

APPENDIX

INLAND
RAIL 

G

Geotechnical Investigation Results

Part 3 of 4

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

APPENDIX

G

Geotechnical Investigation Results

Geotechnical Laboratory Results Certificates

Part 2 of 3

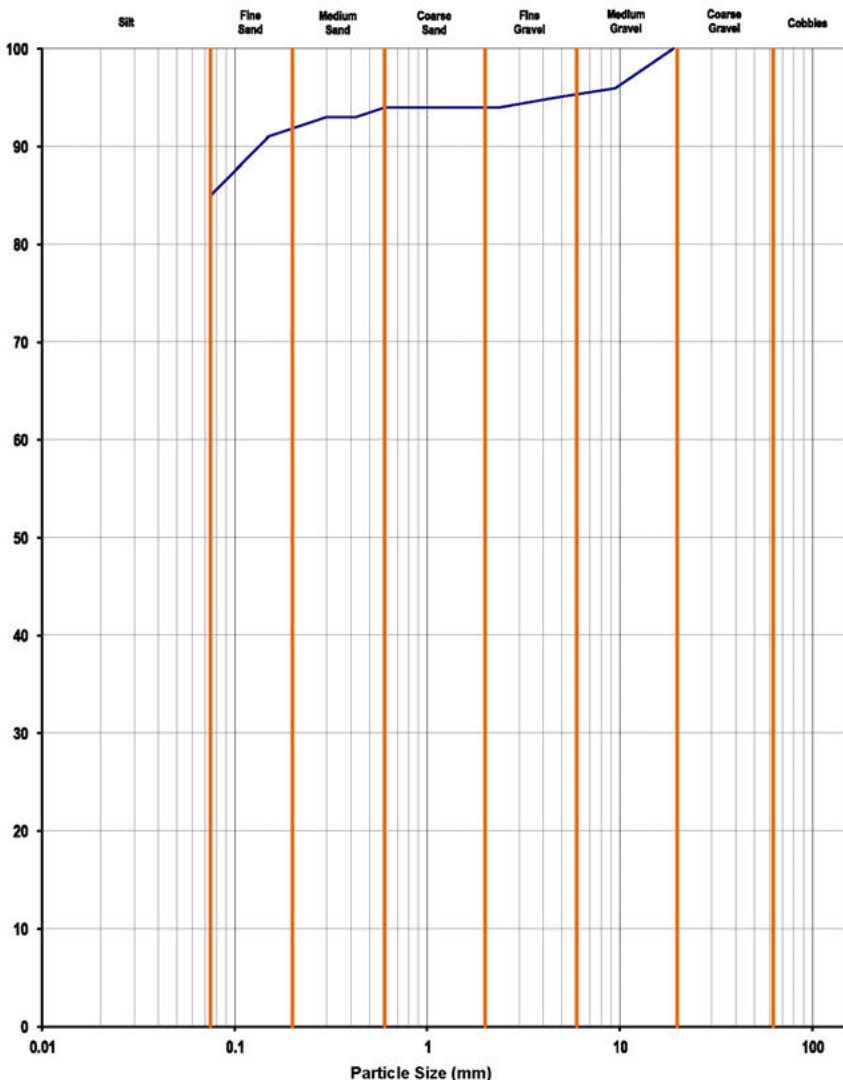
INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101073-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R2_BH_Rev1_4060
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2311		
Bore Hole	310-01-BH2311-S01430	Depth From (m)	14.3	Depth To (m)	14.75
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	100
13.2	98
9.5	96
6.7	95
4.75	95
2.36	94
1.18	94
0.600	94
0.425	93
0.300	93
0.150	91
0.075	85



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 85% passing for 0.075 mm and rises to 100% passing at 19.0 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 22.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

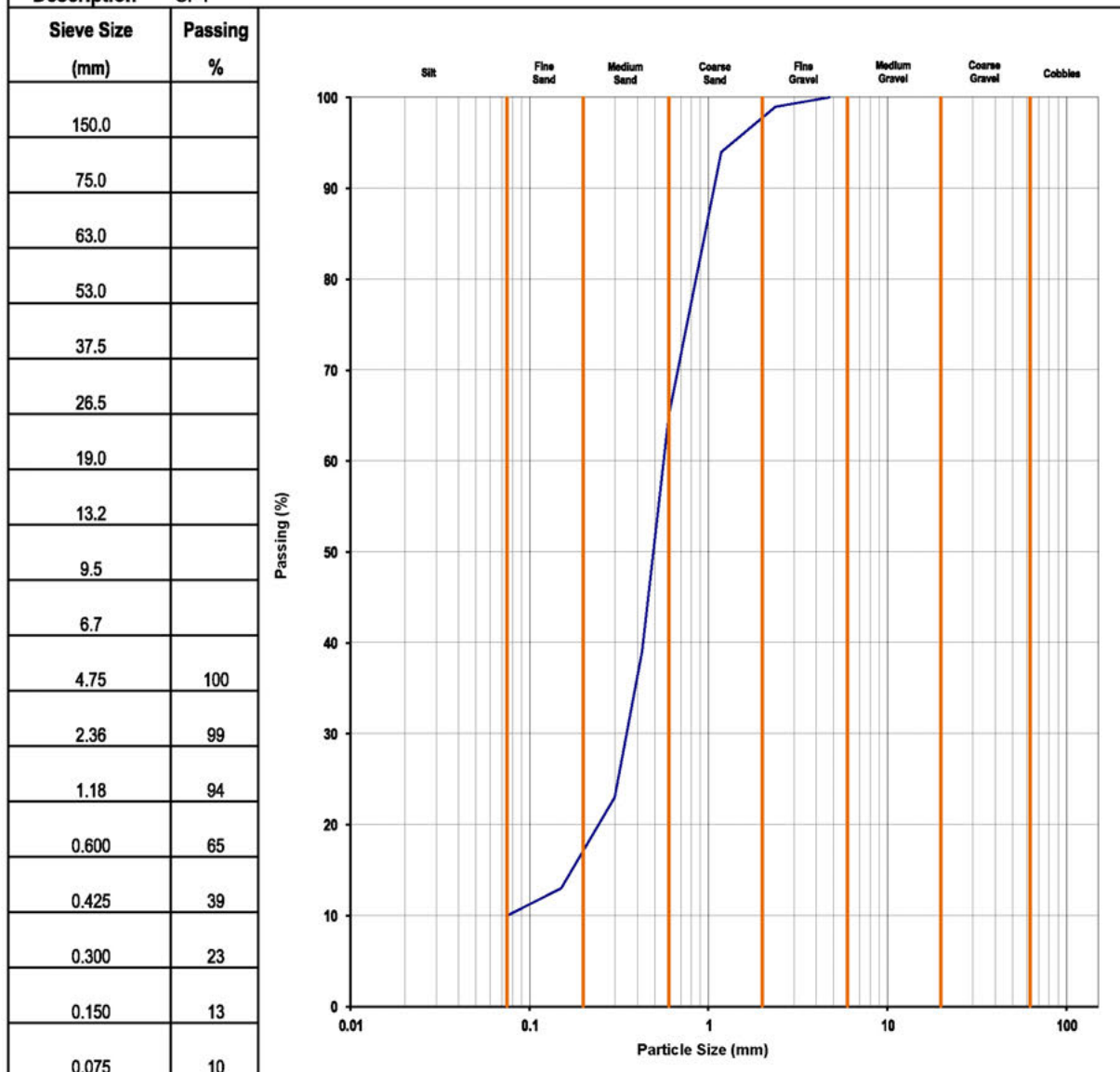
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101074-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R2_BH_Rev1_4070
Project	Inland Rail B2G	Test Date	24/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-BH2617
Bore Hole	310-01-BH2617-S00390	Depth From (m)	3.9
		Depth To (m)	4.35

Description SPT



NOTES/REMARKS:

-
 Moisture Content 7.2%
 Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.8.1

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

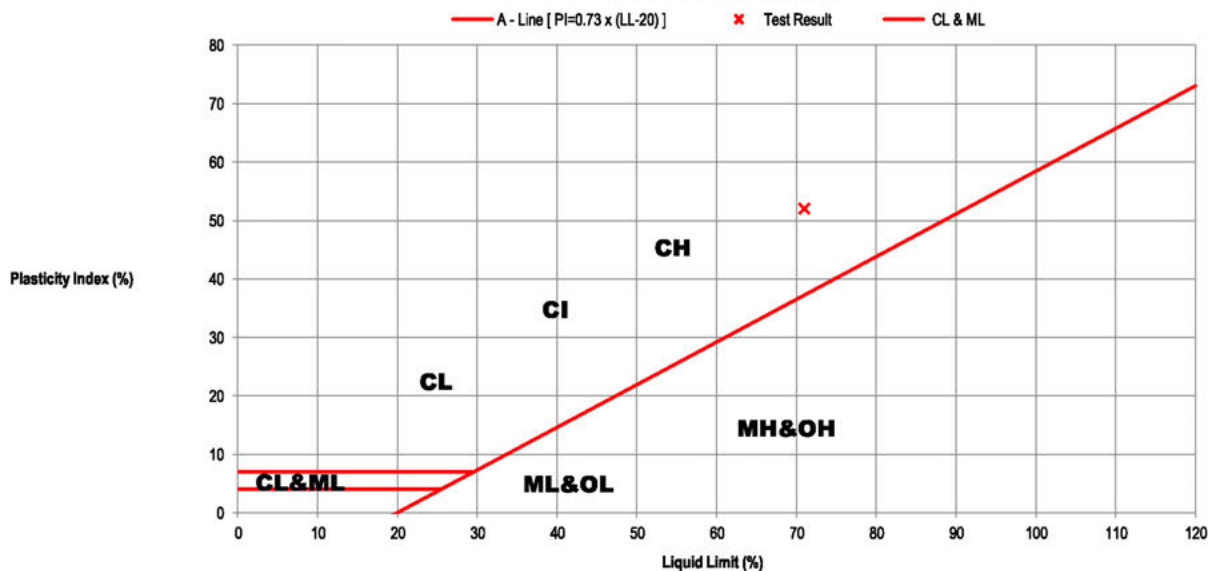
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101076-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4070
Project	Inland Rail B2G	Test Date	1/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-BH2617-S00690	Client Sample No.	310-01-BH2617
Description	SPT	Depth From (m)	6.9
		Depth To (m)	7.35

RESULTS OF TESTING

Liquid Limit (%) 71
 Plastic Limit (%) 19
 Plasticity Index (%) 52
 Linear Shrinkage (%) 16.0 Curling Occurred
 Moisture Content (%) 27.7
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

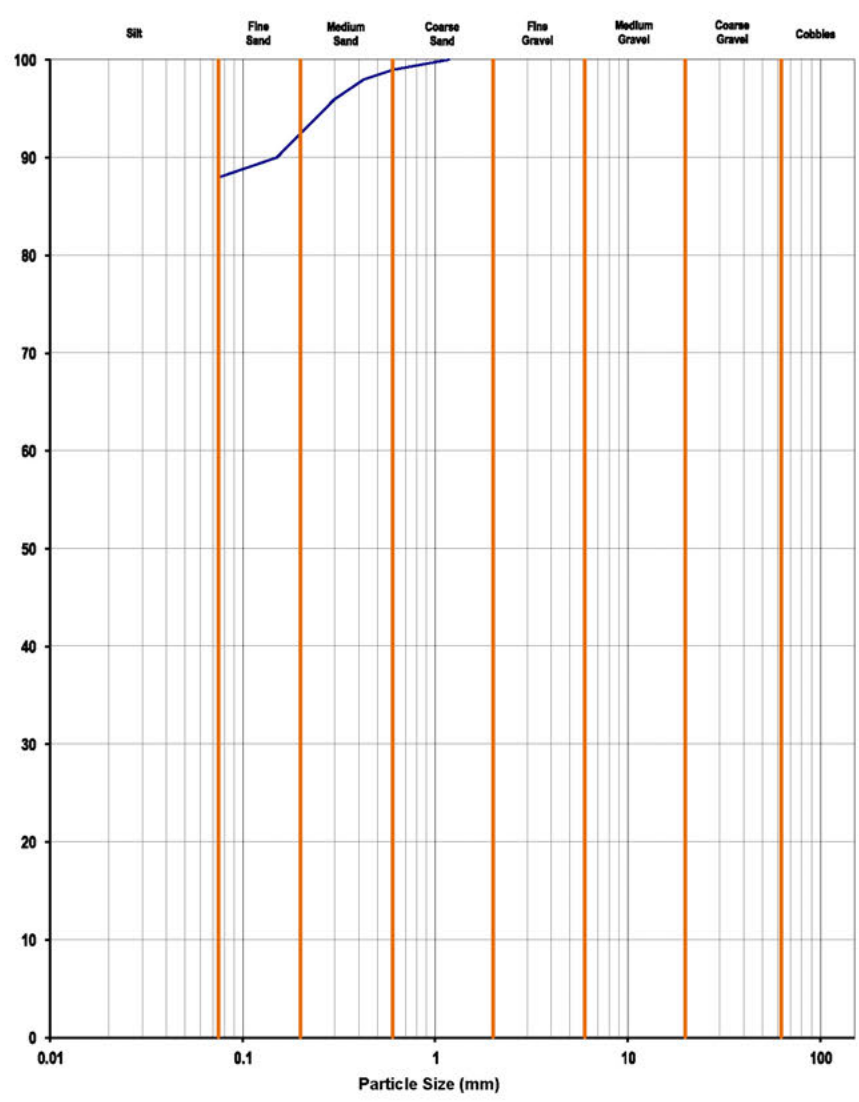
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101076-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R2_BH_Rev1_4070
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2617		
Bore Hole	310-01-BH2617-S00690	Depth From (m)	6.9	Depth To (m)	7.35
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	98
0.300	96
0.150	90
0.075	88



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 88% passing for 0.075 mm and rises to 100% passing at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 27.7%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

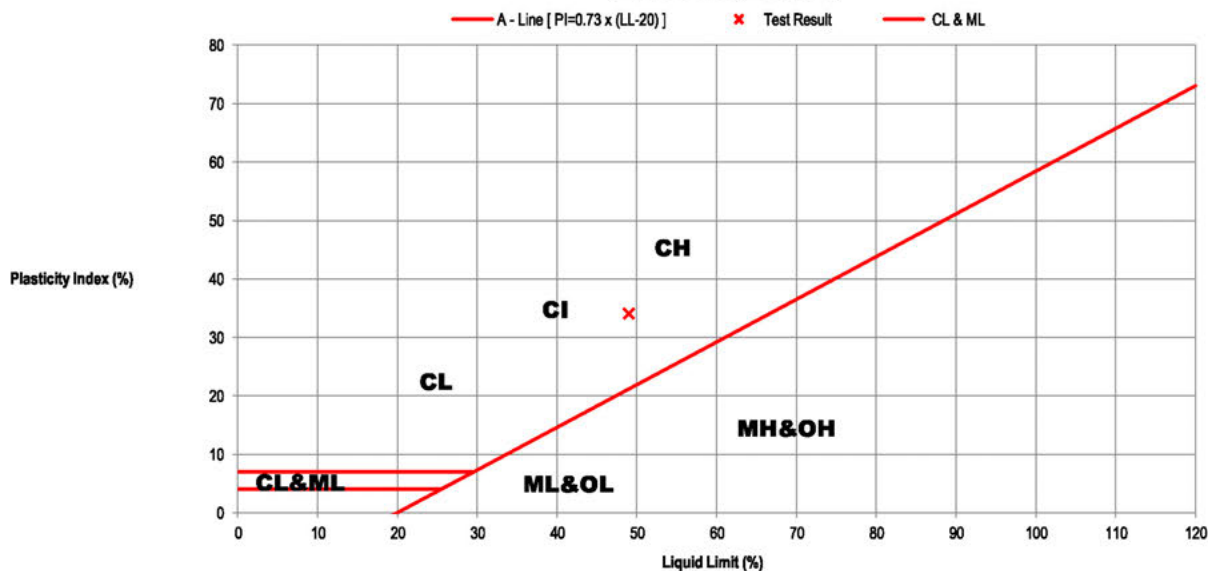
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101079-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4070
Project	Inland Rail B2G	Test Date	1/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-BH2617-S01140	Client Sample No.	310-01-BH2617
Description	SPT	Depth From (m)	11.4
		Depth To (m)	11.85

RESULTS OF TESTING

Liquid Limit (%) 49
 Plastic Limit (%) 15
 Plasticity Index (%) 34
 Linear Shrinkage (%) 13.5 Curling Occurred
 Moisture Content (%) 20.8
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

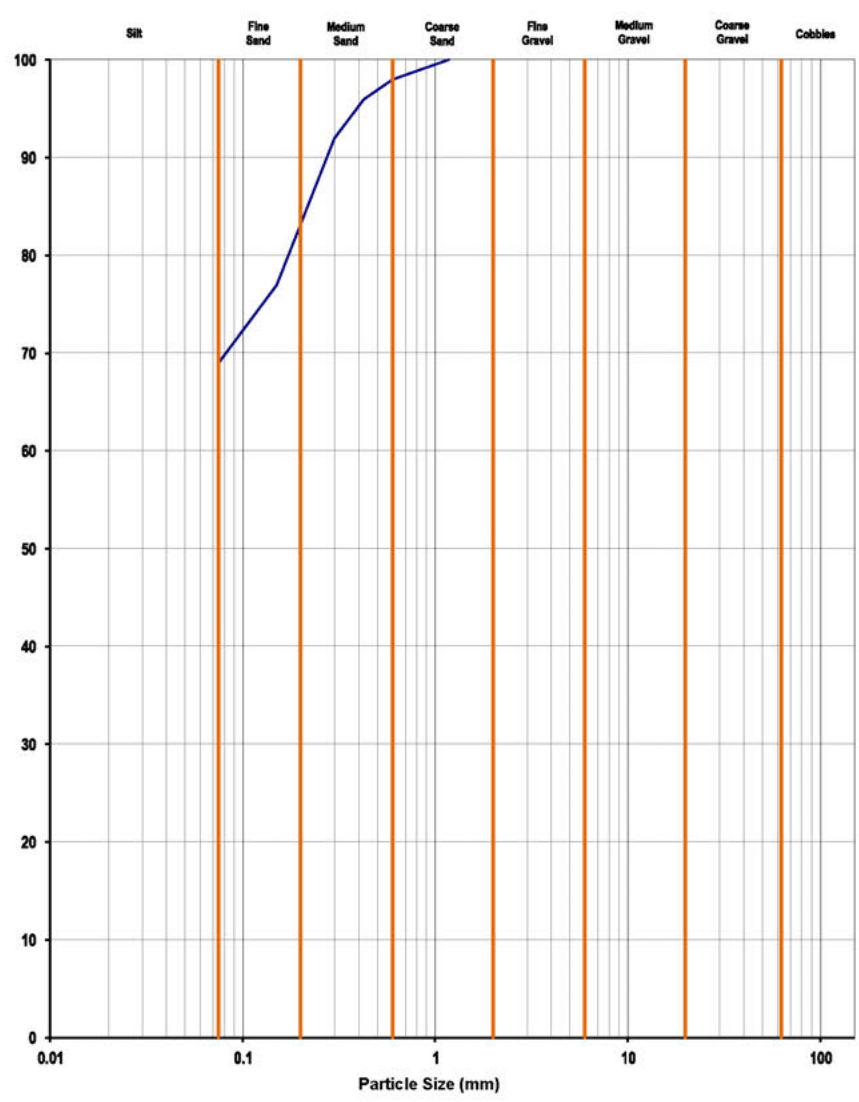
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101079-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R2_BH_Rev1_4070
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2617		
Bore Hole	310-01-BH2617-S01140	Depth From (m)	11.4	Depth To (m)	11.85
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	98
0.425	96
0.300	92
0.150	77
0.075	69



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 69% passing for 0.075 mm and reaches 100% passing at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 20.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101080-G		
Address	PO Box 1734 MILTON BC QLD 4064			Request No	R2_BH_Rev1_4070		
Project	Inland Rail B2G						
Project No	1897791		Client Sample No	310-01-BH2617			
Bore Hole	310-01-BH2617-S01440		Depth From (m)	14.4		Depth To (m)	14.85
Description	SPT						
Sieve Size (mm)	Passing %						

Test Method: AS 1289 3.8.1

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

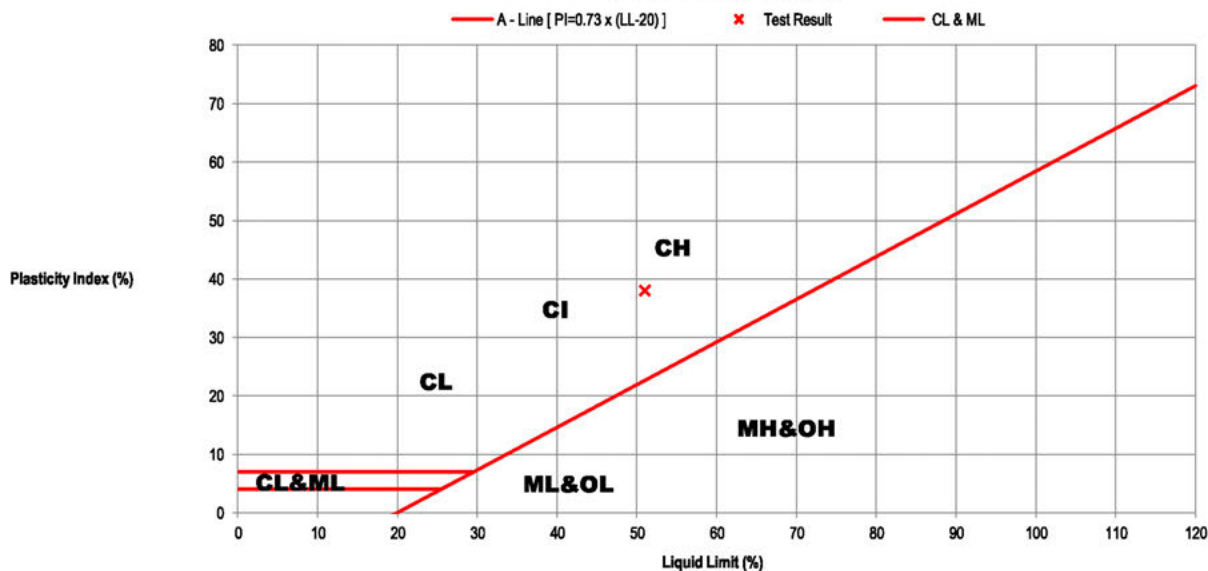
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101033-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2323-S00380	Client Sample No.	310-01-BH2323
Description	SPT	Depth From (m)	3.8
		Depth To (m)	4.25

RESULTS OF TESTING

Liquid Limit (%) 51
 Plastic Limit (%) 13
 Plasticity Index (%) 38
 Linear Shrinkage (%) 14.0 Curling Occurred
 Moisture Content (%) 15.3
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



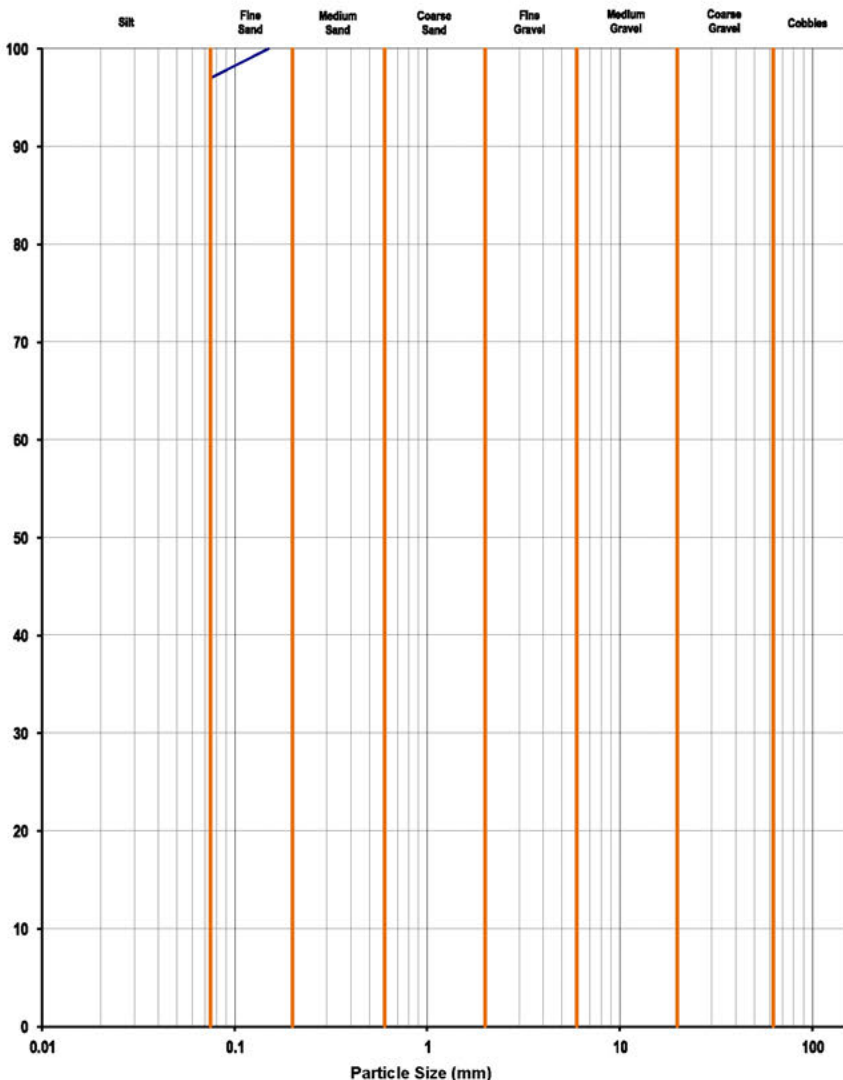
Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101033-G		
Address	PO Box 1734 MILTON BC QLD 4064			Request No	R2_BH_Rev1_4050		
Project	Inland Rail B2G			Test Date	24/10/18-30/10/18		
Project No	1897791		Client Sample No	310-01-BH2323			
Bore Hole	310-01-BH2323-S00380		Depth From (m)	3.8		Depth To (m)	4.25
Description	SPT						
Sieve Size (mm)	Passing %	 The graph shows a particle size distribution curve. The x-axis is Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis is Passing (%) from 0 to 100. The curve starts at 100% passing for 0.075 mm and remains at 100% until 0.150 mm, then drops to 97% at 0.075 mm. The curve is labeled with soil types: Silt, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.					
150.0							
75.0							
63.0							
53.0							
37.5							
26.5							
19.0							
13.2							
9.5							
6.7							
4.75							
2.36							
1.18							
0.600							
0.425							
0.300							
0.150	100						
0.075	97						
NOTES/REMARKS:		- Moisture Content 15.3% Sample/s supplied by the client					

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

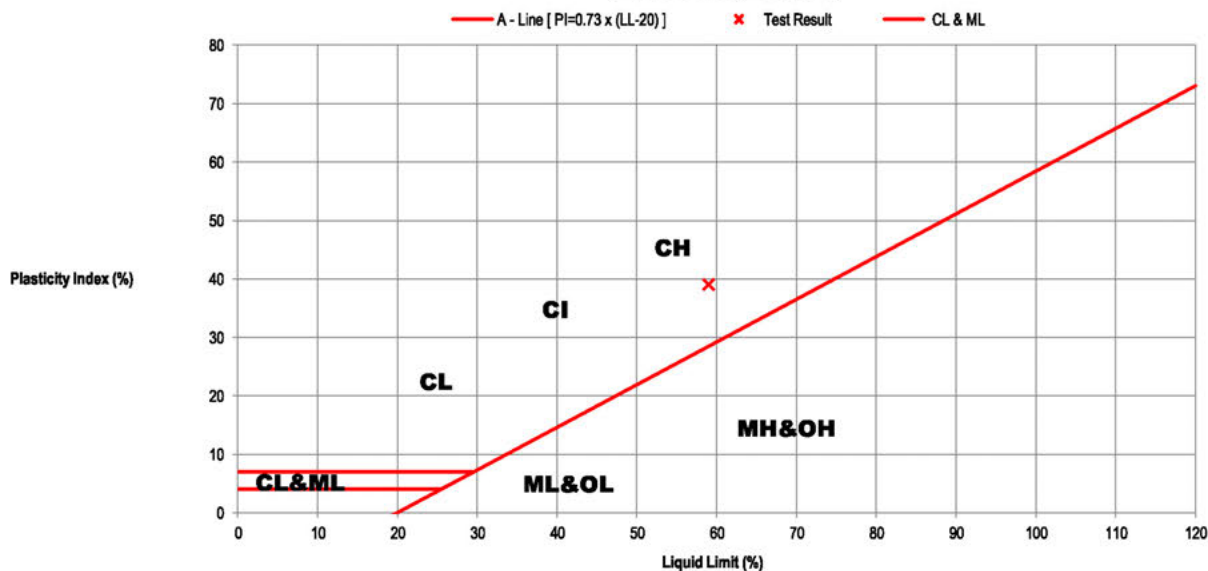
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101034-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2323-S00680	Client Sample No.	310-01-BH2323
Description	SPT	Depth From (m)	6.8
		Depth To (m)	7.22

RESULTS OF TESTING

Liquid Limit (%) 59
 Plastic Limit (%) 20
 Plasticity Index (%) 39
 Linear Shrinkage (%) 15.0 Curling Occurred
 Moisture Content (%) 19.9
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

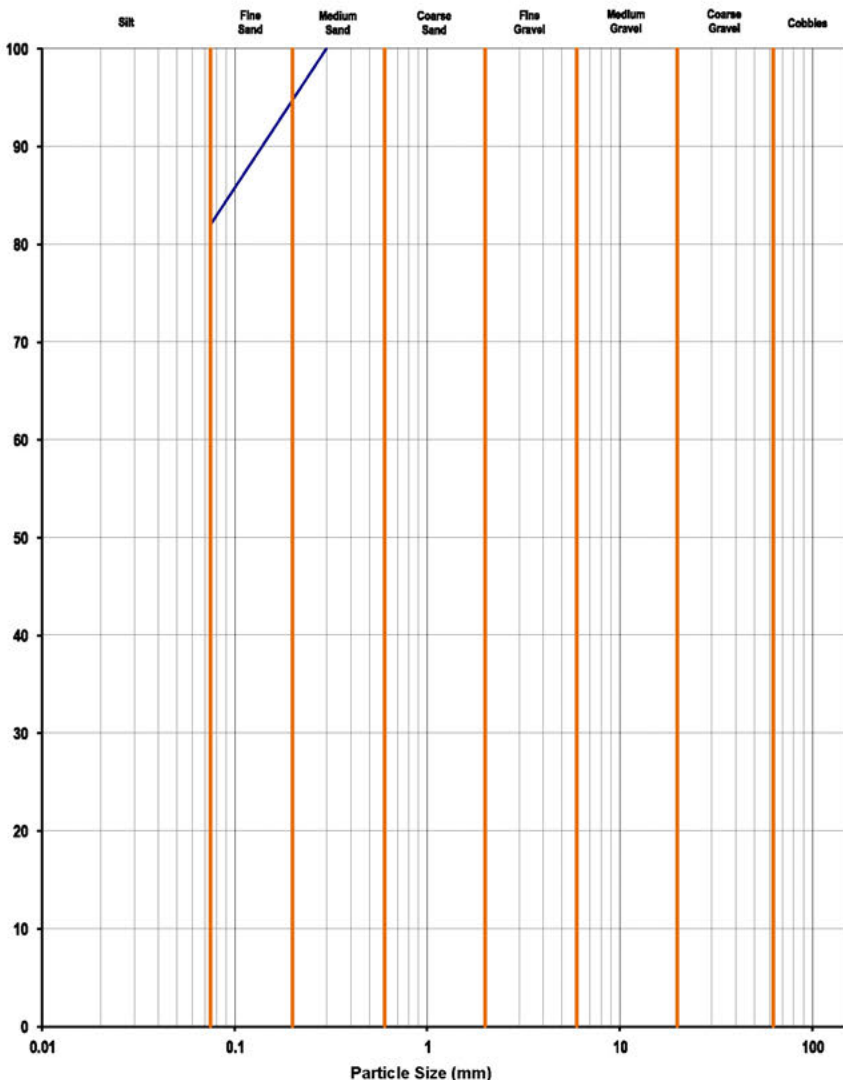
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101034-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R2_BH_Rev1_4050
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2323		
Bore Hole	310-01-BH2323-S00680	Depth From (m)	6.8	Depth To (m)	7.22
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	100
0.150	91
0.075	82



The graph shows the particle size distribution for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. Vertical lines indicate the boundaries for different soil types: Silt, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles. A blue curve is plotted, starting at approximately 82% passing for 0.075 mm and reaching 100% passing at 0.300 mm.

NOTES/REMARKS:

-
Moisture Content 19.9%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

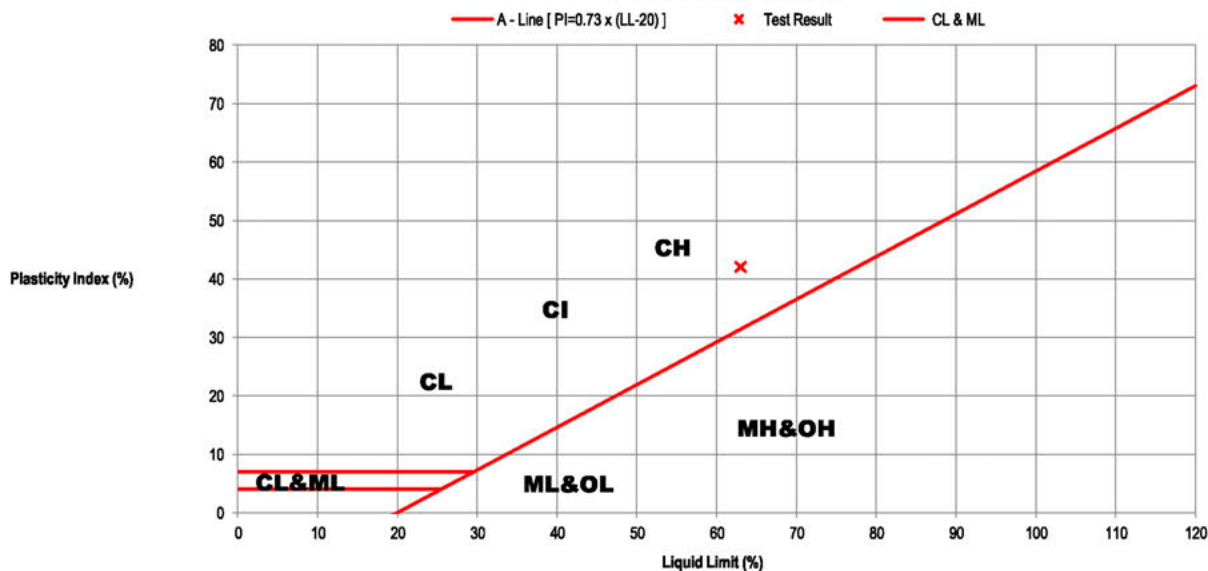
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101036-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2323-S01280	Client Sample No.	310-01-BH2323
Description	SPT	Depth From (m)	12.8
		Depth To (m)	13.19

RESULTS OF TESTING

Liquid Limit (%)	63	
Plastic Limit (%)	21	
Plasticity Index (%)	42	
Linear Shrinkage (%)	15.0	Cracking & Curling Occurred
Moisture Content (%)	18.0	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

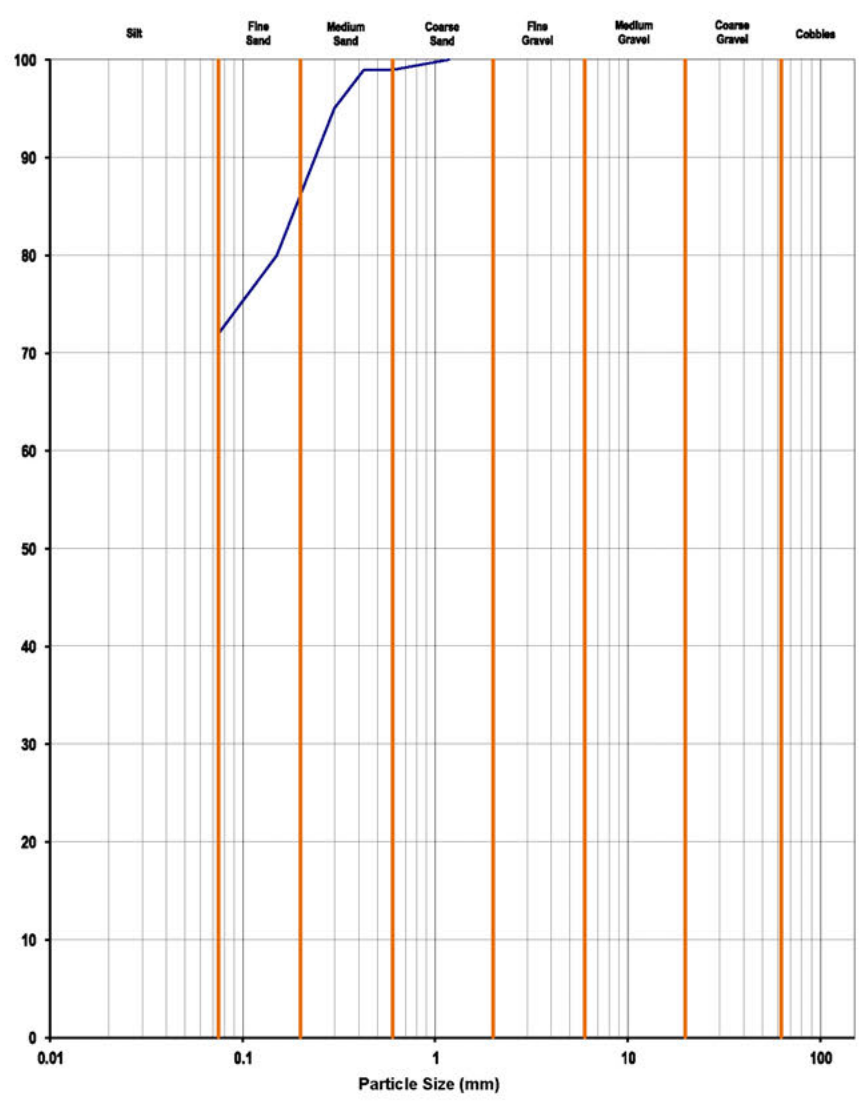
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101036-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R2_BH_Rev1_4050
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2323		
Bore Hole	310-01-BH2323-S01280	Depth From (m)	12.8	Depth To (m)	13.19
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	99
0.300	95
0.150	80
0.075	72



The graph plots Passing (%) on the y-axis (0 to 100) against Particle Size (mm) on a logarithmic x-axis (0.01 to 100). Vertical lines indicate sieve sizes: 0.075, 0.150, 0.300, 0.425, 0.600, 1.18, 2.36, 4.75, 6.7, 9.5, 13.2, 19.0, 26.5, 37.5, 53.0, 63.0, 75.0, 150.0. The curve starts at approximately 72% passing for 0.075 mm and rises to 100% passing for 1.18 mm and above.

