rep Rev. 2.0 Feb-16

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### Particle Size Distribution & Atterberg Limits of a Soil

**Report Number** S865847-A **Client** MHA GEOTECHNICAL

Issue 1

Job Number S865847 Project Ravensthorpe Gold Project - MURRAY ST

Tests carried out at Balcatta Laboratory PERTH

1 Erindale Rd Balcatta WA 6021

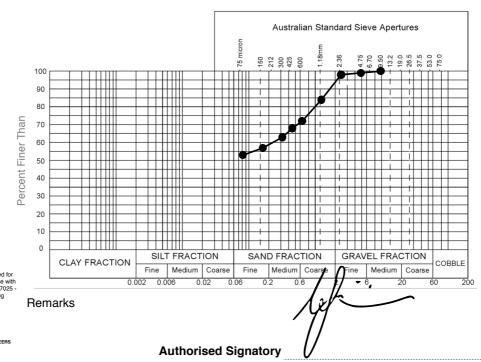
### **Sample Details**

Laboratory Number	S865847-A-18 Date tested		12 Dec 2017		
Sample ID	TP07_0.2-2.5m		Tested by	JWS	
Proposed Use	Foundation			Layer Thickness -	
Material Description	AS 1726 - 2017 Sandy FINES trace gravel			epth	-
Sampling Method	AS 1289.1.4.1	Drying Method	Dried to constant mass		iss

### Particle Size Distribution & Atterberg Limits of a Soil

Particl	e Size Distrib	oution AS 128	Atterberg Limits (AS 1289.3.1.2,AS		
Sieve Size	% Passing	Sieve Size	% Passing	1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
75 mm		1.18 mm	84	Liquid Limit %	
37.5 mm		0.6 mm	72	Plastic Limit %	
19 mm		0.425 mm	68	Plasticity Index %	
9.5 mm	100	0.3 mm	63	Linear Shrinkage %	
4.75 mm	99	0.15 mm	57	Nature Of Shrinkage	
2.36 mm	98	0.075 mm	53	Sample History	Dried at 50 °C
	***************************************				

### **Particle Size Distribution Graph**



Date 16 January 2018

Wayne Rozmianiec Laboratory Manager

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