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

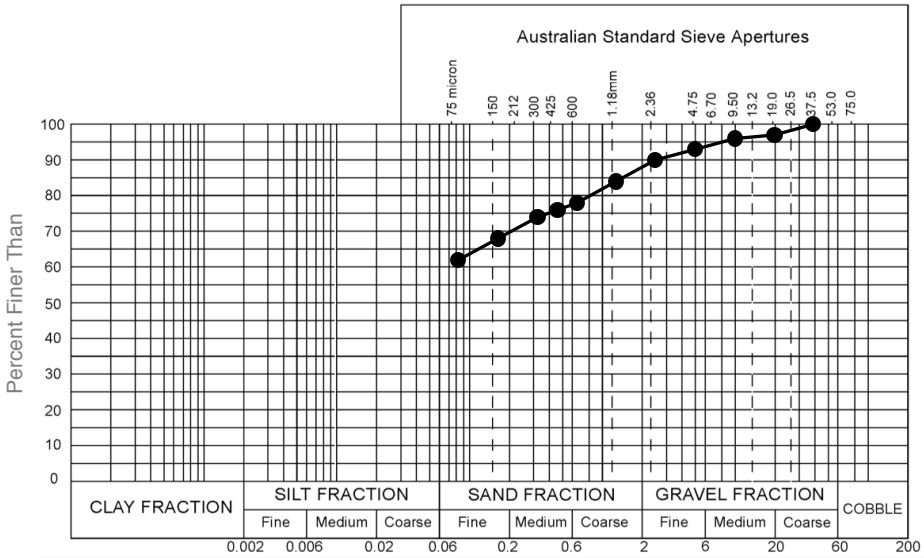
Sample Details

Laboratory Number	S865847-A-19	**Date tested**	13 Dec 2017
Sample ID	TP08_0.1-0.4m	**Tested by**	JSO
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	84	**Liquid Limit %**	
37.5 mm	100	0.6 mm	78	**Plastic Limit %**	
19 mm	97	0.425 mm	76	**Plasticity Index %**	
9.5 mm	96	0.3 mm	74	**Linear Shrinkage %**	
4.75 mm	93	0.15 mm	68	**Nature Of Shrinkage**	
2.36 mm	90	0.075 mm	62	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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STRUCTERRE CONSULTING ENGINEERS
BALCATTA LABORATORY
ACCREDITATION NUMBER 18742

Remarks

Date 16 January 2018

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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

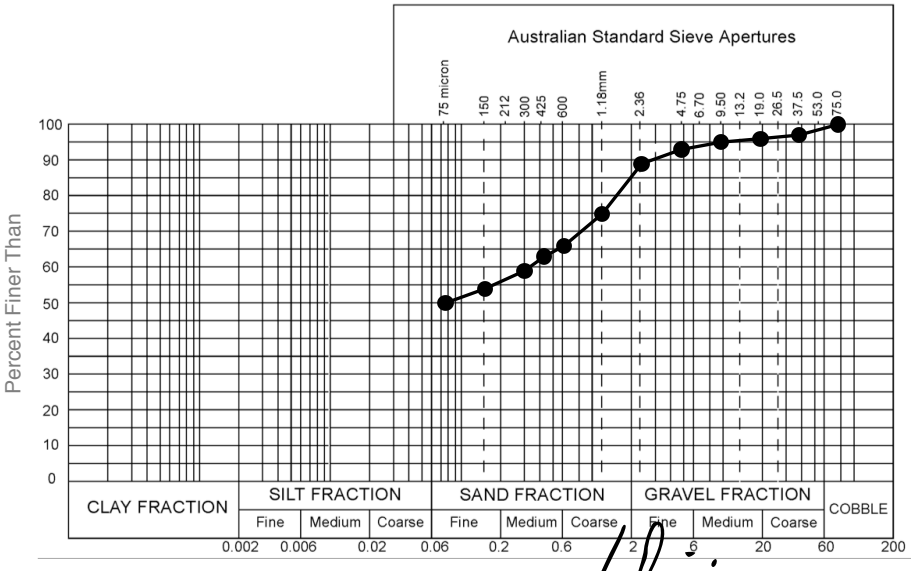
Sample Details

Laboratory Number	S865847-A-20	**Date tested**	13 Dec 2017
Sample ID	TP08_0.4-2.2m	**Tested by**	JSO
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	100	1.18 mm	75	**Liquid Limit %**	
37.5 mm	97	0.6 mm	66	**Plastic Limit %**	
19 mm	96	0.425 mm	63	**Plasticity Index %**	
9.5 mm	95	0.3 mm	59	**Linear Shrinkage %**	
4.75 mm	93	0.15 mm	54	**Nature Of Shrinkage**	
2.36 mm	89	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

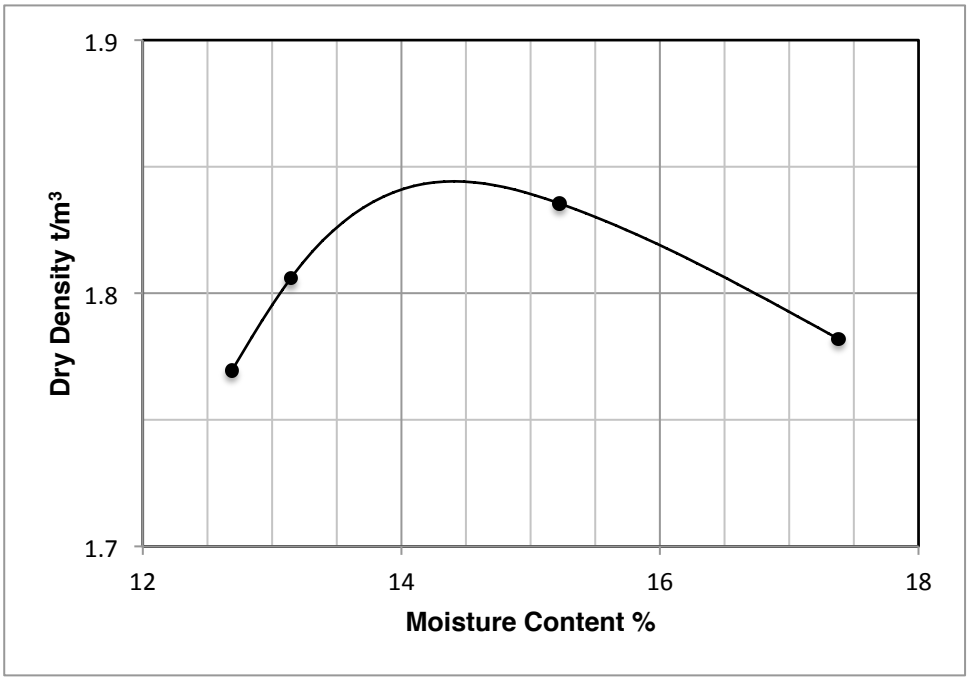
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-A-16	**Date tested**	Monday, 11 December 2017
Sample ID	TP06 0.6 - 2.7m		
Proposed Use	Foundation		
Material Description	Clay		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.84	**Optimum Moisture Content %**	14.5
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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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-16	TP06_0.6-2.7m	2

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Emerson

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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-21	TP09_0.1-0.2m	5.9
S865847-A-22	TP09_0.2-2.2m	6.5
S865847-A-23	TP10_0.1-2.5m	10.6
S865847-A-24	TP11_0.2-2.8m	13.4
S865847-A-25	TP12_0.1-2.8m	15.1
S865847-A-26	TP13_0.1-0.7m	9.9
S865847-A-27	TP13_0.7-2.8m	10.8
S865847-A-28	TP14_0.2-1.0m	6.3
S865847-A-29	TP15_0.2-2.7m	10.0
S865847-A-30	TP16_0.2-0.6m	12.9

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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

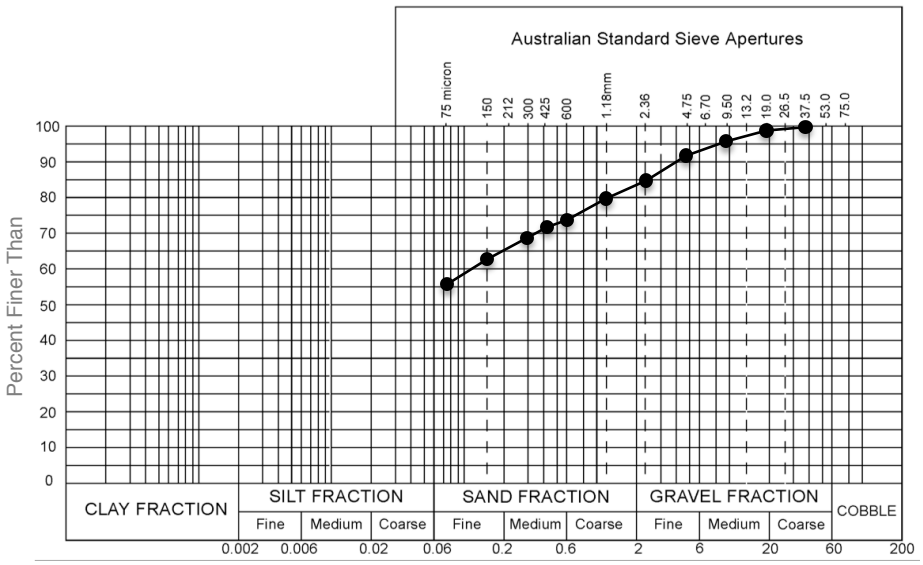
Sample Details

Laboratory Number	S865847-A-21	**Date tested**	13 Dec 2017
Sample ID	TP09_0.1-0.2m	**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	80	**Liquid Limit %**	
37.5 mm	100	0.6 mm	74	**Plastic Limit %**	
19 mm	99	0.425 mm	72	**Plasticity Index %**	
9.5 mm	96	0.3 mm	69	**Linear Shrinkage %**	
4.75 mm	92	0.15 mm	63	**Nature Of Shrinkage**	
2.36 mm	85	0.075 mm	56	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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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

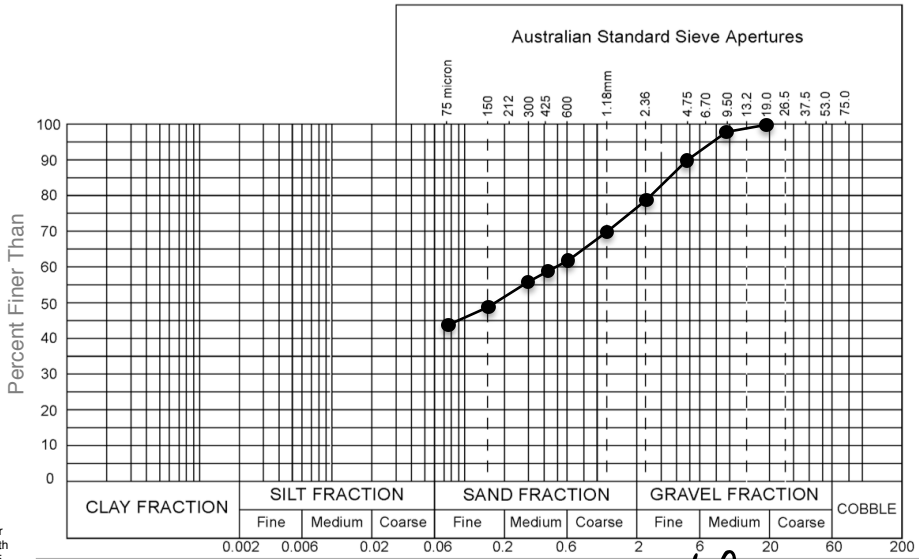
Sample Details

Laboratory Number	S865847-A-22	**Date tested**	13 Dec 2017
Sample ID	TP09_0.2-2.2m	**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	70	**Liquid Limit %**	
37.5 mm		0.6 mm	62	**Plastic Limit %**	
19 mm	100	0.425 mm	59	**Plasticity Index %**	
9.5 mm	98	0.3 mm	56	**Linear Shrinkage %**	
4.75 mm	90	0.15 mm	49	**Nature Of Shrinkage**	
2.36 mm	79	0.075 mm	44	**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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Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

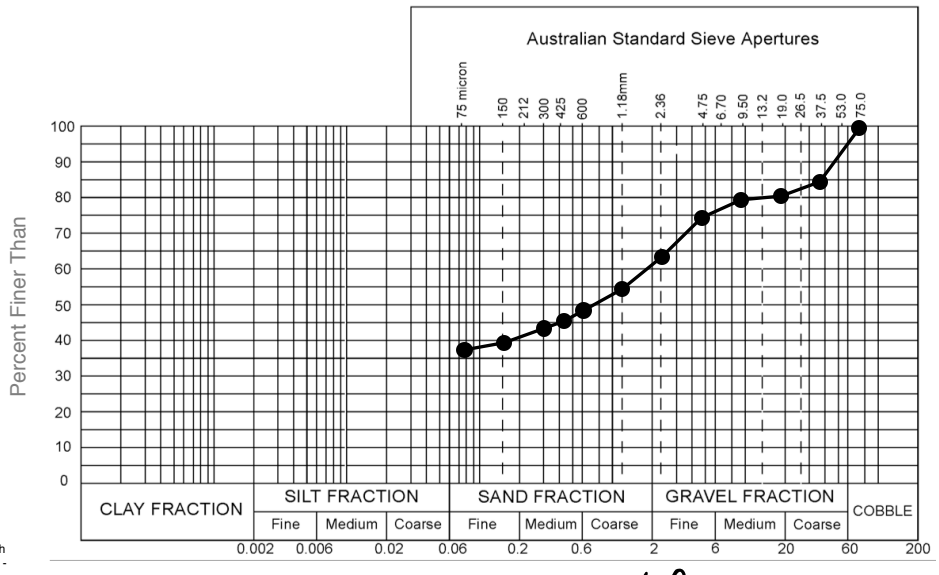
Sample Details

Laboratory Number	S865847-A-23	**Date tested**	20 Dec 2017
Sample ID	TP10_0.1-2.5m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Gravelly FINES 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	100	1.18 mm	55	**Liquid Limit %**	
37.5 mm	85	0.6 mm	49	**Plastic Limit %**	
19 mm	81	0.425 mm	46	**Plasticity Index %**	
9.5 mm	80	0.3 mm	44	**Linear Shrinkage %**	
4.75 mm	75	0.15 mm	40	**Nature Of Shrinkage**	
2.36 mm	64	0.075 mm	38	**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

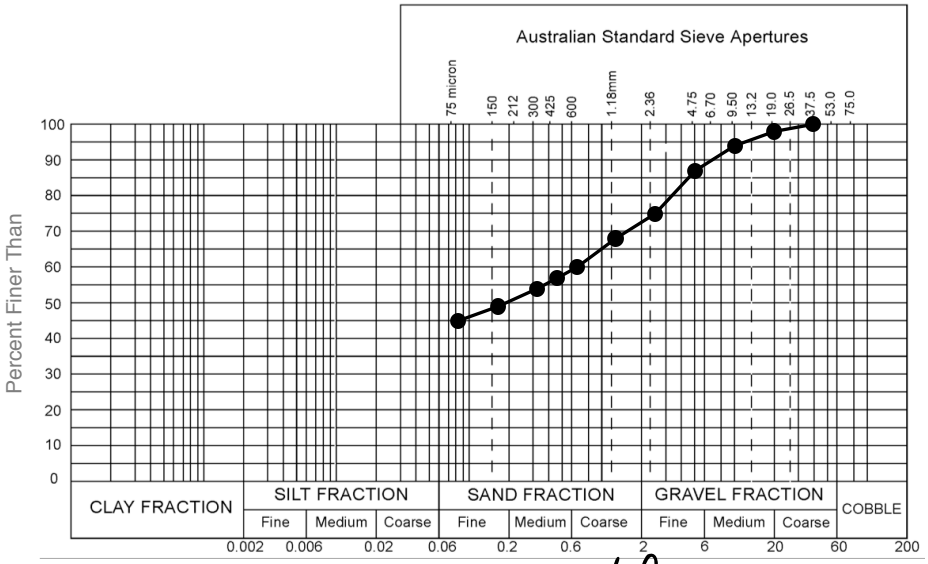
Sample Details

Laboratory Number	S865847-A-24	**Date tested**	20 Dec 2017
Sample ID	TP11_0.2-2.8m	**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	68	**Liquid Limit %**	
37.5 mm	100	0.6 mm	60	**Plastic Limit %**	
19 mm	98	0.425 mm	57	**Plasticity Index %**	
9.5 mm	94	0.3 mm	54	**Linear Shrinkage %**	
4.75 mm	87	0.15 mm	49	**Nature Of Shrinkage**	
2.36 mm	75	0.075 mm	45	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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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

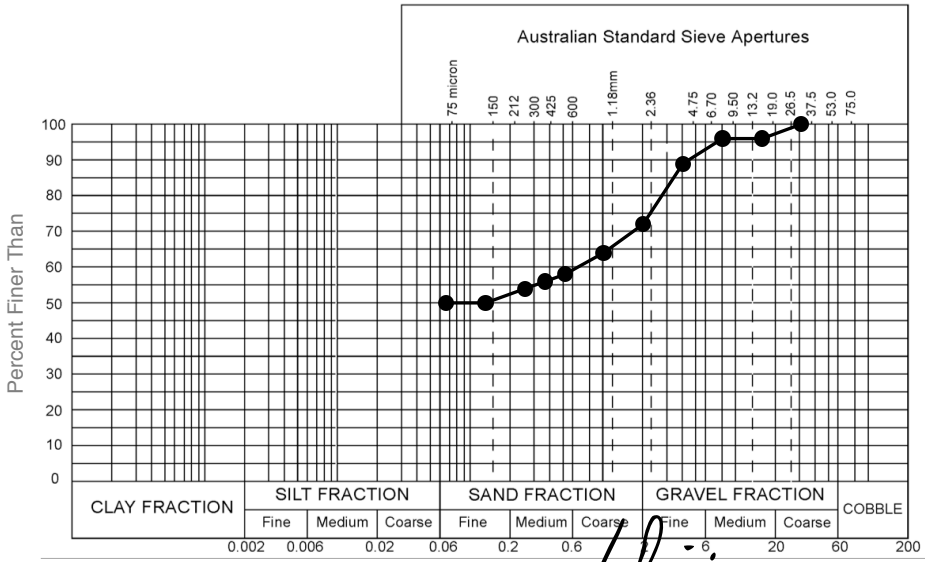
Sample Details

Laboratory Number	S865847-A-25	**Date tested**	20 Dec 2017
Sample ID	TP12_0.1-2.8m	**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	64	**Liquid Limit %**	
37.5 mm	100	0.6 mm	58	**Plastic Limit %**	
19 mm	96	0.425 mm	56	**Plasticity Index %**	
9.5 mm	96	0.3 mm	54	**Linear Shrinkage %**	
4.75 mm	89	0.15 mm	50	**Nature Of Shrinkage**	
2.36 mm	72	0.075 mm	50	**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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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

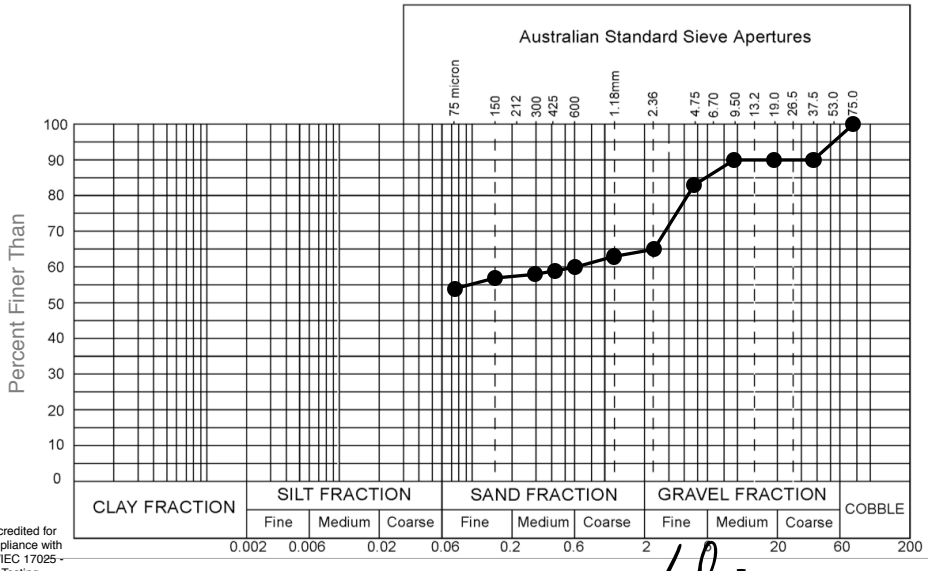
Sample Details

Laboratory Number	S865847-A-26	**Date tested**	20 Dec 2017
Sample ID	TP13_0.1-0.7m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Gravelly FINES trace 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	100	1.18 mm	63	**Liquid Limit %**	
37.5 mm	90	0.6 mm	60	**Plastic Limit %**	
19 mm	90	0.425 mm	59	**Plasticity Index %**	
9.5 mm	90	0.3 mm	58	**Linear Shrinkage %**	
4.75 mm	83	0.15 mm	57	**Nature Of Shrinkage**	
2.36 mm	65	0.075 mm	54	**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

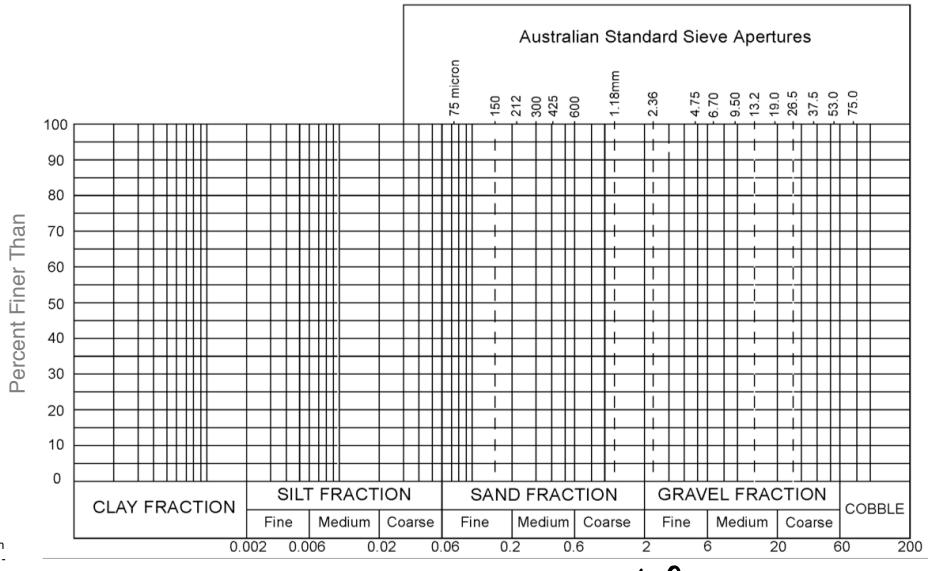
Sample Details

Laboratory Number	S865847-A-27	**Date tested**	11 December 2018
Sample ID	TP13_0.7-2.8m	**Tested by**	CF
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	Clayey Silt	**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 %**	Not obtained
37.5 mm		0.6 mm		**Plastic Limit %**	Not obtained
19 mm		0.425 mm		**Plasticity Index %**	NP
9.5 mm		0.3 mm		**Linear Shrinkage %**	2.0
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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WORLD RECOGNISED ACCREDITATION
STRUCTERRE CONSULTING ENGINEERS
BALCATTA LABORATORY
ACCREDITATION NUMBER 18742

Remarks

Date 16 January 2018

Authorised Signatory

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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

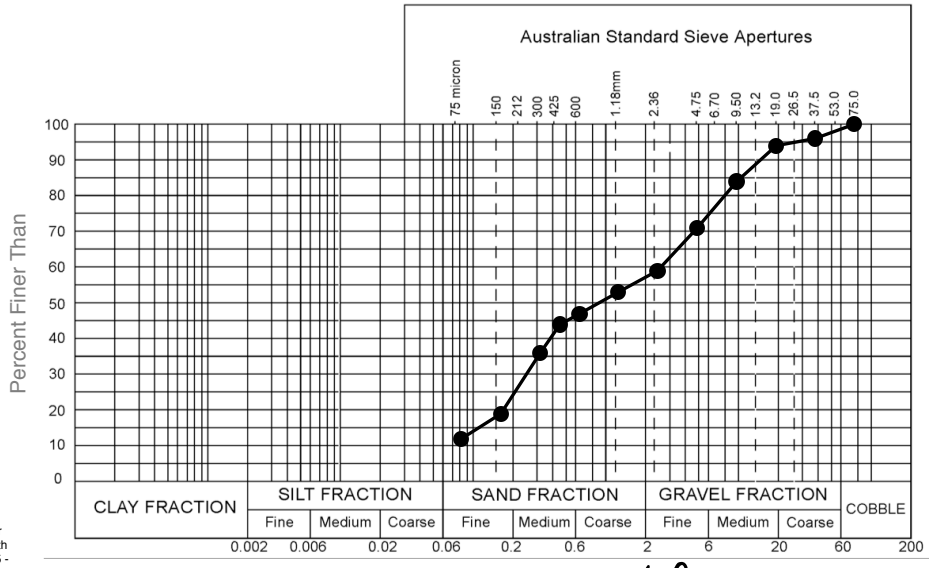
Sample Details

Laboratory Number	S865847-A-28	**Date tested**	20 Dec 2017
Sample ID	TP14_0.2-1.0m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 SM Silty or clayey, gravelly 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	100	1.18 mm	53	**Liquid Limit %**	
37.5 mm	96	0.6 mm	47	**Plastic Limit %**	
19 mm	94	0.425 mm	44	**Plasticity Index %**	
9.5 mm	84	0.3 mm	36	**Linear Shrinkage %**	
4.75 mm	71	0.15 mm	19	**Nature Of Shrinkage**	
2.36 mm	59	0.075 mm	12	**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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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

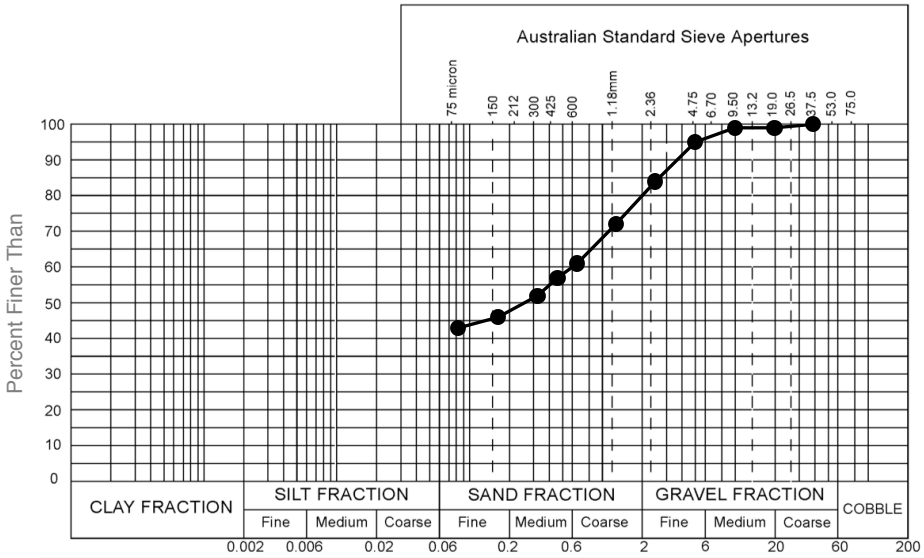
Sample Details

Laboratory Number	S865847-A-29	**Date tested**	20 Dec 2017
Sample ID	TP15_0.2-2.7m	**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	61	**Plastic Limit %**	
19 mm	99	0.425 mm	57	**Plasticity Index %**	
9.5 mm	99	0.3 mm	52	**Linear Shrinkage %**	
4.75 mm	95	0.15 mm	46	**Nature Of Shrinkage**	
2.36 mm	84	0.075 mm	43	**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

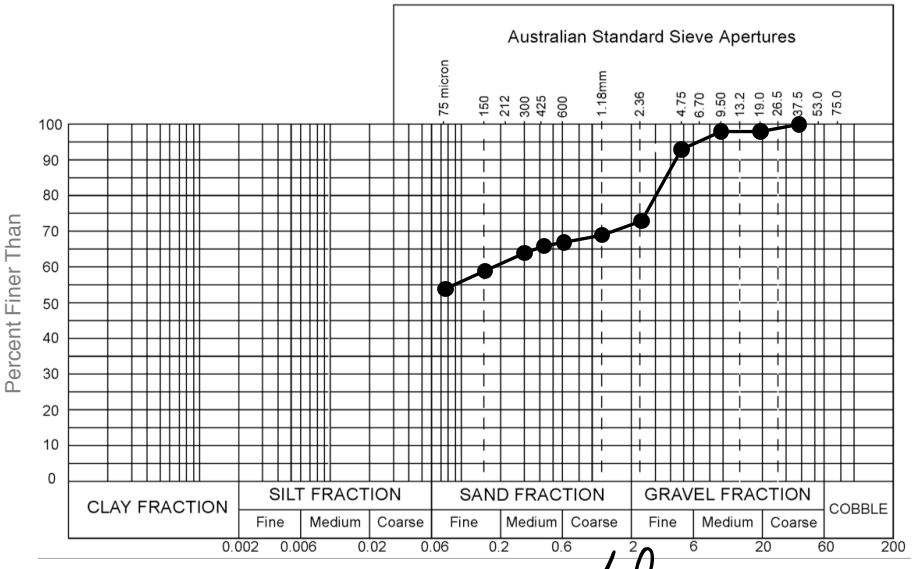
Sample Details

Laboratory Number	S865847-A-30	**Date tested**	20 Dec 2017
Sample ID	TP16_0.2-0.6m	**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	69	**Liquid Limit %**	
37.5 mm	100	0.6 mm	67	**Plastic Limit %**	
19 mm	98	0.425 mm	66	**Plasticity Index %**	
9.5 mm	98	0.3 mm	64	**Linear Shrinkage %**	
4.75 mm	93	0.15 mm	59	**Nature Of Shrinkage**	
2.36 mm	73	0.075 mm	54	**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

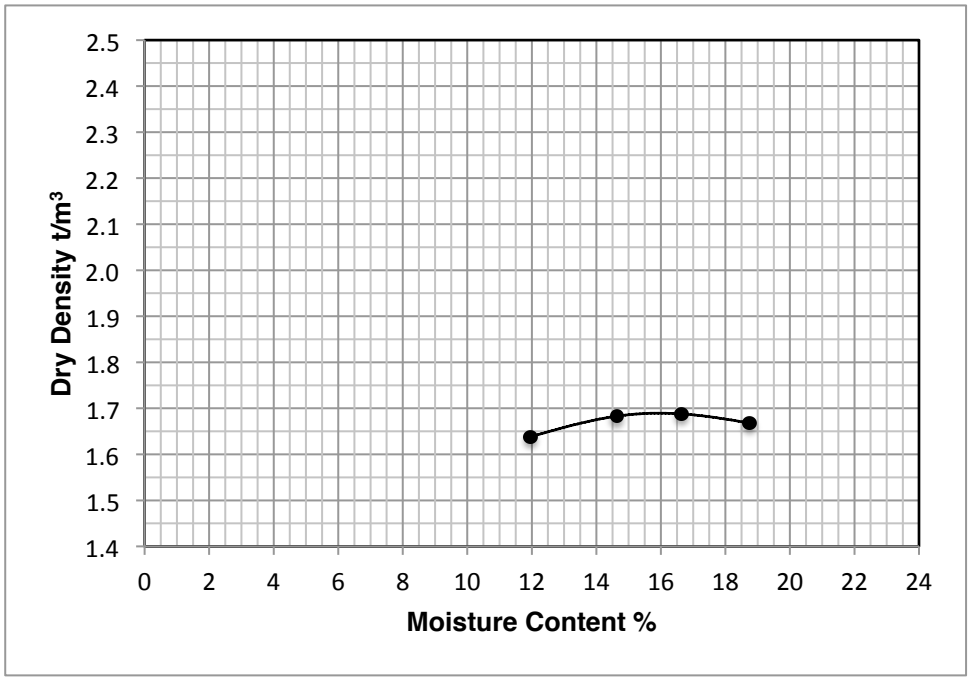
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-A-27	**Date tested**	13 Dec 2017
Sample ID	TP13_0.7-2.8m		
Proposed Use	Foundation		
Material Description	SILT with Clay		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.69	**Optimum Moisture Content %**	16.0
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



Remarks

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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-27	TP13_0.7-2.8m	2

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NDM Spec 201 Report

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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-21	TP09_0.1-0.2m	5.9
S865847-A-22	TP09_0.2-2.2m	6.5
S865847-A-23	TP10_0.1-2.5m	10.6
S865847-A-24	TP11_0.2-2.8m	13.4
S865847-A-25	TP12_0.1-2.8m	15.1
S865847-A-26	TP13_0.1-0.7m	9.9
S865847-A-27	TP13_0.7-2.8m	10.8
S865847-A-28	TP14_0.2-1.0m	6.3
S865847-A-29	TP15_0.2-2.7m	10.0
S865847-A-30	TP16_0.2-0.6m	12.9

Remarks

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STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

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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

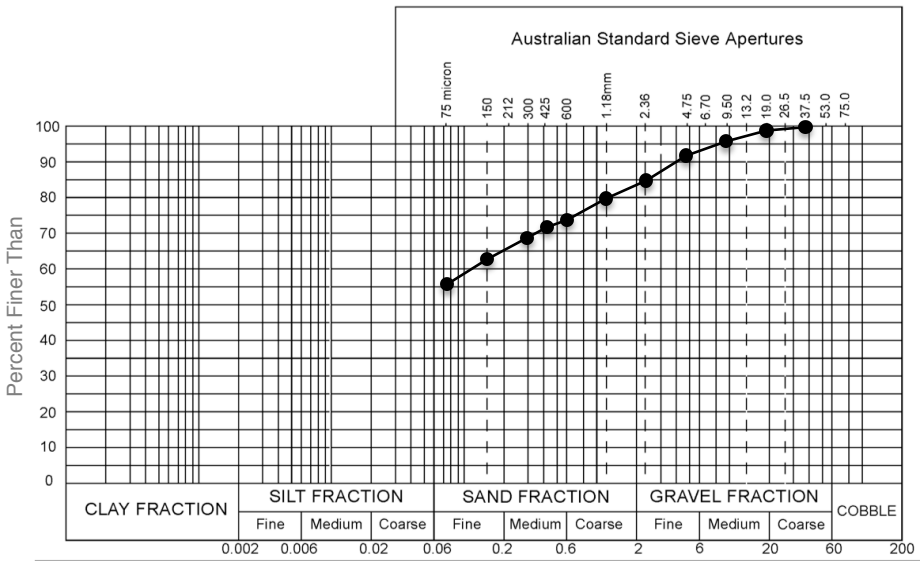
Sample Details

Laboratory Number	S865847-A-21	**Date tested**	13 Dec 2017
Sample ID	TP09_0.1-0.2m	**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	80	**Liquid Limit %**	
37.5 mm	100	0.6 mm	74	**Plastic Limit %**	
19 mm	99	0.425 mm	72	**Plasticity Index %**	
9.5 mm	96	0.3 mm	69	**Linear Shrinkage %**	
4.75 mm	92	0.15 mm	63	**Nature Of Shrinkage**	
2.36 mm	85	0.075 mm	56	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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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

