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

TEST PIT LOG

Job No:	P02-17	Date Started:	20/11/2017
Test Pit ID:	TP 11	Date Finished:	20/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6885004
Logged By:	Harvey Morcom	Northing:	120.2113023

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	2.8	ALLUVIUM	SILT, [ML], stiff to very stiff, non-plastic, white, dry to moist.	Clayey silt, less granular, excavated as rock.	600		Bulk X2
					700		
					800		
					900		
					1000		
2.8	EOH	TERMINATION			1100		
					1200		
					1300		
					1400		
					1500		
					1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

Test pit TP 11 – 2.8m 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
Test Pit ID:	TP 12	Date Finished:	20/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6877109
Logged By:	Harvey Morcom	Northing:	120.2112202

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.1	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.1	2.8	ALLUVIUM	SILT, [ML], firm, non-plastic, white, with clay, dry to moist.	Clayey silt, less granular, excavated as rock.	600		Bulk
					700		
					800		
					900		
					1000		
2.8	EOH	TERMINATION			1100		
					1200		
					1300		
					1400		
					1500		
					1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

Test pit TP 12 – 2.8m 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
Test Pit ID:	TP 13	Date Finished:	20/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6867749
Logged By:	Harvey Morcom	Northing:	120.2111142

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.1	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.1	0.7	ALLUVIUM	SILT, [ML], firm, non-plastic, grey white red motling, with gravel and sand, dry.	Clayey silt, less granular, excavated as rock.	600		Bulk
					700		
					800		
					900		
					1000		
0.7	2.8	ALLUVIUM	SILT, [ML], firm, non-plastic, white, with clay, dry to moist.	Clayey silt, less granular, excavated as rock.	1100		Bulk
					1200		
					1300		
					1400		
					1500		
2.8	EOH	TERMINATION			1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

Test pit TP 13 – 2.9m 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
Test Pit ID:	TP 14	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6861255
Logged By:	Harvey Morcom	Northing:	120.2110391

MHA GEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	1	ALLUVIUM	SILT, [ML], very stiff, non-plastic, white red motling, with gravel and sand, dry.	Cobbly, excavated as rock.	600		Bulk
					700		
					800		
					900		
					1000		
1	EOH	REFUSAL			1100		
					1200		
					1300		
					1400		
					1500		
					1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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

TEST PIT LOG

Job No:	P02-17	Date Started:	21/11/2017
Test Pit ID:	TP 15	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6856138
Logged By:	Harvey Morcom	Northing:	120.2109576

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	2.7	ALLUVIUM	SILT, [ML], very stiff, non-plastic, white, with gravel and sand, dry.	Excavated as rock.	600		Bulk x2
					700		
					800		
					900		
					1000		
2.7	EOH	REFUSAL			1100		
					1200		
					1300		
					1400		
					1500		
					1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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

TEST PIT LOG

Job No:	P02-17	Date Started:	21/11/2017
Test Pit ID:	TP 16	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6852333
Logged By:	Harvey Morcom	Northing:	120.210323

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	0.6	ALLUVIUM	gravelly SILT, [ML], very stiff, low plasticity, red brown, with gravel, dry.	Excavated as rock. Lateritic formation.	600		Bulk
					700		
					800		
					900		
					1000		
0.6	1	ALLUVIUM	SILT, [ML], very stiff, low plasticity, red brown white blend, with gravel, dry.	transition phase between soil units above and below.	1100		Bulk
					1200		
					1300		
					1400		
					1500		
1	2.8	ALLUVIUM	SILT, [ML], very stiff, non-plastic, white, with gravel and sand, dry.	Excavated as rock.	1600		Bulk
					1700		
					1800		
					1900		
					2000		
2.8	EOH	TERMINATED			2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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

TEST PIT LOG

Job No:	P02-17	Date Started:	21/11/2017
Test Pit ID:	TP 17	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6852913
Logged By:	Harvey Morcom	Northing:	120.2093694

MHA GEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy gravelly SILT, [ML], firm, non-plastic, brown grey with gravel, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	0.6	ALLUVIUM	sandy SILT, [ML], very stiff, low plasticity, yellow brown, with gravel, dry.	Yellow brown transition between topsoil and red brown silt beneath.	600		N/S
					700		
					800		
					900		
					1000		
0.6	1.2	ALLUVIUM	SILT, [ML], very stiff, low plasticity, red brown, with gravel, dry.	Cobbled, conglomertitc, contains large quartz clasts.	1100		Bulk
					1200		
					1300		
					1400		
					1500		
1.2	2.7	ALLUVIUM	SILT, [ML], very stiff, non-plastic, white, with gravel and sand, dry.	Excavated as rock.	1600		Bulk
					1700		
					1800		
					1900		
					2000		
2.7	EOH	TERMINATED			2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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
Test Pit ID:	TP 18	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6853516
Logged By:	Harvey Morcom	Northing:	120.2085011

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy SILT, [ML], firm, non-plastic, brown grey with gravel and sand, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	0.6	ALLUVIUM	sandy SILT, [ML], very stiff, low plasticity, yellow brown, with gravel, dry.	Yellow brown transition between topsoil and red brown silt beneath.	600		Bulk
					700		
					800		
					900		
					1000		
0.6	1.2	ALLUVIUM	SILT, [ML], very stiff, low plasticity, red brown, with gravel, dry.	Cobbled, conglomertitc, contains large quartz clasts.	1100		Bulk
					1200		
					1300		
					1400		
					1500		
1.2	2.8	ALLUVIUM	SILT, [ML], very stiff, non-plastic, yellow white, with gravel and sand, dry.	Excavated as rock.	1600		Bulk x2
					1700		
					1800		
					1900		
					2000		
2.8	EOH	TERMINATED			2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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
Test Pit ID:	TP 19	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6854116
Logged By:	Harvey Morcom	Northing:	120.2077879

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T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy SILT, [ML], firm, non-plastic, brown grey with gravel and sand, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	0.6	ALLUVIUM	sandy SILT, [ML], very stiff, low plasticity, white and red brown, with gravel, dry.	White and red brown transition.	600		Bulk
					700		
					800		
					900		
					1000		
0.6	2.8	ALLUVIUM	SILT, [ML], very stiff, non-plastic, white, with gravel and sand, dry.	Excavated as rock.	1100		Bulk
					1200		
					1300		
					1400		
					1500		
2.8	EOH	TERMINATED			1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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

TEST PIT LOG

Job No:	P02-17	Date Started:	21/11/2017
Test Pit ID:	TP 20	Date Finished:	21/11/2017
Contractor:	Gary	Bucket Width:	0.55m
Machine:	JCB	Easting:	-33.6854699
Logged By:	Harvey Morcom	Northing:	120.206819

MHAGEOTECHNICAL

Suite 2, 464 Murray St
Perth WA 6000 Australia
T: +61 8 6110 4768
M: +61 4 1347 4515
ABN: 53 4043 898 19
MHAGeotechnical.com.au
E: info@mhageotechnical.com.au

Depths (From)	Depths (To)	Main material	Material Description	Comments	DCP Depth (mm)	DCP Blows/100m	Laboratory Samples
0	0.2	TOPSOIL	sandy SILT, [ML], firm, non-plastic, brown grey with gravel and sand, dry.	Roots and organics.	100		N/S
					200		
					300		
					400		
					500		
0.2	0.4	ALLUVIUM	sandy SILT, [ML], very stiff, low plasticity, white brown, with gravel, dry.	Indurated, excavated as rock.	600		Bulk
					700		
					800		
					900		
					1000		
0.4	1.3	ALLUVIUM	SILT, [ML], very stiff, non-plastic, white yellow, with gravel and sand, dry.	Lateritic conglomerate.	1100		Bulk
					1200		
					1300		
					1400		
					1500		
1.3	EOH	REFUSAL			1600		
					1700		
					1800		
					1900		
					2000		
					2100		
					2200		
					2300		
					2400		
					2500		
					2600		
					2700		
					2800		
					2900		
					3000		

NOTES AND COMMENTS

Many small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m and few small (1 - 2 mm) / medium (2 - 10 mm) / large (>10 mm) roots to _____ m.

Groundwater recorded at _____ m on the ____/____/____.

Co-ordinate System:_____, Zone: _____.

Origin	Soil Name	Group	Consistency	Plasticity/Grain size	Colour	With/Trace	Moisture
TOPSOIL	Primary	Pt	Fine Grain:	Fine grain:	red	clay	dry
CONCRETE	PEAT	OH	very soft	non-plastic	orange	silt	dry to moist
BITUMEN	CLAY	OL	soft	low plasticity	yellow	sand	moist
FILL	SILT	CH	firm	low - medium	brown	gravel	wet
BASSENDEAN SAND	SAND	CL	stiff	medium plasticity	purple	cobbles	moist to wet
SAND FROM TAMALA LST	GRAVEL	MH	very stiff	medium to high	green	OM	saturated
TAMALA LST	COBBLES	ML	hard	high plasticity	white	BR	
GUILDFORD FORMATION	BOULDERS	SW	Coarse Grain:	Coarse Grain:	cream	Fines:	
ALLUVIUM	Scondary:	SP	very loose	Fine	grey	<=15% "Trace"	
COLLUVIUM	clayey	SC	loose	Medium	black	15-30% "With"	
AEOLIAN	silty	SM	medium dense	Coarse Grain:	blue	>30% "Secondary"	
SWAMP DEPOSIT	sandy	GW	dense	Additional:	Additional:	Coarse:	
LATERITE	gravelly	GP	very dense	Unifor, gap graded, poorly graded. Rounded, sub rounded, sub angular, angular, flaky, platy	Can be modified using pale, dark and motled	<=5% "Trace"	
	cobbly	GC				5-12% "With"	
	bouldery	GM				>12% "Secondary"	

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

Appendix C

Field Permeability Test Results

Summary of Field Falling Head Tests									
Site/Location: ACH Minerals - Ravensthorpe Gold Project - Tailings Storage Facility									
Number	Saturation	Location (Decimal Degrees)		Date	Time	Time Interval	Water Level	h	k
		Latitude	Longitude						
		(mE)	(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	0.110					
			Surface Area of base	0.0095					
								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	2.6E-05
		Test Column	Depth	0.600	6:52:00	383400	-0.175	-0.1100	1.0E-07
			Diameter	0.110					
			Surface Area of base	0.0095					
								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	0.600	10:27:00	476220	-0.075	-0.0050	1.8E-06
			Diameter	0.110					
			Surface Area of base	0.0095					
								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	0.400					
			Diameter	0.110					
			Surface Area of base	0.0095					
								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	0.110					
			Surface Area of base	0.0095					
								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	0.110					
			Surface Area of base	0.0095					
								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	0.110					
			Surface Area of base	0.0095					
								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	0.110					
			Surface Area of base	0.0095					
								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
			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					
			Surface Area of base	0.0095					
								Ave	#REF!
	Saturated			Tuesday, 21 November 2017	7:19:00	0	-0.172	#REF!	-
				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
			Diameter	0.110					

			Surface Area of base	0.0095					
								Ave	3.02E-05
TP 16-17	Unsaturated			Tuesday, 21 November 2017	12:51:00	0	-0.040	-0.040	-
				Temperature: 36°C	14:02:00	4260	-0.110	-0.0700	1.4E-05
		Test Column	Depth	0.600	14:15:00	5040	-0.125		3.6E-04
			Diameter	0.110	16:40:00	14340	-0.201		6.0E-06
			Surface Area of base	0.0095					
								Ave	1.27E-04
	Partially Saturated			Tuesday, 21 November 2017	16:40:00	0	-0.037	-0.037	-
				Temperature: 36°C	18:18:00	5880	-0.080	-0.0430	1.7E-05
		Test Column	Depth	0.600	7:15:00	52860	-0.290	-0.2100	4.3E-07
			Diameter	0.110					
			Surface Area of base	0.0095					
								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	2.9E-05
			Diameter	0.110					
			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

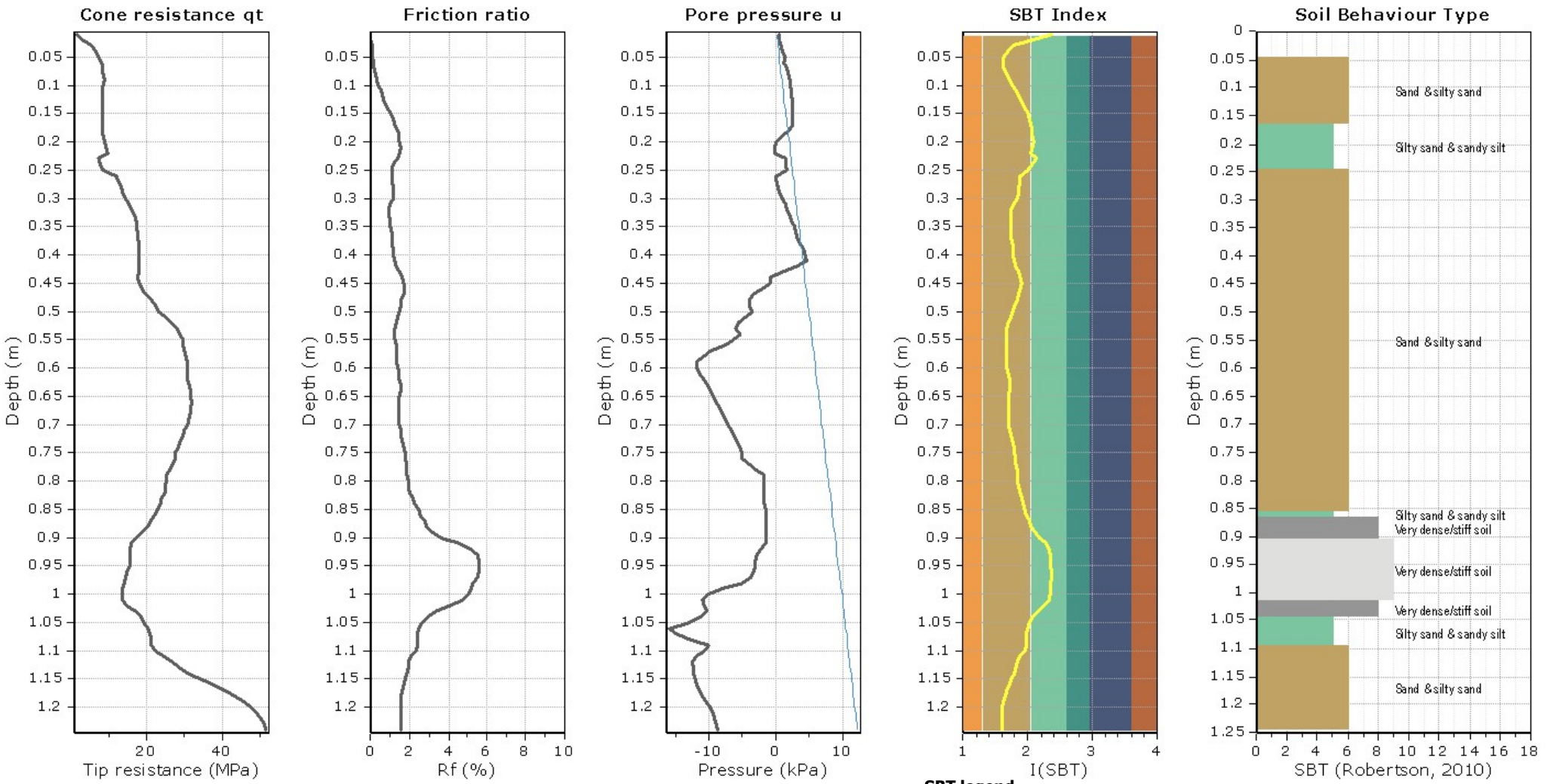
Appendix D

CPT Results

MHA Geotechnical
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



MHA Geotechnical
Suite 2, 464 Murray St PERTH
T: +61 8 6110 4768
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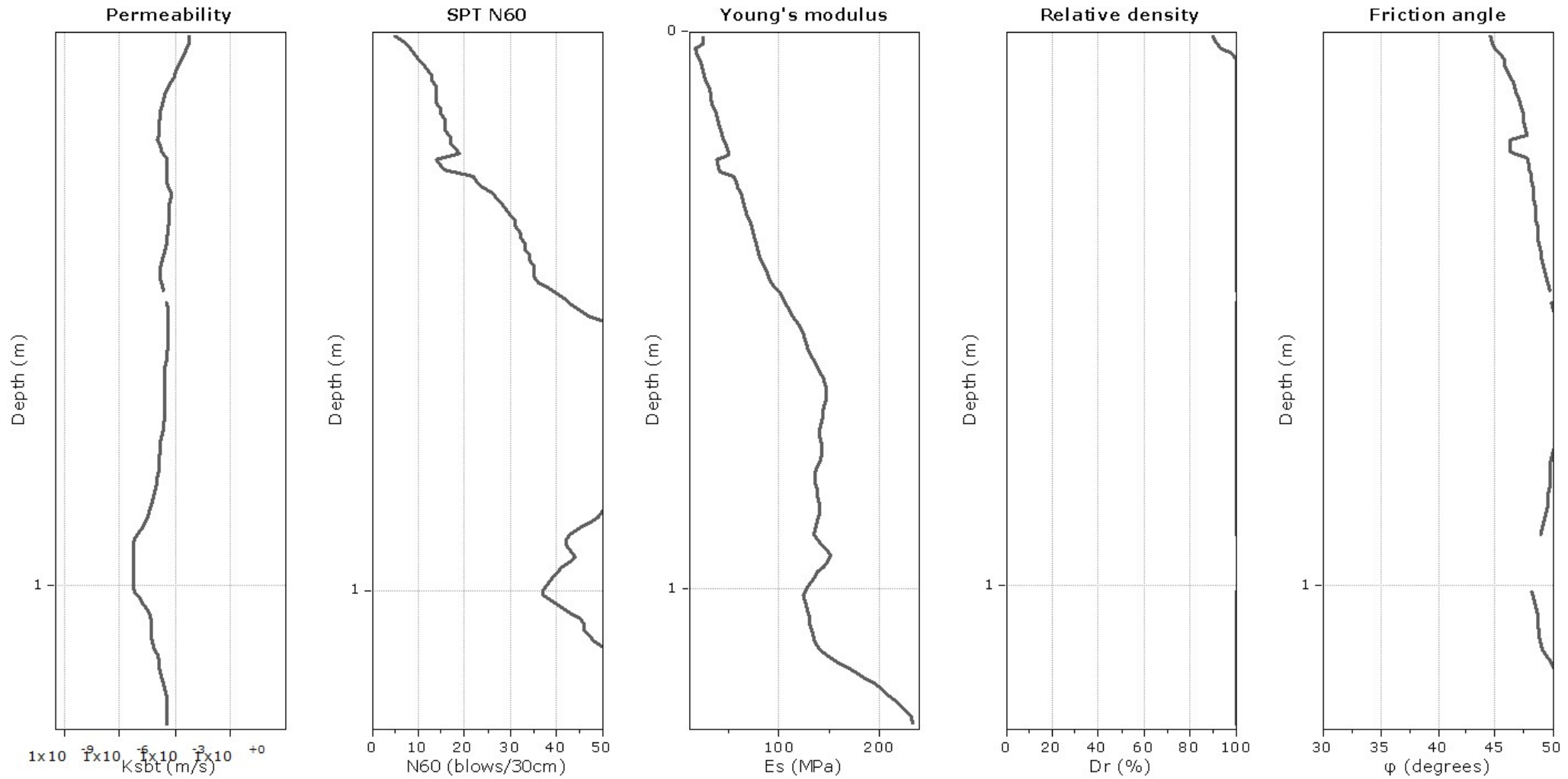
Project:
Location:

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_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

MHA Geotechnical
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T: +61 8 6110 4768
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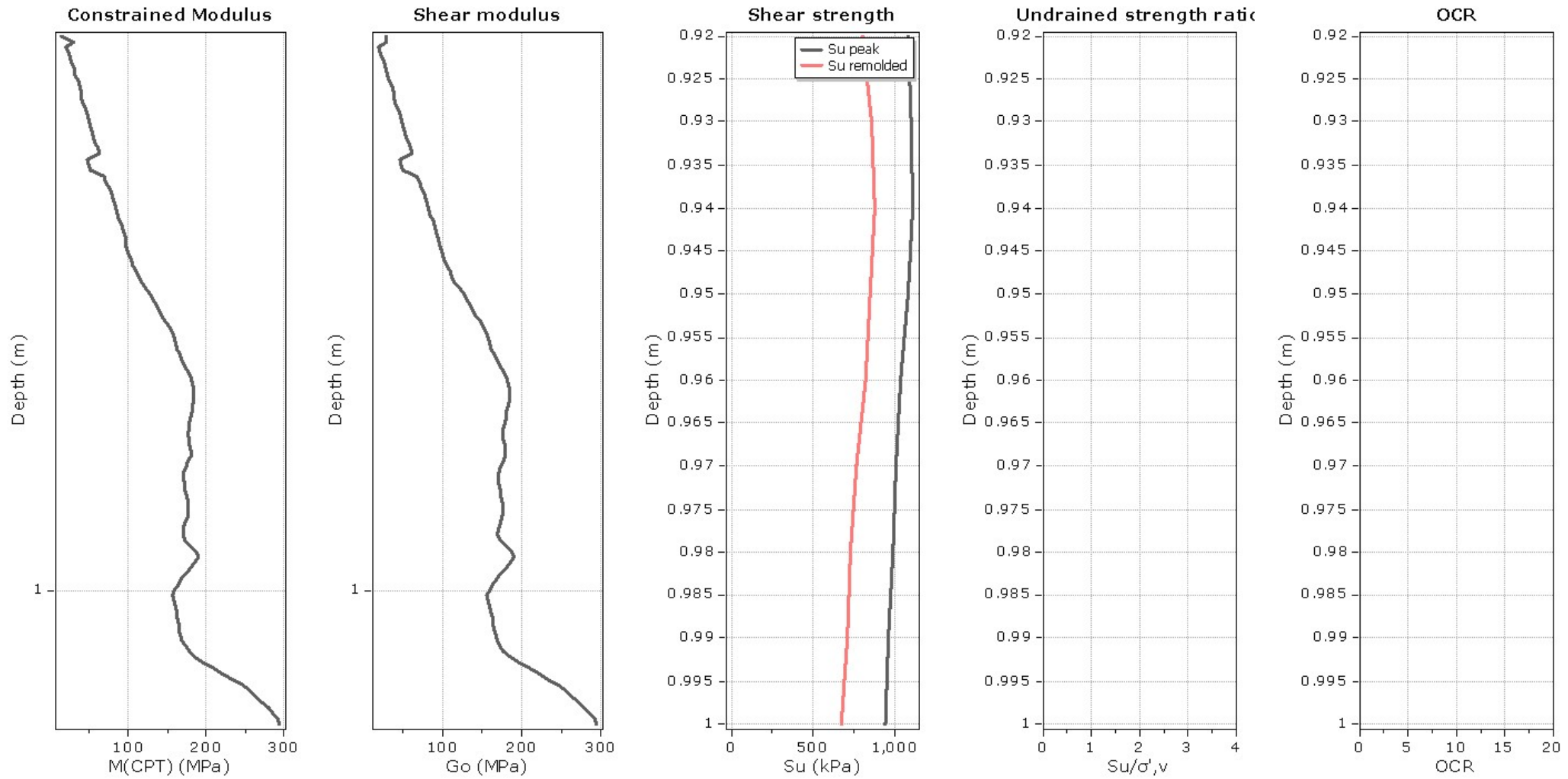
Project:
Location:

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

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
Flat Dilatometer Test data

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Suite 2, 464 Murray St PERTH
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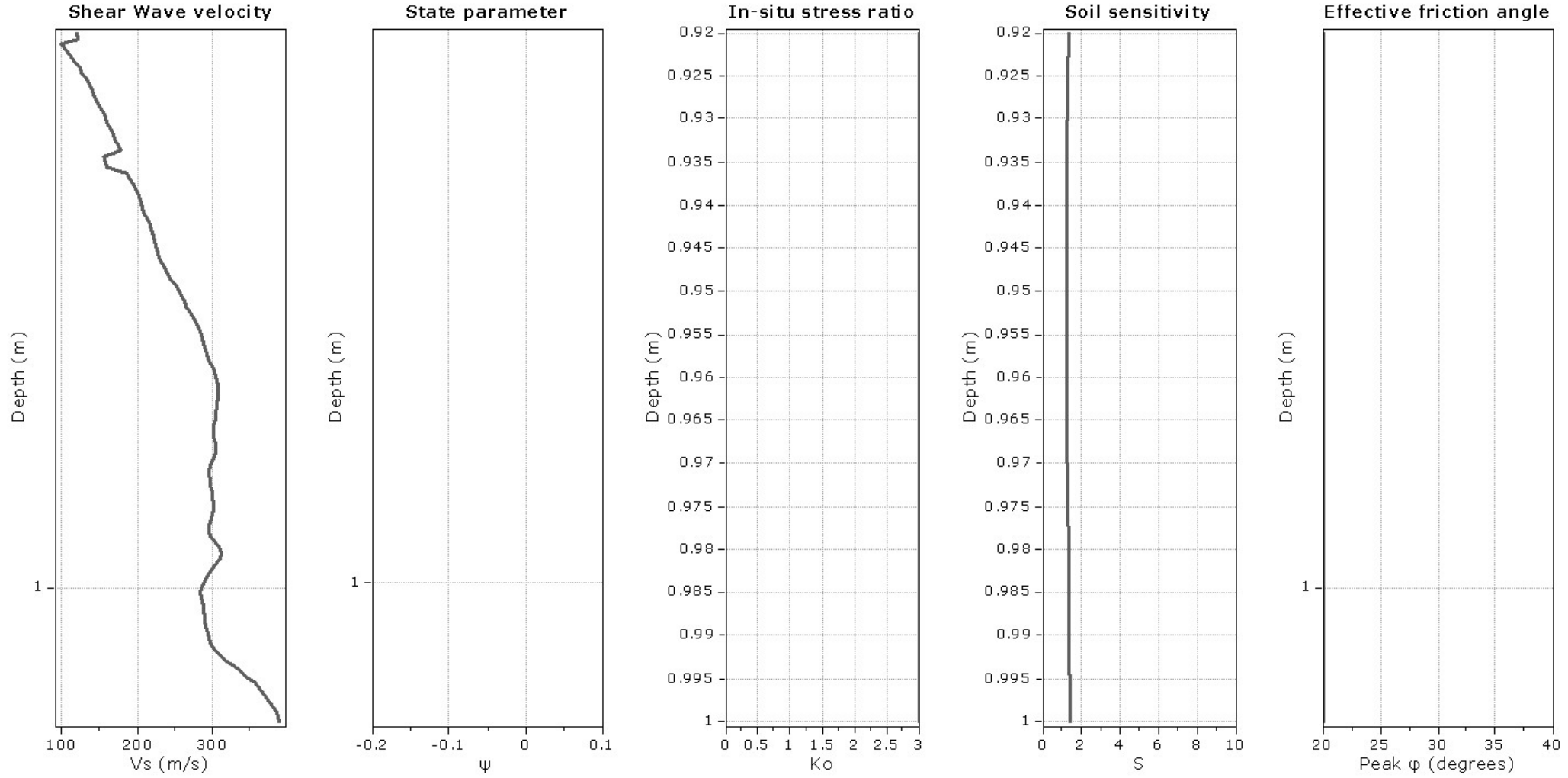
Project:
Location:

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_S: 7.00
User defined estimation data