NOTES/REMARKS:

-
Moisture Content 18%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited	Report No. GA101091-ISS
	Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064	Test Date 6/11/18-16/11/18
	Report Date 16/11/2018
Project Inland Rail B2G	
Description CLAY-brown/dark grey	
Sample No.	310-01-DH2516
Client ID	310-01-DH2516-U00050
Depth (m)	0.5-0.65
RESULTS OF TESTING	
SWELL SPECIMEN	
Swell Pressure (kPa) *	1600
Wet Density (t/m³)	1.96
Initial Moisture Content (%)	12.7
Final Moisture Content (%)	29.1
Swell (%)	11.2
SHRINKAGE SPECIMEN	
Estimated Inert Inclusions (%)	5-10
Extent of Crumbling	Nil
Extent of Cracking	Nil
Moisture (%)	14.3
Shrinkage (%)	2.6
SHRINK SWELL INDEX (Iss) (%)	4.5
Notes/Remarks:	
* Swell pressure determination in accordance with test method AS4133.3.3	
Sample/s supplied by client	Tested as received

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited		Report No. GA101094-ISS
		Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064		Test Date 7/11/18-16/11/18
		Report Date 16/11/2018
Project Inland Rail B2G		
Description CLAY-brown		
Sample No.	310-01-DH2517	
Client ID	310-01-DH2517-U00050	
Depth (m)	0.5-0.65	
RESULTS OF TESTING		
SWELL SPECIMEN		
Swell Pressure (kPa) *	1400	
Wet Density (t/m³)	2.22	
Initial Moisture Content (%)	11.5	
Final Moisture Content (%)	24.7	
Swell (%)	18.9	
SHRINKAGE SPECIMEN		
Estimated Inert Inclusions (%)	5-10	
Extent of Crumbling	Nil	
Extent of Cracking	Slight	
Moisture (%)	12.9	
Shrinkage (%)	1.9	
SHRINK SWELL INDEX (Iss) (%)		6.3

Notes/Remarks:

* Swell pressure determination in accordance with test method AS4133.3.3

Sample/s supplied by client

Tested as received

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited		Report No. GA101091-ISS
		Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064		Test Date 6/11/18-16/11/18
		Report Date 16/11/2018
Project Inland Rail B2G		
Description CLAY-brown/dark grey		
Sample No.	310-01-DH2516	
Client ID	310-01-DH2516-U00050	
Depth (m)	0.5-0.65	
RESULTS OF TESTING		
SWELL SPECIMEN		
Swell Pressure (kPa) *	1600	
Wet Density (t/m³)	1.96	
Initial Moisture Content (%)	12.7	
Final Moisture Content (%)	29.1	
Swell (%)	11.2	
SHRINKAGE SPECIMEN		
Estimated Inert Inclusions (%)	5-10	
Extent of Crumbling	Nil	
Extent of Cracking	Nil	
Moisture (%)	14.3	
Shrinkage (%)	2.6	
SHRINK SWELL INDEX (Iss) (%)		4.5
Notes/Remarks:		
* Swell pressure determination in accordance with test method AS4133.3.3 Sample/s supplied by client Tested as received		

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited		Report No. GA101094-ISS
		Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064		Test Date 7/11/18-16/11/18
		Report Date 16/11/2018
Project Inland Rail B2G		
Description CLAY-brown		
Sample No.	310-01-DH2517	
Client ID	310-01-DH2517-U00050	
Depth (m)	0.5-0.65	
RESULTS OF TESTING		
SWELL SPECIMEN		
Swell Pressure (kPa) *	1400	
Wet Density (t/m³)	2.22	
Initial Moisture Content (%)	11.5	
Final Moisture Content (%)	24.7	
Swell (%)	18.9	
SHRINKAGE SPECIMEN		
Estimated Inert Inclusions (%)	5-10	
Extent of Crumbling	Nil	
Extent of Cracking	Slight	
Moisture (%)	12.9	
Shrinkage (%)	1.9	
SHRINK SWELL INDEX (Iss) (%)		6.3

Notes/Remarks:

* Swell pressure determination in accordance with test method AS4133.3.3

Sample/s supplied by client

Tested as received

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

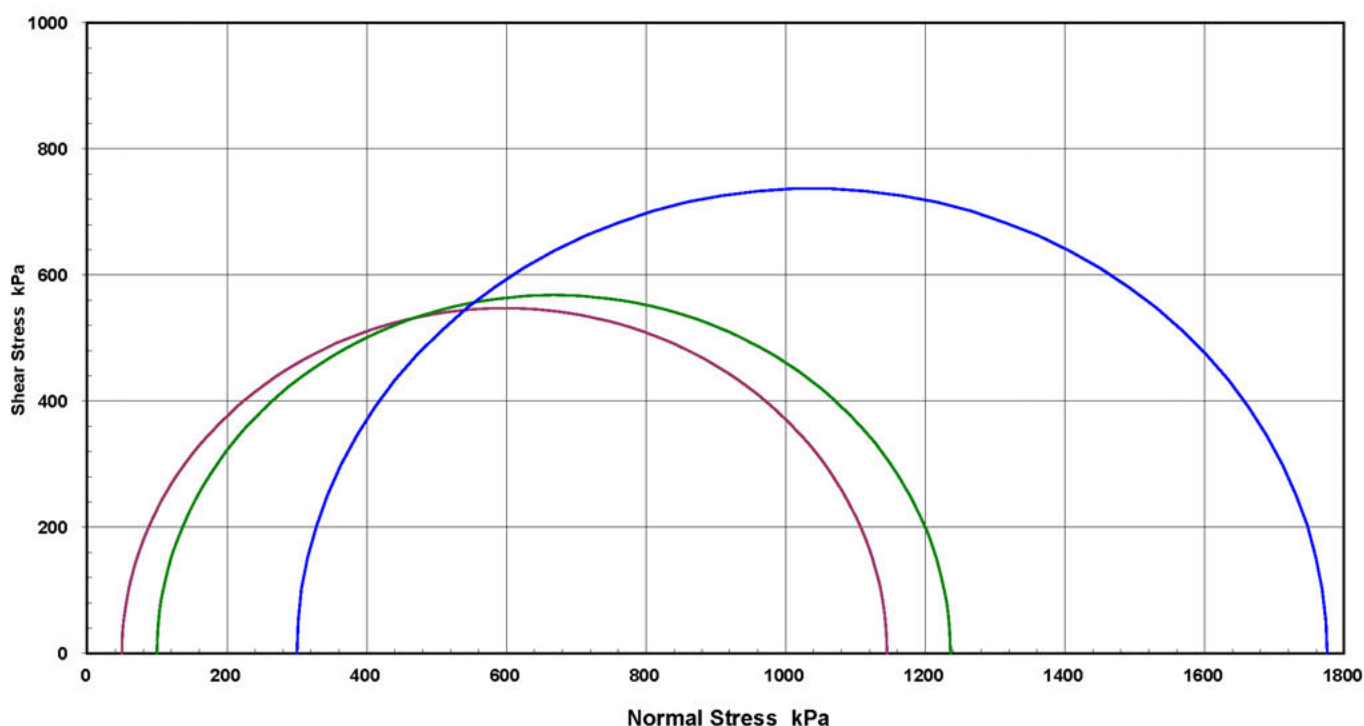
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101018- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	19/11/2018
		Report Date	21/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2216
BoreHole	310-01-BH2216-U01480	Depth From (m)	14.8
		Depth To (m)	15.1
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS		Initial 20.8 %	Final 20.8 %	Failure Criteria			Maximum Deviator Stress	
SAMPLE & TEST DETAILS				FAILURE DETAILS				
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				S ₁	S ₃			
Initial Height	134.2	mm	50 kPa	1146 kPa	50 kPa	1096 kPa	4.28 %	
Initial Diameter	59.2	mm	100 kPa	1237 kPa	100 kPa	1137 kPa	4.81 %	
Wet Density	1.97	t/m ³	300 kPa	1776 kPa	300 kPa	1476 kPa	7.18 %	
Dry Density	1.63	t/m ³						
Rate of Strain	0.596	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

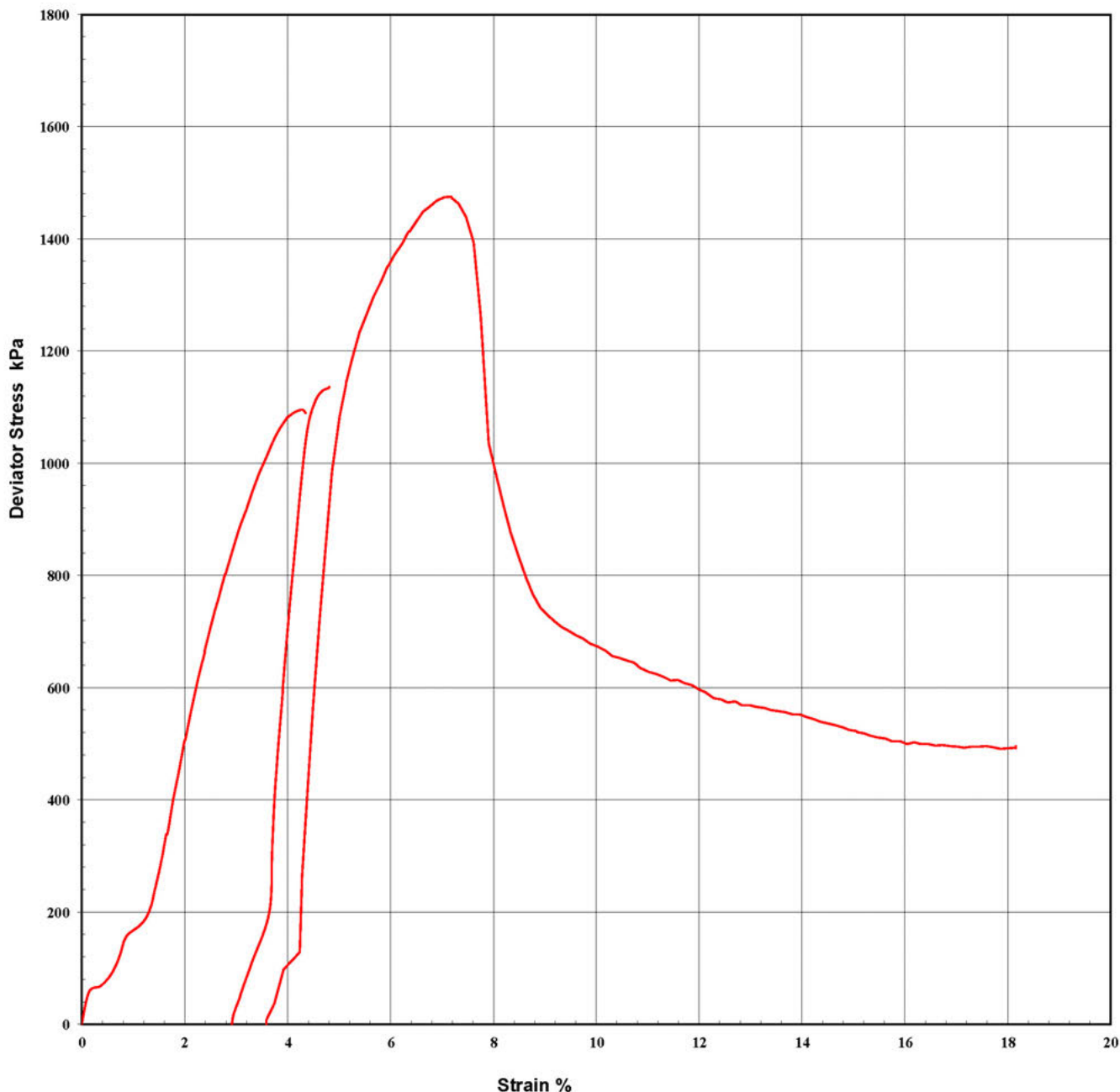
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101018- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101018- UU

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101018	DATE: 30/10/18
BOREHOLE:	310-01-BH2216-U01480	DEPTH: 14.8



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101018	DATE: 19/11/18
BOREHOLE:	310-01-BH2216-U01480	DEPTH: 14.8



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

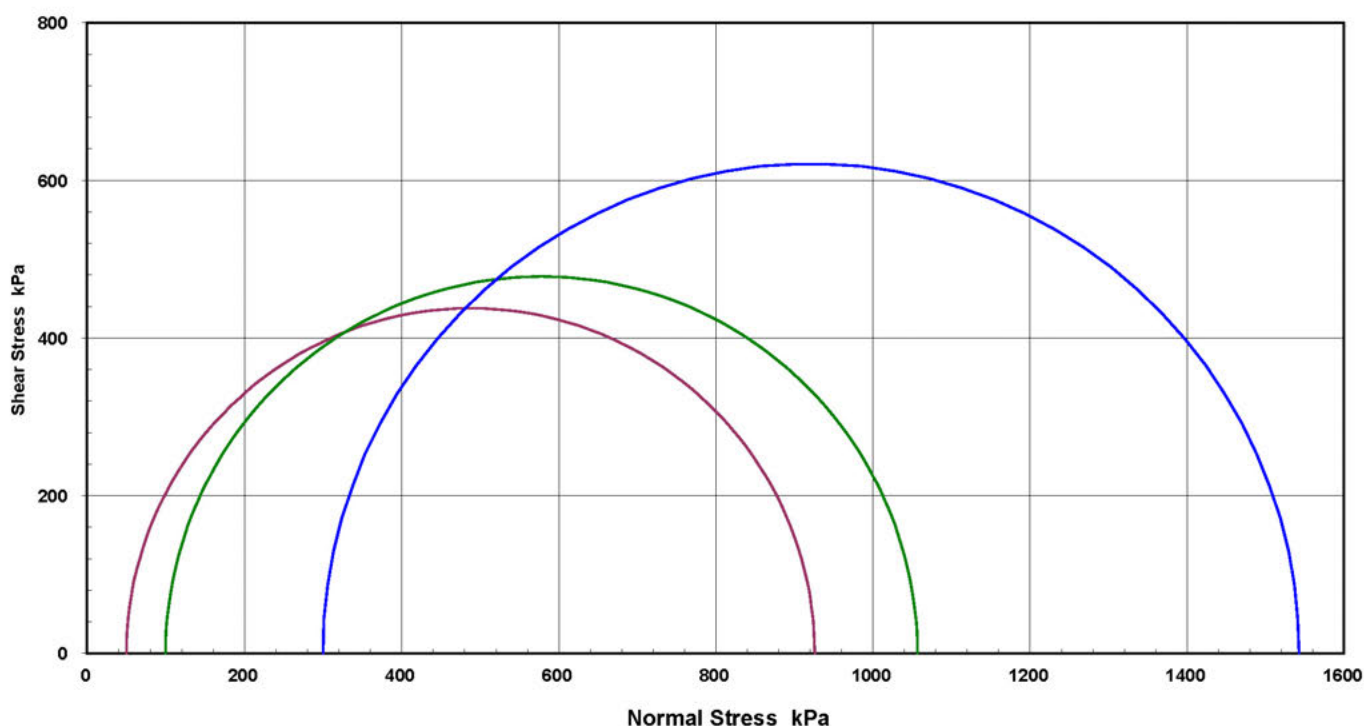
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101024- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	19/11/2018
		Report Date	21/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2219
BoreHole	310-01-BH2219-U00700	Depth From (m)	7
		Depth To (m)	7.22
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS		Initial 18.0 %	Final 18.0 %	Failure Criteria			Maximum Deviator Stress	
SAMPLE & TEST DETAILS				FAILURE DETAILS				
Sample Details		Confining Pressure		Principal Stresses		Deviator Stress	Strain	
Initial Height	99.2 mm	50 kPa		s_1	s_3	876 kPa	2.56 %	
Initial Diameter	47.7 mm	100 kPa		926 kPa	50 kPa	957 kPa	3.18 %	
Wet Density	2.05 t/m ³	300 kPa		1057 kPa	100 kPa	1243 kPa	5.28 %	
Dry Density	1.74 t/m ³			1543 kPa	300 kPa			
Rate of Strain	0.504 % / min							

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

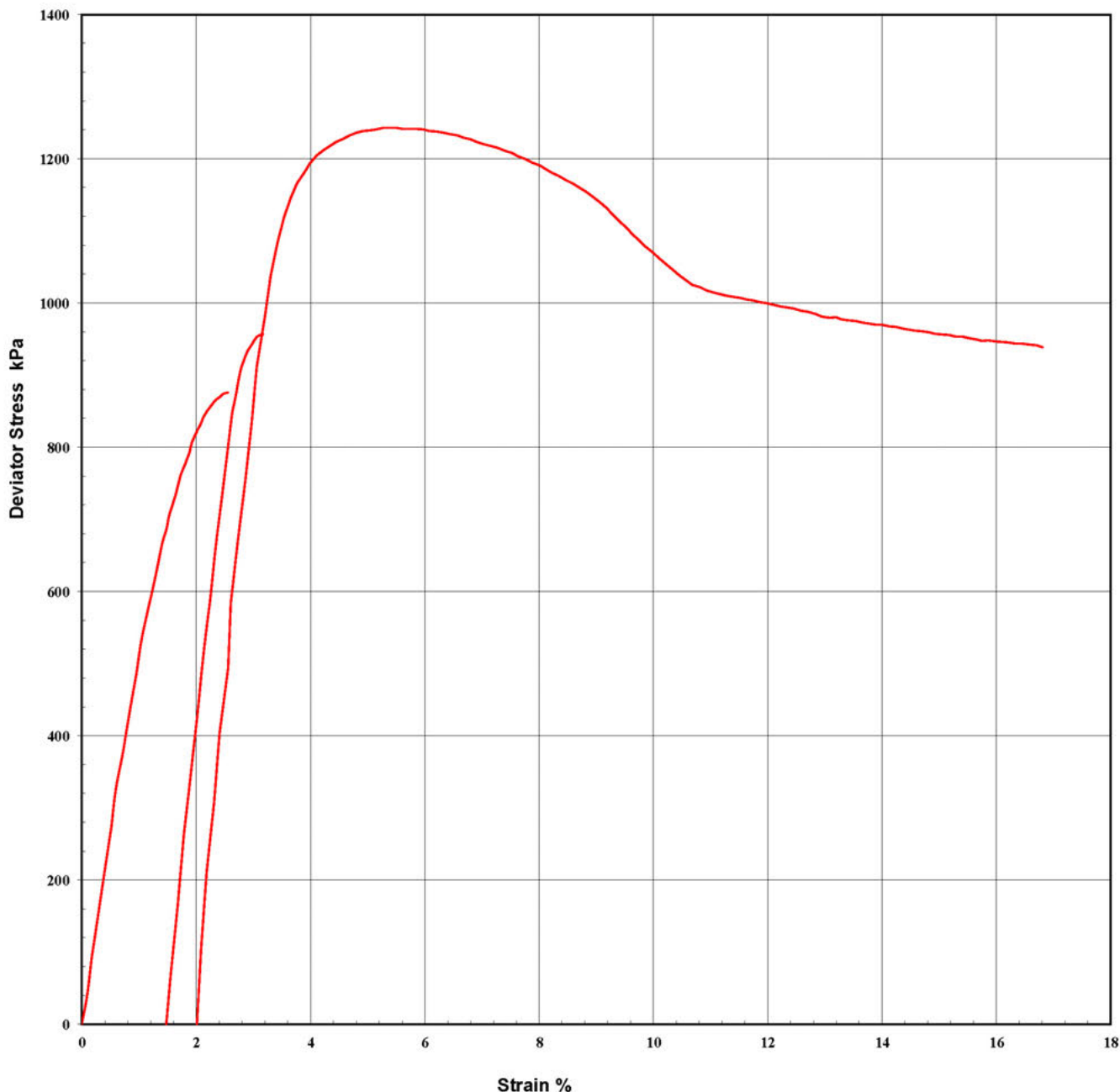
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101024- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101024- UU
---------------	-------------------------------	-------------------	--------------

CLIENT:	Golder Associates Pty Limited		
PROJECT:	Inland Rail B2G	BEFORE TEST	
LAB SAMPLE No.	101024	DATE:	30/10/18
BOREHOLE:	310-01-BH2219-U00700	DEPTH:	7



CLIENT:	Golder Associates Pty Limited		
PROJECT:	Inland Rail B2G	AFTER TEST	
LAB SAMPLE No.	101024	DATE:	19/11/18
BOREHOLE:	310-01-BH2219-U00700	DEPTH:	7



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

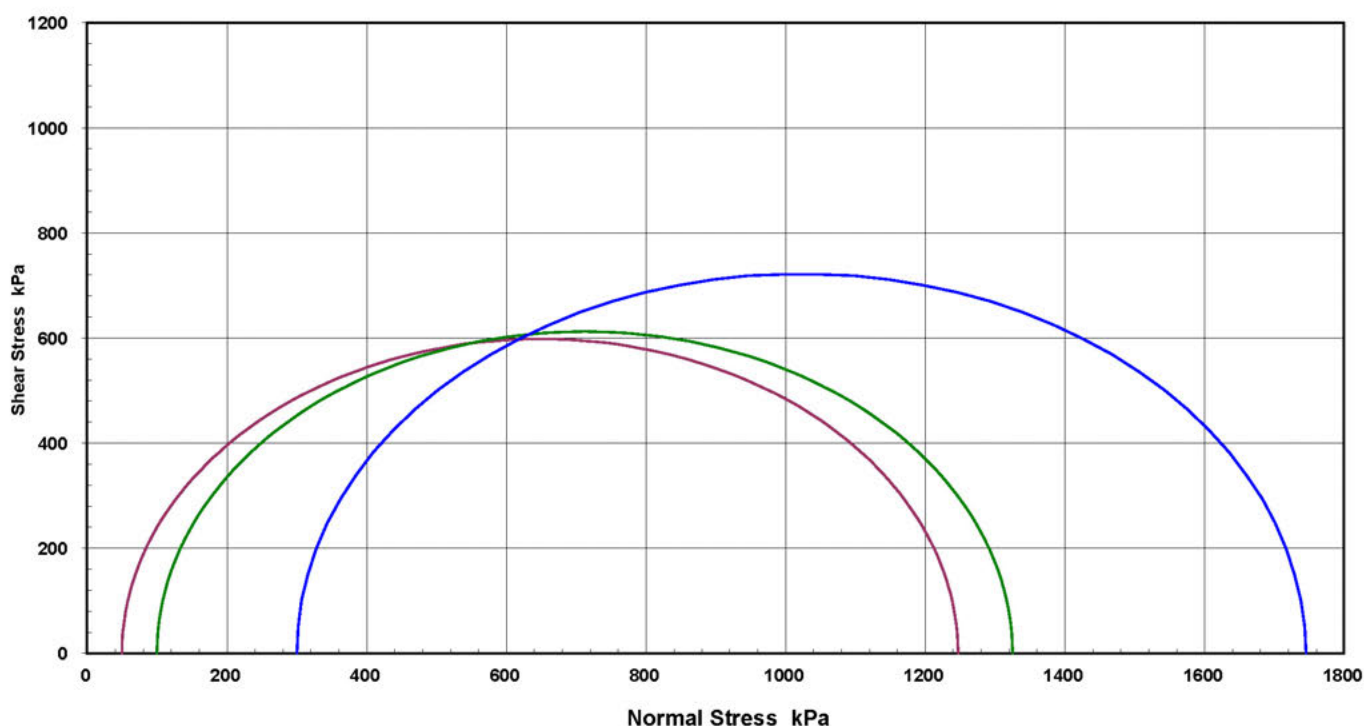
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101026- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	30/10/2018
		Report Date	21/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2219
BoreHole	310-01-BH2219-U00850	Depth From (m)	8.5
		Depth To (m)	8.88
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS			Initial 17.4 %	Final 17.4 %	Failure Criteria		Maximum Deviator Stress	
SAMPLE & TEST DETAILS					FAILURE DETAILS			
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				S ₁	S ₃			
Initial Height	99.5	mm			1247 kPa	50 kPa	1197 kPa	3.30 %
Initial Diameter	47.8	mm		50 kPa	1325 kPa	100 kPa	1225 kPa	3.73 %
Wet Density	2.04	t/m ³		100 kPa	1745 kPa	300 kPa	1445 kPa	4.71 %
Dry Density	1.73	t/m ³	300 kPa					
Rate of Strain	0.503	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

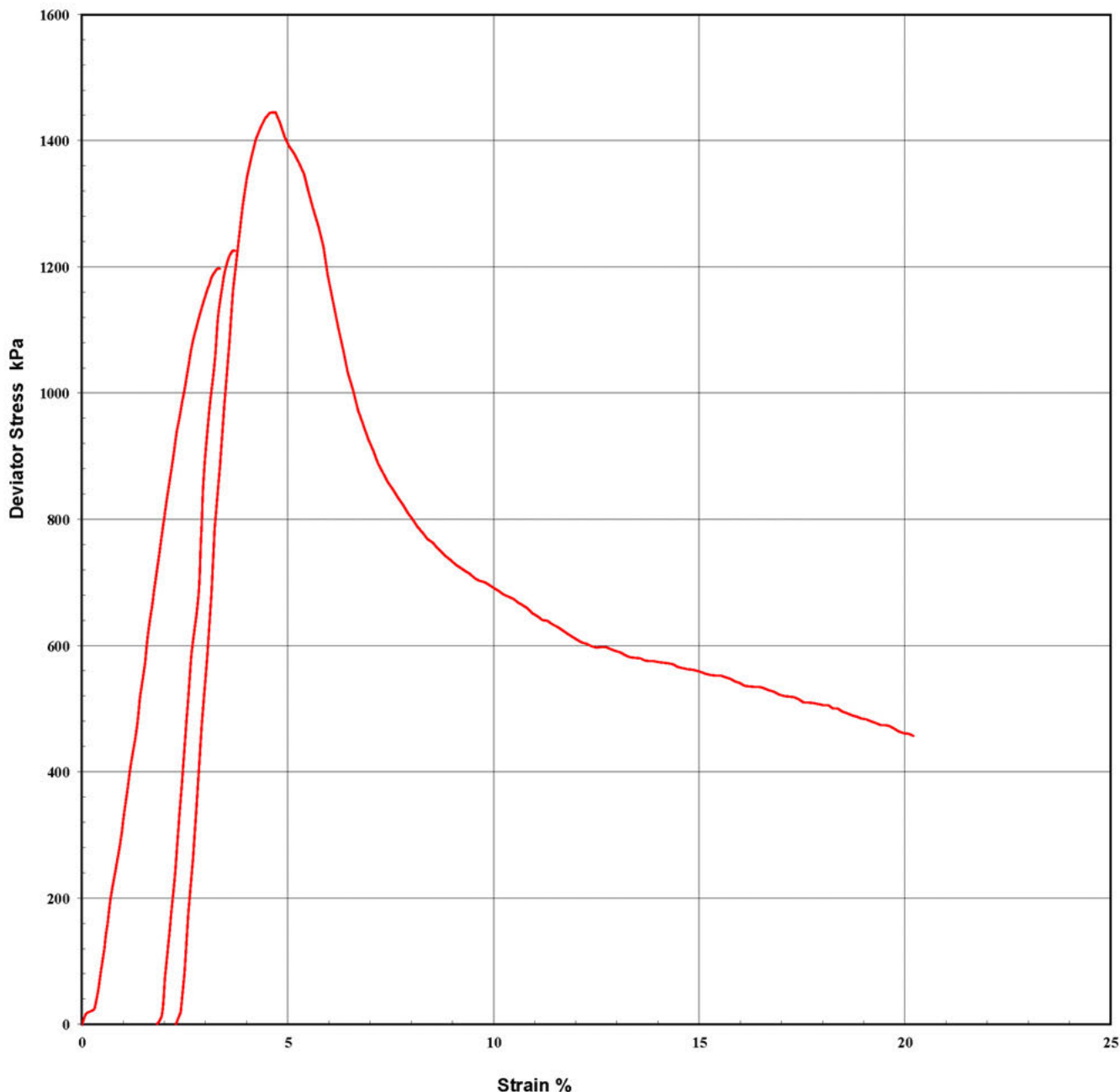
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101026- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101026- UU

CLIENT: Golder Associates Pty Limited

PROJECT: Inland Rail B2G

BEFORE TEST

LAB SAMPLE No. 101026

DATE: 30/10/18

BOREHOLE: 310-01-BH2219-U00850

DEPTH: 8.5



CLIENT: Golder Associates Pty Limited

PROJECT: Inland Rail B2G

AFTER TEST

LAB SAMPLE No. 101026

DATE: 19/11/18

BOREHOLE: 310-01-BH2219-U00850

DEPTH: 8.5



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

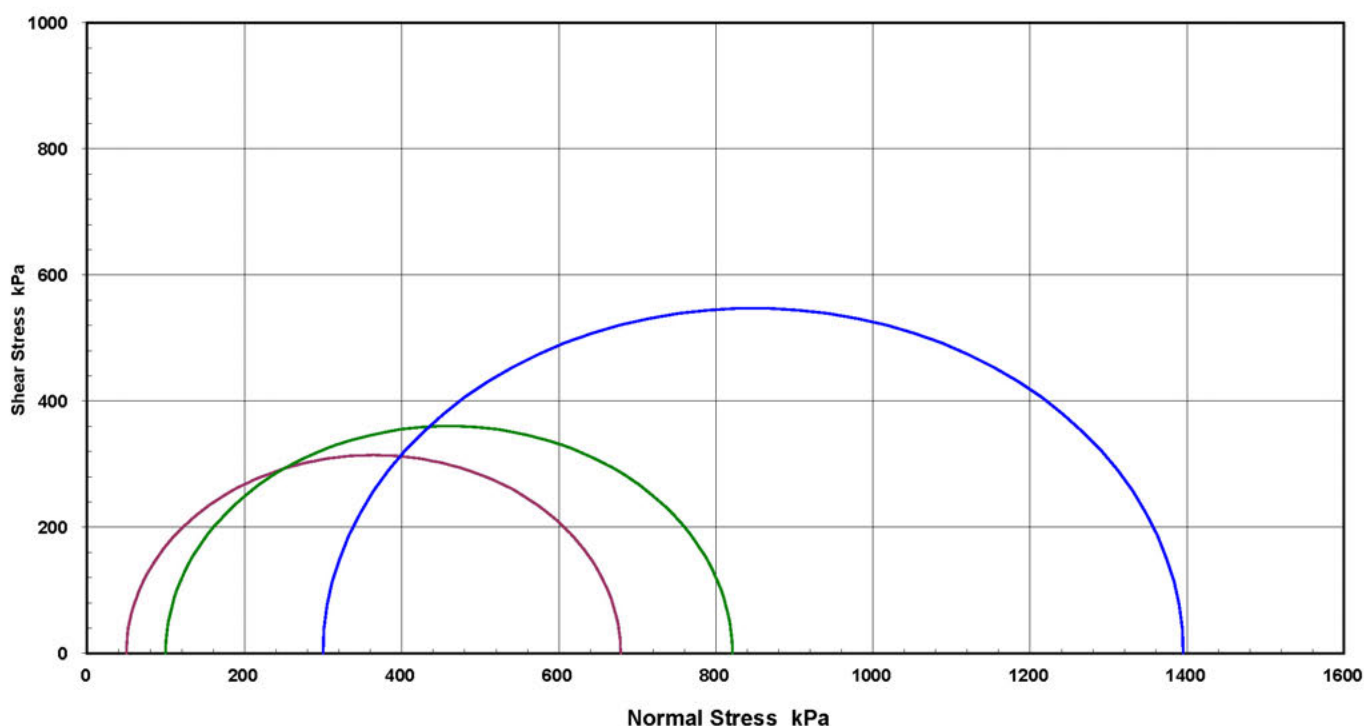
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101027- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	19/11/2018
		Report Date	21/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2219
BoreHole	310-01-BH2219-U01000	Depth From (m)	10
		Depth To (m)	10.2
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS		Initial 16.5 %	Final 16.5 %	Failure Criteria			Maximum Deviator Stress	
SAMPLE & TEST DETAILS				FAILURE DETAILS				
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				s_1	s_3			
Initial Height	99.4	mm	50 kPa	679 kPa	50 kPa	629 kPa	1.63 %	
Initial Diameter	47.8	mm	100 kPa	821 kPa	100 kPa	721 kPa	2.15 %	
Wet Density	2.08	t/m ³	300 kPa	1396 kPa	300 kPa	1096 kPa	3.34 %	
Dry Density	1.78	t/m ³						
Rate of Strain	0.503	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

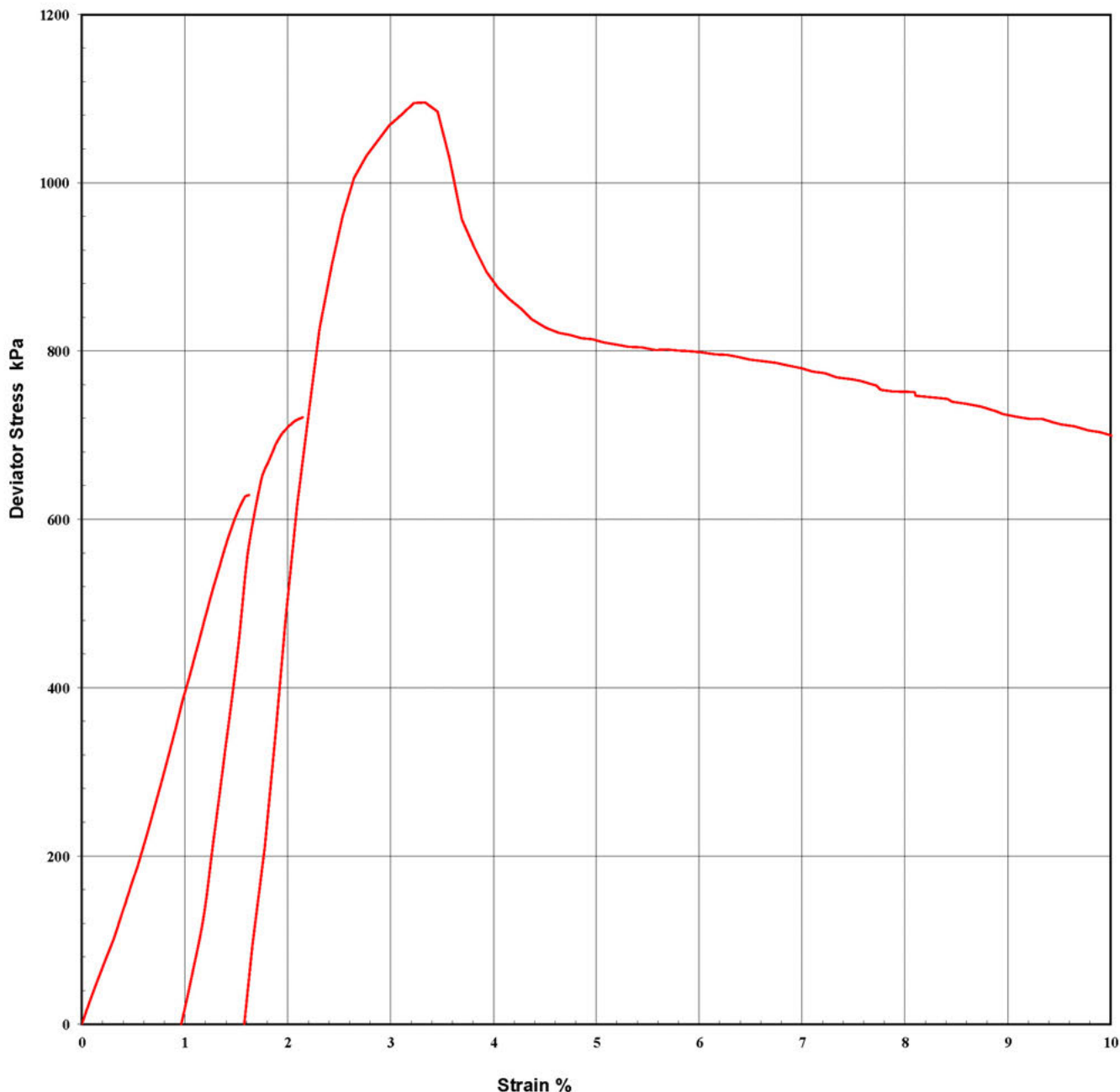
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101027- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101027- UU

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101027	DATE: 30/10/18
BOREHOLE:	310-01-BH2219-U01000	DEPTH: 10



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101027	DATE: 19/11/18
BOREHOLE:	310-01-BH2219-U01000	DEPTH: 10



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

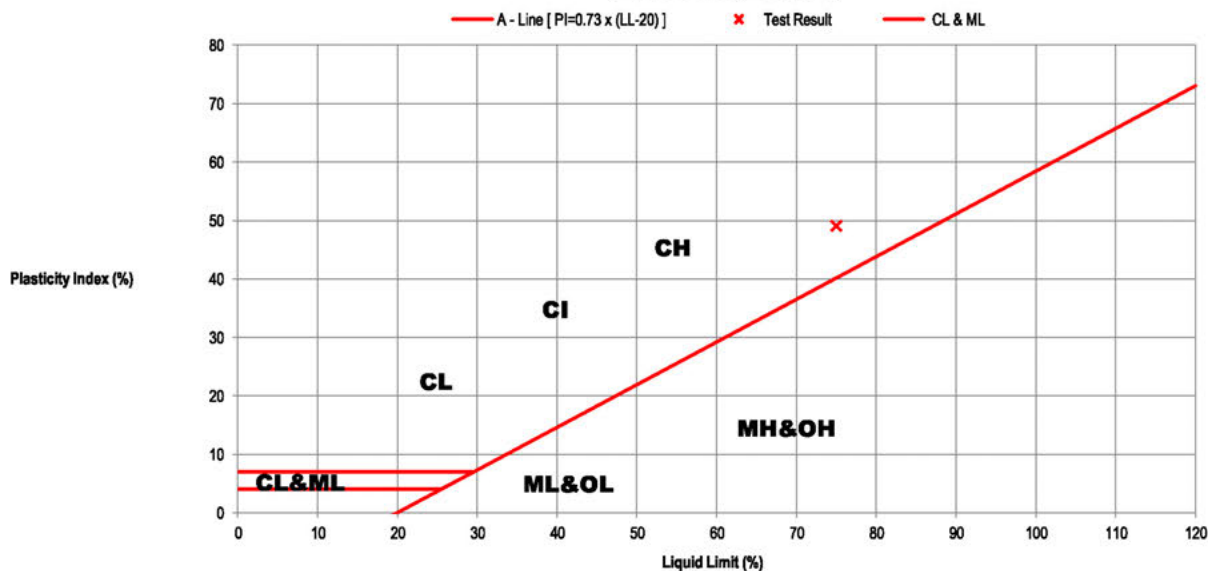
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101077-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4070
Project	Inland Rail B2G	Test Date	29/10/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2617-U00740	Client Sample No.	310-01-BH2617
Description	U	Depth From (m)	7.4
		Depth To (m)	7.85

RESULTS OF TESTING

Liquid Limit (%)	75	
Plastic Limit (%)	26	
Plasticity Index (%)	49	
Linear Shrinkage (%)	20.0	Curling Occurred
Moisture Content (%)	16.5	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

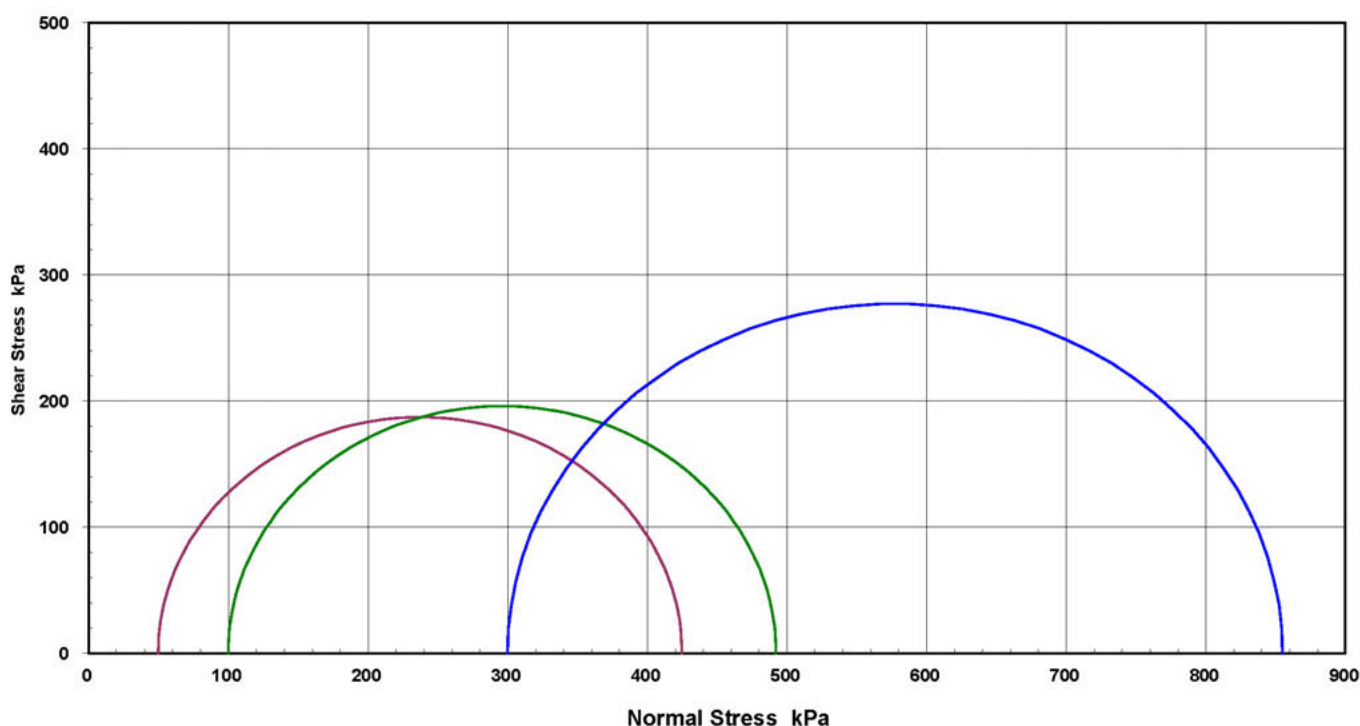
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101077- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4070
Project	Inland Rail B2G	Test Date	20/11/2018
		Report Date	22/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2617
BoreHole	310-01-BH2617-U00740	Depth From (m)	7.4
		Depth To (m)	7.85
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS			Initial 26.2 %	Final 26.2 %	Failure Criteria		Peak Shear Stress	
SAMPLE & TEST DETAILS					FAILURE DETAILS			
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				S ₁	S ₃			
Initial Height	89.4	mm		425 kPa	50 kPa	375 kPa	3.06 %	
Initial Diameter	55.5	mm		492 kPa	100 kPa	392 kPa	3.62 %	
Wet Density	1.88	t/m ³		855 kPa	300 kPa	555 kPa	5.83 %	
Dry Density	1.49	t/m ³						
Rate of Strain	0.895	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

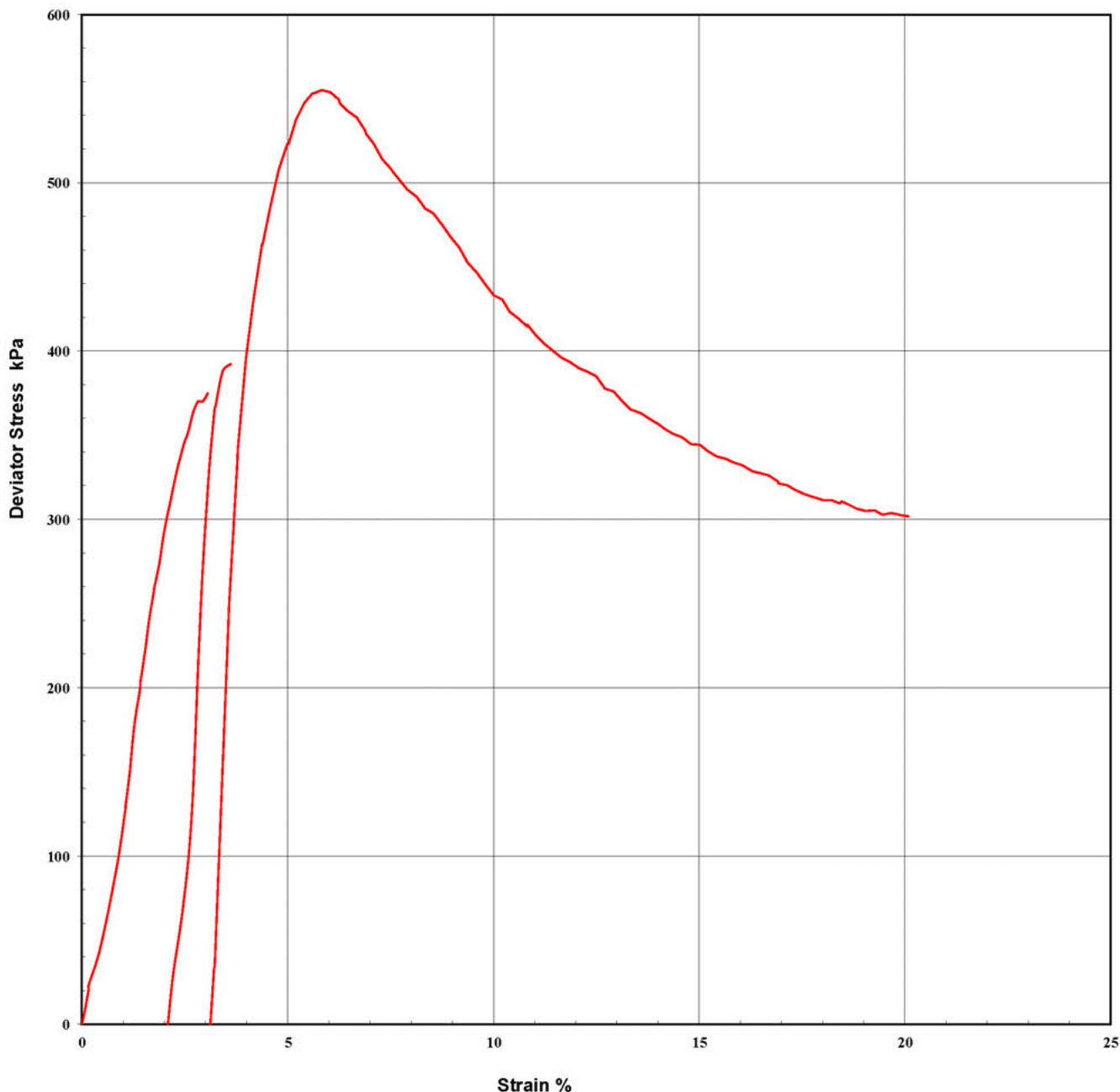
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101077- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101077- UU



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

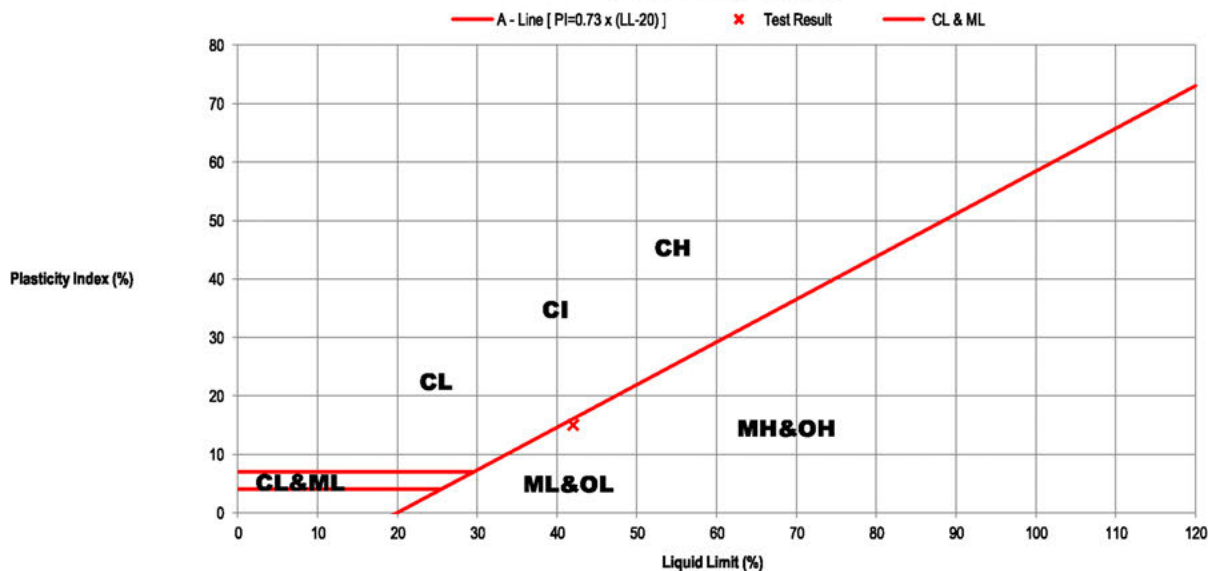
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101081-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-DH2446-B00020	Client Sample No.	310-01-DH2446
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	42	
Plastic Limit (%)	27	
Plasticity Index (%)	15	
Linear Shrinkage (%)	6.5	Cracking & Curling Occurred
Moisture Content (%)	9.9	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

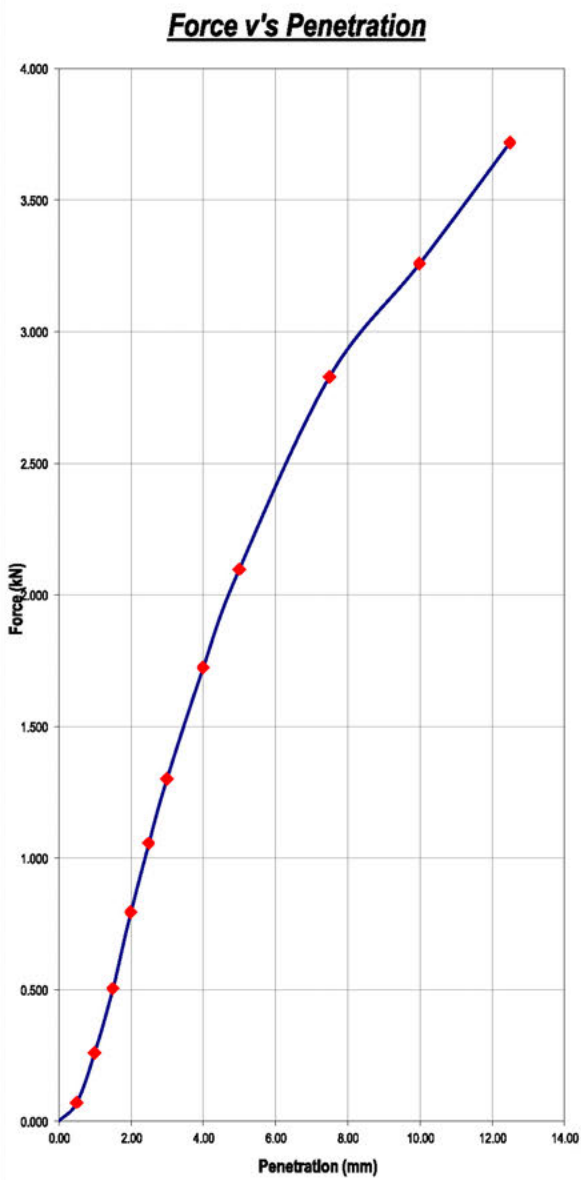
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101081-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2446-B00020	 Force v's Penetration
Client Sample No.	310-01-DH2446	
Depth From/To(m)	0.20-0.60	
Description	Sandy CLAY - brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	9.9	
Maximum Dry Density (t/m³)	1.78	
Optimum Moisture Content (%)	16.0	
Nominated/Achieved Dry Density (t/m³)	1.69 / 1.69	
Nominated/Achieved Moisture Content (%)	16.0 / 16.3	
Laboratory Density Ratio (%)	94.7	
Laboratory Moisture Ratio (%)	101.8	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	0.8	
Moisture Content of Top 30 mm (%)	22.4	
Moisture Content of Remainder (%)	19.4	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	12	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