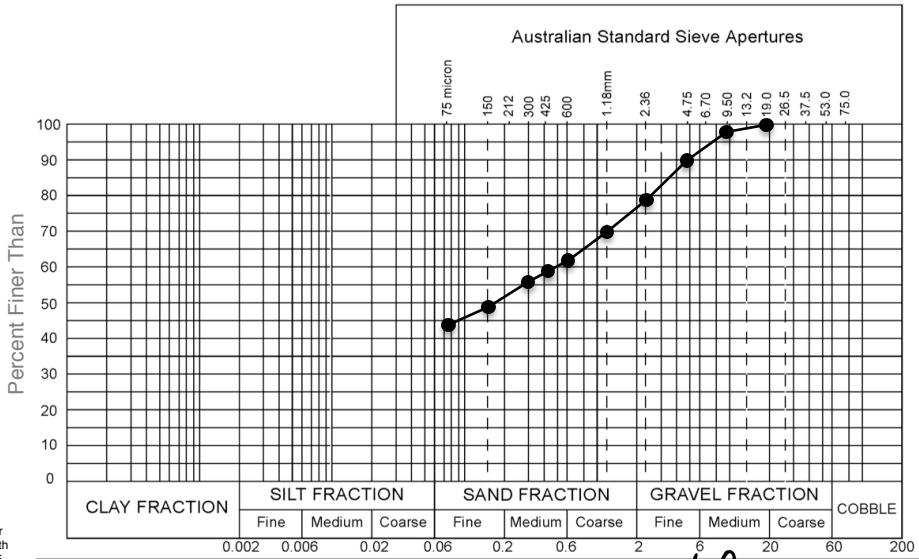
Sample Details

Laboratory Number	S865847-A-22	**Date tested**	13 Dec 2017
Sample ID	TP09_0.2-2.2m	**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	70	**Liquid Limit %**	
37.5 mm		0.6 mm	62	**Plastic Limit %**	
19 mm	100	0.425 mm	59	**Plasticity Index %**	
9.5 mm	98	0.3 mm	56	**Linear Shrinkage %**	
4.75 mm	90	0.15 mm	49	**Nature Of Shrinkage**	
2.36 mm	79	0.075 mm	44	**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

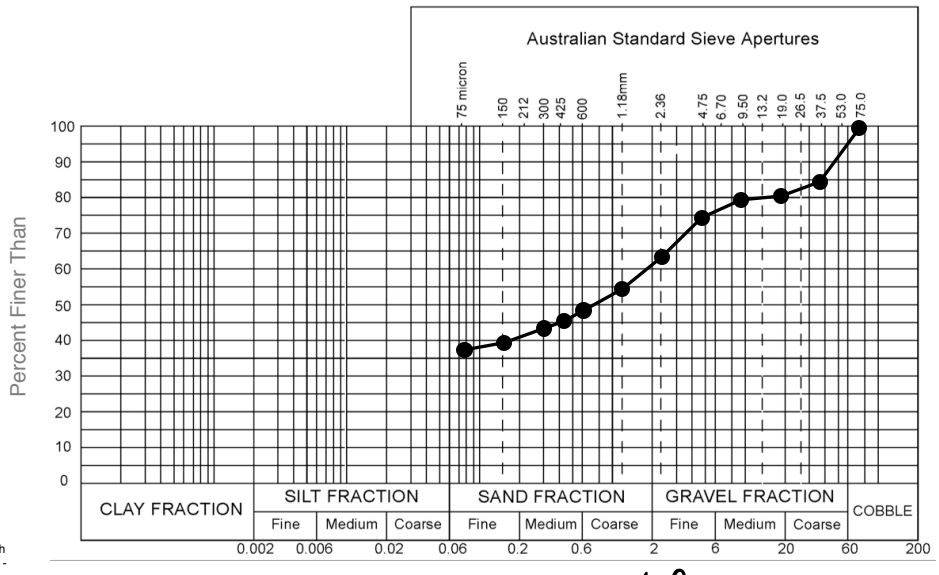
Sample Details

Laboratory Number	S865847-A-23	**Date tested**	20 Dec 2017
Sample ID	TP10_0.1-2.5m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Gravelly FINES 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	100	1.18 mm	55	**Liquid Limit %**	
37.5 mm	85	0.6 mm	49	**Plastic Limit %**	
19 mm	81	0.425 mm	46	**Plasticity Index %**	
9.5 mm	80	0.3 mm	44	**Linear Shrinkage %**	
4.75 mm	75	0.15 mm	40	**Nature Of Shrinkage**	
2.36 mm	64	0.075 mm	38	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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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

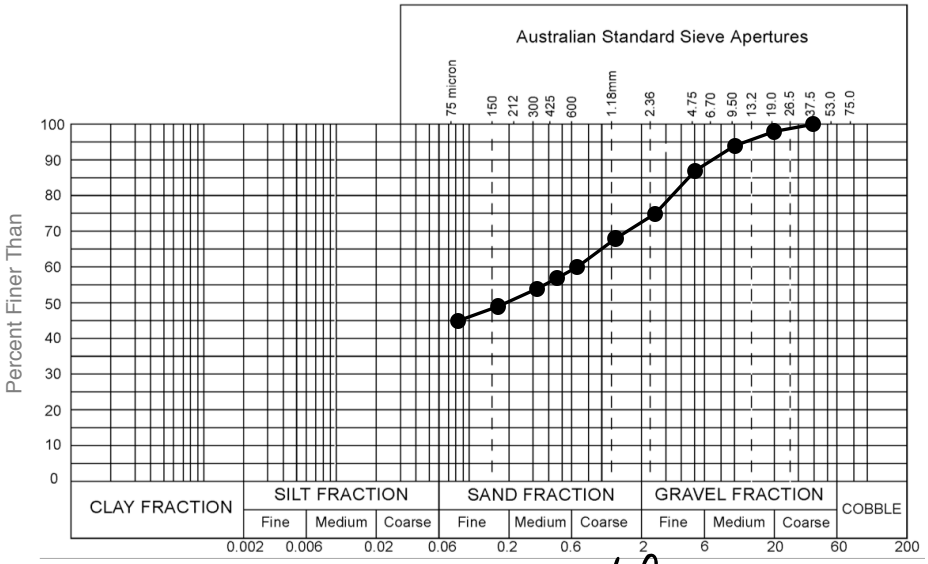
Sample Details

Laboratory Number	S865847-A-24	**Date tested**	20 Dec 2017
Sample ID	TP11_0.2-2.8m	**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	68	**Liquid Limit %**	
37.5 mm	100	0.6 mm	60	**Plastic Limit %**	
19 mm	98	0.425 mm	57	**Plasticity Index %**	
9.5 mm	94	0.3 mm	54	**Linear Shrinkage %**	
4.75 mm	87	0.15 mm	49	**Nature Of Shrinkage**	
2.36 mm	75	0.075 mm	45	**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

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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

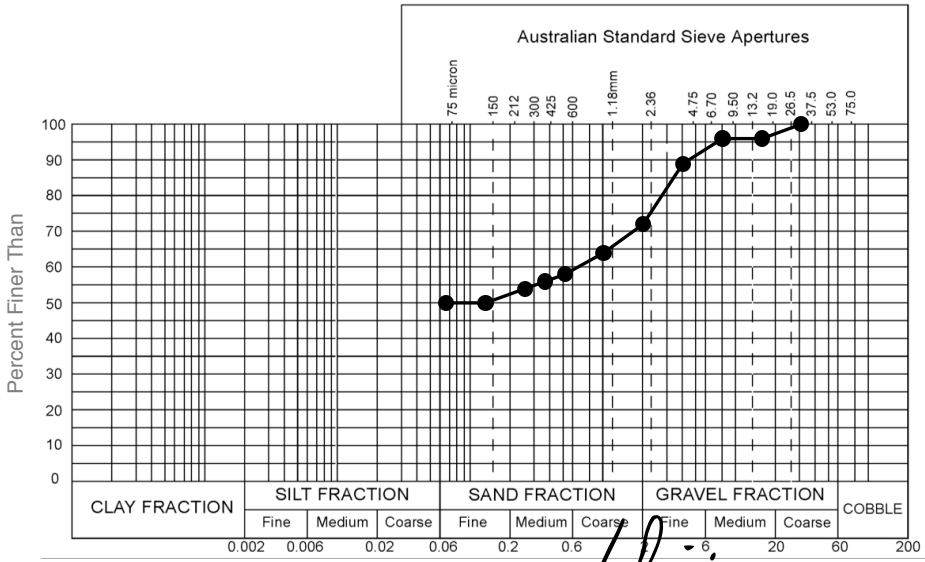
Sample Details

Laboratory Number	S865847-A-25	**Date tested**	20 Dec 2017
Sample ID	TP12_0.1-2.8m	**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	64	**Liquid Limit %**	
37.5 mm	100	0.6 mm	58	**Plastic Limit %**	
19 mm	96	0.425 mm	56	**Plasticity Index %**	
9.5 mm	96	0.3 mm	54	**Linear Shrinkage %**	
4.75 mm	89	0.15 mm	50	**Nature Of Shrinkage**	
2.36 mm	72	0.075 mm	50	**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

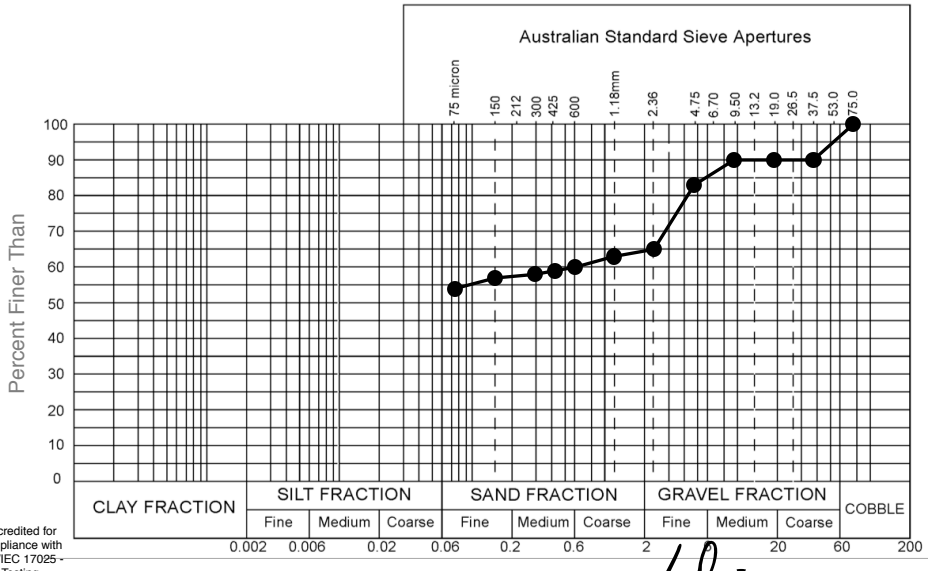
Sample Details

Laboratory Number	S865847-A-26	**Date tested**	20 Dec 2017
Sample ID	TP13_0.1-0.7m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 Gravelly FINES trace 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	100	1.18 mm	63	**Liquid Limit %**	
37.5 mm	90	0.6 mm	60	**Plastic Limit %**	
19 mm	90	0.425 mm	59	**Plasticity Index %**	
9.5 mm	90	0.3 mm	58	**Linear Shrinkage %**	
4.75 mm	83	0.15 mm	57	**Nature Of Shrinkage**	
2.36 mm	65	0.075 mm	54	**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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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

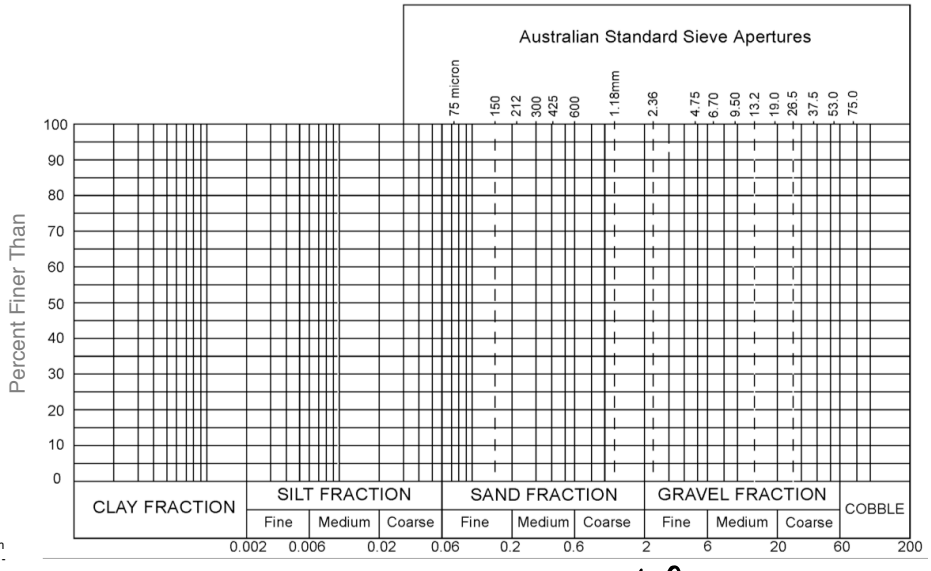
Sample Details

Laboratory Number	S865847-A-27	**Date tested**	11 December 2018
Sample ID	TP13_0.7-2.8m	**Tested by**	CF
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	Clayey Silt	**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 %**	Not obtained
37.5 mm		0.6 mm		**Plastic Limit %**	Not obtained
19 mm		0.425 mm		**Plasticity Index %**	NP
9.5 mm		0.3 mm		**Linear Shrinkage %**	2.0
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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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

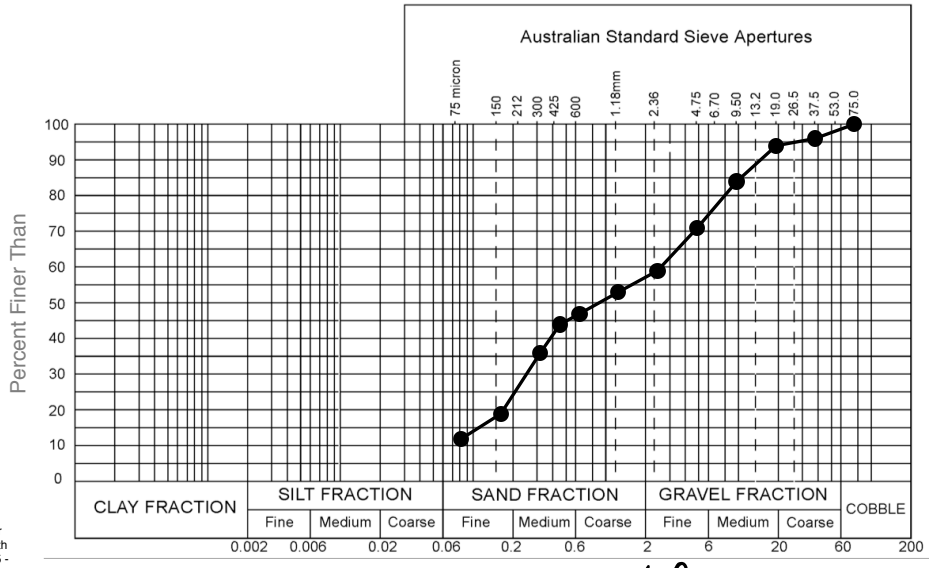
Sample Details

Laboratory Number	S865847-A-28	**Date tested**	20 Dec 2017
Sample ID	TP14_0.2-1.0m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 SM Silty or clayey, gravelly 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	100	1.18 mm	53	**Liquid Limit %**	
37.5 mm	96	0.6 mm	47	**Plastic Limit %**	
19 mm	94	0.425 mm	44	**Plasticity Index %**	
9.5 mm	84	0.3 mm	36	**Linear Shrinkage %**	
4.75 mm	71	0.15 mm	19	**Nature Of Shrinkage**	
2.36 mm	59	0.075 mm	12	**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

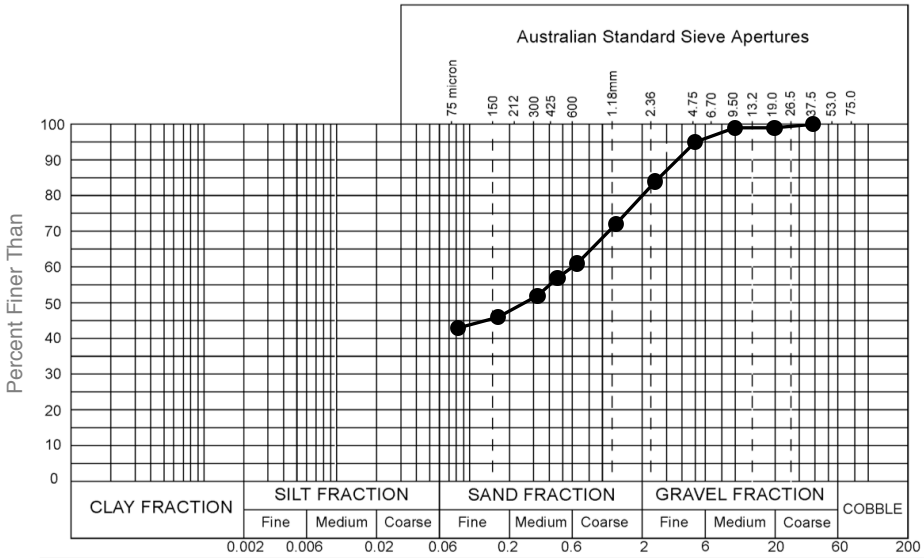
Sample Details

Laboratory Number	S865847-A-29	**Date tested**	20 Dec 2017
Sample ID	TP15_0.2-2.7m	**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	61	**Plastic Limit %**	
19 mm	99	0.425 mm	57	**Plasticity Index %**	
9.5 mm	99	0.3 mm	52	**Linear Shrinkage %**	
4.75 mm	95	0.15 mm	46	**Nature Of Shrinkage**	
2.36 mm	84	0.075 mm	43	**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

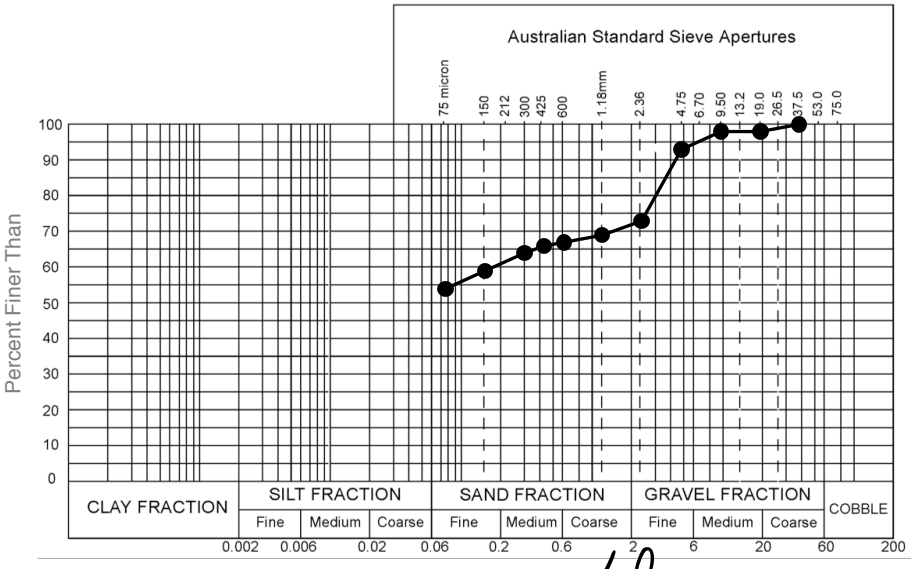
Sample Details

Laboratory Number	S865847-A-30	**Date tested**	20 Dec 2017
Sample ID	TP16_0.2-0.6m	**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	69	**Liquid Limit %**	
37.5 mm	100	0.6 mm	67	**Plastic Limit %**	
19 mm	98	0.425 mm	66	**Plasticity Index %**	
9.5 mm	98	0.3 mm	64	**Linear Shrinkage %**	
4.75 mm	93	0.15 mm	59	**Nature Of Shrinkage**	
2.36 mm	73	0.075 mm	54	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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ACCREDITATION NUMBER 18742

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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

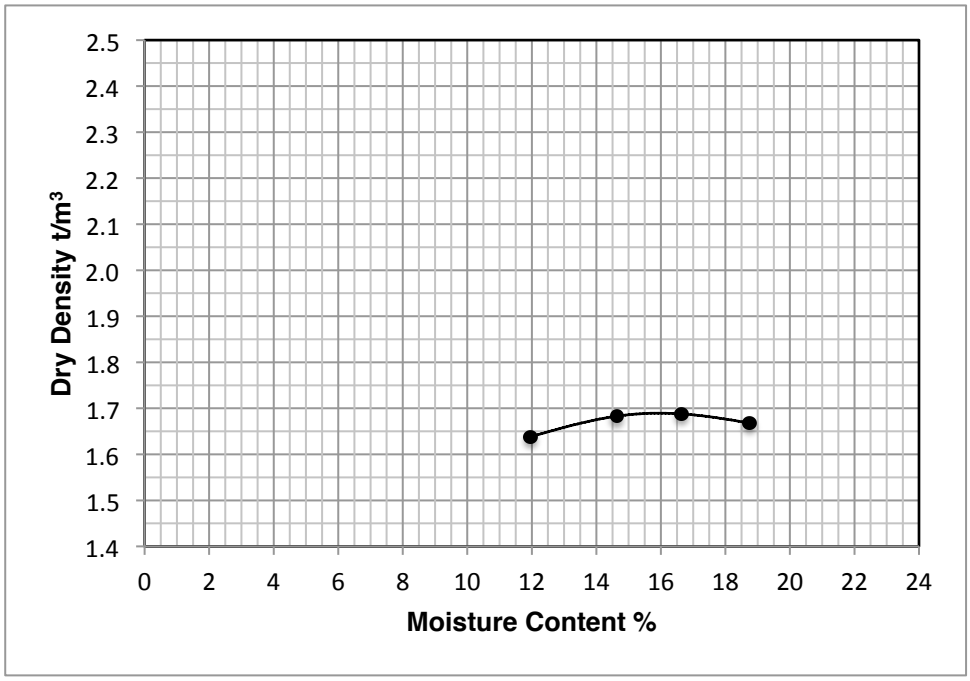
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-A-27	**Date tested**	13 Dec 2017
Sample ID	TP13_0.7-2.8m		
Proposed Use	Foundation		
Material Description	SILT with Clay		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.69	**Optimum Moisture Content %**	16.0
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



Remarks

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Date 16 January 2018

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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-27	TP13_0.7-2.8m	2

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Date 16 January 2018

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NDM Spec 201 Report

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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-31	TP16_0.6-1.0m	11.1
S865847-A-32	TP16_1.0-2.8m	8.7
S865847-A-33	TP17_0.6-1.2m	9.1
S865847-A-34	TP17_1.2-2.7m	10.8
S865847-A-35	TP18_0.2-0.6m	6.1
S865847-A-36	TP18_0.6-1.2m	11.1
S865847-A-37	TP18_1.2-2.8m	9.9
S865847-A-38	TP19_0.2-0.6m	12.7
S865847-A-39	TP19_0.6-2.8m	14.6
S865847-A-40	TP20_0.2-0.4m	12.1

Remarks

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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

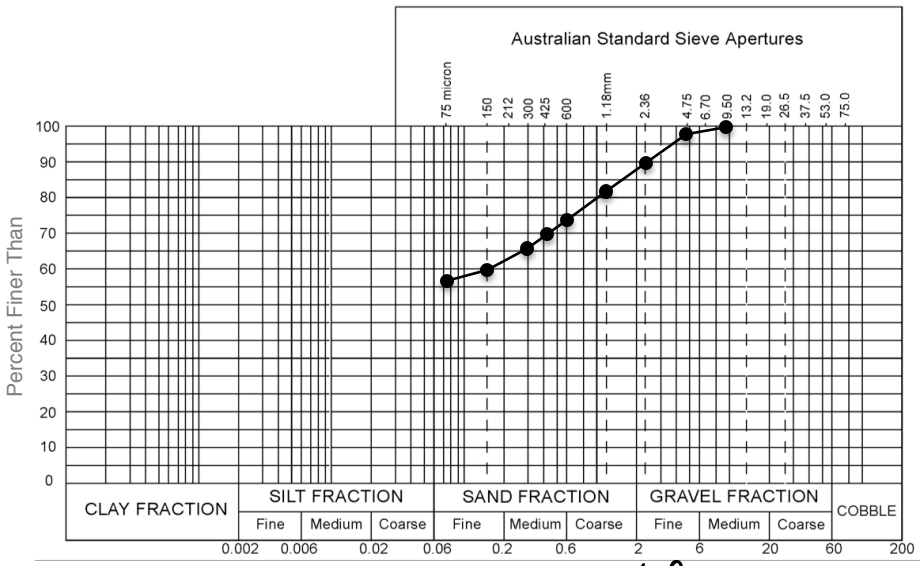
Sample Details

Laboratory Number	S865847-A-31	**Date tested**	20 Dec 2017
Sample ID	TP16_0.6-1.0m	**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	82	**Liquid Limit %**	
37.5 mm		0.6 mm	74	**Plastic Limit %**	
19 mm		0.425 mm	70	**Plasticity Index %**	
9.5 mm	100	0.3 mm	66	**Linear Shrinkage %**	
4.75 mm	98	0.15 mm	60	**Nature Of Shrinkage**	
2.36 mm	90	0.075 mm	57	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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Project Ravensthorpe Gold Project - MURRAY ST PERTH

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

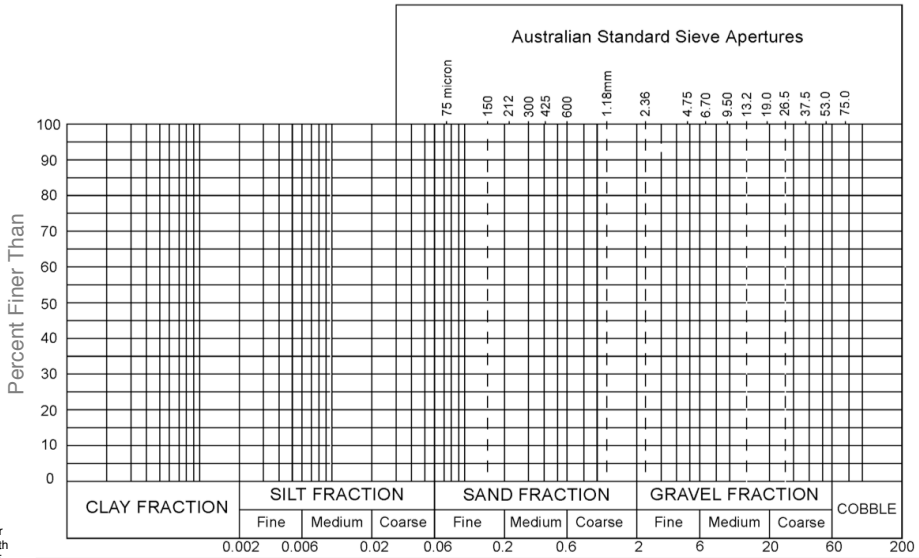
Sample Details

Laboratory Number	S865847-A-32	**Date tested**	11 December 2017
Sample ID	TP16_1.0-2.8m	**Tested by**	CF
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	Clayey Silt	**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 %**	Not obtained
37.5 mm		0.6 mm		**Plastic Limit %**	Not obtained
19 mm		0.425 mm		**Plasticity Index %**	NP
9.5 mm		0.3 mm		**Linear Shrinkage %**	1.5
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

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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

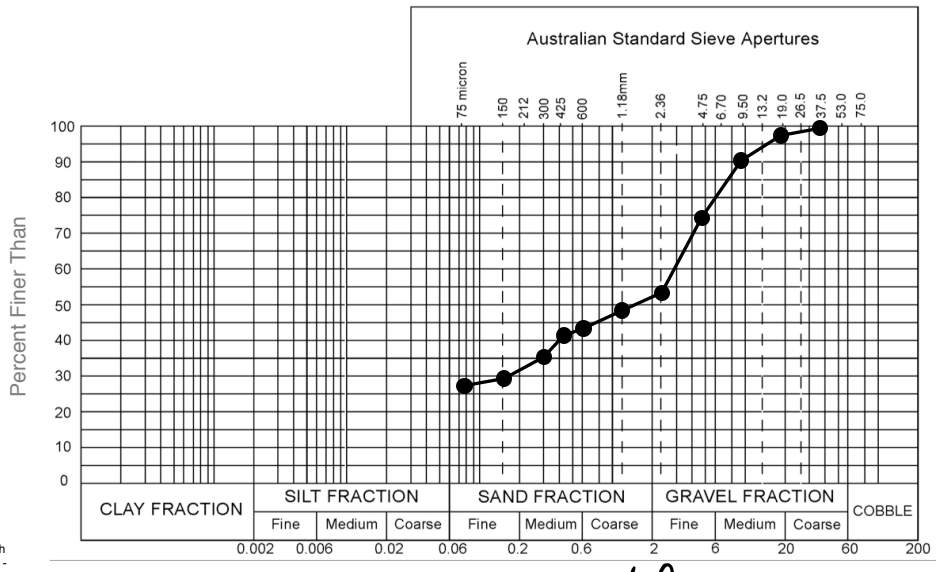
Sample Details

Laboratory Number	S865847-A-33	**Date tested**	20 Dec 2017
Sample ID	TP17_0.6-1.2m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 GM Silty or clayey 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	49	**Liquid Limit %**	
37.5 mm	100	0.6 mm	44	**Plastic Limit %**	
19 mm	98	0.425 mm	42	**Plasticity Index %**	
9.5 mm	91	0.3 mm	36	**Linear Shrinkage %**	
4.75 mm	75	0.15 mm	30	**Nature Of Shrinkage**	
2.36 mm	54	0.075 mm	28	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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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

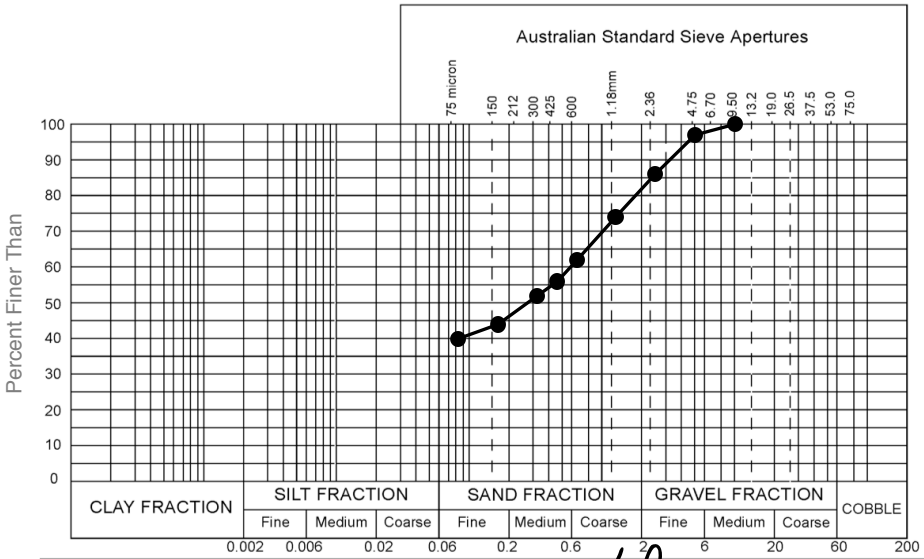
Sample Details

Laboratory Number	S865847-A-34	**Date tested**	20 Dec 2017
Sample ID	TP17_1.2-2.7m	**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	74	**Liquid Limit %**	
37.5 mm		0.6 mm	62	**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	44	**Nature Of Shrinkage**	
2.36 mm	86	0.075 mm	40	**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

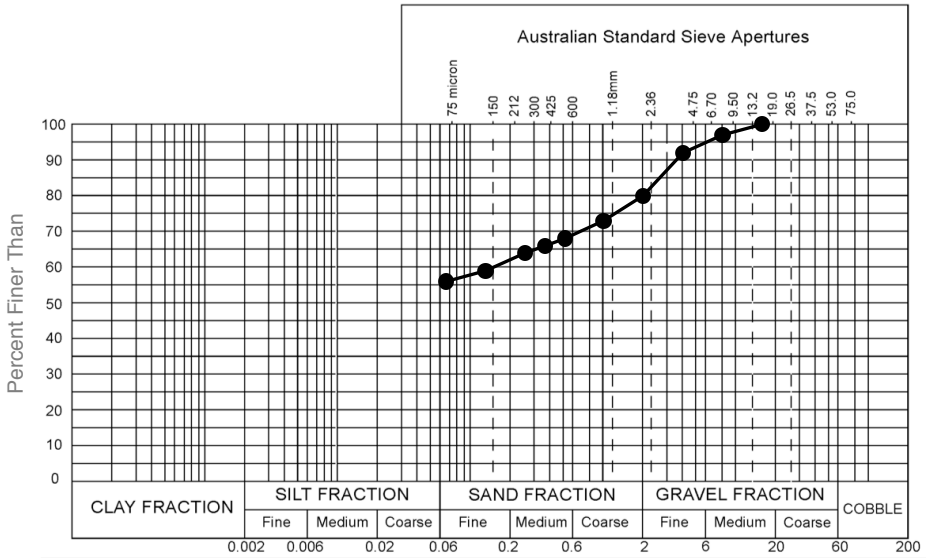
Sample Details

Laboratory Number	S865847-A-35	**Date tested**	20 Dec 2017
Sample ID	TP18_0.2-0.6m	**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	73	**Liquid Limit %**	
37.5 mm		0.6 mm	68	**Plastic Limit %**	
19 mm	100	0.425 mm	66	**Plasticity Index %**	
9.5 mm	97	0.3 mm	64	**Linear Shrinkage %**	
4.75 mm	92	0.15 mm	59	**Nature Of Shrinkage**	
2.36 mm	80	0.075 mm	56	**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

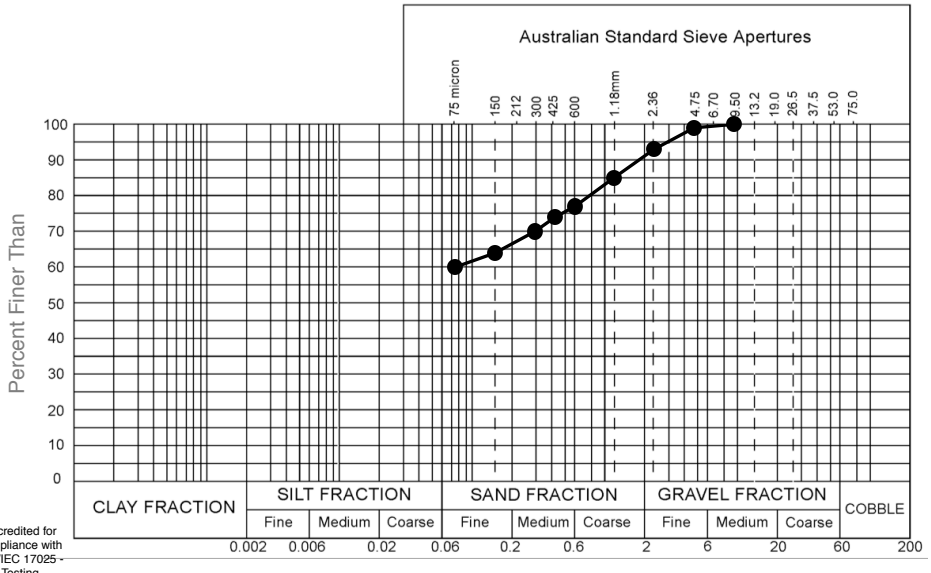
Sample Details

Laboratory Number	S865847-A-36	**Date tested**	20 Dec 2017
Sample ID	TP18_0.6-1.2m	**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	85	**Liquid Limit %**	
37.5 mm		0.6 mm	77	**Plastic Limit %**	
19 mm		0.425 mm	74	**Plasticity Index %**	
9.5 mm	100	0.3 mm	70	**Linear Shrinkage %**	
4.75 mm	99	0.15 mm	64	**Nature Of Shrinkage**	
2.36 mm	93	0.075 mm	60	**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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Job Number S865847