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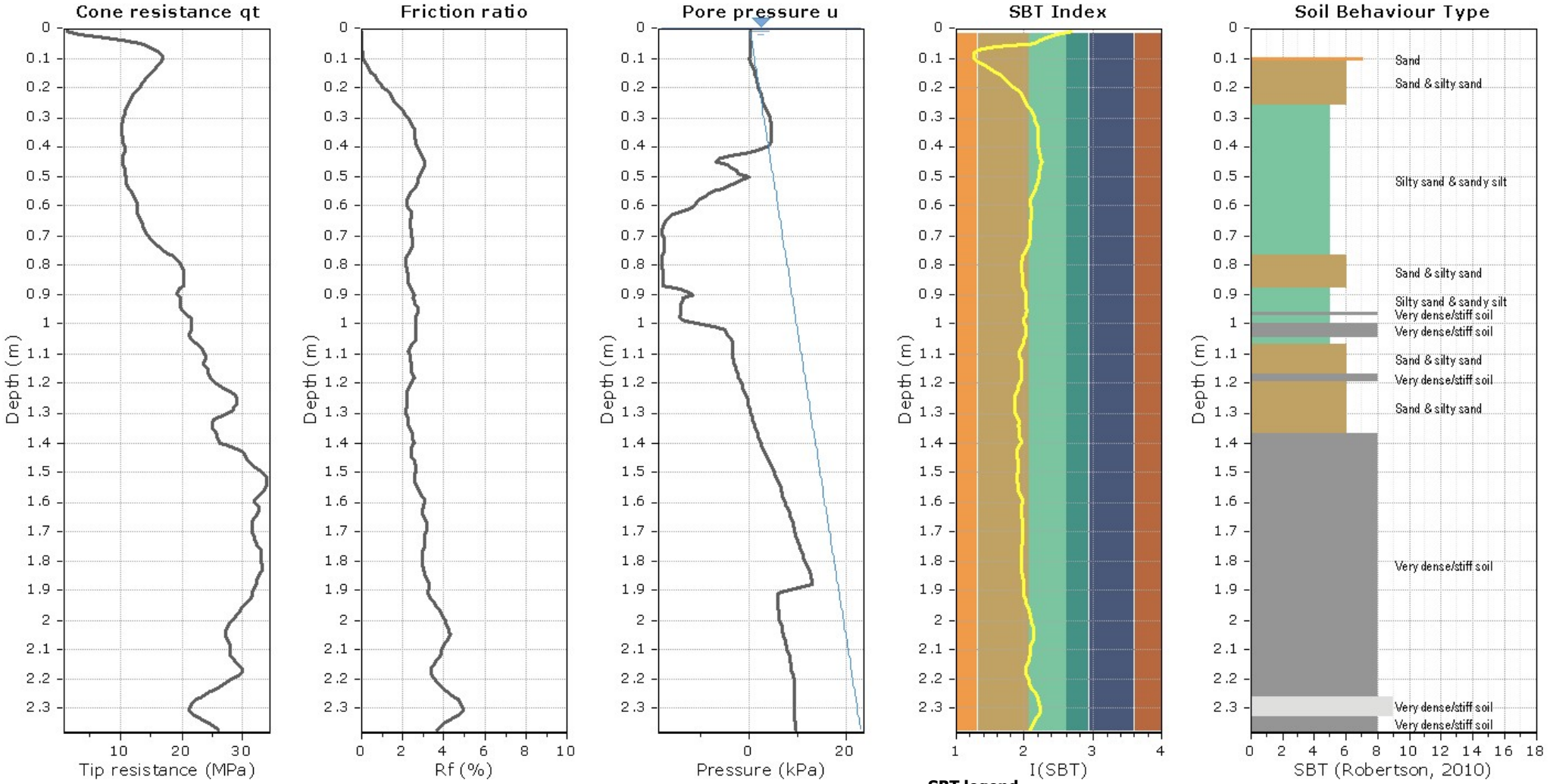
Project:
Location:

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



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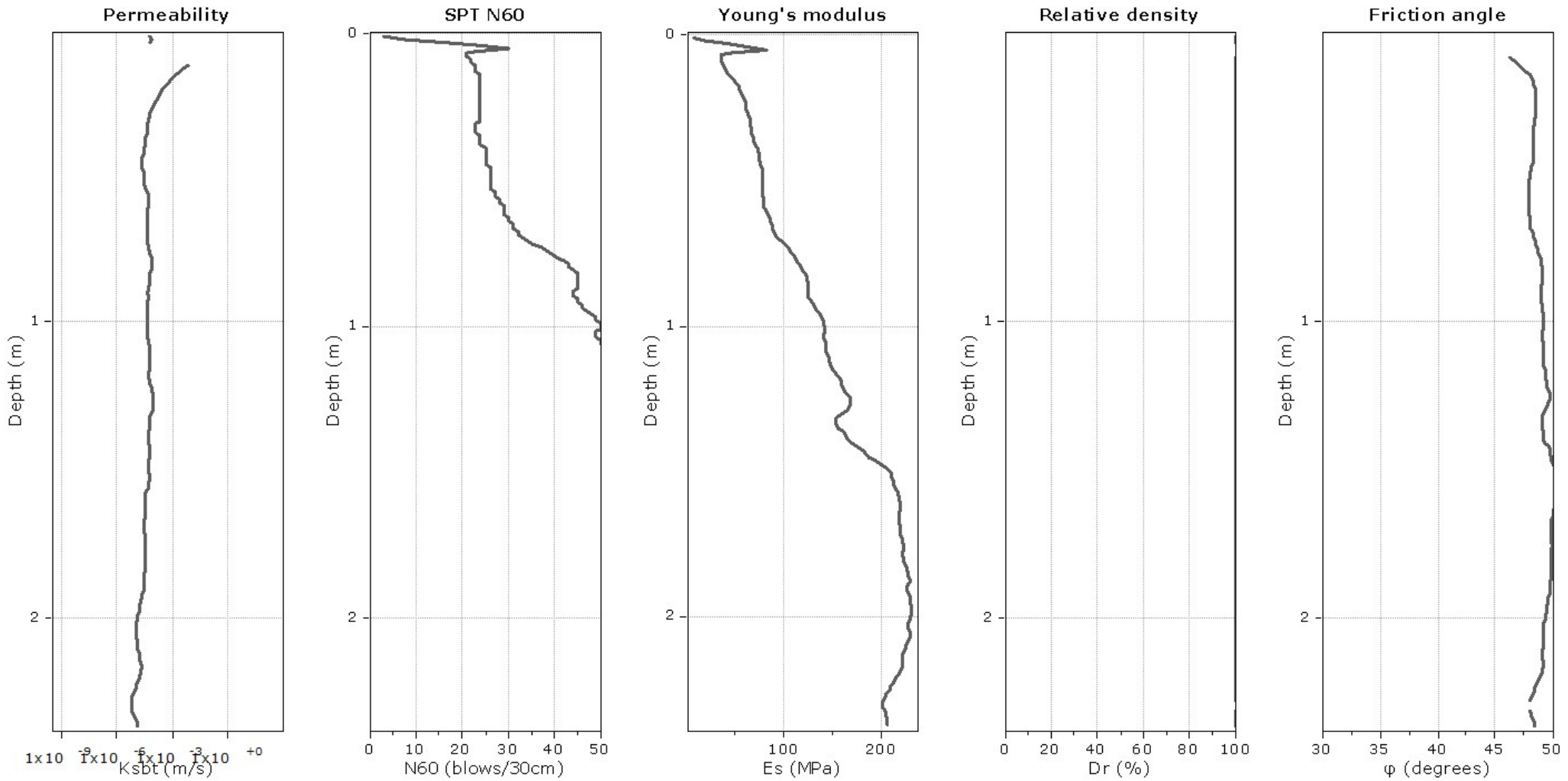
Project:
Location:

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

MHA Geotechnical
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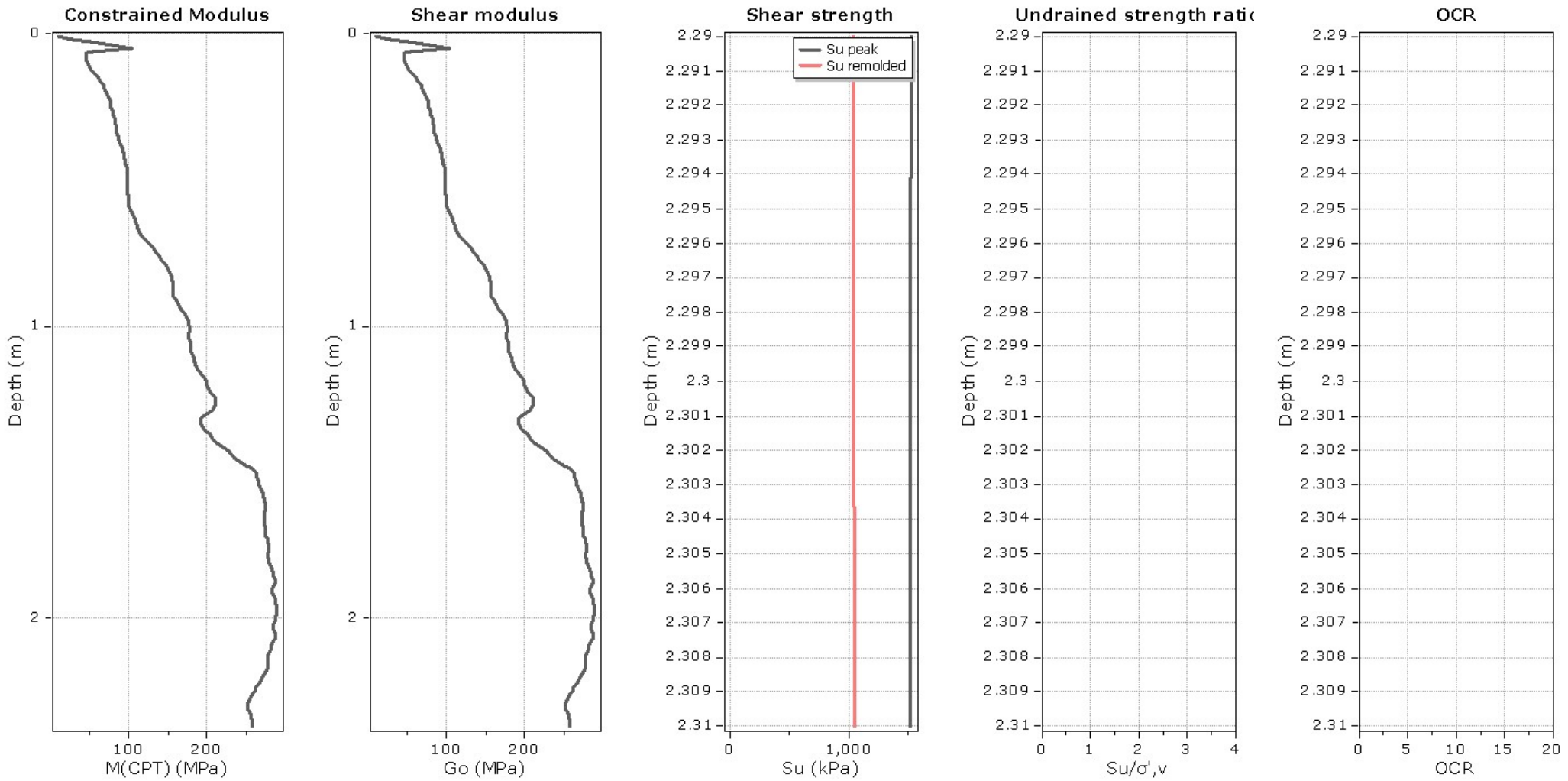
Project:
Location:

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



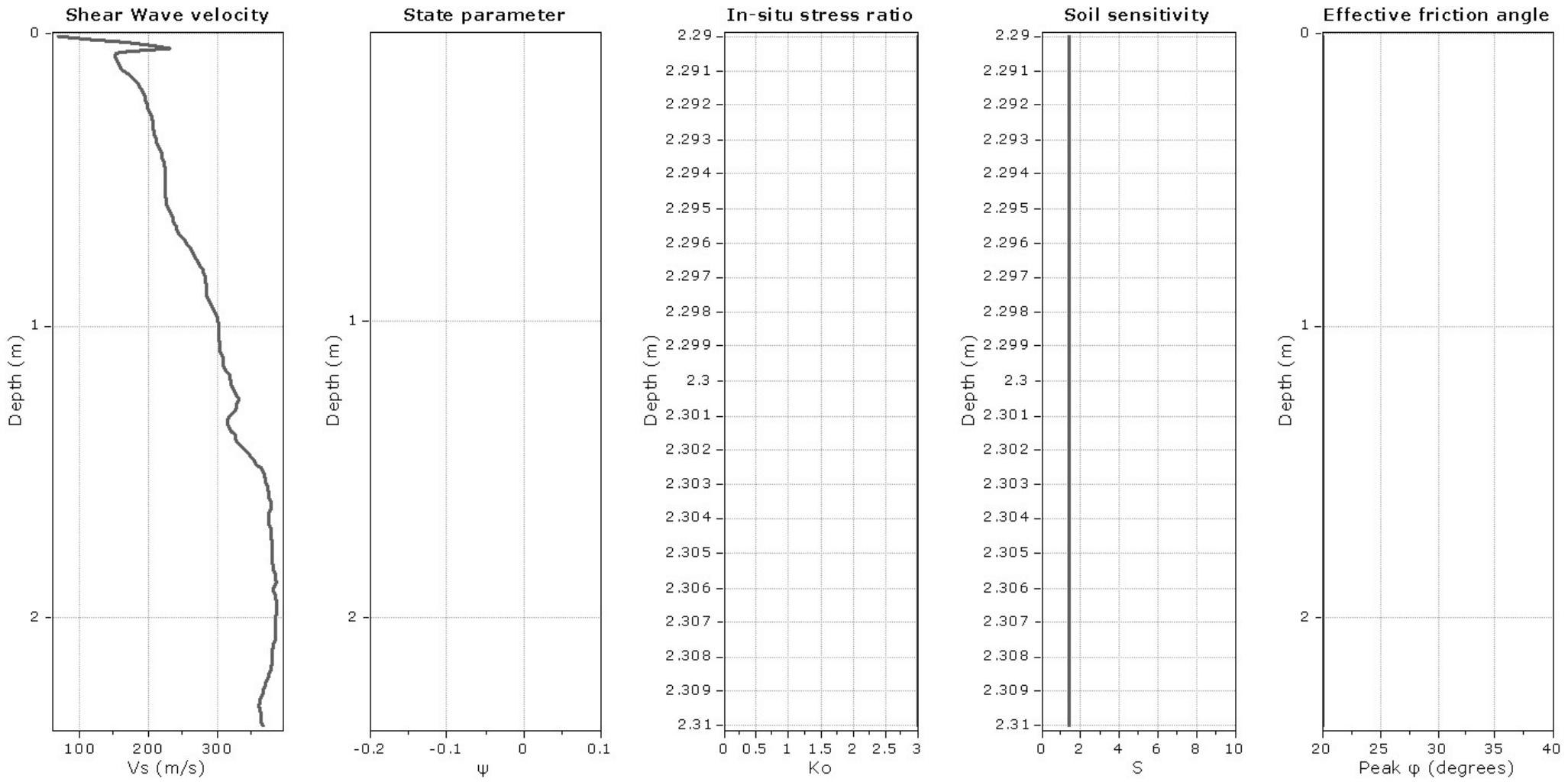
Calculation parameters

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
Flat Dilatometer Test data

MHA Geotechnical
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



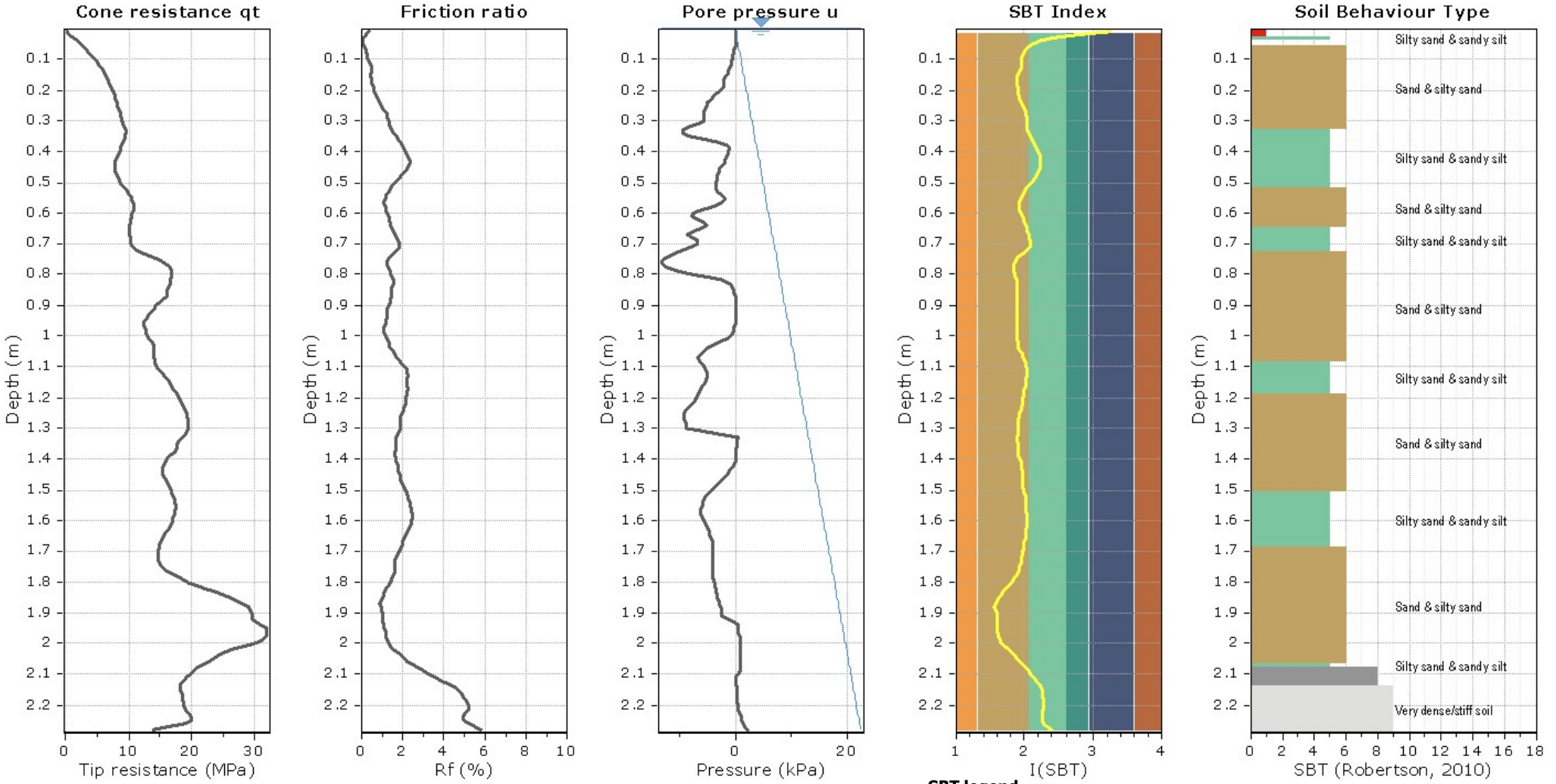
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

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

Project:
Location:

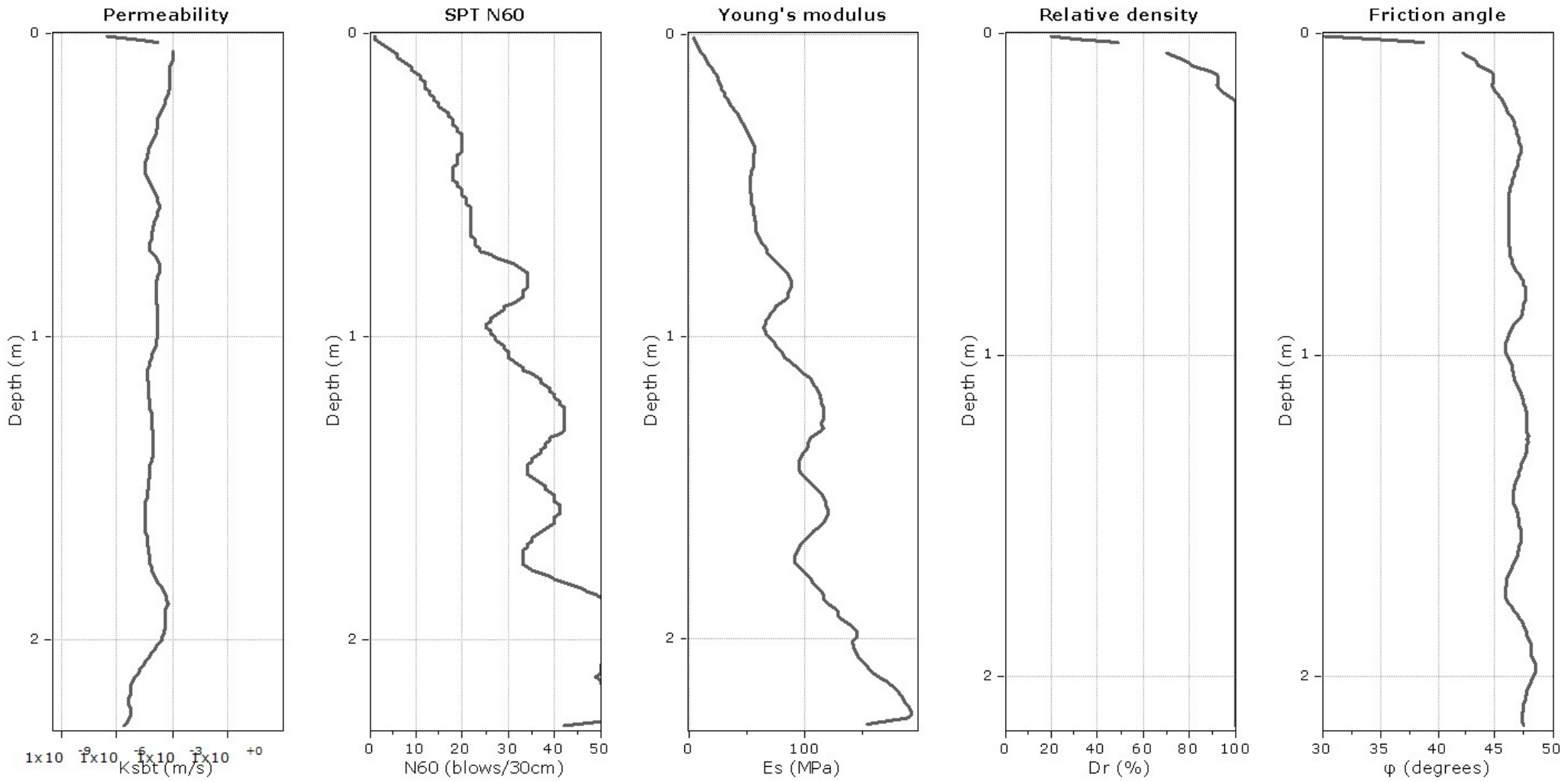
CPT: CPT 12
Total depth: 2.28 m, Date: 4/12/2017
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown



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

Project:
Location:

CPT: CPT 12
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



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

MHA Geotechnical
Suite 2, 464 Murray St PERTH
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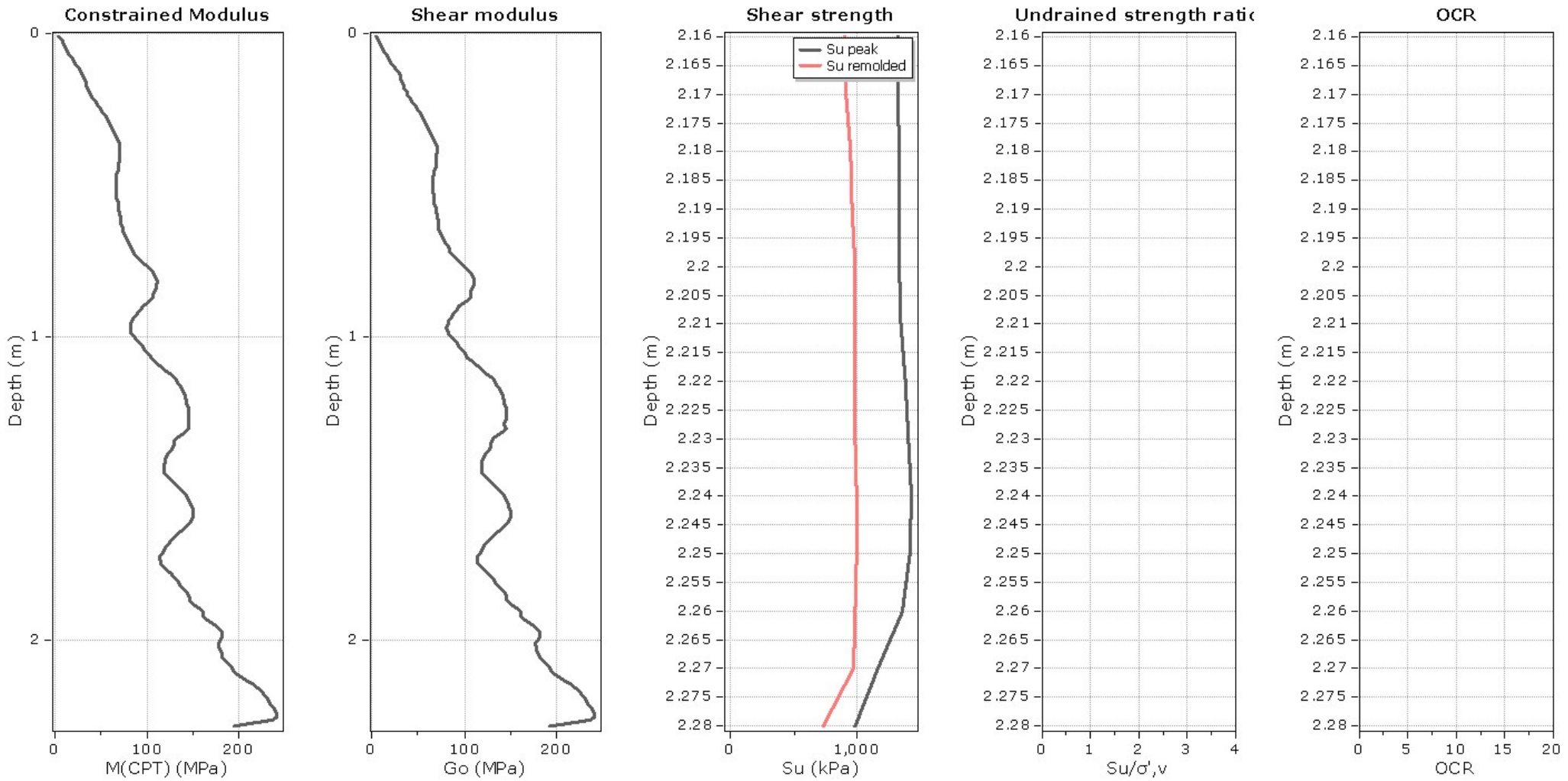
www.mhageotechnical.com.au

Project:
Location:

CPT: CPT 12
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



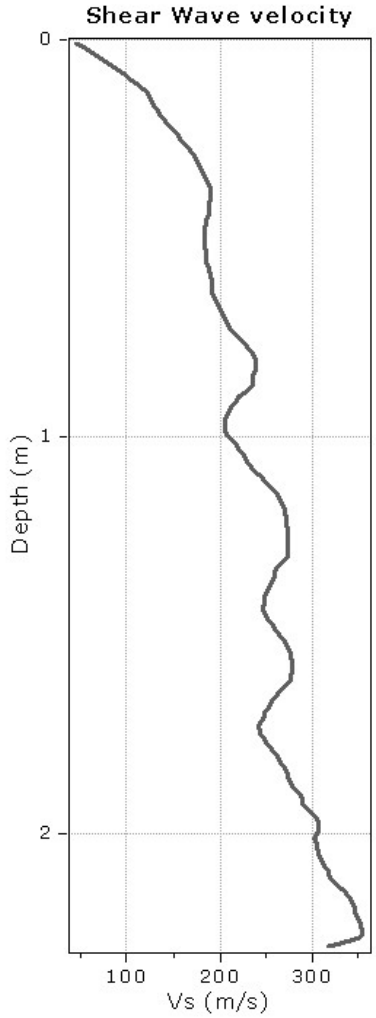
Calculation parameters

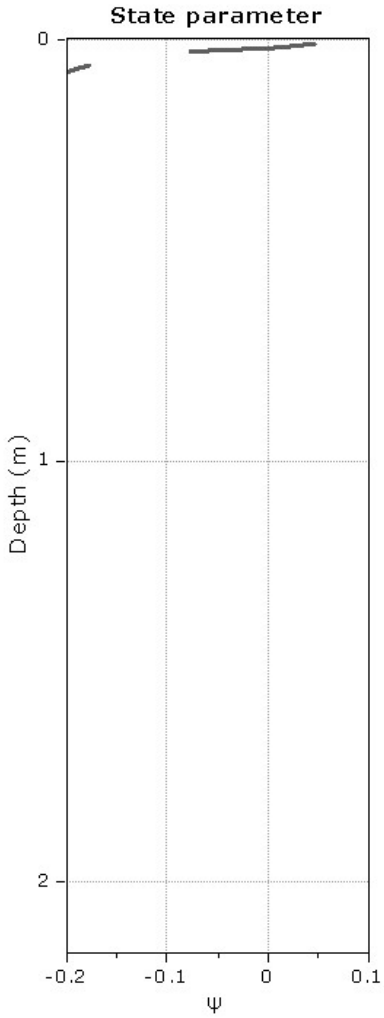
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
User defined estimation data
Flat Dilatometer Test data

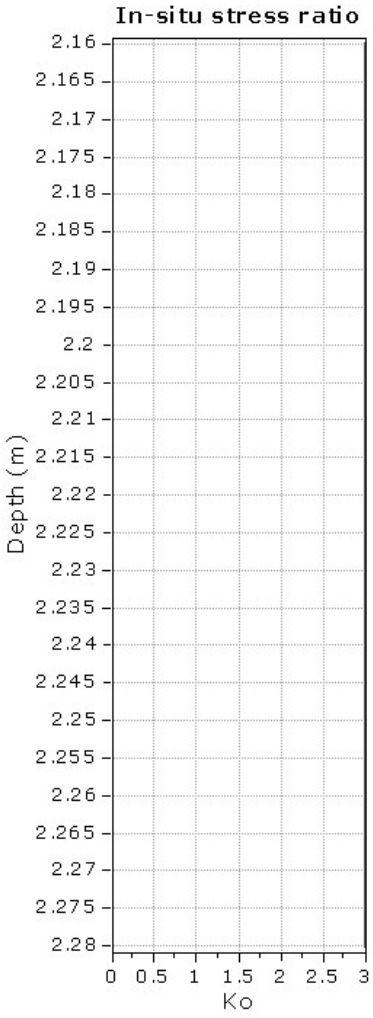
MHA Geotechnical
Suite 2, 464 Murray St PERTH
T: +61 8 6110 4768
www.mhageotechnical.com.au

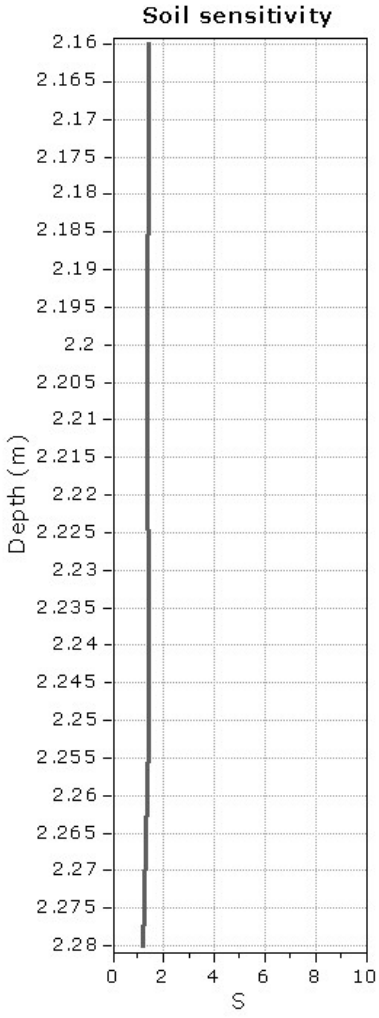
Project:
Location:

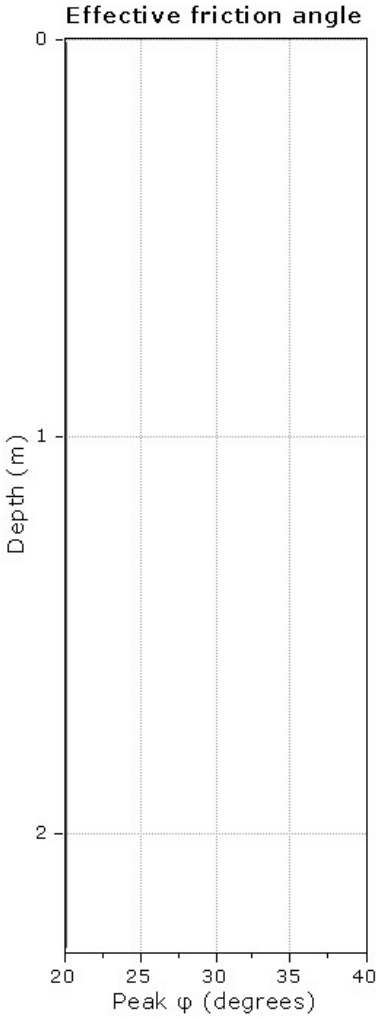
CPT: CPT 12
Total depth: 2.28 m, Date: 4/12/2017
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown











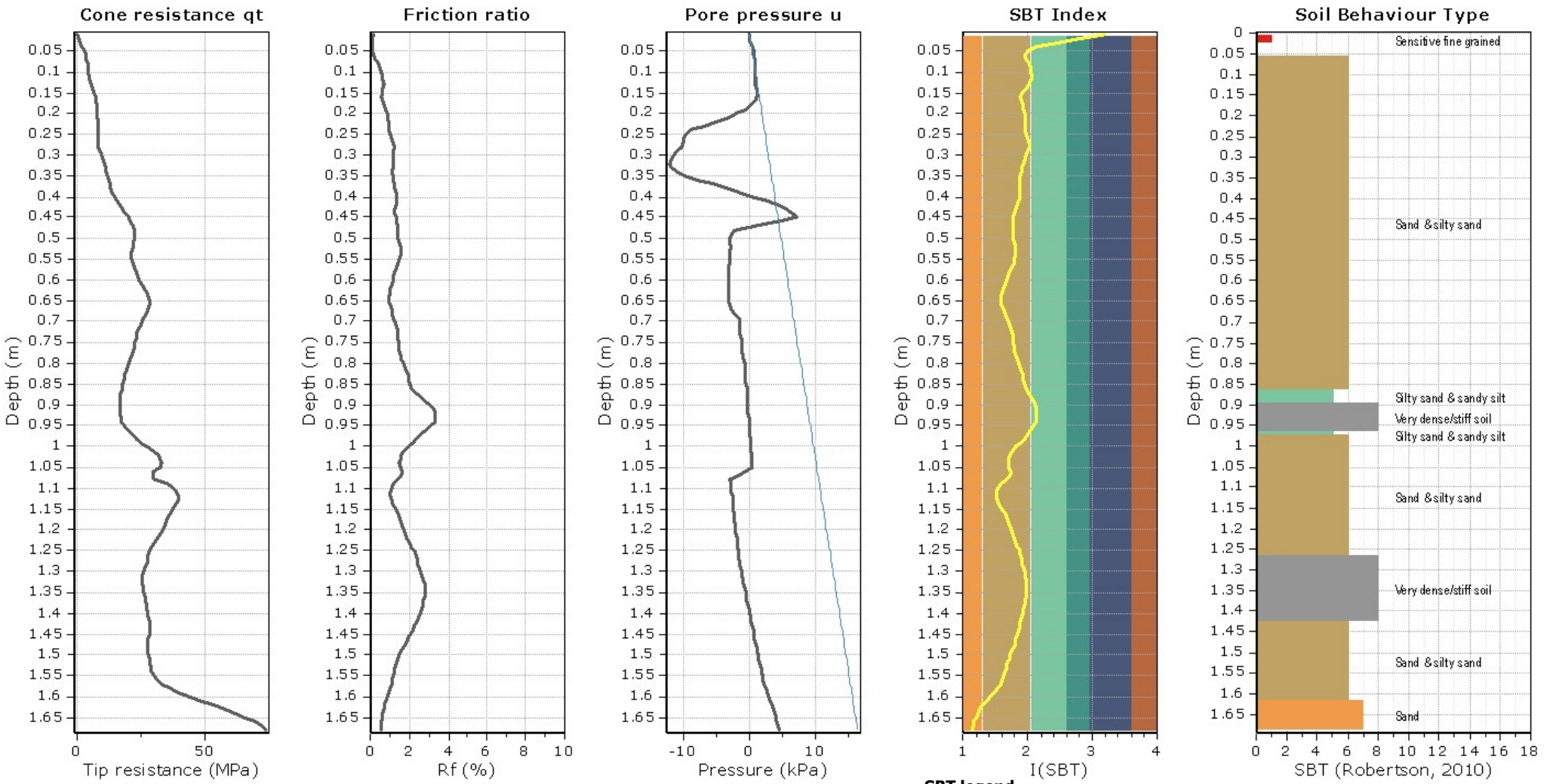
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

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

Project:
Location:

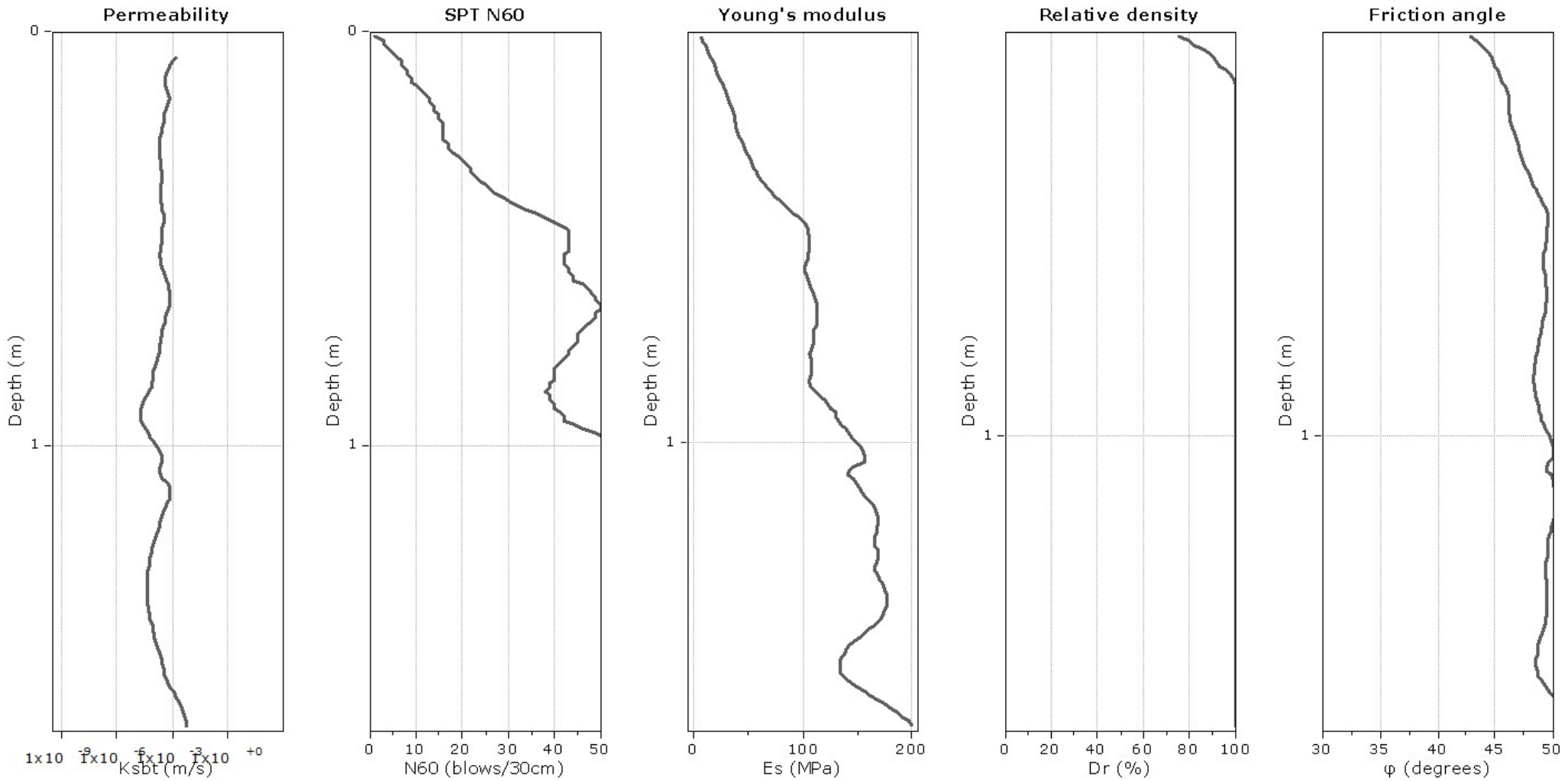
CPT: CPT 12B
Total depth: 1.68 m, Date: 4/12/2017
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown



MHA Geotechnical
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_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)
User defined estimation data

MHA Geotechnical
Suite 2, 464 Murray St PERTH
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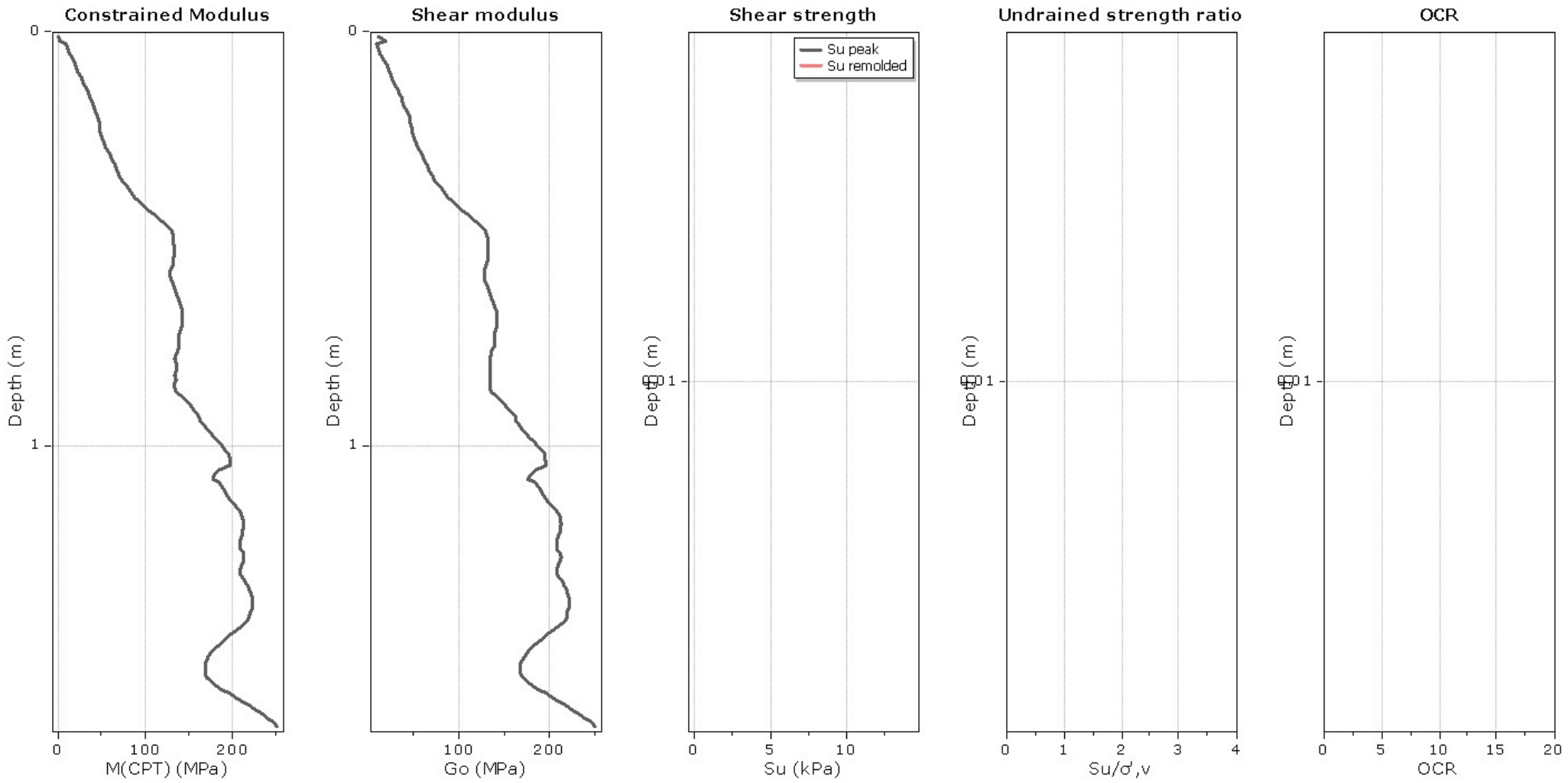
www.mhageotechnical.com.au

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



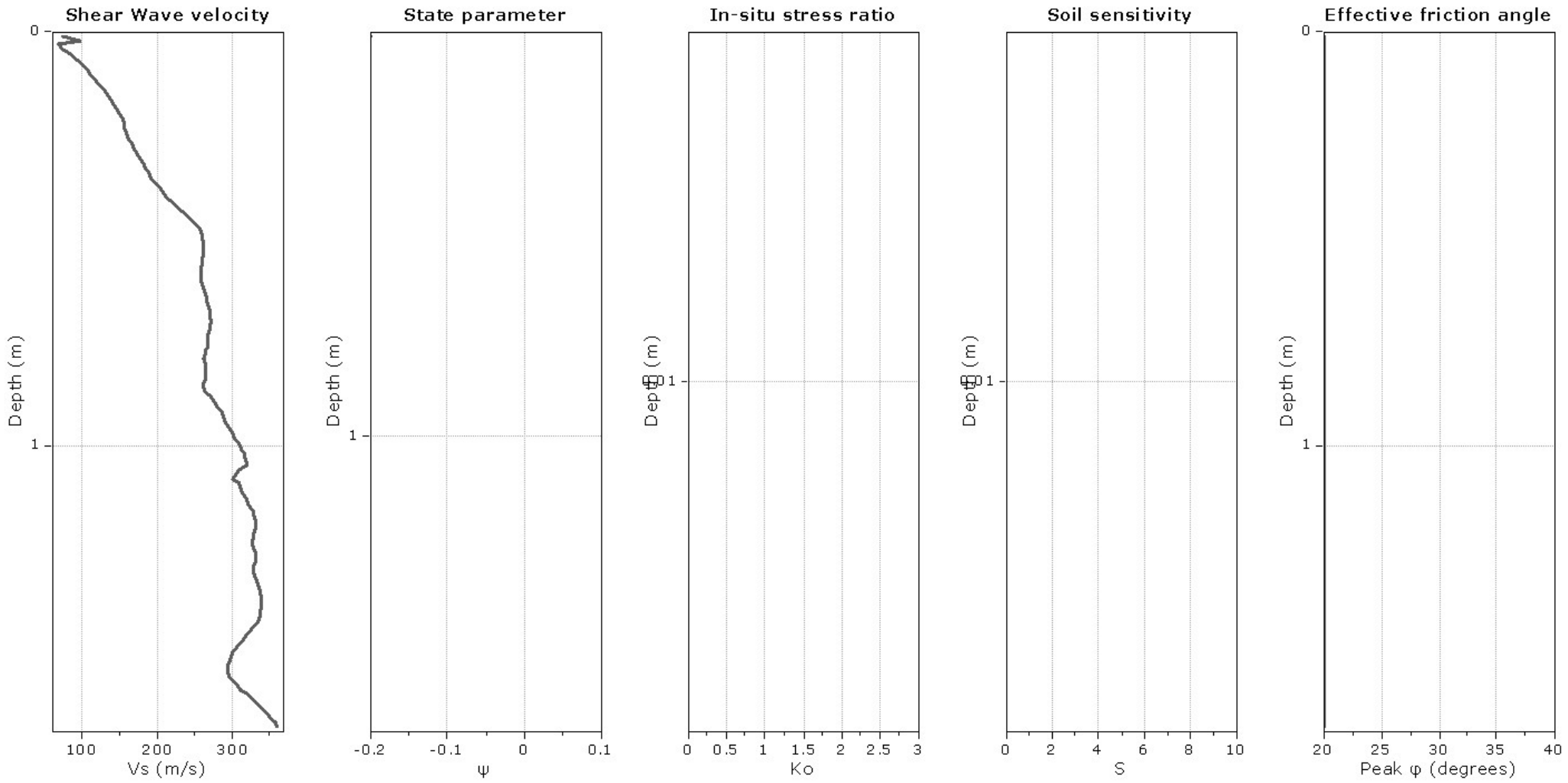
Calculation parameters

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
Flat Dilatometer Test data

MHA Geotechnical
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



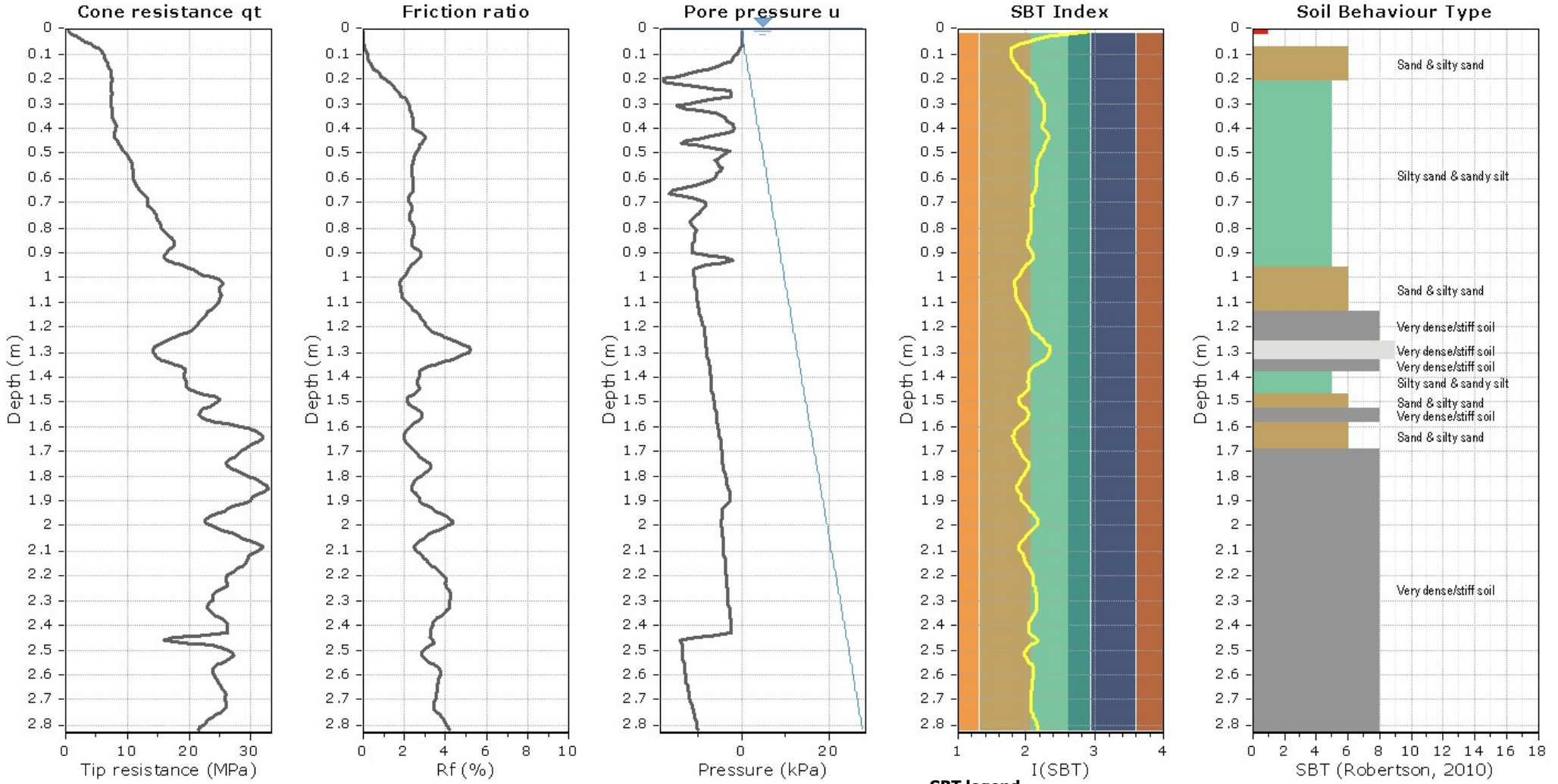
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

MHA Geotechnical
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



MHA Geotechnical
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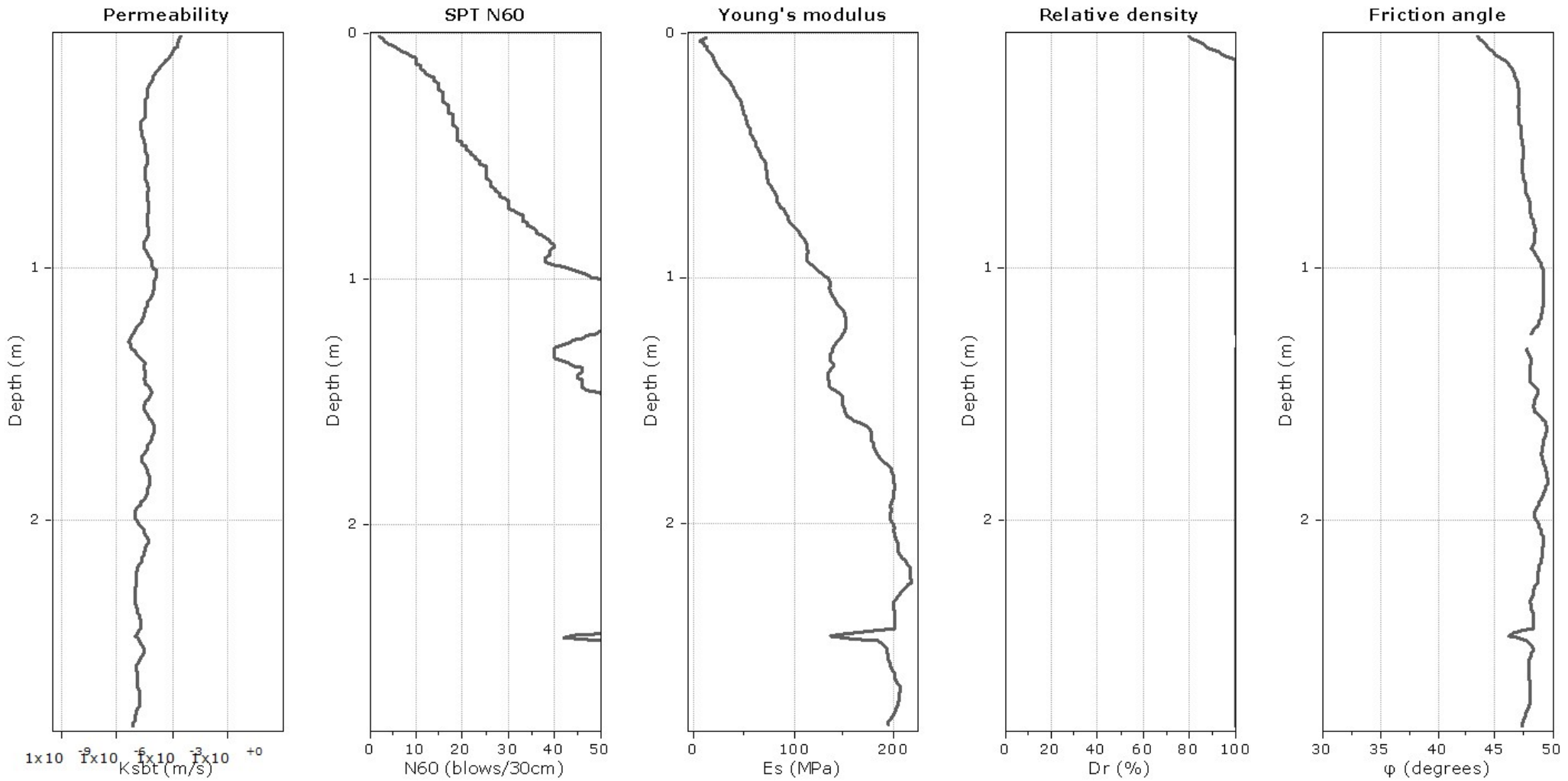
www.mhageotechnical.com.au