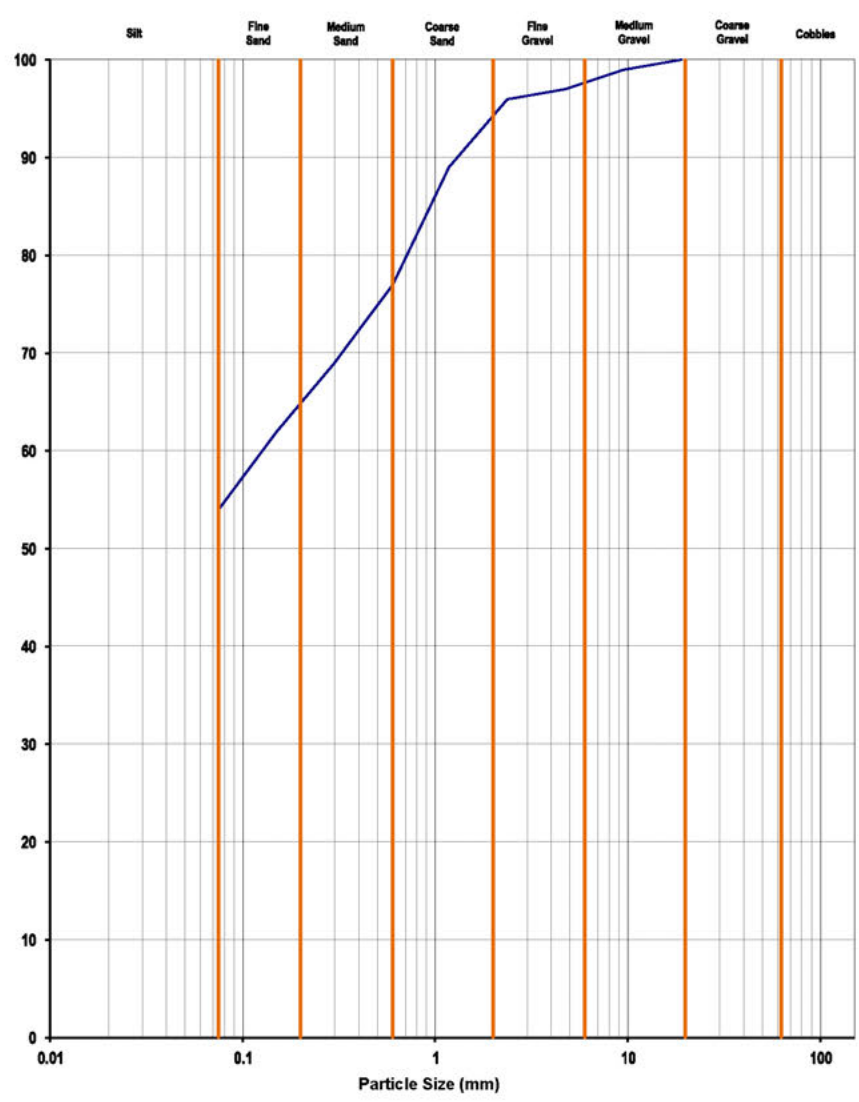
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101081-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2446		
Bore Hole	310-01-DH2446-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	100
13.2	99
9.5	99
6.7	98
4.75	97
2.36	96
1.18	89
0.600	77
0.425	73
0.300	69
0.150	62
0.075	54



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 54% passing for 0.075 mm and rises to 100% passing at 19.0 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 9.9%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

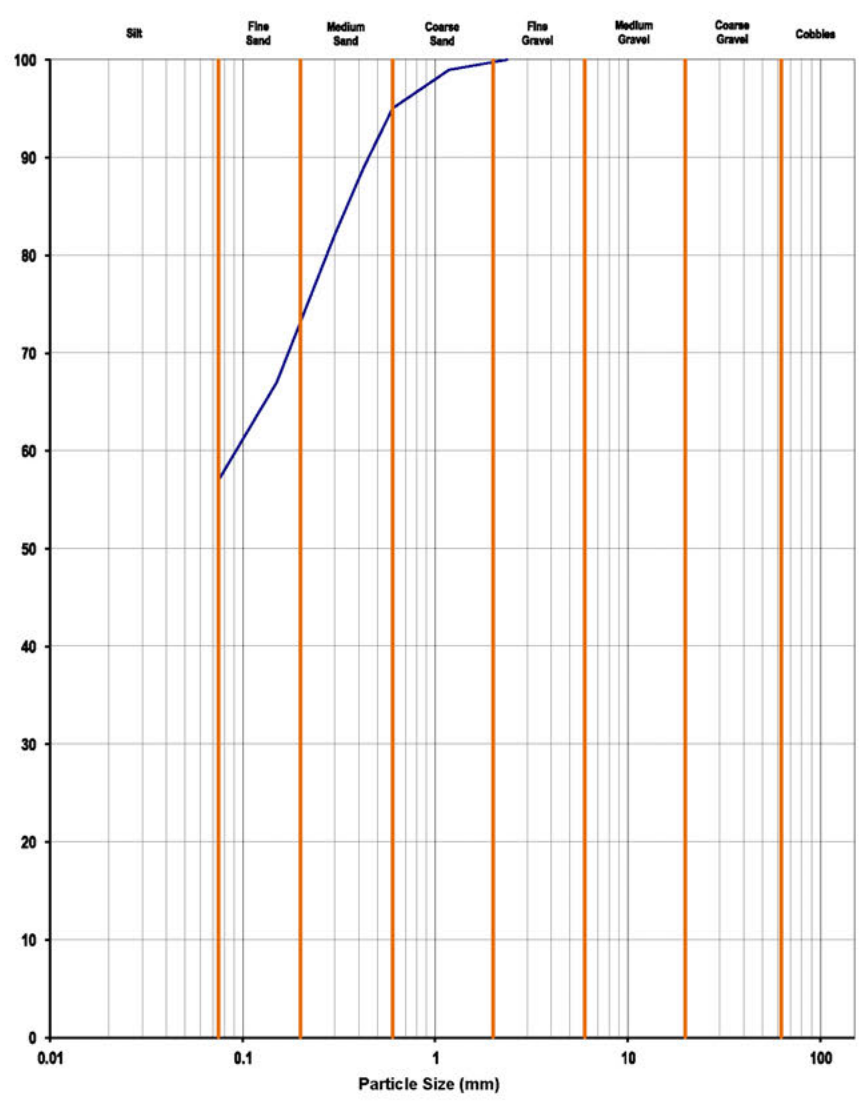
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101083-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2508		
Bore Hole	310-01-DH2508-S00050	Depth From (m)	0.5	Depth To (m)	0.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	95
0.425	89
0.300	82
0.150	67
0.075	57



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 57% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.36 mm), Fine Gravel (2.36 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 7.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101084-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
		Test Date	25/10/18-30/10/18
		Report Date	30/10/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2508		
Bore Hole	310-01-DH2508-S00250	Depth From (m)	2.5	Depth To (m)	2.645

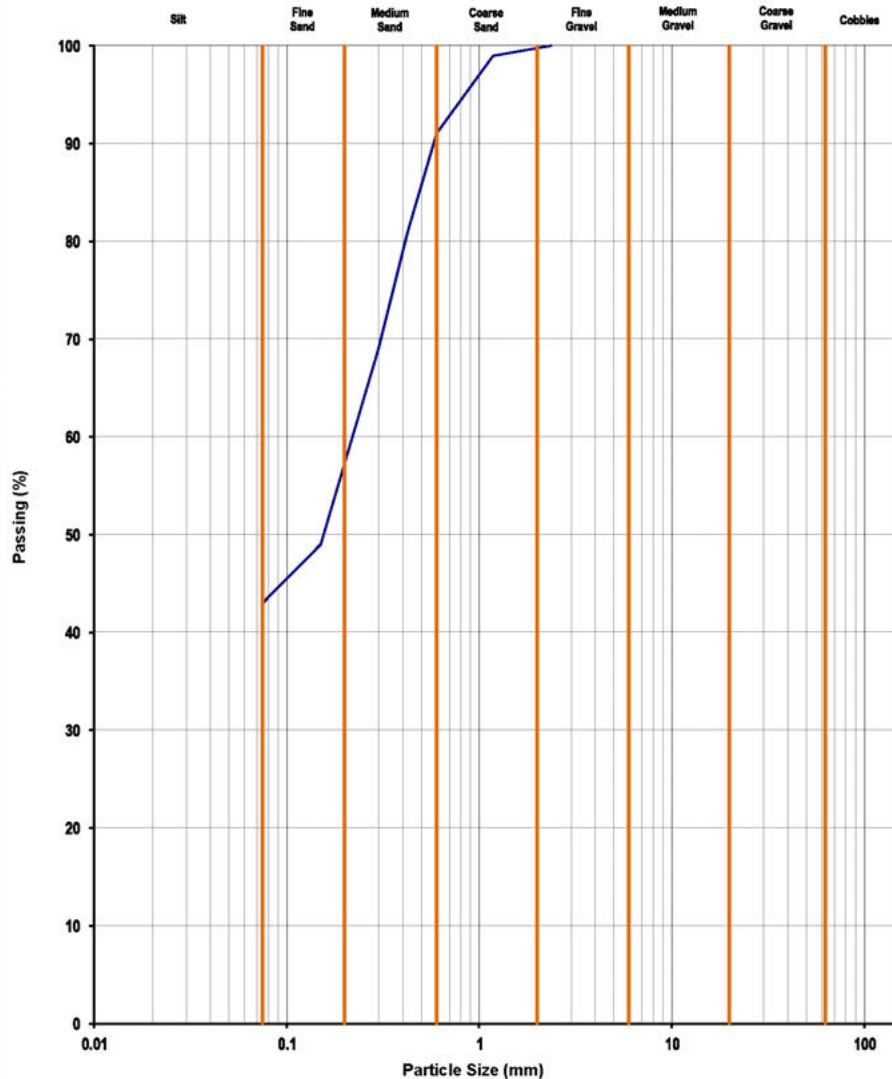
Description		SPT
Sieve Size (mm)	Passing %	
150.0		
75.0		
63.0		
53.0		
37.5		
26.5		
19.0		
13.2		
9.5		
6.7		
4.75		
2.36	100	
1.18	99	
0.600	91	
0.425	81	
0.300	69	
0.150	49	
0.075	43	

Soil Texture Classification:

- Silt
- Fine Sand
- Medium Sand
- Coarse Sand
- Fine Gravel
- Medium Gravel
- Coarse Gravel
- Cobbles

Particle Size (mm)

Passing (%)



NOTES/REMARKS:

-
Moisture Content 6.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

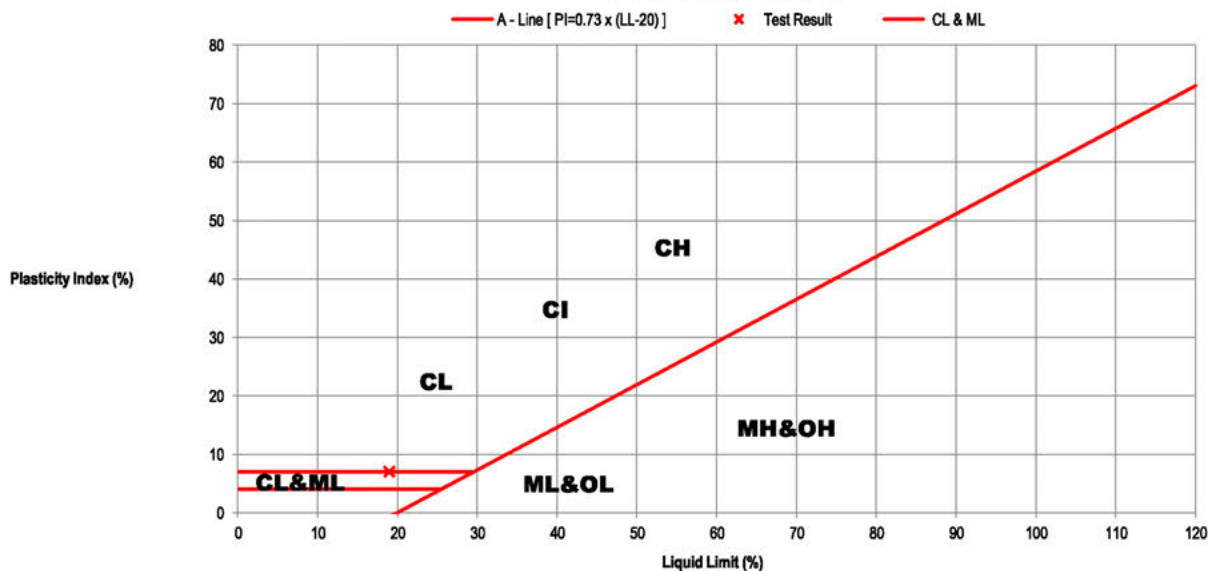
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101085-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-DH2509-S00050	Client Sample No.	310-01-DH2509
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%) 19
Plastic Limit (%) 12
Plasticity Index (%) 7
Linear Shrinkage (%) 3.0 **Cracking & Curling Occurred**
Moisture Content (%) 3.7
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

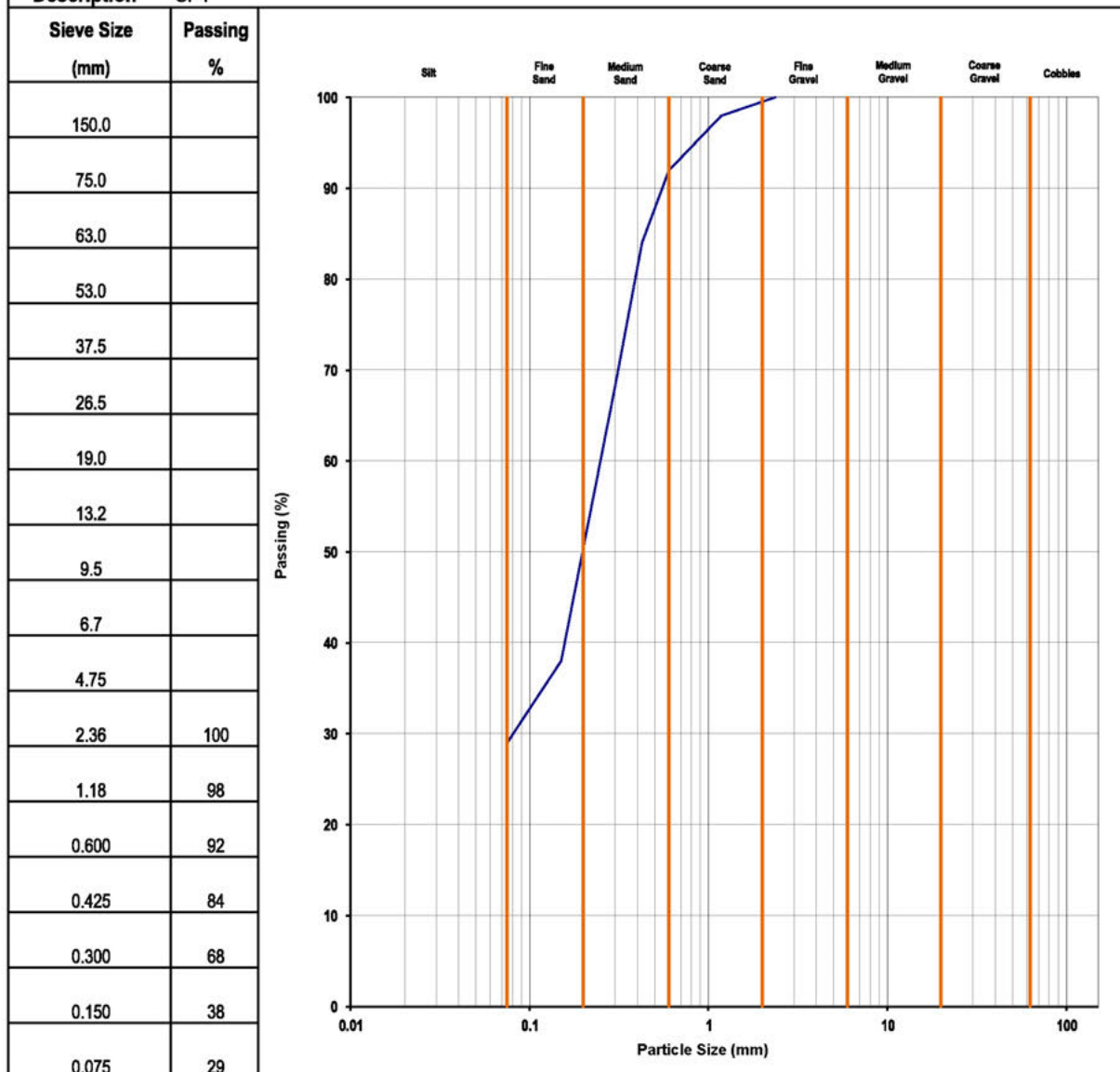
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101085-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	25/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-DH2509
Bore Hole	310-01-DH2509-S00050	Depth From (m)	0.5
		Depth To (m)	0.95

Description SPT



NOTES/REMARKS:

-
Moisture Content 3.7%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

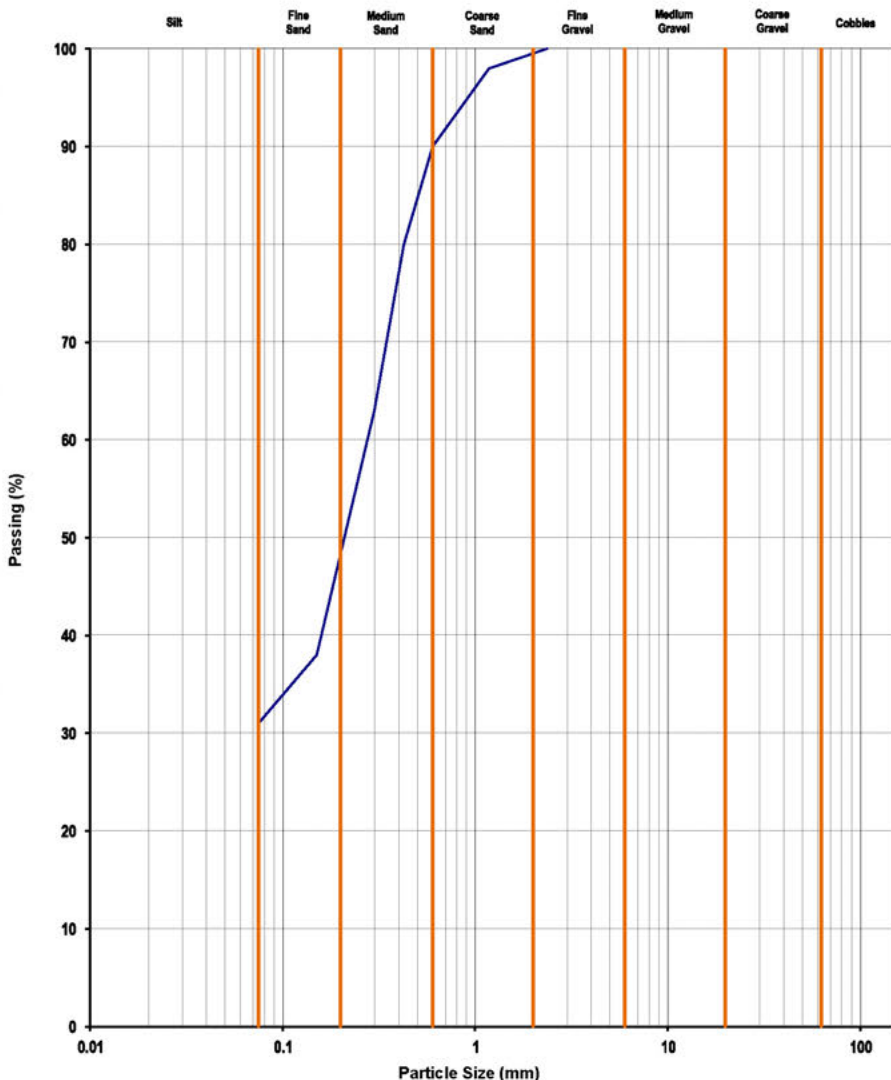
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101086-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2509		
Bore Hole	310-01-DH2509-S00650	Depth From (m)	6.5	Depth To (m)	6.7
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	98
0.600	90
0.425	80
0.300	63
0.150	38
0.075	31



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 31% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 8.4%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

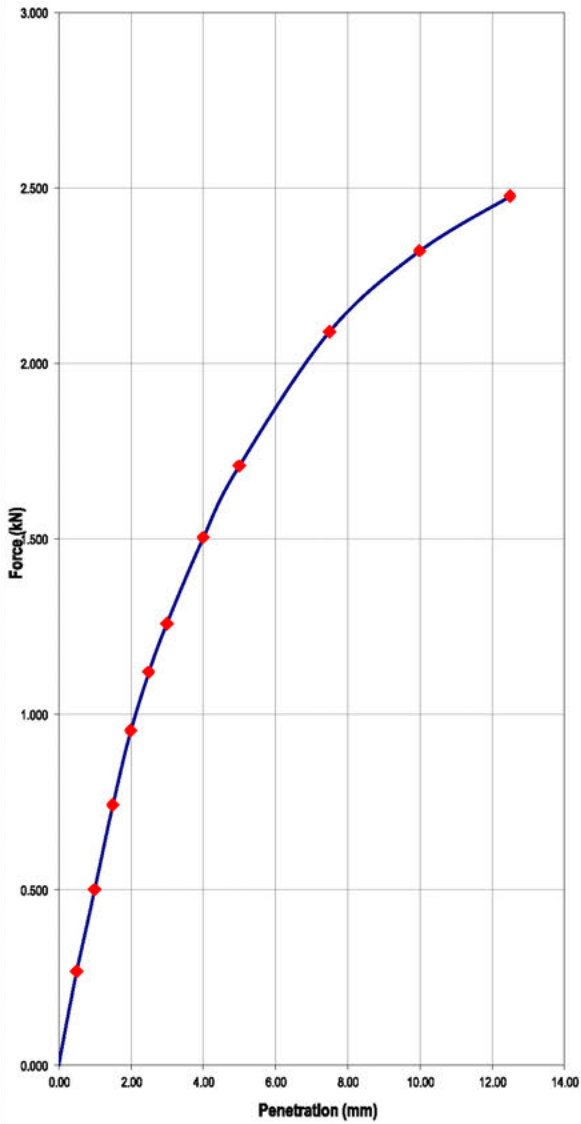
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101087-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2510-B00020	<u>Force v's Penetration</u> 
Client Sample No.	310-01-DH2510	
Depth From/To(m)	0.20-0.60	
Description	Silty SAND - pale brown/grey	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	3.3	
Maximum Dry Density (t/m³)	1.99	
Optimum Moisture Content (%)	9.7	
Nominated/Achieved Dry Density (t/m³)	1.89 / 1.89	
Nominated/Achieved Moisture Content (%)	9.7 / 9.8	
Laboratory Density Ratio (%)	94.8	
Laboratory Moisture Ratio (%)	101.3	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	0.2	
Moisture Content of Top 30 mm (%)	12.5	
Moisture Content of Remainder (%)	11.9	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	9	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

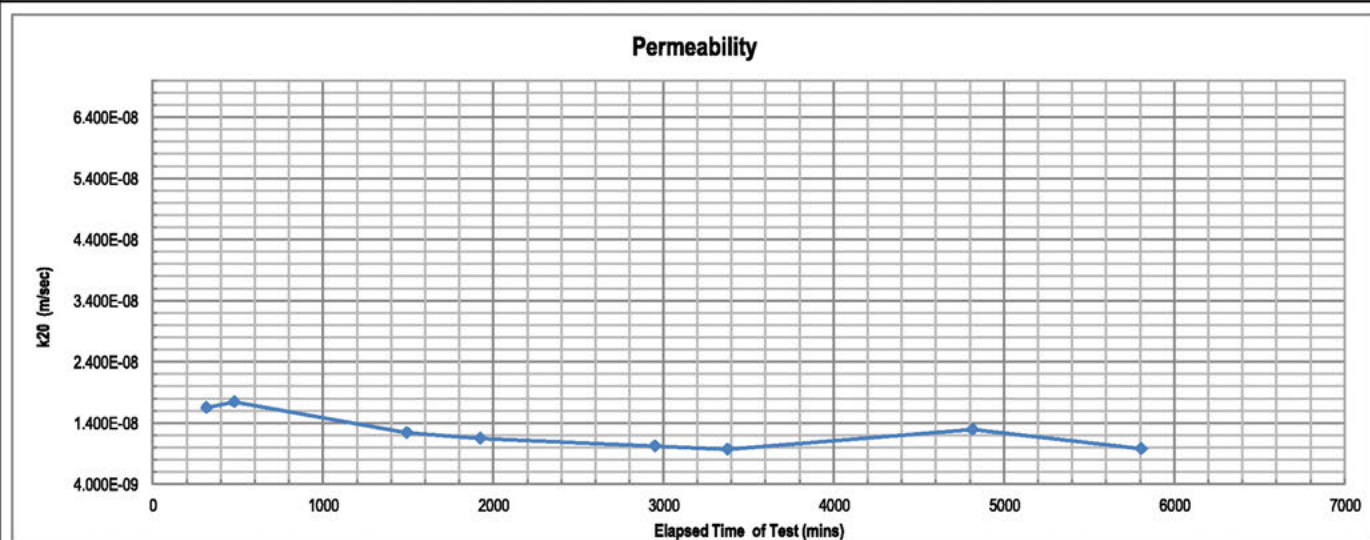
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101087-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	19/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2510
Bore Hole	310-01-DH2510-B00020	Depth From (m)	0.2
Description	Silty SAND - pale brown / grey	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.99	Hydraulic Gradient	9.4
Optimum Moisture Content (%)	9.7	Surcharge (kPa)	3.0
Placement Moisture Content (%)	10.3	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	106.1	Water Type	De-ionized
Placement Wet Density (t/m ³)	2.07	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	94.5	Sample Height and Diameter (mm)	116.48 / 101.1 mm

PERMEABILITY $k_{(20)} = 9.8 \times 10^{-09}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

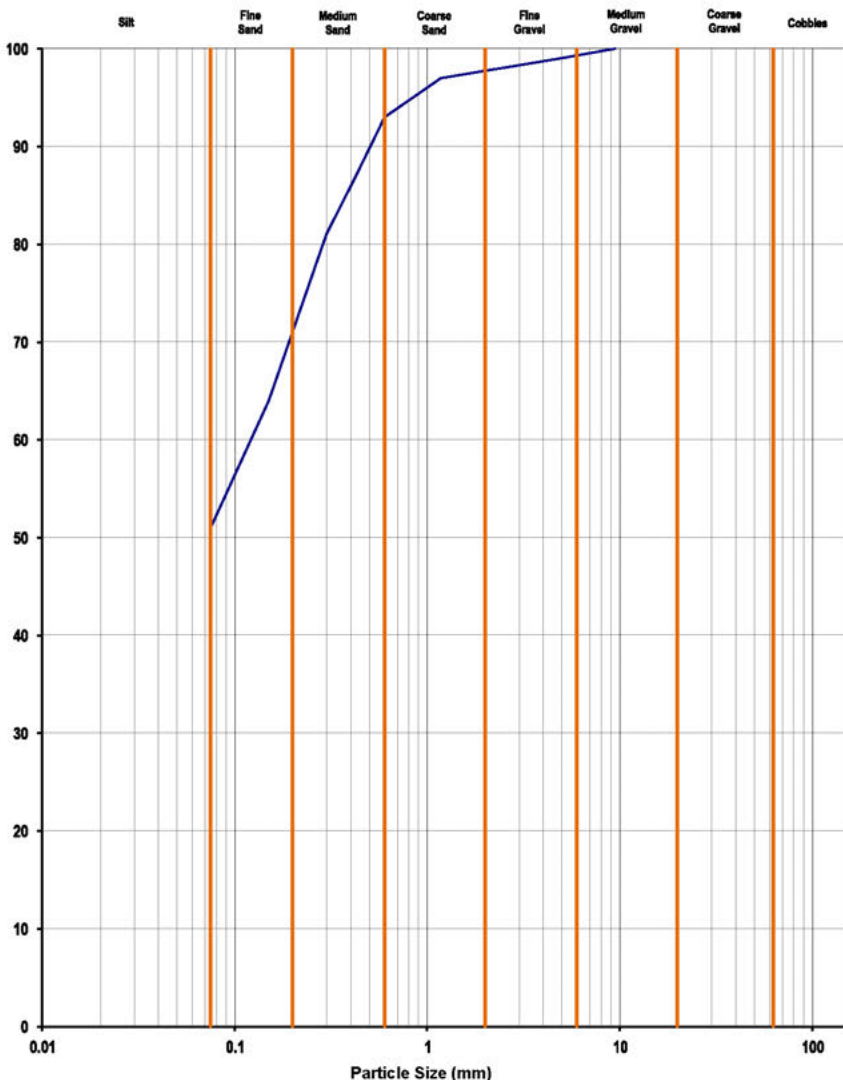
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101087-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2510		
Bore Hole	310-01-DH2510-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	100
4.75	99
2.36	98
1.18	97
0.600	93
0.425	87
0.300	81
0.150	64
0.075	51



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 51% passing for 0.075 mm and rises to 100% passing at 6.7 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 3.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

CERTIFICATE OF ANALYSIS

Work Order : **EB1826673**
Client : **TRILAB PTY LTD**
Contact : **MR CHRIS CHANNON**
Address : **346A BILSEN RD**
GEEBUNG QLD, AUSTRALIA 4031
Telephone : **+61 07 3265 5656**
Project : **1897791 - Inland Rail B2G**
Order number : **BNE 1910024**
C-O-C number : **---**
Sampler : **---**
Site : **---**
Quote number : **EN/333**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division Brisbane**
Contact : **Customer Services EB**
Address : **2 Byth Street Stafford QLD Australia 4053**
Telephone : **+61-7-3243 7222**
Date Samples Received : **02-Nov-2018 11:20**
Date Analysis Commenced : **05-Nov-2018**
Issue Date : **09-Nov-2018 15:10**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				101088 / 310-01-DH2510-S0005 0 / 0.50-0.95m	101092 / 310-01-DH2516-S0010 0 / 1.00-1.45m	101095 / 310-01-DH2517-S0010 0 / 1.00-1.45m	101101 / 310-01-DH2521-S0010 0 / 1.00-1.45m	----
Client sampling date / time				02-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EB1826673-001	EB1826673-002	EB1826673-003	EB1826673-004	-----
				Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	6.8	9.2	6.6	9.3	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	2.3	12.4	3.0	14.5	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	80	20	60	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	20	780	880	820	----

QUALITY CONTROL REPORT

Work Order	: EB1826673	Page	: 1 of 3
Client	: TRILAB PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS CHANNON	Contact	: Customer Services EB
Address	: 346A BILSEN RD GEEBUNG QLD, AUSTRALIA 4031	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3265 5656	Telephone	: +61-7-3243 7222
Project	: 1897791 - Inland Rail B2G	Date Samples Received	: 02-Nov-2018
Order number	: BNE 1910024	Date Analysis Commenced	: 05-Nov-2018
C-O-C number	: ---	Issue Date	: 09-Nov-2018
Sampler	: ---		
Site	: ---		
Quote number	: EN/333		
No. of samples received	: 4		
No. of samples analysed	: 4		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA002: pH 1:5 (Soils) (QC Lot: 2019743)									
EB1826673-002	101092 / 310-01-DH2516-S00100 / 1.00-1.45m	EA002: pH Value	----	0.1	pH Unit	9.2	9.1	1.09	0% - 20%
EB1826663-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.3	7.2	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2019752)									
EB1826672-001	Anonymous	EA055: Moisture Content	----	0.1	%	17.3	18.6	7.16	0% - 20%
EB1826674-006	Anonymous	EA055: Moisture Content	----	0.1	%	18.3	18.3	0.00	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 2019744)									
EB1826674-005	Anonymous	ED040S: Sulfate as SO ₄ 2-	14808-79-8	10	mg/kg	20	20	0.00	No Limit
EB1826672-001	Anonymous	ED040S: Sulfate as SO ₄ 2-	14808-79-8	10	mg/kg	<10	<10	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2019745)									
EB1826674-006	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	360	360	0.00	0% - 20%
EB1826672-001	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	30	20	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA002: pH 1:5 (Soils) (QCLot: 2019743)								
EA002: pH Value	----	---	pH Unit	----	4 pH Unit	99.2	98	102
				----	7 pH Unit	99.6	98	102
ED040S: Soluble Major Anions (QCLot: 2019744)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	500 mg/kg	91.4	90	114
ED045G: Chloride by Discrete Analyser (QCLot: 2019745)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	98.3	83	119
				<10	5000 mg/kg	106	83	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1826673	Page	: 1 of 4
Client	: TRILAB PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS CHANNON	Telephone	: +61-7-3243 7222
Project	: 1897791 - Inland Rail B2G	Date Samples Received	: 02-Nov-2018
Site	: ----	Issue Date	: 09-Nov-2018
Sampler	: ----	No. of samples received	: 4
Order number	: BNE 1910024	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA002: pH 1:5 (Soils)									
Snap Lock Bag (EA002) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	06-Nov-2018	09-Nov-2018	✓	06-Nov-2018	06-Nov-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)									
Snap Lock Bag (EA055) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	---	---	---	05-Nov-2018	16-Nov-2018	✓
ED040S : Soluble Sulfate by ICPAES									
Snap Lock Bag (ED040S) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	06-Nov-2018	30-Nov-2018	✓	09-Nov-2018	04-Dec-2018	✓
ED045G: Chloride by Discrete Analyser									
Snap Lock Bag (ED045G) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	06-Nov-2018	30-Nov-2018	✓	09-Nov-2018	04-Dec-2018	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Chloride Soluble By Discrete Analyser	ED045G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

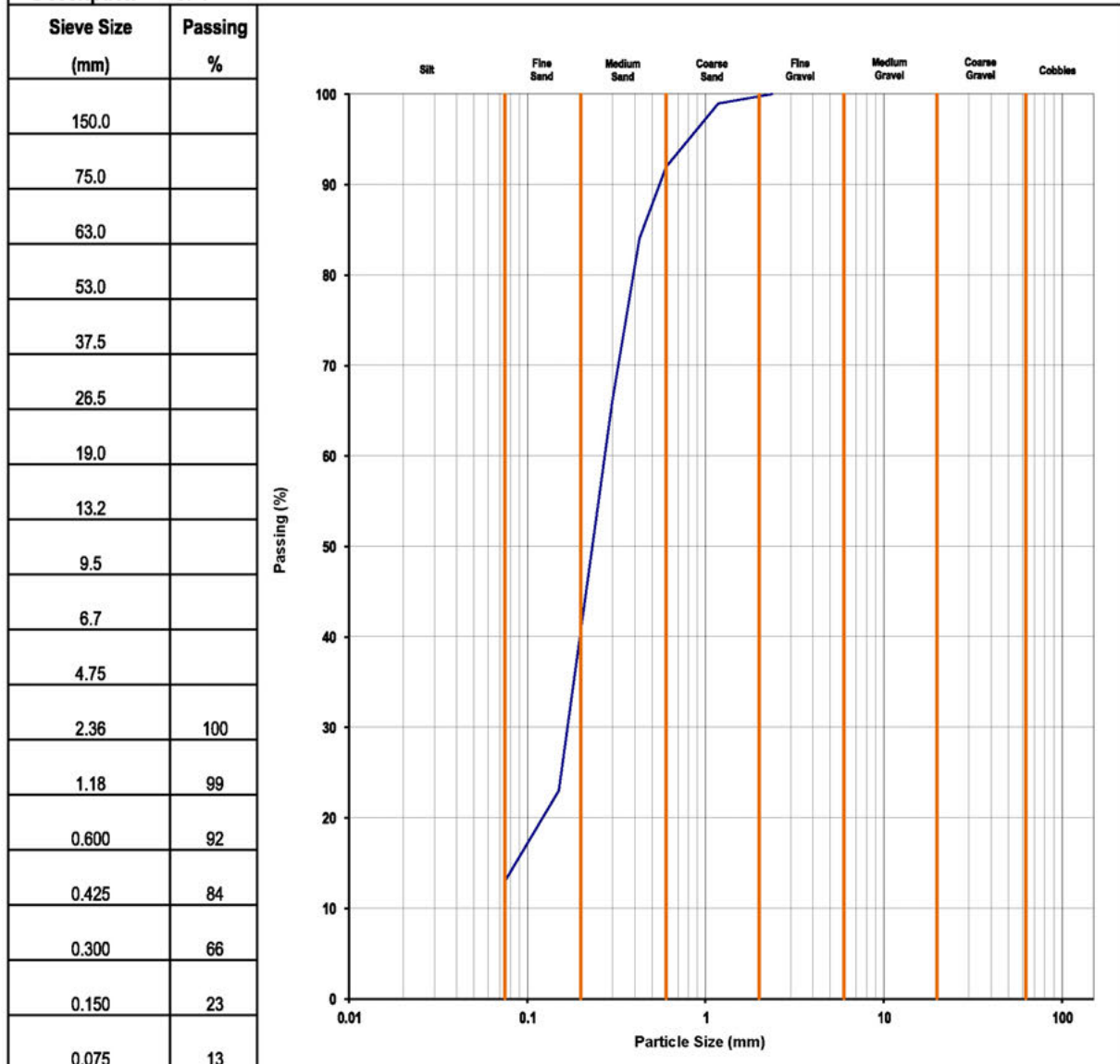
Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101088-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
		Test Date	26/1018-30/10/18
		Report Date	30/10/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2510		
Bore Hole	310-01-DH2510-S00050	Depth From (m)	0.5	Depth To (m)	0.95
Description	SPT				



NOTES/REMARKS:

-
Moisture Content 3.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

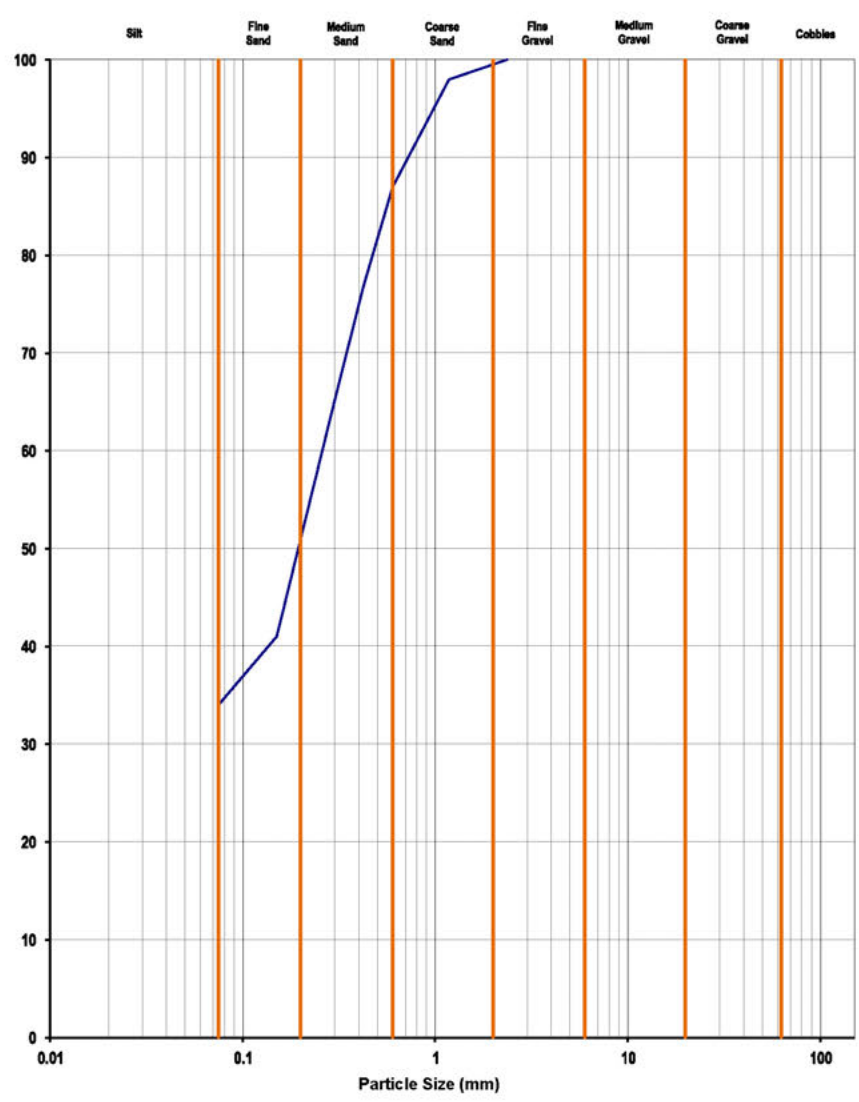
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101089-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2510		
Bore Hole	310-01-DH2510-S00250	Depth From (m)	2.5	Depth To (m)	2.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	98
0.600	87
0.425	77
0.300	65
0.150	41
0.075	34



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 34% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 5.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

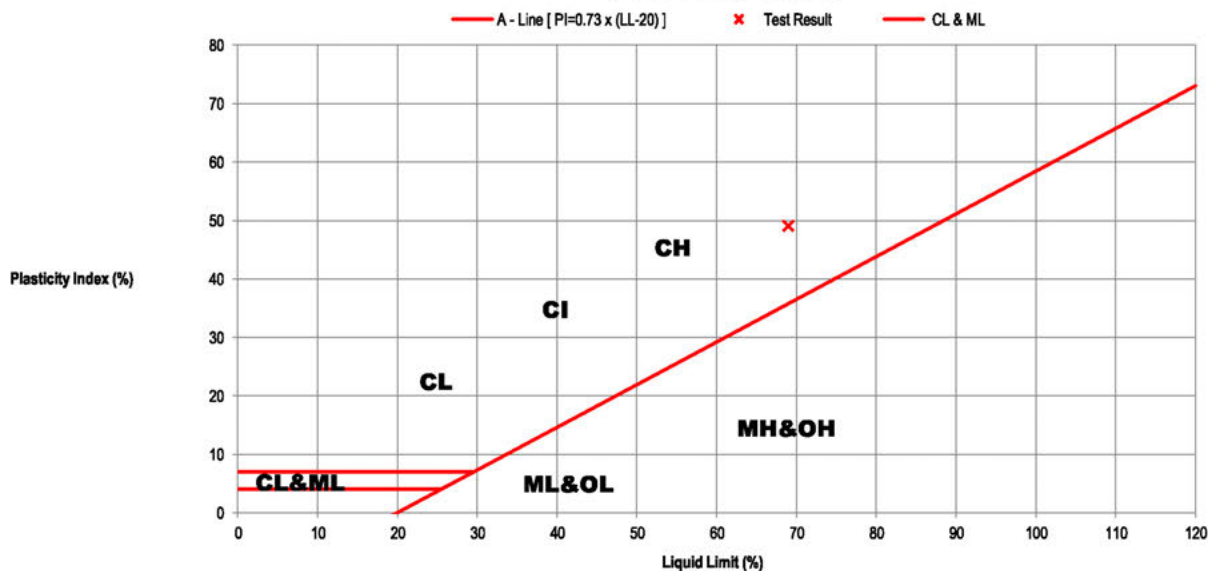
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101090-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2516-B00020	Client Sample No.	310-01-DH2516
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	69	
Plastic Limit (%)	20	
Plasticity Index (%)	49	
Linear Shrinkage (%)	18.0	Cracking & Curling Occurred
Moisture Content (%)	16.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

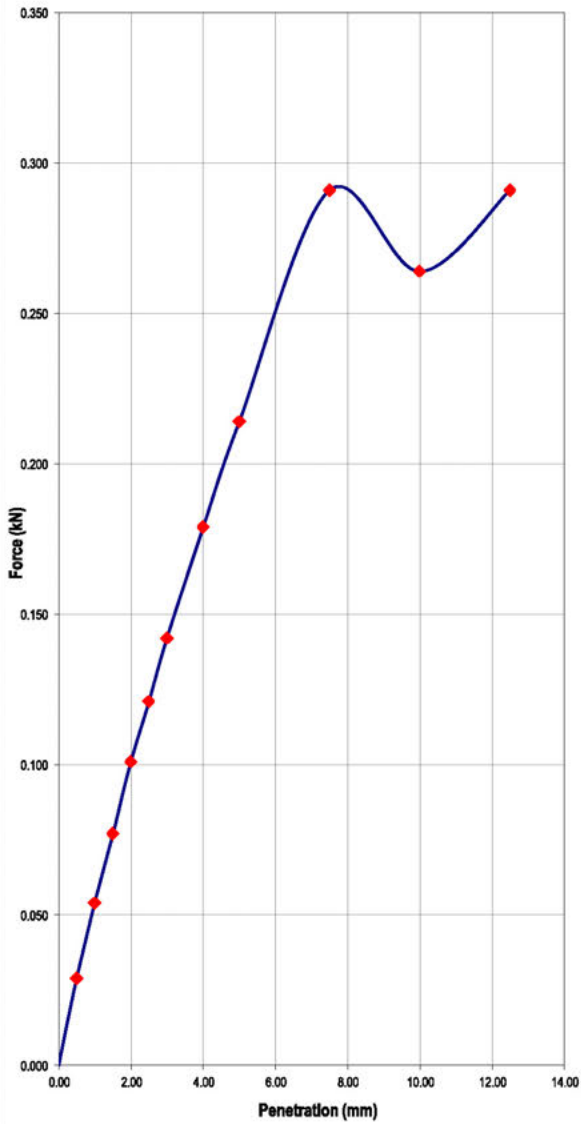
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101090-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2516-B00020	<u>Force v's Penetration</u>  The graph plots Force (kN) on the y-axis (0.000 to 0.350) against Penetration (mm) on the x-axis (0.00 to 14.00). The curve starts at (0,0), rises steeply to a peak of approximately 0.29 kN at 7.5 mm penetration, then dips to about 0.26 kN at 10 mm, and rises again to 0.29 kN at 12.5 mm.
Client Sample No.	310-01-DH2516	
Depth From/To(m)	0.20-0.60	
Description	Sandy Silty CLAY - black	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	16.6	
Maximum Dry Density (t/m³)	1.53	
Optimum Moisture Content (%)	20.3	
Nominated/Achieved Dry Density (t/m³)	1.45 / 1.45	
Nominated/Achieved Moisture Content (%)	20.3 / 20.2	
Laboratory Density Ratio (%)	95.0	
Laboratory Moisture Ratio (%)	99.5	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	9.8	
Moisture Content of Top 30 mm (%)	42.3	
Moisture Content of Remainder (%)	25.4	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	1	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

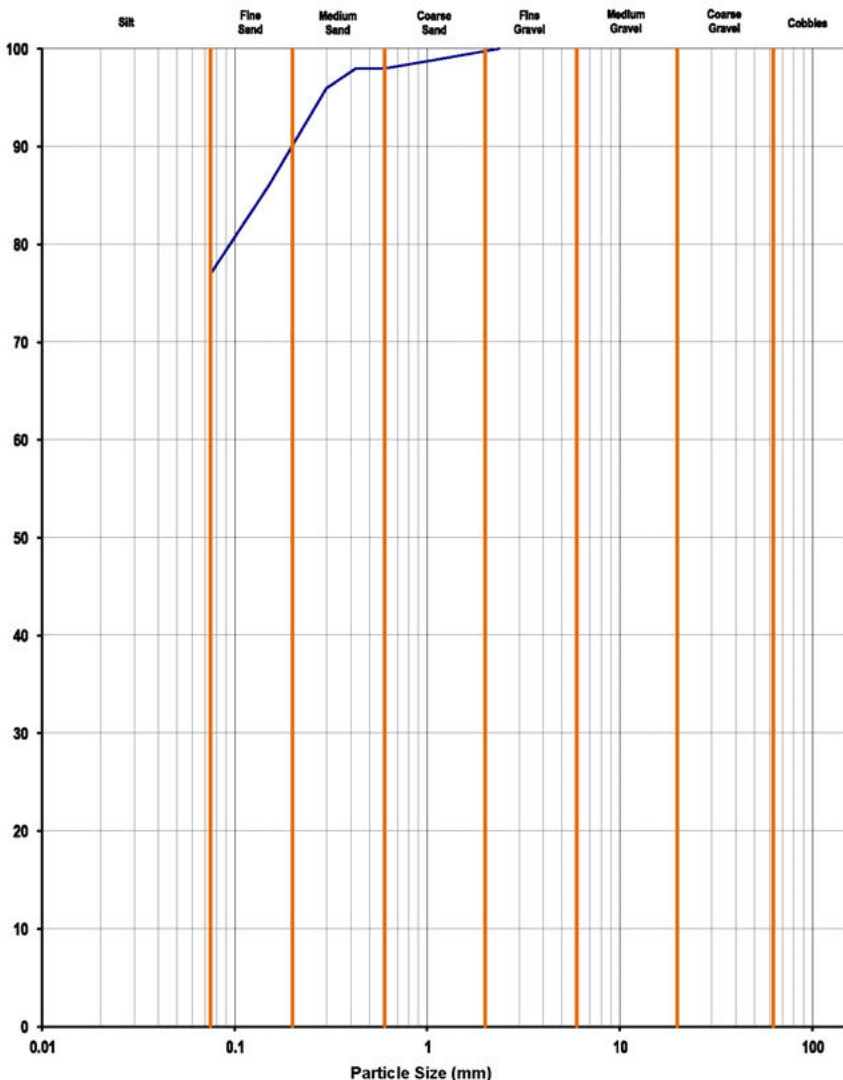
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101090-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2516		
Bore Hole	310-01-DH2516-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	98
0.425	98
0.300	96
0.150	86
0.075	77



The graph plots 'Passing (%)' on the y-axis (0 to 100) against 'Particle Size (mm)' on a logarithmic x-axis (0.01 to 100). Vertical lines mark sieve sizes: 0.075, 0.150, 0.300, 0.425, 0.600, 1.18, 2.36, 4.75, 6.7, 9.5, 13.2, 19.0, 26.5, 37.5, 53.0, 63.0, 75.0, 150.0. The curve starts at 77% passing for 0.075mm and rises to 100% passing at 2.36mm, remaining at 100% for larger sizes.