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

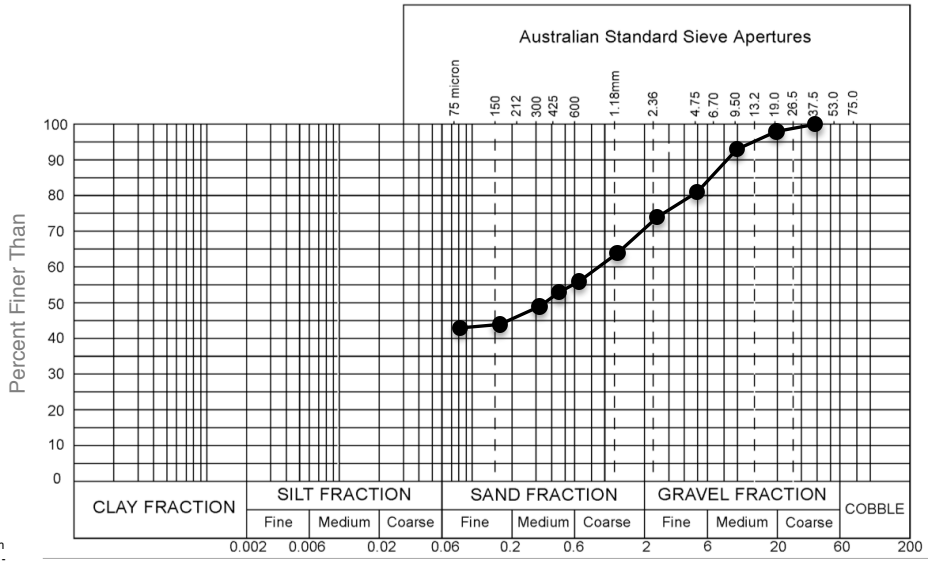
Sample Details

Laboratory Number	S865847-A-37	**Date tested**	20 Dec 2017
Sample ID	TP18_1.2-2.8m	**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	56	**Plastic Limit %**	
19 mm	98	0.425 mm	53	**Plasticity Index %**	
9.5 mm	93	0.3 mm	49	**Linear Shrinkage %**	
4.75 mm	81	0.15 mm	44	**Nature Of Shrinkage**	
2.36 mm	74	0.075 mm	43	**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

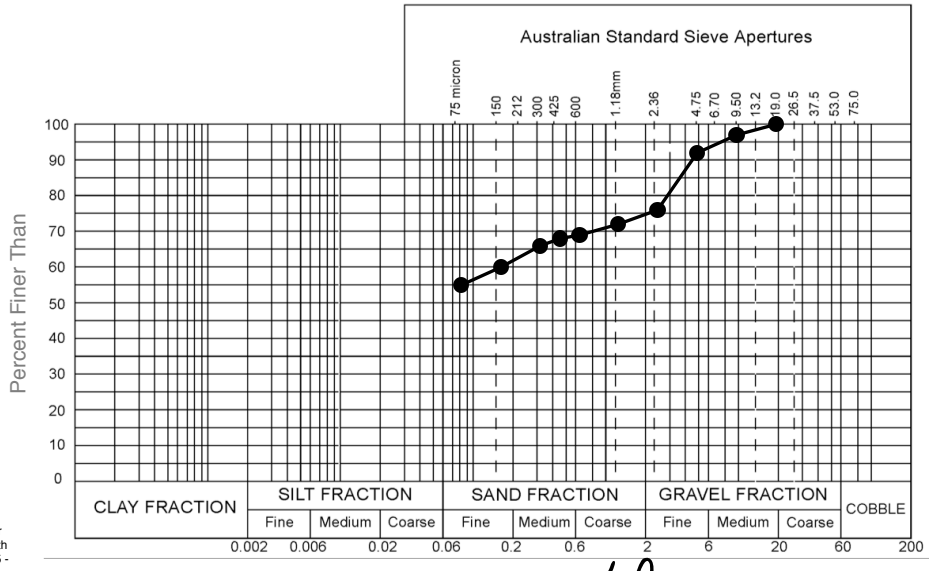
Sample Details

Laboratory Number	S865847-A-38	**Date tested**	20 Dec 2017
Sample ID	TP19_0.2-0.6m	**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	72	**Liquid Limit %**	
37.5 mm		0.6 mm	69	**Plastic Limit %**	
19 mm	100	0.425 mm	68	**Plasticity Index %**	
9.5 mm	97	0.3 mm	66	**Linear Shrinkage %**	
4.75 mm	92	0.15 mm	60	**Nature Of Shrinkage**	
2.36 mm	76	0.075 mm	55	**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

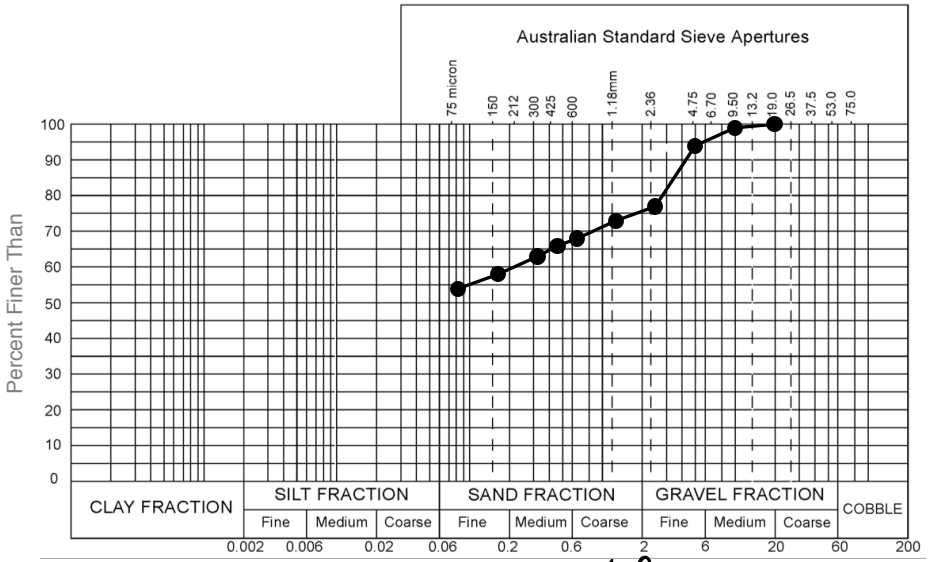
Sample Details

Laboratory Number	S865847-A-39	**Date tested**	20 Dec 2017
Sample ID	TP19_0.6-2.8m	**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	73	**Liquid Limit %**	
37.5 mm		0.6 mm	68	**Plastic Limit %**	
19 mm	100	0.425 mm	66	**Plasticity Index %**	
9.5 mm	99	0.3 mm	63	**Linear Shrinkage %**	
4.75 mm	94	0.15 mm	58	**Nature Of Shrinkage**	
2.36 mm	77	0.075 mm	54	**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

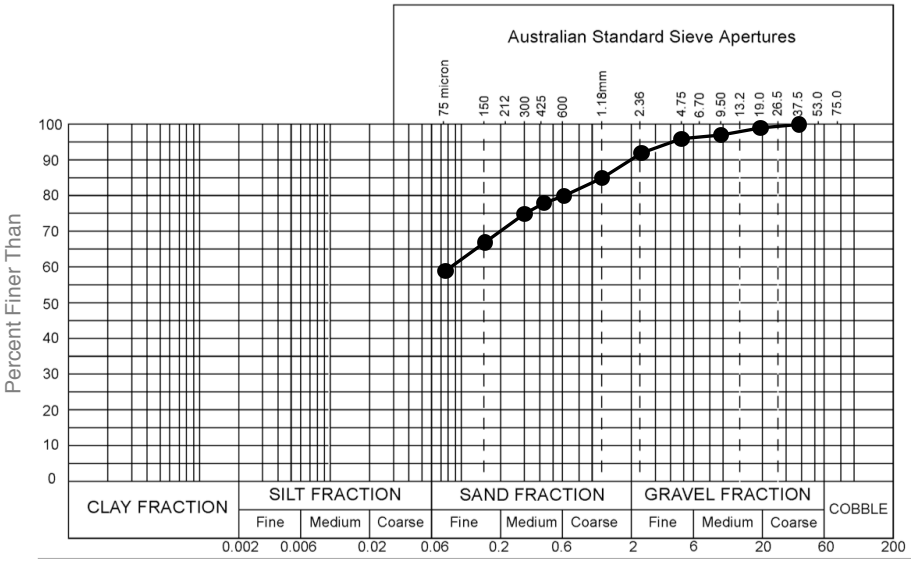
Sample Details

Laboratory Number	S865847-A-40	**Date tested**	20 Dec 2017
Sample ID	TP20_0.2-0.4m	**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	85	**Liquid Limit %**	
37.5 mm	100	0.6 mm	80	**Plastic Limit %**	
19 mm	99	0.425 mm	78	**Plasticity Index %**	
9.5 mm	97	0.3 mm	75	**Linear Shrinkage %**	
4.75 mm	96	0.15 mm	67	**Nature Of Shrinkage**	
2.36 mm	92	0.075 mm	59	**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

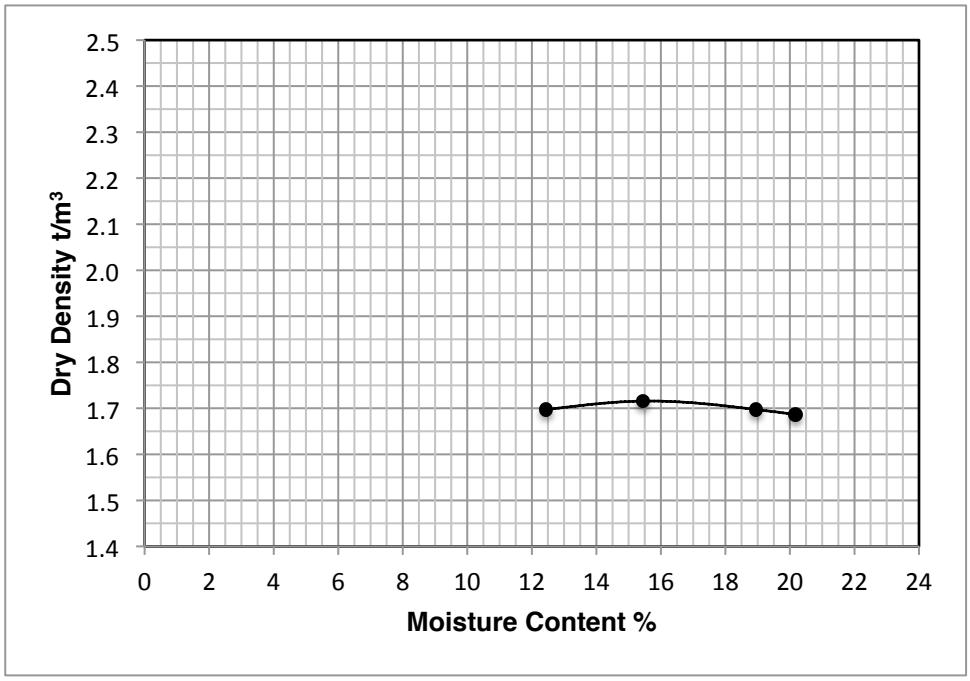
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-A-32	**Date tested**	13 Dec 2017
Sample ID	TP16_1.0-2.8m		
Proposed Use	Foundation		
Material Description	SILT		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m³	1.72	**Optimum Moisture Content %**	15.5
% Retained 19mm Sieve	1	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	8	**Method used to determine LL**	Visual/Tactile



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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-32	TP16_1.0-2.8m	6

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NDM Spec 201 Report

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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-41	TP20_0.4-1.0m	7

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STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

Remarks

Authorised Signatory

Date 16 January 2018

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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

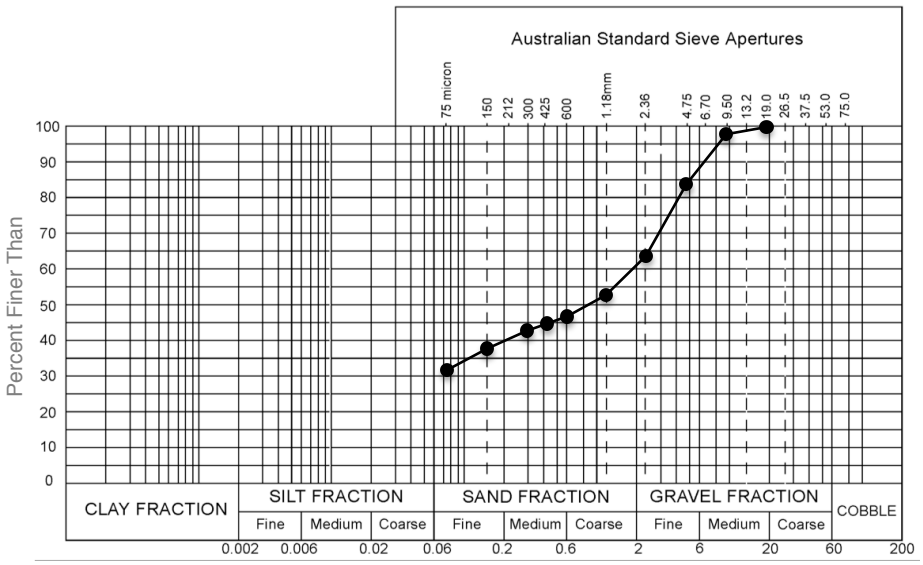
Sample Details

Laboratory Number	S865847-A-41	**Date tested**	20 Dec 2017
Sample ID	TP20_0.4-1.3m	**Tested by**	JWS
Proposed Use	Foundation	**Layer Thickness**	-
Material Description	AS 1726 - 2017 GM Silty or clayey, sandy 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	53	**Liquid Limit %**	
37.5 mm		0.6 mm	47	**Plastic Limit %**	
19 mm	100	0.425 mm	45	**Plasticity Index %**	
9.5 mm	98	0.3 mm	43	**Linear Shrinkage %**	
4.75 mm	84	0.15 mm	38	**Nature Of Shrinkage**	
2.36 mm	64	0.075 mm	32	**Sample History**	Dried at 50 °C

Particle Size Distribution Graph



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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-B 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-B			**Date tested**	1 December 2007
Sample ID	-			**Time Tested**	-
Proposed Use	Borrow			**Layer Thickness mm**	-
Material Description	Various			**Test Depth mm**	-
Sampling Method	Client	**Site Selection Method**	Client		

Sample No.	Sample ID	Moisture Content %
S865847-B-1	Borrow 1	6.3
S865847-B-2	Borrow 2	3.8
S865847-B-3	Borrow 3	7.2

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MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-B 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

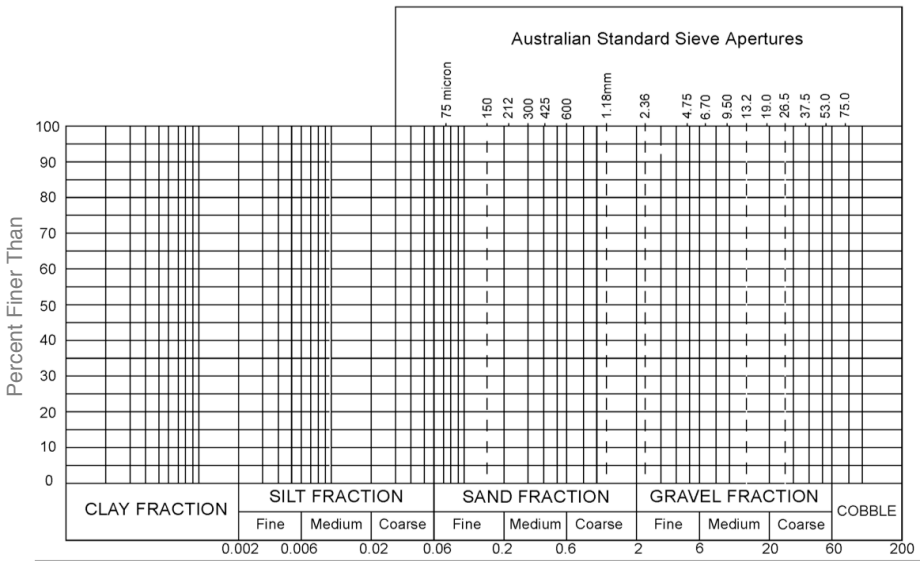
Sample Details

Laboratory Number	S865847-B-1	**Date tested**	11 December 2017		
Sample ID	Borrow 1			**Tested by**	CF
Proposed Use	Borrow		**Layer Thickness**		-
Material Description	Clayey Silt		**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 %**	Not obtained
37.5 mm		0.6 mm		**Plastic Limit %**	Not obtained
19 mm		0.425 mm		**Plasticity Index %**	NP
9.5 mm		0.3 mm		**Linear Shrinkage %**	2.0
4.75 mm		0.15 mm		**Nature Of Shrinkage**	Normal
2.36 mm		0.075 mm		**Sample History**	Dried at 50 °C
				Moisture Content % of LL specimen	31.8

Particle Size Distribution Graph



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MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-B
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

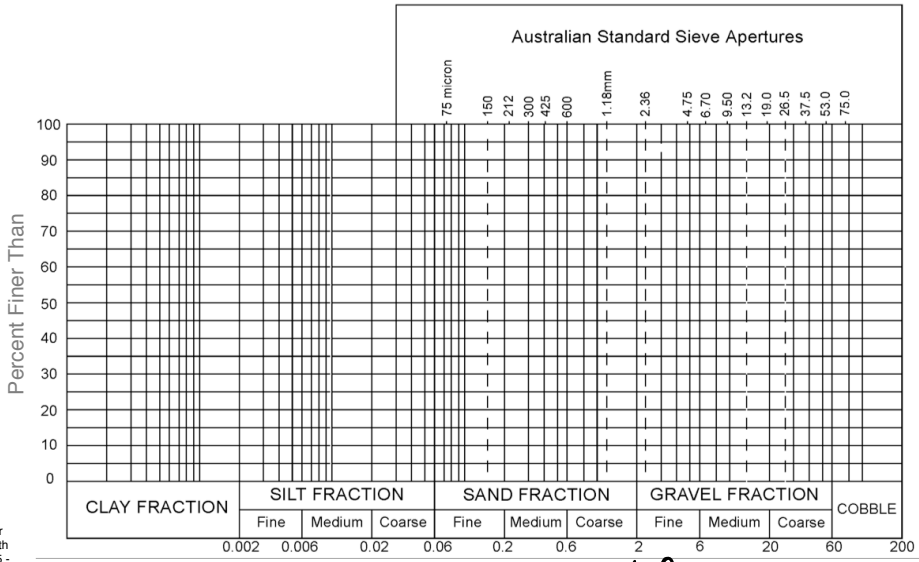
Sample Details

Laboratory Number	S865847-B-2	**Date tested**	11 December 2017		
Sample ID	Borrow 2			**Tested by**	CF
Proposed Use	Borrow		**Layer Thickness**		-
Material Description	Clayey Silt		**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 %**	Not obtained
37.5 mm		0.6 mm		**Plastic Limit %**	Not obtained
19 mm		0.425 mm		**Plasticity Index %**	NP
9.5 mm		0.3 mm		**Linear Shrinkage %**	1.5
4.75 mm		0.15 mm		**Nature Of Shrinkage**	Normal
2.36 mm		0.075 mm		**Sample History**	Dried at 50 °C
				Moisture Content % of LL specimen	36.7

Particle Size Distribution Graph



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MATERIAL TEST CERTIFICATE

Particle Size Distribution & Atterberg Limits of a Soil

Report Number S865847-B 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

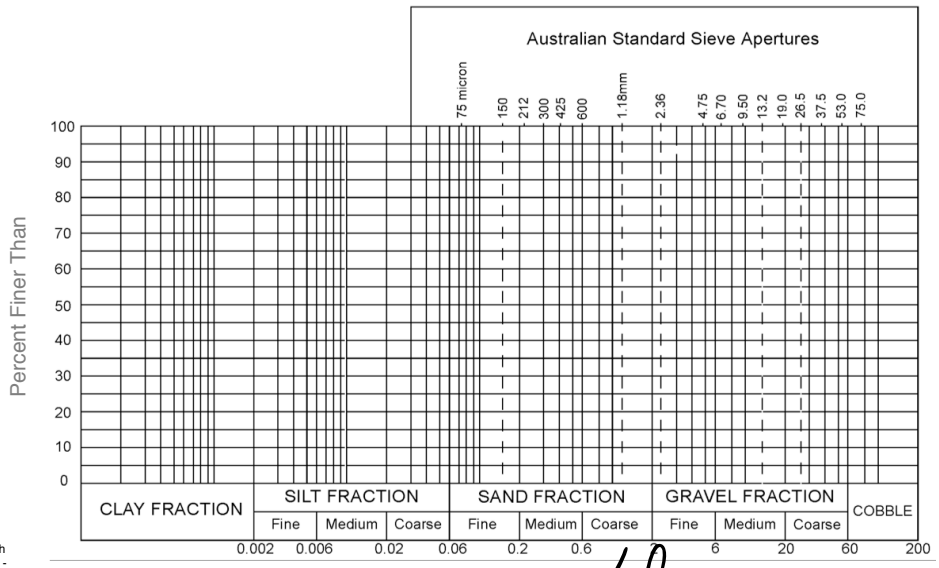
Sample Details

Laboratory Number	S865847-B-3	**Date tested**	11 December 2017		
Sample ID	Borrow 3			**Tested by**	CF
Proposed Use	Borrow		**Layer Thickness**		-
Material Description	Clayey Silt		**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 %**	Not obtained
37.5 mm		0.6 mm		**Plastic Limit %**	Not obtained
19 mm		0.425 mm		**Plasticity Index %**	NP
9.5 mm		0.3 mm		**Linear Shrinkage %**	1.5
4.75 mm		0.15 mm		**Nature Of Shrinkage**	Normal
2.36 mm		0.075 mm		**Sample History**	Dried at 50 °C
				Moisture Content % of LL specimen	31.6

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

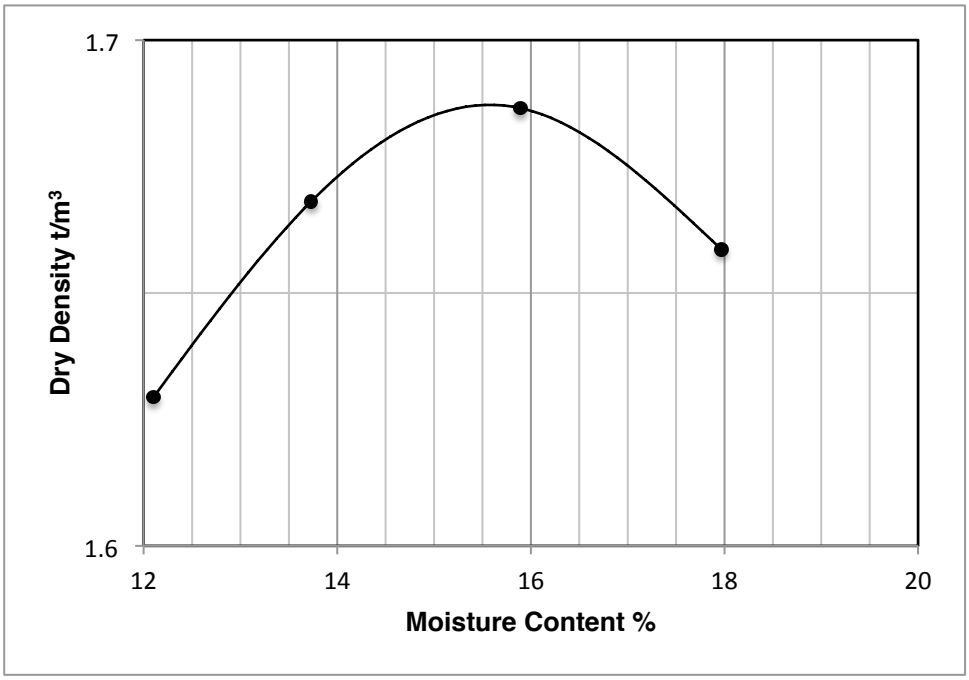
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-B-1	**Date tested**	Monday, 11 December 2017
Sample ID	Borrow Pit 1		
Proposed Use	Embankment Construction		
Material Description	Clay		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.69	**Optimum Moisture Content %**	15.5
% Retained 19mm Sieve	2	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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

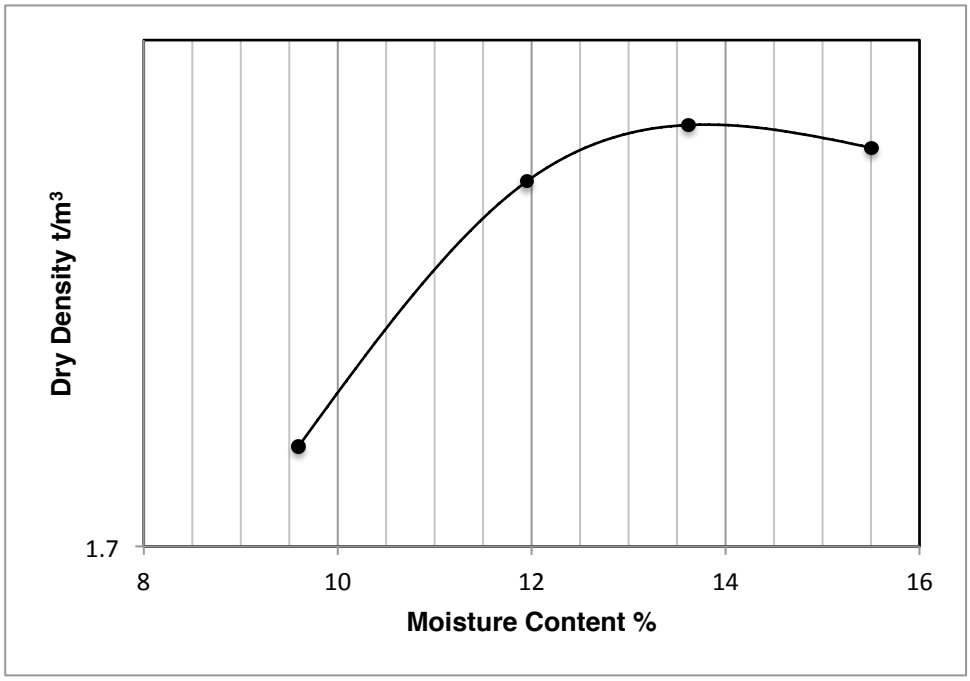
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-B-2	**Date tested**	Monday, 11 December 2017
Sample ID	Borrow Pit 2		
Proposed Use	Embankment Construction		
Material Description	Clay		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.74	**Optimum Moisture Content %**	14.0
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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

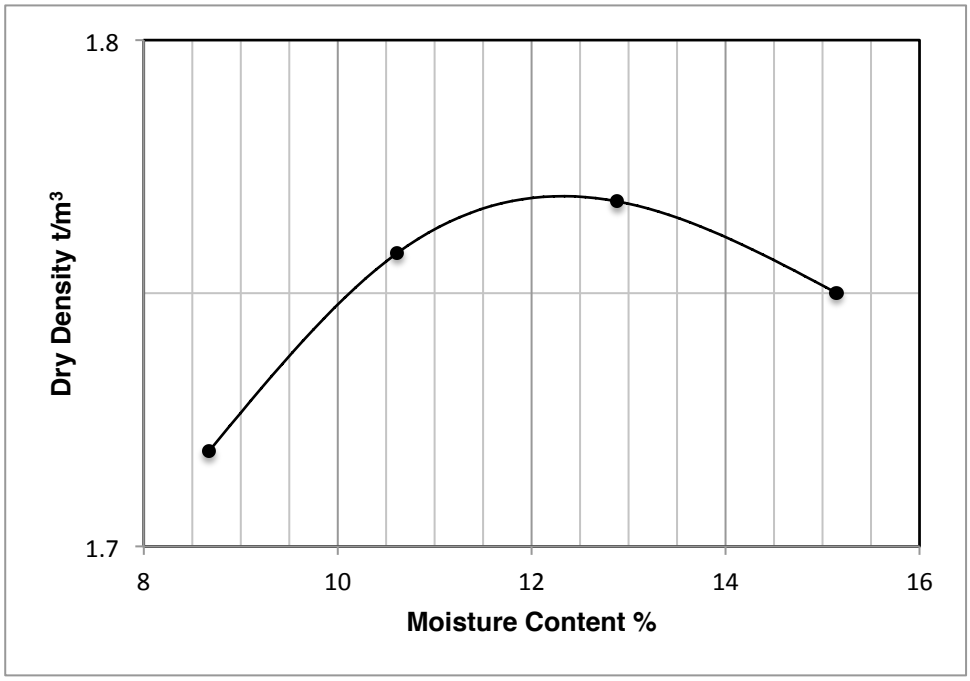
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-B-3	**Date tested**	Monday, 11 December 2017
Sample ID	Borrow Pit 3		
Proposed Use	Embankment Construction		
Material Description	Clay		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.77	**Optimum Moisture Content %**	12.5
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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Material Test Certificate

AS 1289.5.2.1 Determination of the dry density/moisture content relation of a soil using modified compactive effort

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

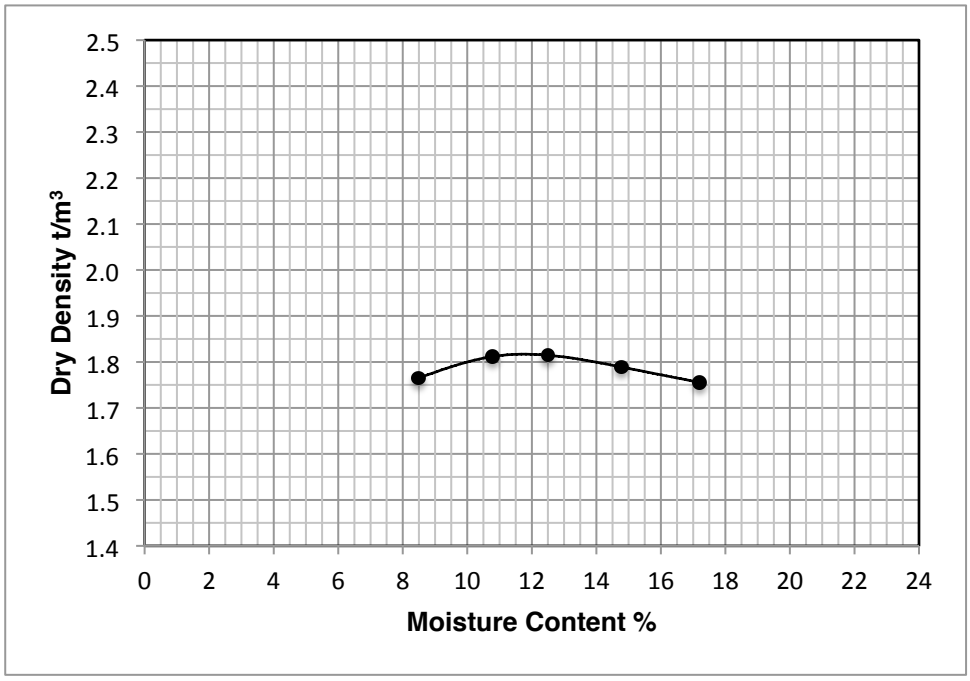
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-B-1	**Date tested**	13 Dec 2017
Sample ID	Borrow 1		
Proposed Use	Borrow		
Material Description	Clayey Silt		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.82	**Optimum Moisture Content %**	12.0
% Retained 19mm Sieve	1	**% Retained 37.5mm Sieve**	4
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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Material Test Certificate

AS 1289.5.2.1 Determination of the dry density/moisture content relation of a soil using modified compactive effort

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

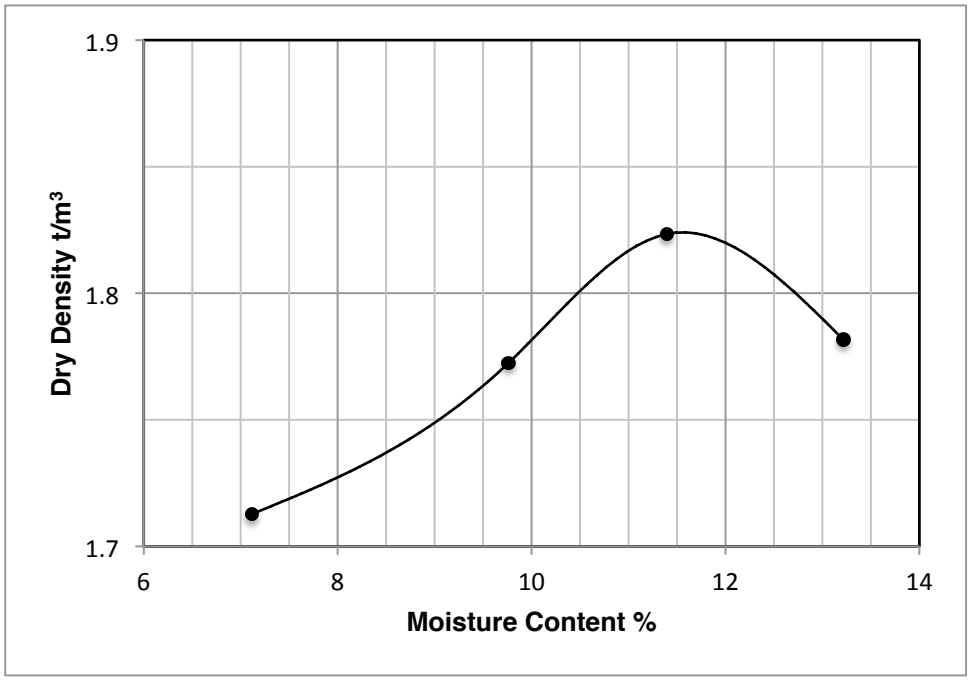
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-B-2	**Date tested**	Monday, 11 December 2017
Sample ID	Borrow Pit 2		
Proposed Use	Borrow		
Material Description	Clayey Silt		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m^3	1.82	**Optimum Moisture Content %**	11.5
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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Material Test Certificate

AS 1289.5.2.1 Determination of the dry density/moisture content relation of a soil using modified compactive effort

Report Number S865847-B Issue 1 **Client** MHA GEOTECHNICAL

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

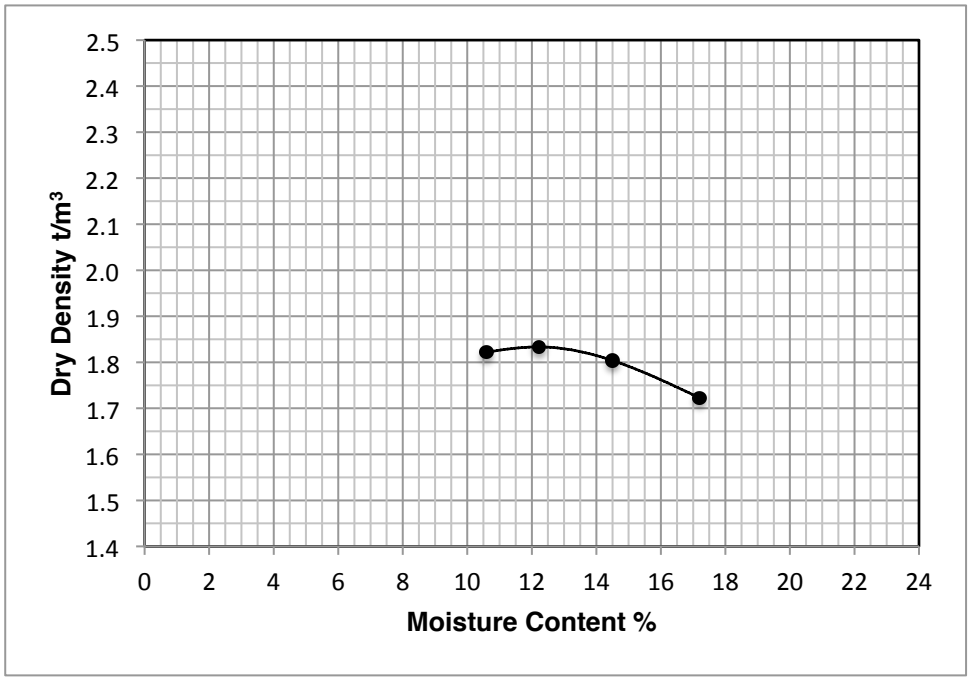
Tests carried out at Balcatta Laboratory
1 Erindale Rd Balcatta WA 6021

Sample Details

Laboratory Number	S865847-B-3	**Date tested**	13 Dec 2017
Sample ID	Borrow 3		
Proposed Use	Borrow		
Material Description	Clayey Silt		
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1

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

Maximum Dry Density t/m³	1.83	**Optimum Moisture Content %**	12.0
% Retained 19mm Sieve	0	**% Retained 37.5mm Sieve**	0
Curing Time (hrs)	2	**Method used to determine LL**	Visual/Tactile



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Material Test Certificate

AS 1289.3.8.1 Determination of the Emerson class number of a soil

Report Number S865847-B 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-B			**Date tested**	20 December 2017
Sample ID	Borrow			**Time Tested**	-
Proposed Use	Borrow			**Layer Thickness mm**	-
Material Description	Various			**Test Depth mm**	-
Sampling Method	AS 1289.1.2.1	**Site Selection Method**	AS 1289.1.4.1		

Sample No.	Sample ID	Emerson Class No.
S865847-B-1	Borrow 1	5
S865847-B-2	Borrow 2	6
S865847-B-3	Borrow 3	6

Authorised Signatory

Date 16 January 2018

Wayne Rozmianiec
Laboratory Manager

NDM Spec 201 Report

WA | QLD | NSW | VIC
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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

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Ph: +61 8 9258 8323

TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client:	Structerre Consulting Engineers	**Report No.:**	18010243 - CD
		Workorder No.	0003674
Address	PO Box 792 BALCATTA WA 6914	**Test Date:**	14/01/2018
		Report Date:	22/01/2018
Project:	Ravensthorpe Gold Project		
Client Id.:	A5 TP02	**Depth (m):**	0.50-1.10
Description:	GRAVELLY SILTY CLAY- red brown		

SAMPLE & TEST DETAILS

Sample 1

Initial Height:	199.8	mm
Initial Diameter:	100.2	mm
L/D Ratio:	2.0 : 1	
Initial Moisture Content:	9.4	%
Final Moisture Content:	13.3	%
Wet Density:	2.14	t/m^3
Dry Density:	1.96	t/m^3
Rate of Strain:	0.002	%/min
B Response:	98	%

Failure Criteria: Maximum Deviator Stress

FAILURE DETAILS

Effective Pressure	Confining Pressure	Back Pressure	Initial Pore	Failure Pore	*Principal Effective Stresses*			*Deviator Stress*	*Strain*
					σ'_1	σ'_3	σ'_1 / σ'_3		
292 kPa	800 kPa	508 kPa	508 kPa	507 kPa	770 kPa	293 kPa	2.629	477 kPa	7.36 %

Sample Type: Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client — Note: Graph not to scale — **Page 1 of 6**

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Tested at Trilab Brisbane Laboratory.