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

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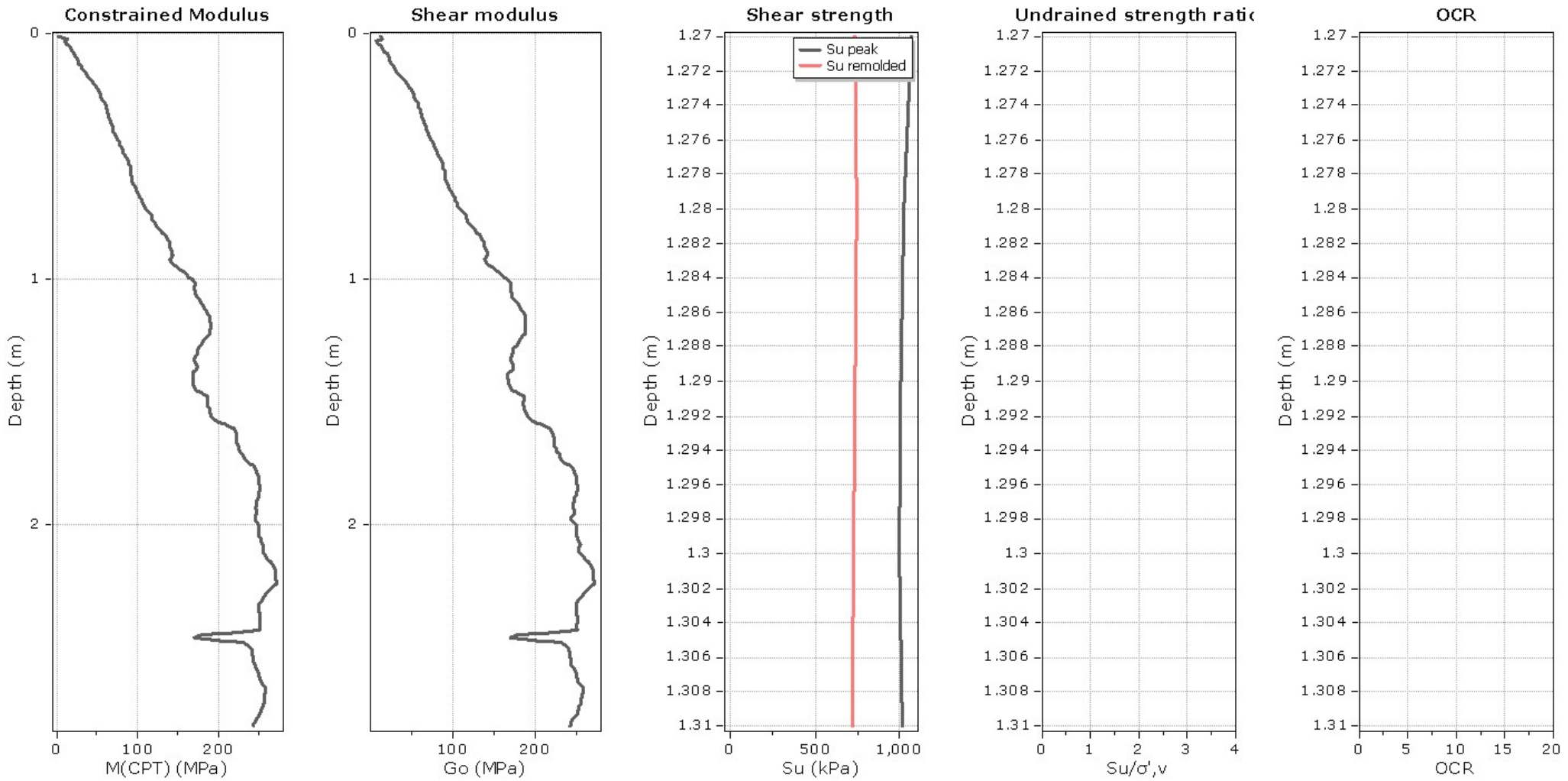
Project:
Location:

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



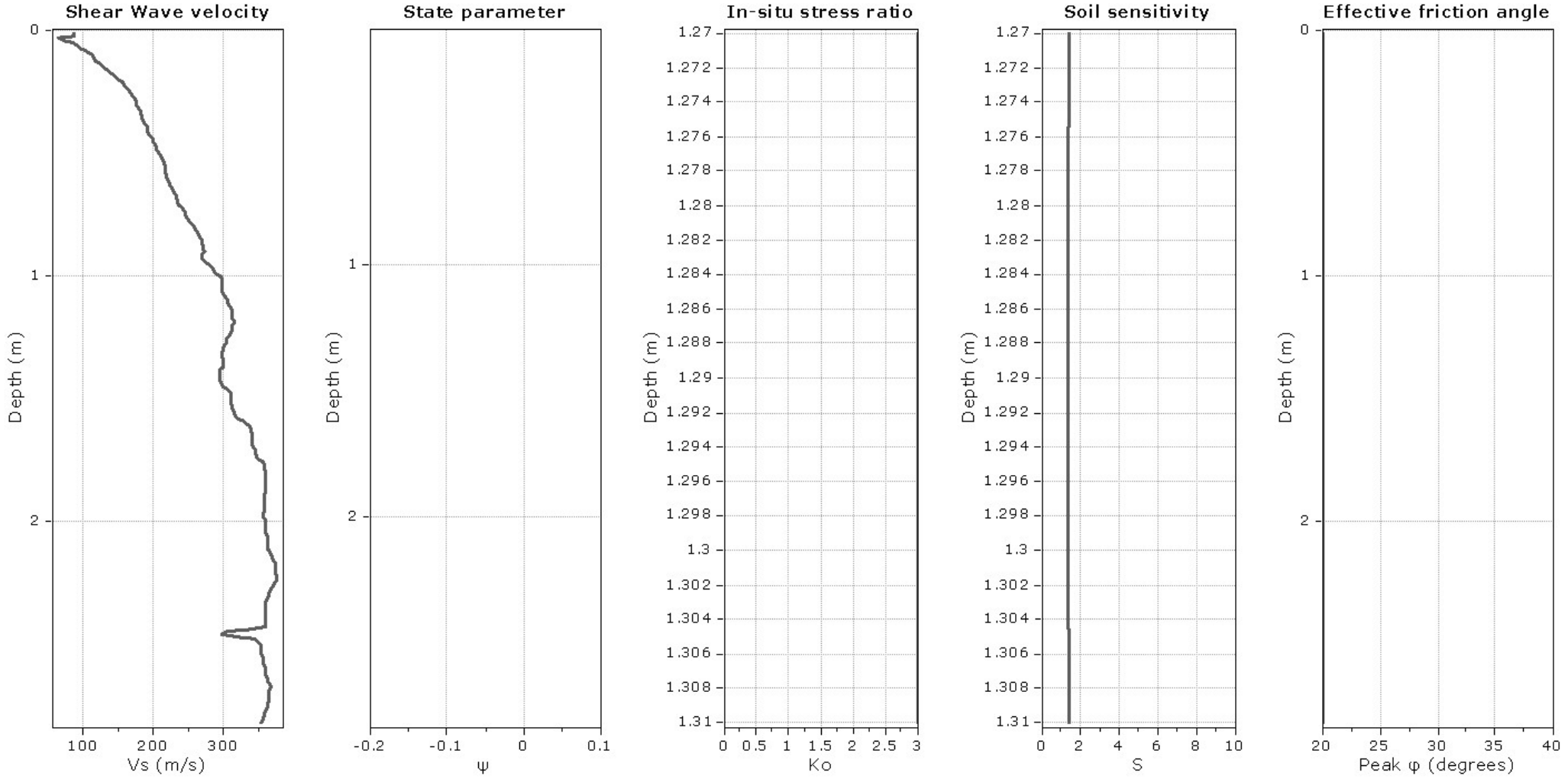
Calculation parameters

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
Flat Dilatometer Test data

MHA Geotechnical
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



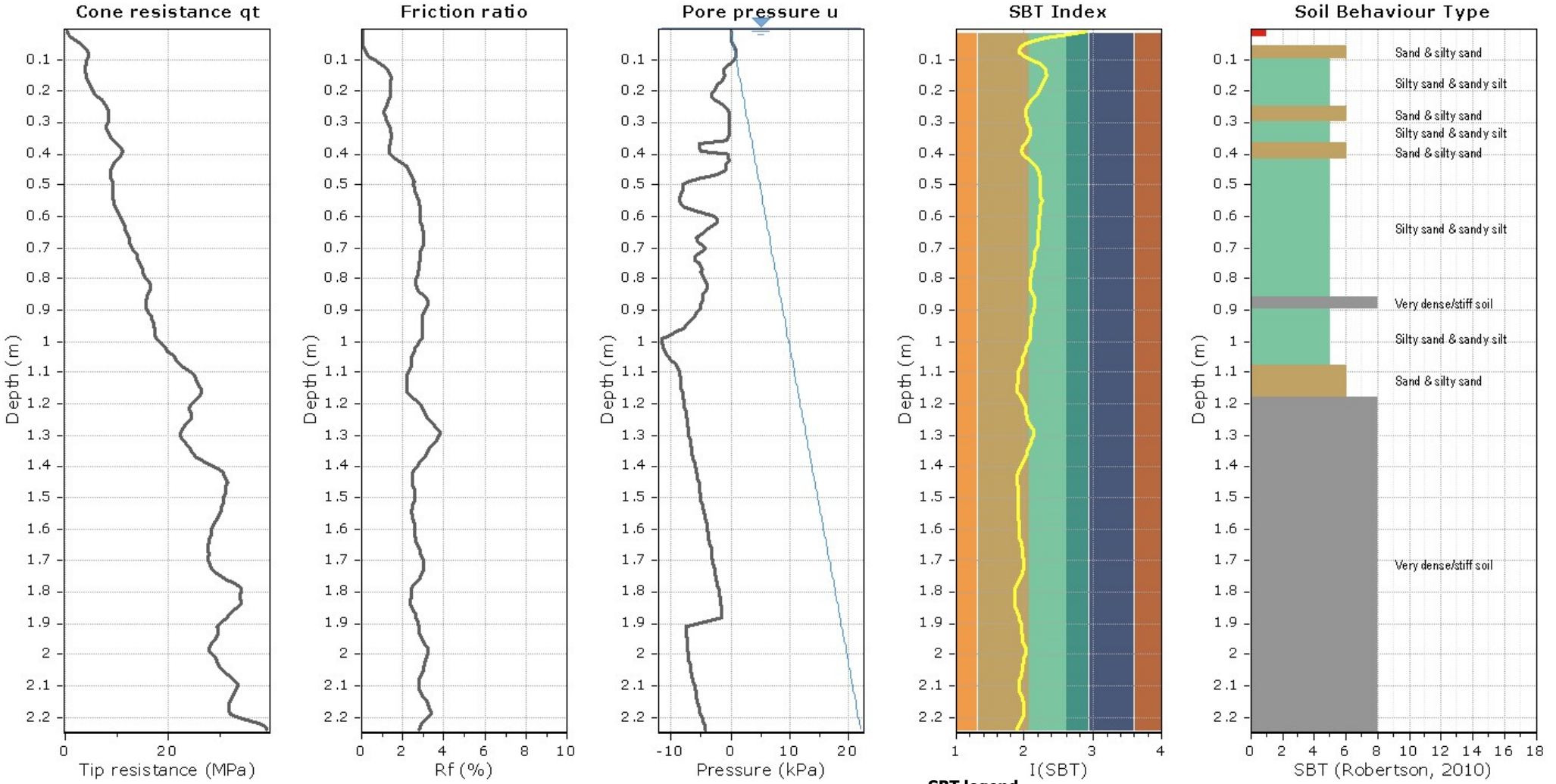
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

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

Project:
Location:

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
Cone Operator: Uknown



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

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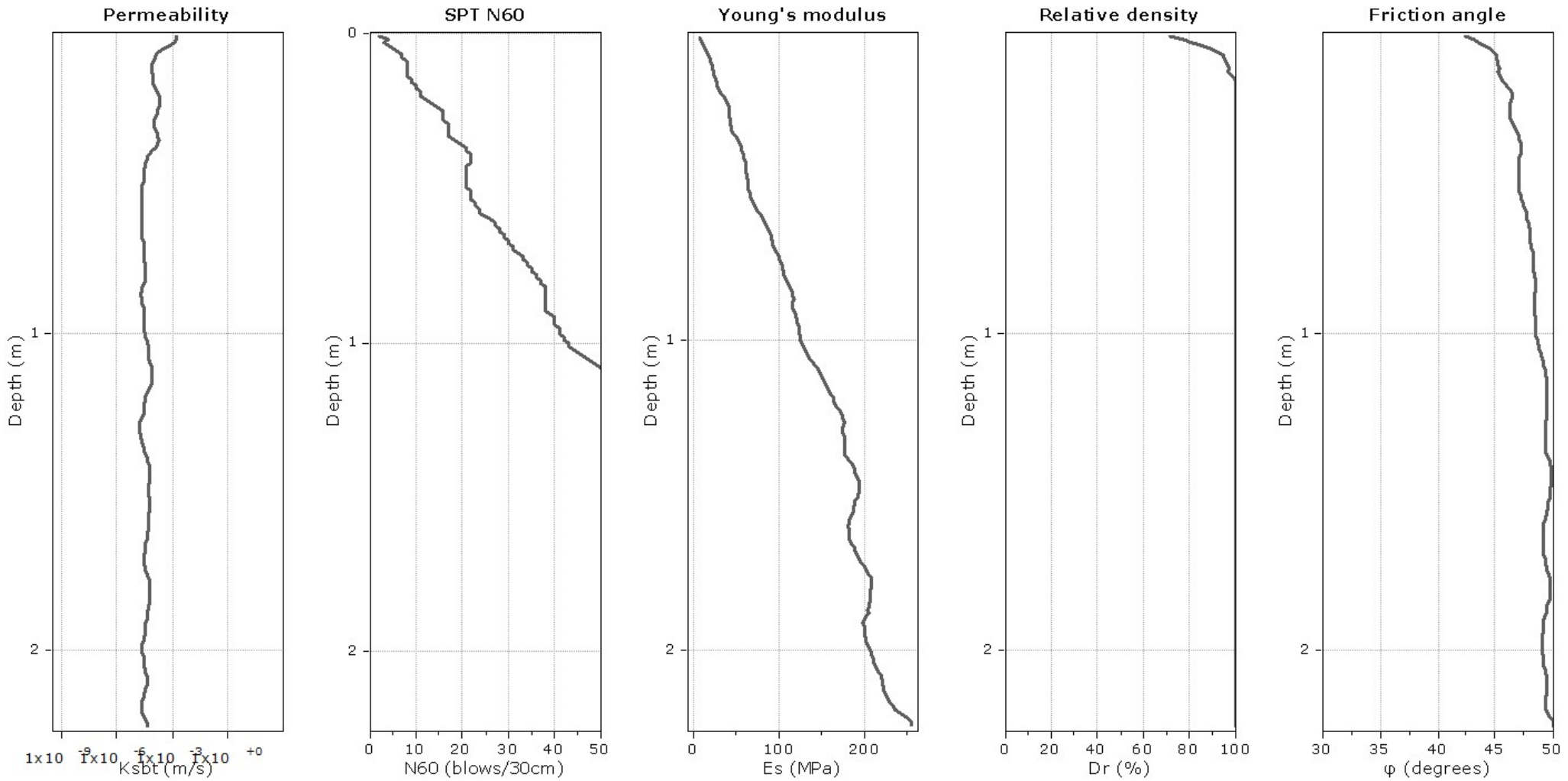
Project:
Location:

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
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

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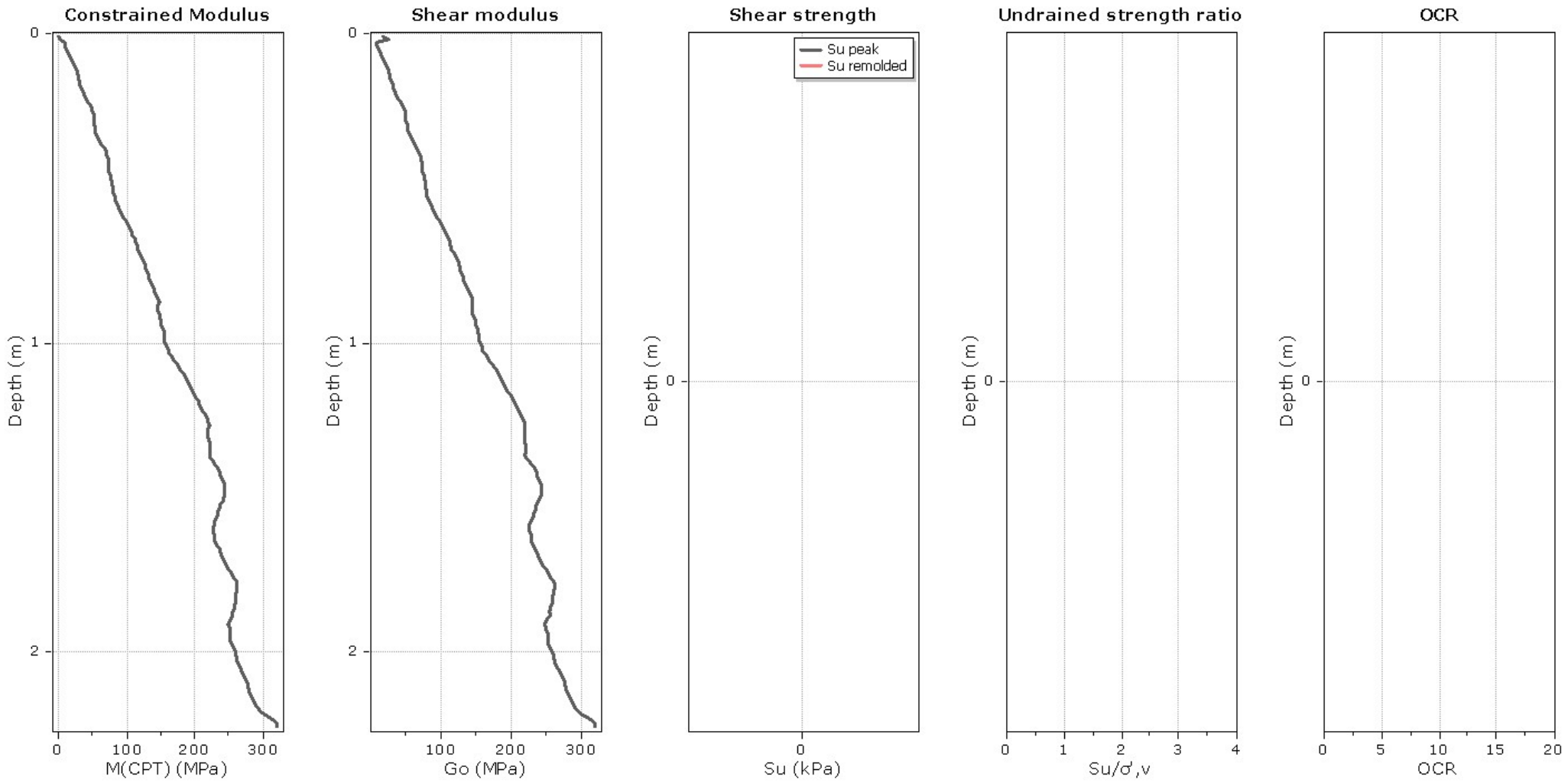
Project:
Location:

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
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
Flat Dilatometer Test data

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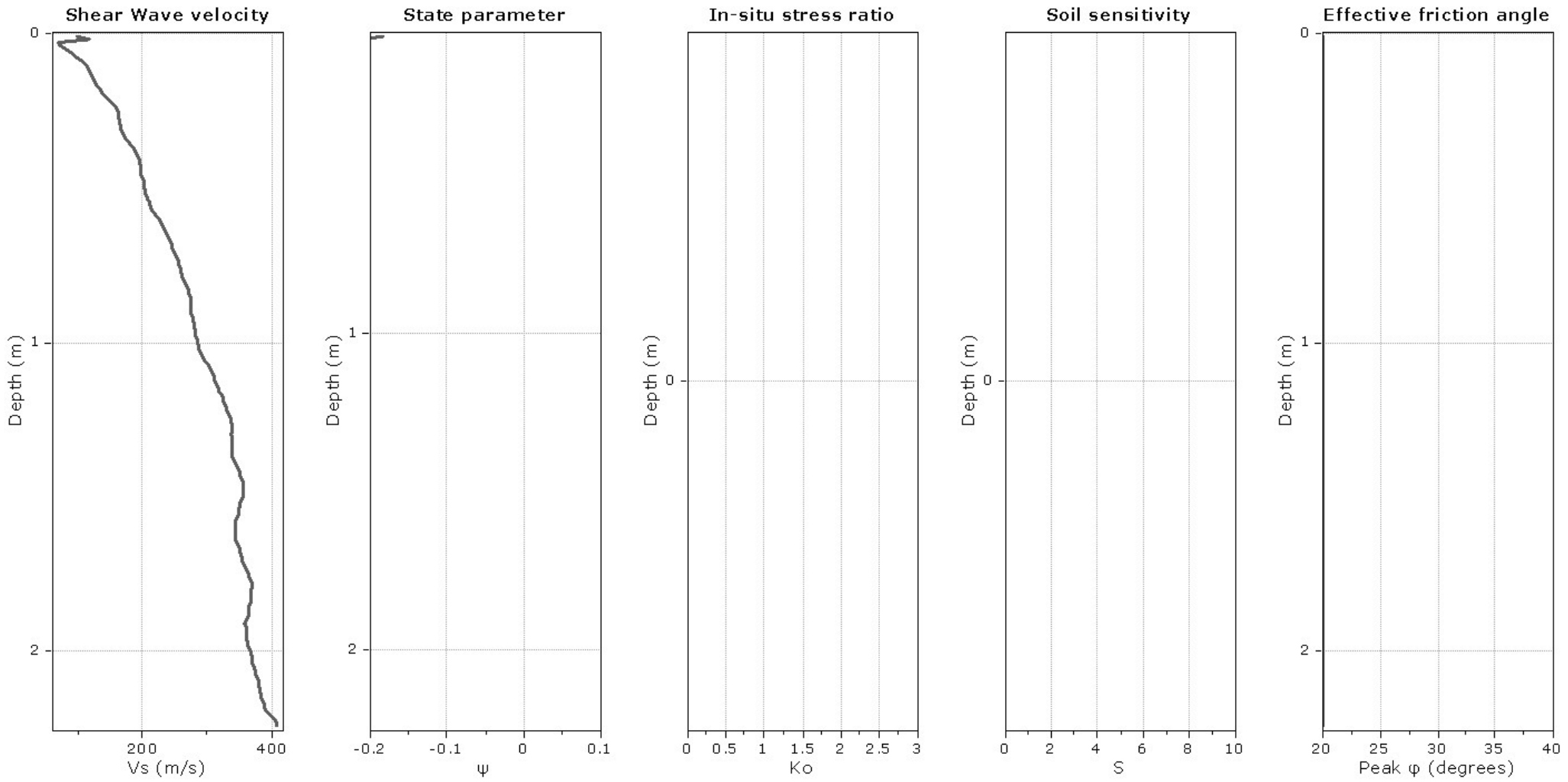
Project:
Location:

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
Cone Operator: Uknown



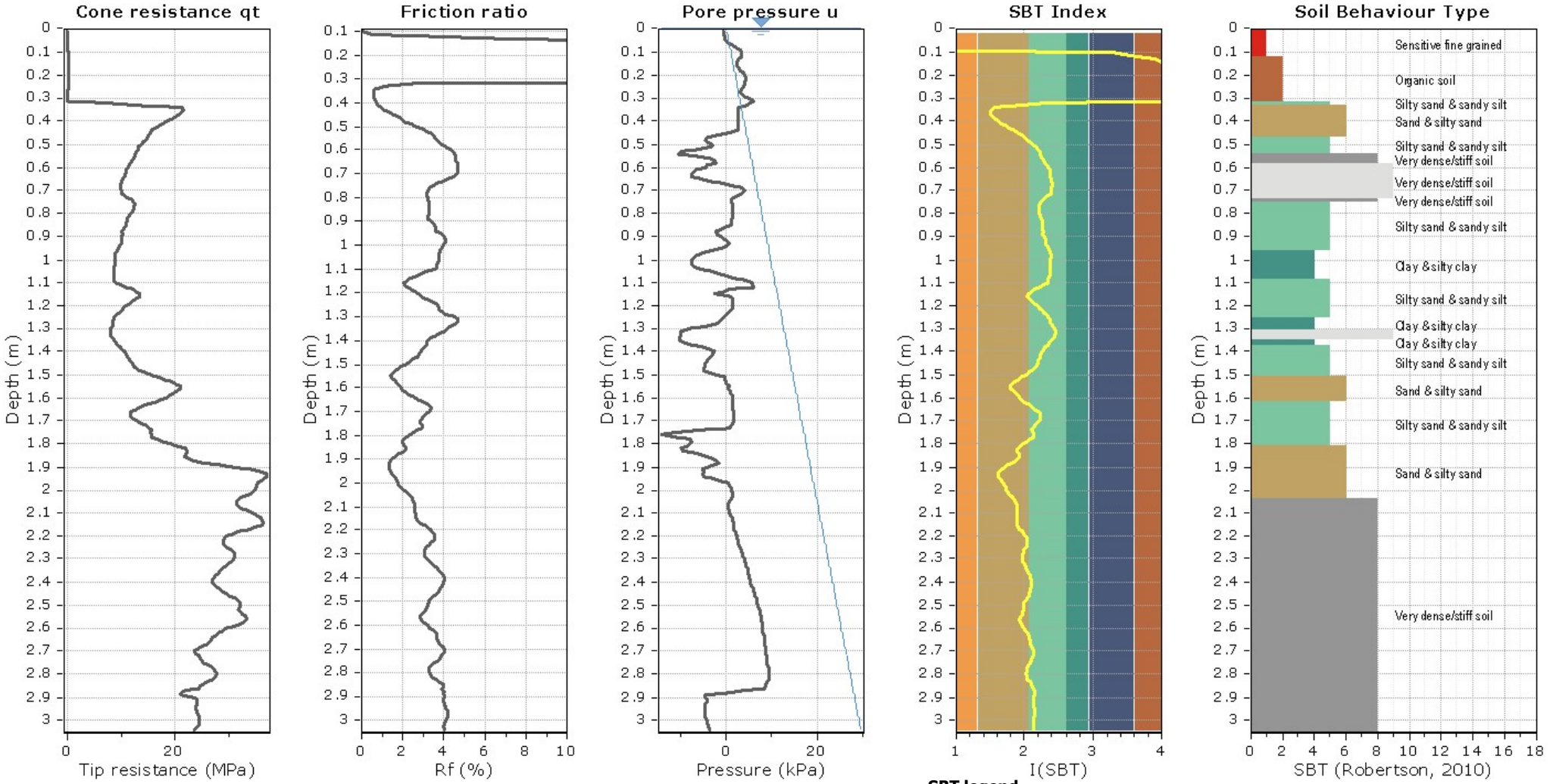
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