NOTES/REMARKS:

-

Moisture Content 16.6%

Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

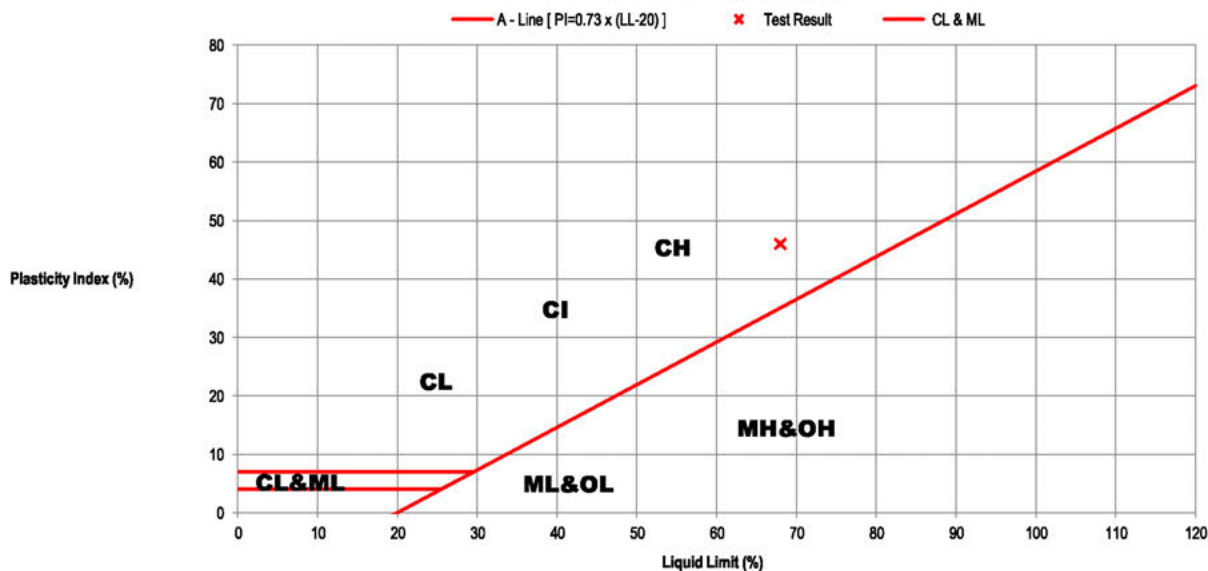
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101092-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	10/11/2018
Bore Hole	310-01-DH2516-S00100	Client Sample No.	310-01-DH2516
Description	SPT	Depth From (m)	1
		Depth To (m)	1.45

RESULTS OF TESTING

Liquid Limit (%)	68	
Plastic Limit (%)	22	
Plasticity Index (%)	46	
Linear Shrinkage (%)	17.0	Cracking & Curling Occurred
Moisture Content (%)	16.1	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101092-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	25/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-DH2516
Bore Hole	310-01-DH2516-S00100	Depth From (m)	1
		Depth To (m)	1.45

Description		SPT
Sieve Size	Passing	
(mm)	%	
150.0		
75.0		
63.0		
53.0		
37.5		
26.5		
19.0		
13.2		
9.5		
6.7		
4.75	100	
2.36	99	
1.18	99	
0.600	98	
0.425	97	
0.300	95	
0.150	87	
0.075	79	

Passing (%)

Silt

Fine Sand

Medium Sand

Coarse Sand

Fine Gravel

Medium Gravel

Coarse Gravel

Cobbles

Particle Size (mm)	Passing (%)
0.075	79
0.150	87
0.300	95
0.425	97
0.600	98
1.18	99
2.36	99
4.75	100

Particle Size (mm)

NOTES/REMARKS:	-
	Moisture Content 16.1%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

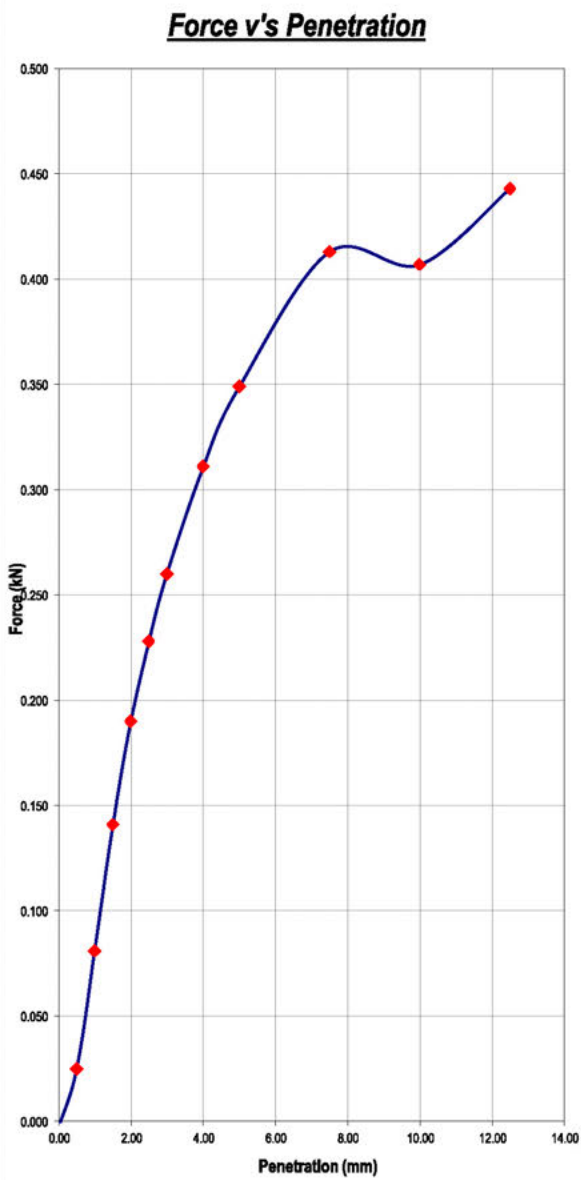
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101093-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2517-B00020	 Force v's Penetration
Client Sample No.	310-01-DH2517	
Depth From/To(m)	0.20-0.60	
Description	Sandy Silty CLAY - dark brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	13.2	
Maximum Dry Density (t/m³)	1.60	
Optimum Moisture Content (%)	20.9	
Nominated/Achieved Dry Density (t/m³)	1.52 / 1.52	
Nominated/Achieved Moisture Content (%)	20.9 / 20.7	
Laboratory Density Ratio (%)	95.2	
Laboratory Moisture Ratio (%)	98.9	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	3.9	
Moisture Content of Top 30 mm (%)	37.1	
Moisture Content of Remainder (%)	26.4	
CBR Penetration (mm)	2.5	
CBR VALUE (%)	2	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

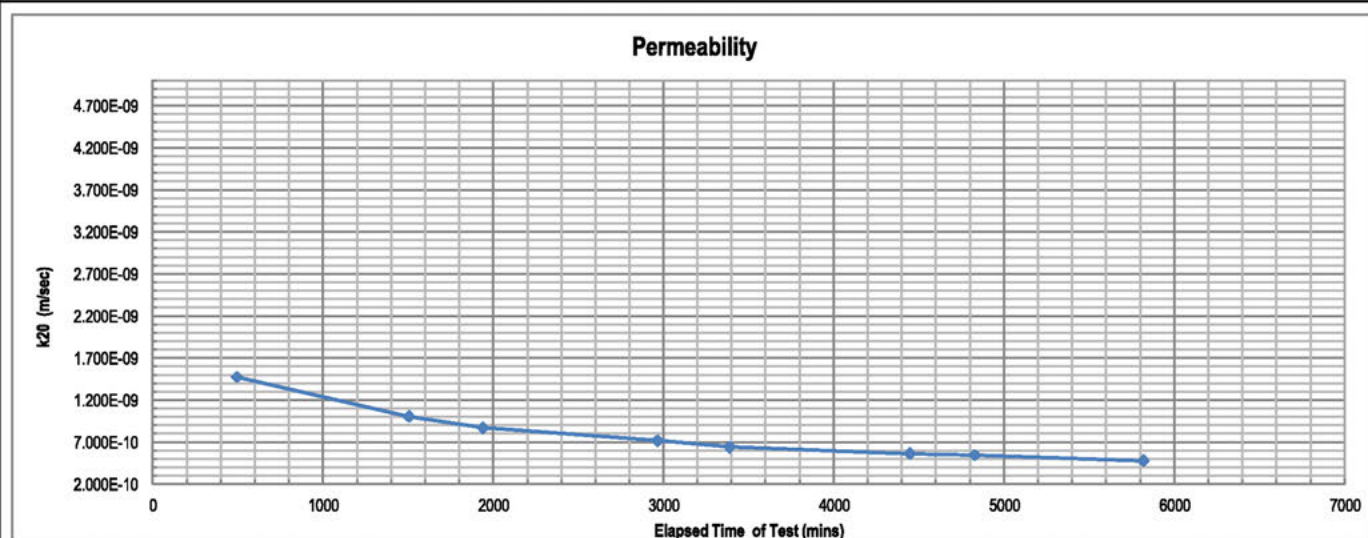
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101093-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	17/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2517
Bore Hole	310-01-DH2517-B00020	Depth From (m)	0.2
Description	Sandy Silty CLAY - dark grey	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.60	Hydraulic Gradient	9.4
Optimum Moisture Content (%)	20.9	Surcharge (kPa)	3.0
Placement Moisture Content (%)	21.0	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	100.6	Water Type	De-ionized
Placement Wet Density (t/m ³)	1.83	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	94.7	Sample Height and Diameter (mm)	116.45 / 100.98 mm

PERMEABILITY $k_{(20)} = 4.8 \times 10^{-10}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1 REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

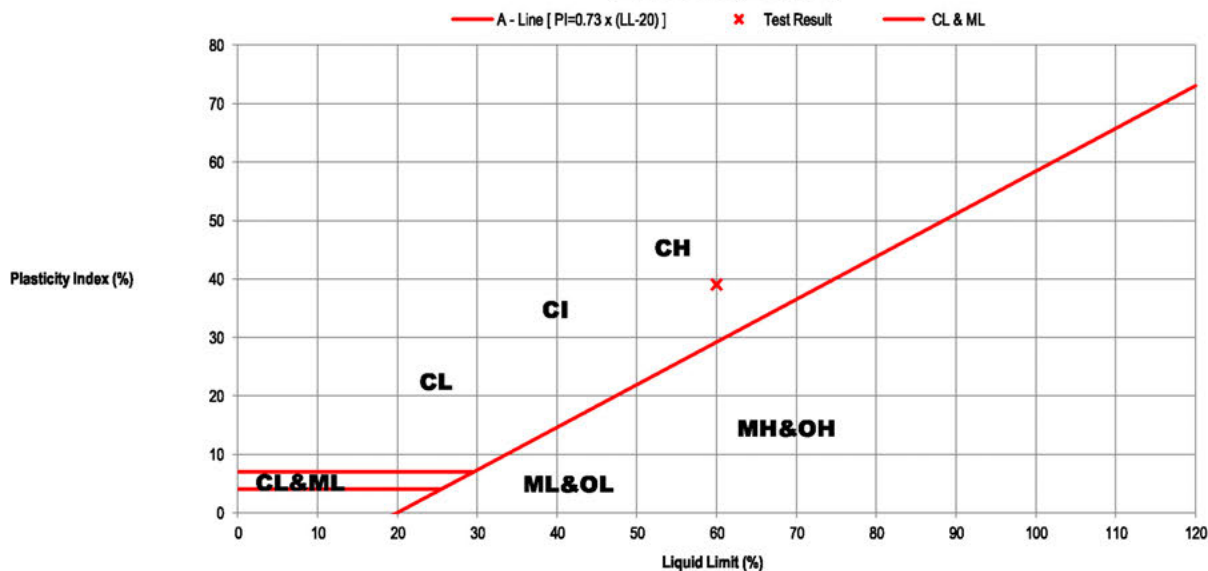
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101095-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-DH2517-S00100	Client Sample No.	310-01-DH2517
Description	SPT	Depth From (m)	1
		Depth To (m)	1.45

RESULTS OF TESTING

Liquid Limit (%)	60	
Plastic Limit (%)	21	
Plasticity Index (%)	39	
Linear Shrinkage (%)	15.0	Curling Occurred
Moisture Content (%)	13.0	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

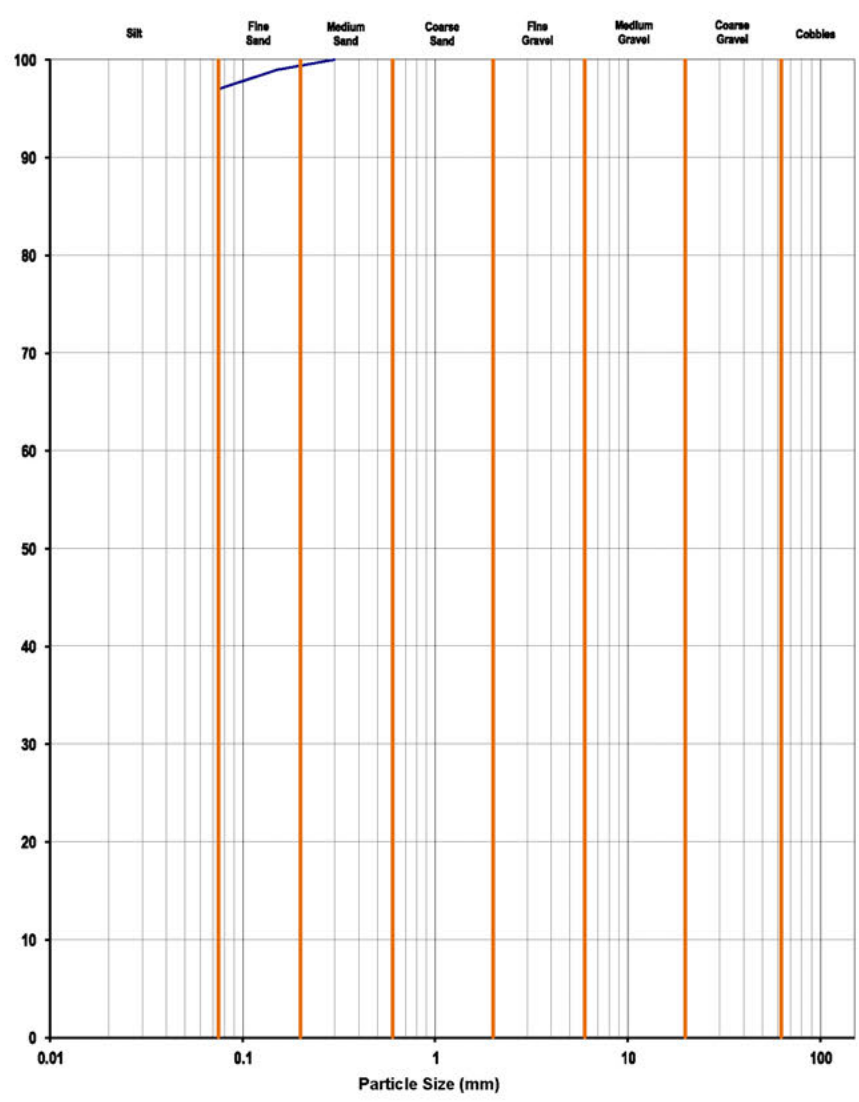
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101095-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2517		
Bore Hole	310-01-DH2517-S00100	Depth From (m)	1	Depth To (m)	1.45
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	100
0.150	99
0.075	97



The graph shows the particle size distribution for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. Vertical lines indicate the boundaries between soil types: Silt, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles. A blue curve is plotted, showing that approximately 97% of the sample passes through a 0.075 mm sieve and 100% passes through a 0.300 mm sieve.

NOTES/REMARKS:

-
Moisture Content 13%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

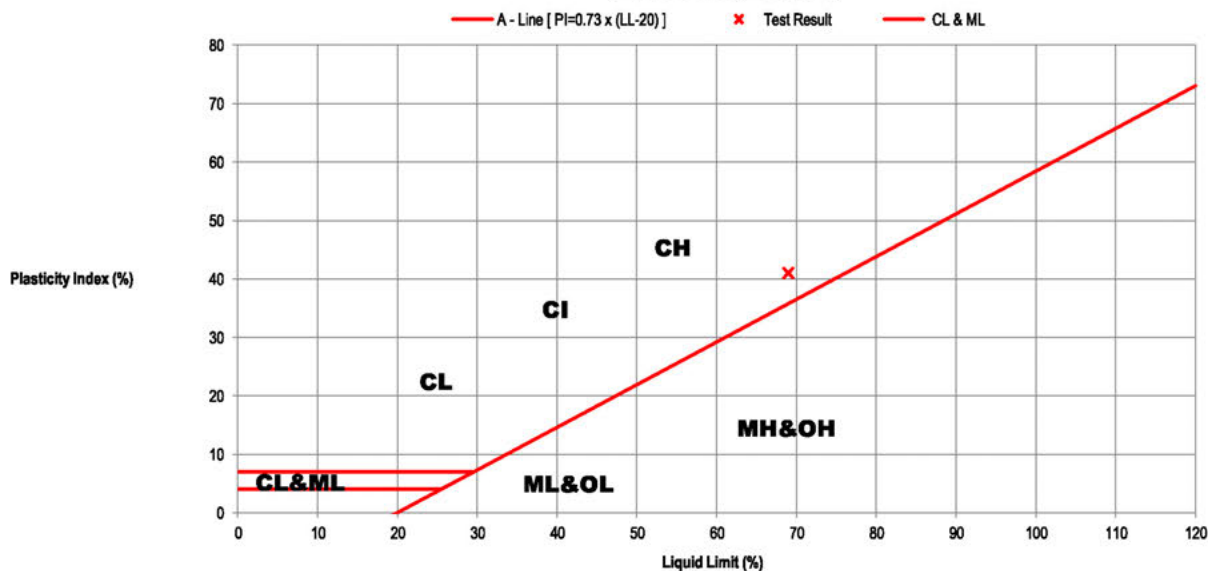
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101096-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	7/11/2018
Bore Hole	310-01-DH2518-B00020	Client Sample No.	310-01-DH2518
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	69	
Plastic Limit (%)	28	
Plasticity Index (%)	41	
Linear Shrinkage (%)	18.0	Cracking & Curling Occurred
Moisture Content (%)	25.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

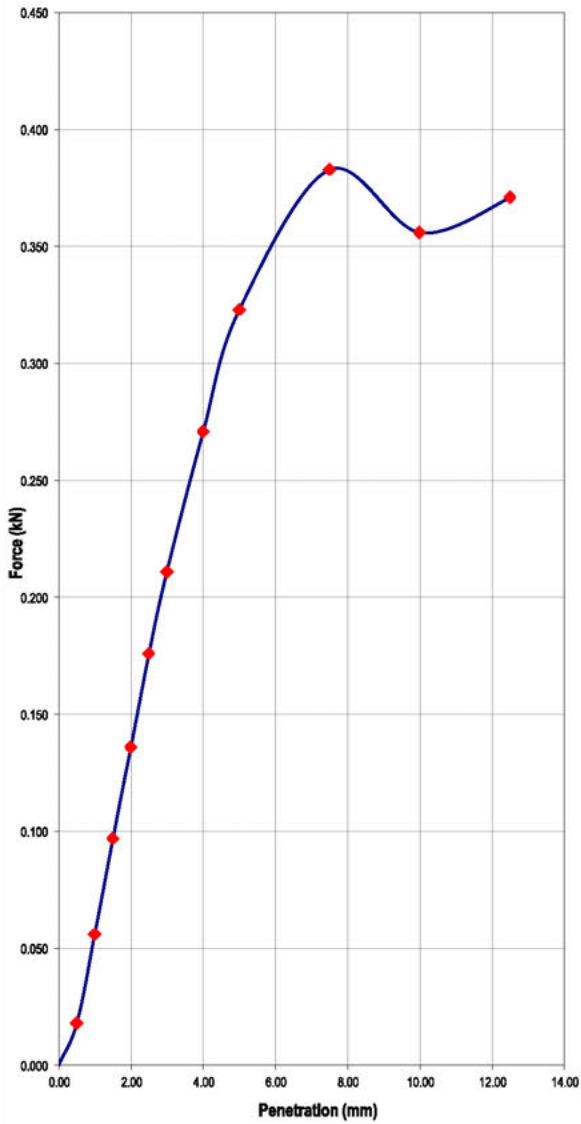
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101096-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2518-B00020	Force v's Penetration 
Client Sample No.	310-01-DH2518	
Depth From/To(m)	0.20-0.60	
Description	Silty CLAY - black	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	25.3	
Maximum Dry Density (t/m³)	1.51	
Optimum Moisture Content (%)	25.3	
Nominated/Achieved Dry Density (t/m³)	1.43 / 1.43	
Nominated/Achieved Moisture Content (%)	25.3 / 25.4	
Laboratory Density Ratio (%)	94.8	
Laboratory Moisture Ratio (%)	100.3	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	6.3	
Moisture Content of Top 30 mm (%)	42.3	
Moisture Content of Remainder (%)	27.3	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	1.5	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

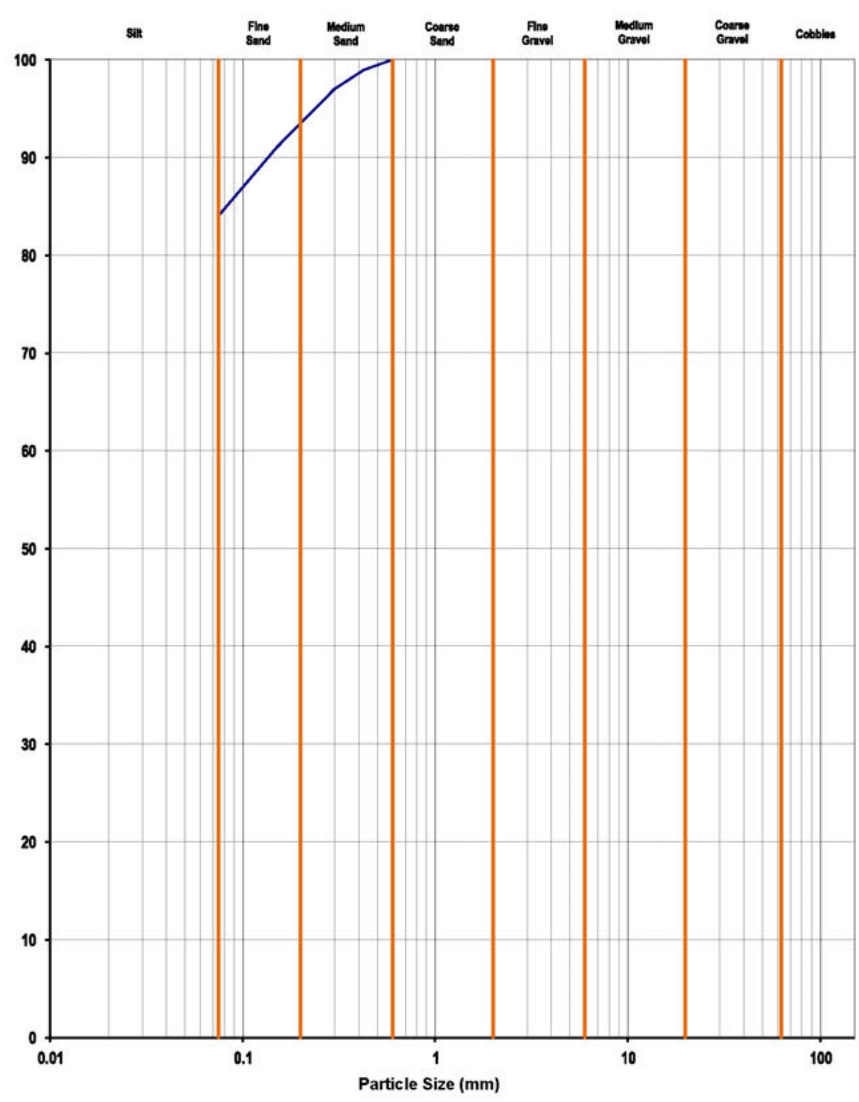
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101096-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2518		
Bore Hole	310-01-DH2518-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	100
0.425	99
0.300	97
0.150	91
0.075	84



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 84% passing for 0.075 mm and reaches 100% passing at 0.600 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.850 mm), Coarse Sand (0.850 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 25.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

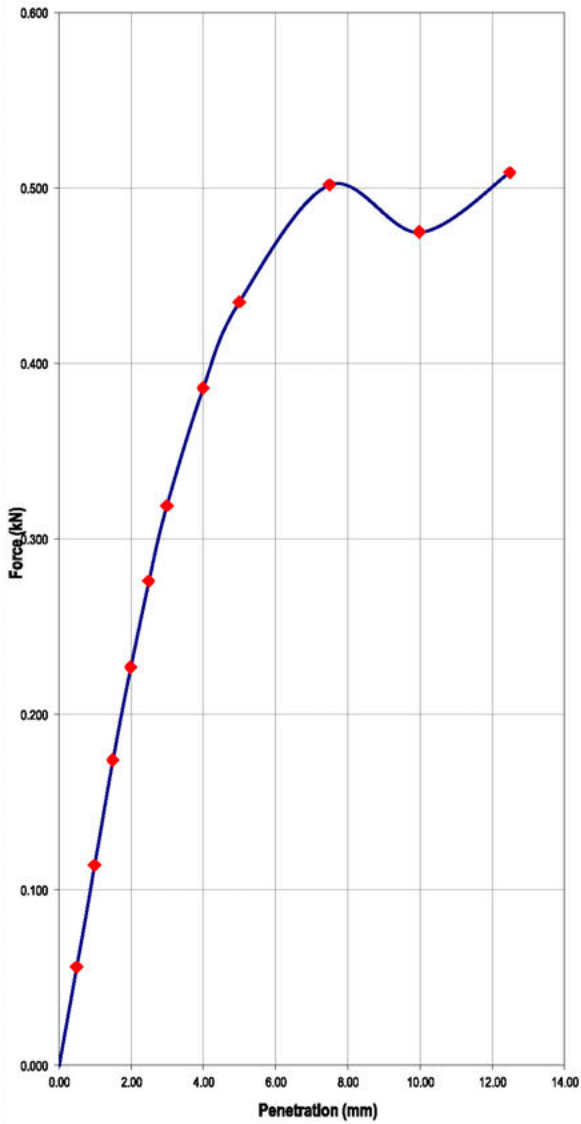
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101099-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2521-B00020	Force v's Penetration 
Client Sample No.	310-01-DH2521	
Depth From/To(m)	0.20-0.60	
Description	Sandy Silty CLAY - dark brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	13.6	
Maximum Dry Density (t/m³)	1.68	
Optimum Moisture Content (%)	18.2	
Nominated/Achieved Dry Density (t/m³)	1.60 / 1.60	
Nominated/Achieved Moisture Content (%)	18.2 / 18.2	
Laboratory Density Ratio (%)	95.0	
Laboratory Moisture Ratio (%)	99.7	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	3.2	
Moisture Content of Top 30 mm (%)	31.0	
Moisture Content of Remainder (%)	24.4	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	2	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

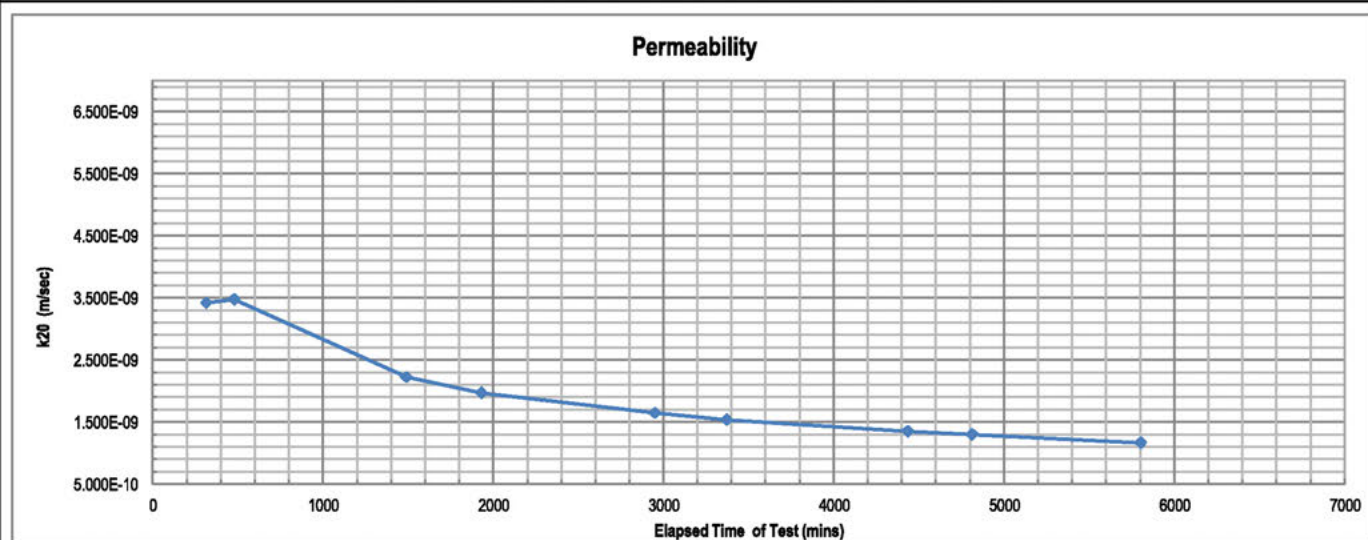
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101099-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	19/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2521
Bore Hole	310-01-DH2521-B00020	Depth From (m)	0.2
Description	Sandy Silty CLAY - dark brown	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.68	Hydraulic Gradient	9.5
Optimum Moisture Content (%)	18.1	Surcharge (kPa)	2.9
Placement Moisture Content (%)	18.0	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	99.3	Water Type	Deaerated
Placement Wet Density (t/m ³)	1.89	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	95.2	Sample Height and Diameter (mm)	116.28 / 100.91 mm

PERMEABILITY $k_{(20)} = 1.2 \times 10^{-09}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

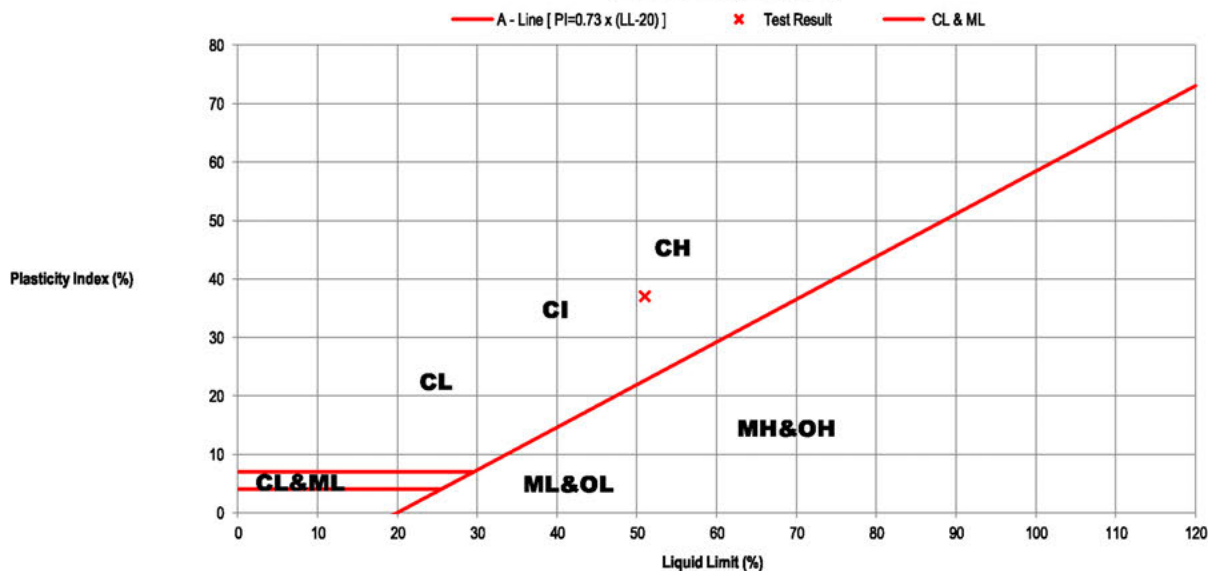
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101100-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2521-U00050	Client Sample No.	310-01-DH2521
Description	U	Depth From (m)	0.5
		Depth To (m)	0.75

RESULTS OF TESTING

Liquid Limit (%)	51	
Plastic Limit (%)	14	
Plasticity Index (%)	37	
Linear Shrinkage (%)	15.5	Curling Occurred
Moisture Content (%)	14.4	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

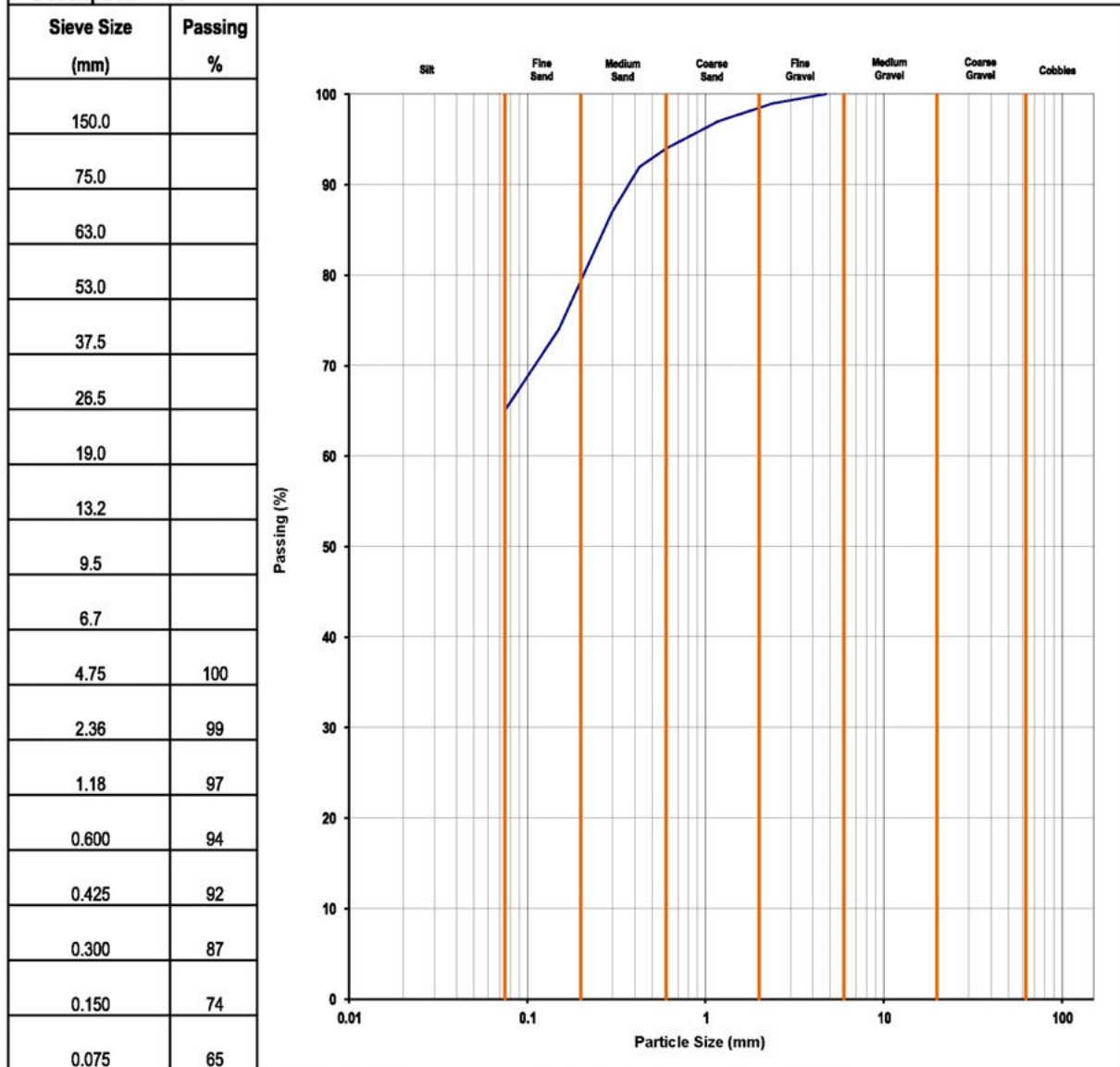
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101100-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
		Test Date	30/10/18-6/10/18
		Report Date	6/11/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2521		
Bore Hole	310-01-DH2521-U00050	Depth From (m)	0.5	Depth To (m)	0.75
Description	U				



NOTES/REMARKS:

-
Moisture Content 14.4%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited	Report No. GA101100-ISS
	Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064	Test Date 30/10/18-5/11/18
	Report Date 5/11/2018
Project Inland Rail B2G	
Description CLAY-brown	
Sample No.	310-01-DH2521
Client ID	310-01-DH2521-U00050
Depth (m)	0.5-0.75
RESULTS OF TESTING	
SWELL SPECIMEN	
Swell Pressure (kPa) *	800
Wet Density (t/m³)	2.15
Initial Moisture Content (%)	14.4
Final Moisture Content (%)	23.2
Swell (%)	11.2
SHRINKAGE SPECIMEN	
Estimated Inert Inclusions (%)	10-20
Extent of Crumbling	Nil
Extent of Cracking	Slight
Moisture (%)	15.3
Shrinkage (%)	2.3
SHRINK SWELL INDEX (Iss) (%)	4.4
Notes/Remarks:	
* Swell pressure determination in accordance with test method AS4133.3.3 Sample/s supplied by client Tested as received	

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

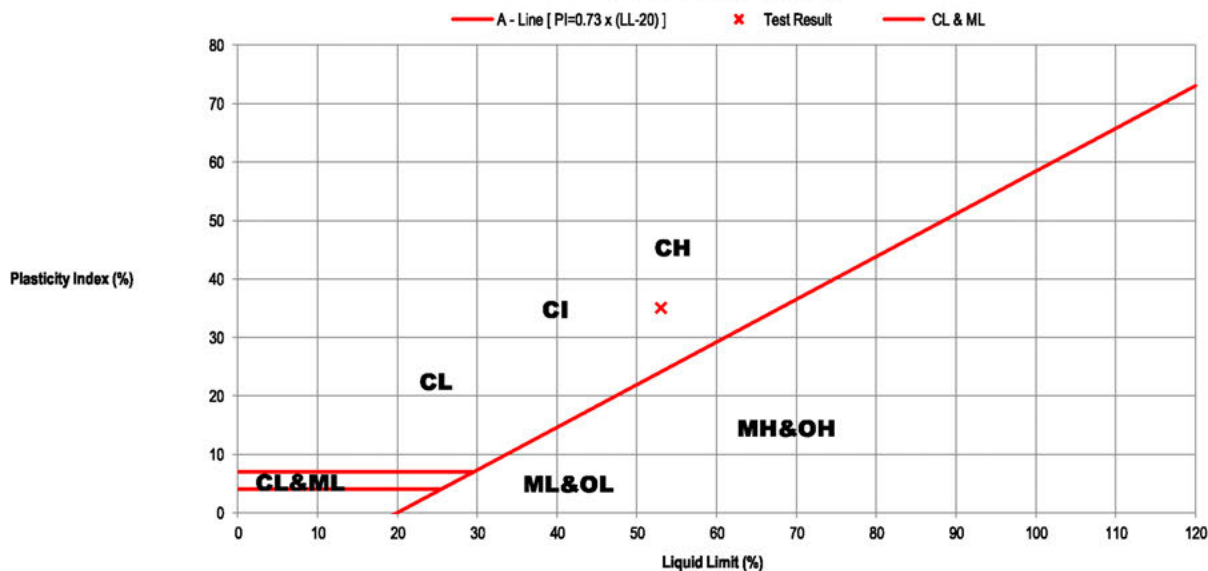
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101102-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	7/11/2018
Bore Hole	310-01-DH2521-S00250	Client Sample No.	310-01-DH2521
Description	SPT	Depth From (m)	2.5
		Depth To (m)	2.95

RESULTS OF TESTING

Liquid Limit (%)	53	
Plastic Limit (%)	18	
Plasticity Index (%)	35	
Linear Shrinkage (%)	14.5	Curling Occurred
Moisture Content (%)	14.5	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