Authorised Signatory
C. Channon

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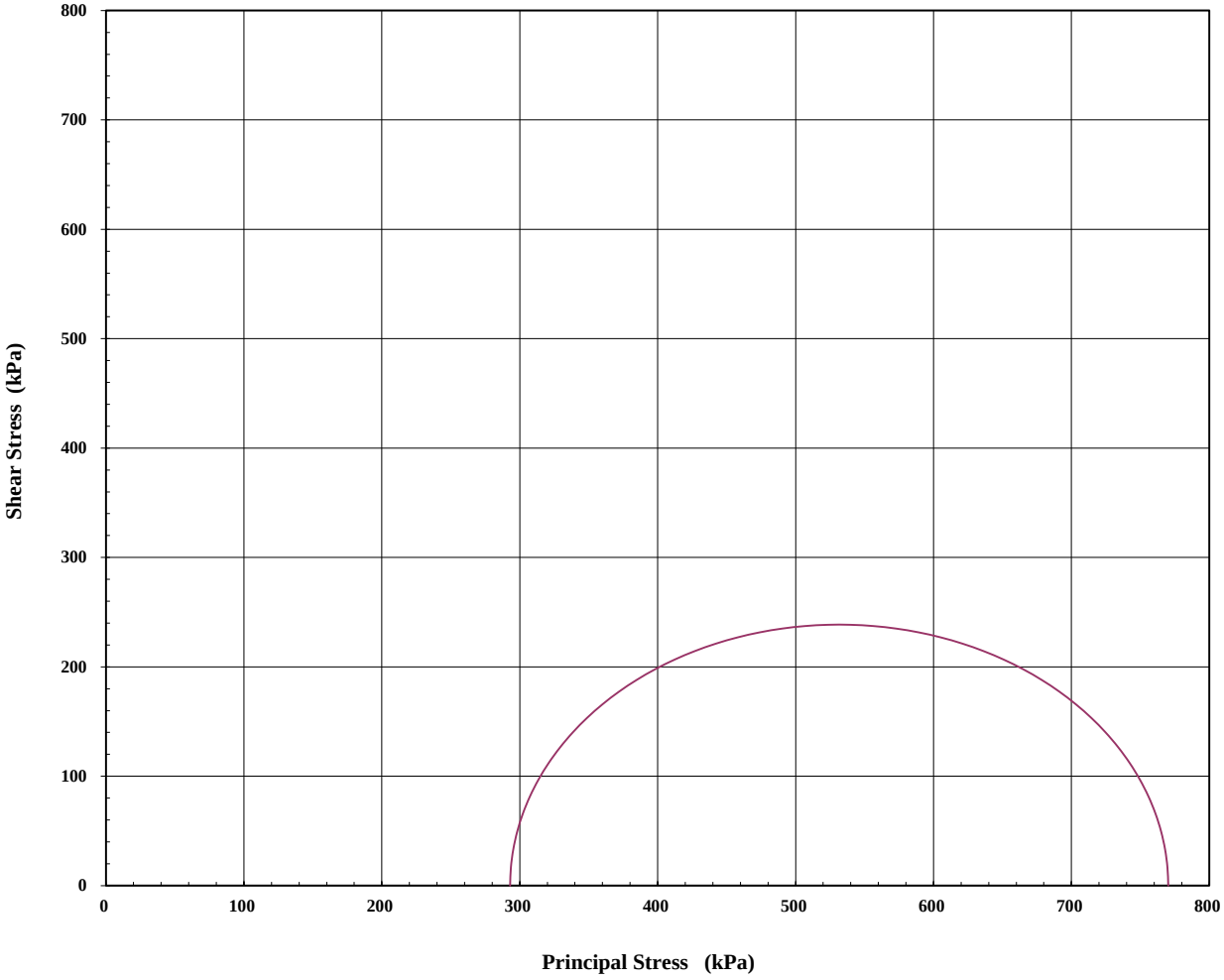
TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client: Structerre Consulting Engineers

Report No.: 18010243 - CD

Mohr Circle Diagram



Interpretation between stages :

Cohesion C' (kPa) :

Angle of Shear Resistance Φ' (Degrees) :

Sample Type: Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client — Note: Graph not to scale — **Page 2 of 6**

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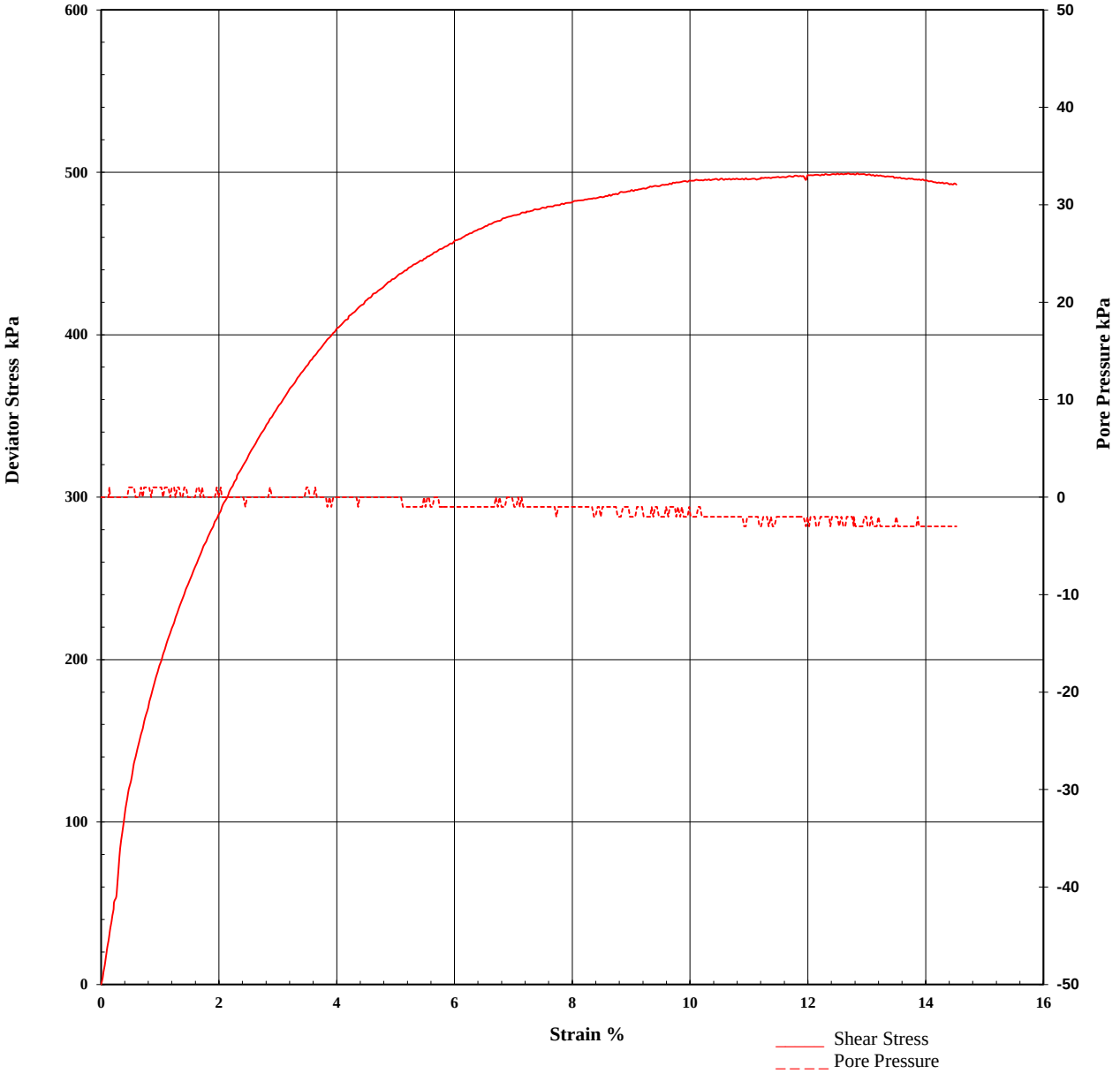
TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client: Structerre Consulting Engineers

Report No.: 18010243 - CD

Stress/Strain & Pore Pressure/Strain Diagram



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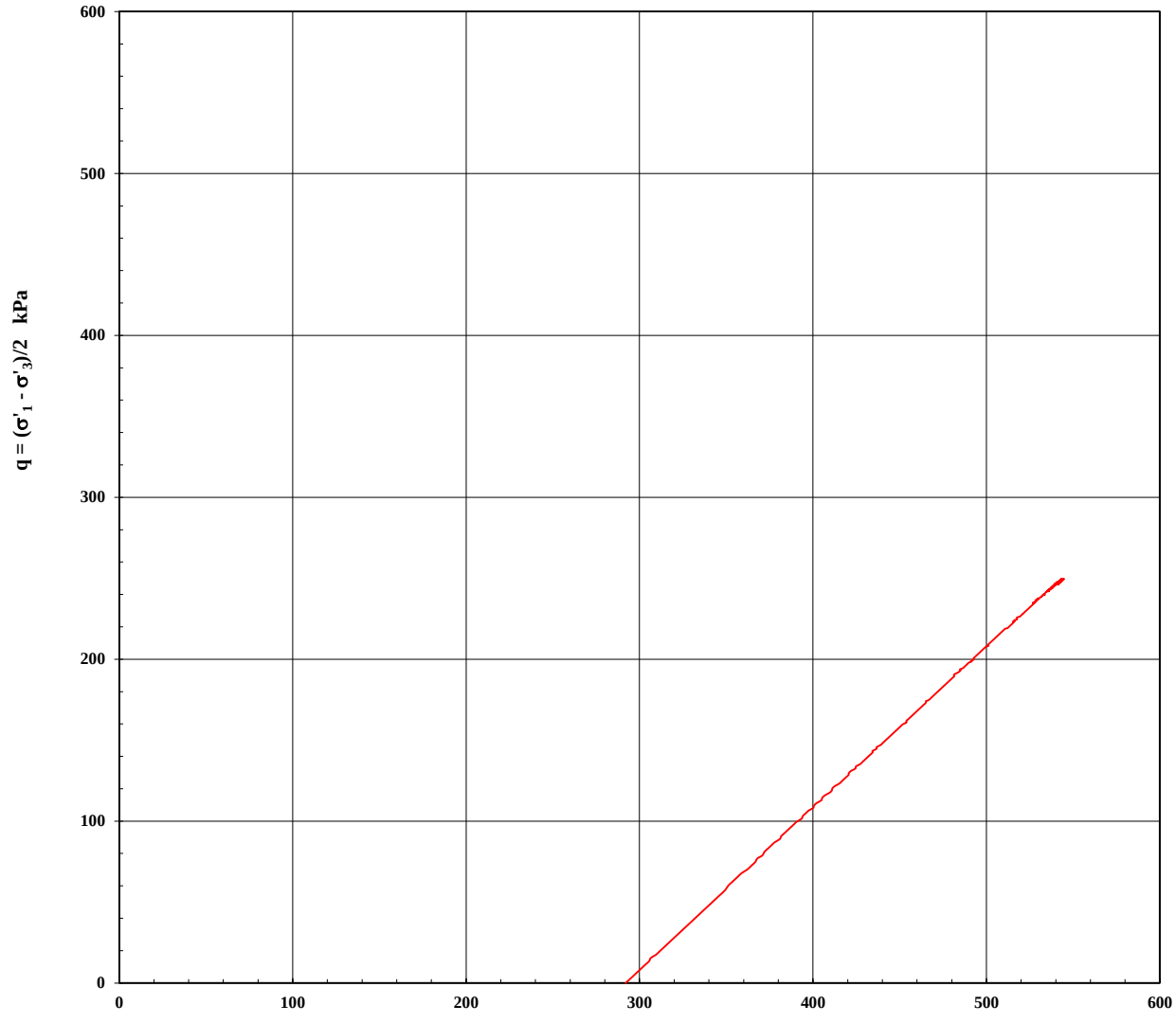
TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client: Structerre Consulting Engineers

Report No.: 18010243 - CD

p' - q Diagram



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Sample/s supplied by the client

Note: Graph not to scale

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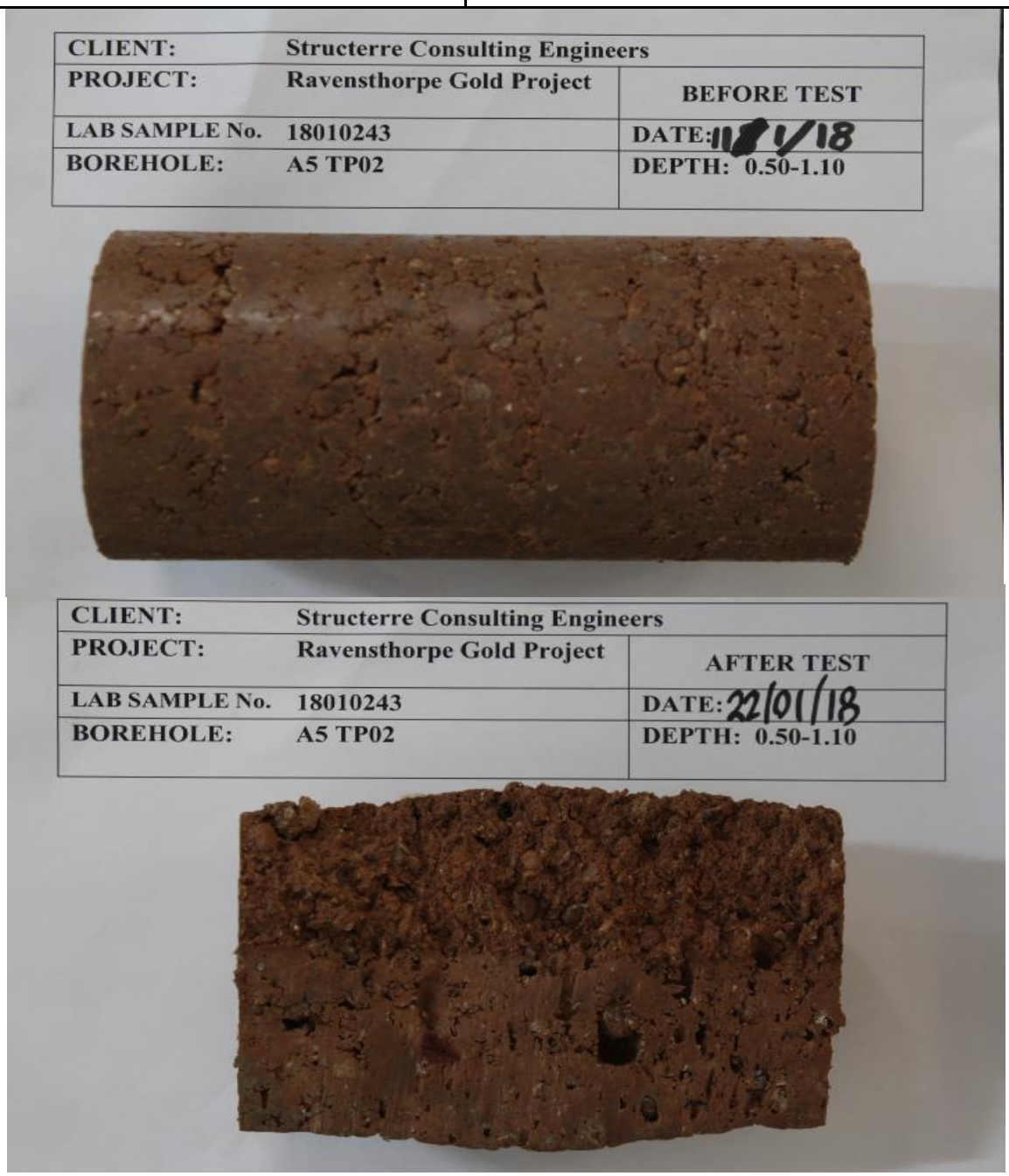

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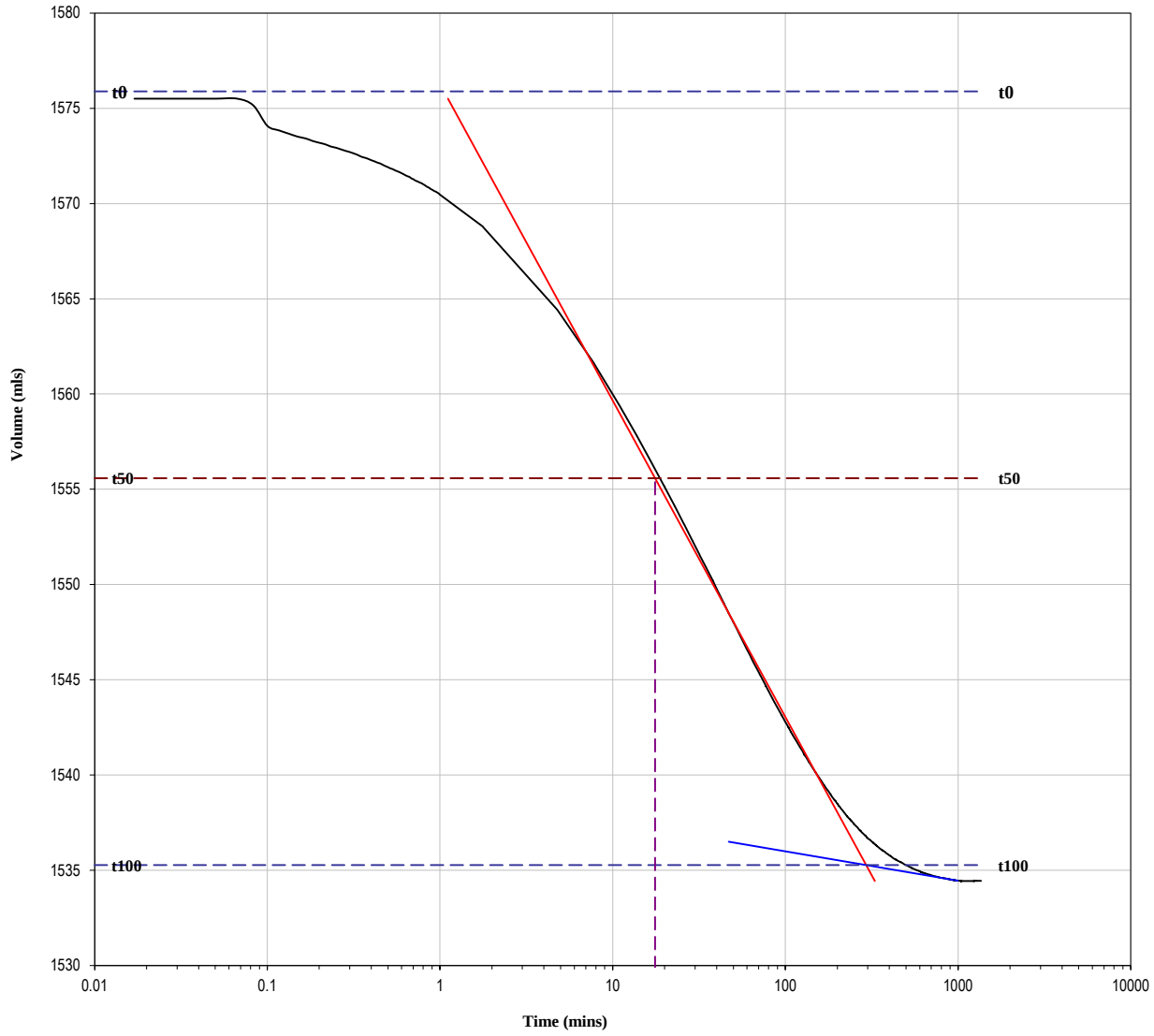
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.2

Client: Structerre Consulting Engineers

Report No.: 18010243 - CD

Volume v's Time (Log Scale)



t_{50} = 17.6 mins

Sample Type: Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client

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TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client:	Structerre Consulting Engineers	**Report No.:**	18010244 - CD
		Workorder No.	0003674
Address	PO Box 792 BALCATTA WA 6914	**Test Date:**	11/01/2018
		Report Date:	22/01/2018
Project:	Ravensthorpe Gold Project		
Client Id.:	A27 TP13	**Depth (m):**	0.70-2.80
Description:	CLAYEY SILT- pale brown		

SAMPLE & TEST DETAILS

Sample 1

Initial Height:	199.9	mm
Initial Diameter:	100.2	mm
L/D Ratio:	2.0 : 1	
Initial Moisture Content:	16.2	%
Final Moisture Content:	22.0	%
Wet Density:	1.88	t/m^3
Dry Density:	1.62	t/m^3
Rate of Strain:	0.002	%/min
B Response:	98	%

Failure Criteria: Maximum Deviator Stress

FAILURE DETAILS

Effective Pressure	Confining Pressure	Back Pressure	Initial Pore	Failure Pore	*Principal Effective Stresses*			*Deviator Stress*	*Strain*
					σ'_1	σ'_3	σ'_1 / σ'_3		
296 kPa	801 kPa	505 kPa	505 kPa	507 kPa	779 kPa	294 kPa	2.646	484 kPa	7.67 %

Sample Type: Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client — Note: Graph not to scale — **Page 1 of 6**

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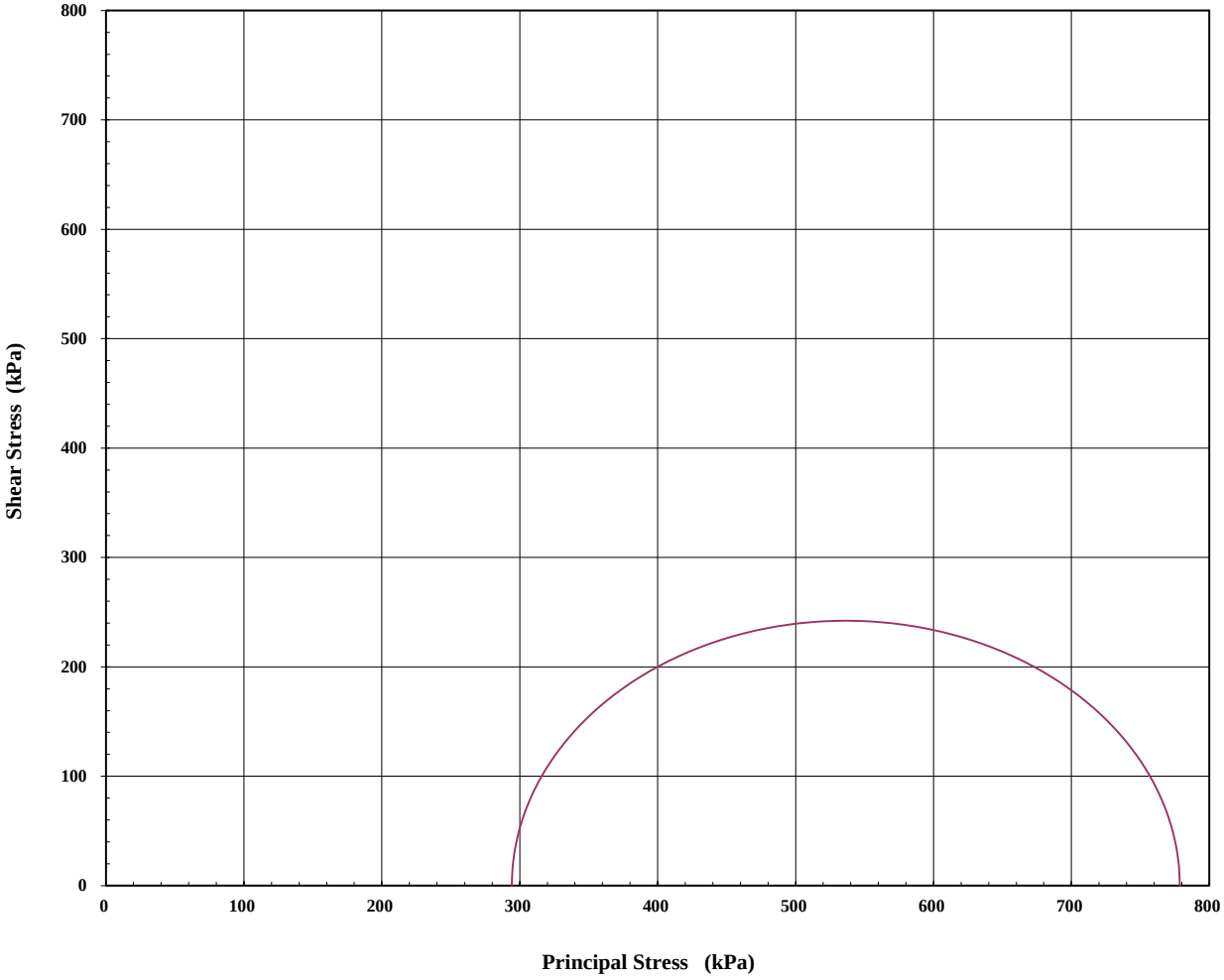
TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client: Structerre Consulting Engineers

Report No.: 18010244 - CD

Mohr Circle Diagram



Interpretation between stages :

Cohesion C' (kPa) :

Angle of Shear Resistance Φ' (Degrees) :

Sample Type: Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

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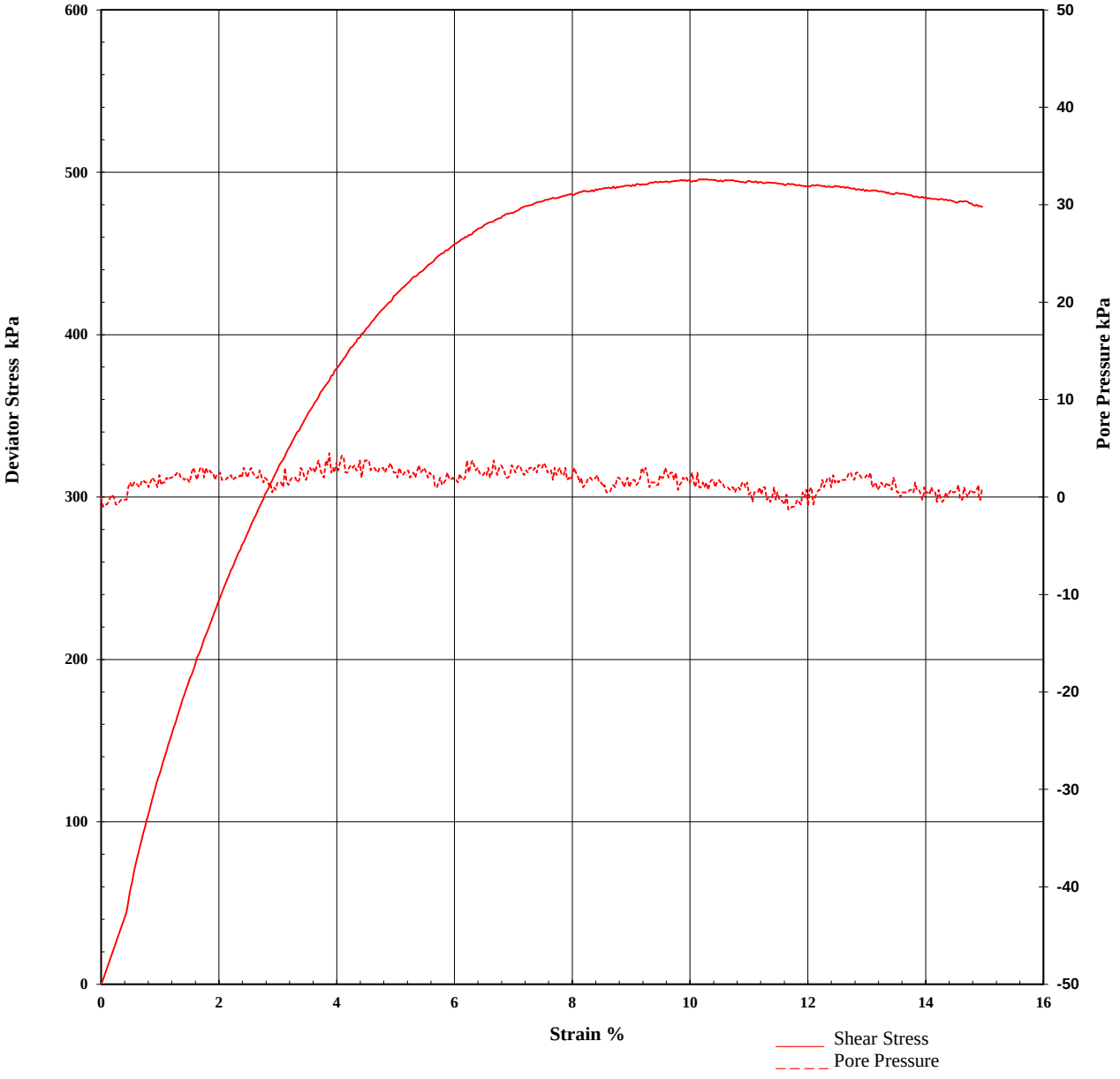
TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