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

Project:
Location:

CPT: CPT 17
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



MHA Geotechnical
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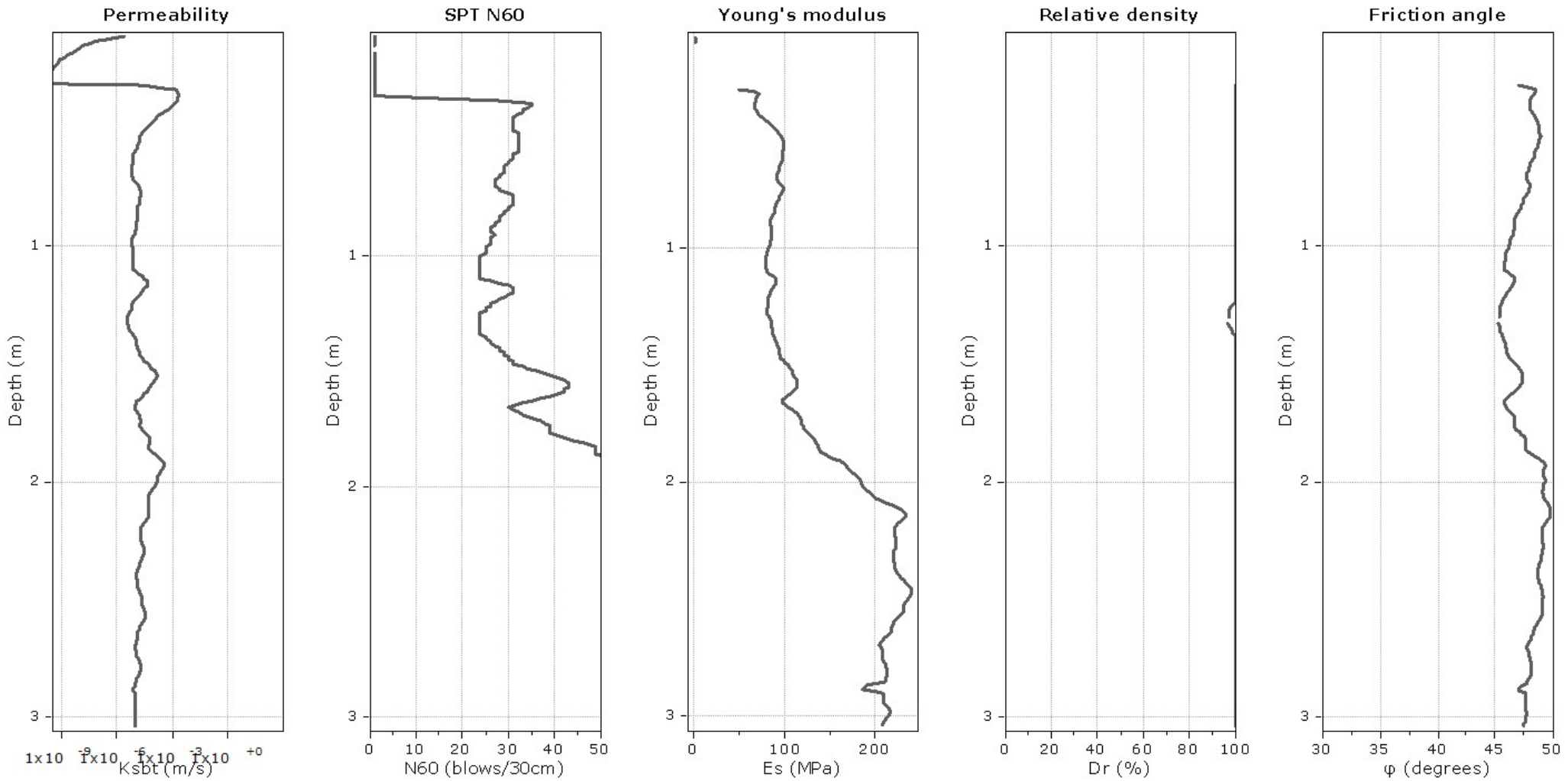
www.mhageotechnical.com.au

Project:
Location:

CPT: CPT 17
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



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

MHA Geotechnical
Suite 2, 464 Murray St PERTH
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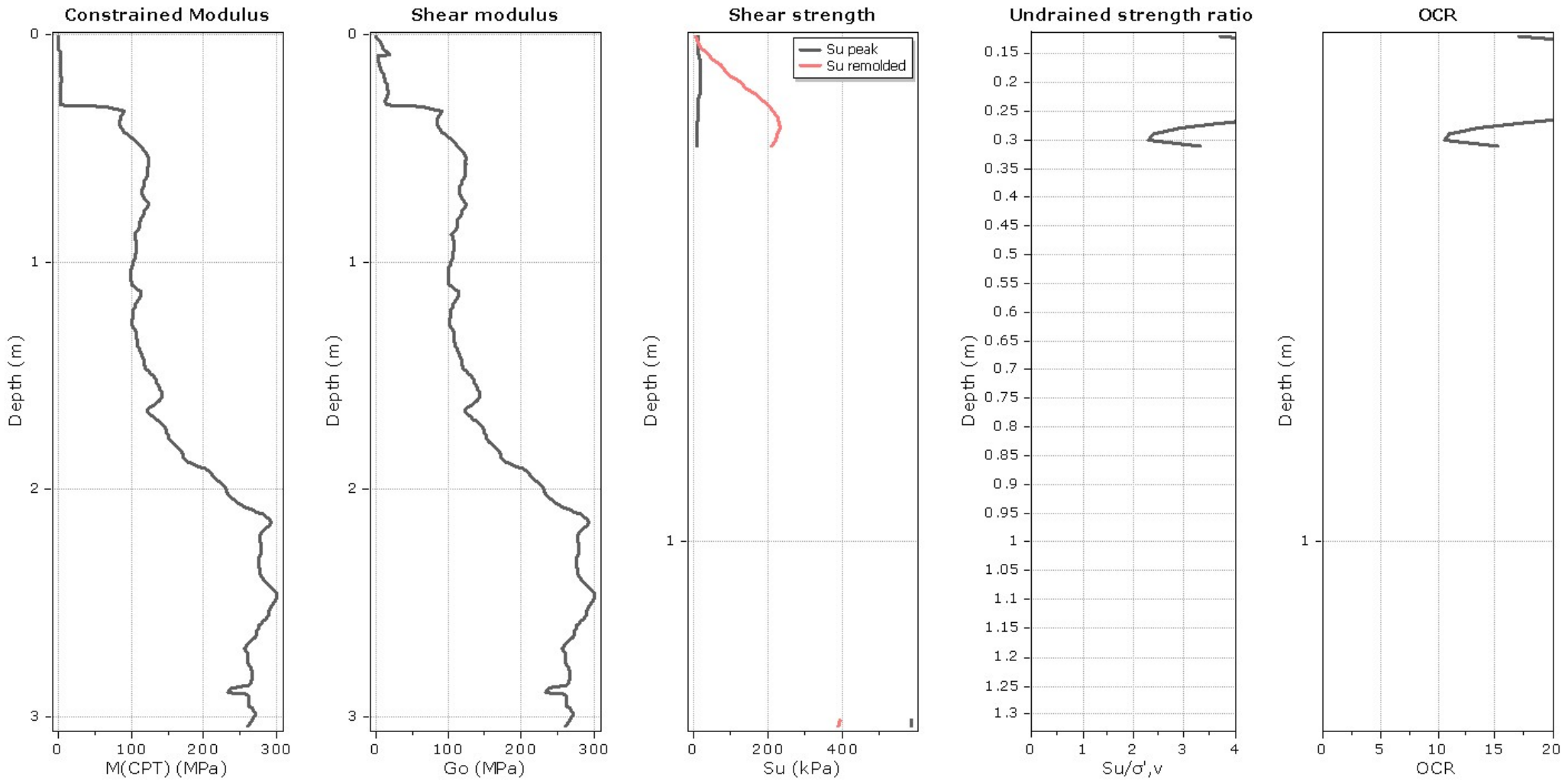
www.mhageotechnical.com.au

Project:
Location:

CPT: CPT 17
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



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
Flat Dilatometer Test data

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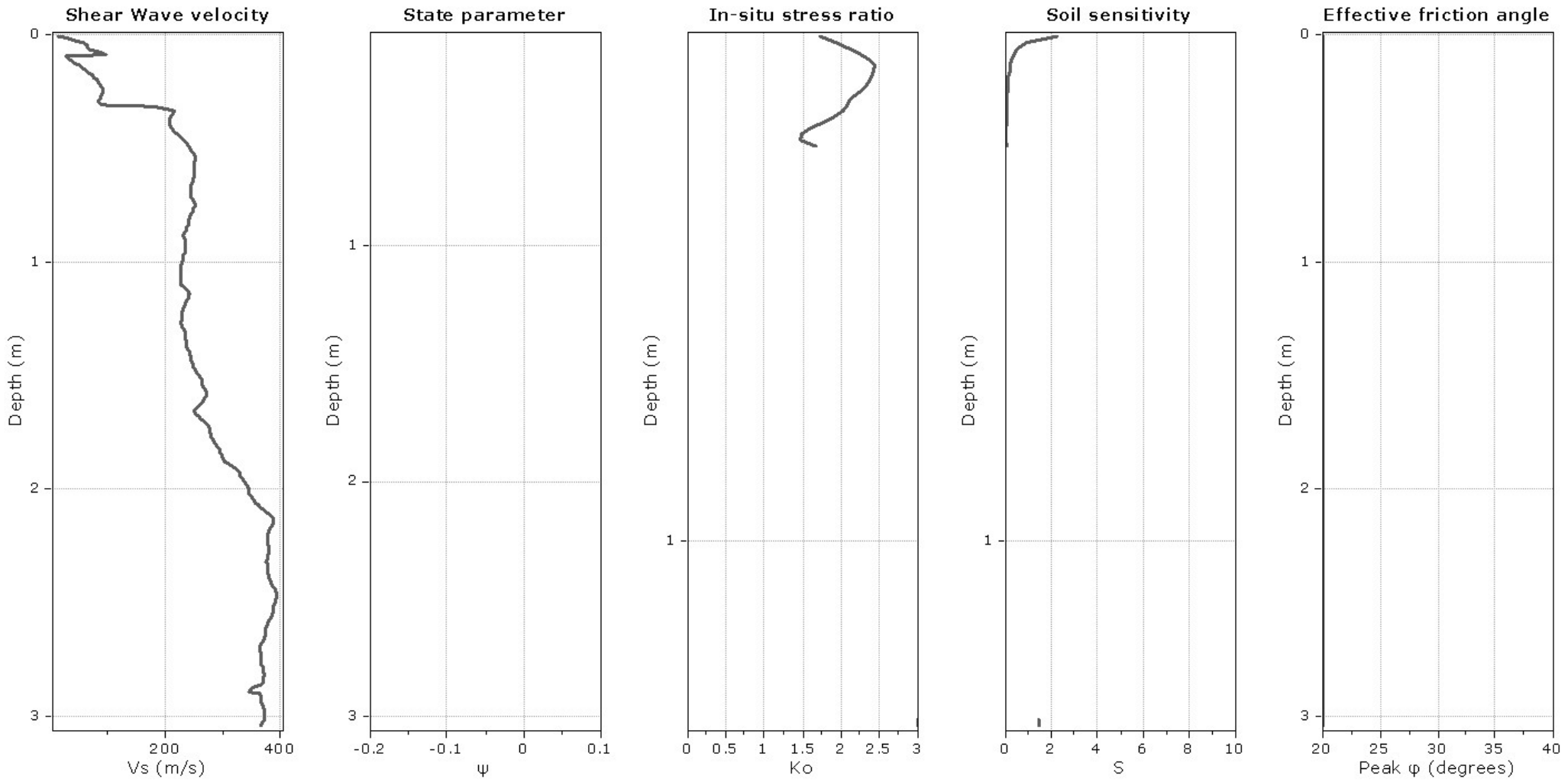
www.mhageotechnical.com.au

Project:
Location:

CPT: CPT 17
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



Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

Appendix E

Laboratory Test Schedule and Test Result Certificates

Analytical Laboratory	Certificate Number(s)	Analytes	Sample				
			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	B3	Stockpile	-	-	Stockpile Bulk Sample

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Ravensthorpe Gold Particle Size Distributions			Sieve Analysis													Soil Classification		
			+75µm		+300µm	+425µm	+600µm	+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			Sand						Gravel						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	-	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	-	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	-	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	-	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	-	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	-	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
B3	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**

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Ravensthorpe Gold Particle Size Distributions			Hydrometer Analysis													
			+1µm	+2µm	+3µm	+3µm	+4µm	+4µm	+6µm	+8µm	+11µm	+16µm	+21µm	+30µm	+42µm	+59µm
		% Passing Units	Clay		Silt											
		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**

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Ravensthorpe Gold Soil Physical Parameters			MDD and CBR					Atterberg Limits				Permeability		Dispersivity	
			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
Units			(t/m^3)	(%)	(t/m^3)	(%)	(%)	(%)	(%)	(%)	(%)	(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 Obtainable and N.P denotes Non Plastic.**														

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Ravensthorpe Gold Project Triaxial Testing		Laboratory Measurements													
		Multi Stage Triaxial Testing													
		Stage 1				Stage 2				Stage 3				Results	
		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 denotes not obtainable														

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

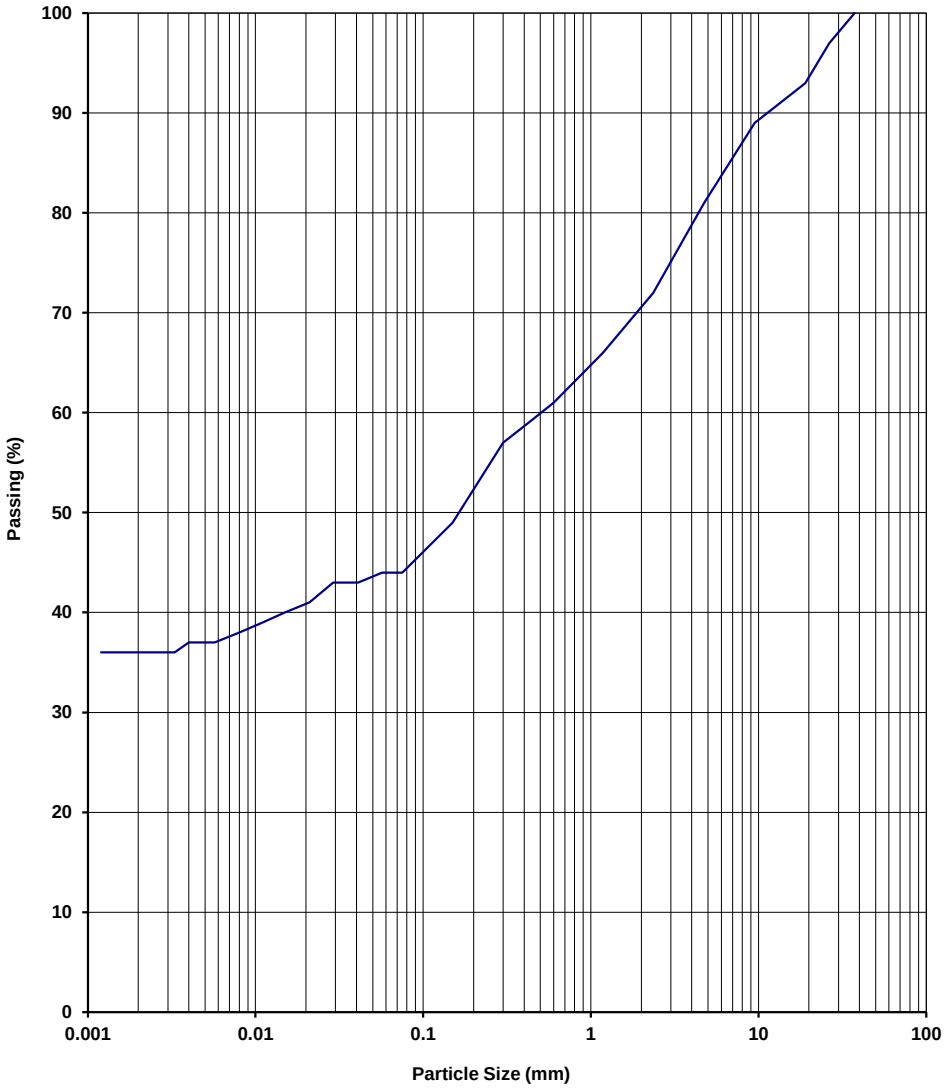
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120138-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	20/12/2017
		Report Date	2/01/2018
Client ID	A5 TP02	**Depth (m)**	0.50-1.10

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	
37.5	100
26.5	97
19.0	93
9.5	89
4.75	81
2.36	72
1.18	66
0.600	61
0.425	59
0.300	57
0.150	49
0.075	44
0.057	44
0.041	43
0.029	43
0.021	41
0.015	40
0.011	39
0.008	38
0.006	37
0.004	37
0.003	36
0.003	36
0.002	36
0.002	36
0.001	36



NOTES/REMARKS:

Moisture Content 8.5%

-2.36mm Soil Particle Density(t/m^3) 2.63

Sample/s supplied by the client

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.

Tested at Trilab Perth Laboratory

Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

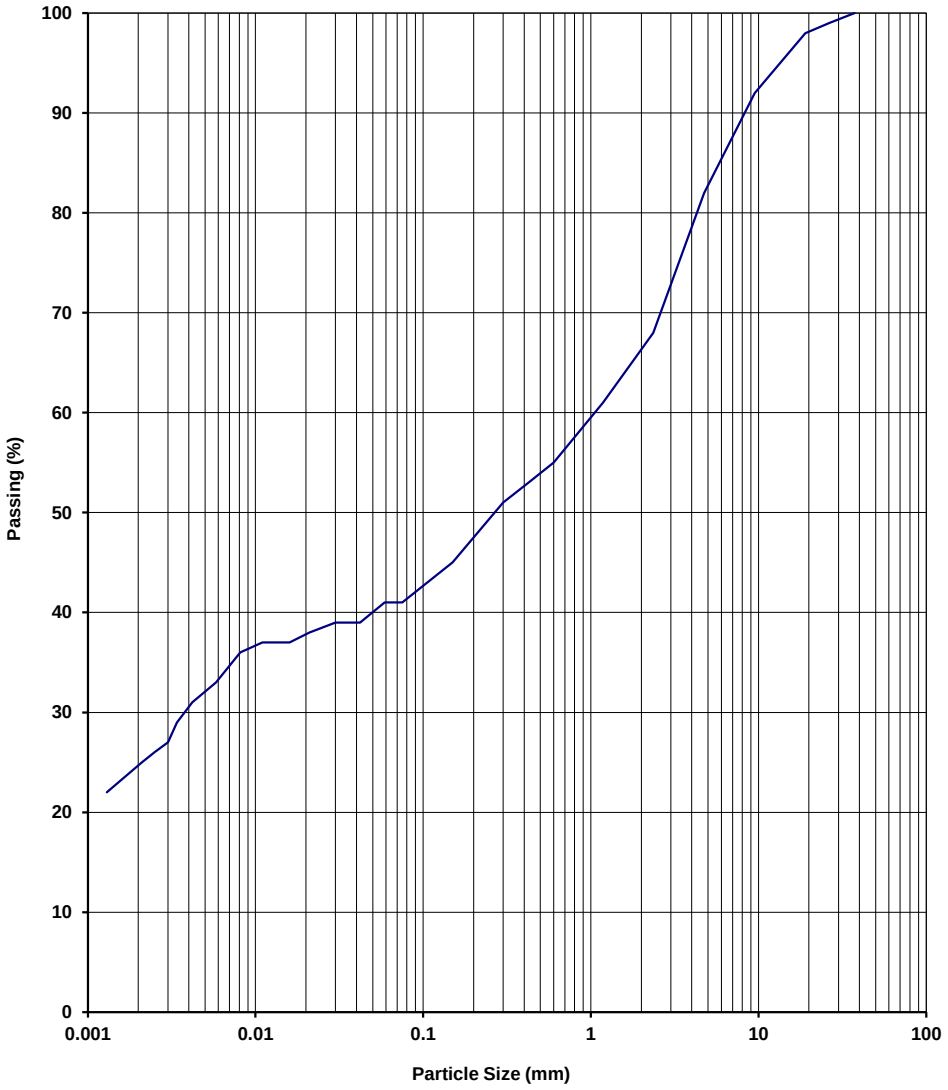
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120139-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	21/12/2017
		Report Date	8/01/2018
Client ID	A7 TP03	**Depth (m)**	0.00-0.70

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	
37.5	100
26.5	99
19.0	98
9.5	92
4.75	82
2.36	68
1.18	61
0.600	55
0.425	53
0.300	51
0.150	45
0.075	41
0.059	41
0.042	39
0.03	39
0.021	38
0.016	37
0.011	37
0.008	36
0.006	33
0.004	31
0.003	29
0.003	27
0.003	26
0.002	25
0.001	22



NOTES/REMARKS:

Moisture Content 7.8%

-2.36mm Soil Particle Density(t/m^3) 2.61

Sample/s supplied by the client

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.

Tested at Trilab Perth Laboratory

Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

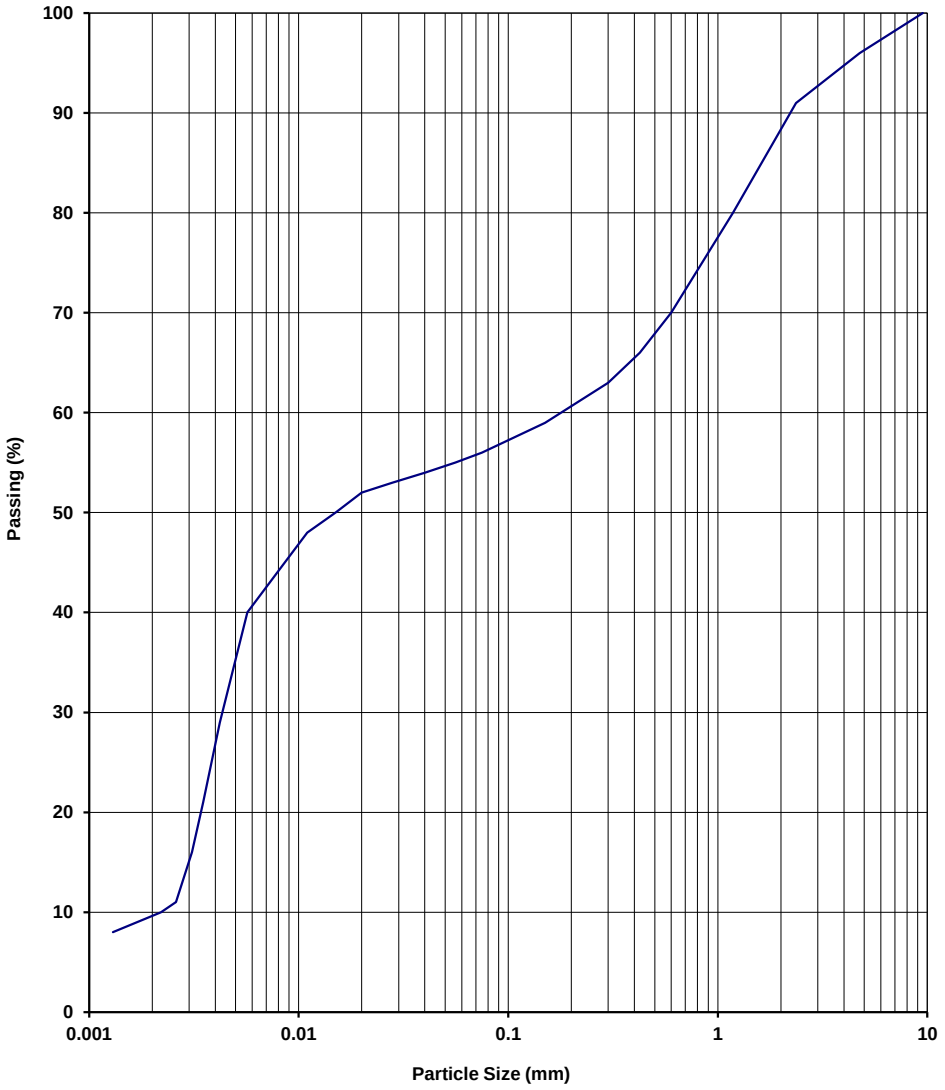
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120140-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	21/12/2017
		Report Date	8/01/2018
Client ID	A16 TP06	**Depth (m)**	0.60-2.70

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	
37.5	
26.5	
19.0	
9.5	100
4.75	96
2.36	91
1.18	80
0.600	70
0.425	66
0.300	63
0.150	59
0.075	56
0.056	55
0.04	54
0.028	53
0.02	52
0.015	50
0.011	48
0.008	44
0.006	40
0.004	29
0.004	21
0.003	16
0.003	11
0.002	10
0.001	8



NOTES/REMARKS:

Moisture Content 8.9%

-2.36mm Soil Particle Density(t/m^3) 2.72

Sample/s supplied by the client

Page 1 of 1 REP33901

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Tested at Trilab Perth Laboratory

Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

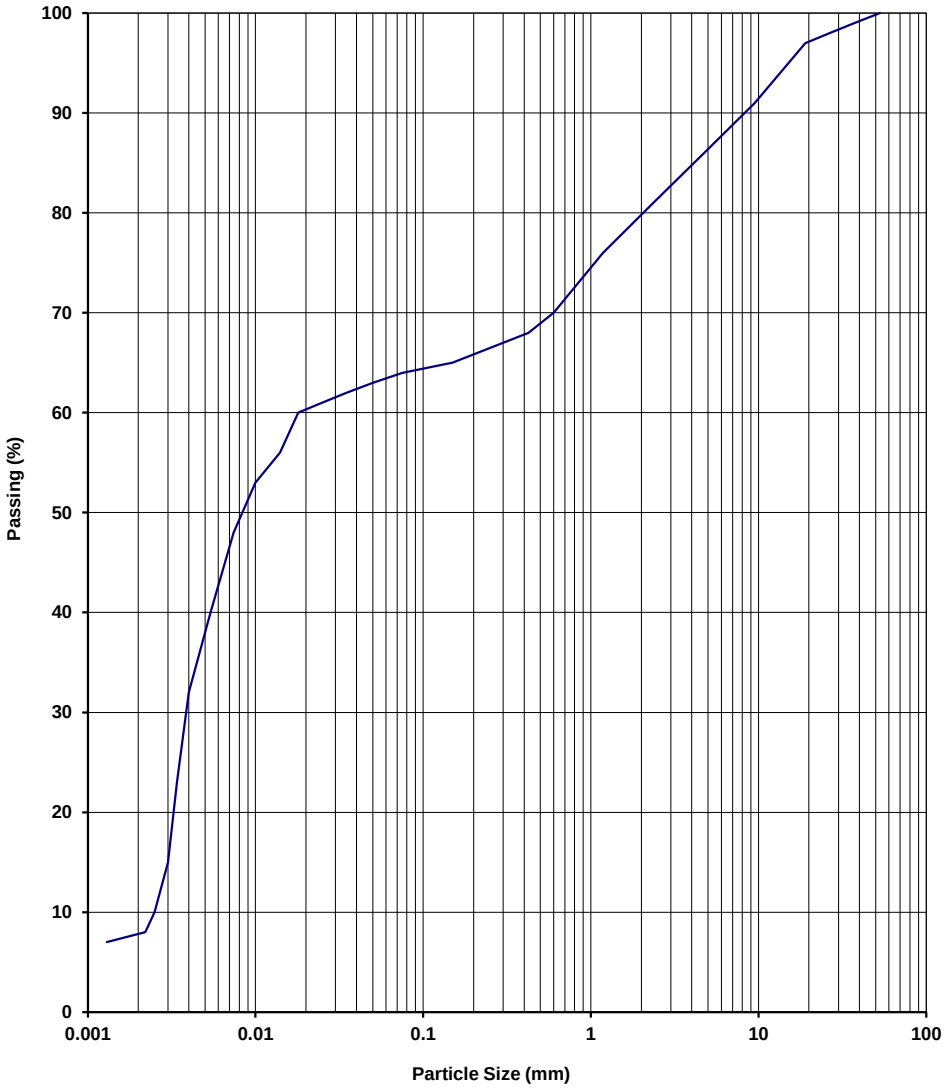
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120141-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	20/12/2017
		Report Date	5/01/2018
Client ID	A27 TP13	**Depth (m)**	0.70-2.80