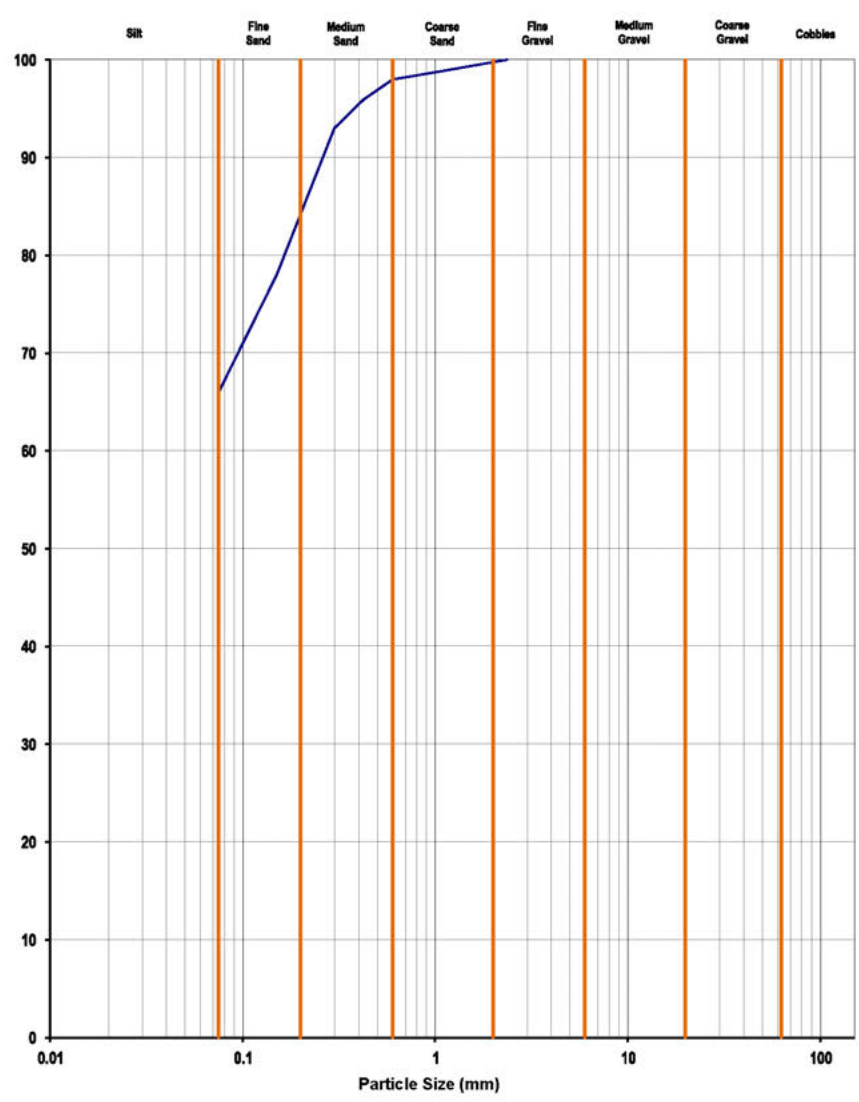
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101102-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2521		
Bore Hole	310-01-DH2521-S00250	Depth From (m)	2.5	Depth To (m)	2.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	98
0.425	96
0.300	93
0.150	78
0.075	66



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 66% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 14.5%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

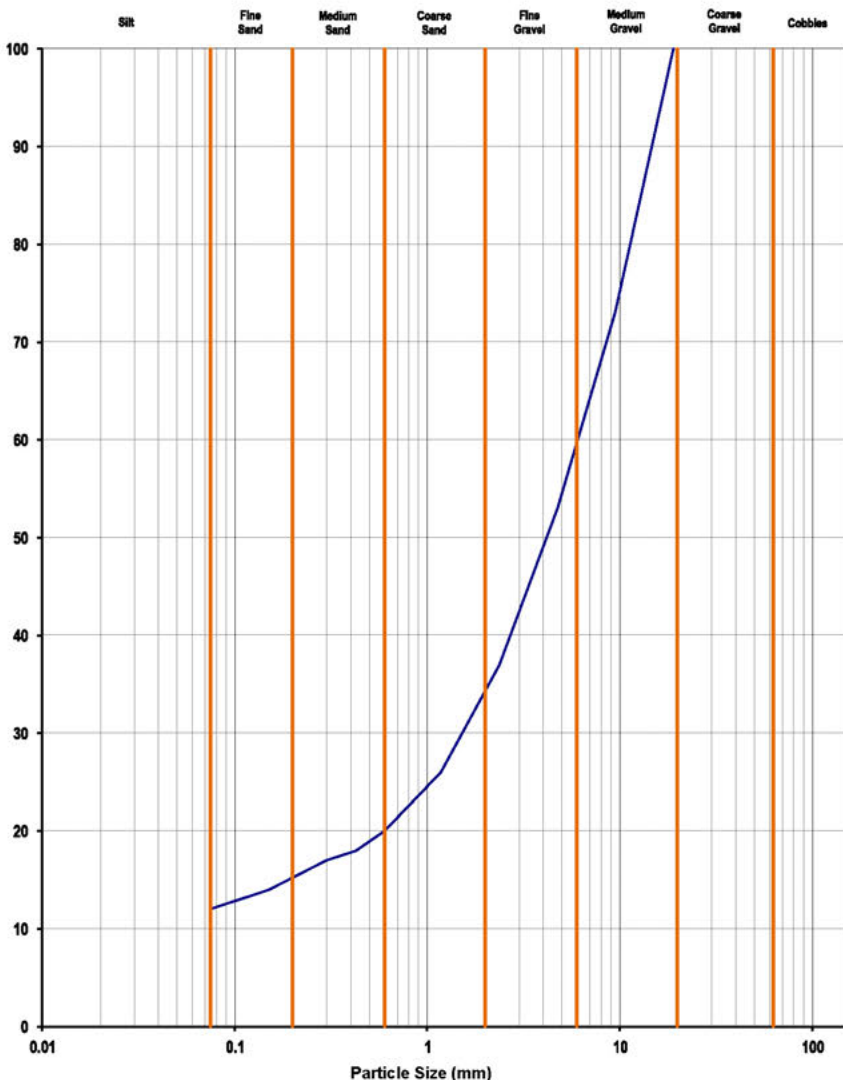
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101103-G			
Address	PO Box 1734 MILTON BC QLD 4064			Request No	R3_BH_Rev1_4030			
Project	Inland Rail B2G							
Project No	1897791		Client Sample No	310-01-DH2541				
Bore Hole	310-01-DH2541-S00050		Depth From (m)	0.5		Depth To (m)	0.58	
Description	SPT							
Sieve Size (mm)	Passing %							
150.0								
75.0								
63.0								
53.0								
37.5								
26.5								
19.0	100							
13.2	81							
9.5	73							
6.7	61							
4.75	53							
2.36	37							
1.18	26							
0.600	20							
0.425	18							
0.300	17							
0.150	14							
0.075	12							
NOTES/REMARKS:		- Moisture Content 4.7% Sample/s supplied by the client						

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

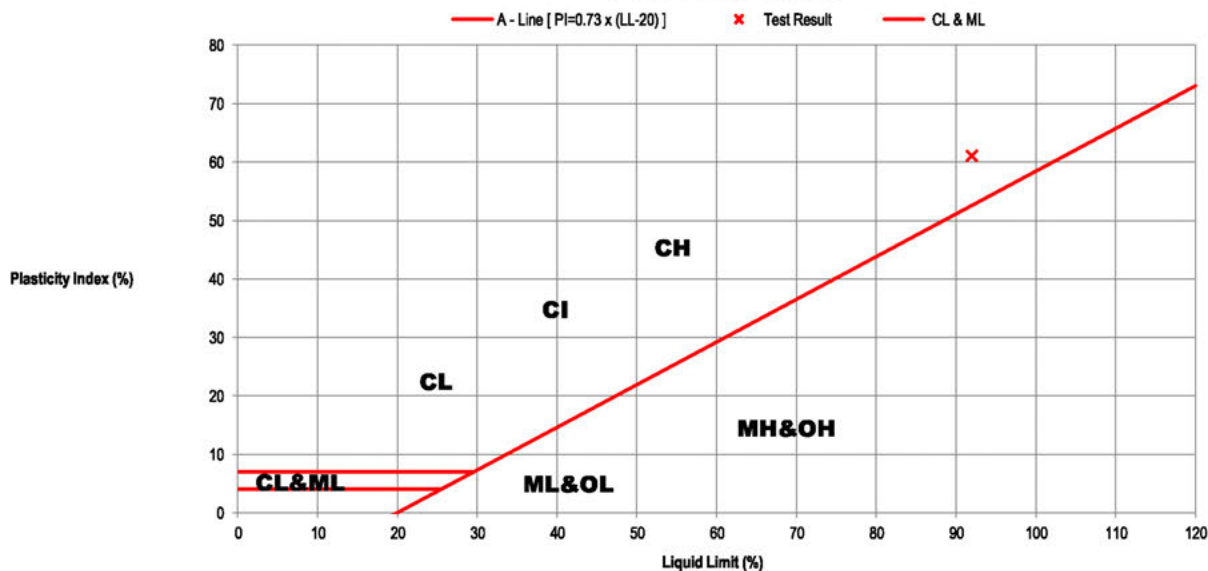
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101104-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2543-S00050	Client Sample No.	310-01-DH2543
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	92	
Plastic Limit (%)	31	
Plasticity Index (%)	61	
Linear Shrinkage (%)	23.0	Cracking & Curling Occurred
Moisture Content (%)	22.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

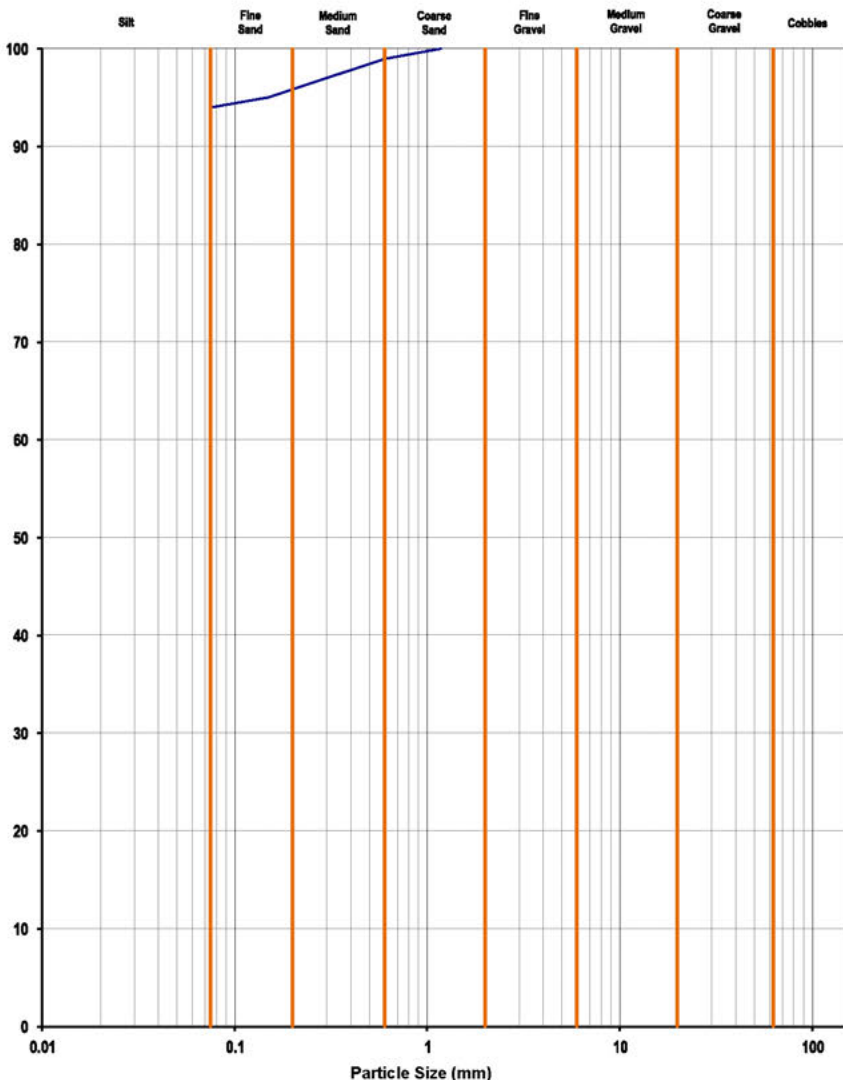
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101104-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2543		
Bore Hole	310-01-DH2543-S00050	Depth From (m)	0.5	Depth To (m)	0.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	98
0.300	97
0.150	95
0.075	94



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at 100% passing for 1.18 mm and decreases to 94% passing for 0.075 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 22.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

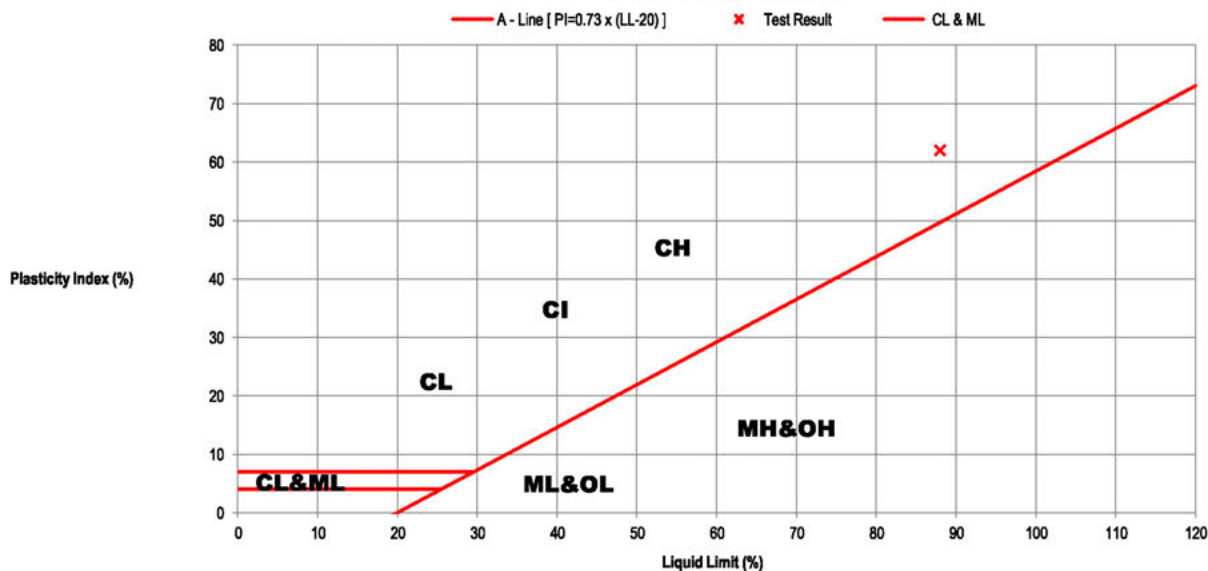
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101116-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2231-U00550	Client Sample No.	310-01-BH2231
Description	U	Depth From (m)	5.5
		Depth To (m)	6

RESULTS OF TESTING

Liquid Limit (%)	88	
Plastic Limit (%)	26	
Plasticity Index (%)	62	
Linear Shrinkage (%)	23.5	Cracking & Curling Occurred
Moisture Content (%)	22.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

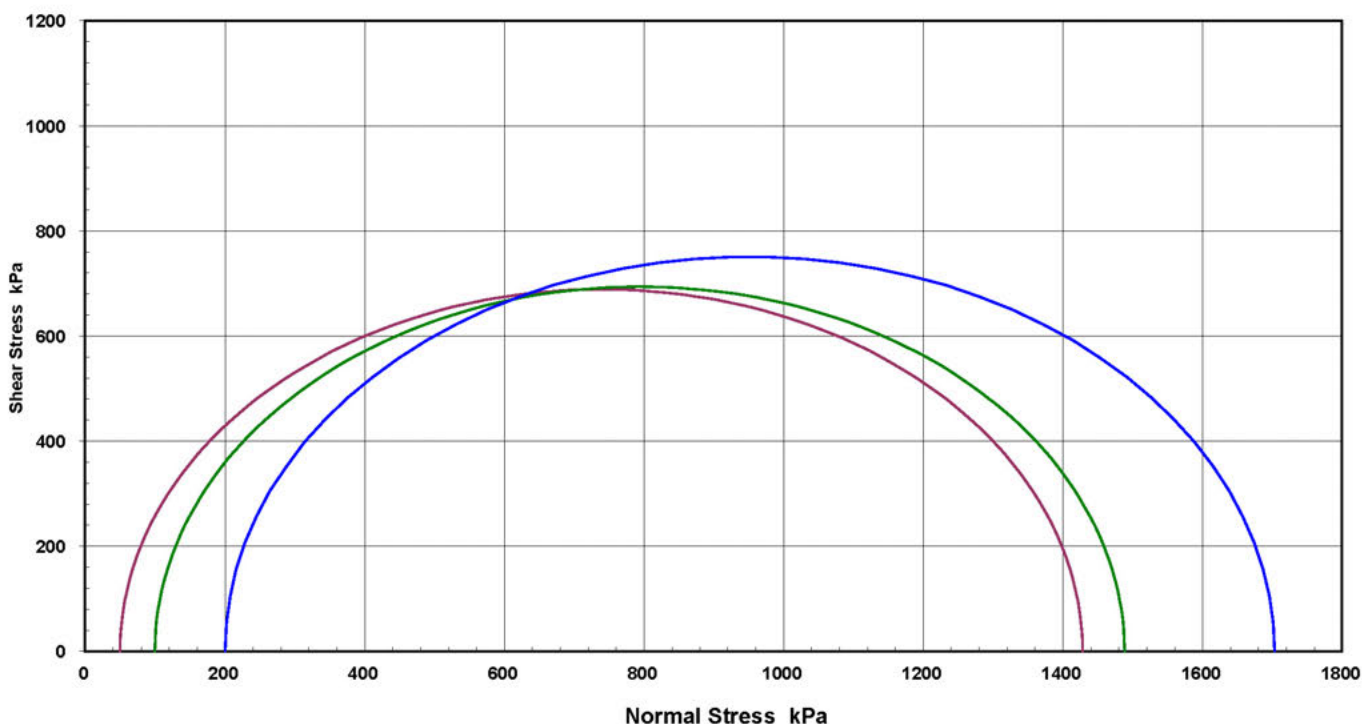
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101116- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	20/11/2018
		Report Date	21/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2231
BoreHole	310-01-BH2231-U00550	Depth From (m)	5.5
		Depth To (m)	6
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS			Initial 22.8 %	Final 22.8 %	Failure Criteria		Peak Shear Stress	
SAMPLE & TEST DETAILS					FAILURE DETAILS			
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
Initial Height	102.3	mm		s ₁	s ₃			
Initial Diameter	47.3	mm		1428 kPa	50 kPa	1378 kPa	1.94 %	
Wet Density	1.98	t/m ³		1489 kPa	100 kPa	1389 kPa	2.00 %	
Dry Density	1.61	t/m ³		1703 kPa	200 kPa	1503 kPa	2.96 %	
Rate of Strain	0.489	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

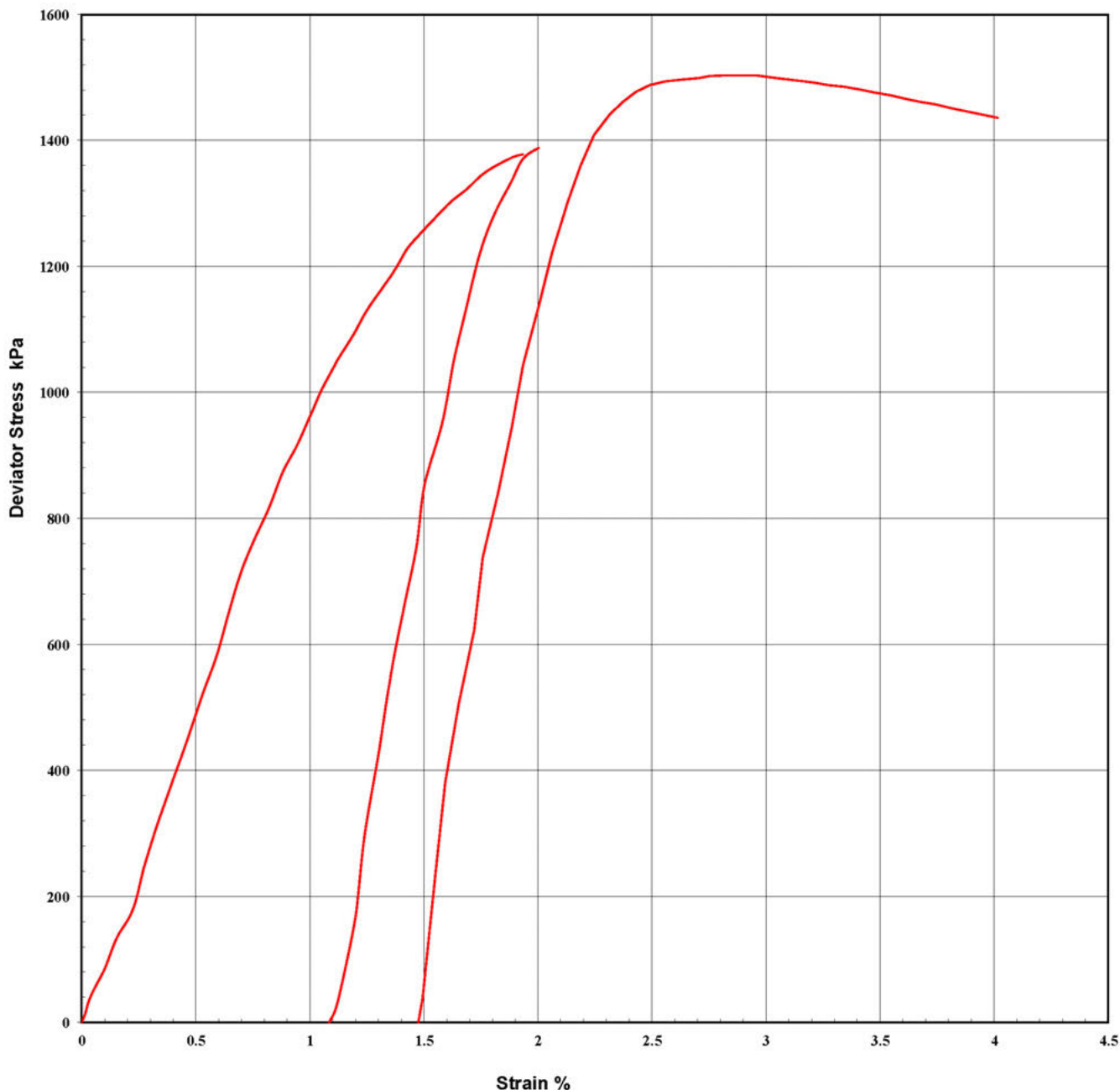
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101116- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101116- UU

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101116	DATE: 01/11/18
BOREHOLE:	310-01-BH2231-U00550	DEPTH: 5.5



PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101116	DATE: 20/11/18
BOREHOLE:	310-01-BH2231-U00550	DEPTH: 5.5



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

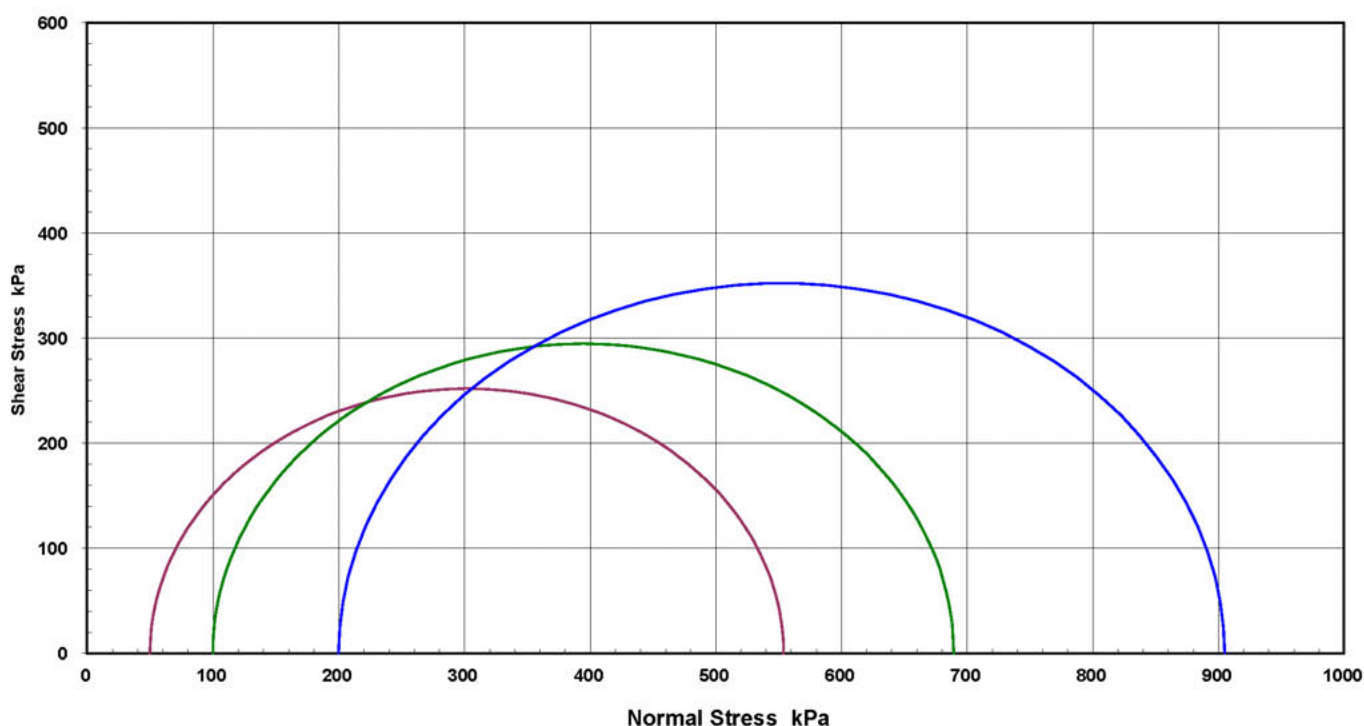
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101132- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	20/11/2018
		Report Date	22/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2233
BoreHole	310-01-BH2233-U01750	Depth From (m)	17.5
		Depth To (m)	17.89
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS			Initial 15.4 %	Final 15.4 %	Failure Criteria		Peak Shear Stress	
SAMPLE & TEST DETAILS					FAILURE DETAILS			
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				s ₁	s ₃			
Initial Height	99.5	mm		554 kPa	50 kPa	504 kPa	1.64 %	
Initial Diameter	47.7	mm		690 kPa	100 kPa	590 kPa	2.27 %	
Wet Density	2.09	t/m ³		905 kPa	200 kPa	705 kPa	4.42 %	
Dry Density	1.81	t/m ³						
Rate of Strain	0.503	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

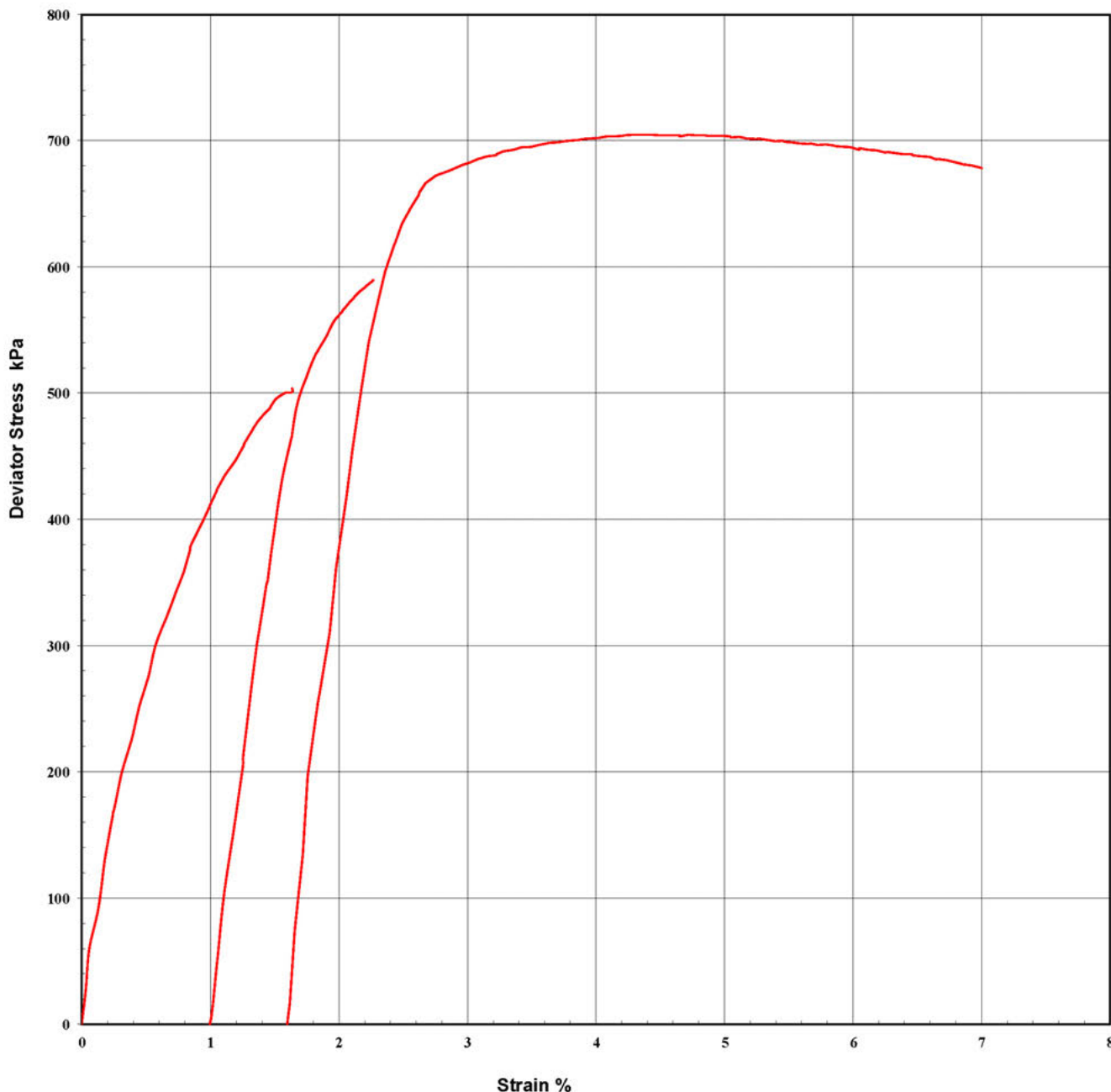
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101132- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101132- UU

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101132	DATE: 01/11/18
BOREHOLE:	310-01-BH2233-U01750	DEPTH: 17.5



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101132	DATE: 20/11/18
BOREHOLE:	310-01-BH2233-U01750	DEPTH: 17.5



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

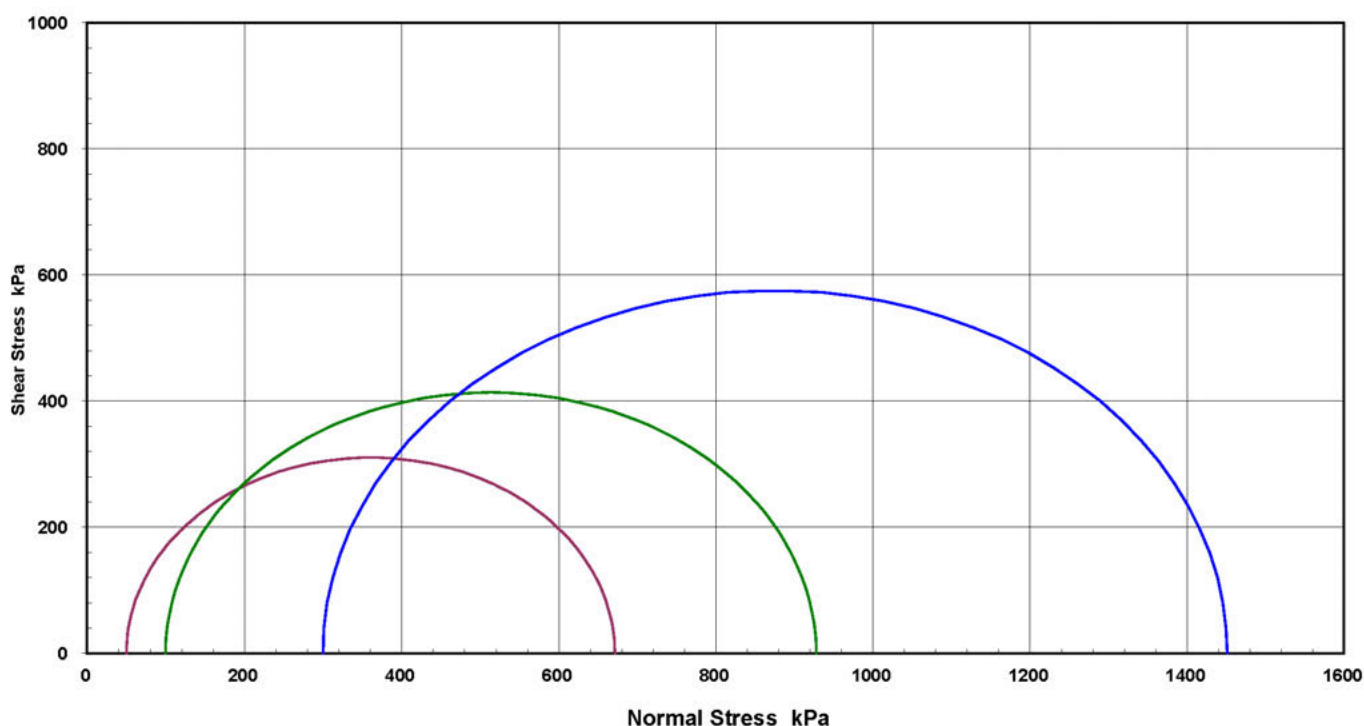
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	Golder Associates Pty Limited	Report No.	GA101144- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	21/11/2018
		Report Date	22/11/2018
Project No.	1897791	Client Sample No.	310-01-BH2235
BoreHole	310-01-BH2235-U02530	Depth From (m)	25.3
		Depth To (m)	25.68
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS			Initial 32.7 %	Final 32.7 %	Failure Criteria		Peak Shear Stress	
SAMPLE & TEST DETAILS					FAILURE DETAILS			
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				s ₁	s ₃			
Initial Height	128.1	mm	50 kPa 100 kPa 300 kPa	672 kPa	50 kPa	622 kPa	2.69 %	
Initial Diameter	60.1	mm		928 kPa	100 kPa	828 kPa	4.66 %	
Wet Density	1.78	t/m ³		1452 kPa	300 kPa	1152 kPa	6.29 %	
Dry Density	1.34	t/m ³						
Rate of Strain	0.390	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

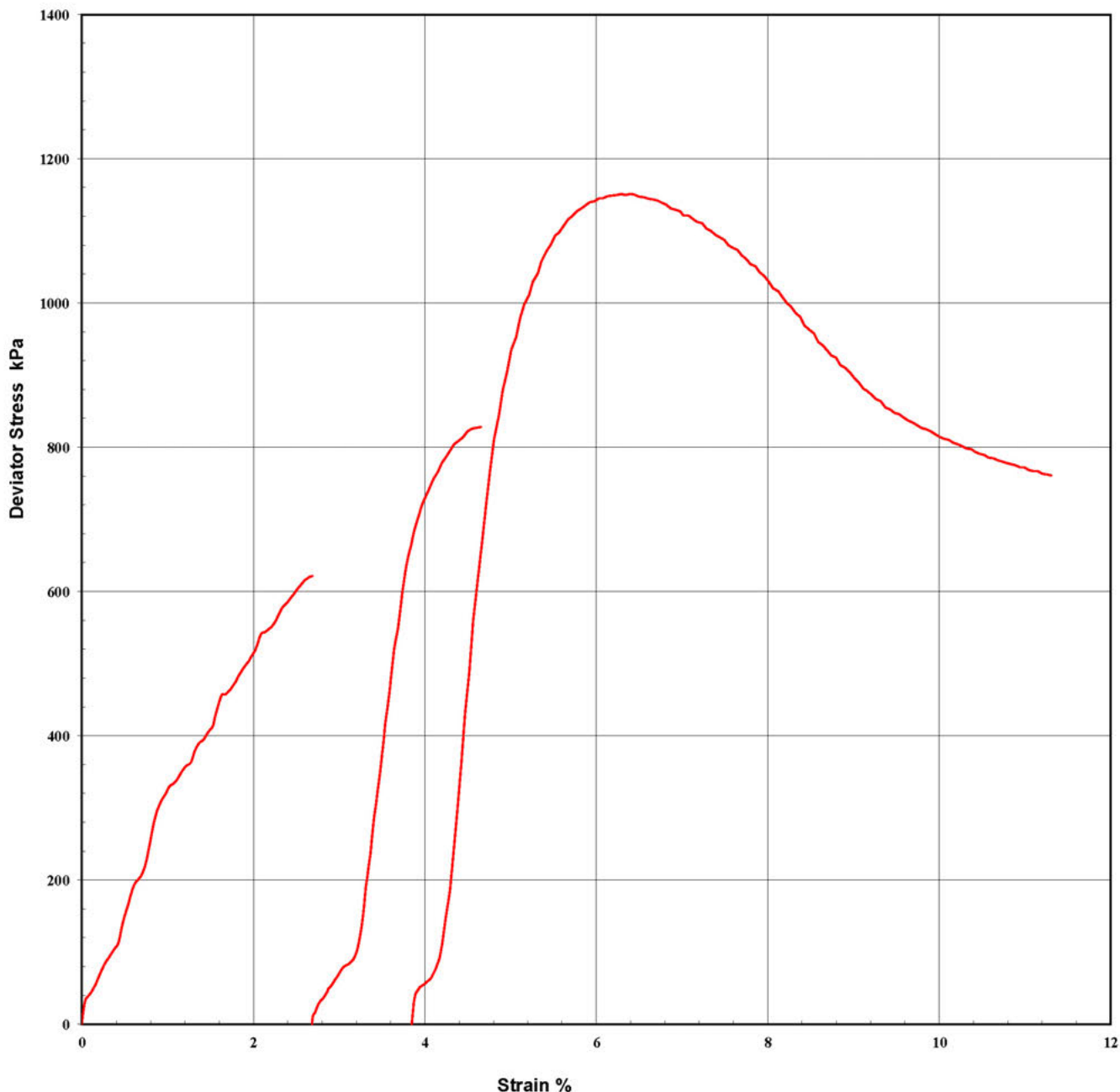
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101144- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client Golder Associates Pty Limited

Report No. GA101144- UU

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101144	DATE: 01/11/18
BOREHOLE:	310-01-BH2235-U02530	DEPTH: 25.3



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101144	DATE: 21/11/18
BOREHOLE:	310-01-BH2235-U02530	DEPTH: 25.3



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

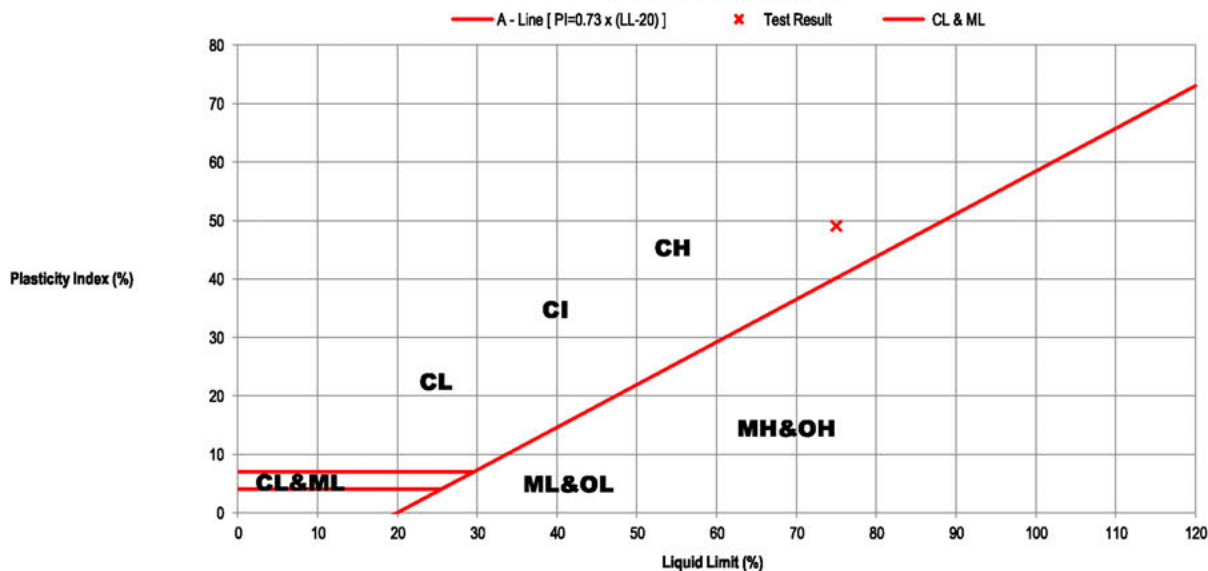
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101077-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4070
Project	Inland Rail B2G	Test Date	29/10/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2617-U00740	Client Sample No.	310-01-BH2617
Description	U	Depth From (m)	7.4
		Depth To (m)	7.85

RESULTS OF TESTING

Liquid Limit (%)	75	
Plastic Limit (%)	26	
Plasticity Index (%)	49	
Linear Shrinkage (%)	20.0	Curling Occurred
Moisture Content (%)	16.5	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

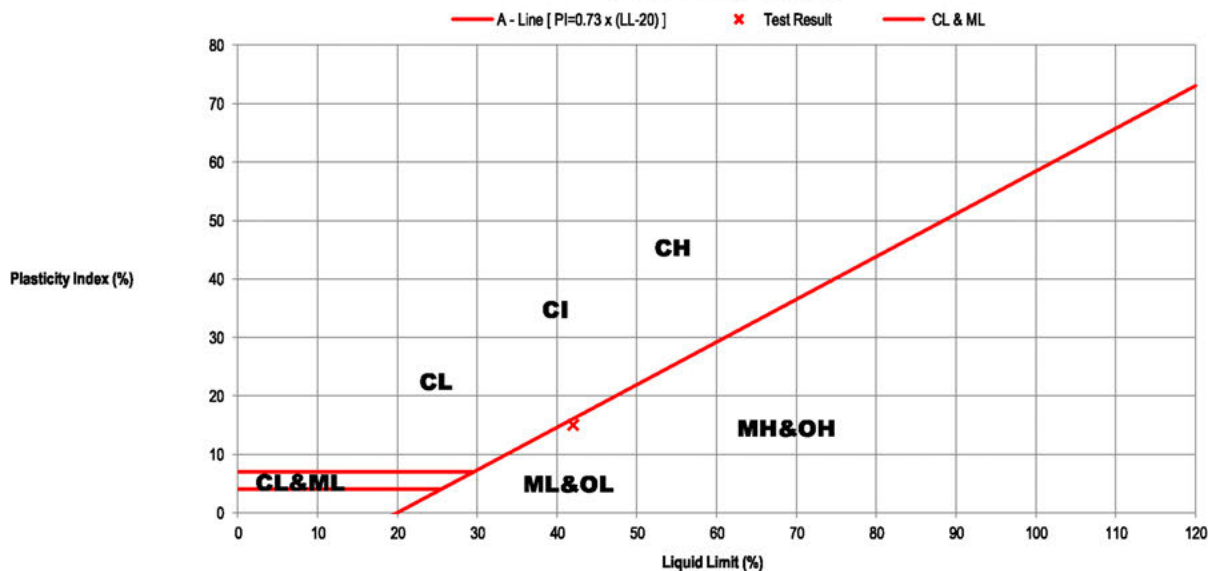
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101081-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-DH2446-B00020	Client Sample No.	310-01-DH2446
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	42	
Plastic Limit (%)	27	
Plasticity Index (%)	15	
Linear Shrinkage (%)	6.5	Cracking & Curling Occurred
Moisture Content (%)	9.9	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

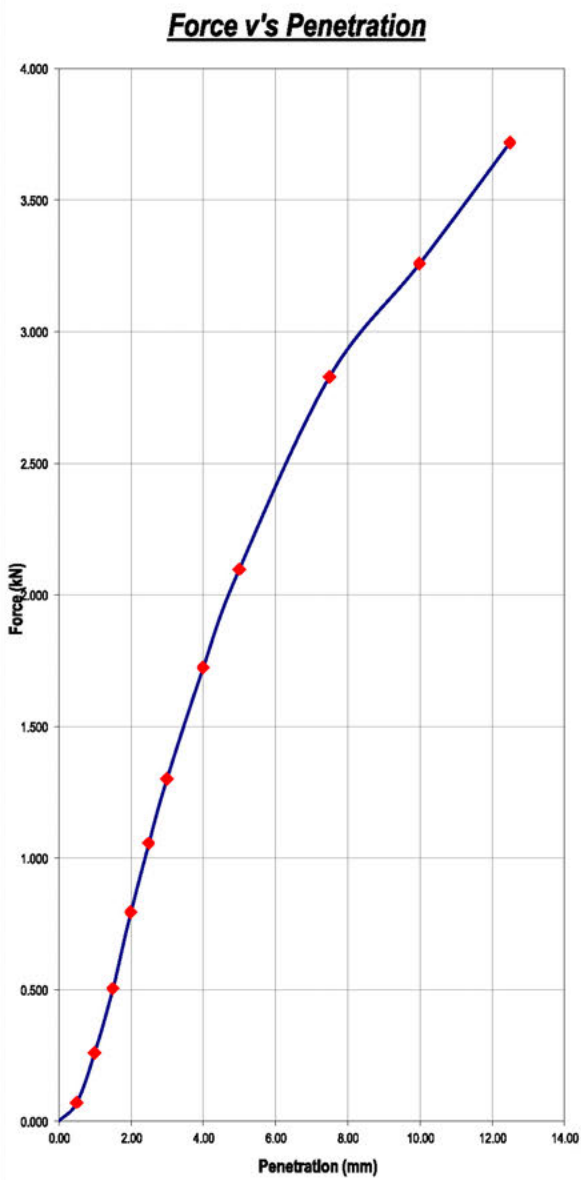
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101081-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2446-B00020	 Force v's Penetration
Client Sample No.	310-01-DH2446	
Depth From/To(m)	0.20-0.60	
Description	Sandy CLAY - brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	9.9	
Maximum Dry Density (t/m³)	1.78	
Optimum Moisture Content (%)	16.0	
Nominated/Achieved Dry Density (t/m³)	1.69 / 1.69	
Nominated/Achieved Moisture Content (%)	16.0 / 16.3	
Laboratory Density Ratio (%)	94.7	
Laboratory Moisture Ratio (%)	101.8	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	0.8	
Moisture Content of Top 30 mm (%)	22.4	
Moisture Content of Remainder (%)	19.4	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	12	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