Client: Structerre Consulting Engineers

Report No.: 18010244 - CD

Stress/Strain & Pore Pressure/Strain Diagram



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TRIAXIAL TEST REPORT

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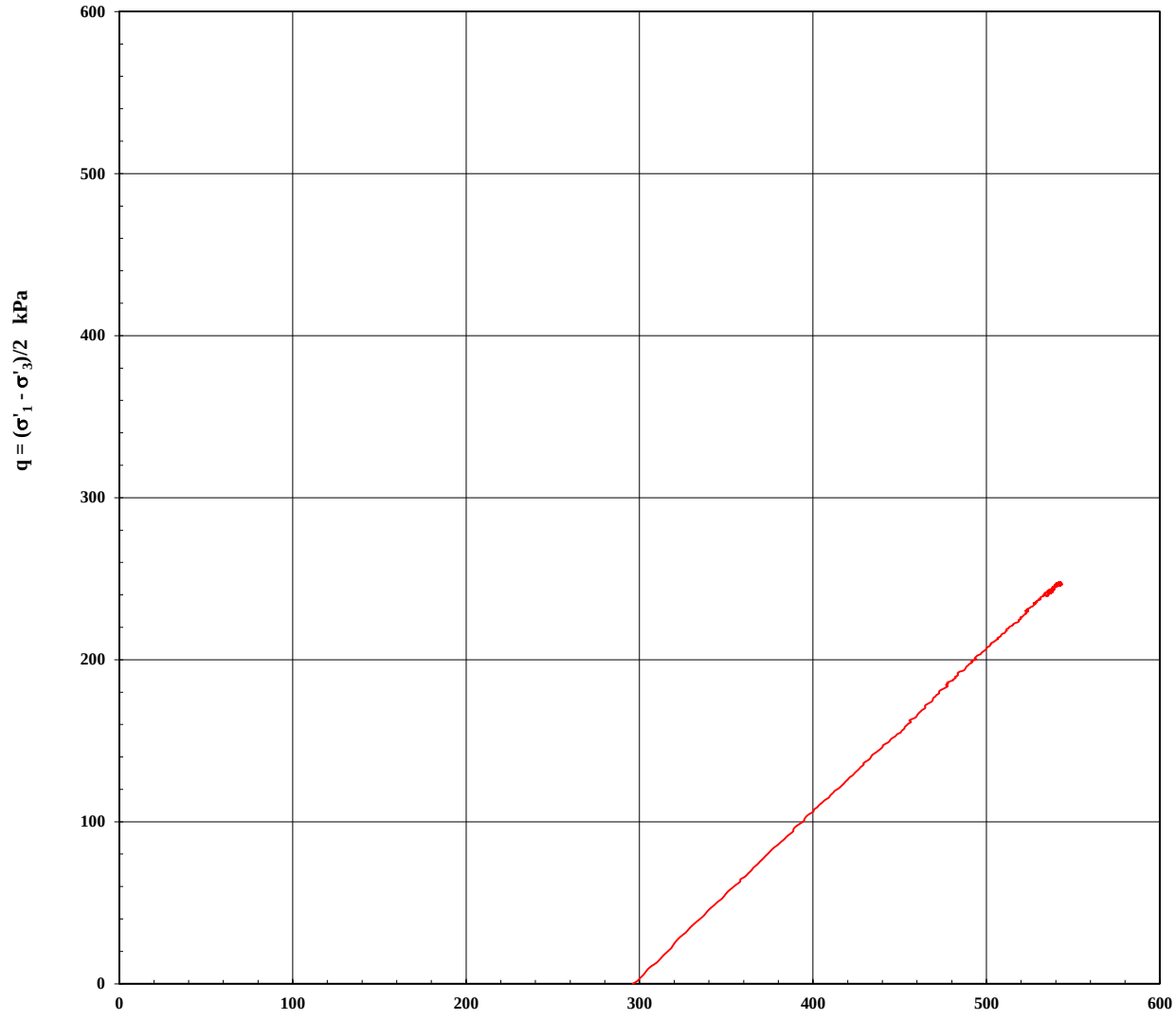
p' - q Diagram



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TRIAXIAL TEST REPORT

Test Method: ASTM D7181-11

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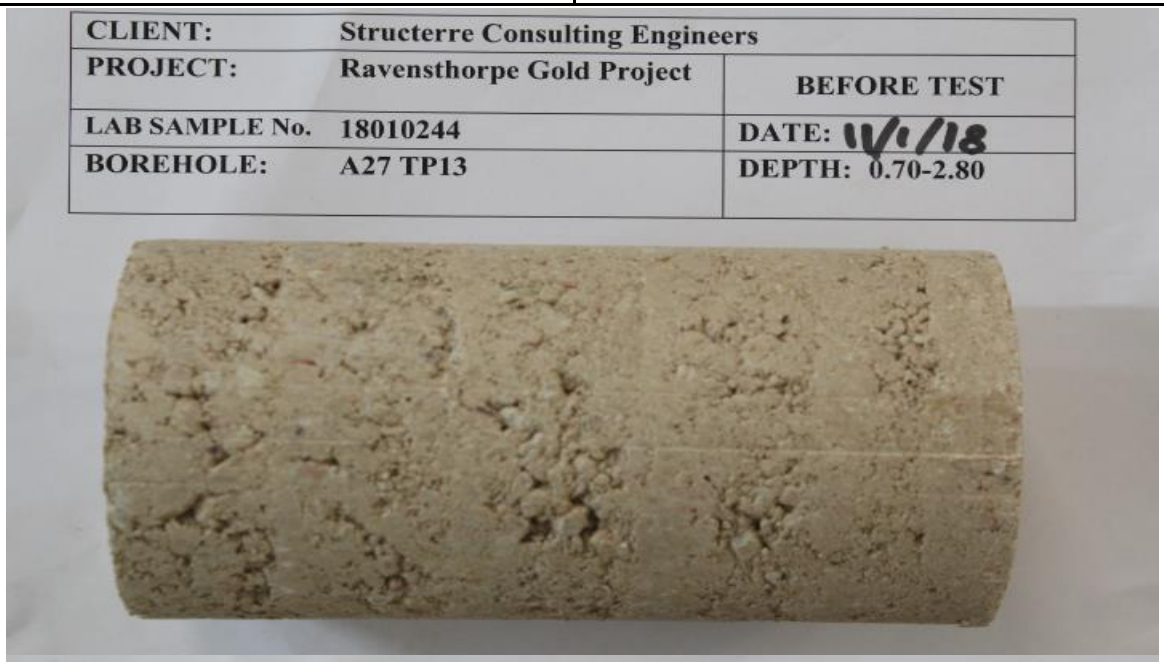
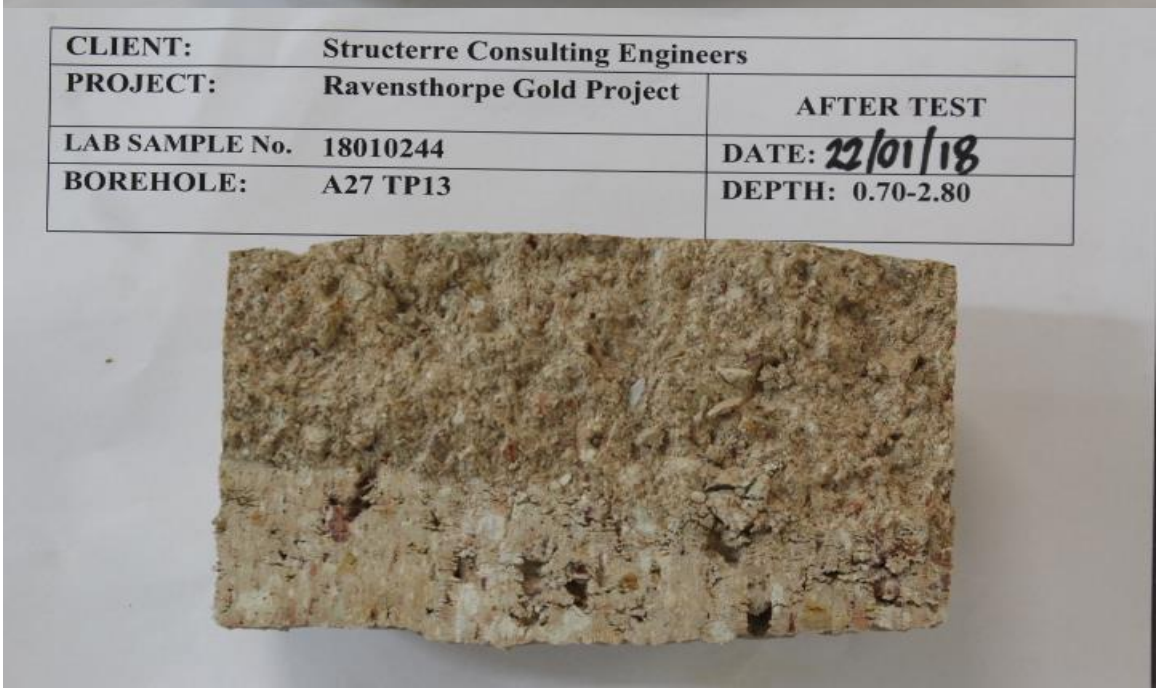
Report No.: 18010244 - CD





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Sample/s supplied by the client — Note: Graph not to scale — **Page 5 of 6**

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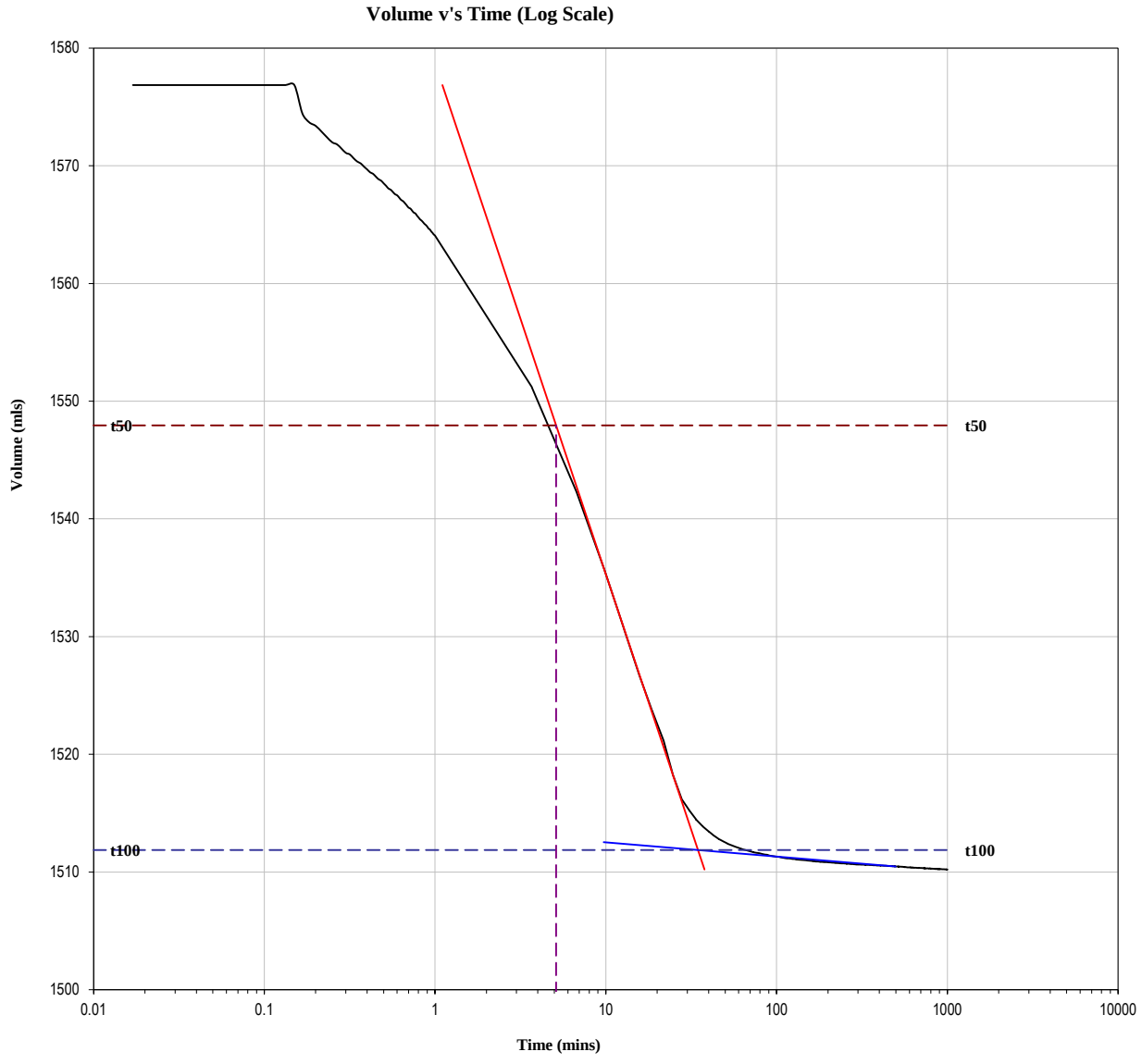
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.2

Client: Structerre Consulting Engineers

Report No.: 18010244 - CD



t_{50} = 5.1 mins

Sample Type: Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client

Note: Graph not to scale

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TRIAXIAL TEST REPORT

Test Method: ASTM D4767-04

Client:	Structerre Consulting Engineers	**Report No.:**	18010245 - CU
		Workorder No.	0003674
Address	PO Box 792 BALCATTA WA 6914	**Test Date:**	11/01/2018
		Report Date:	22/01/2018
Project:	Ravensthorpe Gold Project		
Client Id.:	B1	**Depth (m):**	Not Supplied
Description:	SANDY CLAYEY SILT- pale brown		

SAMPLE & TEST DETAILS

Sample 1

Initial Height:	199.8	mm
Initial Diameter:	100.2	mm
L/D Ratio:	2.0 : 1	
Initial Moisture Content:	15.6	%
Final Moisture Content:	20.8	%
Wet Density:	1.86	t/m^3
Dry Density:	1.61	t/m^3
Rate of Strain:	0.002	%/min
B Response:	98	%

Failure Criteria: Maximum Deviator Stress

FAILURE DETAILS

Effective Pressure	Confining Pressure	Back Pressure	Initial Pore	Failure Pore	*Principal Effective Stresses*			*Deviator Stress*	*Strain*
					σ'_1	σ'_3	σ'_1 / σ'_3		
304 kPa	800 kPa	496 kPa	496 kPa	499 kPa	880 kPa	302 kPa	2.916	578 kPa	10.46 %

Sample Type: Single Individual Specimen remoulded to a target density of 98% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client — Note: Graph not to scale

REP04001

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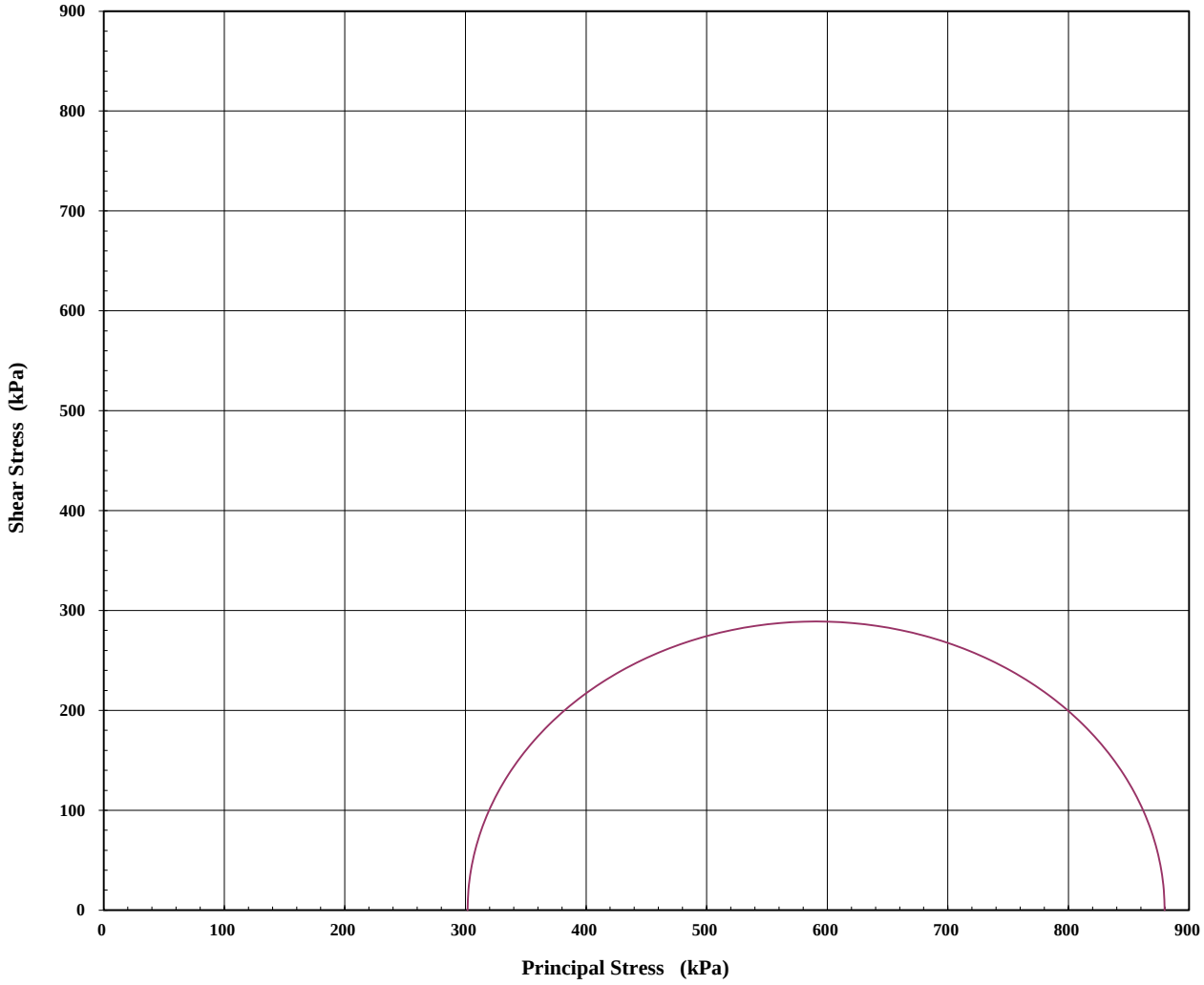
TRIAXIAL TEST REPORT

Test Method: ASTM D4767-04

Client: Structerre Consulting Engineers

Report No.: 18010245 - CU

Mohr Circle Diagram



Interpretation between stages :

Cohesion C' (kPa) :

Angle of Shear Resistance Φ' (Degrees) :

Sample Type: Single Individual Specimen remoulded to a target density of 98% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client

Note: Graph not to scale

REP04001

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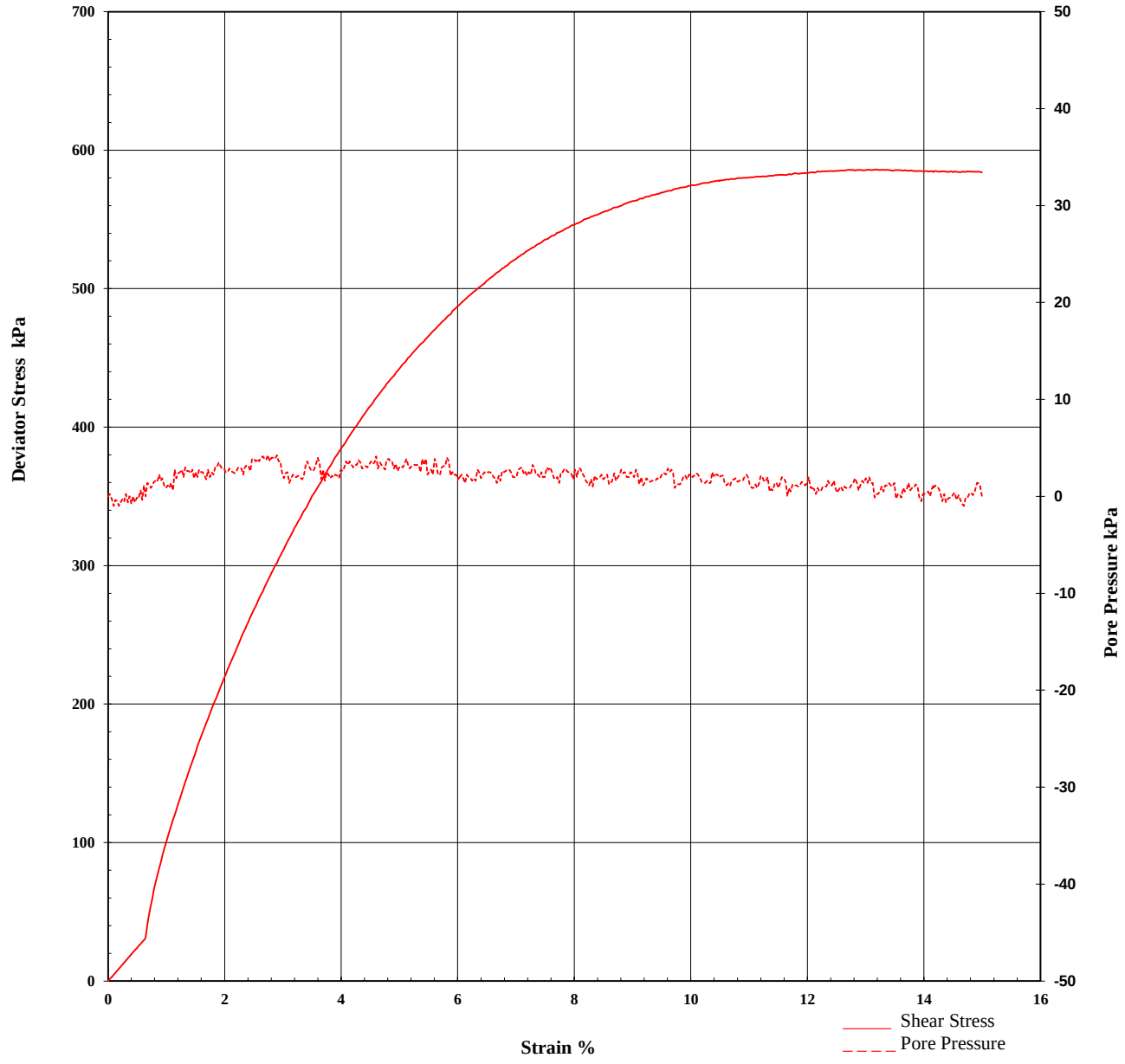
TRIAXIAL TEST REPORT

Test Method: ASTM D4767-04

Client: Structerre Consulting Engineers

Report No.: 18010245 - CU

Stress/Strain & Pore Pressure/Strain Diagram



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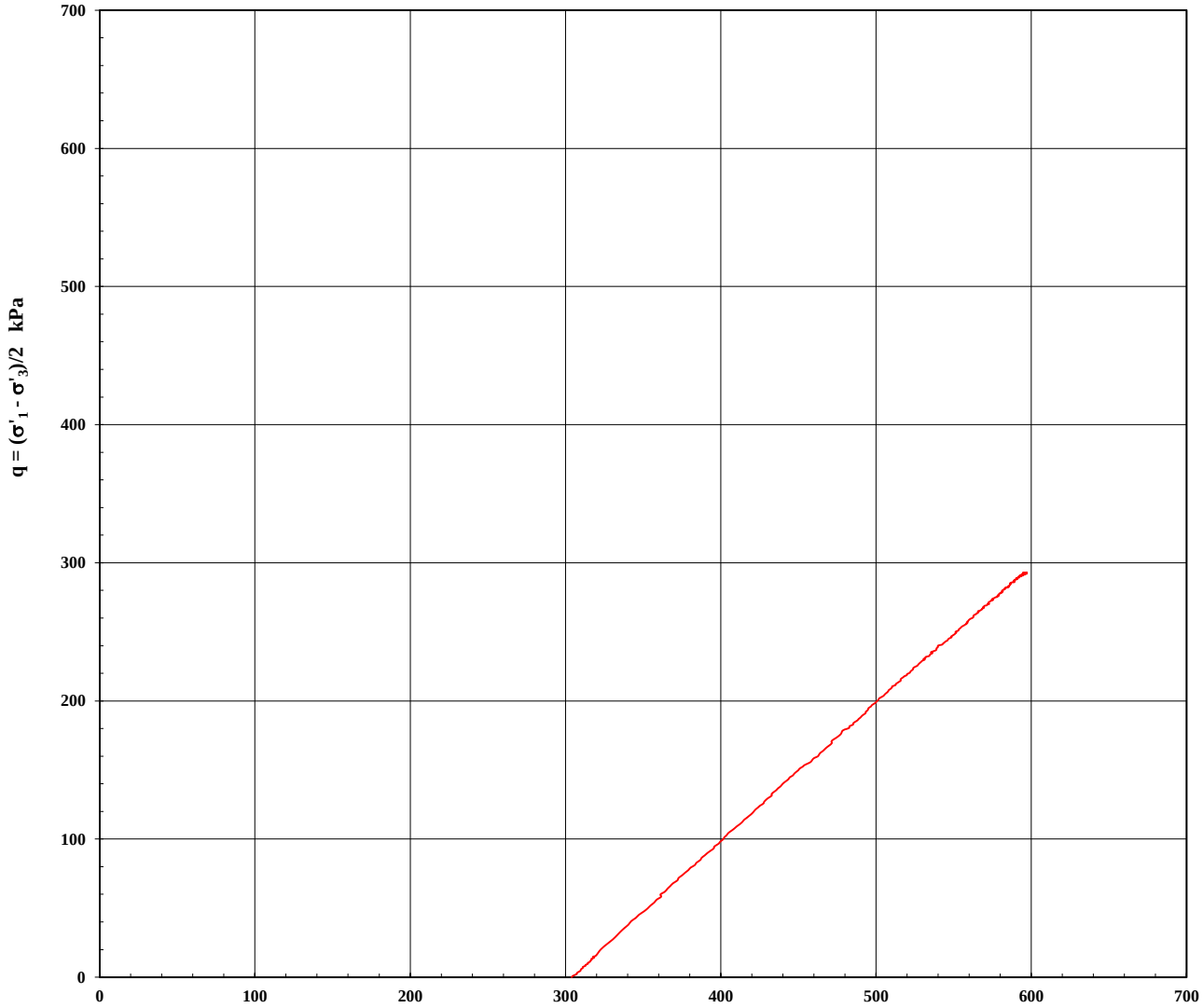
Test Method: ASTM D4767-04

Client: Structerre Consulting Engineers

Report No.: 18010245 - CU

p' - q Diagram



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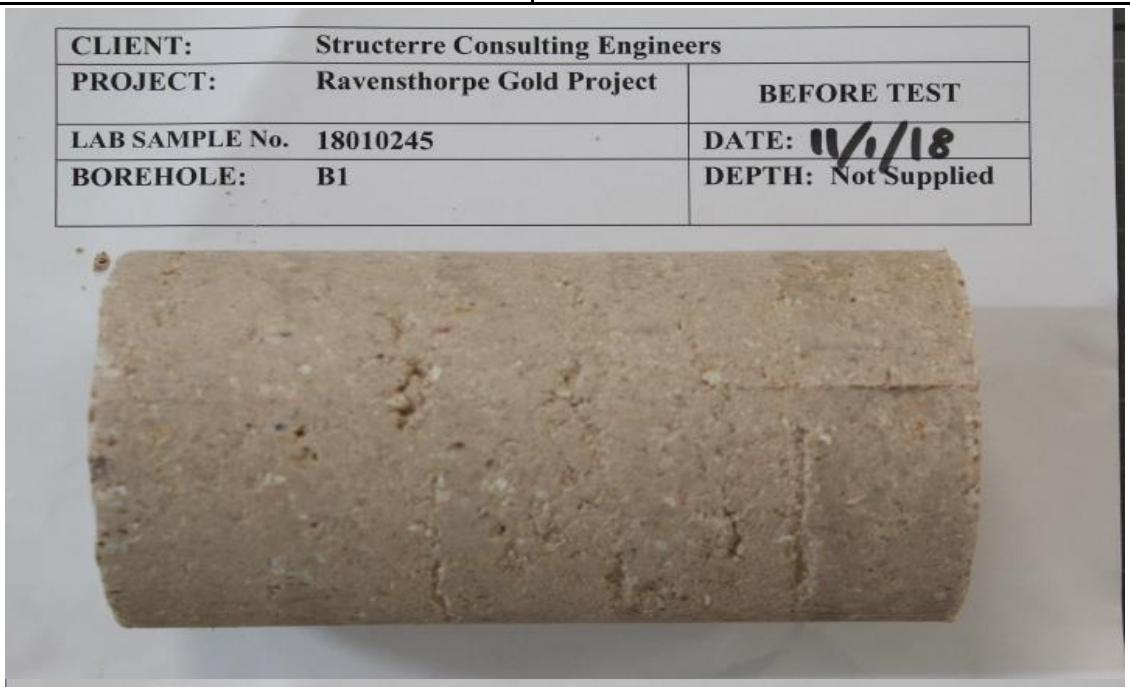
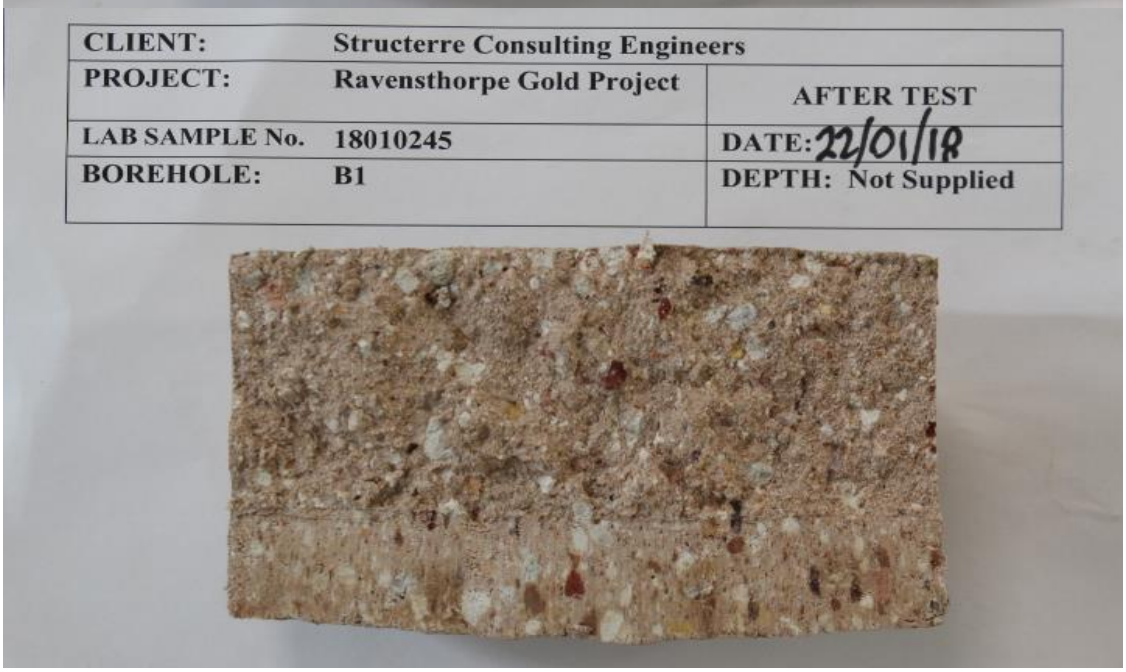
Test Method: ASTM D4767-04

Client: Structerre Consulting Engineers

Report No.: 18010245 - CU





Sample Type: Single Individual Specimen remoulded to a target density of 98% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client

Note: Graph not to scale

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Tested at Trilab Brisbane Laboratory.

Authorised Signatory

C. Channon

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory Number 9926

Trilab
Soil Rock Calibration

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QLD 4034
Ph: +61 7 3265 5656

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

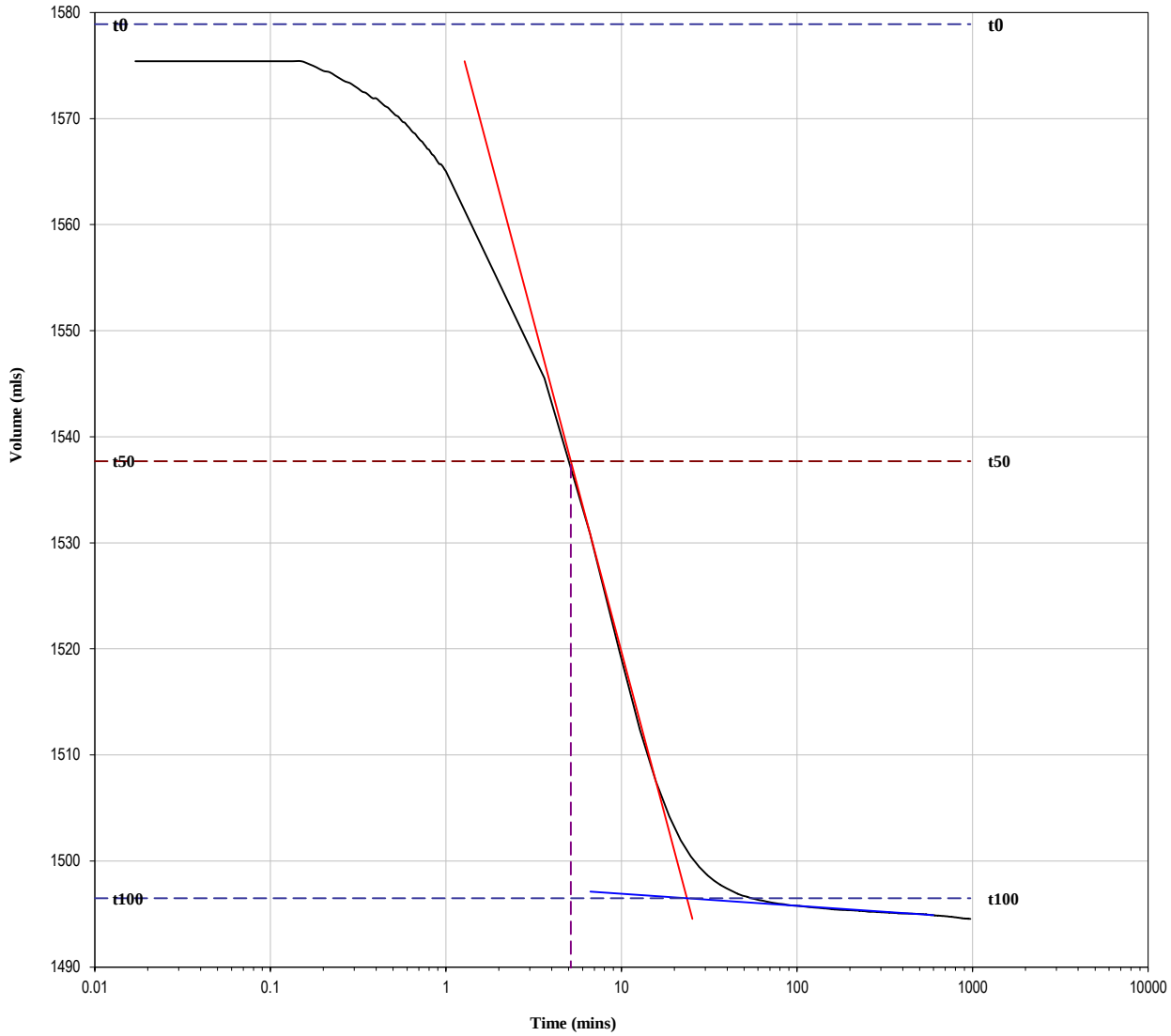
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.2

Client: Structerre Consulting Engineers

Report No.: 18010245 - CU

Volume v's Time (Log Scale)



t_{50} = 5.1 mins

Sample Type: Single Individual Specimen remoulded to a target density of 98% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Sample/s supplied by the client

Note: Graph not to scale

REP04001

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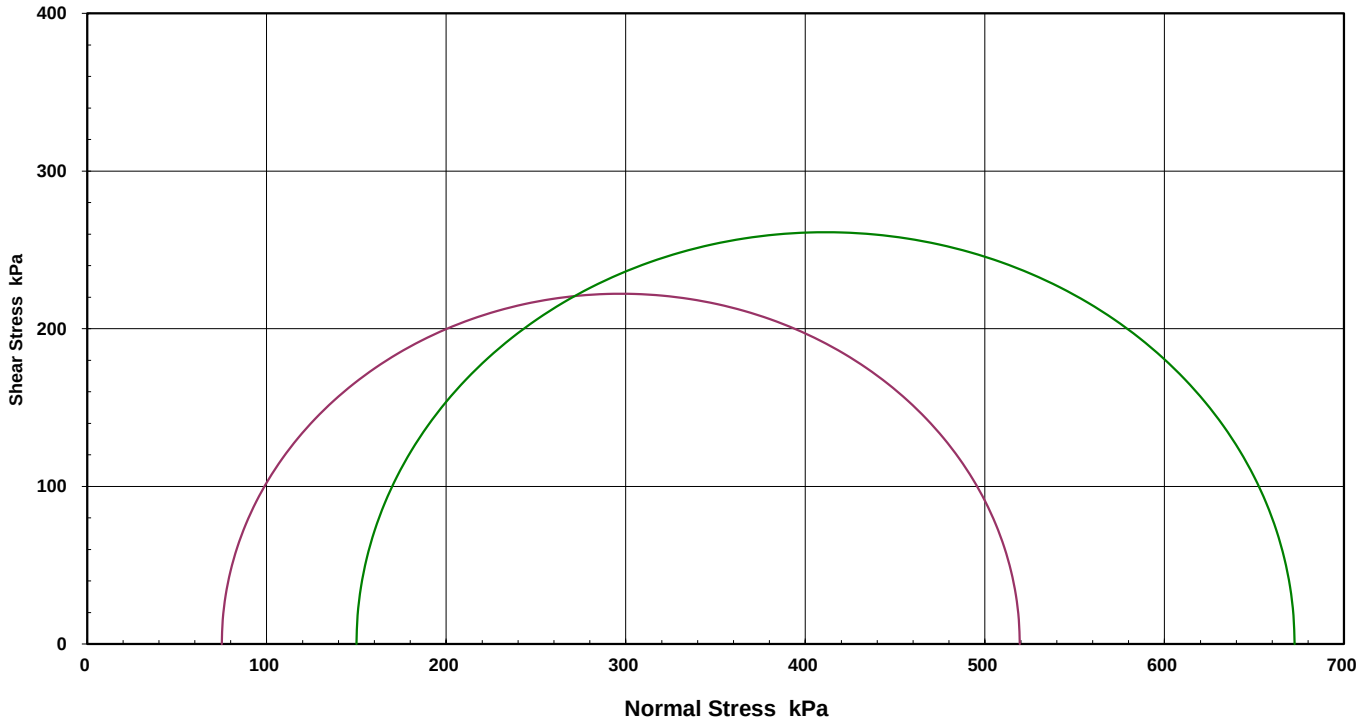
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010243- UU
		Workorder No.	0003674
Address	PO Box 792 BALCATTA WA 6914	**Test Date**	10/01/2018
		Report Date	16/01/2018
Project	Ravensthorpe Gold Project		
Client ID	A5 TP02	**Depth (m)**	0.50-1.10
Description	GRAVELLY SILTY CLAY- red brown	**Sample Type**	Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Mohr Circle Diagram



Interpretation between stages	**1 to 2**
Cohesion C (kPa)	**128.2**
Angle of Shear Resistance Φ (^{0})	**20.0**

MOISTURE CONTENTS **Initial** 9.4 % **Final** 9.4 %

Failure Criteria Maimum Deviator Stress

SAMPLE & TEST DETAILS

Sample Details		
Initial Height	200.2	mm
Initial Diameter	100.4	mm
Wet Density	2.13	t/m^3
Dry Density	1.94	t/m^3
Rate of Strain	0.500	% / min

FAILURE DETAILS

Confining Pressure	Principal Stresses σ_1	Principal Stresses σ_3	Deviator Stress	Strain
75 kPa	519 kPa	75 kPa	444 kPa	11.51 %
150 kPa	672 kPa	150 kPa	522 kPa	19.28 %

Notes/Remarks: Test completed on Stage 2 as 20% strain has been reached as per AS1289 6.4.1.