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	100
37.5	99
26.5	98
19.0	97
9.5	91
4.75	86
2.36	81
1.18	76
0.600	70
0.425	68
0.300	67
0.150	65
0.075	64
0.05	63
0.035	62
0.025	61
0.018	60
0.014	56
0.01	53
0.007	48
0.005	40
0.004	32
0.003	23
0.003	15
0.003	10
0.002	8
0.001	7



NOTES/REMARKS:

Moisture Content 11.1%

-2.36mm Soil Particle Density(t/m^3) 2.75

Sample/s supplied by the client

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Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

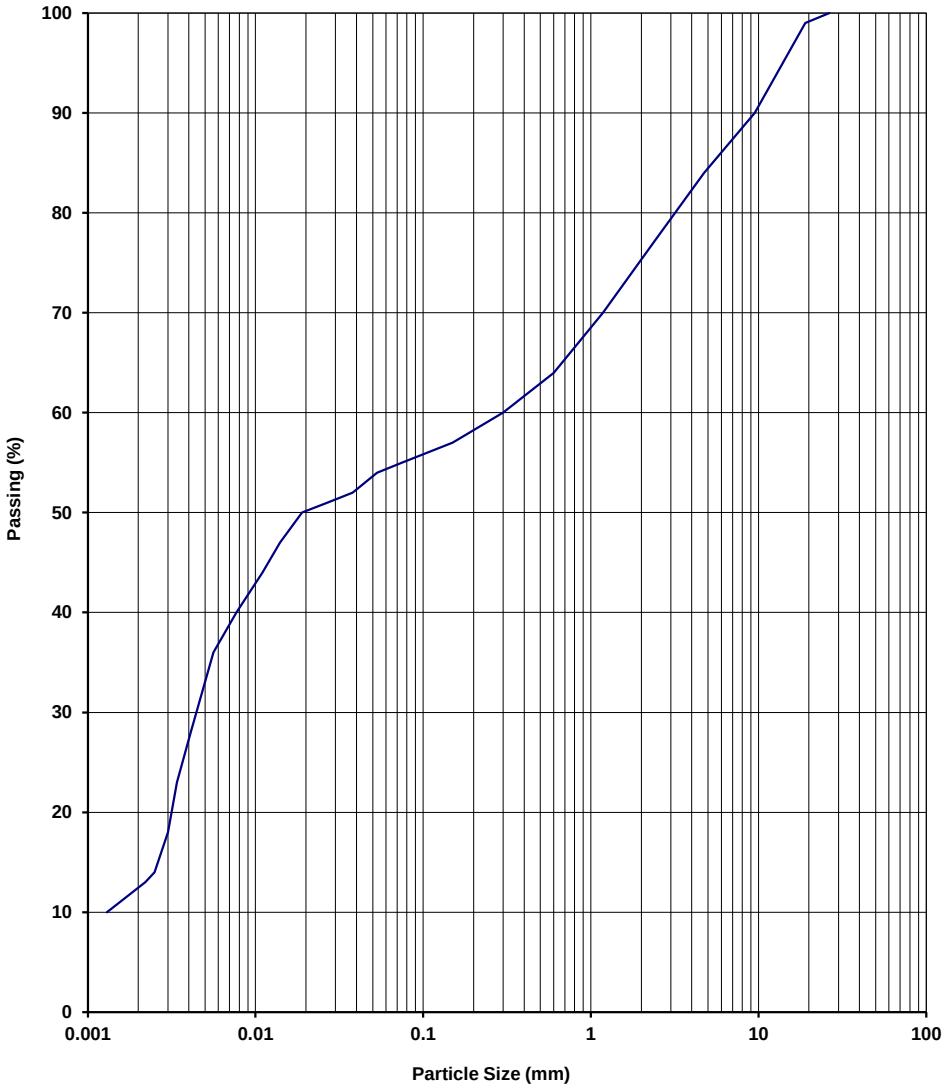
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120142-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	21/12/2017
		Report Date	8/01/2018
Client ID	A32 TP16	**Depth (m)**	1.00-2.80

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	
37.5	
26.5	100
19.0	99
9.5	90
4.75	84
2.36	77
1.18	70
0.600	64
0.425	62
0.300	60
0.150	57
0.075	55
0.053	54
0.038	52
0.027	51
0.019	50
0.014	47
0.011	44
0.008	40
0.006	36
0.004	28
0.003	23
0.003	18
0.003	14
0.002	13
0.001	10



NOTES/REMARKS:

Moisture Content 12.4%

-2.36mm Soil Particle Density(t/m^3) 2.71

Sample/s supplied by the client

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Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

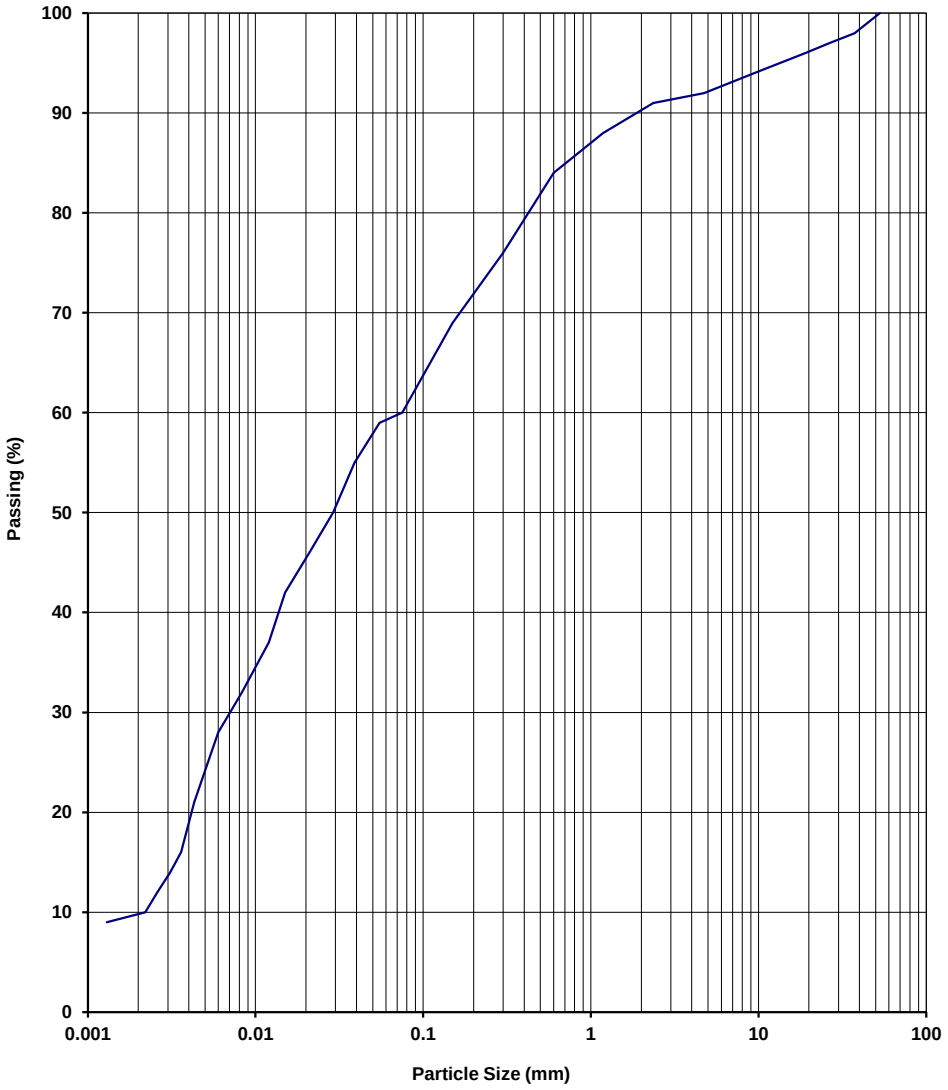
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120143-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	20/12/2017
		Report Date	5/01/2018
Client ID	B1	**Depth (m)**	Not Supplied

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	100
37.5	98
26.5	97
19.0	96
9.5	94
4.75	92
2.36	91
1.18	88
0.600	84
0.425	80
0.300	76
0.150	69
0.075	60
0.055	59
0.039	55
0.029	50
0.021	46
0.015	42
0.012	37
0.008	32
0.006	28
0.004	21
0.004	16
0.003	14
0.003	12
0.002	10
0.001	9



NOTES/REMARKS:

Moisture Content 8.2%

-2.36mm Soil Particle Density(t/m^3) 2.68

Sample/s supplied by the client

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Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

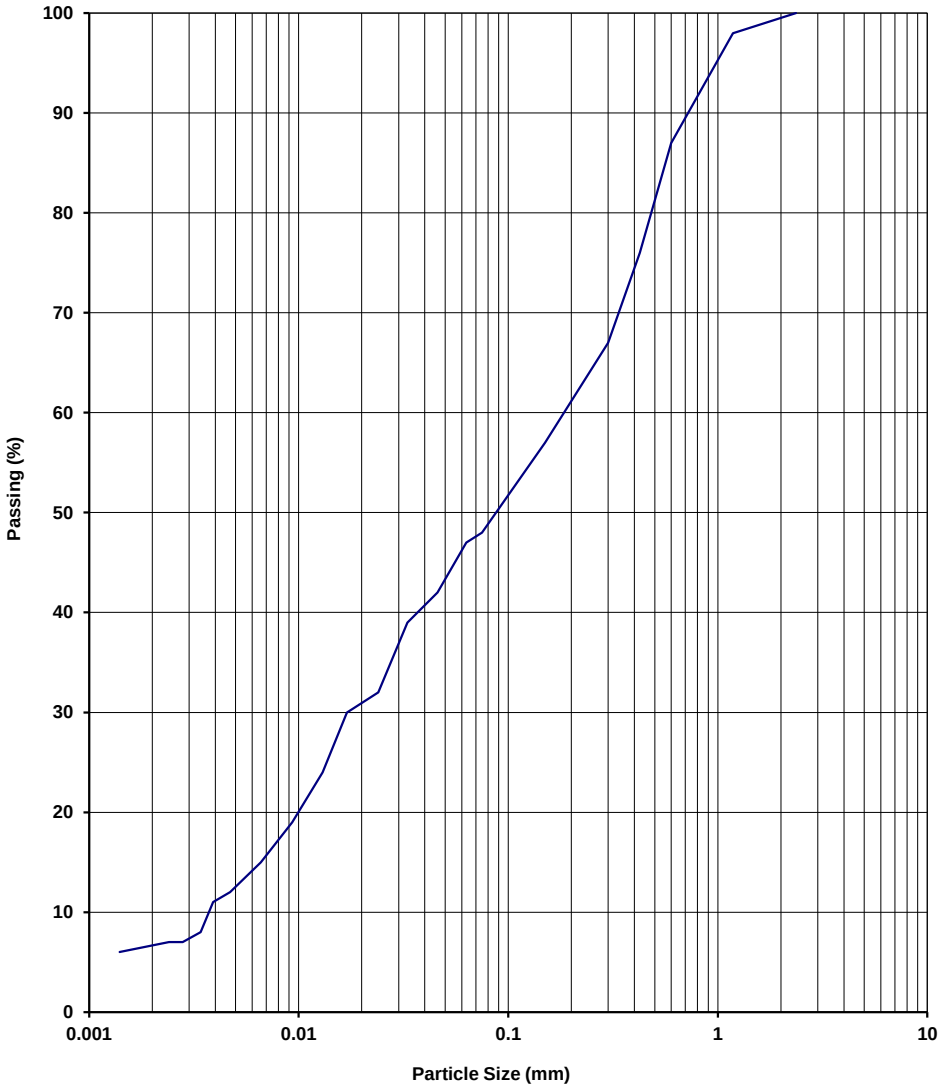
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120144-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	21/12/2017
		Report Date	8/01/2018
Client ID	B2	**Depth (m)**	Not Supplied

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	
37.5	
26.5	
19.0	
9.5	
4.75	
2.36	100
1.18	98
0.600	87
0.425	76
0.300	67
0.150	57
0.075	48
0.063	47
0.046	42
0.033	39
0.024	32
0.017	30
0.013	24
0.009	19
0.007	15
0.005	12
0.004	11
0.003	8
0.003	7
0.002	7
0.001	6



NOTES/REMARKS:

Moisture Content 4%

Sample/s supplied by the client

-2.36mm Soil Particle Density(t/m^3) 2.69

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Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

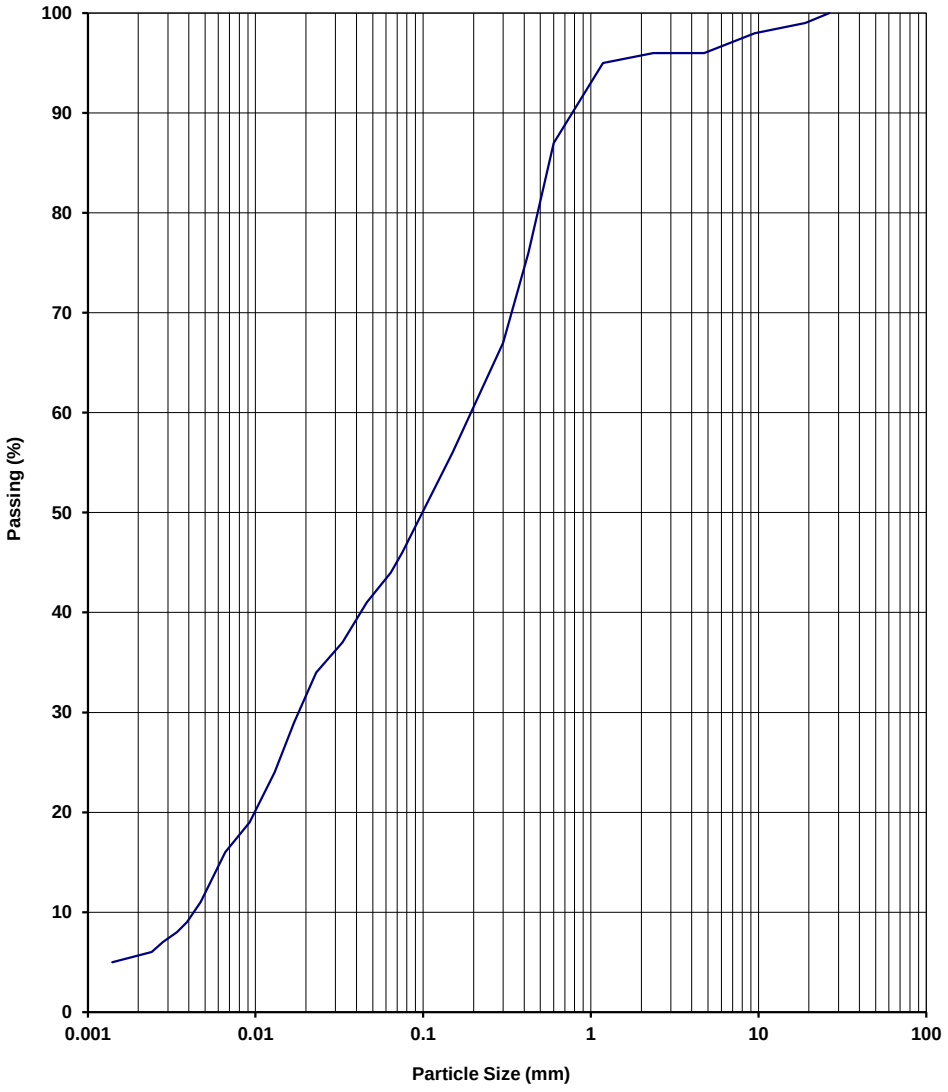
Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.3, 3.5.1

Client	Structerre Consulting Engineers	**Report No.**	P 17120145-G
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	21/12/2018
		Report Date	8/01/2018
Client ID	B3	**Depth (m)**	Not Supplied

Sieve Size (mm)	Passing %
150.0	
75.0	
53.0	
37.5	
26.5	100
19.0	99
9.5	98
4.75	96
2.36	96
1.18	95
0.600	87
0.425	76
0.300	67
0.150	56
0.075	46
0.064	44
0.046	41
0.033	37
0.023	34
0.017	29
0.013	24
0.009	19
0.007	16
0.005	11
0.004	9
0.003	8
0.003	7
0.002	6
0.001	5



NOTES/REMARKS:

Moisture Content 7%

Sample/s supplied by the client

-2.36mm Soil Particle Density(t/m^3) 2.69

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Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

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

PERMEABILITY BY FALLING HEAD TEST REPORT

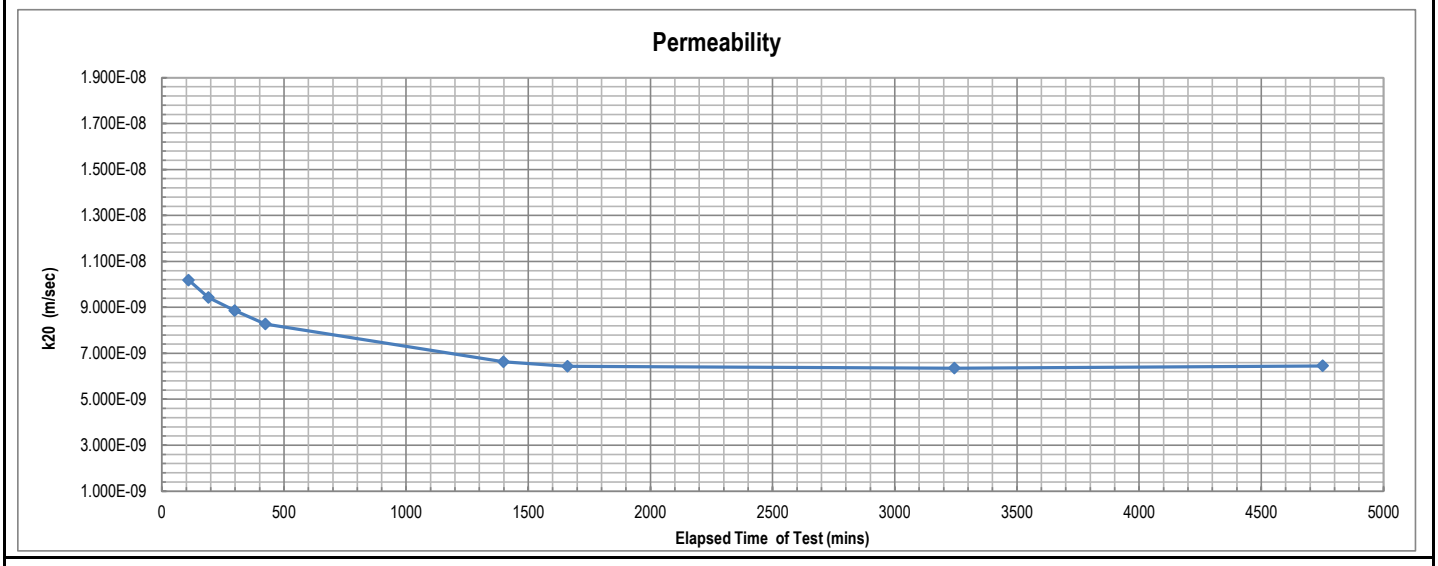
Test Method AS 1289 6.7.2, 5.1.1 , KH2 (Based on K H Head (1988) Manual of Laboratory Testing,10.7)

Client	Structerre Consulting Engineers	**Report No.**	P 17120138-FHPT
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	3/01/2018
		Report Date	9/01/2018
Client ID	A5 TP02	**Depth (m)**	0.50-1.10
Description	GRAVELLY SANDY SILT - pale brown	**Sample Type**	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	**AS1289.5.1.1 - Standard Compaction**		
Maximum Dry Density (t/m^3)	**2.05**	Hydraulic Gradient	**10.1**
Optimum Moisture Content (%)	**9.0**	Surcharge (kPa)	**2.9**
Placement Moisture Content (%)	**9.4**	Head Pressure Applied (kPa)	**11.58**
Moisture Ratio (%)	**104.2**	Water Type	**Distilled**
Placement Wet Density (t/m^3)	**2.12**	Percentage Material Retained/Sieve Size (mm)	**11 / 9.5**
Density Ratio (%)	**94.7**	Sample Height and Diameter (mm)	**116.6 / 101.1**

PERMEABILITY $k_{(20)}$ = 6.5E-09 (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. **Page: 1 of 1** REP36301

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Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

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

PERMEABILITY BY FALLING HEAD TEST REPORT

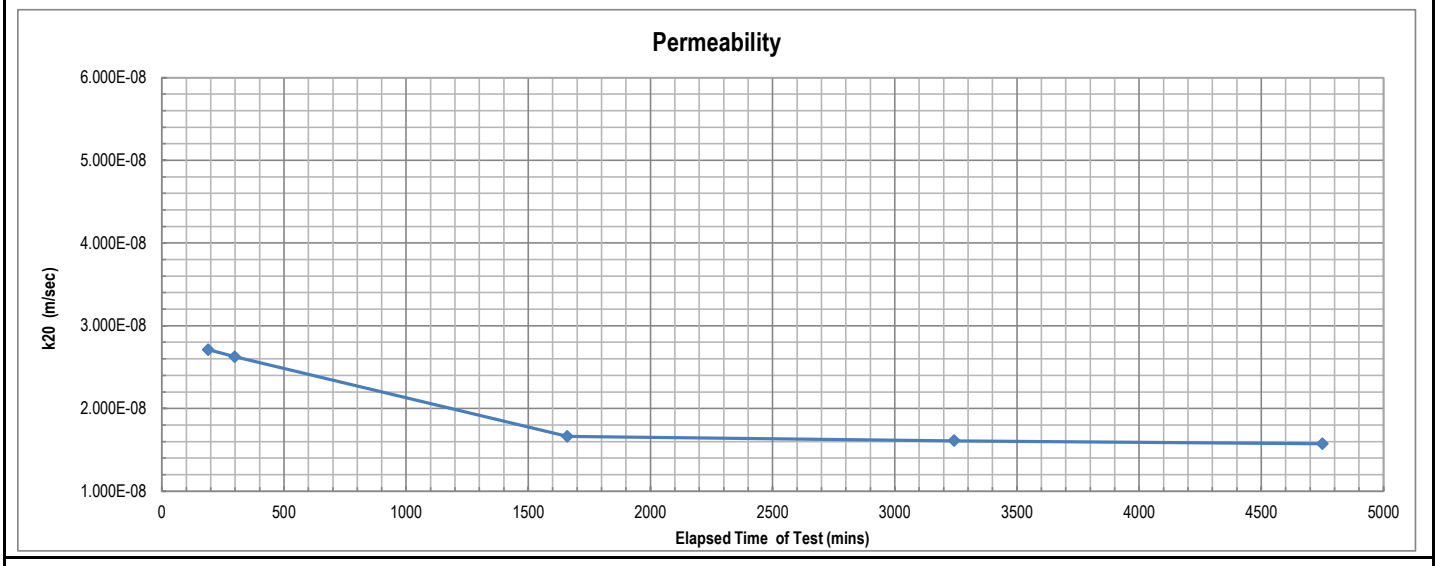
Test Method AS 1289 6.7.2, 5.1.1 , KH2 (Based on K H Head (1988) Manual of Laboratory Testing,10.7)

Client	Structerre Consulting Engineers	**Report No.**	P 17120139-FHPT
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	3/01/2018
		Report Date	11/01/2018
Client ID	A7 TP03	**Depth (m)**	0.00-0.70
Description	SILTY CLAYEY GRAVEL - grey	**Sample Type**	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	**AS1289.5.1.1 - Standard Compaction**		
Maximum Dry Density (t/m^3)	**1.88**	Hydraulic Gradient	**10.1**
Optimum Moisture Content (%)	**14.0**	Surcharge (kPa)	**2.9**
Placement Moisture Content (%)	**14.1**	Head Pressure Applied (kPa)	**11.58**
Moisture Ratio (%)	**100.8**	Water Type	**Distilled**
Placement Wet Density (t/m^3)	**2.04**	Percentage Material Retained/Sieve Size (mm)	**8 / 9.5**
Density Ratio (%)	**94.9**	Sample Height and Diameter (mm)	**116.6 / 101**

PERMEABILITY $k_{(20)}$ = 1.6E-08 (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. **Page: 1 of 1** REP36301

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C. Channon

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Laboratory No. 9926

Trilab
Soil Rock Calibration

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

PERMEABILITY BY FALLING HEAD TEST REPORT

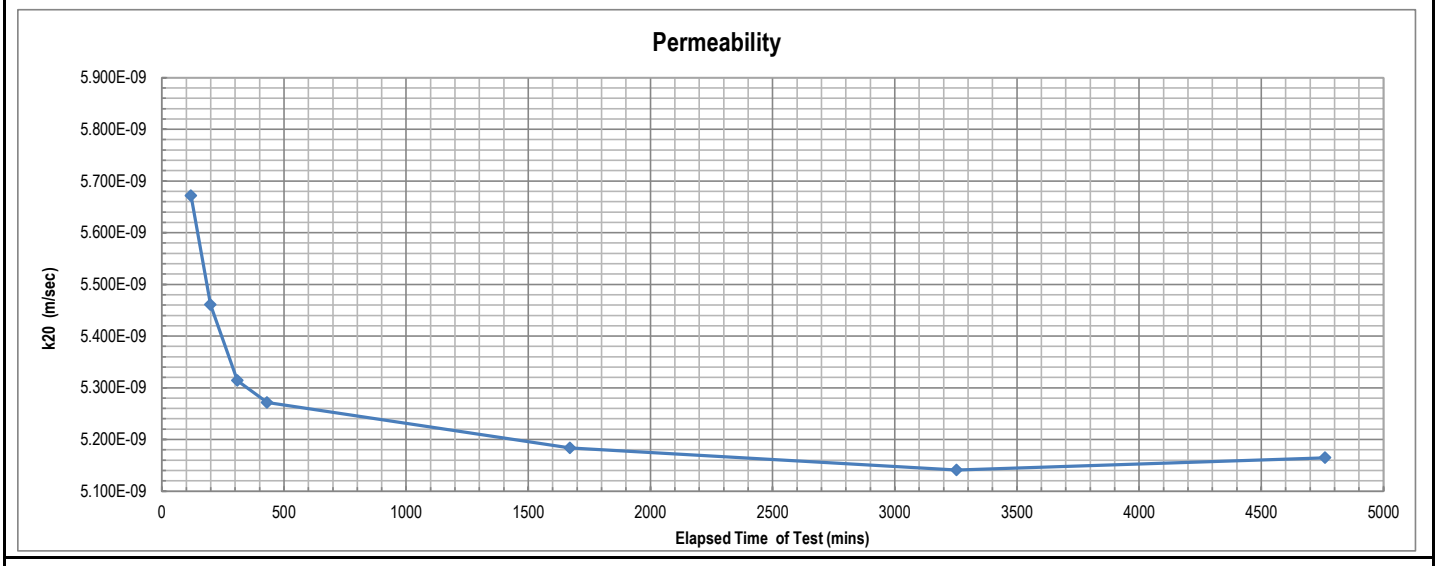
Test Method AS 1289 6.7.2, 5.1.1 , KH2 (Based on K H Head (1988) Manual of Laboratory Testing,10.7)