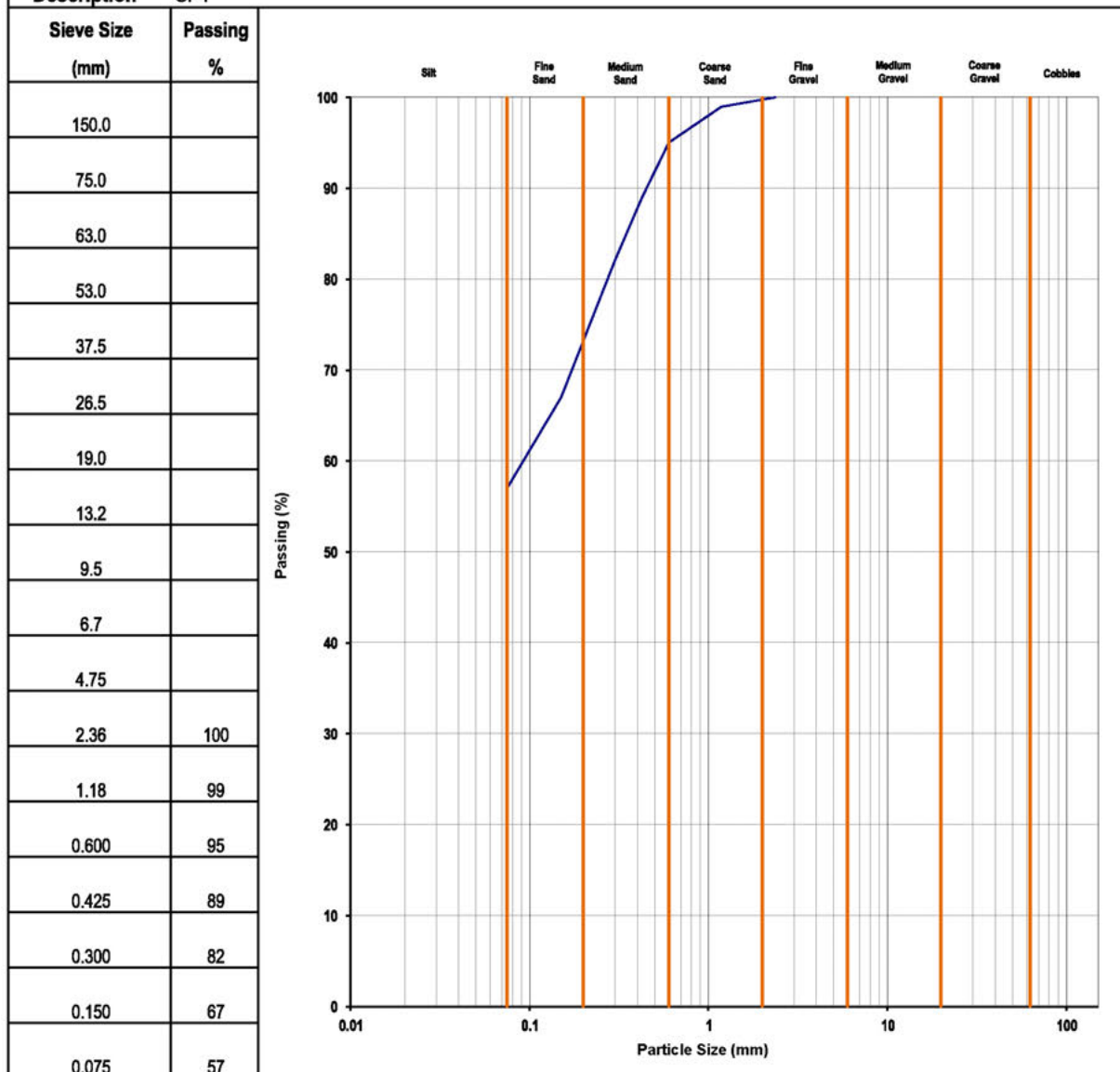
Client	Golder Associates Pty Limited			Report No.	GA101081-G			
Address	PO Box 1734 MILTON BC QLD 4064			Request No	R3_BH_Rev1_4030			
Project	Inland Rail B2G							
Project No	1897791		Client Sample No	310-01-DH2446				
Bore Hole	310-01-DH2446-B00020		Depth From (m)	0.2		Depth To (m)	0.6	
Description	BDS							
Sieve Size (mm)	Passing %							

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101083-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	25/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-DH2508
Bore Hole	310-01-DH2508-S00050	Depth From (m)	0.5
		Depth To (m)	0.95

Description SPT



NOTES/REMARKS:

-
Moisture Content 7.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

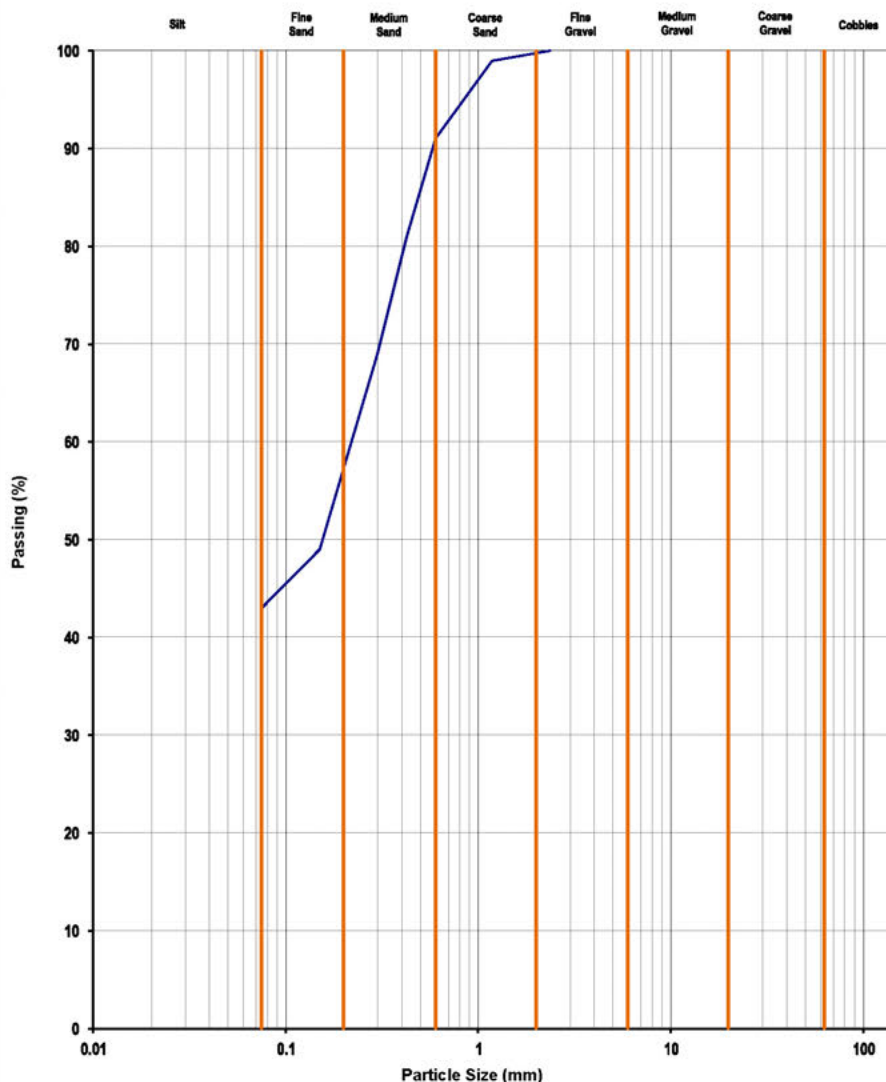
Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101084-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	25/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-DH2508
Bore Hole	310-01-DH2508-S00250	Depth From (m)	2.5
		Depth To (m)	2.645

Description		SPT
Sieve Size	Passing	
(mm)	%	
150.0		
75.0		
63.0		
53.0		
37.5		
26.5		
19.0		
13.2		
9.5		
6.7		
4.75		
2.36	100	
1.18	99	
0.600	91	
0.425	81	
0.300	69	
0.150	49	
0.075	43	

Grain size distribution curve showing passing percentage versus particle size (mm) on a semi-logarithmic scale. The curve starts at 43% passing for 0.075 mm and reaches 100% passing at 2.36 mm. Vertical lines indicate sieve sizes from 0.075 mm to 150 mm. Soil texture labels (Silt, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, Cobbles) are shown at the top.

Particle Size (mm)	Passing (%)
0.075	43
0.150	49
0.300	69
0.425	81
0.600	91
0.850	95
1.180	99
2.360	100



NOTES/REMARKS:

-
Moisture Content 6.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

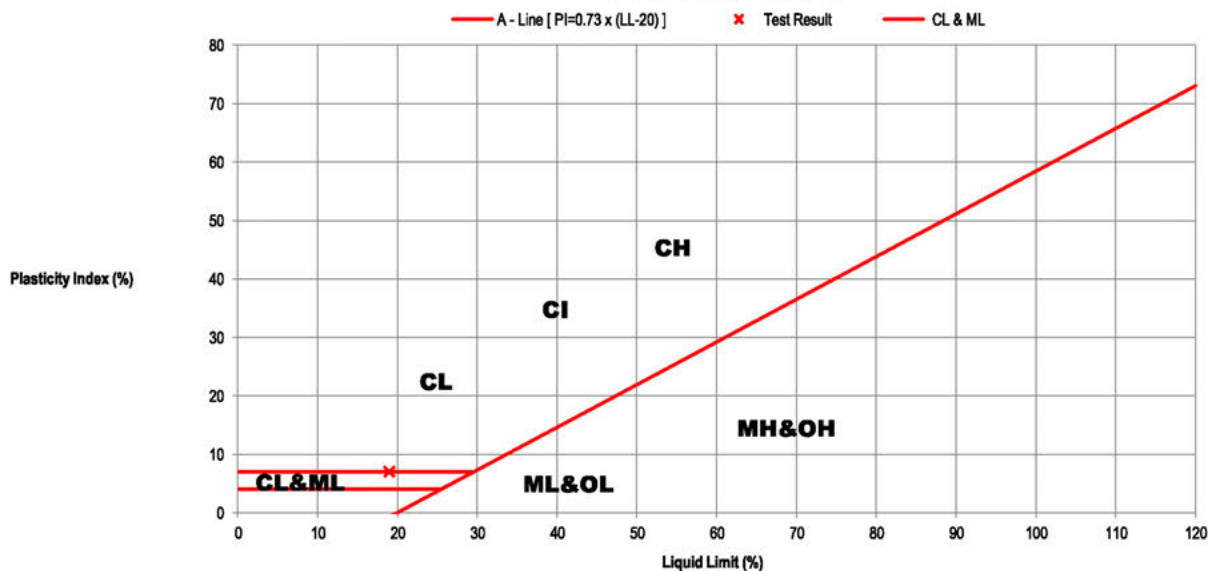
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101085-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-DH2509-S00050	Client Sample No.	310-01-DH2509
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	19	
Plastic Limit (%)	12	
Plasticity Index (%)	7	
Linear Shrinkage (%)	3.0	Cracking & Curling Occurred
Moisture Content (%)	3.7	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

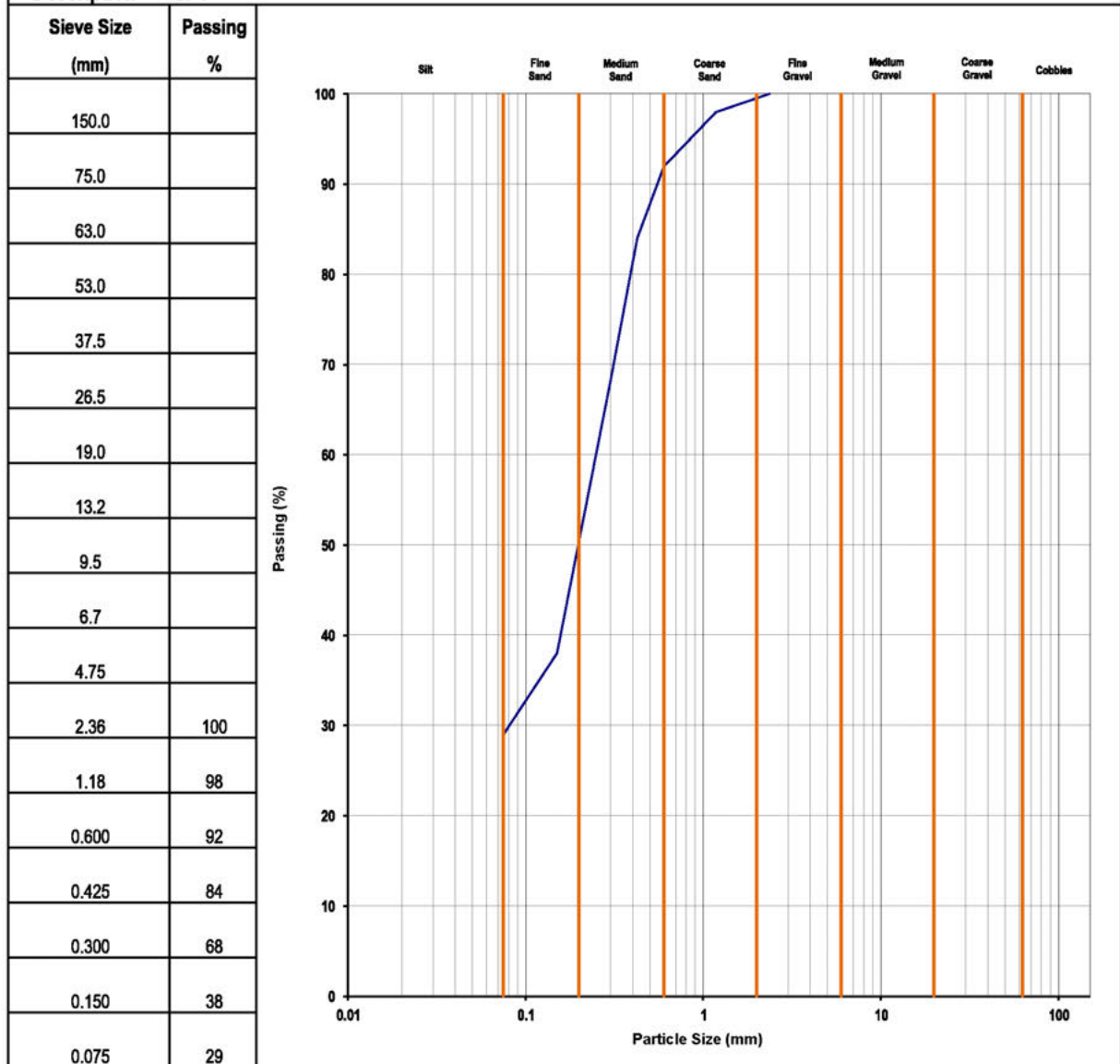
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited		Report No.	GA101085-G
Address	PO Box 1734 MILTON BC	QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G		Test Date	25/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-DH2509	
Bore Hole	310-01-DH2509-S00050	Depth From (m)	0.5	Depth To (m) 0.95

Description SPT



NOTES/REMARKS:

-
Moisture Content 3.7%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

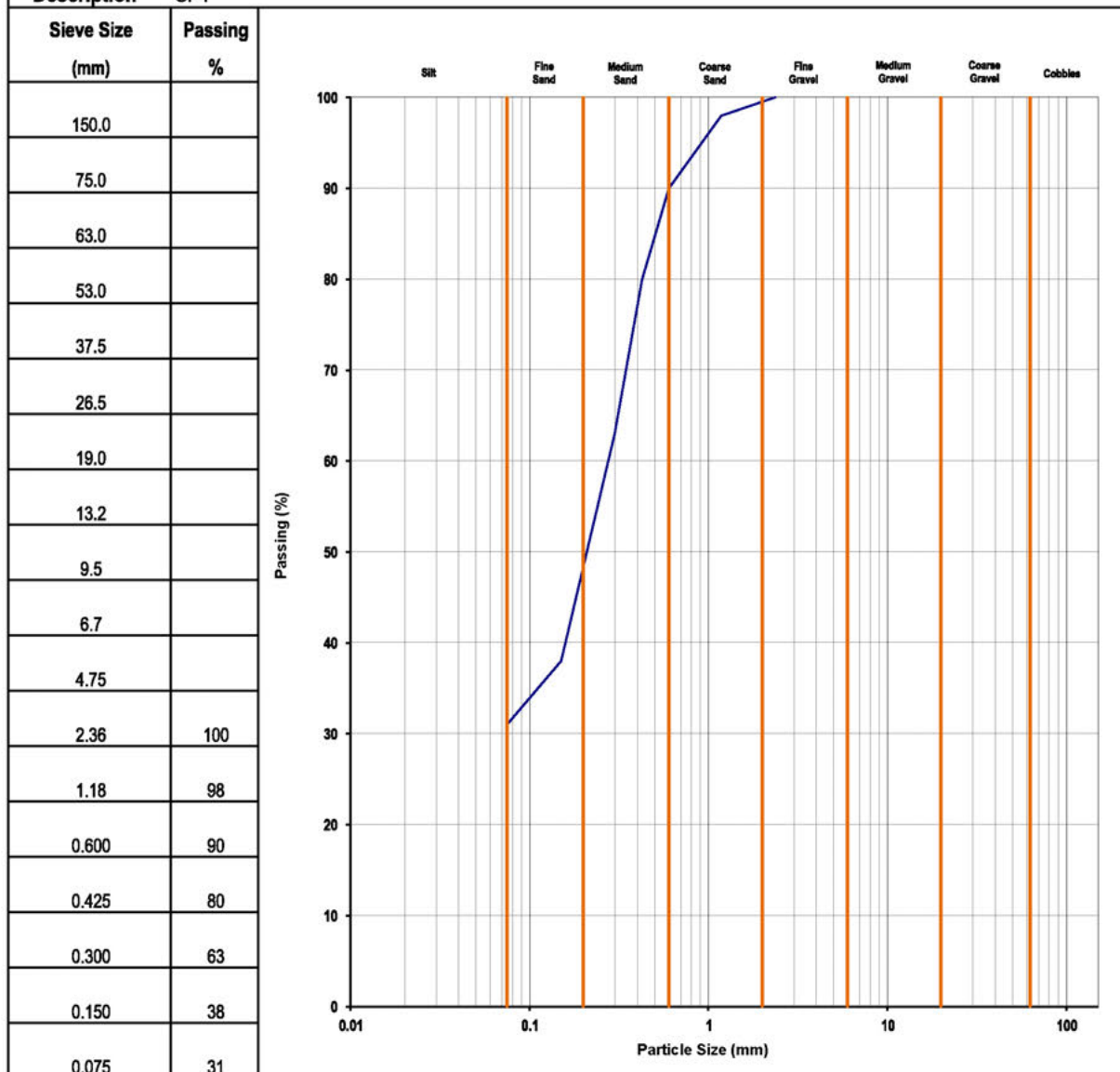
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101086-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	25/10/18-30/10/18
Project No	1897791	Report Date	30/10/2018
Bore Hole	310-01-DH2509-S00650	Client Sample No	310-01-DH2509
Depth From (m)	6.5	Depth To (m)	6.7

Description SPT



NOTES/REMARKS:

-
Moisture Content 8.4%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

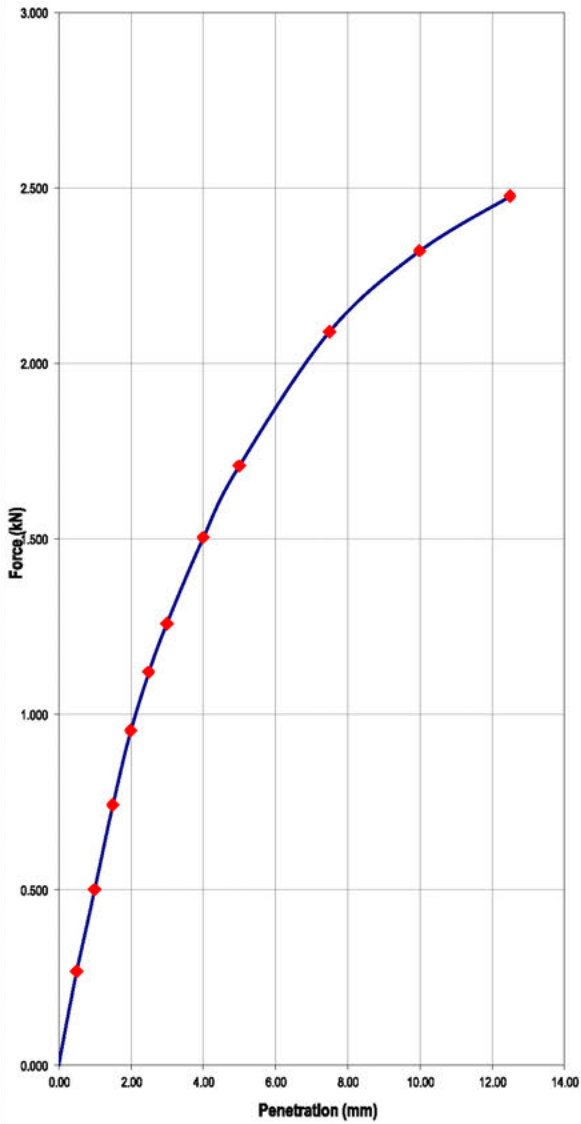
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101087-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2510-B00020	<u>Force v's Penetration</u> 
Client Sample No.	310-01-DH2510	
Depth From/To(m)	0.20-0.60	
Description	Silty SAND - pale brown/grey	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	3.3	
Maximum Dry Density (t/m³)	1.99	
Optimum Moisture Content (%)	9.7	
Nominated/Achieved Dry Density (t/m³)	1.89 / 1.89	
Nominated/Achieved Moisture Content (%)	9.7 / 9.8	
Laboratory Density Ratio (%)	94.8	
Laboratory Moisture Ratio (%)	101.3	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	0.2	
Moisture Content of Top 30 mm (%)	12.5	
Moisture Content of Remainder (%)	11.9	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	9	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

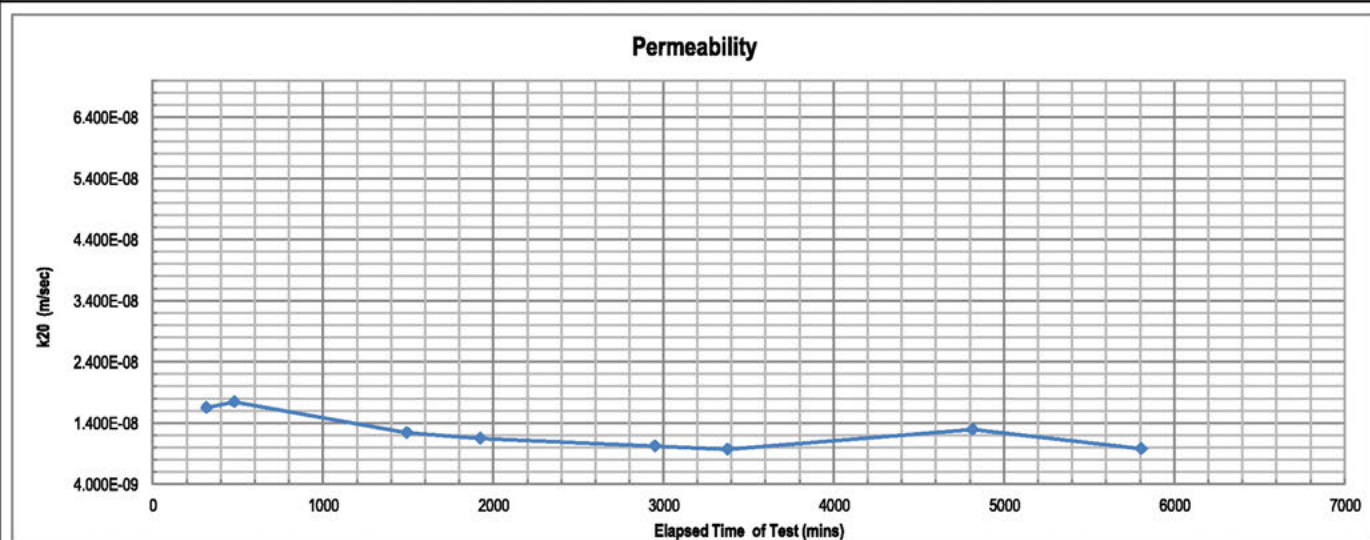
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101087-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	19/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2510
Bore Hole	310-01-DH2510-B00020	Depth From (m)	0.2
Description	Silty SAND - pale brown / grey	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.99	Hydraulic Gradient	9.4
Optimum Moisture Content (%)	9.7	Surcharge (kPa)	3.0
Placement Moisture Content (%)	10.3	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	106.1	Water Type	De-ionized
Placement Wet Density (t/m ³)	2.07	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	94.5	Sample Height and Diameter (mm)	116.48 / 101.1 mm

PERMEABILITY $k_{(20)} = 9.8 \times 10^{-09}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

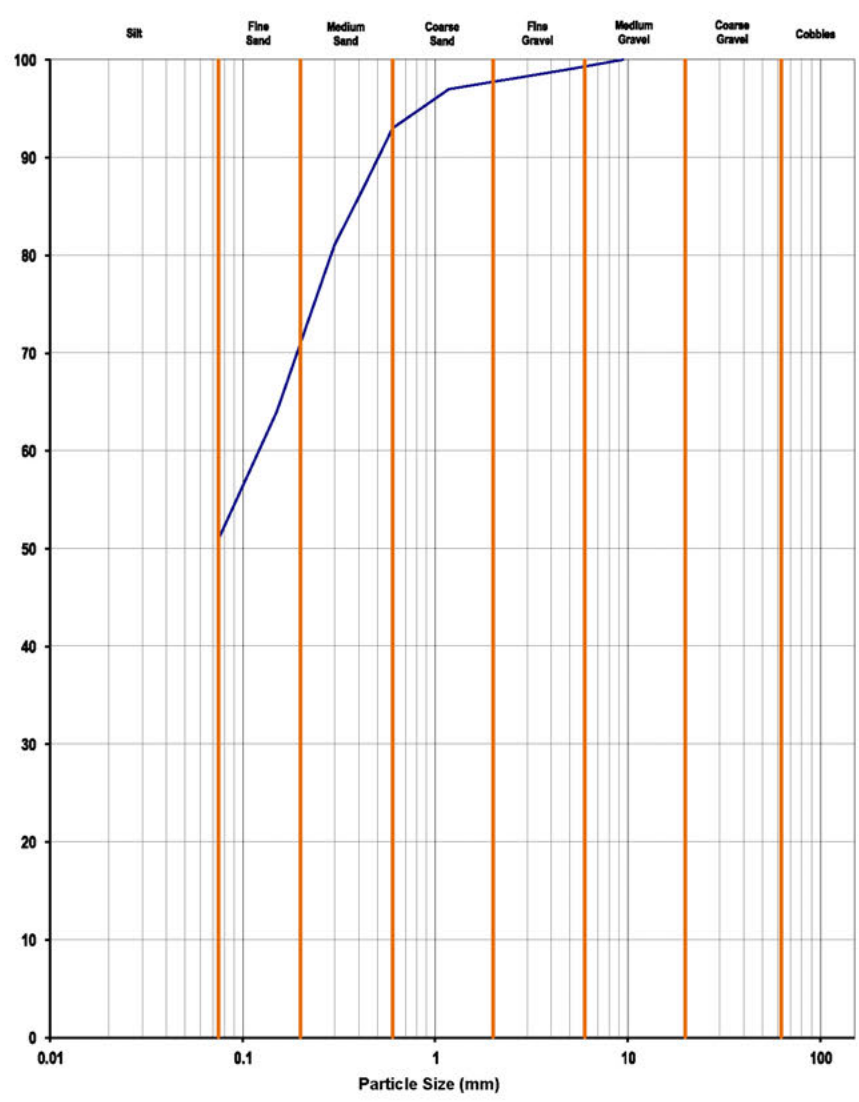
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101087-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2510		
Bore Hole	310-01-DH2510-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	100
4.75	99
2.36	98
1.18	97
0.600	93
0.425	87
0.300	81
0.150	64
0.075	51



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 51% passing for 0.075 mm and rises to 100% passing at 6.7 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 3.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

CERTIFICATE OF ANALYSIS

Work Order : **EB1826673**
Client : **TRILAB PTY LTD**
Contact : **MR CHRIS CHANNON**
Address : **346A BILSEN RD**
GEEBUNG QLD, AUSTRALIA 4031
Telephone : **+61 07 3265 5656**
Project : **1897791 - Inland Rail B2G**
Order number : **BNE 1910024**
C-O-C number : **---**
Sampler : **---**
Site : **---**
Quote number : **EN/333**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division Brisbane**
Contact : **Customer Services EB**
Address : **2 Byth Street Stafford QLD Australia 4053**
Telephone : **+61-7-3243 7222**
Date Samples Received : **02-Nov-2018 11:20**
Date Analysis Commenced : **05-Nov-2018**
Issue Date : **09-Nov-2018 15:10**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				101088 / 310-01-DH2510-S0005 0 / 0.50-0.95m	101092 / 310-01-DH2516-S0010 0 / 1.00-1.45m	101095 / 310-01-DH2517-S0010 0 / 1.00-1.45m	101101 / 310-01-DH2521-S0010 0 / 1.00-1.45m	----
Client sampling date / time				02-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EB1826673-001	EB1826673-002	EB1826673-003	EB1826673-004	-----
				Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	6.8	9.2	6.6	9.3	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	2.3	12.4	3.0	14.5	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	80	20	60	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	20	780	880	820	----

QUALITY CONTROL REPORT

Work Order	: EB1826673	Page	: 1 of 3
Client	: TRILAB PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS CHANNON	Contact	: Customer Services EB
Address	: 346A BILSEN RD GEEBUNG QLD, AUSTRALIA 4031	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3265 5656	Telephone	: +61-7-3243 7222
Project	: 1897791 - Inland Rail B2G	Date Samples Received	: 02-Nov-2018
Order number	: BNE 1910024	Date Analysis Commenced	: 05-Nov-2018
C-O-C number	: ---	Issue Date	: 09-Nov-2018
Sampler	: ---		
Site	: ---		
Quote number	: EN/333		
No. of samples received	: 4		
No. of samples analysed	: 4		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA002: pH 1:5 (Soils) (QC Lot: 2019743)									
EB1826673-002	101092 / 310-01-DH2516-S00100 / 1.00-1.45m	EA002: pH Value	----	0.1	pH Unit	9.2	9.1	1.09	0% - 20%
EB1826663-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.3	7.2	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2019752)									
EB1826672-001	Anonymous	EA055: Moisture Content	----	0.1	%	17.3	18.6	7.16	0% - 20%
EB1826674-006	Anonymous	EA055: Moisture Content	----	0.1	%	18.3	18.3	0.00	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 2019744)									
EB1826674-005	Anonymous	ED040S: Sulfate as SO ₄ 2-	14808-79-8	10	mg/kg	20	20	0.00	No Limit
EB1826672-001	Anonymous	ED040S: Sulfate as SO ₄ 2-	14808-79-8	10	mg/kg	<10	<10	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2019745)									
EB1826674-006	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	360	360	0.00	0% - 20%
EB1826672-001	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	30	20	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EA002: pH 1:5 (Soils) (QCLot: 2019743)								
EA002: pH Value	----	---	pH Unit	----	4 pH Unit	99.2	98	102
				----	7 pH Unit	99.6	98	102
ED040S: Soluble Major Anions (QCLot: 2019744)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	500 mg/kg	91.4	90	114
ED045G: Chloride by Discrete Analyser (QCLot: 2019745)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	98.3	83	119
				<10	5000 mg/kg	106	83	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1826673	Page	: 1 of 4
Client	: TRILAB PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS CHANNON	Telephone	: +61-7-3243 7222
Project	: 1897791 - Inland Rail B2G	Date Samples Received	: 02-Nov-2018
Site	: ----	Issue Date	: 09-Nov-2018
Sampler	: ----	No. of samples received	: 4
Order number	: BNE 1910024	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA002: pH 1:5 (Soils)									
Snap Lock Bag (EA002) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	06-Nov-2018	09-Nov-2018	✓	06-Nov-2018	06-Nov-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)									
Snap Lock Bag (EA055) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	---	---	---	05-Nov-2018	16-Nov-2018	✓
ED040S : Soluble Sulfate by ICPAES									
Snap Lock Bag (ED040S) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	06-Nov-2018	30-Nov-2018	✓	09-Nov-2018	04-Dec-2018	✓
ED045G: Chloride by Discrete Analyser									
Snap Lock Bag (ED045G) 101088 / 310-01-DH2510-S00050 / 0.50-0.95m, 101095 / 310-01-DH2517-S00100 / 1.00-1.45m,		101092 / 310-01-DH2516-S00100 / 1.00-1.45m, 101101 / 310-01-DH2521-S00100 / 1.00-1.45m	02-Nov-2018	06-Nov-2018	30-Nov-2018	✓	09-Nov-2018	04-Dec-2018	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Chloride Soluble By Discrete Analyser	ED045G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

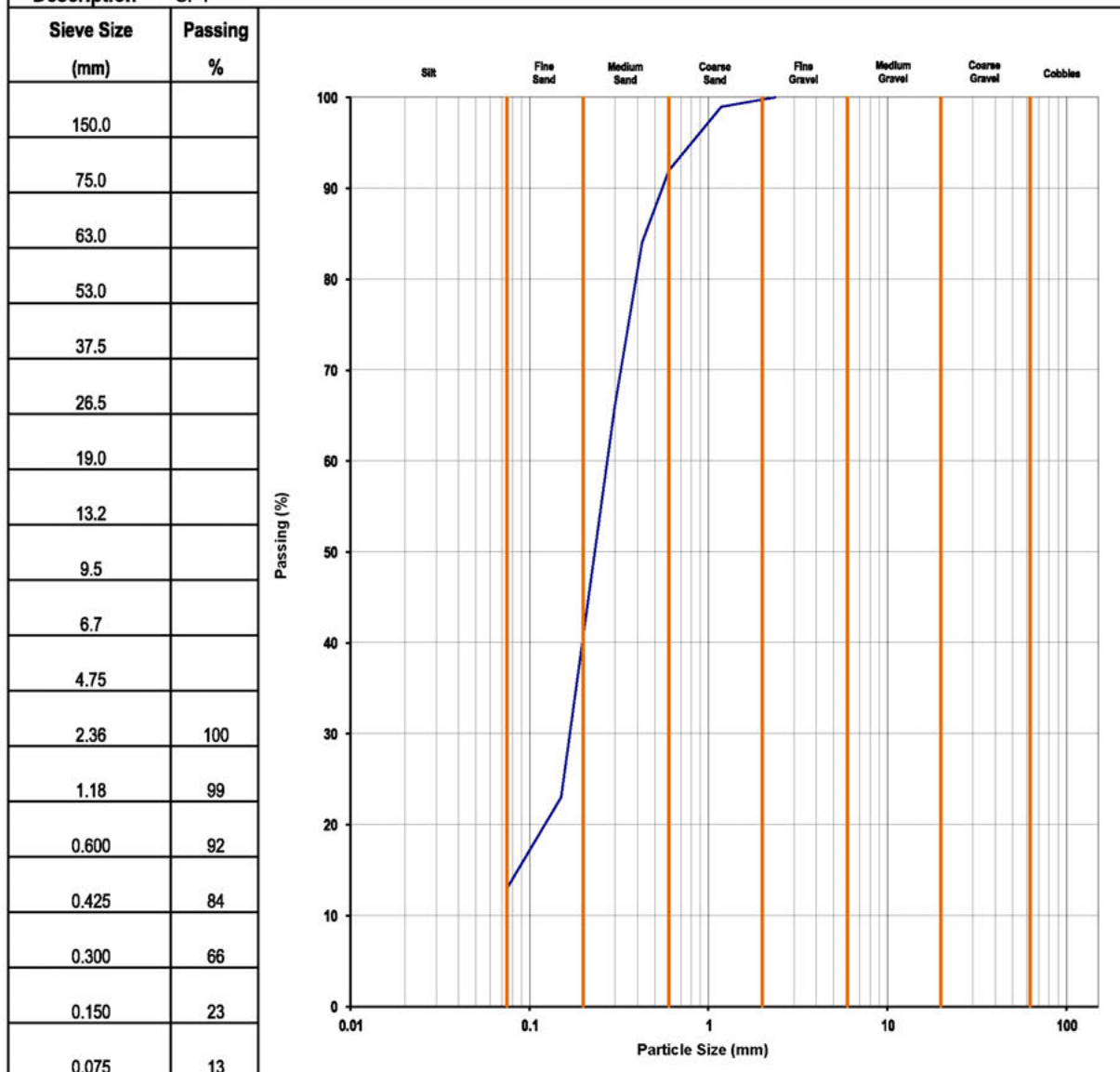
Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101088-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	26/10/18-30/10/18
Project No	1897791	Client Sample No	310-01-DH2510
Bore Hole	310-01-DH2510-S00050	Depth From (m)	0.5
		Depth To (m)	0.95

Description SPT



NOTES/REMARKS:

-
Moisture Content 3.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

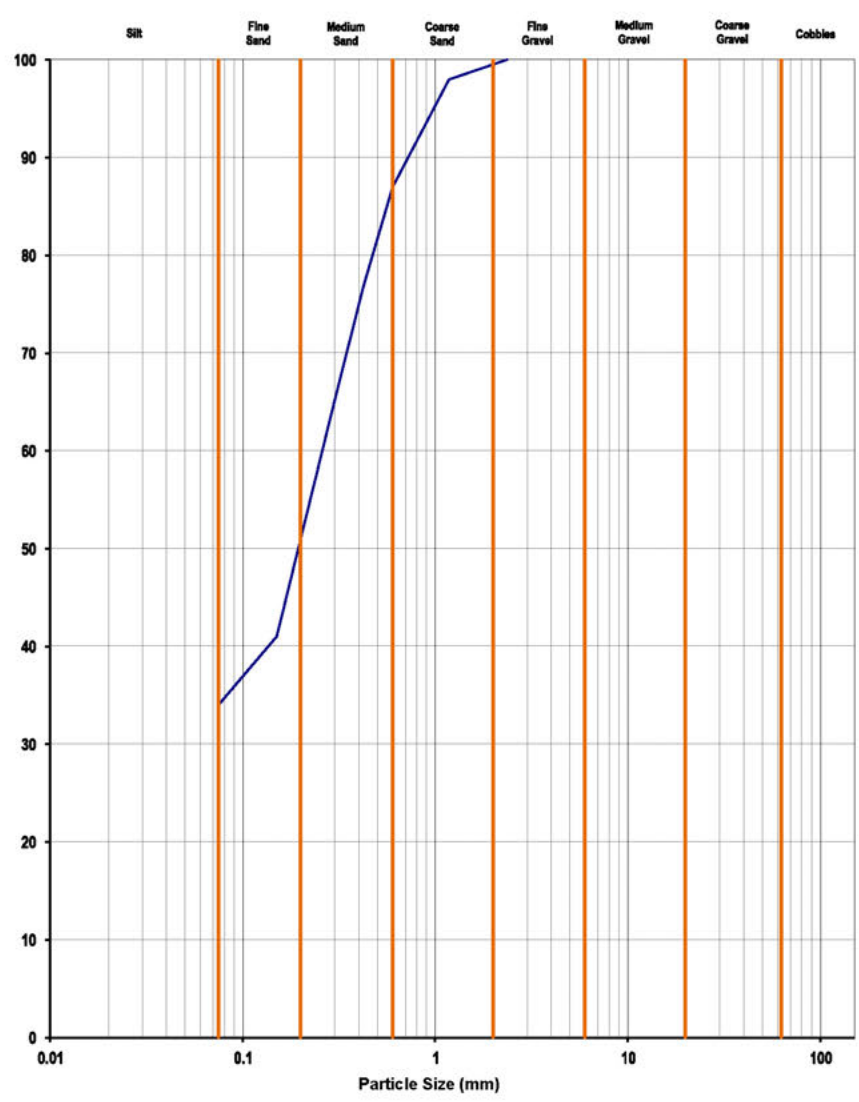
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101089-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2510		
Bore Hole	310-01-DH2510-S00250	Depth From (m)	2.5	Depth To (m)	2.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	98
0.600	87
0.425	77
0.300	65
0.150	41
0.075	34



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 34% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 5.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

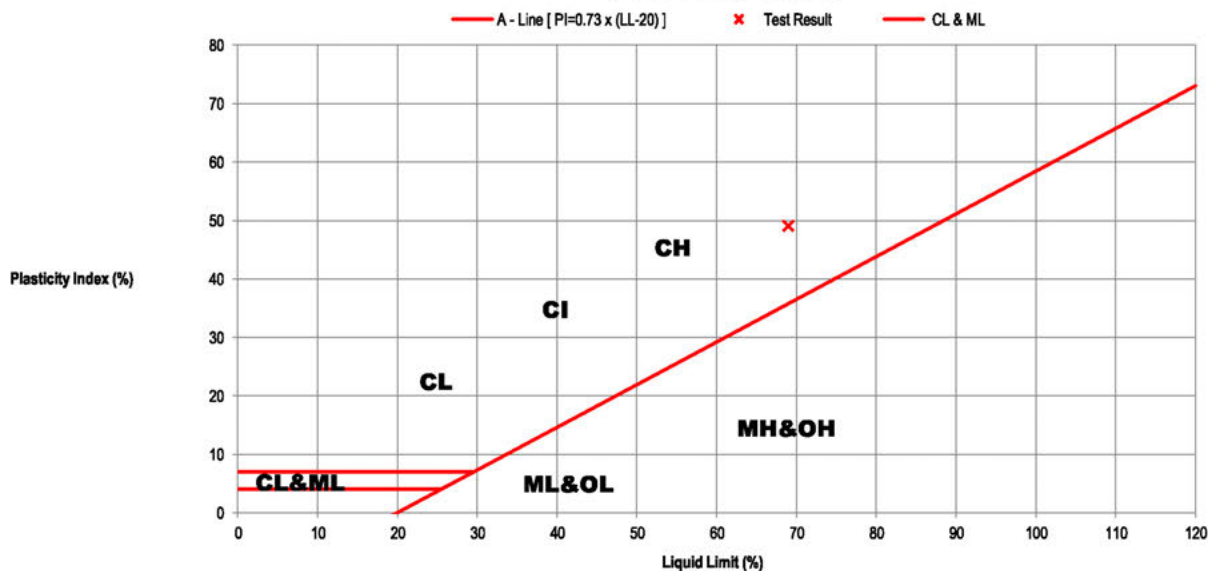
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101090-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2516-B00020	Client Sample No.	310-01-DH2516
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	69	
Plastic Limit (%)	20	
Plasticity Index (%)	49	
Linear Shrinkage (%)	18.0	Cracking & Curling Occurred
Moisture Content (%)	16.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

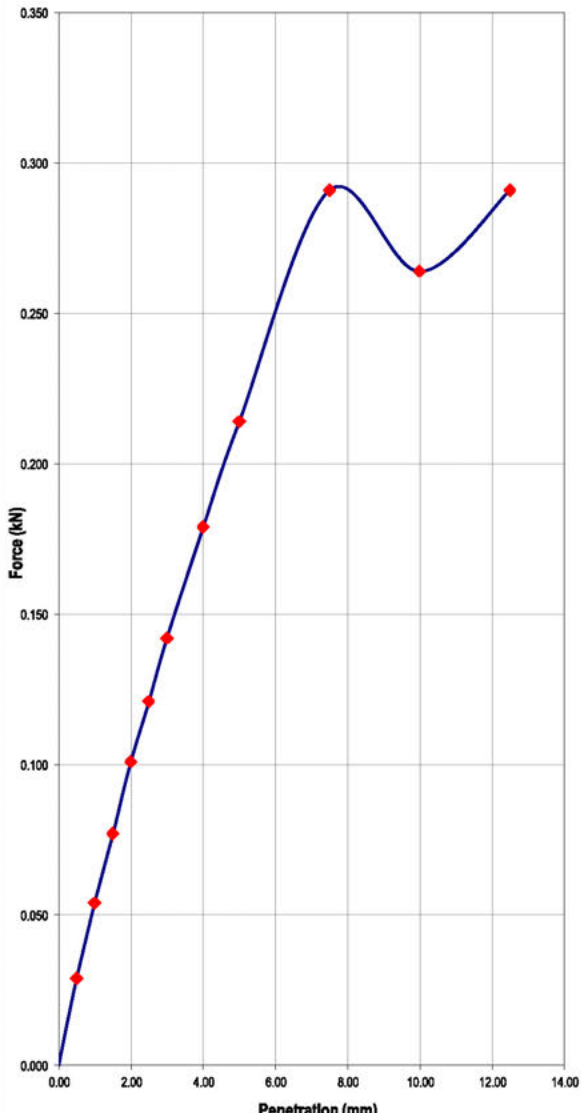
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101090-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2516-B00020	Force v's Penetration 
Client Sample No.	310-01-DH2516	
Depth From/To(m)	0.20-0.60	
Description	Sandy Silty CLAY - black	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	16.6	
Maximum Dry Density (t/m³)	1.53	
Optimum Moisture Content (%)	20.3	
Nominated/Achieved Dry Density (t/m³)	1.45 / 1.45	
Nominated/Achieved Moisture Content (%)	20.3 / 20.2	
Laboratory Density Ratio (%)	95.0	
Laboratory Moisture Ratio (%)	99.5	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	9.8	
Moisture Content of Top 30 mm (%)	42.3	
Moisture Content of Remainder (%)	25.4	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	1	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