Graph not to scale

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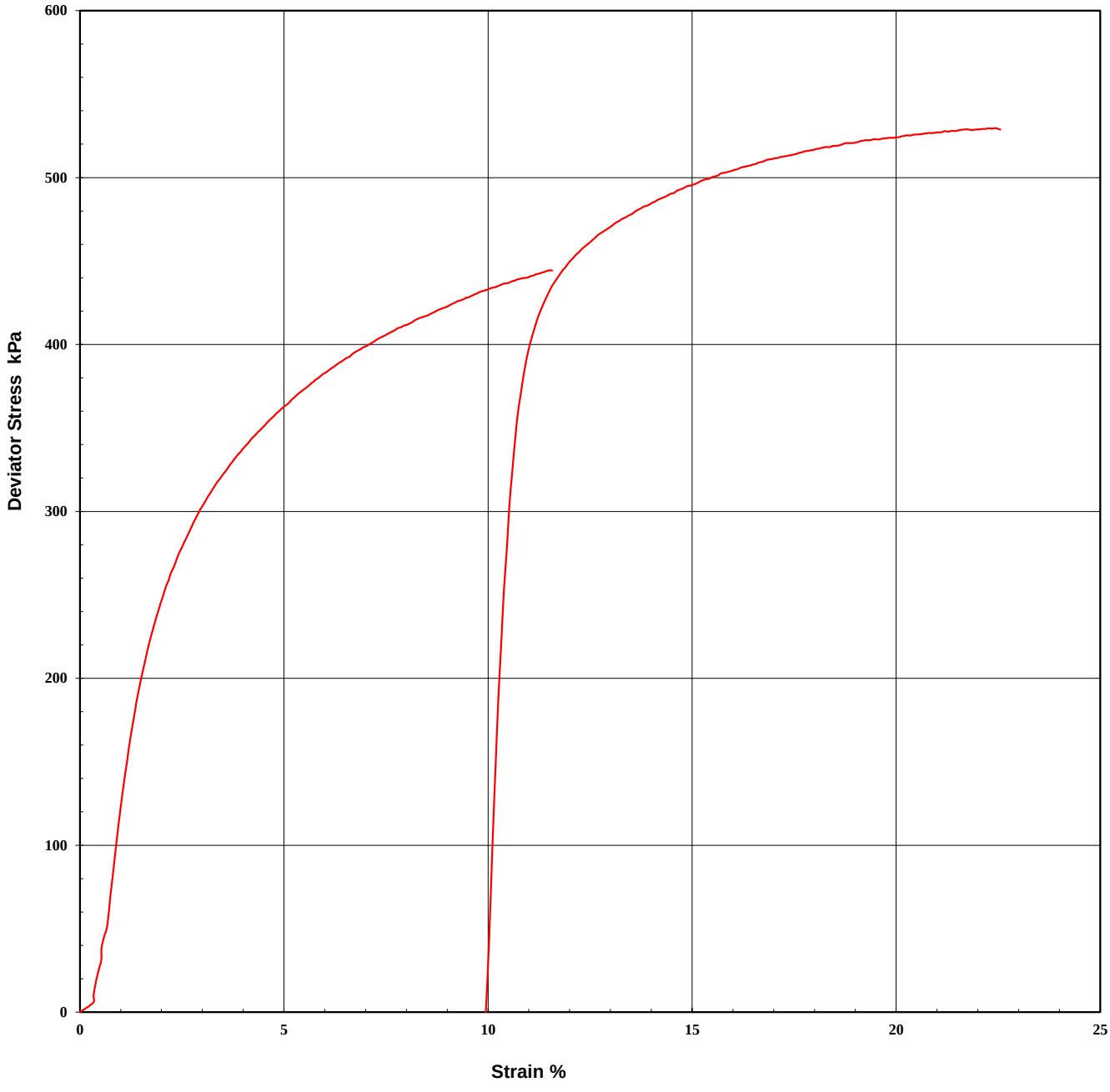
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010243- UU

Stress/Strain Diagram



Notes/Remarks: Test completed on Stage 2 as 20% strain has been reached as per AS1289 6.4.1.

Graph not to scale

Accredited for compliance with ISO/IEC 17025 - Testing.
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Tested at Trilab Brisbane Laboratory.

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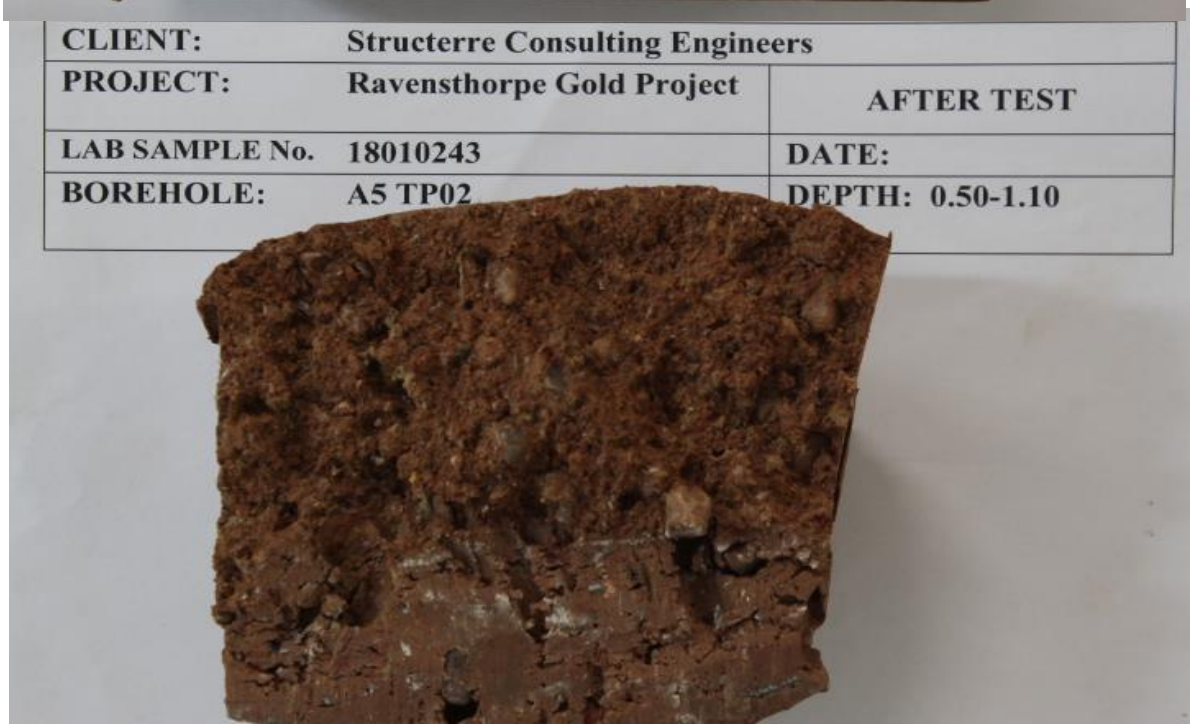
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010243- UU



Notes/Remarks:
Graph not to scale

Photo not to scale

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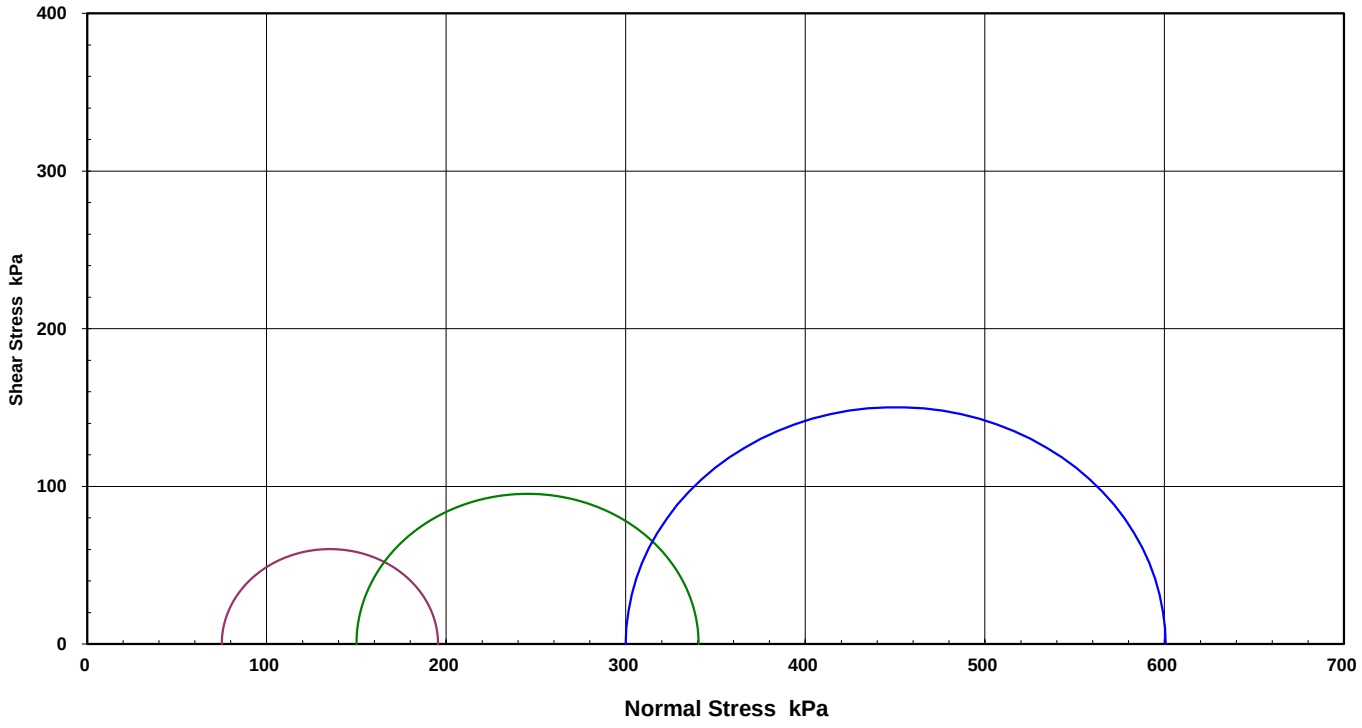
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010244- UU
		Workorder No.	0003674
Address	PO Box 792 BALCATTA WA 6914	**Test Date**	12/01/2018
		Report Date	16/01/2018
Project	Ravensthorpe Gold Project		
Client ID	A27 TP13	**Depth (m)**	0.70-2.80
Description	CLAYEY SILT- yellow/brown	**Sample Type**	Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Mohr Circle Diagram



Interpretation between stages	1 to 2	2 to 3	1 to 3
Cohesion C (kPa)	18.1	30.6	24.4
Angle of Shear Resistance Φ (^{0})	18.6	15.6	16.5

MOISTURE CONTENTS **Initial** 16.2 % **Final** 16.2 %

Failure Criteria Maximum Deviator Stress

SAMPLE & TEST DETAILS

Sample Details		
Initial Height	200.0	mm
Initial Diameter	100.1	mm
Wet Density	1.88	t/m^3
Dry Density	1.62	t/m^3
Rate of Strain	0.250	% / min

FAILURE DETAILS

Confining Pressure	Principal Stresses σ_1	Principal Stresses σ_3	Deviator Stress	Strain
75 kPa	195 kPa	75 kPa	120 kPa	5.41 %
150 kPa	341 kPa	150 kPa	191 kPa	9.78 %
300 kPa	601 kPa	300 kPa	301 kPa	15.09 %

Notes/Remarks:
Graph not to scale

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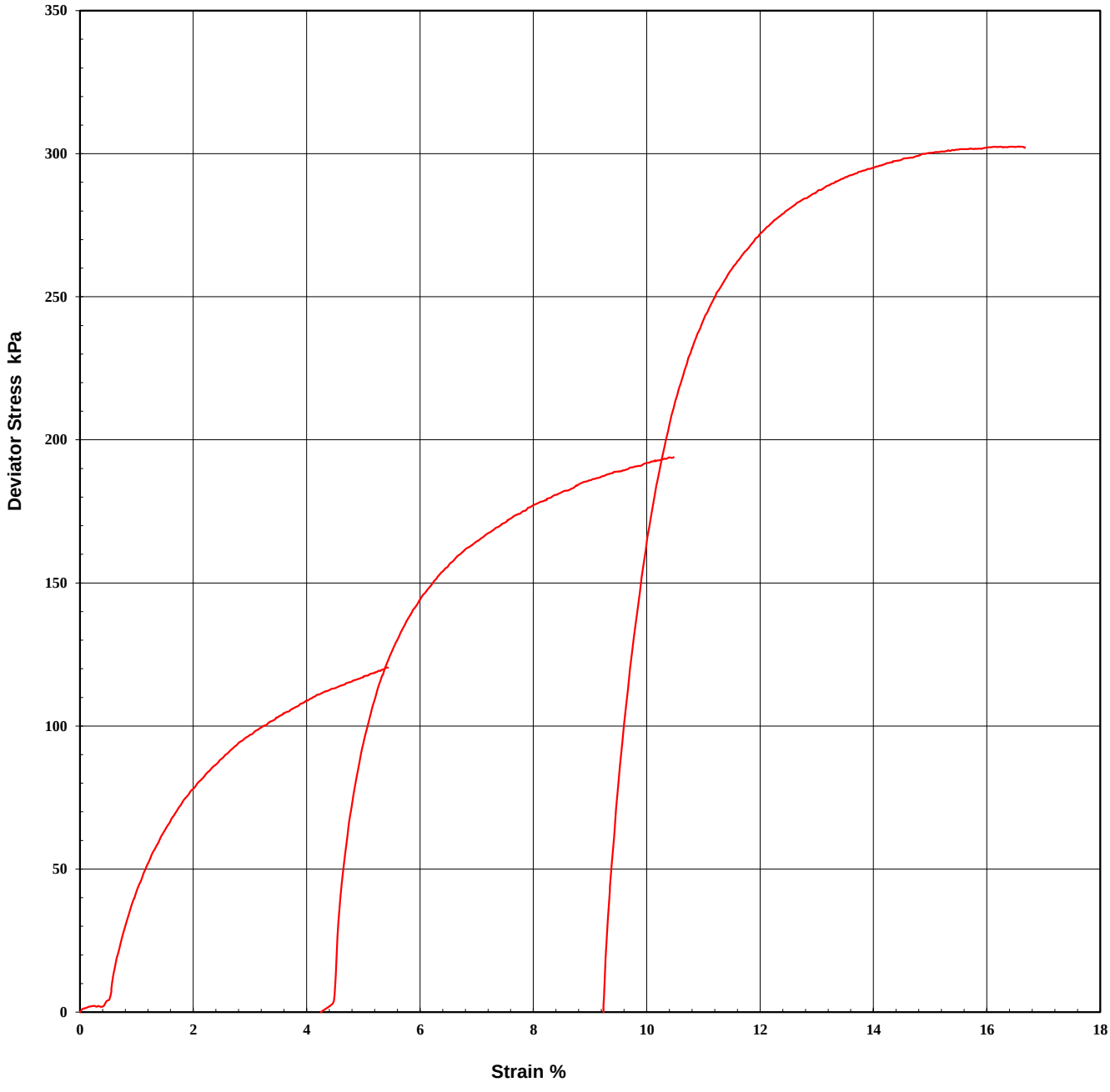
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010244- UU

Stress/Strain Diagram



Notes/Remarks:
Graph not to scale

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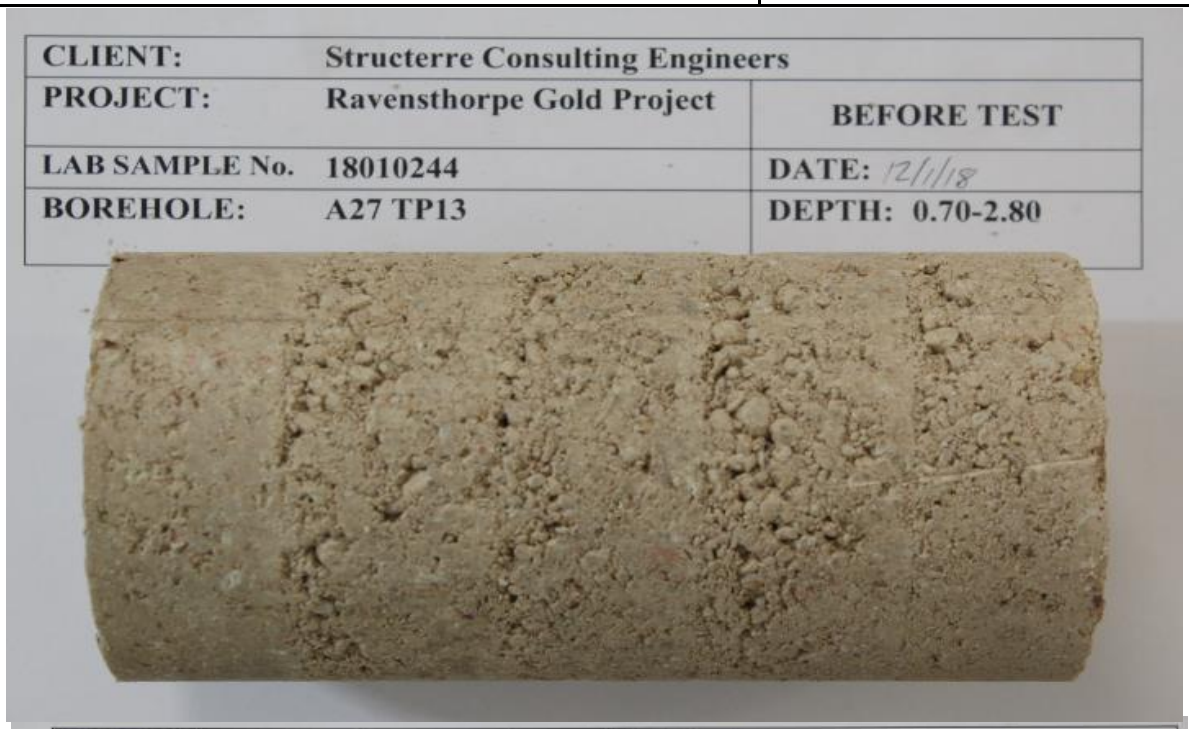
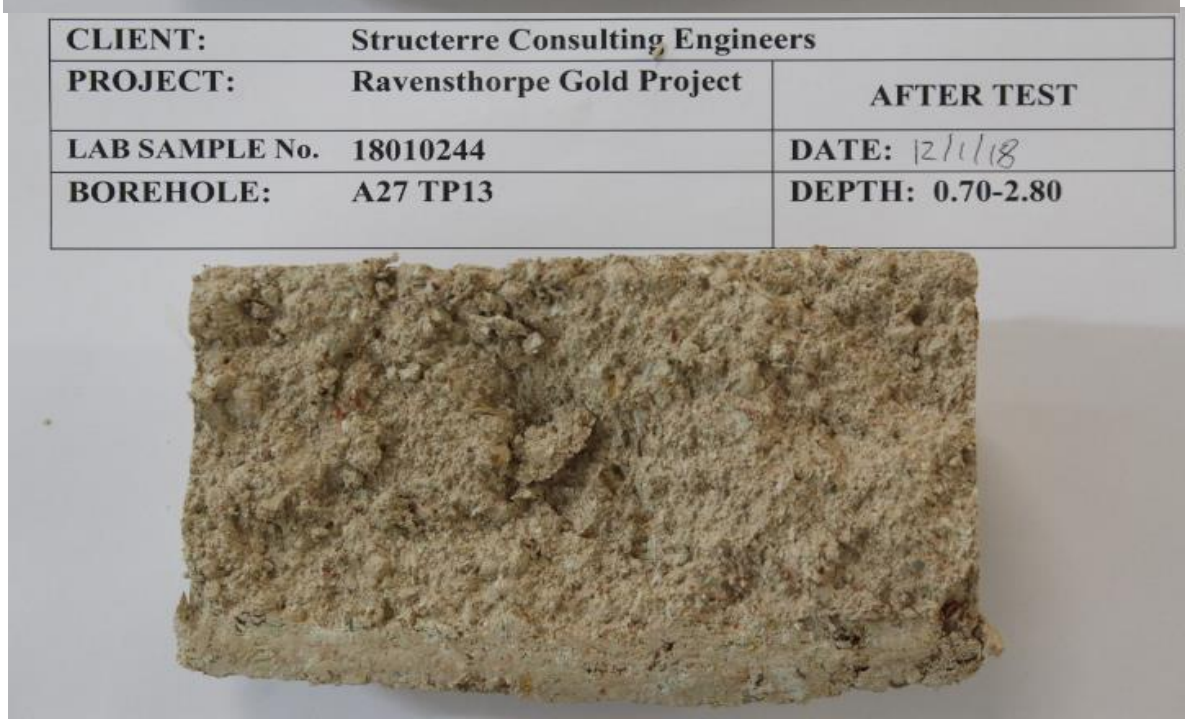
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010244- UU





Notes/Remarks:
Graph not to scale

Photo not to scale

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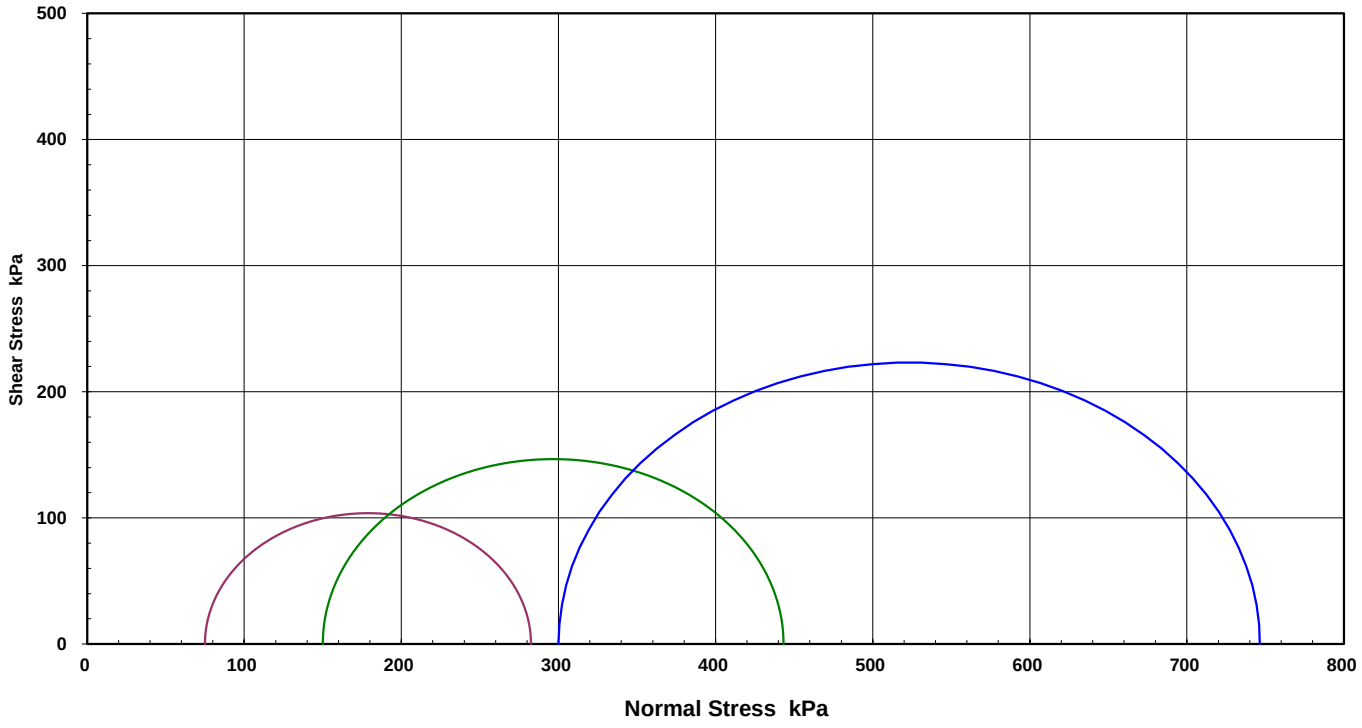
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010245- UU
		Workorder No.	0003674
Address	PO Box 792 BALCATTA WA 6914	**Test Date**	13/01/2018
		Report Date	16/01/2018
Project	Ravensthorpe Gold Project		
Client ID	B1	**Depth (m)**	Not Supplied
Description	SANDY CLAYEY SILT- pale brown	**Sample Type**	Single Individual Specimen remoulded to a target density of 95% of Standard Maximum Dry Density at Optimum Moisture Content (-19.0mm material tested)

Mohr Circle Diagram



Interpretation between stages	**1 to 2**	**2 to 3**	**1 to 3**
Cohesion C (kPa)	**41.6**	**49.3**	**45.6**
Angle of Shear Resistance Φ (^{0})	**21.3**	**19.8**	**20.2**

MOISTURE CONTENTS **Initial** 15.6 % **Final** 15.6 %

Failure Criteria Maximum Deviator Stress

SAMPLE & TEST DETAILS

Sample Details		
Initial Height	199.6	mm
Initial Diameter	100.1	mm
Wet Density	1.86	t/m^3
Dry Density	1.61	t/m^3
Rate of Strain	0.501	% / min

FAILURE DETAILS

Confining Pressure	Principal Stresses σ_1	Principal Stresses σ_3	Deviator Stress	Strain
75 kPa	283 kPa	75 kPa	208 kPa	5.82 %
150 kPa	443 kPa	150 kPa	293 kPa	10.17 %
300 kPa	746 kPa	300 kPa	446 kPa	15.22 %

Notes/Remarks:
Graph not to scale

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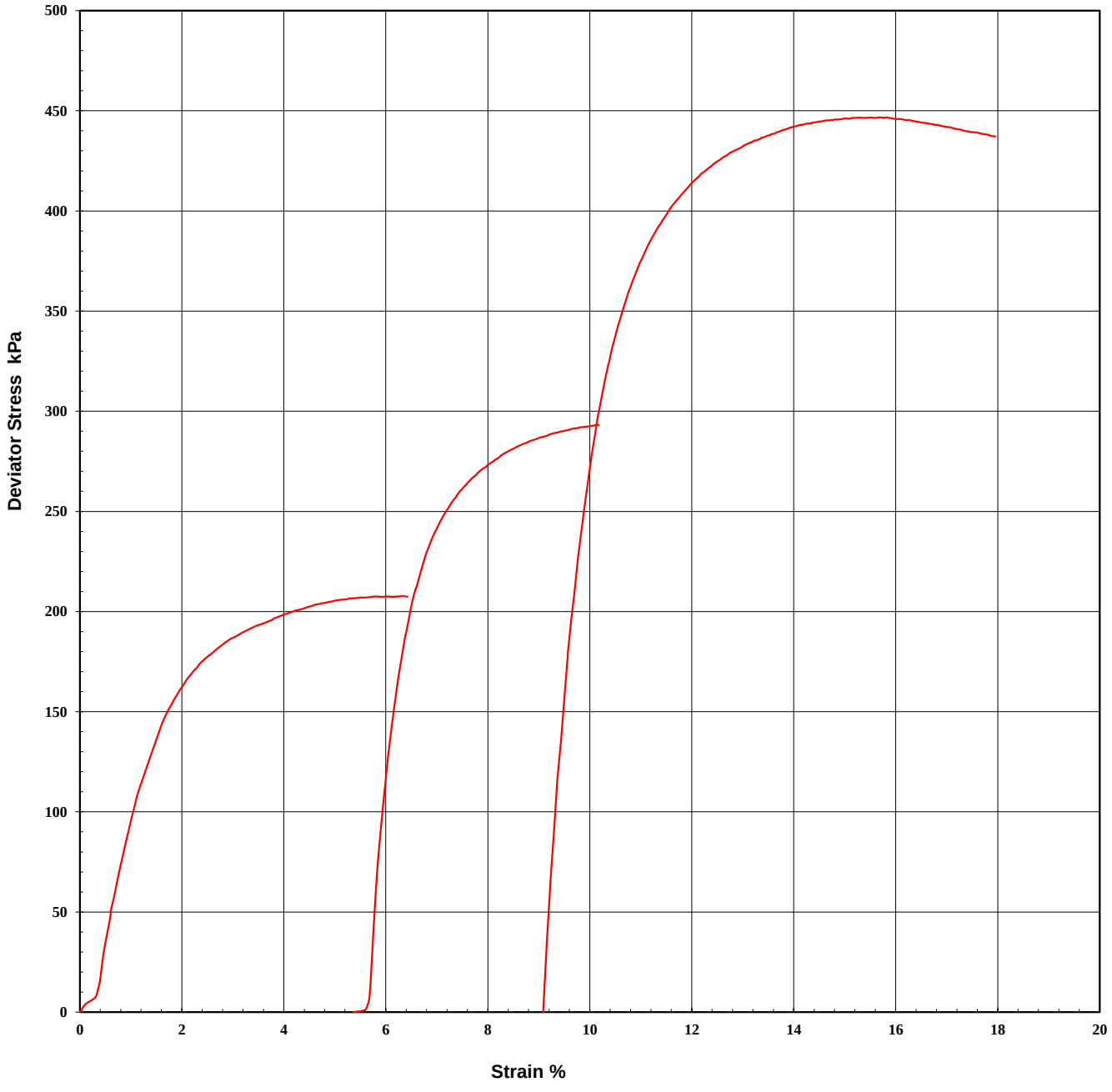
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010245- UU