Client	Structerre Consulting Engineers	**Report No.**	P 17120140-FHPT
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	3/01/2018
		Report Date	11/01/2018
Client ID	A16 TP06	**Depth (m)**	0.60-2.70
Description	SANDY CLAYEY SILT - pale brown	**Sample Type**	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	**AS1289.5.1.1 - Standard Compaction**		
Maximum Dry Density (t/m^3)	**1.84**	Hydraulic Gradient	**10.1**
Optimum Moisture Content (%)	**14.5**	Surcharge (kPa)	**3.0**
Placement Moisture Content (%)	**15.2**	Head Pressure Applied (kPa)	**11.58**
Moisture Ratio (%)	**104.8**	Water Type	**Distilled**
Placement Wet Density (t/m^3)	**2.01**	Percentage Material Retained/Sieve Size (mm)	**0 / 9.5**
Density Ratio (%)	**94.7**	Sample Height and Diameter (mm)	**116.4 / 101.3**

PERMEABILITY $k_{(20)}$ = 5.2E-09 (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. **Page: 1 of 1** REP36301

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Laboratory No. 9926

Trilab
Soil Rock Calibration

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

PERMEABILITY BY FALLING HEAD TEST REPORT

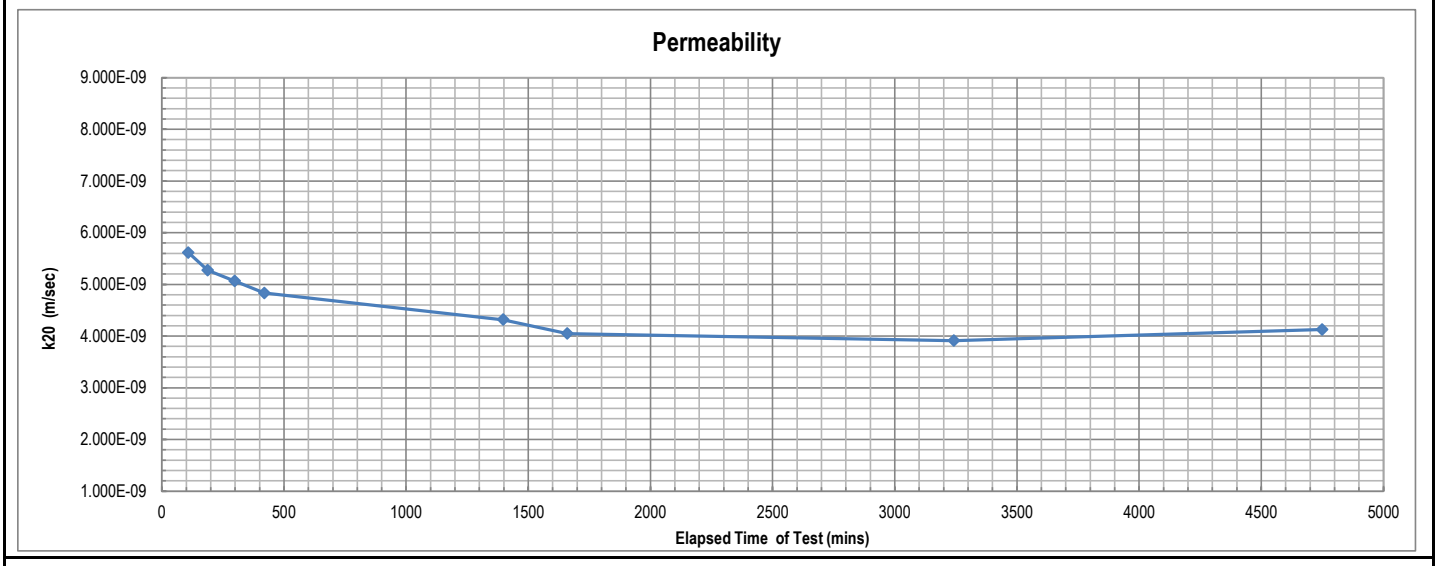
Test Method AS 1289 6.7.2, 5.1.1 , KH2 (Based on K H Head (1988) Manual of Laboratory Testing,10.7)

Client	Structerre Consulting Engineers	**Report No.**	P 17120141-FHPT
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**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 Soil Specimen

RESULTS OF TESTING

Compaction Method	**AS1289.5.1.1 - Standard Compaction**		
Maximum Dry Density (t/m^3)	**1.69**	Hydraulic Gradient	**10.1**
Optimum Moisture Content (%)	**16.0**	Surcharge (kPa)	**3.0**
Placement Moisture Content (%)	**16.1**	Head Pressure Applied (kPa)	**11.58**
Moisture Ratio (%)	**100.8**	Water Type	**Distilled**
Placement Wet Density (t/m^3)	**1.87**	Percentage Material Retained/Sieve Size (mm)	**9 / 9.5**
Density Ratio (%)	**95.1**	Sample Height and Diameter (mm)	**116.5 / 101.1**

PERMEABILITY $k_{(20)}$ = 4.1E-09 (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. **Page: 1 of 1** REP36301

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Laboratory No. 9926

Trilab
Soil Rock Calibration

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

PERMEABILITY BY FALLING HEAD TEST REPORT

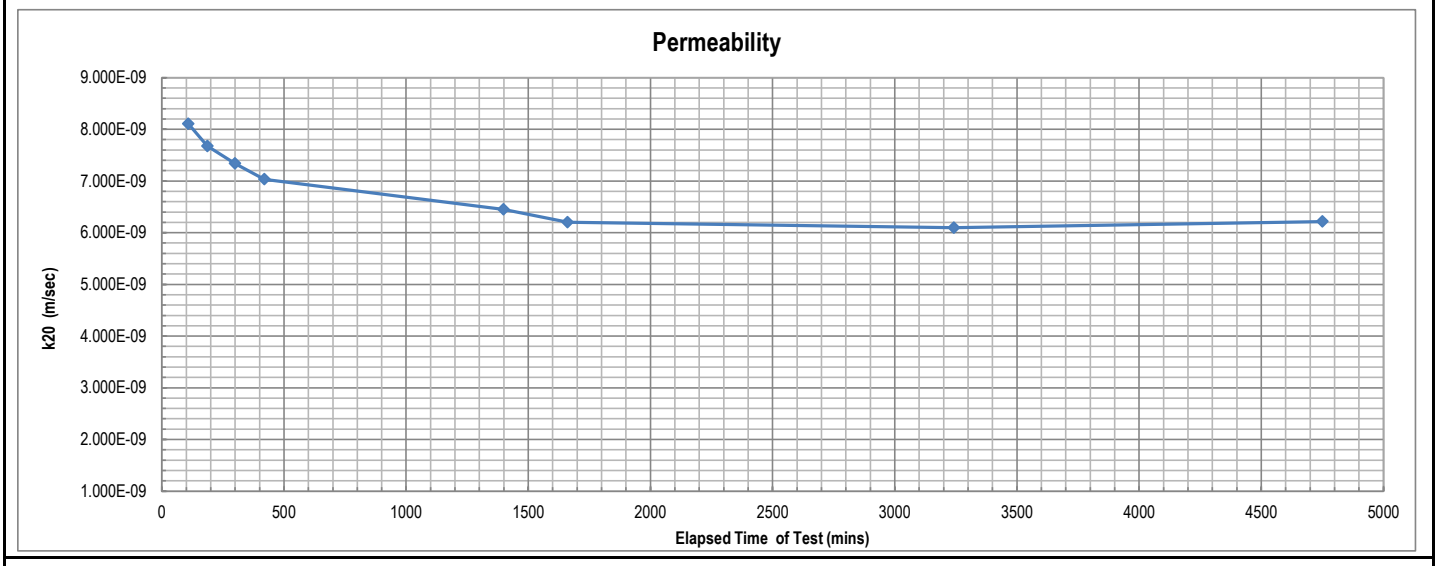
Test Method AS 1289 6.7.2, 5.1.1 , KH2 (Based on K H Head (1988) Manual of Laboratory Testing,10.7)

Client	Structerre Consulting Engineers	**Report No.**	P 17120142-FHPT
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	3/01/2018
		Report Date	11/01/2018
Client ID	A32 TP16	**Depth (m)**	1.00-2.80
Description	GRAVELLY SILT - pale brown	**Sample Type**	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	**AS1289.5.1.1 - Standard Compaction**		
Maximum Dry Density (t/m^3)	**1.72**	Hydraulic Gradient	**10.1**
Optimum Moisture Content (%)	**15.5**	Surcharge (kPa)	**3.0**
Placement Moisture Content (%)	**15.6**	Head Pressure Applied (kPa)	**11.58**
Moisture Ratio (%)	**100.8**	Water Type	**Distilled**
Placement Wet Density (t/m^3)	**1.89**	Percentage Material Retained/Sieve Size (mm)	**0 / 9.5**
Density Ratio (%)	**95.2**	Sample Height and Diameter (mm)	**116.5 / 101.1**

PERMEABILITY $k_{(20)}$ = 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.

Sample/s supplied by client — The compaction data was supplied by the client. **Page: 1 of 1** REP36301

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Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

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

PINHOLE DISPERSION TEST REPORT

Test Method: AS 1289 3.8.3

Client	Structerre Consulting Engineers	**Report No.**	P 17120143-PHD
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	2/01/2018
		Report Date	5/01/2018

Sample No.	17120143	17120143	
Client ID	B1	B1	
Depth (m)	Not Supplied	Not Supplied	
Description	SILTY GRAVEL - white	SILTY GRAVEL - white	
Method of Moisture Determination for Remoulding	Optimum Moisture Content	Optimum Moisture Content	
Initial Moisture Content (%)	8.2	8.2	
Placement Wet Density (t/m³)	1.866	1.922	
Placement Moisture Content (%)	15.9	15.9	
Density Ratio (%)	95.7	98.1	
Variation from Optimum Moisture Content (%)	Nil	Nil	
Curing Time (Days)	2	2	
Source of Water	Distilled	Distilled	
Hole Reformed at 50mm Head Height	Yes	Yes	
PINHOLE DISPERSION CLASSIFICATION: **DESIGNATION**	D1	D1	
DESCRIPTION	Highly dispersive	Highly dispersive	

NOTES/REMARKS:

Sample/s supplied by the client

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Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

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

PINHOLE DISPERSION TEST REPORT

Test Method: AS 1289 3.8.3

Client	Structerre Consulting Engineers	**Report No.**	P 17120144-PHD
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	2/01/2018
		Report Date	5/01/2018

Sample No.	17120144	17120144	
Client ID	B2	B2	
Depth (m)	Not Supplied	Not Supplied	
Description	GRAVELLY SILT - white	GRAVELLY SILT - white	
Method of Moisture Determination for Remoulding	Optimum Moisture Content	Optimum Moisture Content	
Initial Moisture Content (%)	4.0	4.0	
Placement Wet Density (t/m³)	1.96	2.02	
Placement Moisture Content (%)	13.6	13.6	
Density Ratio (%)	95.2	98.1	
Variation from Optimum Moisture Content (%)	Nil	Nil	
Curing Time (Days)	2	2	
Source of Water	Distilled	Distilled	
Hole Reformed at 50mm Head Height	No	No	
PINHOLE DISPERSION CLASSIFICATION: **DESIGNATION**	D1	D1	
DESCRIPTION	Highly dispersive	Highly dispersive	

NOTES/REMARKS:

Sample/s supplied by the client

Accredited for compliance with ISO/IES 17025.
The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

Tested at Trilab Perth Laboratory.

Authorised Signatory

C. Channon

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PINHOLE DISPERSION TEST REPORT

Test Method: AS 1289 3.8.3

Client	Structerre Consulting Engineers	**Report No.**	P 17120145-PHD
Address	PO Box 792 BALCATTA WA 6914		
Project	Ravensthorpe Gold Project - Geotech Investigation Foundation & Borrow Samples	**Test Date**	2/01/2018
		Report Date	5/01/2018

Sample No.	17120145	17120145	
Client ID	B3	B3	
Depth (m)	Not Supplied	Not Supplied	
Description	SANDY SILT- yellow	SANDY SILT- yellow	
Method of Moisture Determination for Remoulding	Optimum Moisture Content	Optimum Moisture Content	
Initial Moisture Content (%)	7.0	7.0	
Placement Wet Density (t/m³)	1.89	1.96	
Placement Moisture Content (%)	12.7	12.7	
Density Ratio (%)	94.9	98.1	
Variation from Optimum Moisture Content (%)	Nil	Nil	
Curing Time (Days)	2	2	
Source of Water	Distilled	Distilled	
Hole Reformed at 50mm Head Height	No	No	
PINHOLE DISPERSION CLASSIFICATION: **DESIGNATION**	D2	D2	
DESCRIPTION	Dispersive	Dispersive	

NOTES/REMARKS:

Sample/s supplied by the client

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Tested at Trilab Perth Laboratory.

Authorised Signatory

C. Channon

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Laboratory No. 9926

Material Test Certificate

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

Report Number	S865847-A Issue 1	**Client**	MHA GEOTECHNICAL
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 tested**	1 December 2007
Sample ID	-			**Time Tested**	-
Proposed Use	Foundation			**Layer Thickness mm**	-
Material Description	Various			**Test Depth mm**	-
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

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WORLD RECOGNISED ACCREDITATION
STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

Authorised Signatory

Date 16 January 2018

Wayne Rozmianiec
Laboratory Manager

WA | QLD | NSW | VIC
1 Erindale Road, Balcatta, Western Australia 6021 | PO Box 792, Balcatta, Western Australia 6914
Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email wageotechlab@structerre.com.au | Web www.structerre.com.au
ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

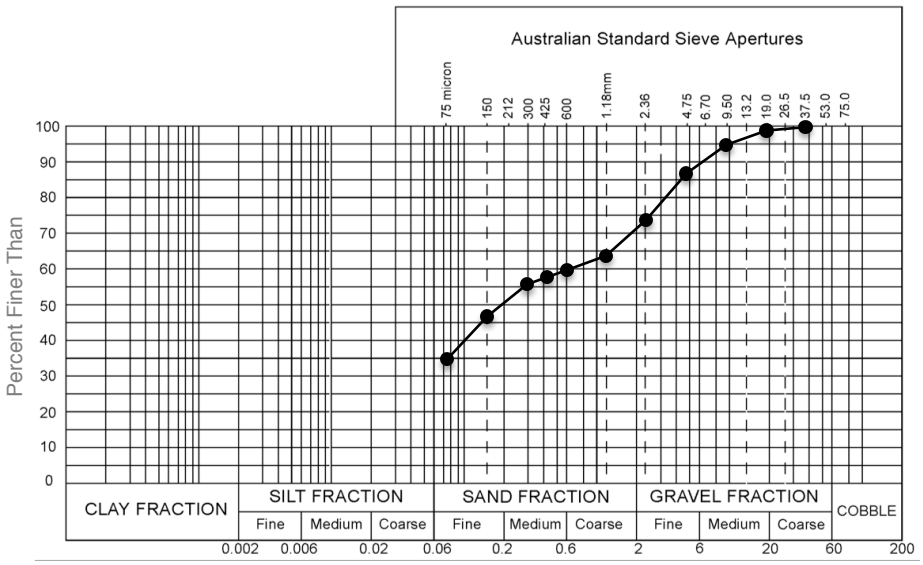
Sample Details

Laboratory Number	S865847-A-1	**Date tested**	05 Dec 2017		
Sample ID	TP01 0.0-0.2m			**Tested by**	JWS
Proposed Use	Foundation			**Layer Thickness**	-
Material Description	AS 1726 - 2017 Sandy FINES with gravel			**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

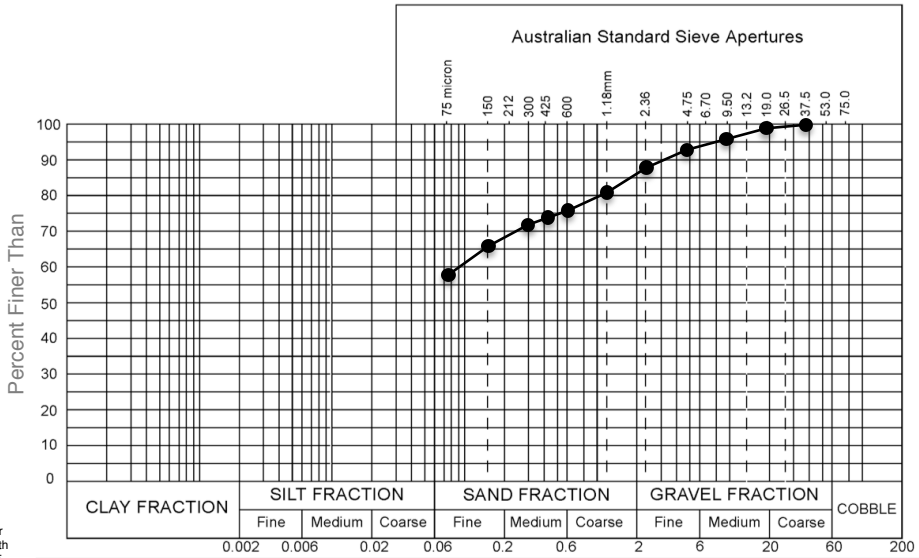
Sample Details

Laboratory Number	S865847-A-2	**Date tested**	05 Dec 2017
Sample ID	TP01 0.2-0.75m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 FINES trace gravel, with sand	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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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Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

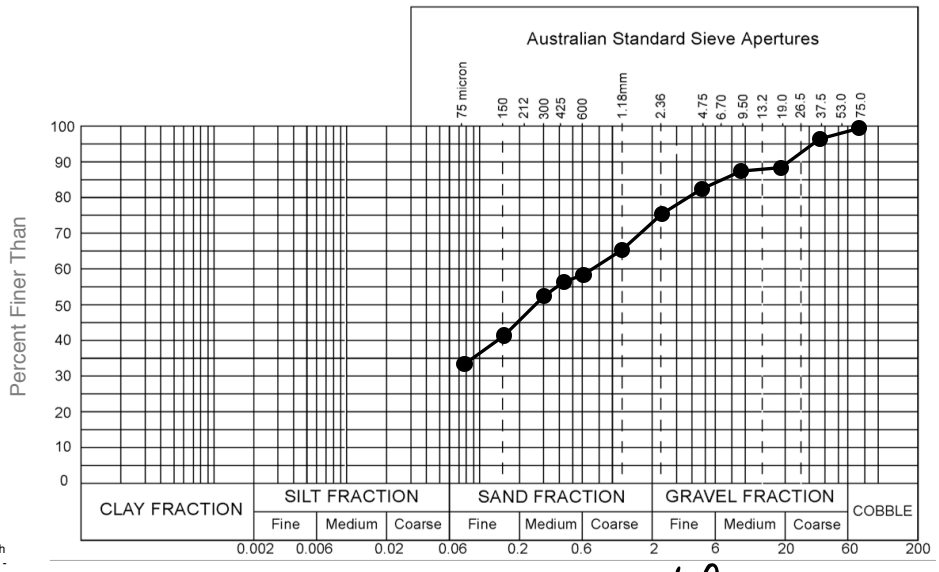
Sample Details

Laboratory Number	S865847-A-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 or clayey SAND with gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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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Particle Size Distribution & Atterberg Limits of a Soil

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Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

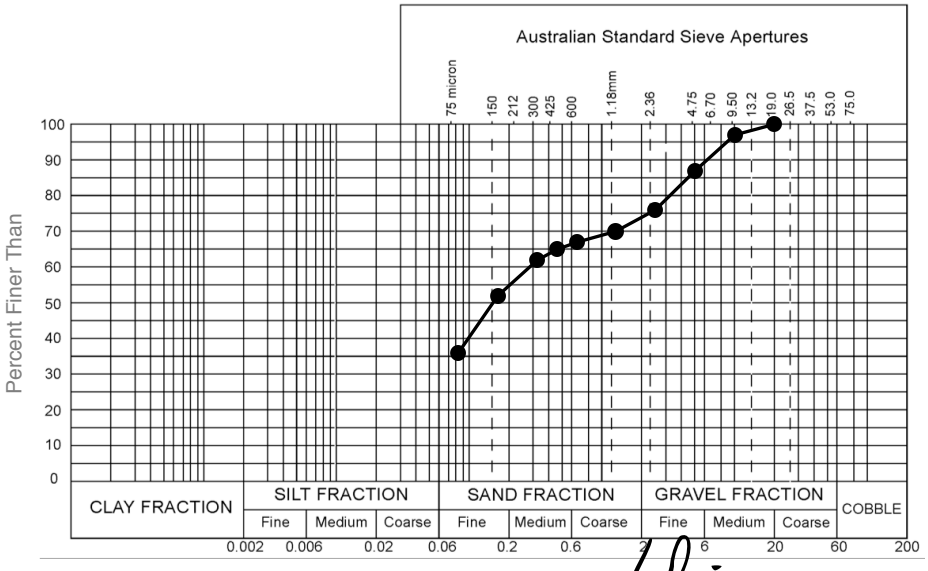
Sample Details

Laboratory Number	S865847-A-4	**Date tested**	05 Dec 2017
Sample ID	TP02 0.1-0.5m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Sandy FINES with gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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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Particle Size Distribution & Atterberg Limits of a Soil

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Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

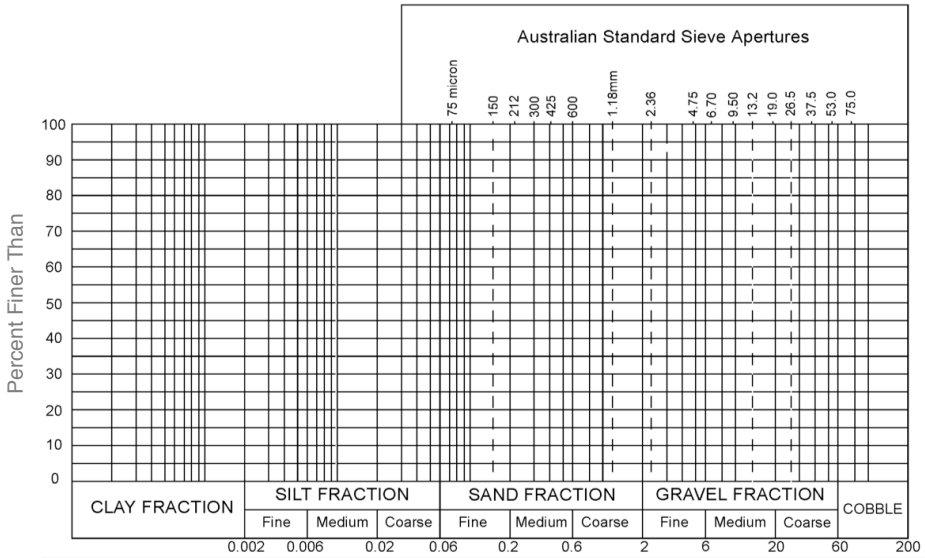
Sample Details

Laboratory Number	S865847-A-5	**Date tested**	7 December 2017		
Sample ID	TP02 0.5-1.1m			**Tested by**	CF
Proposed Use	Foundation			**Layer Thickness**	-
Material Description	Clay or Silt			**Test Depth**	0.5-1.1m
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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MATERIAL TEST CERTIFICATE

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 PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

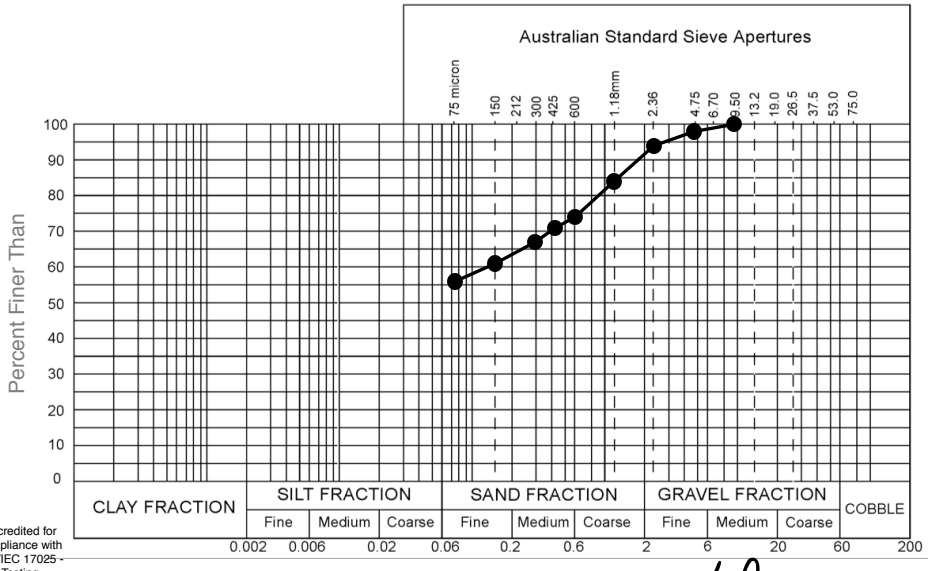
Sample Details

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 FINES trace gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Particle Size Distribution & Atterberg Limits of a Soil

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Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

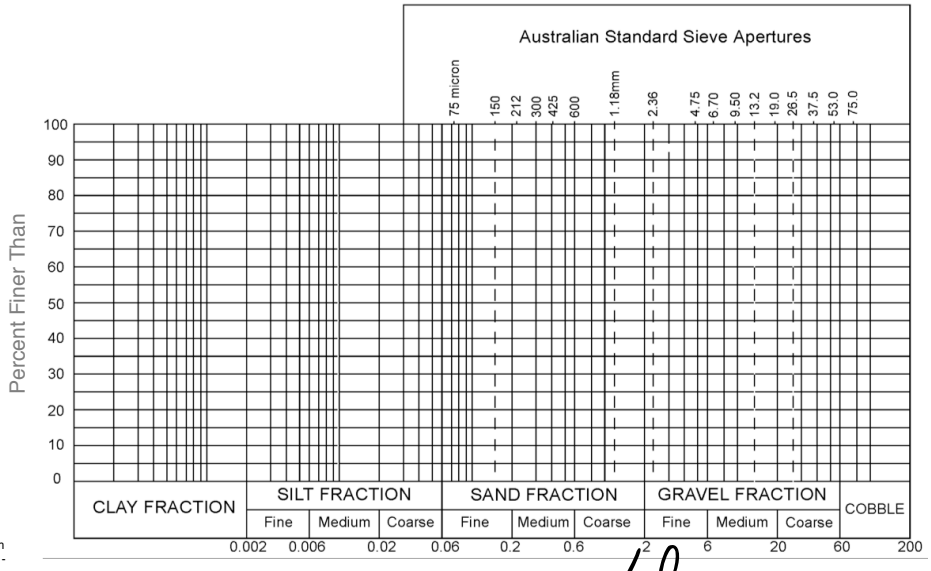
Sample Details

Laboratory Number	S865847-A-7	**Date tested**	11 December 2017
Sample ID	TP03_0.0-0.7m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 - -	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