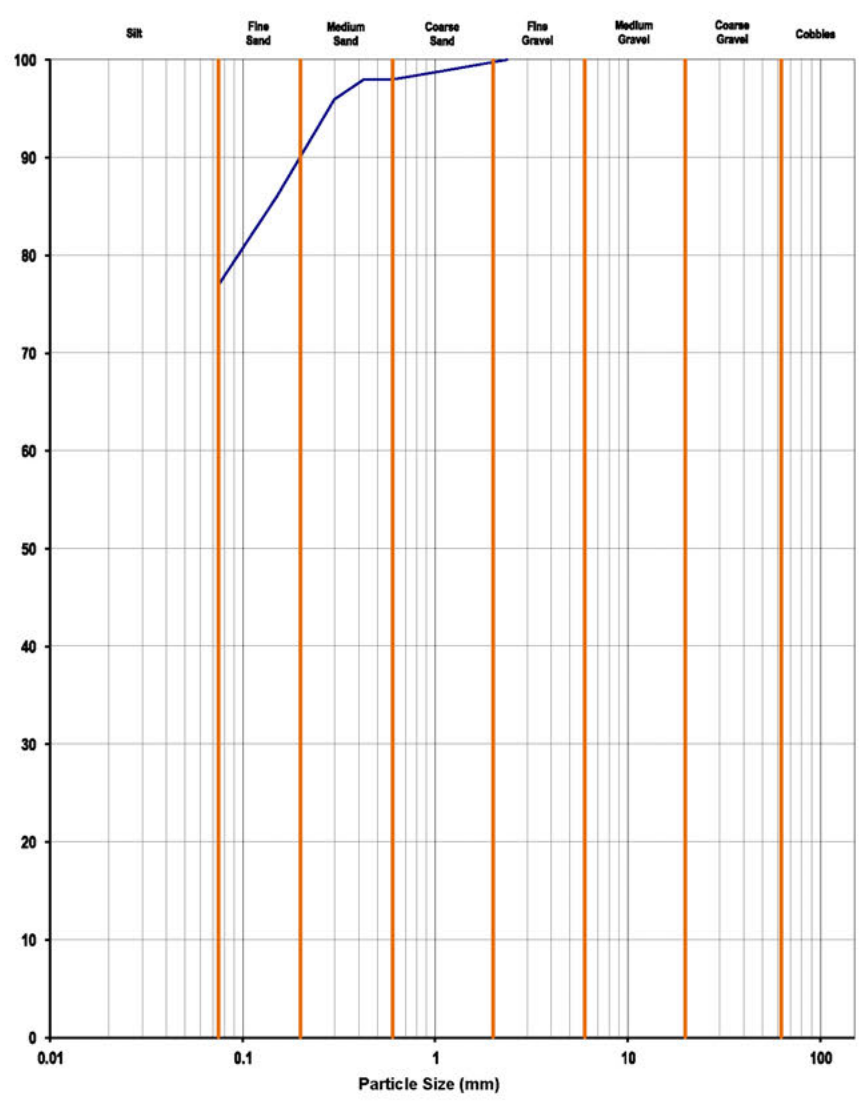
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101090-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2516		
Bore Hole	310-01-DH2516-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	98
0.425	98
0.300	96
0.150	86
0.075	77



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 77% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 16.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

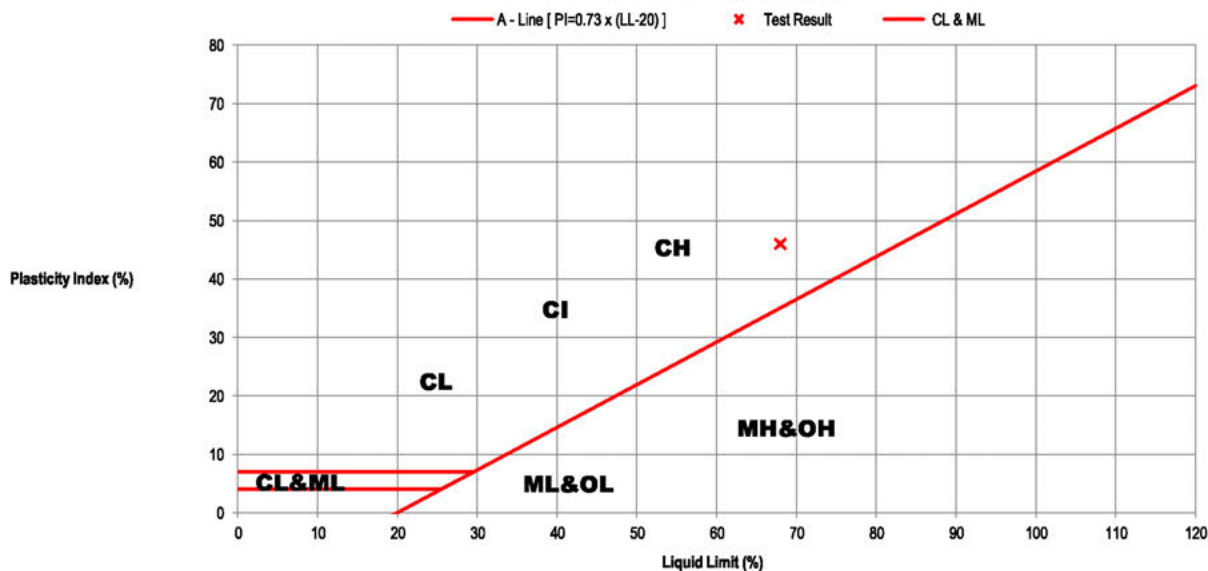
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101092-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	10/11/2018
Bore Hole	310-01-DH2516-S00100	Client Sample No.	310-01-DH2516
Description	SPT	Depth From (m)	1
		Depth To (m)	1.45

RESULTS OF TESTING

Liquid Limit (%)	68	
Plastic Limit (%)	22	
Plasticity Index (%)	46	
Linear Shrinkage (%)	17.0	Cracking & Curling Occurred
Moisture Content (%)	16.1	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

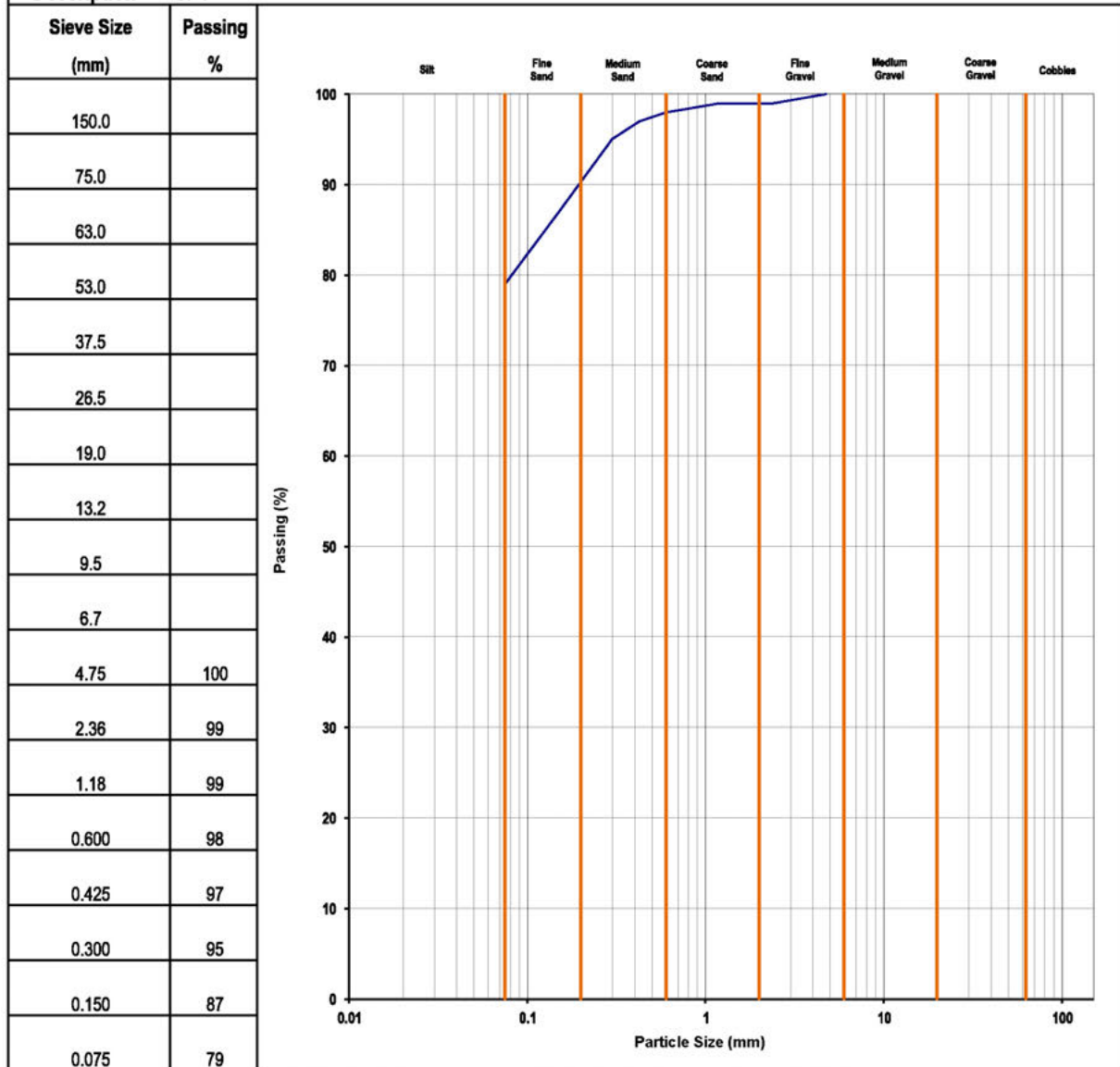
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101092-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
		Test Date	25/10/18-30/10/18
		Report Date	30/10/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2516		
Bore Hole	310-01-DH2516-S00100	Depth From (m)	1	Depth To (m)	1.45

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 16.1%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

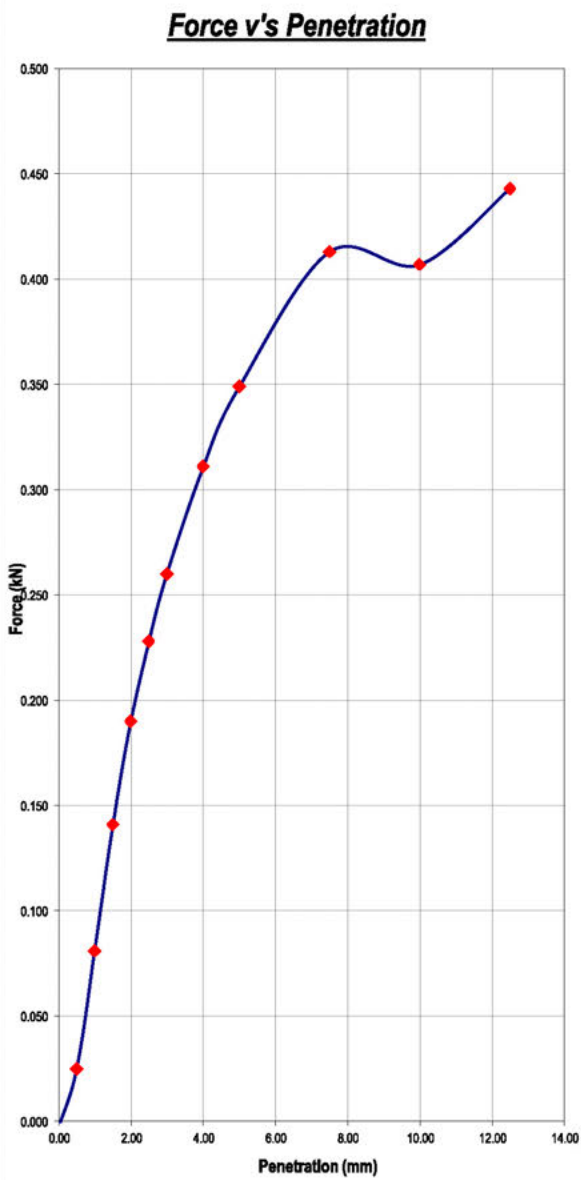
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101093-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2517-B00020	 Force v's Penetration
Client Sample No.	310-01-DH2517	
Depth From/To(m)	0.20-0.60	
Description	Sandy Silty CLAY - dark brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	13.2	
Maximum Dry Density (t/m³)	1.60	
Optimum Moisture Content (%)	20.9	
Nominated/Achieved Dry Density (t/m³)	1.52 / 1.52	
Nominated/Achieved Moisture Content (%)	20.9 / 20.7	
Laboratory Density Ratio (%)	95.2	
Laboratory Moisture Ratio (%)	98.9	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	3.9	
Moisture Content of Top 30 mm (%)	37.1	
Moisture Content of Remainder (%)	26.4	
CBR Penetration (mm)	2.5	
CBR VALUE (%)	2	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

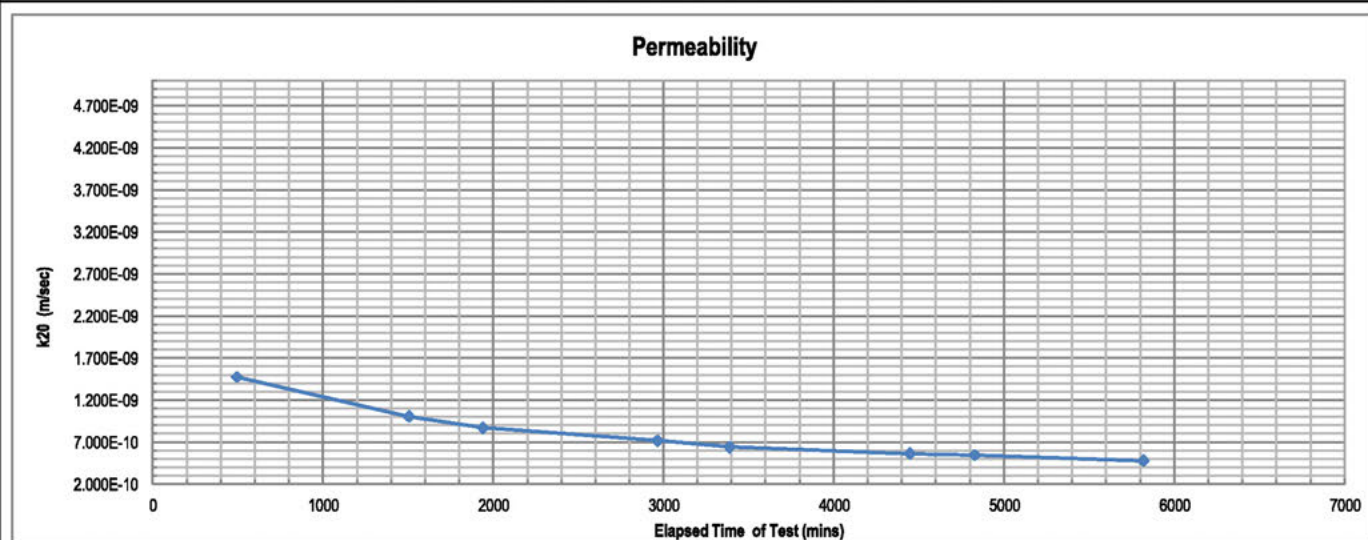
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101093-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	17/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2517
Bore Hole	310-01-DH2517-B00020	Depth From (m)	0.2
Description	Sandy Silty CLAY - dark grey	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.60	Hydraulic Gradient	9.4
Optimum Moisture Content (%)	20.9	Surcharge (kPa)	3.0
Placement Moisture Content (%)	21.0	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	100.6	Water Type	De-ionized
Placement Wet Density (t/m ³)	1.83	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	94.7	Sample Height and Diameter (mm)	116.45 / 100.98 mm

PERMEABILITY $k_{(20)} = 4.8 \times 10^{-10}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

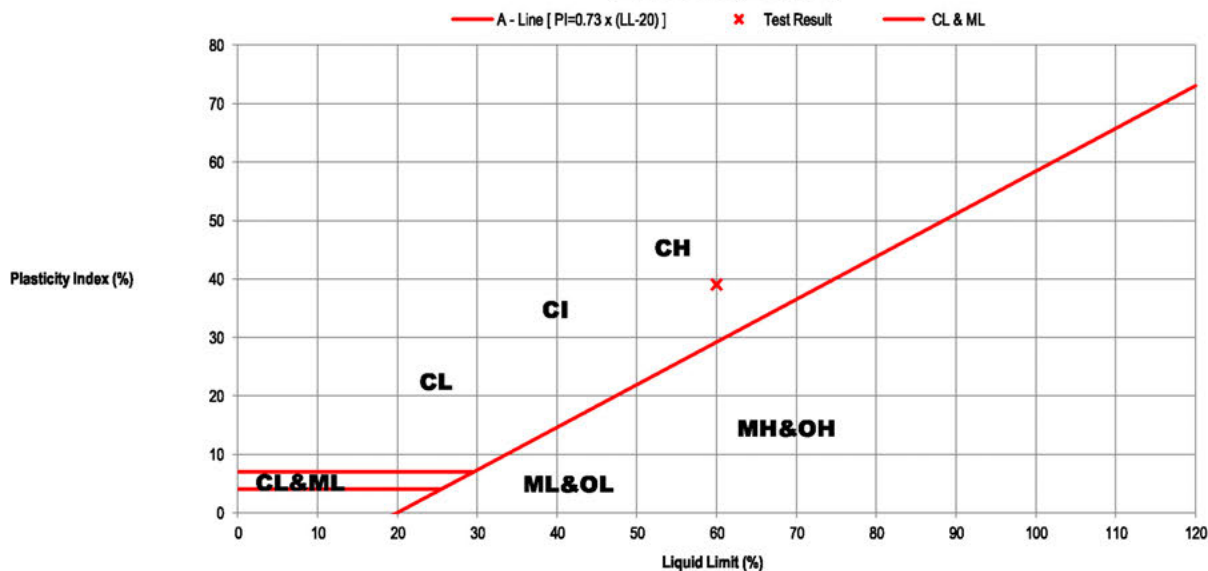
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101095-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	8/11/2018
Bore Hole	310-01-DH2517-S00100	Client Sample No.	310-01-DH2517
Description	SPT	Depth From (m)	1
		Depth To (m)	1.45

RESULTS OF TESTING

Liquid Limit (%) 60
Plastic Limit (%) 21
Plasticity Index (%) 39
Linear Shrinkage (%) 15.0 **Curling Occurred**
Moisture Content (%) 13.0
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

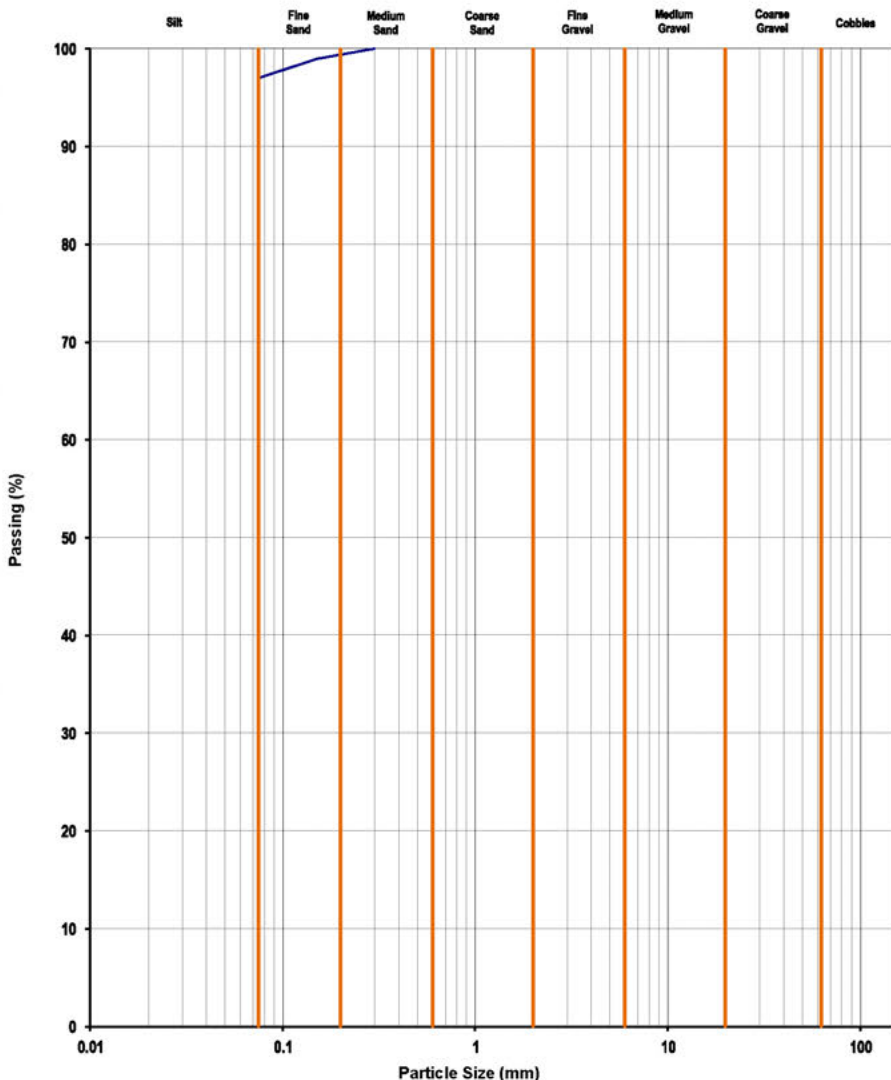
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101095-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2517		
Bore Hole	310-01-DH2517-S00100	Depth From (m)	1	Depth To (m)	1.45
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	100
0.150	99
0.075	97



The graph shows the particle size distribution for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. Vertical lines indicate the boundaries between soil types: Silt, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles. A blue curve is plotted, showing that approximately 97% of the sample passes through a 0.075 mm sieve and 100% passes through a 0.300 mm sieve.

NOTES/REMARKS:

-
Moisture Content 13%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

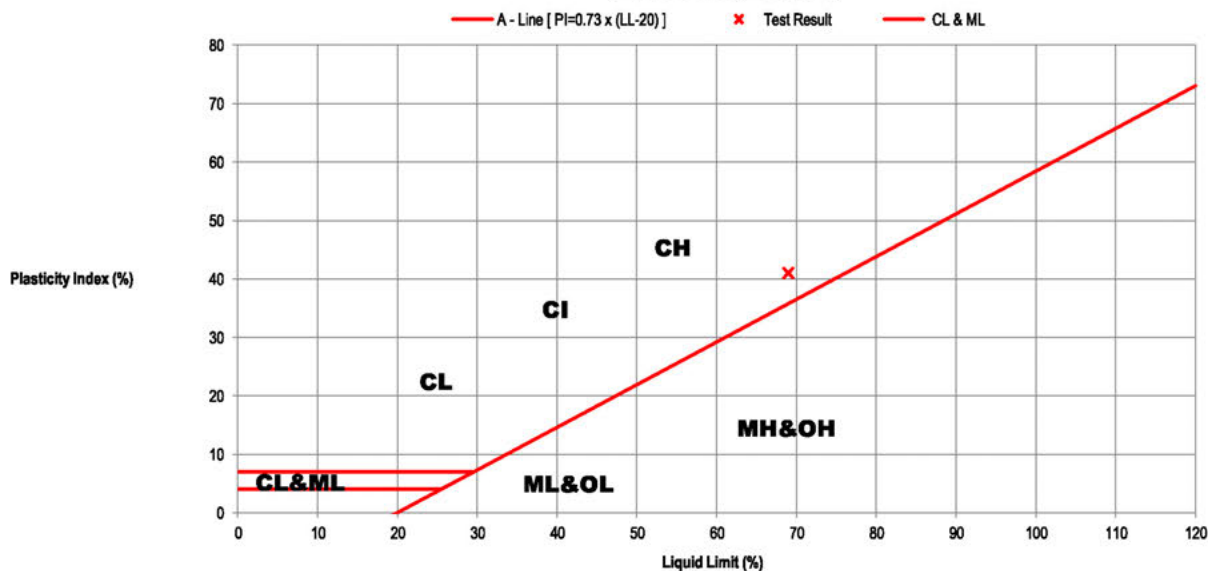
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101096-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	7/11/2018
Bore Hole	310-01-DH2518-B00020	Client Sample No.	310-01-DH2518
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	69	
Plastic Limit (%)	28	
Plasticity Index (%)	41	
Linear Shrinkage (%)	18.0	Cracking & Curling Occurred
Moisture Content (%)	25.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

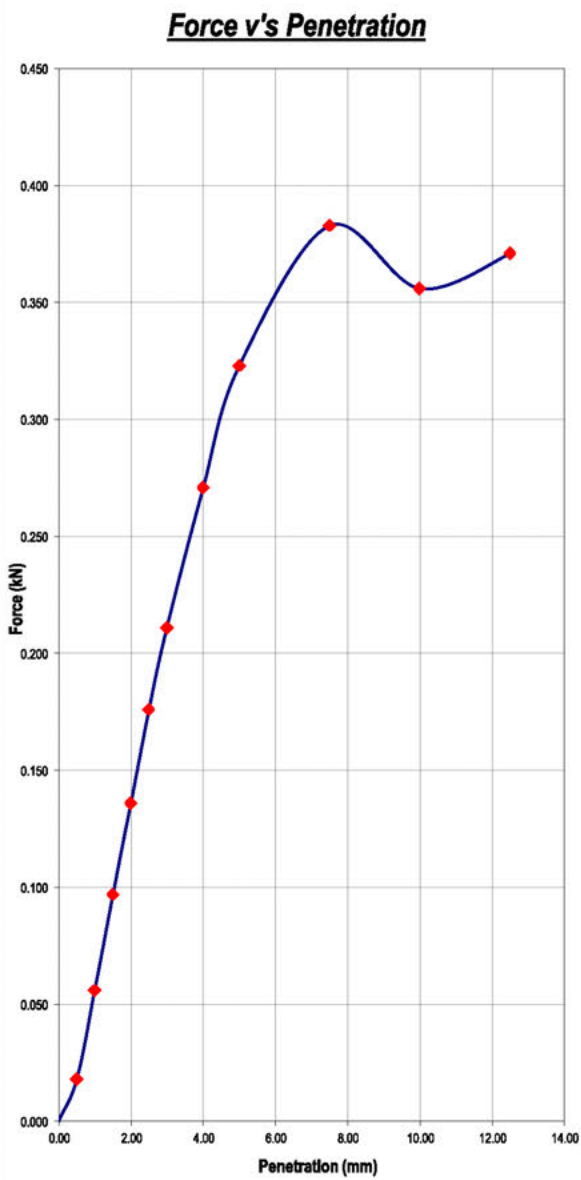
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101096-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2518-B00020	 <u>Force v's Penetration</u>
Client Sample No.	310-01-DH2518	
Depth From/To(m)	0.20-0.60	
Description	Silty CLAY - black	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	25.3	
Maximum Dry Density (t/m³)	1.51	
Optimum Moisture Content (%)	25.3	
Nominated/Achieved Dry Density (t/m³)	1.43 / 1.43	
Nominated/Achieved Moisture Content (%)	25.3 / 25.4	
Laboratory Density Ratio (%)	94.8	
Laboratory Moisture Ratio (%)	100.3	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	6.3	
Moisture Content of Top 30 mm (%)	42.3	
Moisture Content of Remainder (%)	27.3	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	1.5	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

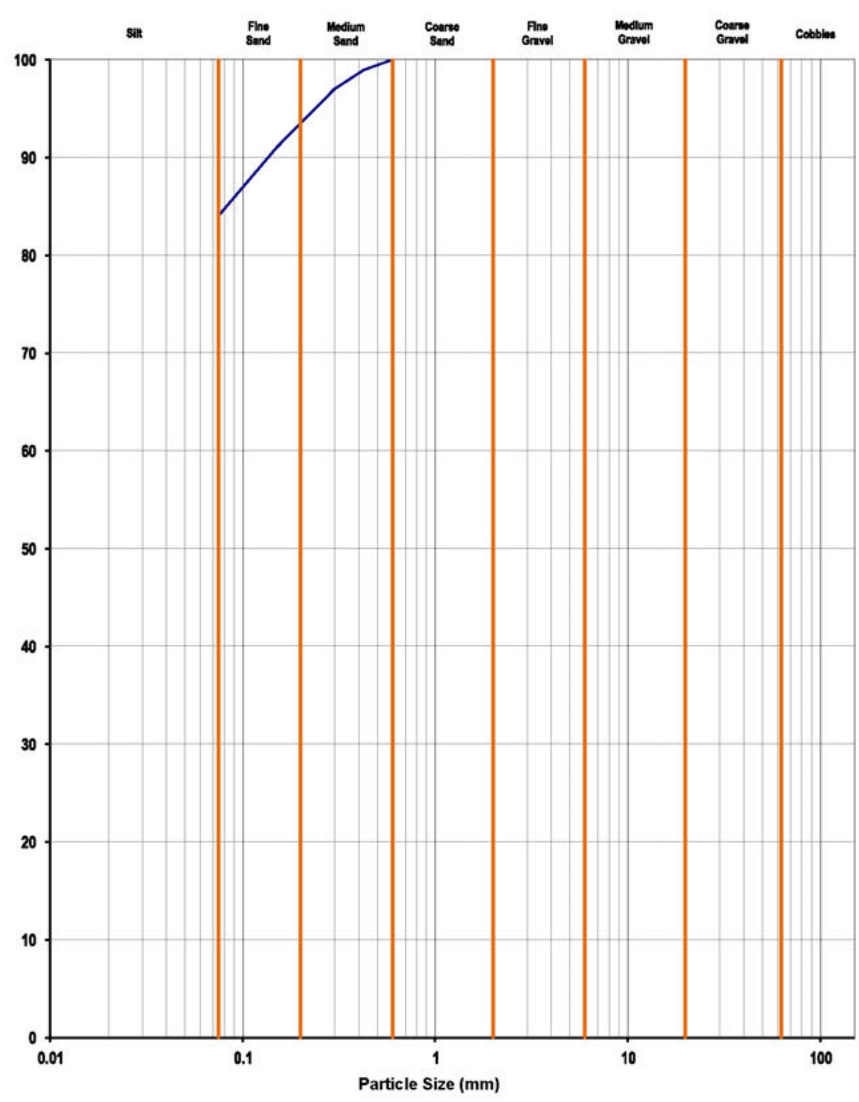
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101096-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2518		
Bore Hole	310-01-DH2518-B00020	Depth From (m)	0.2	Depth To (m)	0.6
Description	BDS				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	100
0.425	99
0.300	97
0.150	91
0.075	84



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 84% passing for 0.075 mm and reaches 100% passing at 0.600 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.850 mm), Coarse Sand (0.850 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 25.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

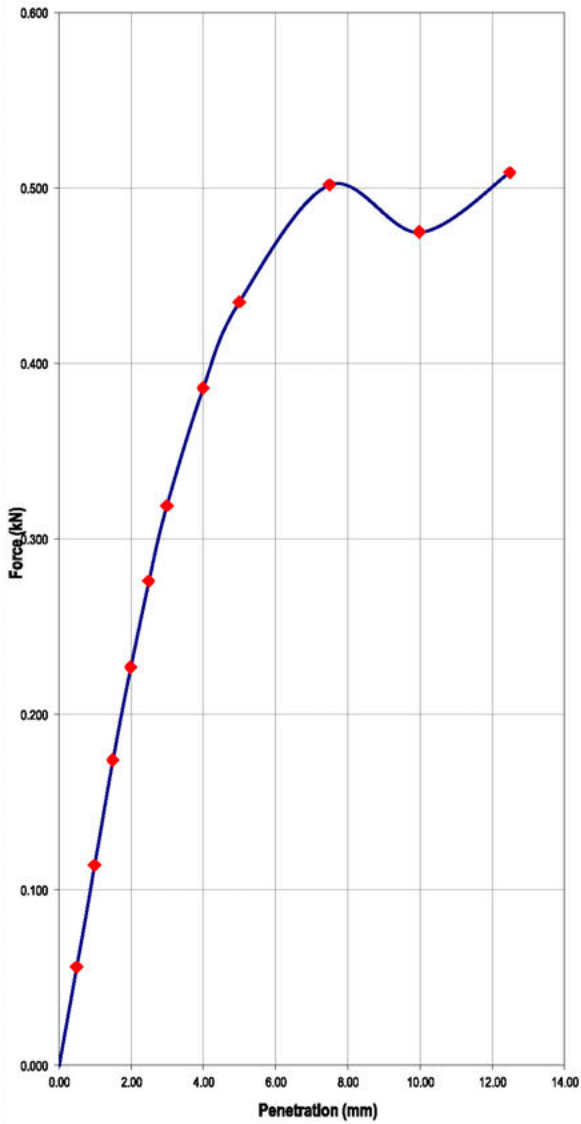
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	Golder Associates Pty Limited	Report No.	GA101099-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project No.	1897791	Test Date	3/11/18-9/11/18
Project	Inland Rail B2G	Report Date	12/11/2018

Test Results

Bore Hole/Test Pit	310-01-DH2521-B00020	Force v's Penetration 
Client Sample No.	310-01-DH2521	
Depth From/To(m)	0.20-0.60	
Description	Sandy Silty CLAY - dark brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	13.6	
Maximum Dry Density (t/m³)	1.68	
Optimum Moisture Content (%)	18.2	
Nominated/Achieved Dry Density (t/m³)	1.60 / 1.60	
Nominated/Achieved Moisture Content (%)	18.2 / 18.2	
Laboratory Density Ratio (%)	95.0	
Laboratory Moisture Ratio (%)	99.7	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	3.2	
Moisture Content of Top 30 mm (%)	31.0	
Moisture Content of Remainder (%)	24.4	
CBR Penetration (mm)	5.0	
CBR VALUE (%)	2	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

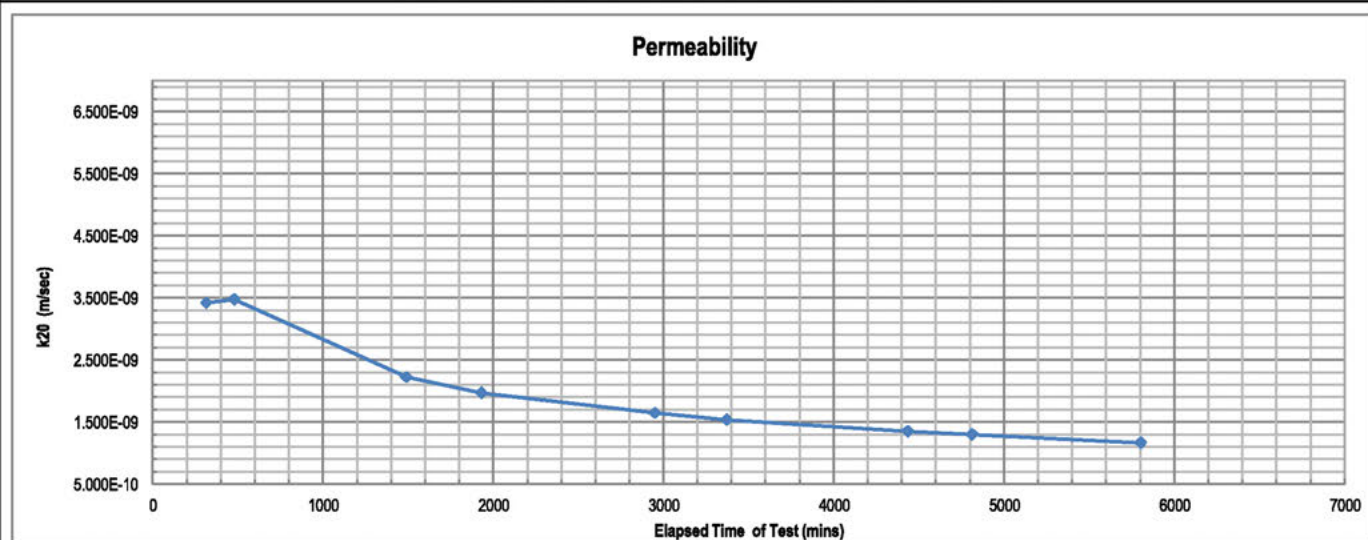
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101099-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	19/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2521
Bore Hole	310-01-DH2521-B00020	Depth From (m)	0.2
Description	Sandy Silty CLAY - dark brown	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.68	Hydraulic Gradient	9.5
Optimum Moisture Content (%)	18.1	Surcharge (kPa)	2.9
Placement Moisture Content (%)	18.0	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	99.3	Water Type	Deaerated
Placement Wet Density (t/m ³)	1.89	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	95.2	Sample Height and Diameter (mm)	116.28 / 100.91 mm

PERMEABILITY $k_{(20)} = 1.2 \times 10^{-09}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

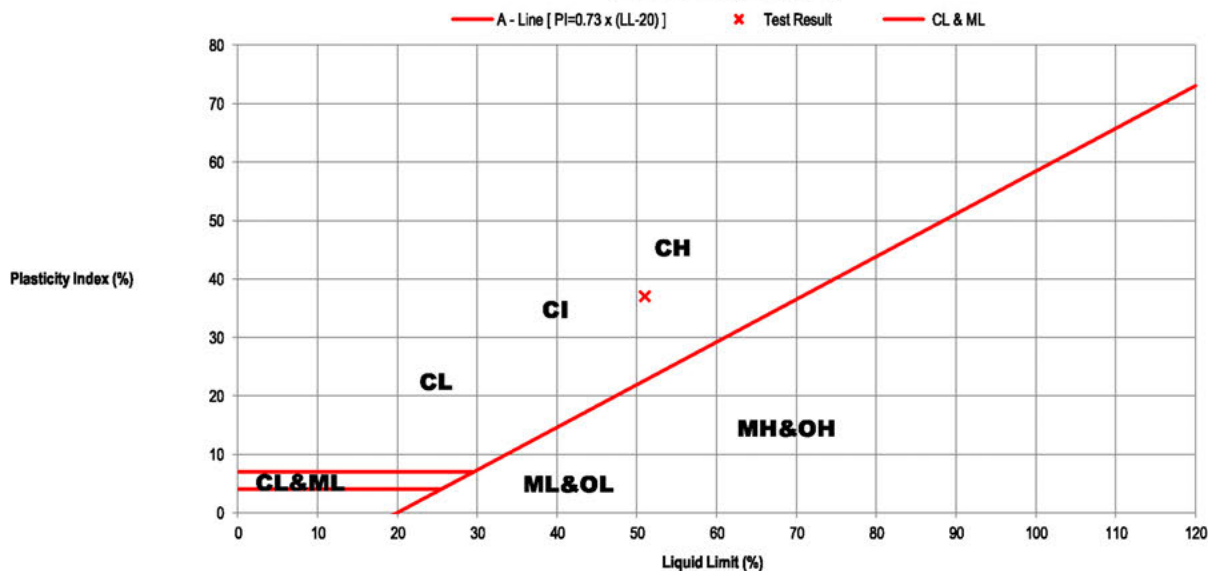
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101100-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2521-U00050	Client Sample No.	310-01-DH2521
Description	U	Depth From (m)	0.5
		Depth To (m)	0.75

RESULTS OF TESTING

Liquid Limit (%)	51	
Plastic Limit (%)	14	
Plasticity Index (%)	37	
Linear Shrinkage (%)	15.5	Curling Occurred
Moisture Content (%)	14.4	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

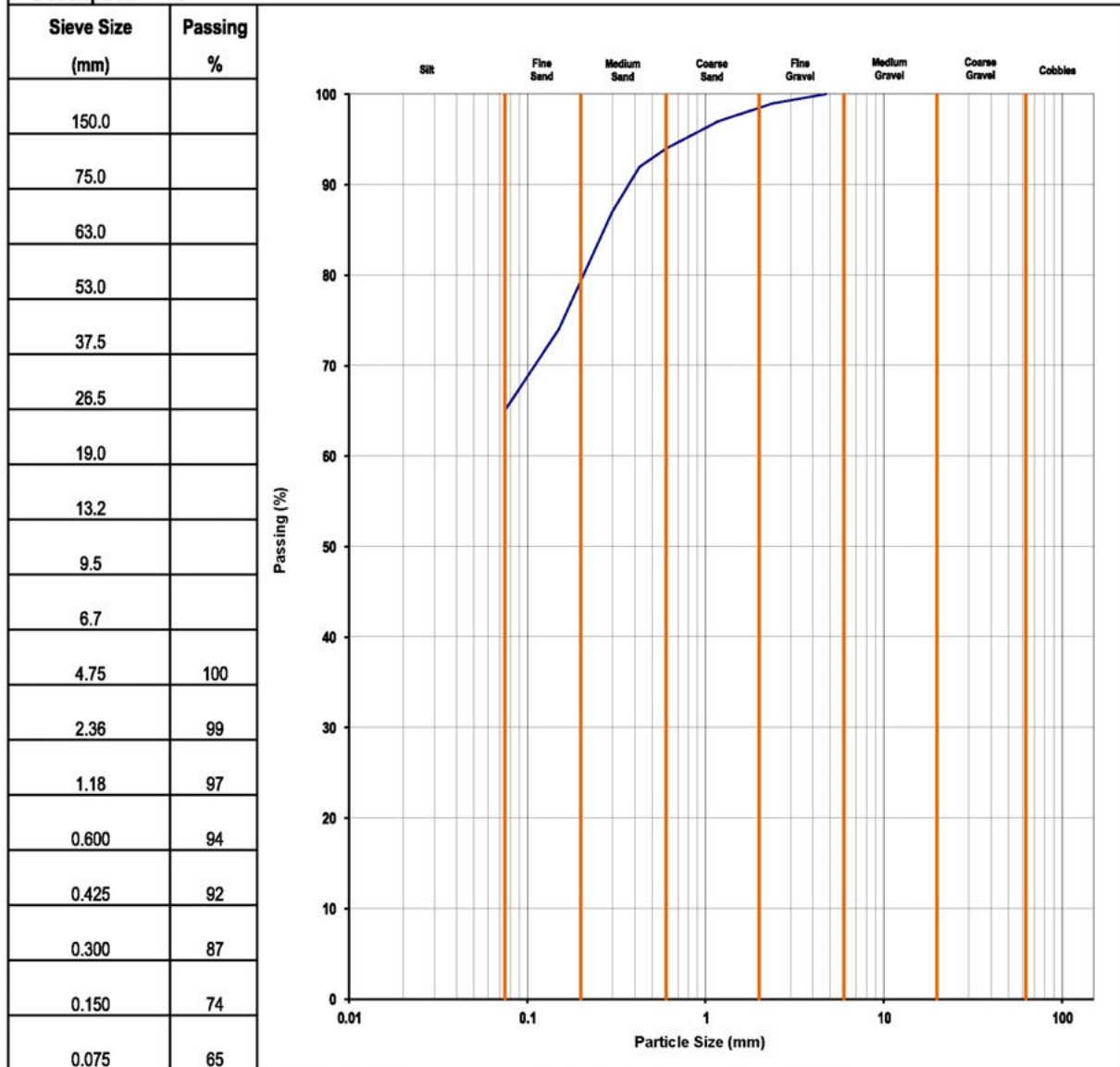
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101100-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
		Test Date	30/10/18-6/10/18
		Report Date	6/11/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2521		
Bore Hole	310-01-DH2521-U00050	Depth From (m)	0.5	Depth To (m)	0.75
Description	U				



NOTES/REMARKS:

-
Moisture Content 14.4%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited		Report No. GA101100-ISS
		Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064		Test Date 30/10/18-5/11/18
		Report Date 5/11/2018
Project Inland Rail B2G		
Description CLAY-brown		
Sample No.	310-01-DH2521	
Client ID	310-01-DH2521-U00050	
Depth (m)	0.5-0.75	
RESULTS OF TESTING		
SWELL SPECIMEN		
Swell Pressure (kPa) *	800	
Wet Density (t/m³)	2.15	
Initial Moisture Content (%)	14.4	
Final Moisture Content (%)	23.2	
Swell (%)	11.2	
SHRINKAGE SPECIMEN		
Estimated Inert Inclusions (%)	10-20	
Extent of Crumbling	Nil	
Extent of Cracking	Slight	
Moisture (%)	15.3	
Shrinkage (%)	2.3	
SHRINK SWELL INDEX (Iss) (%)		4.4
Notes/Remarks:		
* Swell pressure determination in accordance with test method AS4133.3.3 Sample/s supplied by client Tested as received		