Stress/Strain Diagram



Notes/Remarks:
Graph not to scale

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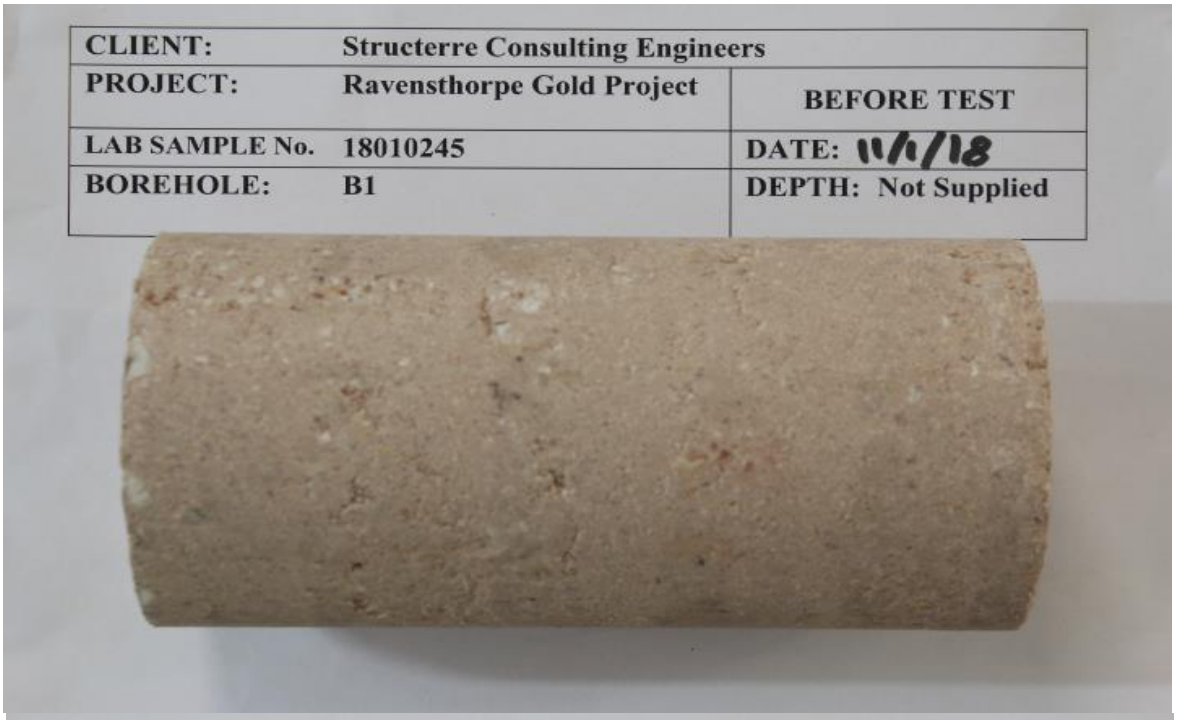
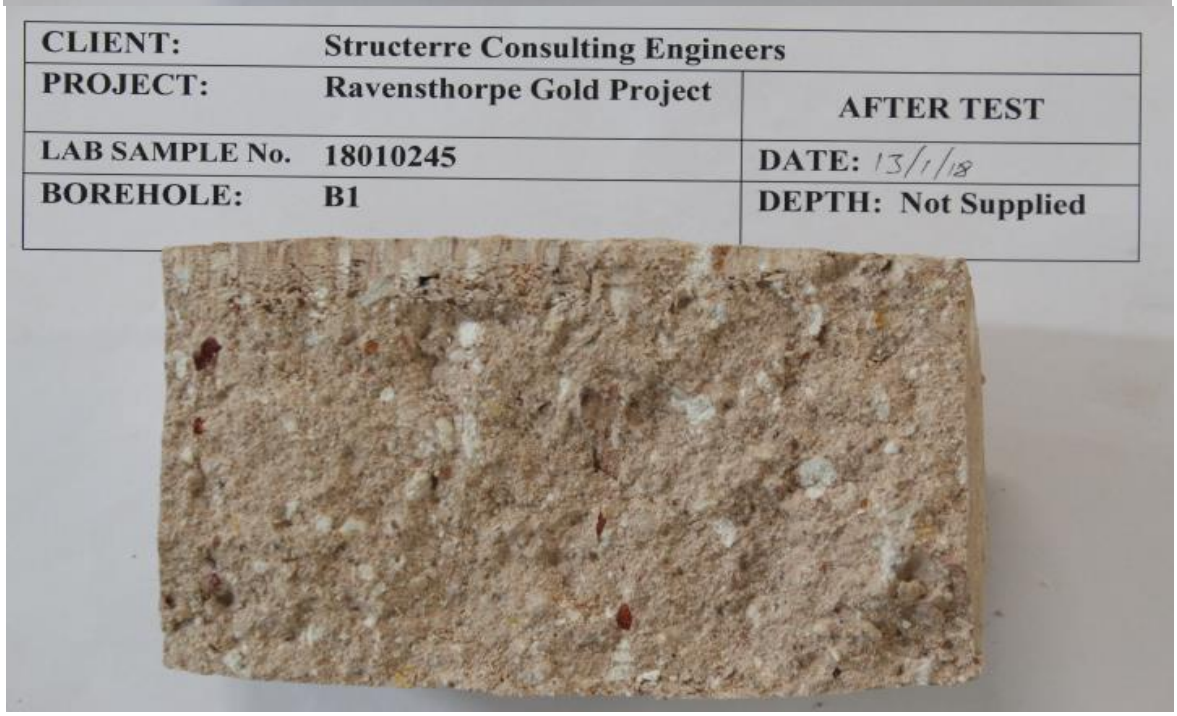
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Structerre Consulting Engineers	**Report No.**	18010245- UU





Notes/Remarks:
Graph not to scale

Photo not to scale

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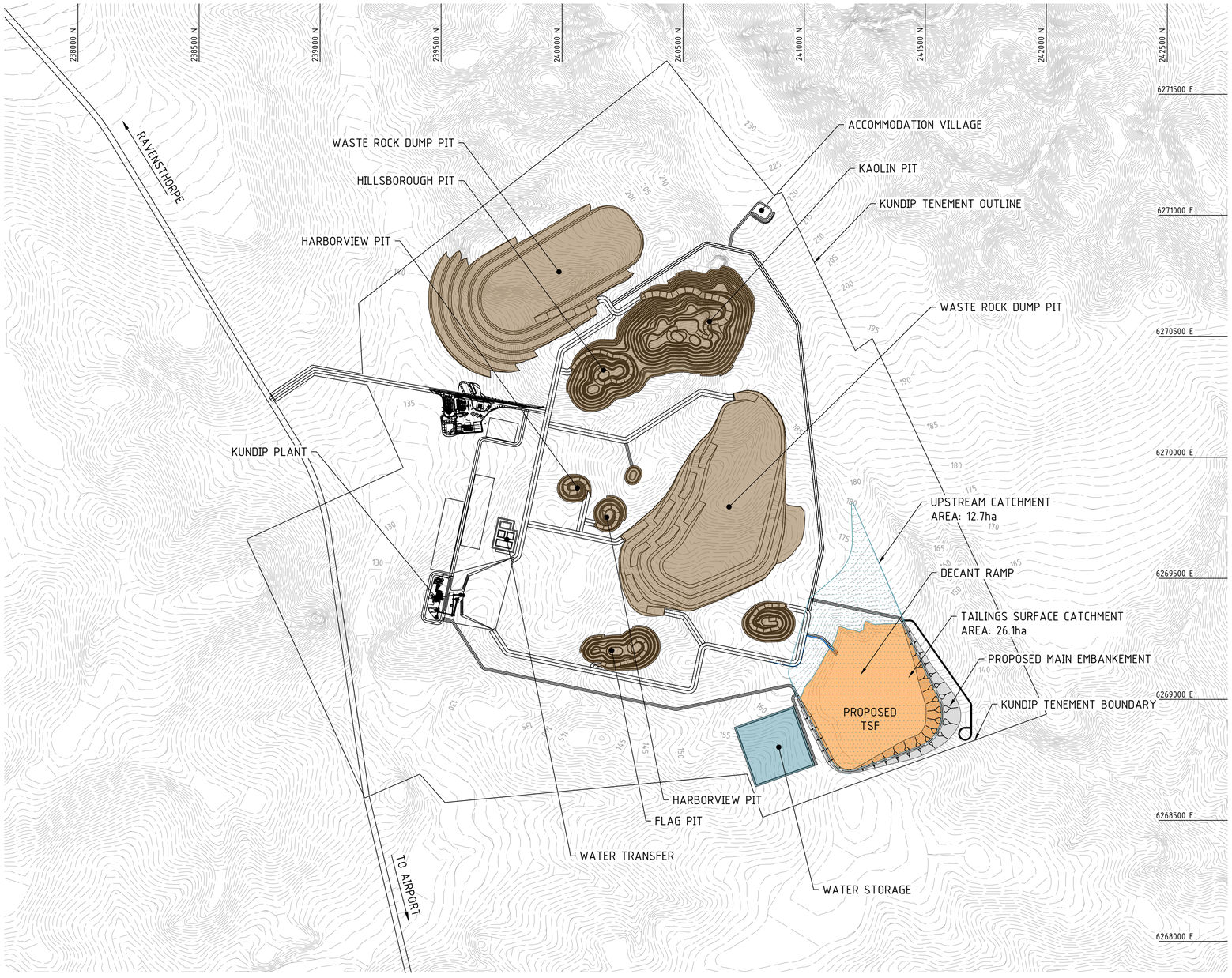
Laboratory No. 9926

Appendix F

Drawings



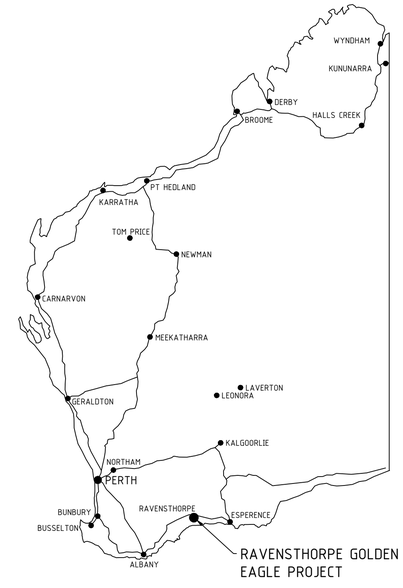
PLAN
1:10000

NOTES:

1. HORIZONTAL DATUM: MGA94 ZONE 51
   VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM (AHD)m
2. SURVEY SUPPLIED BY:
   - ACH MINERALS (OCT' 2017)
3. DESIGN LEVELS SHOWN ARE TO TOP OF CLAY AND TOP OF TAILINGS UNLESS NOTED OTHERWISE.
4. THESE DRAWINGS ARE PROVIDED FOR INFORMATION ONLY AS PART OF THE RAVENSTHORPE GOLD PROJECT FEASIBILITY STUDY. NOT FOR CONSTRUCTION.
5. DIMENSIONS SHOWN IN METRES U.N.O.
6. USE FIGURED DIMENSIONS, DO NOT SCALE OFF DRAWING.
7. EXISTING UNDERGROUND SERVICES ARE NOT SHOWN ON THIS DRAWING U.N.O. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES TO DETERMINE THE PRESENCE OF UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.
8. ALL RELEVANT WORKING PERMITS SHALL BE ACQUIRED PRIOR TO COMMENCEMENT OF ANY WORKS.

DRAWING INDEX

CIVIL:



GEOGRAPHICAL LOCATION
NOT TO SCALE

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

200 0 200 400 600 Metres
SCALE 1 : 10,000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
SITE LAYOUT AND DRAWINGS INDEX

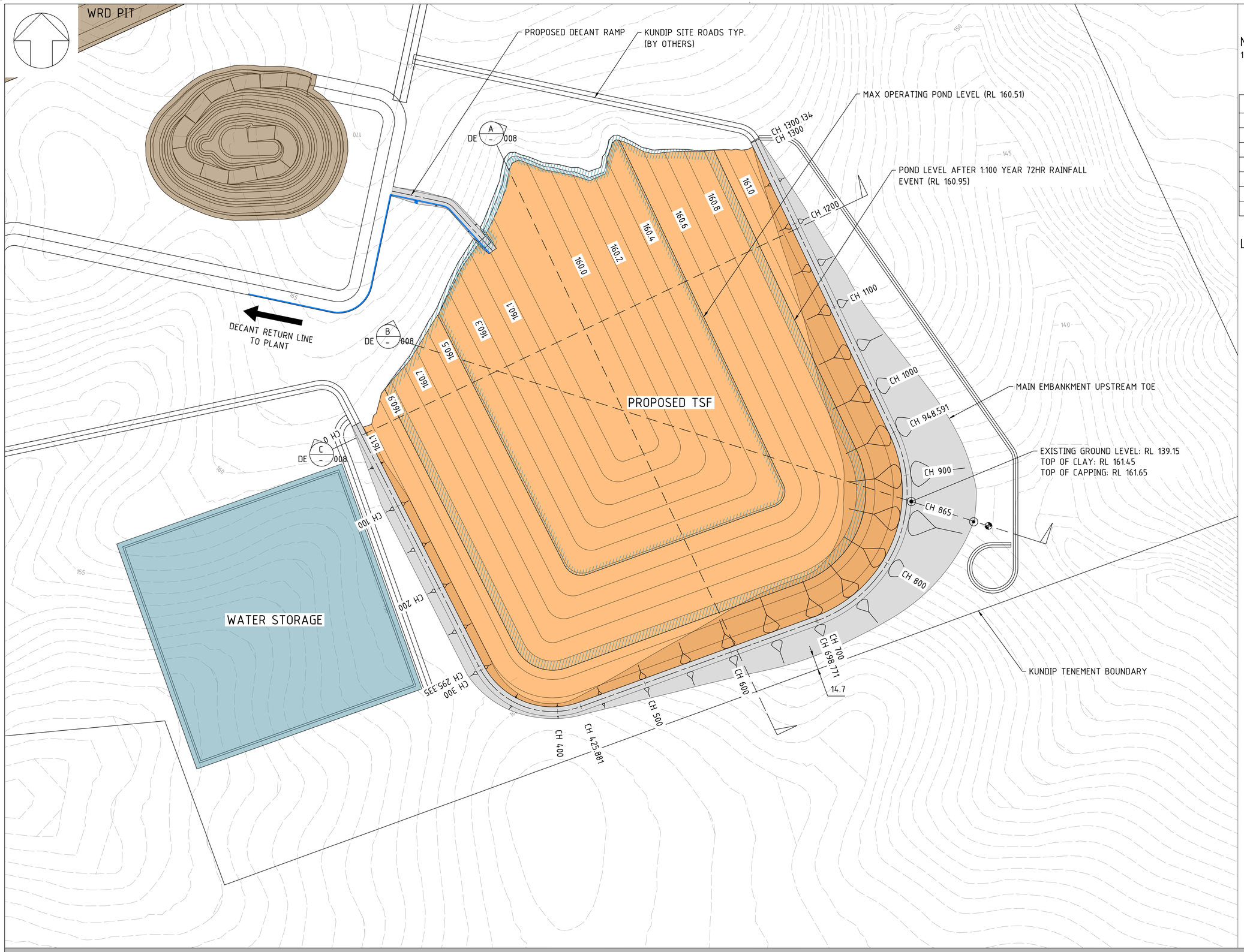
SCALE
1:10,000 @ A1

DRAWING No. DE-001

REV C

Cad File: C:\Users\MHA Geotechnical\REC Group\MHA Geotechnical - 1. MHA Project Folders\3 - Projects 2017\P17-02 ACH Minerals Ltd\2. Project Information\Drawings\Working\DE-001.dwg 8-Aug-18 - 03:08:42 PM

A1 Border v1.4



NOTES:

1. REFER TO DRG. DE-001 FOR NOTES.

MAIN EMBANKMENT SETOUT				
CHAINAGE	EASTING (m)	NORTHING (m)	RL (m)	RADIUS
0.000	240972.025	6269013.989	161.350	-
295.335	241105.543	6268750.559		90
425.881	241216.582	6268706.668		
698.771	241473.038	6268799.939		150
948.591	241557.258	6269005.270		
1300.134	241406.412	6269322.804		-

LEGEND:

- PROPOSED MAIN EMBANKMENT
- PROPOSED FINAL TAILINGS SURFACE
- POND EXTENTS
- 160.6 — PROPOSED CONTOUR AND HEIGHT
- 140 — EXISTING CONTOUR AND HEIGHT
- PROPOSED VIBRATING WIRE PIEZOMETER
- PROPOSED MONITORING BORE

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

40 0 40 80 120 Metres

SCALE 1 : 2,000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

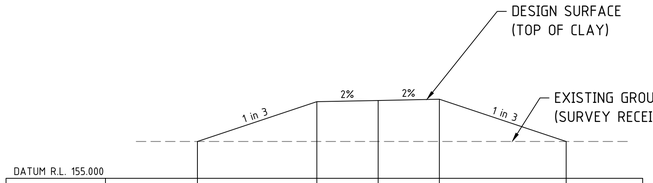
	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
GENERAL ARRANGEMENT

SCALE 1:2,000 @ A1

DRAWING No. DE-002

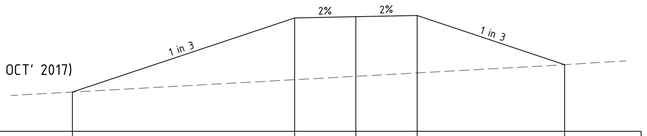
REV C



DATUM R.L. 155.000

DESIGN SURFACE (TOP OF CLAY)	158.000	161.250	161.350	161.450	158.000	
DEPTH CUT - / FILL +	0.000	3.250	3.350	3.450	0.000	
SURVEY	158.000	158.000	158.000	158.000	158.000	
OFFSET FROM REF. LINE	-14.750	-5.000	0.000	5.000	15.350	

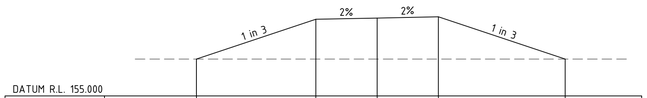
CH 295.335



DATUM R.L. 152.000

DESIGN SURFACE (TOP OF CLAY)	155.205	161.250	161.350	161.450	157.438	
DEPTH CUT - / FILL +	0.000	5.039	4.863	4.686	0.000	
SURVEY	155.205	156.211	156.487	156.764	157.438	
OFFSET FROM REF. LINE	-23.136	-5.000	0.000	5.000	17.036	

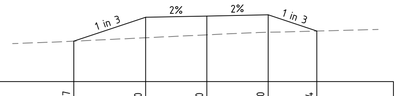
CH 500



DATUM R.L. 155.000

DESIGN SURFACE (TOP OF CLAY)	158.000	161.250	161.350	161.450	158.000	
DEPTH CUT - / FILL +	0.000	3.250	3.350	3.450	0.000	
SURVEY	158.000	158.000	158.000	158.000	158.000	
OFFSET FROM REF. LINE	-14.750	-5.000	0.000	5.000	15.350	

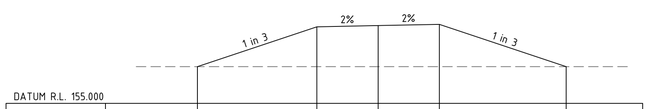
CH 200



DATUM R.L. 156.000

DESIGN SURFACE (TOP OF CLAY)	159.297	161.250	161.350	161.450	160.124	
DEPTH CUT - / FILL +	0.000	1.673	1.534	1.427	0.000	
SURVEY	159.297	159.577	159.816	160.023	160.124	
OFFSET FROM REF. LINE	-10.858	-5.000	0.000	5.000	8.977	

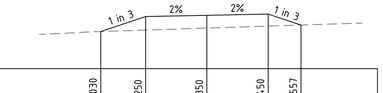
CH 425.881



DATUM R.L. 155.000

DESIGN SURFACE (TOP OF CLAY)	158.000	161.250	161.350	161.450	158.000	
DEPTH CUT - / FILL +	0.000	3.250	3.350	3.450	0.000	
SURVEY	158.000	158.000	158.000	158.000	158.000	
OFFSET FROM REF. LINE	-14.750	-5.000	0.000	5.000	15.350	

CH 100



DATUM R.L. 157.000

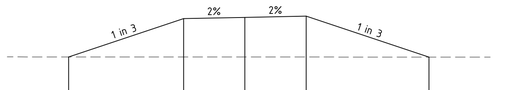
DESIGN SURFACE (TOP OF CLAY)	160.030	161.250	161.350	161.450	160.557	
DEPTH CUT - / FILL +	0.000	1.102	1.041	0.980	0.000	
SURVEY	160.030	160.148	160.309	160.470	160.557	
OFFSET FROM REF. LINE	-8.661	-5.000	0.000	5.000	7.680	

CH 400

DATUM R.L. 158.000

DESIGN SURFACE (TOP OF CLAY)	161.352	161.250	161.350	161.450	161.371	
DEPTH CUT - / FILL +	0.000	-0.102	-0.001	0.080	0.000	
SURVEY	161.352	161.352	161.351	161.370	161.371	
OFFSET FROM REF. LINE	-5.305	-5.000	0.000	5.000	5.236	

CH 0



DATUM R.L. 155.000

DESIGN SURFACE (TOP OF CLAY)	158.121	161.250	161.350	161.450	158.109	
DEPTH CUT - / FILL +	0.000	3.133	3.235	3.337	0.000	
SURVEY	158.121	158.117	158.115	158.113	158.109	
OFFSET FROM REF. LINE	-14.388	-5.000	0.000	5.000	15.024	

CH 300

NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.
2. REFER TO DRG. DE-009 FOR TYPICAL SECTION.

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

5 0 5 10 15 Metres

SCALE 1 : 250

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
CROSS SECTIONS - SHEET 1 OF 5

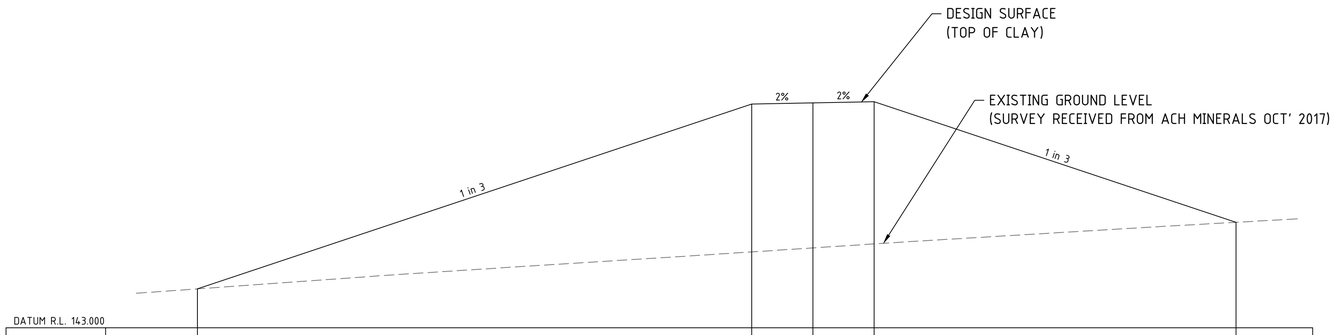
SCALE 1:250 @ A1

DRAWING No. DE-003

REV C

Cad File: C:\Users\MHA Geotechnical\REC Group\MHA Geotechnical - 1. MHA Project Folders\3 - Projects 2017\P17-02 ACH Minerals Ltd\2. Project Information\Drawings\Working\DE-003.dwg 8-Aug-18 - 03:35:32 PM

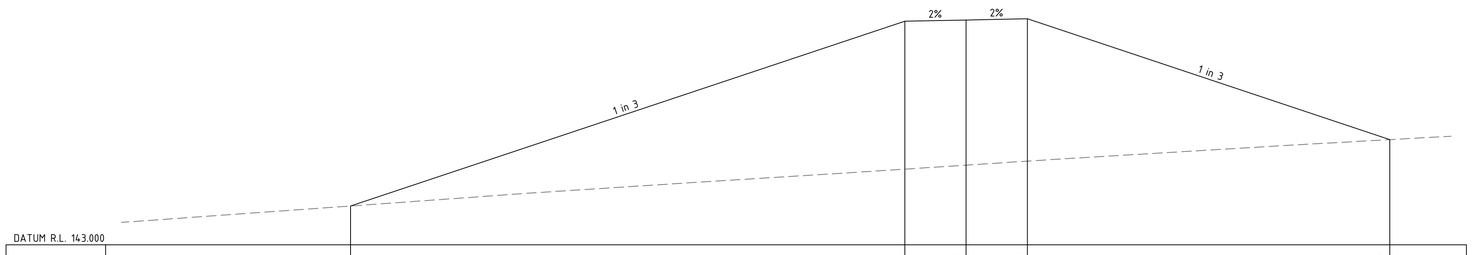
A1 Border v1.4



DATUM R.L. 143.000

DESIGN SURFACE (TOP OF CLAY)	146.170	161.250	161.350	161.450	151.604		
DEPTH CUT - / FILL +	0.000	12.061	11.835	11.608	0.000		
SURVEY	146.170	149.189	149.515	149.841	151.604		
OFFSET FROM REF. LINE	-50.240	-5.000	0.000	5.000	34.536		

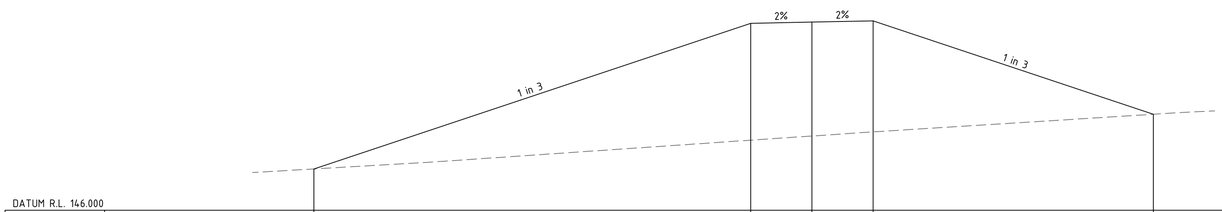
CH 700



DATUM R.L. 143.000

DESIGN SURFACE (TOP OF CLAY)	146.170	161.250	161.350	161.450	151.587		
DEPTH CUT - / FILL +	0.000	12.072	11.846	11.620	0.000		
SURVEY	146.170	149.178	149.504	149.830	151.587		
OFFSET FROM REF. LINE	-50.238	-5.000	0.000	5.000	34.589		

CH 698.771



DATUM R.L. 146.000

DESIGN SURFACE (TOP OF CLAY)	149.364	161.250	161.350	161.450	153.827		
DEPTH CUT - / FILL +	0.000	9.538	9.297	9.061	0.000		
SURVEY	149.364	151.712	152.053	152.389	153.827		
OFFSET FROM REF. LINE	-40.657	-5.000	0.000	5.000	27.869		

CH 600

NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.
2. REFER TO DRG. DE-009 FOR TYPICAL SECTION.

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

5 0 5 10 15 Metres

SCALE 1 : 250

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT: ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
CROSS SECTIONS - SHEET 2 OF 5

SCALE: 1:250 @ A1

DRAWING No.: DE-004

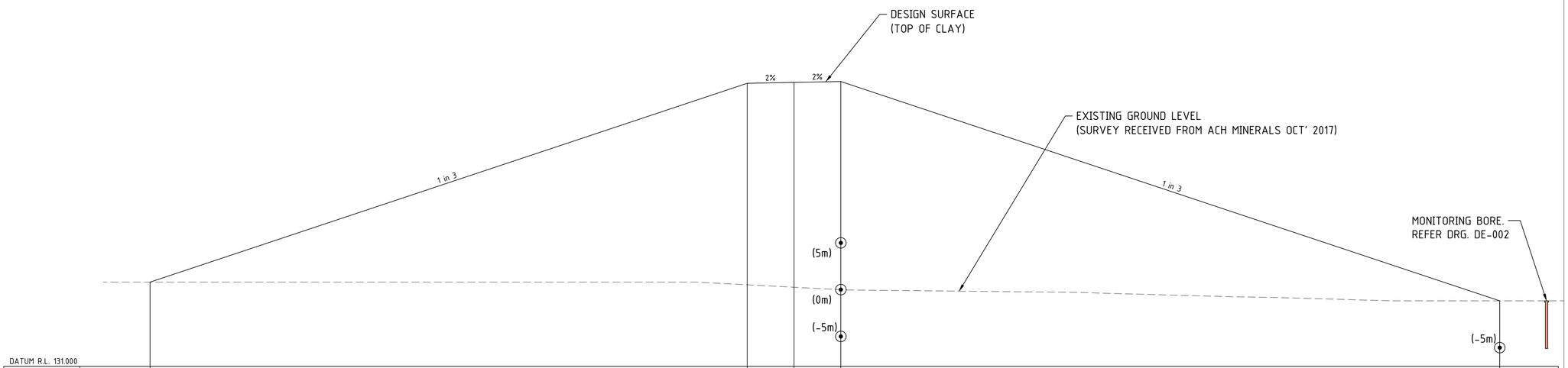
REV: C

NOTES:

1. REFER TO DRG. DE-001 FOR NOTES.
2. REFER TO DRG. DE-009 FOR TYPICAL SECTION.

LEGEND:

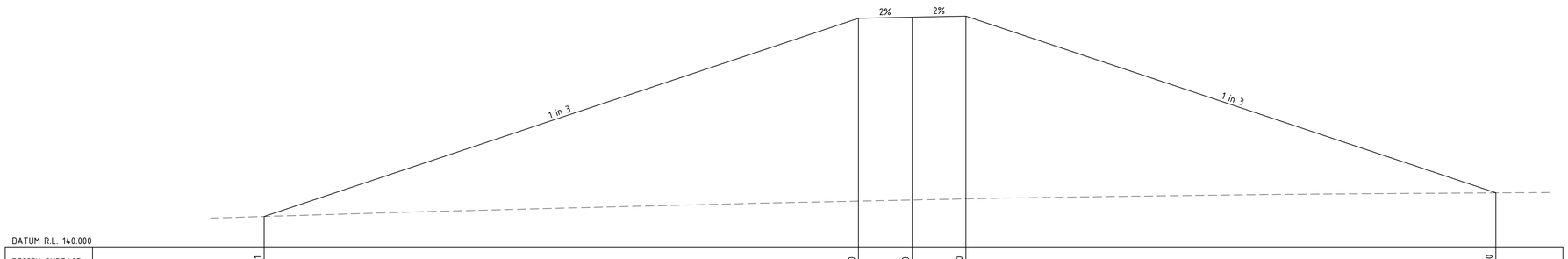
(5m) ⊙ PROPOSED VIBRATING WIRE PIEZOMETER (RELATIVE EXISTING GROUND LEVEL DEPTH IN METRES)



DATUM R.L. 131.000

DESIGN SURFACE (TOP OF CLAY)	140.000	161.250	161.350	161.450	138.000	
DEPTH CUT - / FILL +	0.000	21.531	21.894	22.256	0.000	
SURVEY	140.000	139.719	139.456	139.194	138.000	
OFFSET FROM REF. LINE	-68.750	-5.000	0.000	5.000	75.350	

CH 865



DATUM R.L. 140.000

DESIGN SURFACE (TOP OF CLAY)	142.821	161.250	161.350	161.450	145.020	
DEPTH CUT - / FILL +	0.000	17.001	16.995	16.990	0.000	
SURVEY	142.821	144.249	144.355	144.460	145.020	
OFFSET FROM REF. LINE	-60.286	-5.000	0.000	5.000	54.291	

CH 800

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

5 0 5 10 15 Metres

SCALE 1 : 250

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
CROSS SECTIONS - SHEET 3 OF 5

SCALE 1:250 @ A1

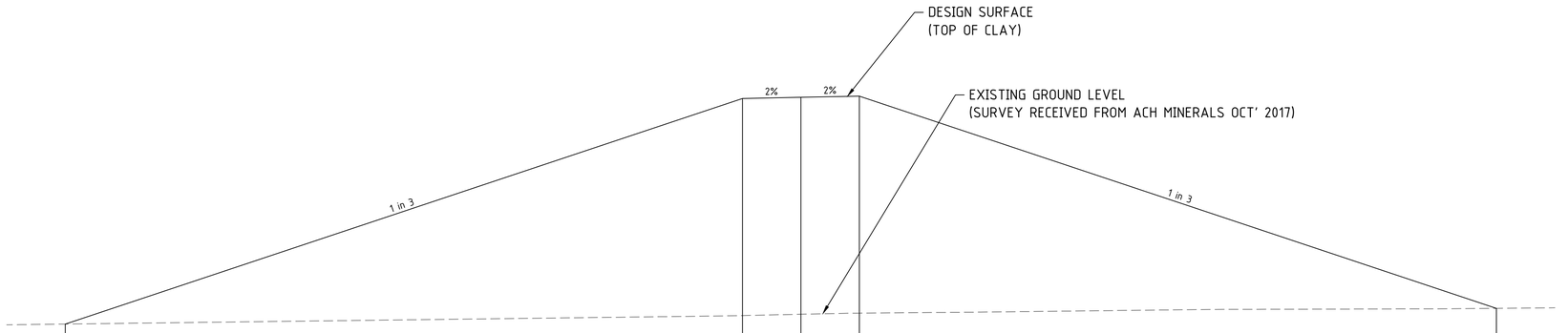
DRAWING No. DE-005

REV C

Cad File: C:\Users\MHA Geotechnical\REC Group\MHA Geotechnical - 1. MHA Project Folders\3 - Projects 2017\P17-02 ACH Minerals Ltd\2. Project Information\Drawings\Working\DE-005.dwg 8-Aug-18 - 03:44:47 PM

A1 Border v1.4

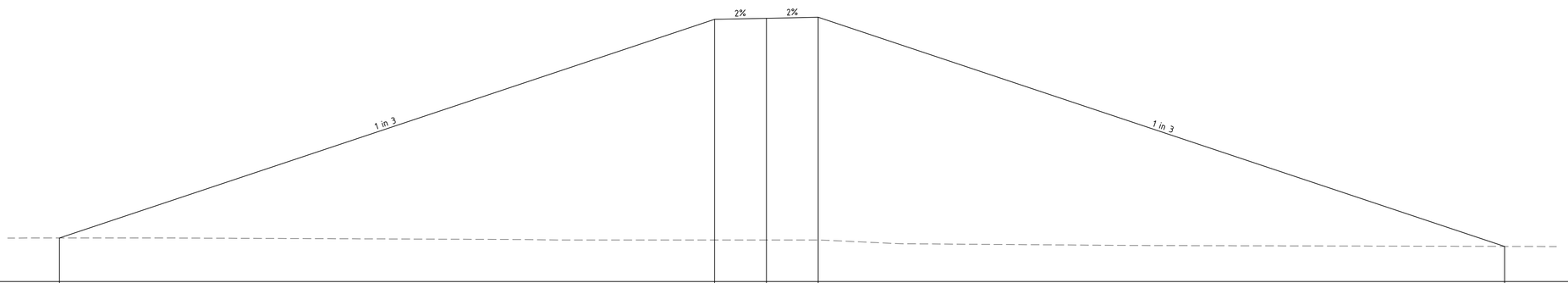
NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.
2. REFER TO DRG. DE-009 FOR TYPICAL SECTION.