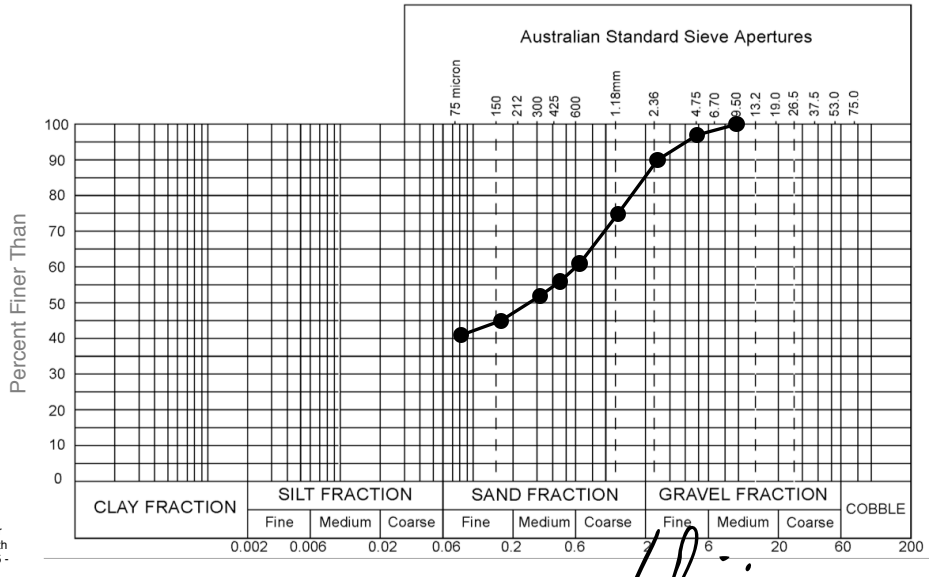
Sample Details

Laboratory Number	S865847-A-8	**Date tested**	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	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Laboratory Manager

WA | QLD | NSW | VIC

1 Erindale Road, Balcatta, Western Australia 6021 | PO Box 792, Balcatta, Western Australia 6914
Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email wageotechlab@structerre.com.au | Web www.structerre.com.au
ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

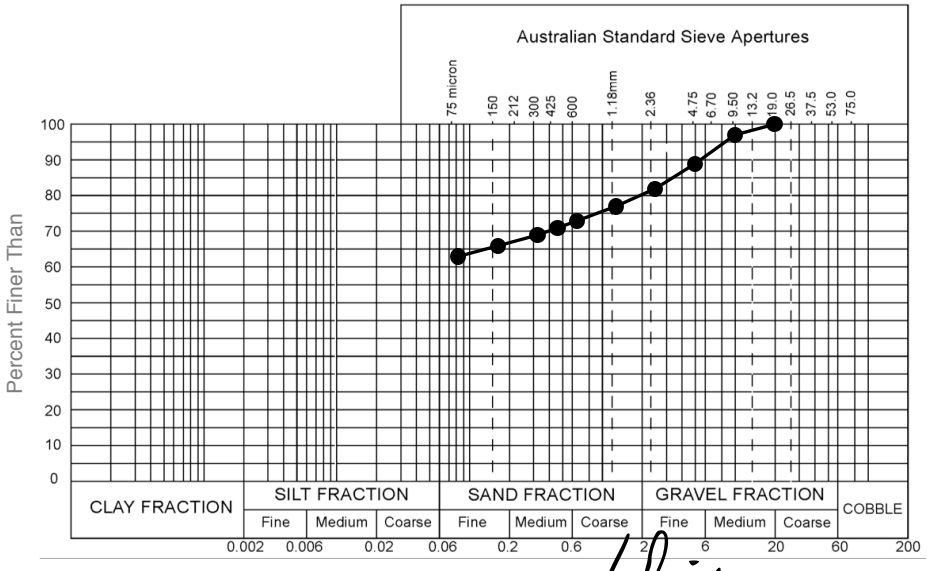
Sample Details

Laboratory Number	S865847-A-9	**Date tested**	11 Dec 2017
Sample ID	TP04_0.0-0.25m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 FINES with gravel, with sand	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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BALCATTA LABORATORY
ACCREDITATION NUMBER 18742

Remarks

Date 16 January 2018

Authorised Signatory

Wayne Rozmianiec
Laboratory Manager

WA | QLD | NSW | VIC

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MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

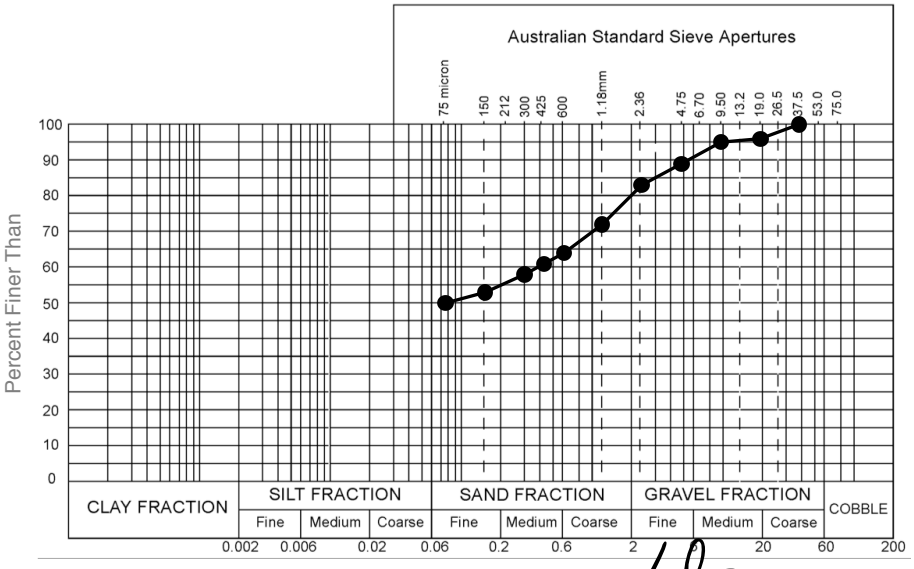
Sample Details

Laboratory Number	S865847-A-10	**Date tested**	11 Dec 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 Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Material Test Certificate

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

Report Number	S865847-A Issue 1	**Client**	MHA GEOTECHNICAL
Job Number	S865847	**Project**	Ravensthorpe Gold Project - MURRAY ST PERTH

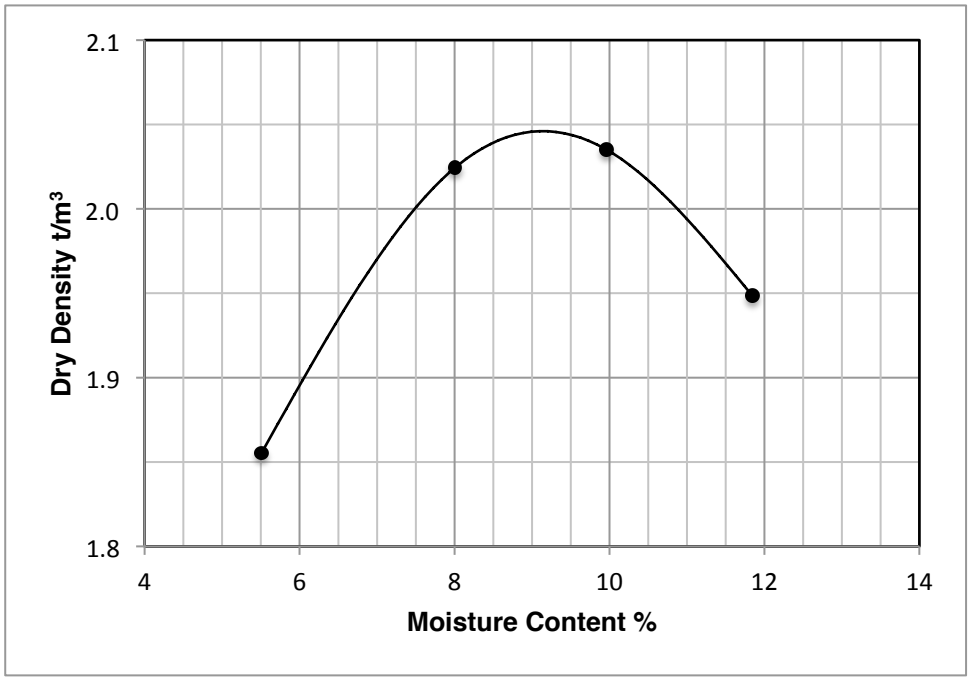
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

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/m³	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



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Wayne Rozmianiec
Laboratory Manager

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WA | QLD | NSW | VIC
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Material Test Certificate

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

Report Number	S865847-A Issue 1	**Client**	MHA GEOTECHNICAL
Job Number	S865847	**Project**	Ravensthorpe Gold Project - MURRAY ST PERTH

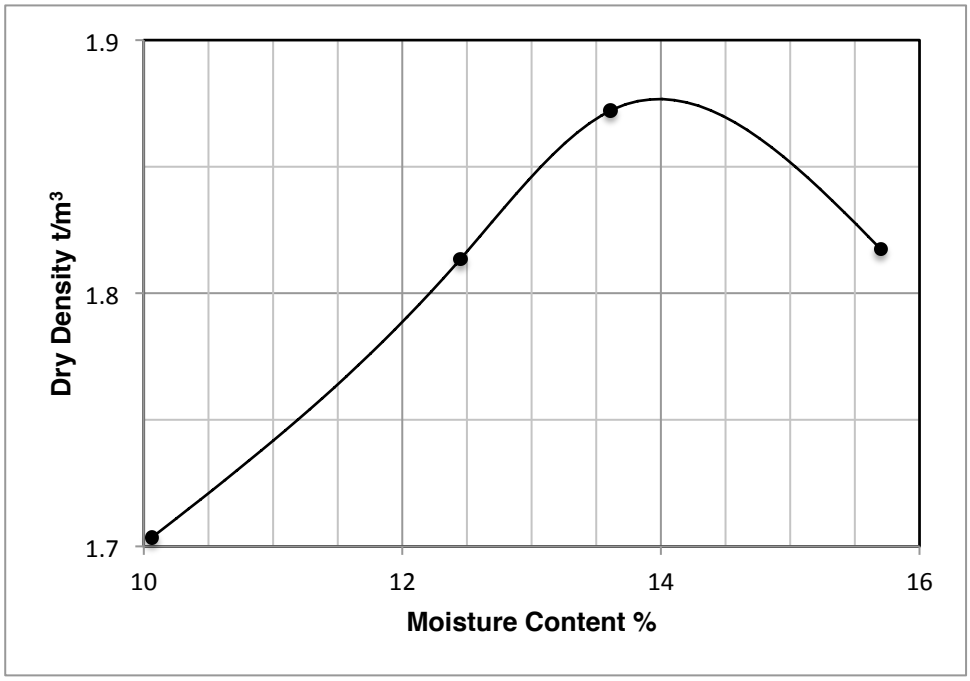
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-A-7	**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/m³	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



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Laboratory Manager

WA | QLD | NSW | VIC
1 Erindale Road, Balcatta, Western Australia 6021 | PO Box 792, Balcatta, Western Australia 6914
Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email wageotechlab@structerre.com.au | Web www.structerre.com.au
ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

Material Test Certificate

AS 1289.3.8.1 Determination of the Emerson class number of a soil

Report Number S865847-A Issue 1
Client MHA GEOTECHNICAL

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 tested**	12 December 2017
Sample ID	-			**Time Tested**	-
Proposed Use	Foundation			**Layer Thickness mm**	-
Material Description	Various			**Test Depth mm**	-
Sampling Method	Client	**Site Selection Method**	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

Wayne Rozmianiec
Laboratory Manager

Emerson

WA | QLD | NSW | VIC
1 Erindale Road, Balcatta, Western Australia 6021 | PO Box 792, Balcatta, Western Australia 6914
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Material Test Certificate

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

Report Number	S865847-A Issue 1	**Client**	MHA GEOTECHNICAL
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 tested**	1 December 2007
Sample ID	-			**Time Tested**	-
Proposed Use	Foundation			**Layer Thickness mm**	-
Material Description	Various			**Test Depth mm**	-
Sampling Method	Client	**Site Selection Method**	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

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Laboratory Manager

WA | QLD | NSW | VIC
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MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

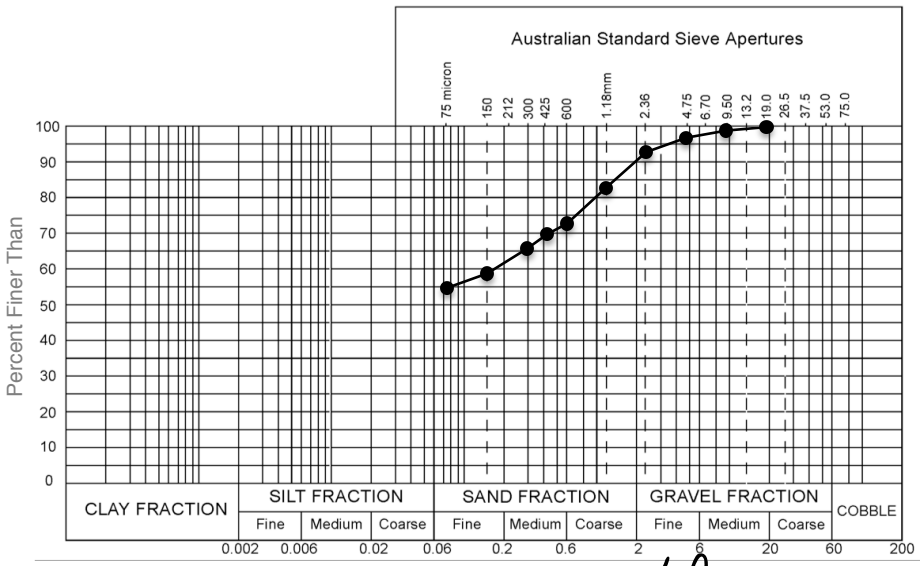
Sample Details

Laboratory Number	S865847-A-11	**Date tested**	11 Dec 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 Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

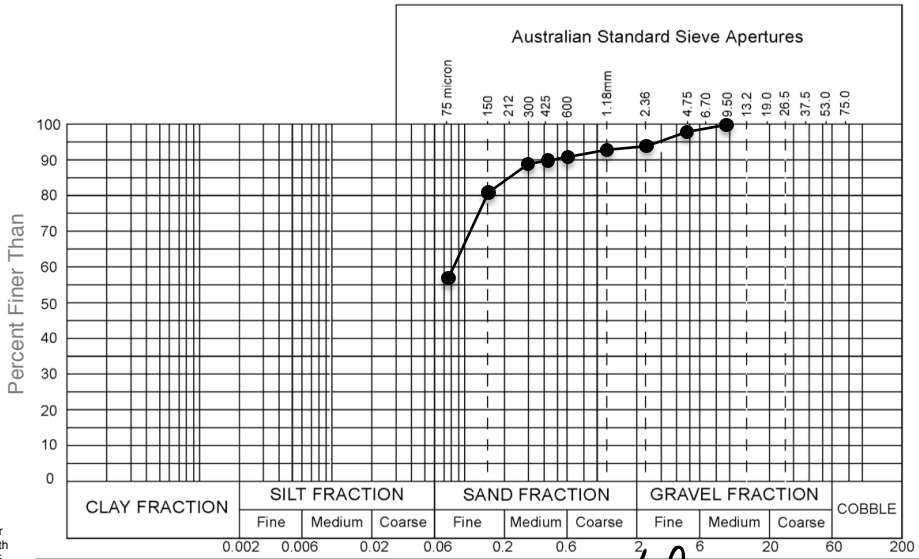
Sample Details

Laboratory Number	S865847-A-12	**Date tested**	11 Dec 2017
Sample ID	TP05_0.1-0.8m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Sandy FINES trace gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Job Number S865847

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Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

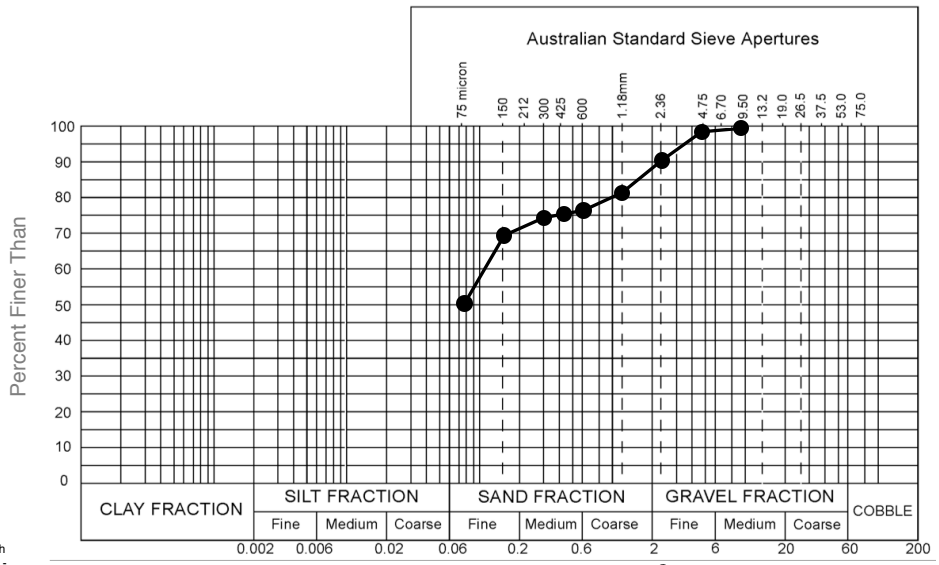
Sample Details

Laboratory Number	S865847-A-13	**Date tested**	11 Dec 2017
Sample ID	TP05_0.8-1.8m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Sandy FINES trace gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

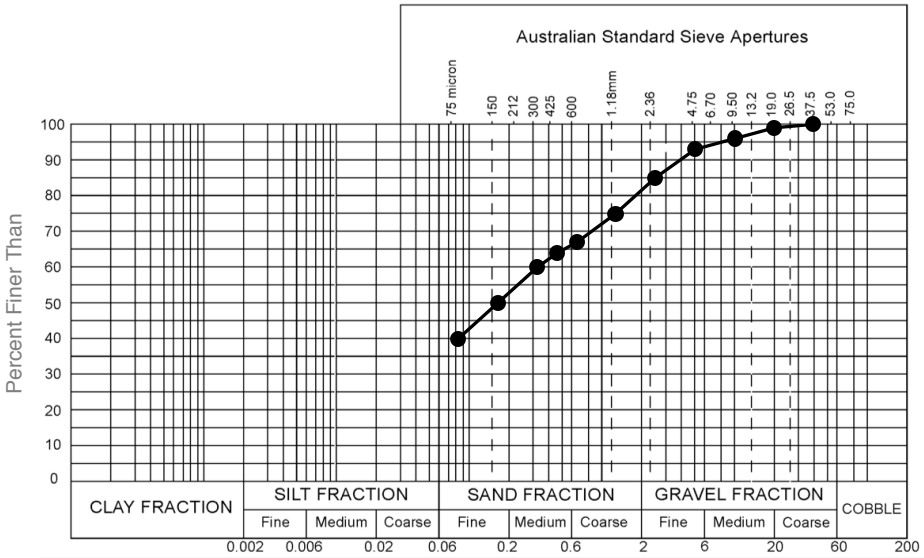
Sample Details

Laboratory Number	S865847-A-14	**Date tested**	11 Dec 2017
Sample ID	TP05_1.8-2.9m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Sandy FINES trace gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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1 Erindale Rd Balcatta WA 6021

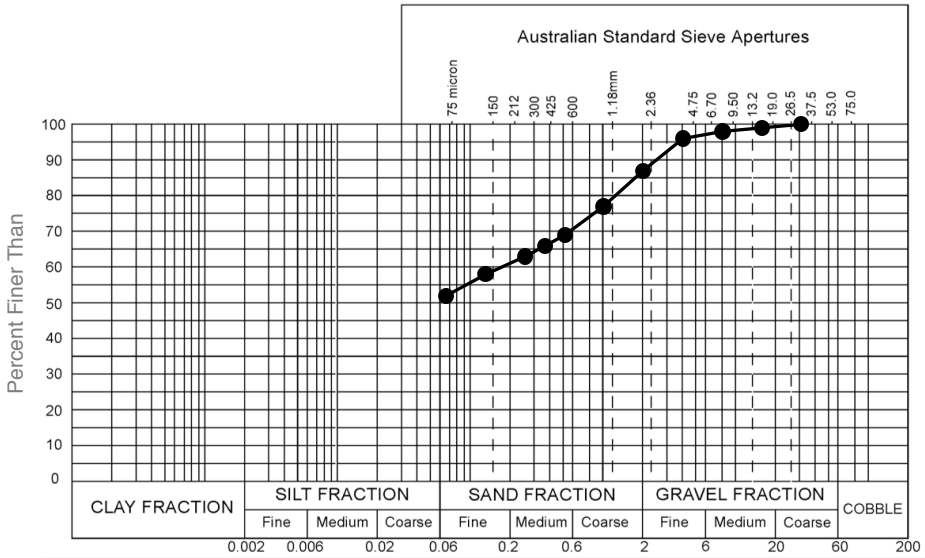
Sample Details

Laboratory Number	S865847-A-15	**Date tested**	12 Dec 2017
Sample ID	TP06_0.0-0.6m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Sandy FINES trace gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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1 Erindale Road, Balcatta, Western Australia 6021 | PO Box 792, Balcatta, Western Australia 6914
Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email wageotechlab@structerre.com.au | Web www.structerre.com.au
ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-A
Issue 1

Client MHA GEOTECHNICAL

Job Number S865847

Project Ravensthorpe Gold Project - MURRAY ST PERTH

Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

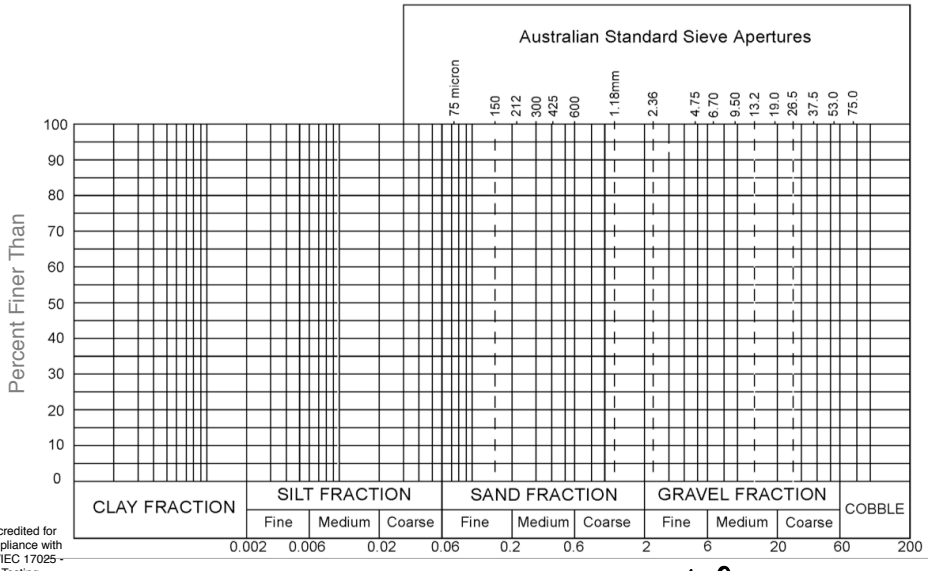
Sample Details

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 Depth**	0.6-2.7m
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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

Particle Size Distribution Graph



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WORLD RECOGNISED ACCREDITATION
STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

Remarks

Date 16 January 2018

Authorised Signatory

Wayne Rozmianiec
Laboratory Manager

WA | QLD | NSW | VIC

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1 Erindale Rd Balcatta WA 6021

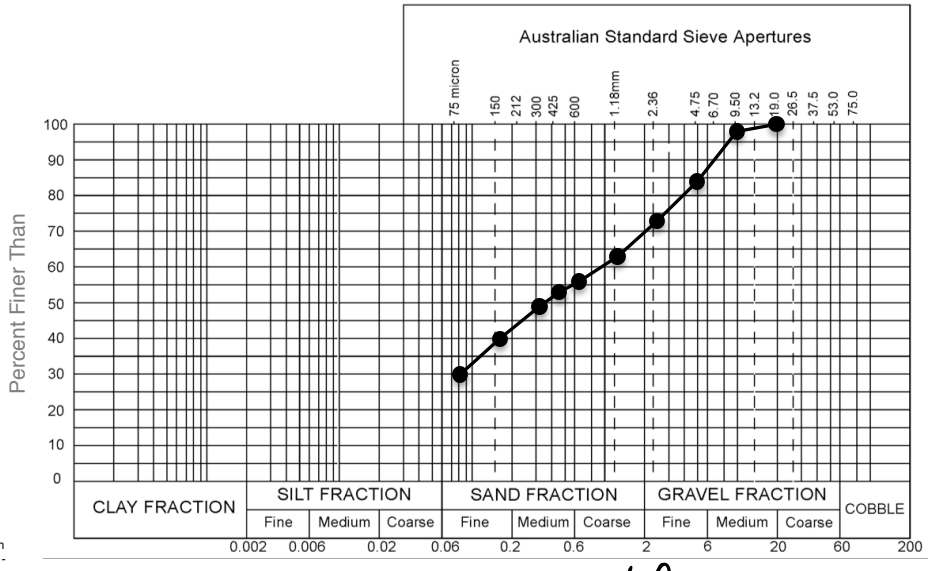
Sample Details

Laboratory Number	S865847-A-17	**Date tested**	12 Dec 2017
Sample ID	TP07_0.1-0.2m	**Tested by**	JSO
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 SM Silty or clayey SAND with gravel	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

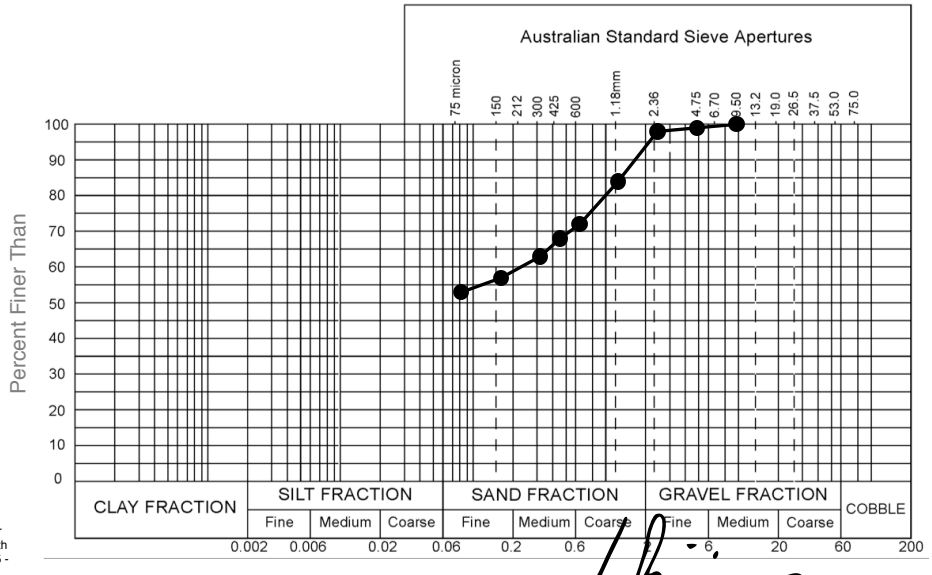
Sample Details

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	**Test Depth**	-
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 1289.3.2.1,AS 1289.3.3.1,AS 1289.3.4.1)	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**		
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



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