DATUM R.L. 139.000

DESIGN SURFACE (TOP OF CLAY)	141.957	161.250	161.350	161.450	143.301	
DEPTH CUT - / FILL +	0.000	18.564	18.554	18.561	0.000	
SURVEY	141.957	142.686	142.795	142.889	143.301	
OFFSET FROM REF. LINE	-62.819	-5.000	0.000	5.000	59.448	

CH 948.591



DATUM R.L. 136.000

DESIGN SURFACE (TOP OF CLAY)	140.188	161.250	161.350	161.450	139.381	
DEPTH CUT - / FILL +	0.000	21.250	21.350	21.450	0.000	
SURVEY	140.188	140.000	140.000	140.000	139.381	
OFFSET FROM REF. LINE	-68.187	-5.000	0.000	5.000	71.208	

CH 900

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

5 0 5 10 15 Metres
SCALE 1 : 250

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
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A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
CROSS SECTIONS - SHEET 4 OF 5

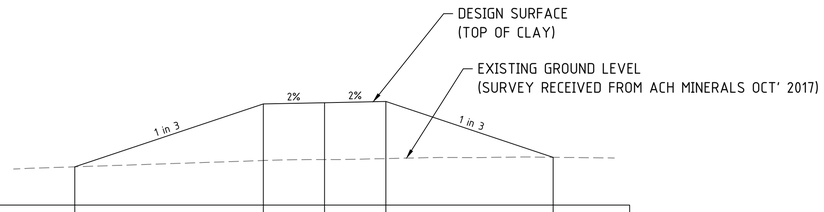
SCALE 1:250 @ A1

DRAWING No. DE-006

REV C

Cad File: C:\Users\MHA Geotechnical\REC Group\MHA Geotechnical - 1. MHA Project Folders\3 - Projects 2017\P17-02 ACH Minerals Ltd\2. Project Information\Drawings\Working\DE-006.dwg 8-Aug-18 - 03:11:59 PM

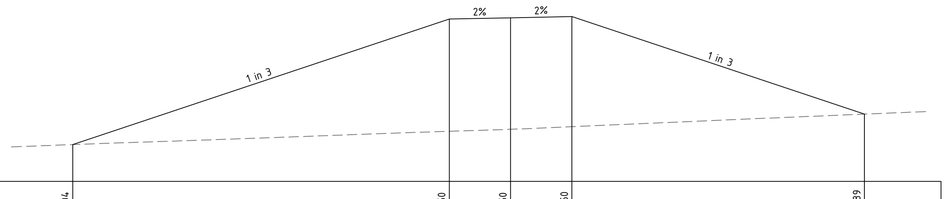
A1 Border v1.4



DATUM R.L. 153.000

DESIGN SURFACE (TOP OF CLAY)	156.122	161.250	161.350	161.450	156.898
DEPTH CUT - / FILL +	0.000	4.616	4.636	4.658	0.000
SURVEY	156.122	156.634	156.714	156.792	156.898
OFFSET FROM REF. LINE	-20.385	-5.000	0.000	5.000	18.655

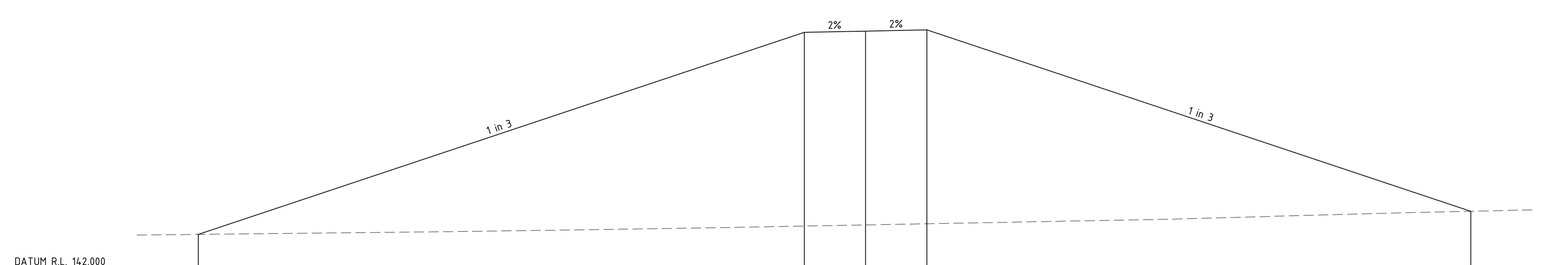
CH 1200



DATUM R.L. 148.000

DESIGN SURFACE (TOP OF CLAY)	151.004	161.250	161.350	161.450	153.489
DEPTH CUT - / FILL +	0.000	9.162	9.100	8.986	0.000
SURVEY	151.004	152.088	152.250	152.464	153.489
OFFSET FROM REF. LINE	-35.737	-5.000	0.000	5.000	28.882

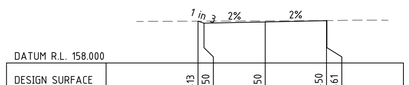
CH 1100



DATUM R.L. 142.000

DESIGN SURFACE (TOP OF CLAY)	144.762	161.250	161.350	161.450	146.651
DEPTH CUT - / FILL +	0.000	15.808	15.815	15.821	0.000
SURVEY	144.762	145.442	145.535	145.629	146.651
OFFSET FROM REF. LINE	-54.463	-5.000	0.000	5.000	49.398

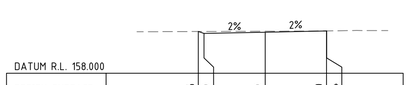
CH 1000



DATUM R.L. 158.000

DESIGN SURFACE (TOP OF CLAY)	161.413	161.250	161.350	161.450	161.461	
DEPTH CUT - / FILL +	0.000	-0.165	-0.086	-0.010	0.000	
SURVEY	161.413	161.415	161.436	161.460	161.461	
OFFSET FROM REF. LINE	-5.489	-5.000	0.000	5.000	5.032	

CH 1300.134



DATUM R.L. 158.000

DESIGN SURFACE (TOP OF CLAY)	161.406	161.250	161.350	161.450	161.454
DEPTH CUT - / FILL +	0.000	-0.158	-0.079	-0.004	0.000
SURVEY	161.406	161.408	161.428	161.454	161.454
OFFSET FROM REF. LINE	-5.467	-5.000	0.000	5.000	5.011

CH 1300

NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.
2. REFER TO DRG. DE-009 FOR TYPICAL SECTION.

FOR INFORMATION ONLY

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5 0 5 10 15 Metres
SCALE 1 : 250

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

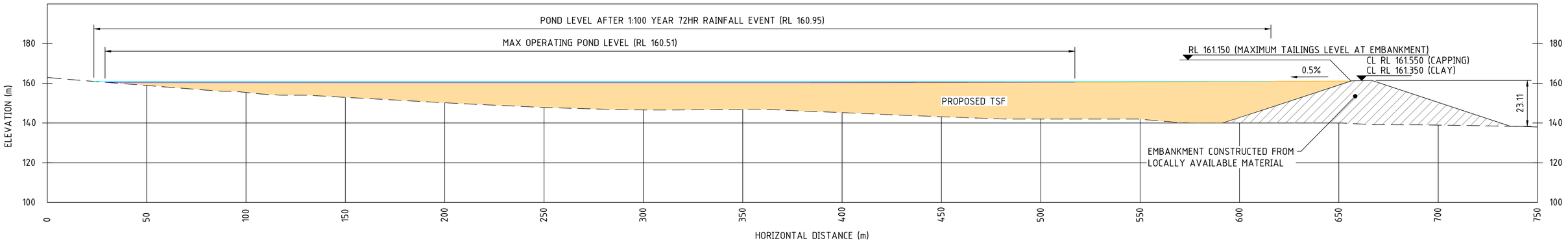
	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
CROSS SECTIONS - SHEET 5 OF 5

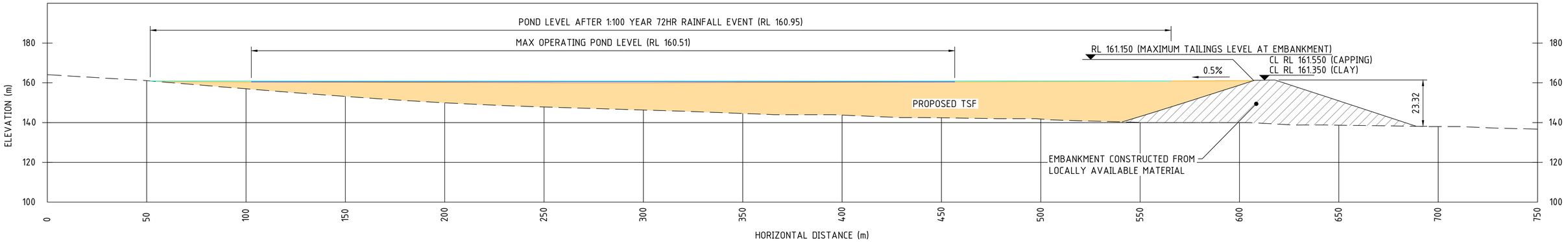
SCALE 1:250 @ A1

DRAWING No. DE-007

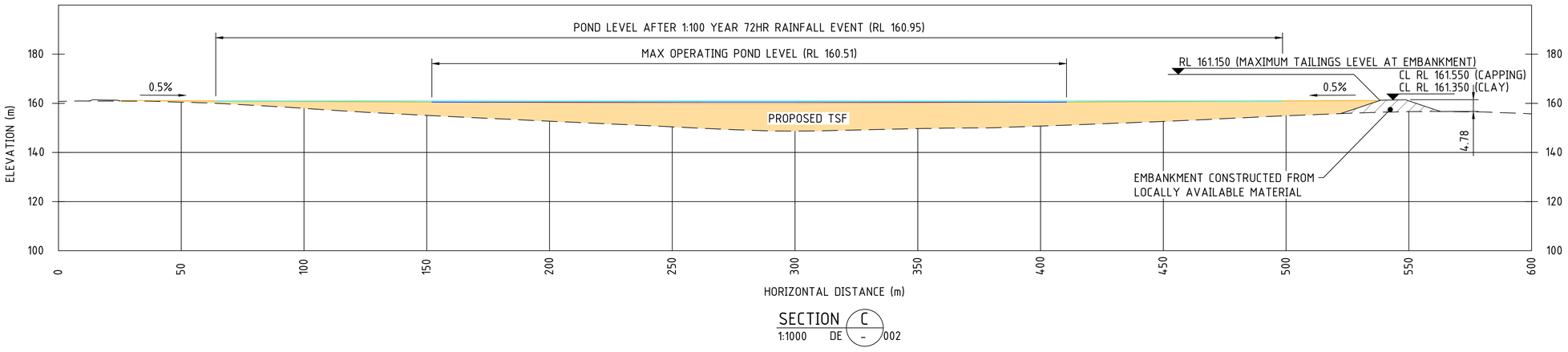
REV C



SECTION A
1:1000 DE - 002



SECTION B
1:1000 DE - 002



SECTION C
1:1000 DE - 002

NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.
2. REFER TO DRG. DE-009 FOR TYPICAL SECTION.

FOR INFORMATION ONLY

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20 0 20 40 60 Metres
SCALE 1 : 1000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHA GEOTECHNICAL AS PART OF REC.

CLIENT ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
SECTIONS

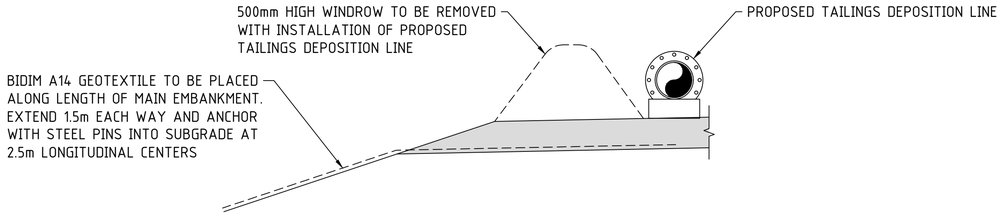
SCALE
1:1000 @ A1

DRAWING No. DE-008

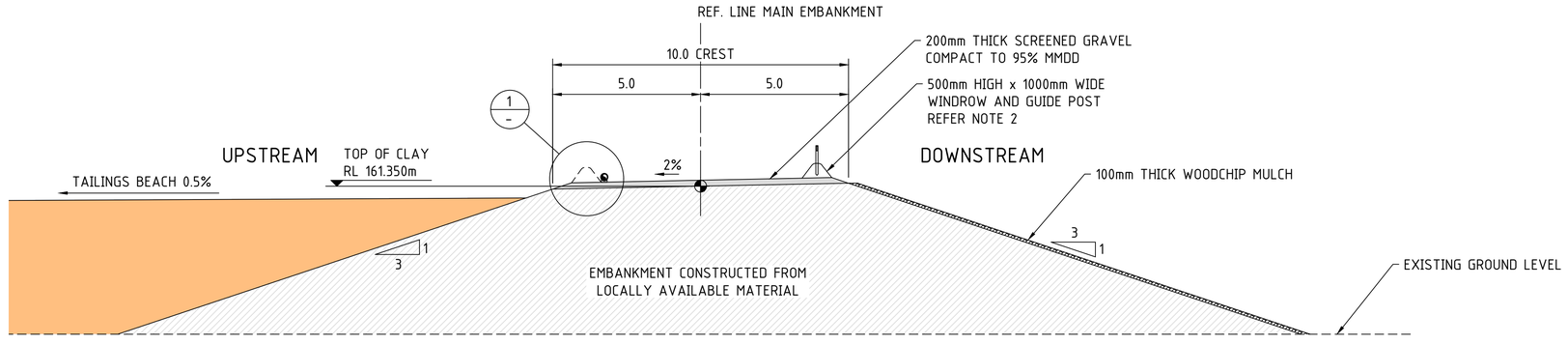
REV C

Cad File: C:\Users\MHA Geotechnical\REC Group\MHA Geotechnical - 1. MHA Project Folders\3 - Projects 2017\P17-02 ACH Minerals Ltd\2. Project Information\Drawings\Working\DE-008.dwg 8-Aug-18 - 03:14:23 PM

A1 Border v1.4



DETAIL 1/-
1:20



TYPICAL SECTION - MAIN EMBANKMENT
1:100

NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.

REFERENCE DRAWINGS
DE-001 - SITE LAYOUT AND DRAWING INDEX
DE-002 - MAIN EMBANKMENT GENERAL ARRANGEMENT

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

0.4 0 0.4 0.8 1.2 Metres
SCALE 1 : 20

2 0 2 4 6 Metres
SCALE 1 : 100

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHAGEOTECHNICAL AS PART OF REC.

CLIENT ACH

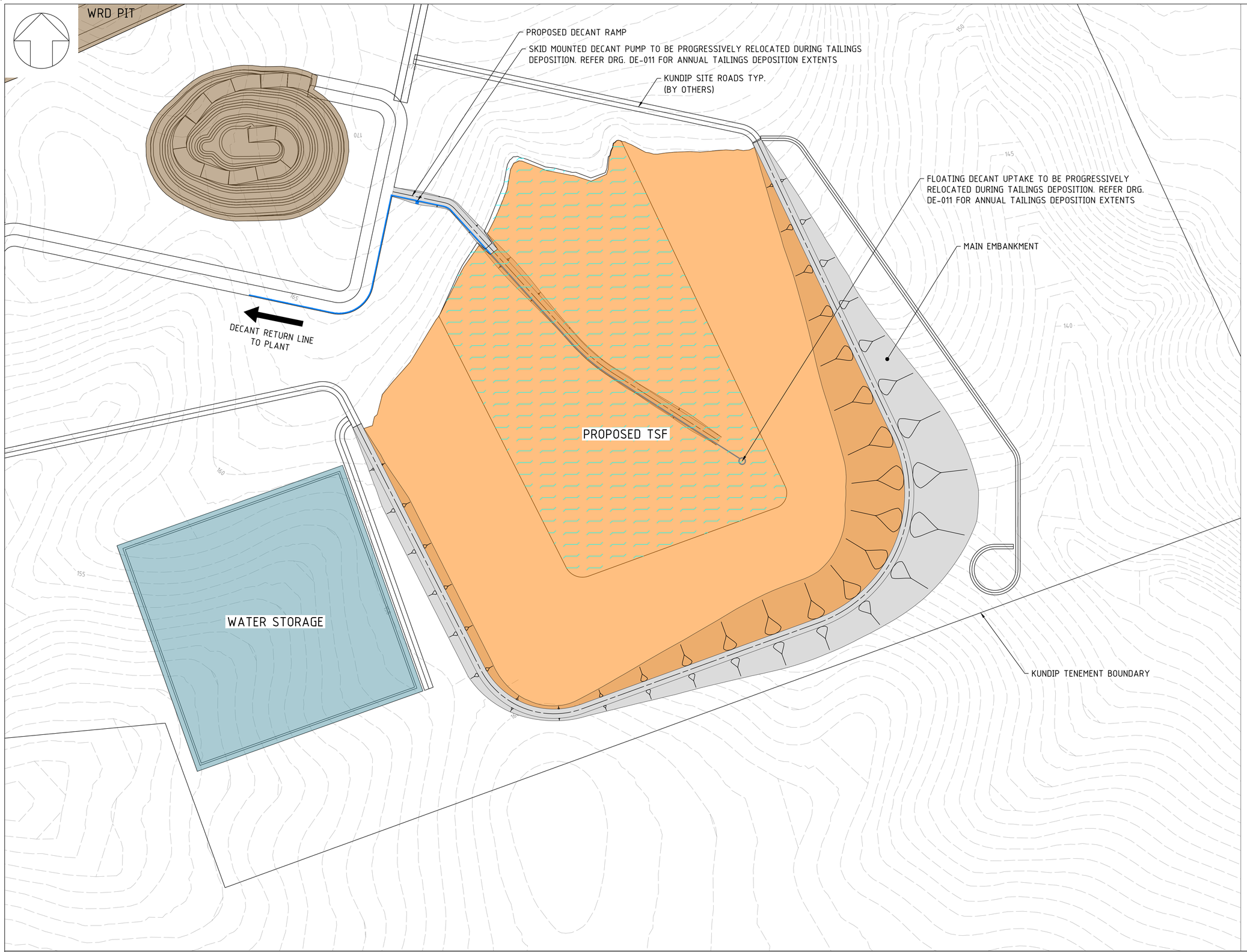
	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
MAIN EMBANKMENT
SECTIONS AND DETAILS

SCALE
AS SHOWN @ A1

DRAWING No. DE-009

REV C



NOTES:

1. REFER TO DRG. DE-001 FOR NOTES.

LEGEND:

- MAXIMUM TAILINGS DEPOSITION EXTENTS (RL 161.15 AT EMBANKMENT)
- MAXIMUM NORMAL OPERATING POND EXTENT (RL 160.510)
- RETURN WATER LINE AND SKID MOUNTED DECANT PUMP

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

40 0 40 80 120 Metres

SCALE 1 : 2,000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
C	08/08/18	ISSUED FOR CLIENT REVIEW		
B	09/07/18	ISSUED FOR CLIENT REVIEW		
A	05/07/18	ISSUED FOR INTERNAL REVIEW		

MHA GEOTECHNICAL AS PART OF REC.

CLIENT: ACH

	BY	DATE	INITIAL
DRAWN :	D.SIBANIC	30/06/18	
DESIGNED :	M.HANGER	30/06/18	
CHECKED :	M.HANGER	06/07/18	
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
DECANT
ARRANGEMENT AND DETAILS

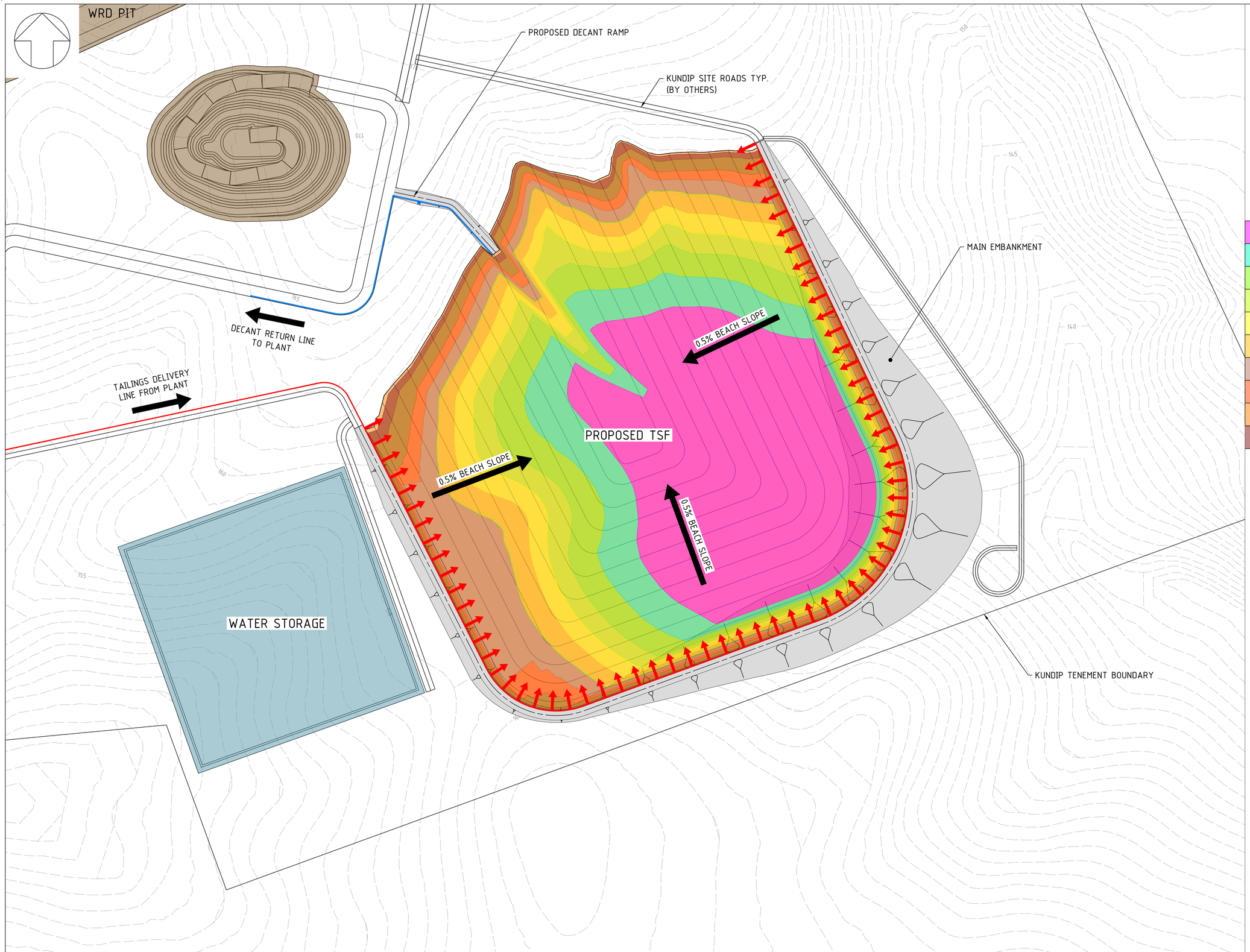
SCALE: 1:2,000 @ A1

DRAWING No.: DE-010

REV: C

Cad File: C:\Users\MHA Geotechnical\REC Group\MHA Geotechnical - 1. MHA Project Folders\3 - Projects 2017\P17-02 ACH Minerals Ltd\2. Project Information\Drawings\Working\DE-010.dwg 8-Aug-18 - 03:47:46 PM

A1 Border v1.4



NOTES:

1. REFER TO DRG. DE-001 FOR NOTES.

LEGEND:

TAILINGS DISTRIBUTION LINE AND SPIGOTS AT 20m SPACINGS

ANNUAL TAILINGS DEPOSITION				
	YEAR	RL (m)	AREA (m)	VOLUME (m3)
	1	150.000	86,281	276,902
	2	152.200	114,862	476,002
	3	154.000	139,720	687,479
	4	155.400	160,143	884,117
	5	156.600	178,597	1,076,217
	6	157.800	197,442	1,291,566
	7	158.800	222,387	1,495,082
	8	159.600	233,107	1,672,648
	9	160.600	244,099	1,906,593
	10	161.000	246,811	2,003,623

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

40 0 40 80 120 Metres

SCALE 1 : 2,000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
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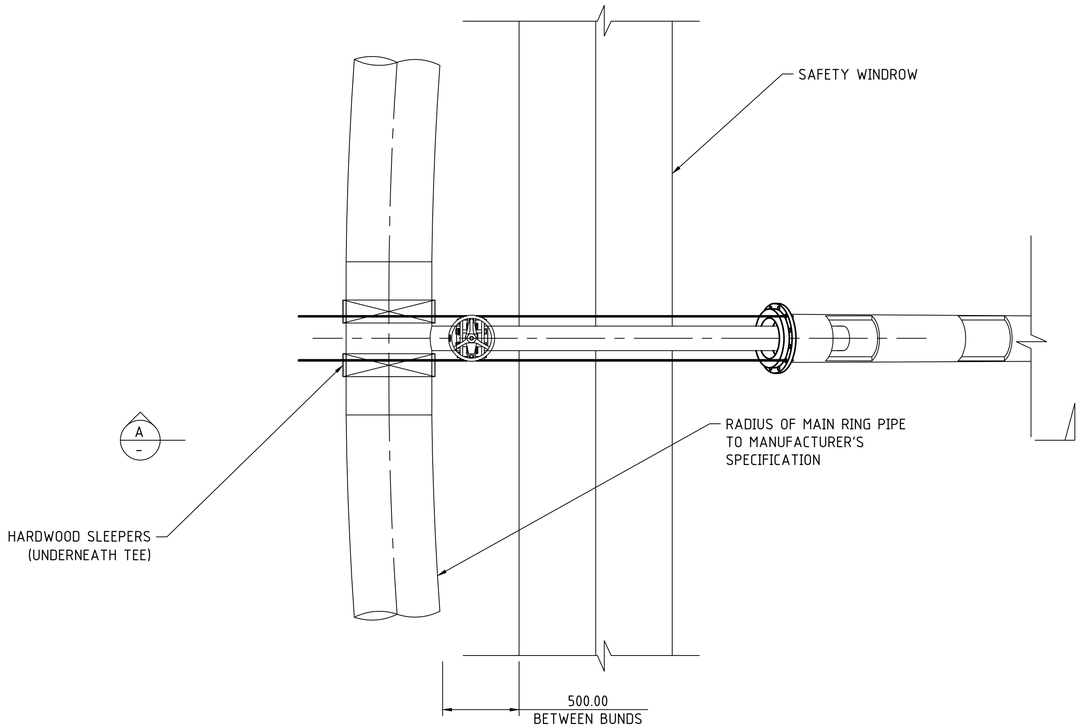
TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
TAILINGS DISTRIBUTION NETWORK
GENERAL ARRANGEMENT

SCALE 1:2,000 @ A1

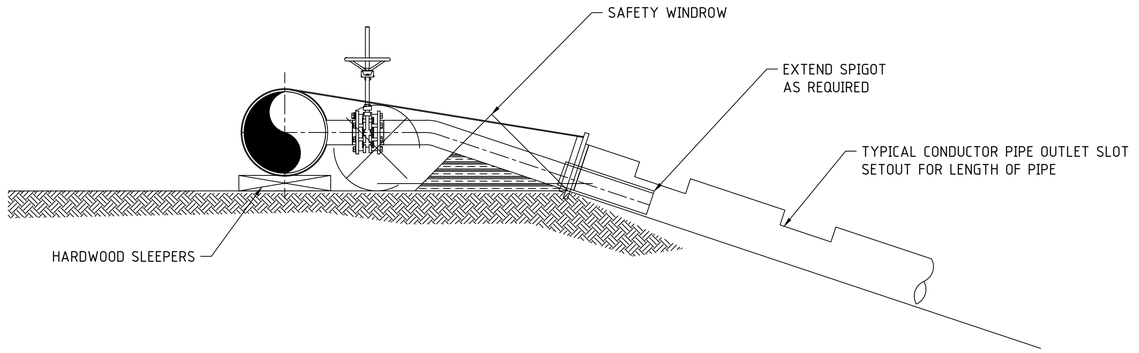
DRAWING No. DE-011

REV C

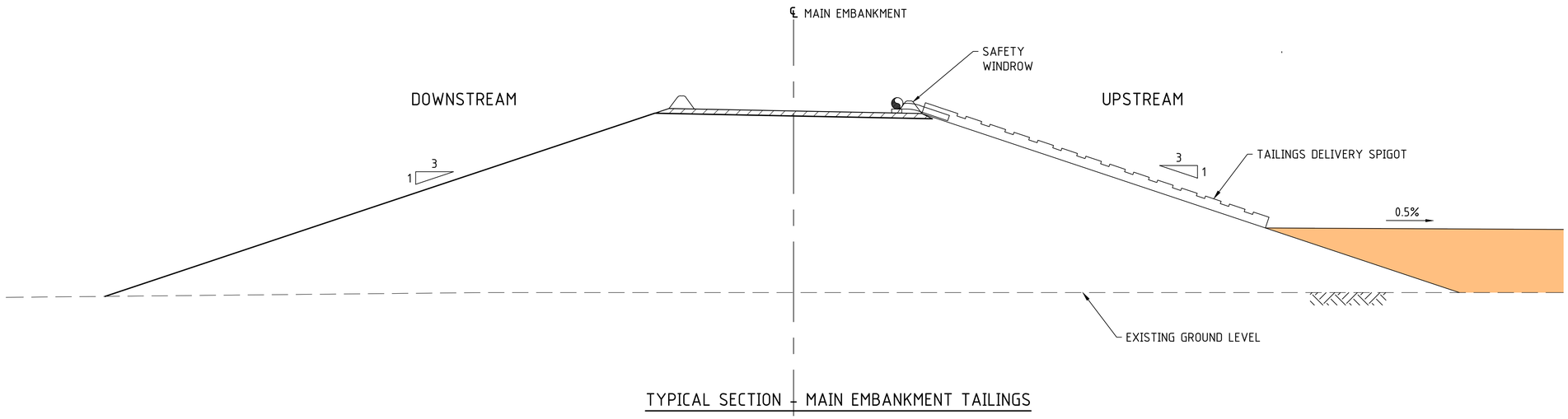
NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.



SPIGOT ARRANGEMENT PLAN
1:20



SECTION A
1:20
-



TYPICAL SECTION - MAIN EMBANKMENT TAILINGS
1:100

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

0.4 0 0.4 0.8 1.2 Metres
SCALE 1 : 20

2 0 2 4 6 Metres
SCALE 1 : 100

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MHAGEOTECHNICAL AS PART OF REC.

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DESIGNED :	M.HANGER	30/06/18	
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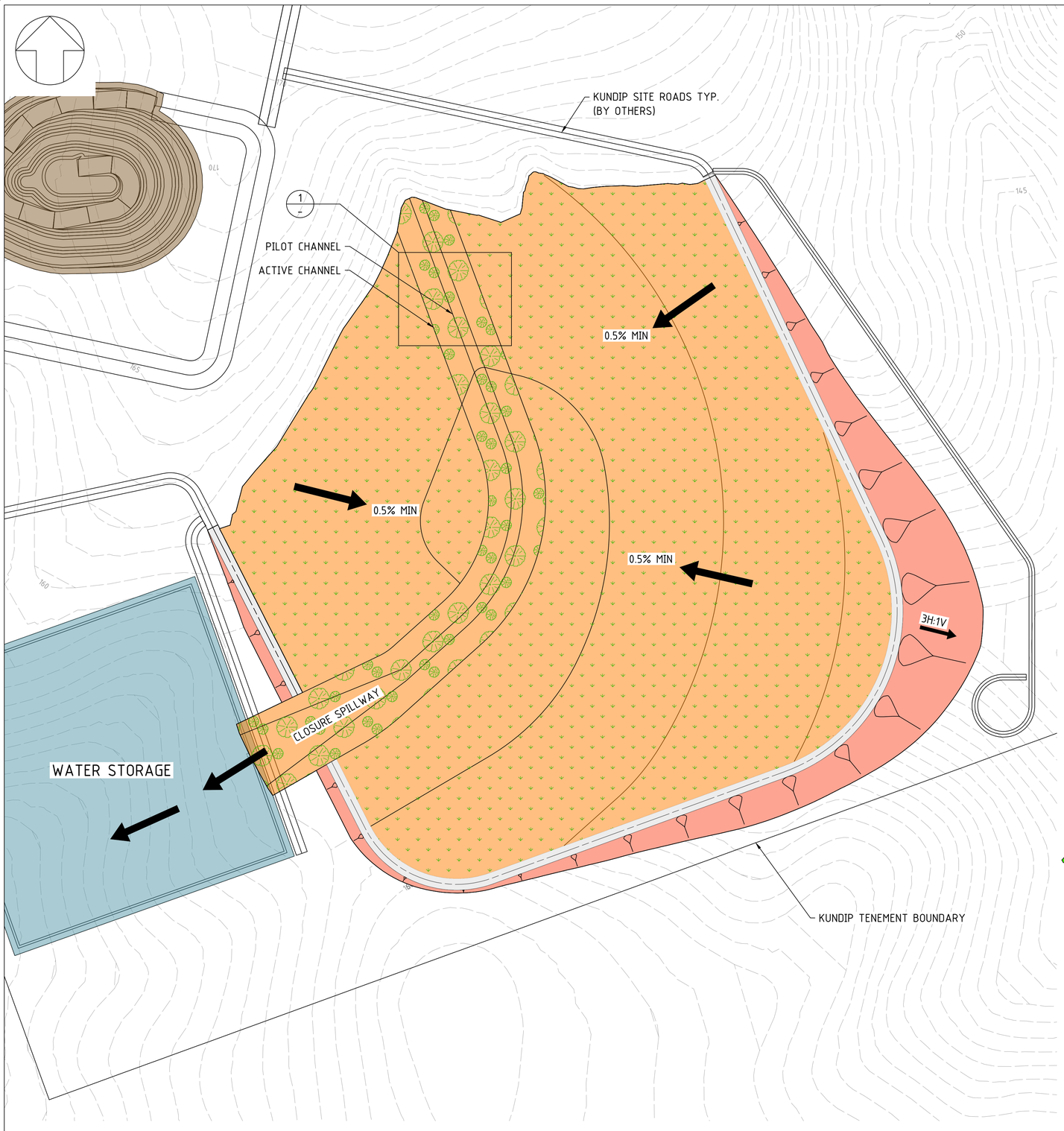
ORIGINATOR :			
COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
TAILINGS DISTRIBUTION NETWORK
SECTIONS AND DETAILS

SCALE: AS SHOWN @ A1

DRAWING No. DE-012

REV C

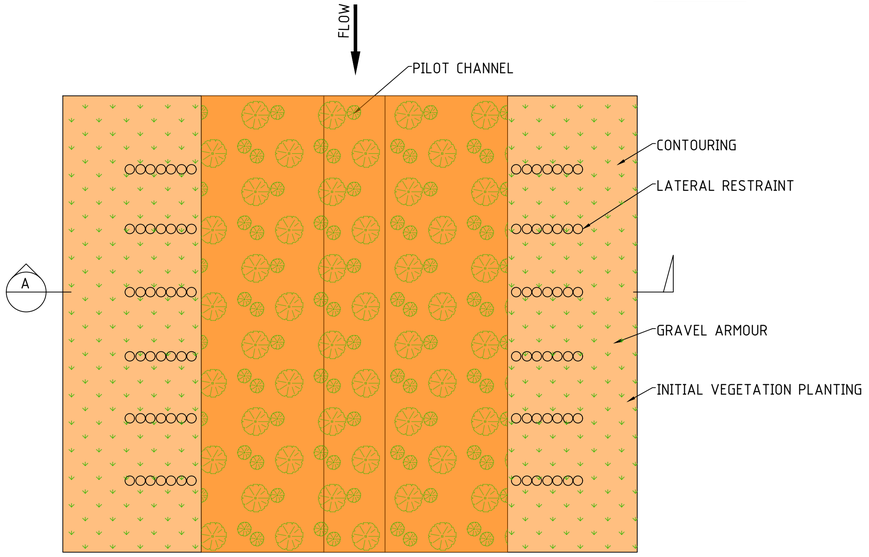


PLAN
1:2000

NOTES:
1. REFER TO DRG. DE-001 FOR NOTES.

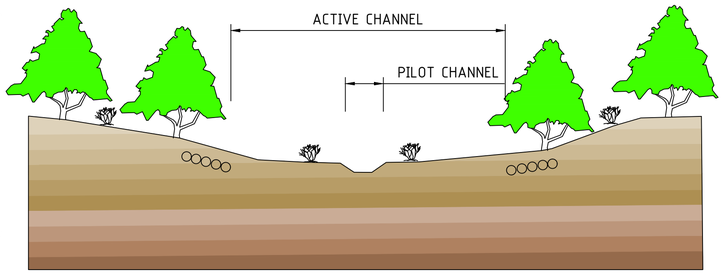
LEGEND:

- EMBANKMENT CLOSURE SLOPE 3H:1V
- EMBANKMENT CREST
- WASTE BACKFILL COVER
- ACTIVE CHANNEL



ACTIVE CHANNEL
WIDTH SCALED FROM PRE-MINING TOPOGRAPHY
PHOTOGRAPHY QW > 100 YEARS ARI

DETAIL 1 / -
N.T.S.



SECTION A / -
N.T.S.

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

40 0 40 80 120 Metres
SCALE 1 : 2,000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
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COMPANY :			
APPROVED :			

TITLE
ACH MINERALS PTY LTD
GOLDEN EAGLE PROJECT PRELIMINARY DESIGN
CONCEPTUAL CLOSURE PLAN

SCALE: 1:2,000 @ A1

DRAWING No.: DE-013

REV: C