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

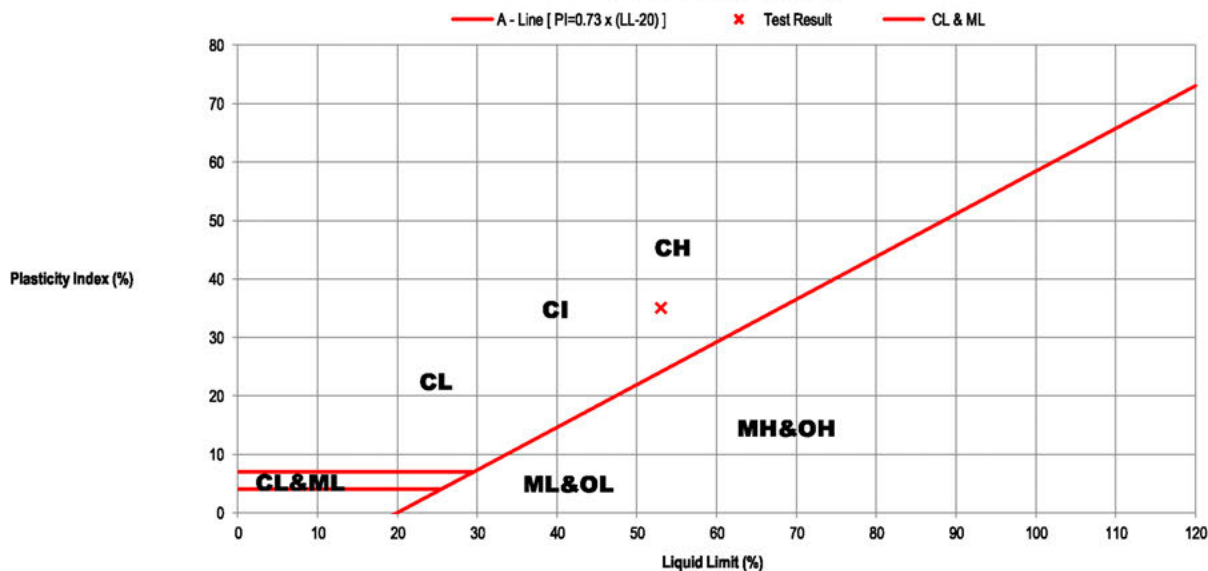
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101102-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	2/11/2018
Project No.	1897791	Report Date	7/11/2018
Bore Hole	310-01-DH2521-S00250	Client Sample No.	310-01-DH2521
Description	SPT	Depth From (m)	2.5
		Depth To (m)	2.95

RESULTS OF TESTING

Liquid Limit (%)	53	
Plastic Limit (%)	18	
Plasticity Index (%)	35	
Linear Shrinkage (%)	14.5	Curling Occurred
Moisture Content (%)	14.5	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

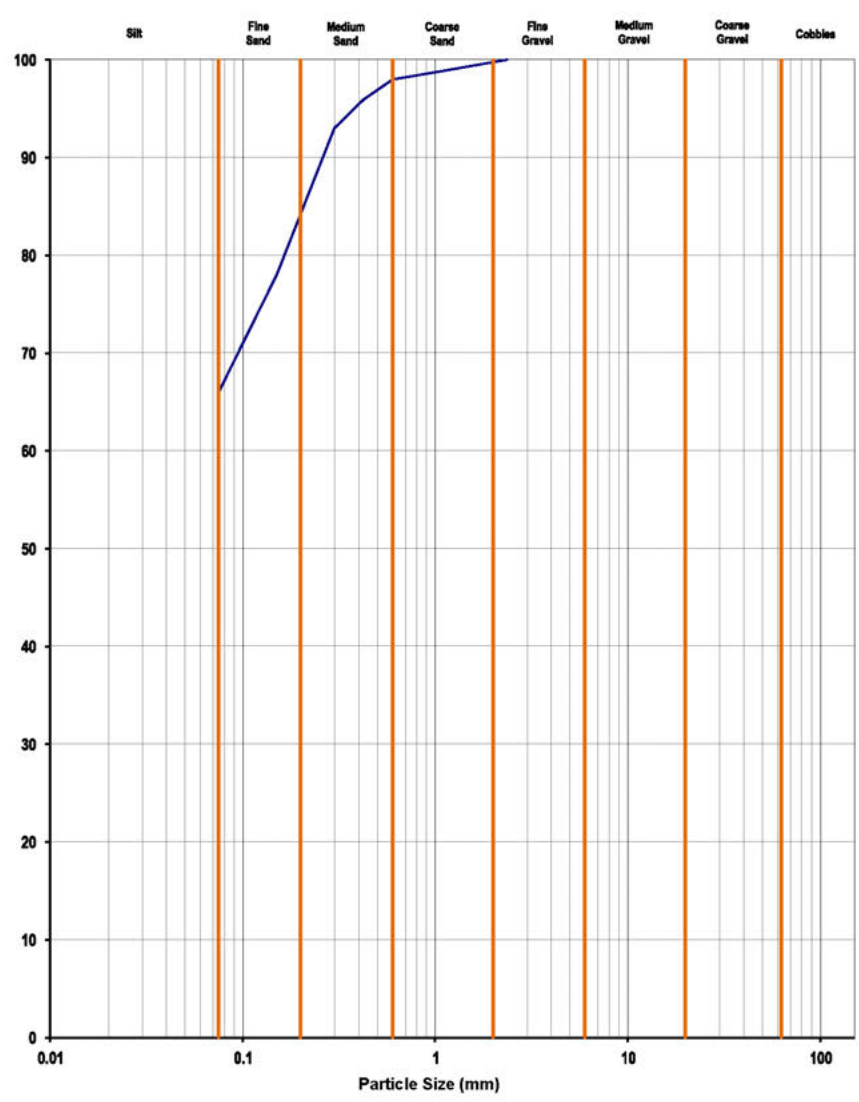
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101102-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2521		
Bore Hole	310-01-DH2521-S00250	Depth From (m)	2.5	Depth To (m)	2.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	98
0.425	96
0.300	93
0.150	78
0.075	66



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 66% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 14.5%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

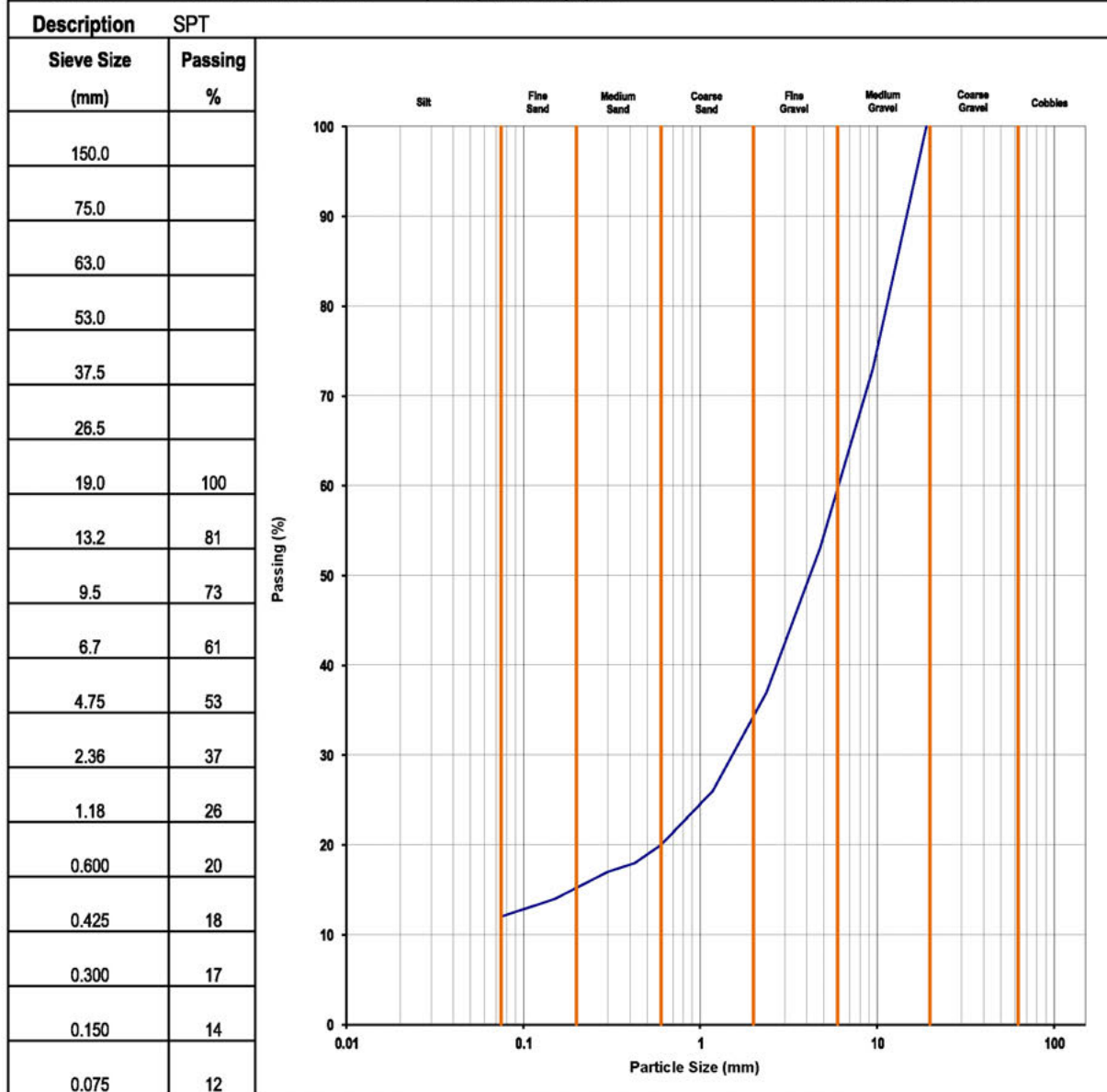
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101103-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	25/10/18-30/10/18
Project No	1897791	Report Date	30/10/2018
Bore Hole	310-01-DH2541-S00050	Client Sample No	310-01-DH2541
Depth From (m)	0.5	Depth To (m)	0.58



NOTES/REMARKS:

-
Moisture Content 4.7%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

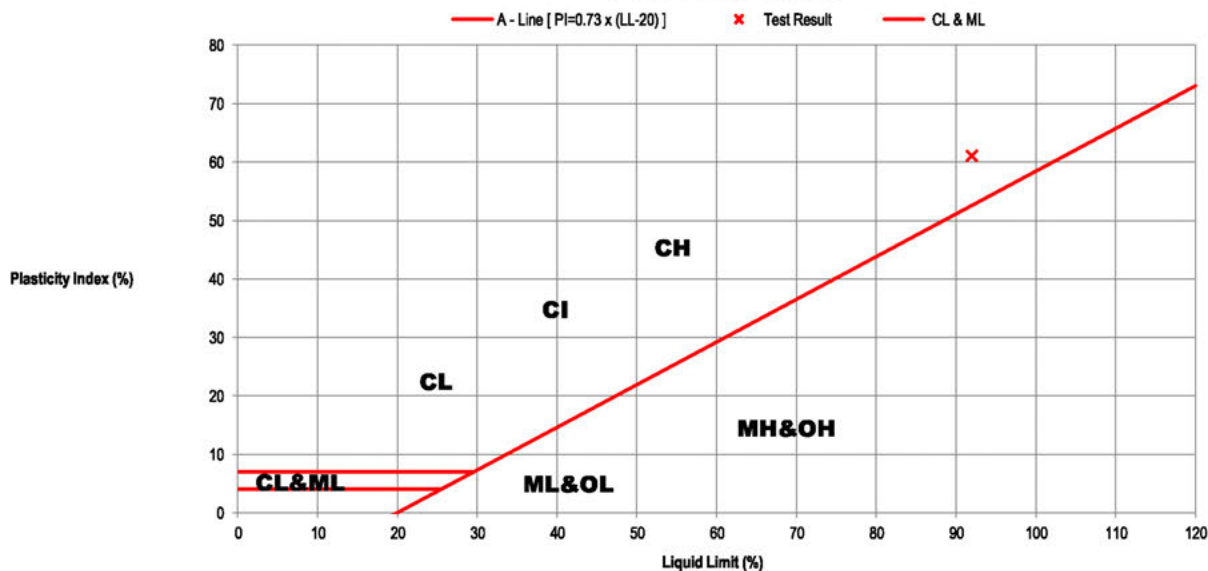
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101104-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2543-S00050	Client Sample No.	310-01-DH2543
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	92	
Plastic Limit (%)	31	
Plasticity Index (%)	61	
Linear Shrinkage (%)	23.0	Cracking & Curling Occurred
Moisture Content (%)	22.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

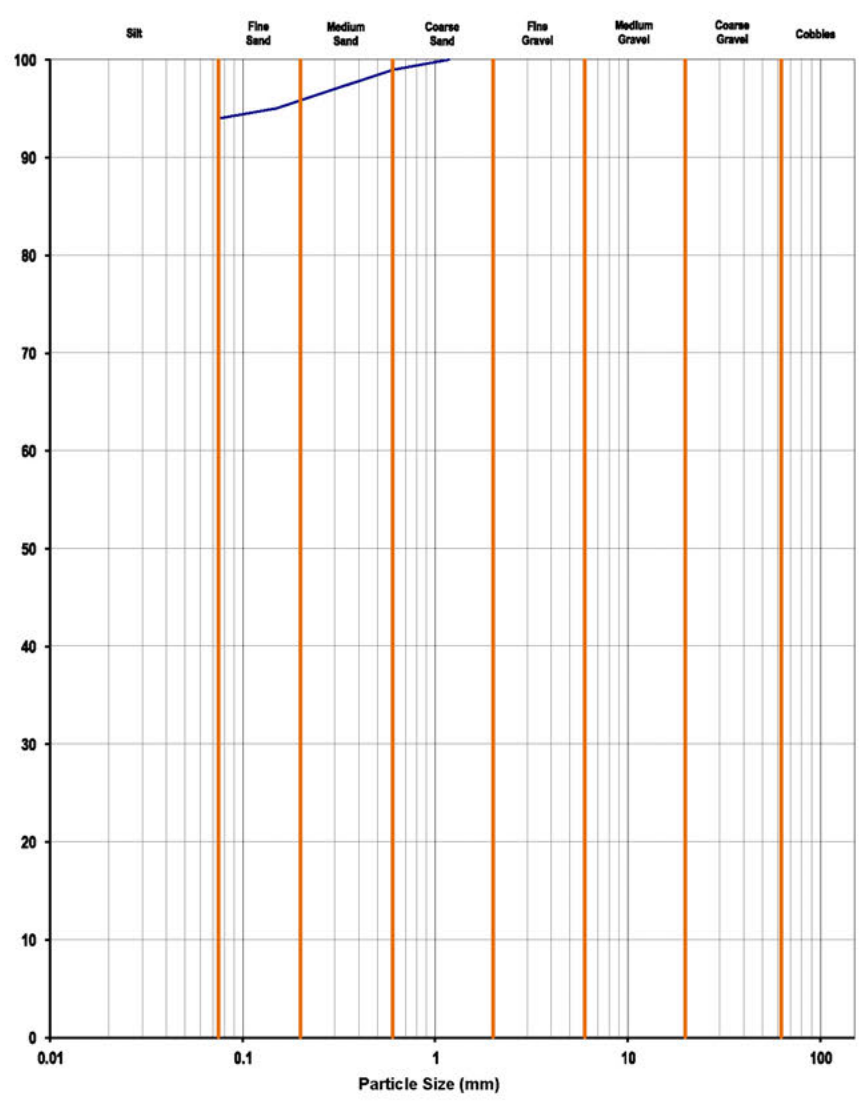
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101104-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4030
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-DH2543		
Bore Hole	310-01-DH2543-S00050	Depth From (m)	0.5	Depth To (m)	0.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	98
0.300	97
0.150	95
0.075	94



The graph shows the particle size distribution for sample 310-01-DH2543-S00050. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. Vertical lines indicate sieve sizes: 0.075, 0.150, 0.300, 0.425, 0.600, 1.18, 2.36, 4.75, 6.7, 9.5, 13.2, 19.0, 26.5, 37.5, 53.0, 63.0, 75.0, 150.0. The distribution curve starts at 100% passing for 1.18 mm and decreases to 94% passing for 0.075 mm. The soil is classified as Silt.

NOTES/REMARKS:

-
Moisture Content 22.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

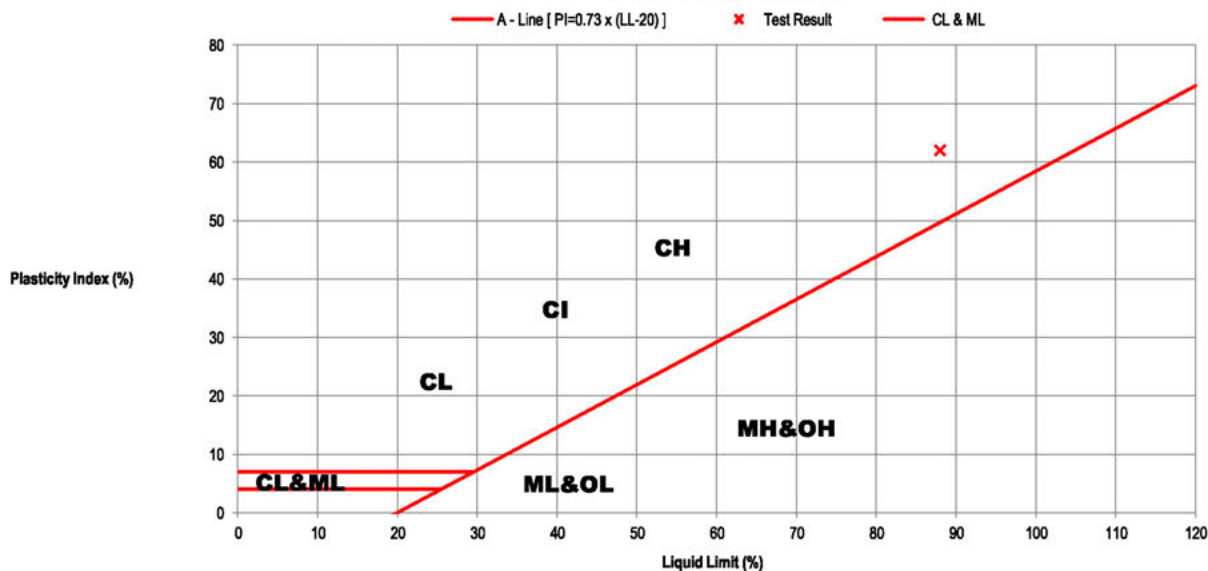
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101116-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2231-U00550	Client Sample No.	310-01-BH2231
Description	U	Depth From (m)	5.5
		Depth To (m)	6

RESULTS OF TESTING

Liquid Limit (%)	88	
Plastic Limit (%)	26	
Plasticity Index (%)	62	
Linear Shrinkage (%)	23.5	Cracking & Curling Occurred
Moisture Content (%)	22.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Channon



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.8.1

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

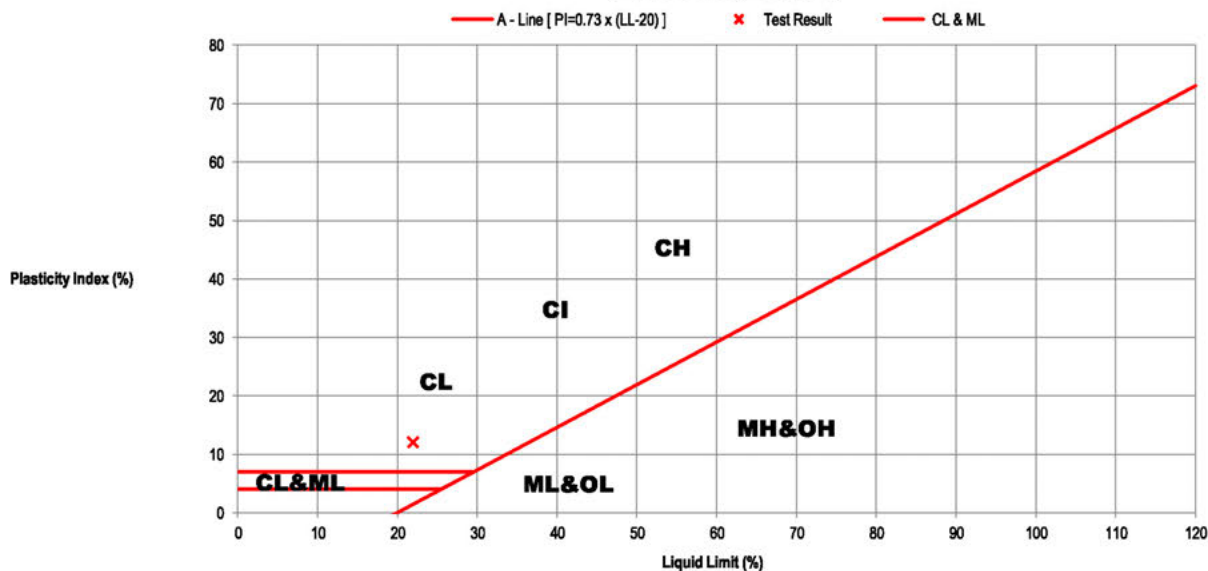
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101004-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2206-S02180	Client Sample No.	310-01-BH2206
Description	SPT	Depth From (m)	21.8
		Depth To (m)	22.1

RESULTS OF TESTING

Liquid Limit (%) 22
Plastic Limit (%) 10
Plasticity Index (%) 12
Linear Shrinkage (%) 4.5 **Curling Occurred**
Moisture Content (%) 15.3
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

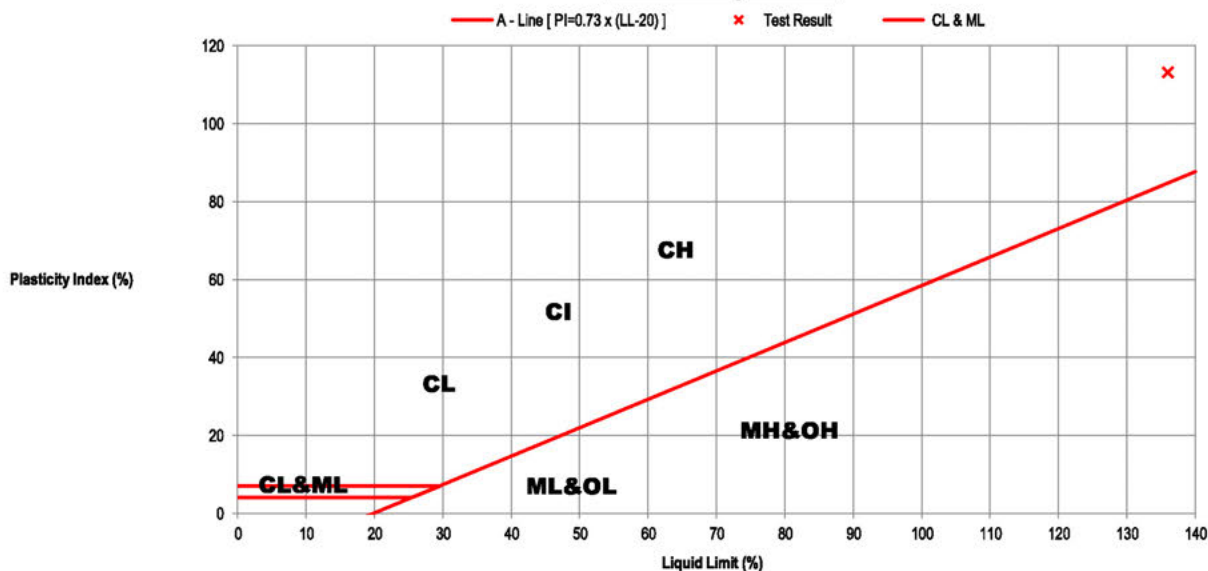
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101011-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	8/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2210-S01550	Client Sample No.	310-01-BH2210
Description	SPT	Depth From (m)	15.5
		Depth To (m)	15.95

RESULTS OF TESTING

Liquid Limit (%) 136
 Plastic Limit (%) 23
 Plasticity Index (%) 113
 Linear Shrinkage (%) 18.5 Curling Occurred
 Moisture Content (%) 38.0
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

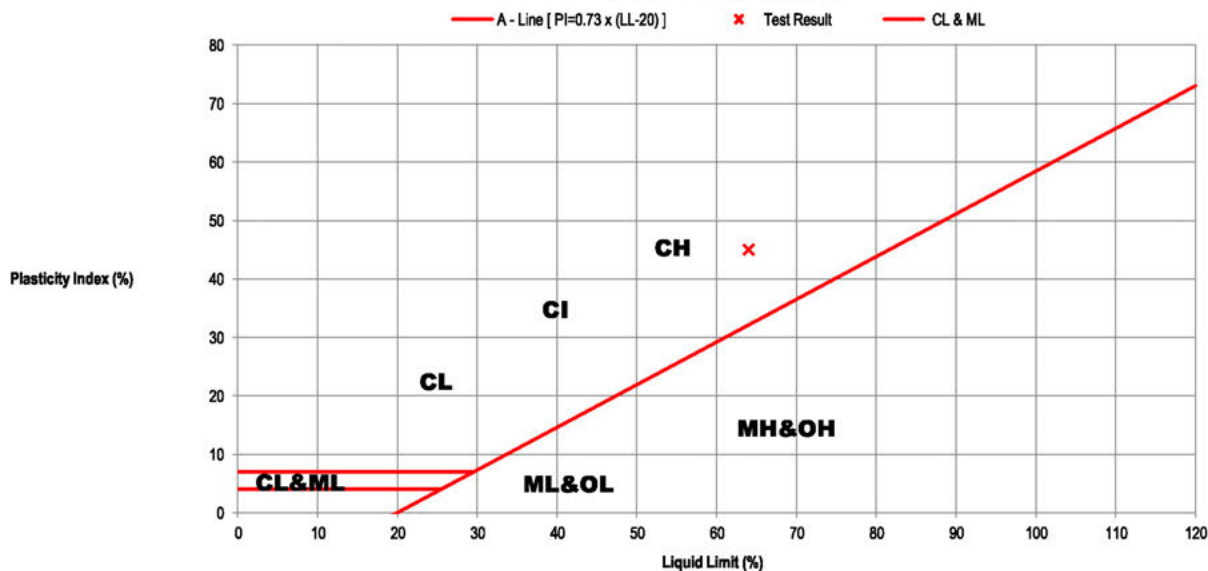
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101018-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	22/11/2018
Project No.	1897791	Report Date	27/11/2018
Bore Hole	310-01-BH2216-U01480	Client Sample No.	310-01-BH2216
Description	U	Depth From (m)	14.8
		Depth To (m)	15.1

RESULTS OF TESTING

Liquid Limit (%) 64
Plastic Limit (%) 19
Plasticity Index (%) 45
Linear Shrinkage (%) 6.0 **Curling Occurred**
Moisture Content (%) 26.7
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PERMEABILITY BY FALLING HEAD TEST REPORT

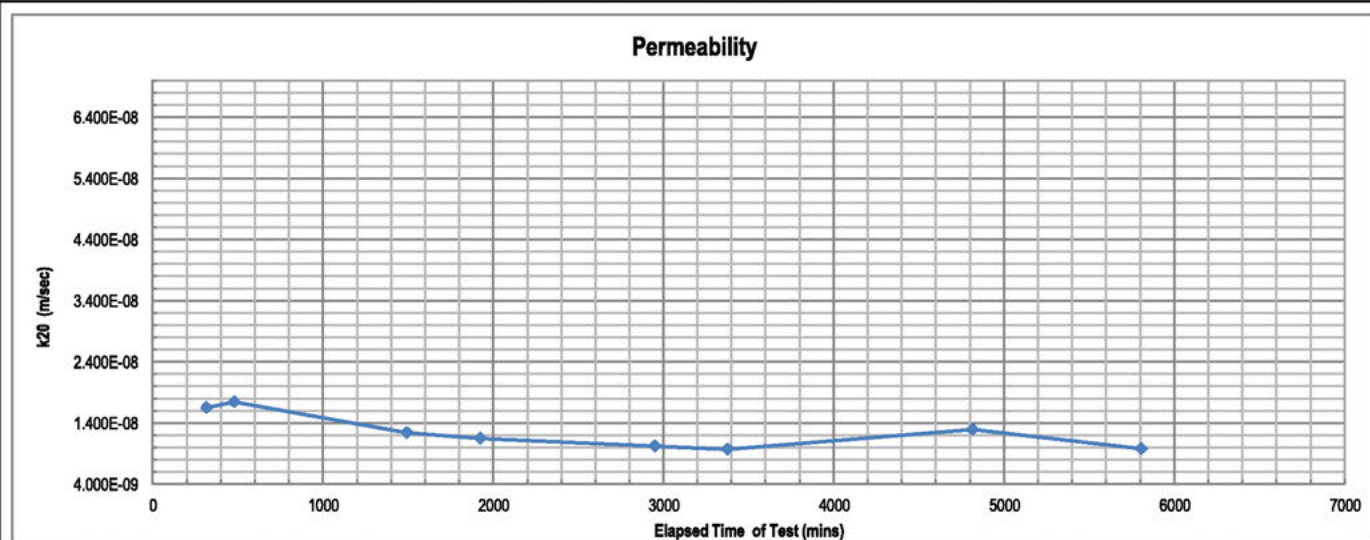
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101087-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	19/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2510
Bore Hole	310-01-DH2510-B00020	Depth From (m)	0.2
Description	Silty SAND - pale brown / grey	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.99	Hydraulic Gradient	9.4
Optimum Moisture Content (%)	9.7	Surcharge (kPa)	3.0
Placement Moisture Content (%)	10.3	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	106.1	Water Type	De-ionized
Placement Wet Density (t/m ³)	2.07	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	94.5	Sample Height and Diameter (mm)	116.48 / 101.1 mm

PERMEABILITY $k_{(20)} = 9.8 \times 10^{-09}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

CERTIFICATE OF ANALYSIS

Work Order : **EB1826673**
Client : **TRILAB PTY LTD**
Contact : **MR CHRIS CHANNON**
Address : **346A BILSEN RD**
GEEBUNG QLD, AUSTRALIA 4031
Telephone : **+61 07 3265 5656**
Project : **1897791 - Inland Rail B2G**
Order number : **BNE 1910024**
C-O-C number : **---**
Sampler : **---**
Site : **---**
Quote number : **EN/333**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division Brisbane**
Contact : **Customer Services EB**
Address : **2 Byth Street Stafford QLD Australia 4053**
Telephone : **+61-7-3243 7222**
Date Samples Received : **02-Nov-2018 11:20**
Date Analysis Commenced : **05-Nov-2018**
Issue Date : **09-Nov-2018 15:10**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				101088 / 310-01-DH2510-S0005 0 / 0.50-0.95m	101092 / 310-01-DH2516-S0010 0 / 1.00-1.45m	101095 / 310-01-DH2517-S0010 0 / 1.00-1.45m	101101 / 310-01-DH2521-S0010 0 / 1.00-1.45m	----
Client sampling date / time				02-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EB1826673-001	EB1826673-002	EB1826673-003	EB1826673-004	-----
				Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	6.8	9.2	6.6	9.3	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	2.3	12.4	3.0	14.5	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	80	20	60	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	20	780	880	820	----

ATTERBERG LIMITS TEST REPORT

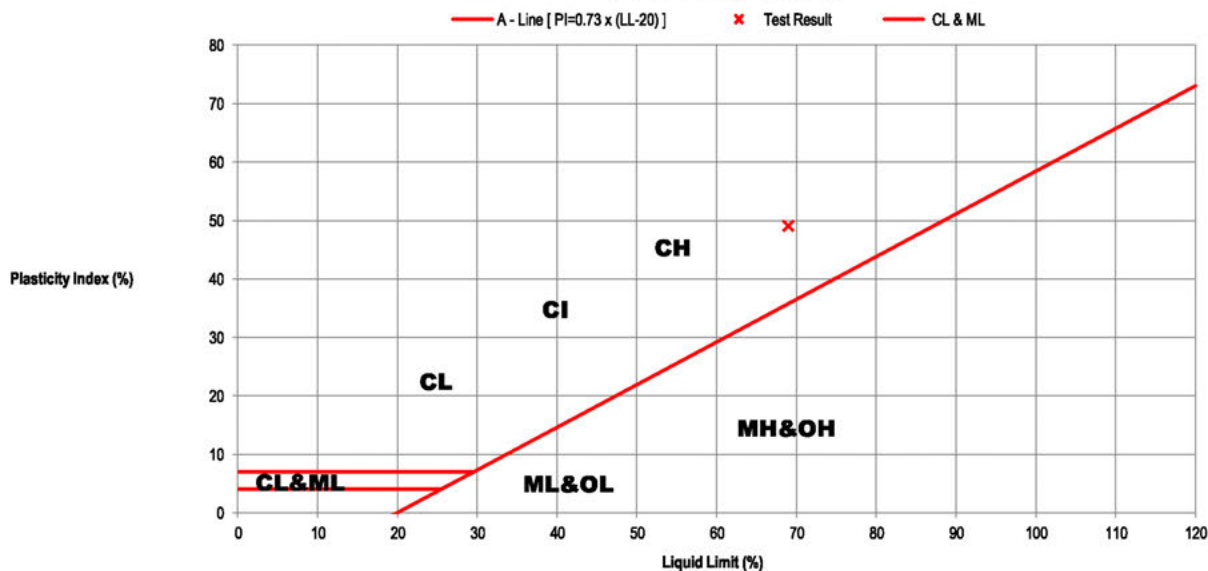
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101090-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2516-B00020	Client Sample No.	310-01-DH2516
Description	BDS	Depth From (m)	0.2
		Depth To (m)	0.6

RESULTS OF TESTING

Liquid Limit (%)	69	
Plastic Limit (%)	20	
Plasticity Index (%)	49	
Linear Shrinkage (%)	18.0	Cracking & Curling Occurred
Moisture Content (%)	16.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited	Report No. GA101091-ISS
	Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064	Test Date 6/11/18-16/11/18
	Report Date 16/11/2018
Project Inland Rail B2G	
Description CLAY-brown/dark grey	
Sample No.	310-01-DH2516
Client ID	310-01-DH2516-U00050
Depth (m)	0.5-0.65
RESULTS OF TESTING	
SWELL SPECIMEN	
Swell Pressure (kPa) *	1600
Wet Density (t/m³)	1.96
Initial Moisture Content (%)	12.7
Final Moisture Content (%)	29.1
Swell (%)	11.2
SHRINKAGE SPECIMEN	
Estimated Inert Inclusions (%)	5-10
Extent of Crumbling	Nil
Extent of Cracking	Nil
Moisture (%)	14.3
Shrinkage (%)	2.6
SHRINK SWELL INDEX (Iss) (%)	4.5
Notes/Remarks:	
* Swell pressure determination in accordance with test method AS4133.3.3	
Sample/s supplied by client	Tested as received

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

PERMEABILITY BY FALLING HEAD TEST REPORT

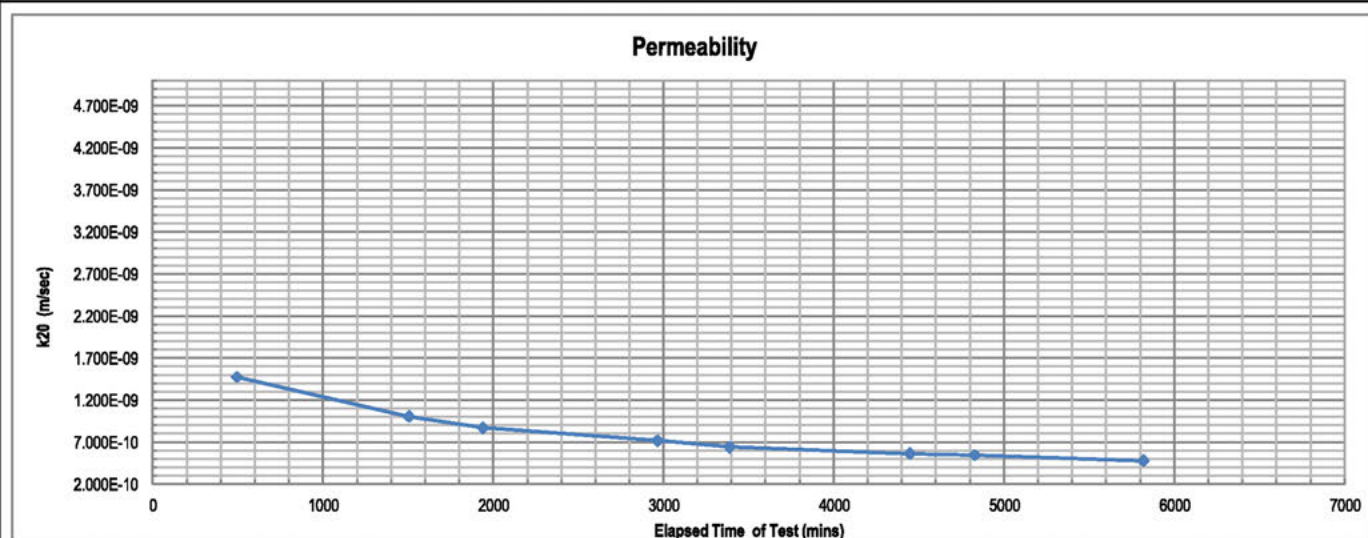
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101093-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	17/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2517
Bore Hole	310-01-DH2517-B00020	Depth From (m)	0.2
Description	Sandy Silty CLAY - dark grey	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.60	Hydraulic Gradient	9.4
Optimum Moisture Content (%)	20.9	Surcharge (kPa)	3.0
Placement Moisture Content (%)	21.0	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	100.6	Water Type	De-ionized
Placement Wet Density (t/m ³)	1.83	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	94.7	Sample Height and Diameter (mm)	116.45 / 100.98 mm

PERMEABILITY $k_{(20)} = 4.8 \times 10^{-10}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client Golder Associates Pty Limited		Report No. GA101094-ISS
		Request No. R3_BH_Rev1_4030
Address PO Box 1734 MILTON BC QLD 4064		Test Date 7/11/18-16/11/18
		Report Date 16/11/2018
Project Inland Rail B2G		
Description CLAY-brown		
Sample No.	310-01-DH2517	
Client ID	310-01-DH2517-U00050	
Depth (m)	0.5-0.65	
RESULTS OF TESTING		
SWELL SPECIMEN		
Swell Pressure (kPa) *	1400	
Wet Density (t/m³)	2.22	
Initial Moisture Content (%)	11.5	
Final Moisture Content (%)	24.7	
Swell (%)	18.9	
SHRINKAGE SPECIMEN		
Estimated Inert Inclusions (%)	5-10	
Extent of Crumbling	Nil	
Extent of Cracking	Slight	
Moisture (%)	12.9	
Shrinkage (%)	1.9	
SHRINK SWELL INDEX (Iss) (%)		6.3

Notes/Remarks:

* Swell pressure determination in accordance with test method AS4133.3.3

Sample/s supplied by client

Tested as received

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

PERMEABILITY BY FALLING HEAD TEST REPORT

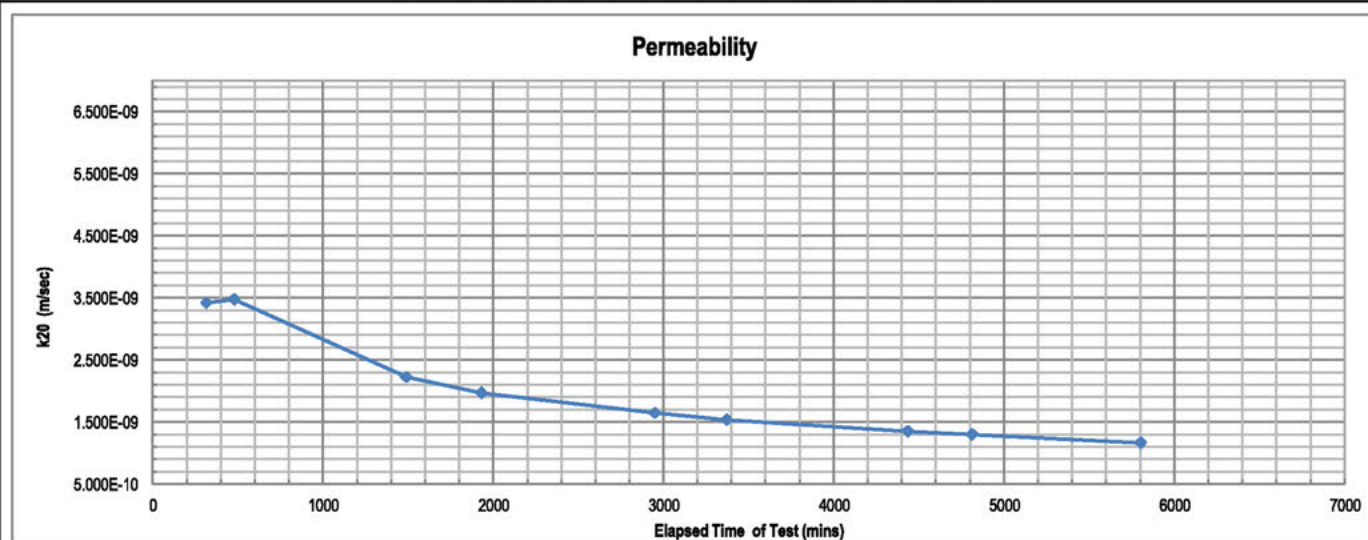
Test Method AS 1289 6.7.2, 5.1.1, KH2 (Based on K H Head (1988) Manual of Laboratory Testing, 10.7)

Client	Golder Associates Pty Limited	Report No.	GA101099-FHPT
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3 BH Rev1 4030
Project	Inland Rail B2G	Test Date	19/11/18-23/11/18
Project No.	1897791	Client Sample No.	310-01-DH2521
Bore Hole	310-01-DH2521-B00020	Depth From (m)	0.2
Description	Sandy Silty CLAY - dark brown	Depth To (m)	0.6
		Sample Type	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	AS1289.5.1.1 - Standard Compaction		
Maximum Dry Density (t/m ³)	1.68	Hydraulic Gradient	9.5
Optimum Moisture Content (%)	18.1	Surcharge (kPa)	2.9
Placement Moisture Content (%)	18.0	Head Pressure Applied (kPa)	10.79
Moisture Ratio (%)	99.3	Water Type	Deaerated
Placement Wet Density (t/m ³)	1.89	Percentage Material Retained/Sieve Size (mm)	0 % / 9.5 mm
Density Ratio (%)	95.2	Sample Height and Diameter (mm)	116.28 / 100.91 mm

PERMEABILITY $k_{(20)} = 1.2 \times 10^{-09}$ (m/sec)



Remarks: The above specimen was remoulded at 95% Standard Dry Density and at Optimum Moisture Content as advised by the client

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

Page: 1 of 1

REP06301

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

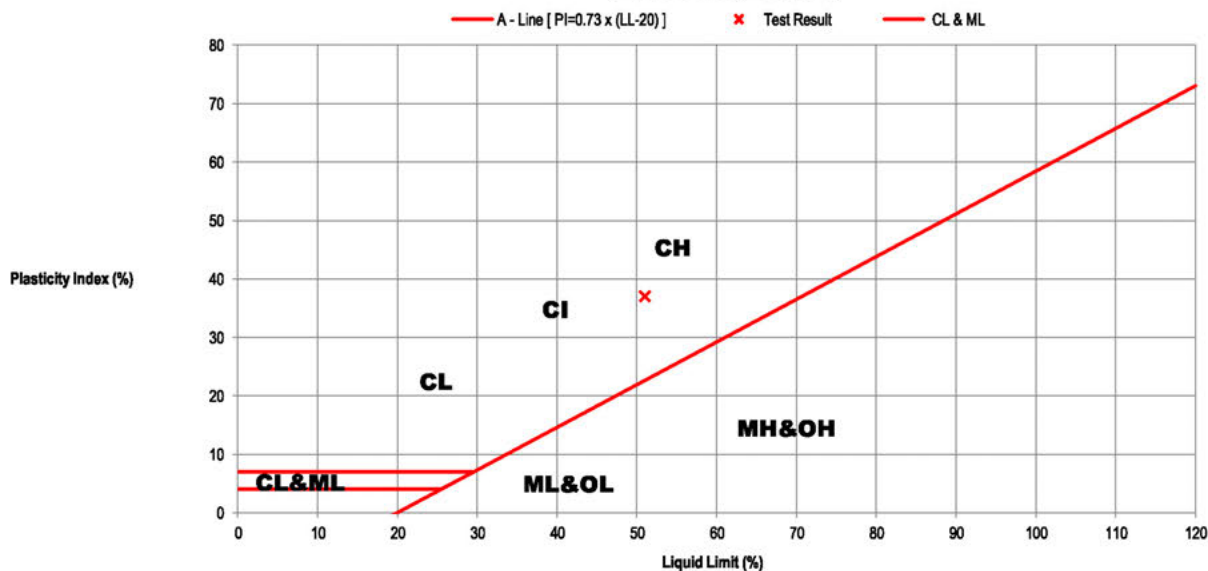
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101100-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2521-U00050	Client Sample No.	310-01-DH2521
Description	U	Depth From (m)	0.5
		Depth To (m)	0.75

RESULTS OF TESTING

Liquid Limit (%) 51
 Plastic Limit (%) 14
 Plasticity Index (%) 37
 Linear Shrinkage (%) 15.5 Curling Occurred
 Moisture Content (%) 14.4
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

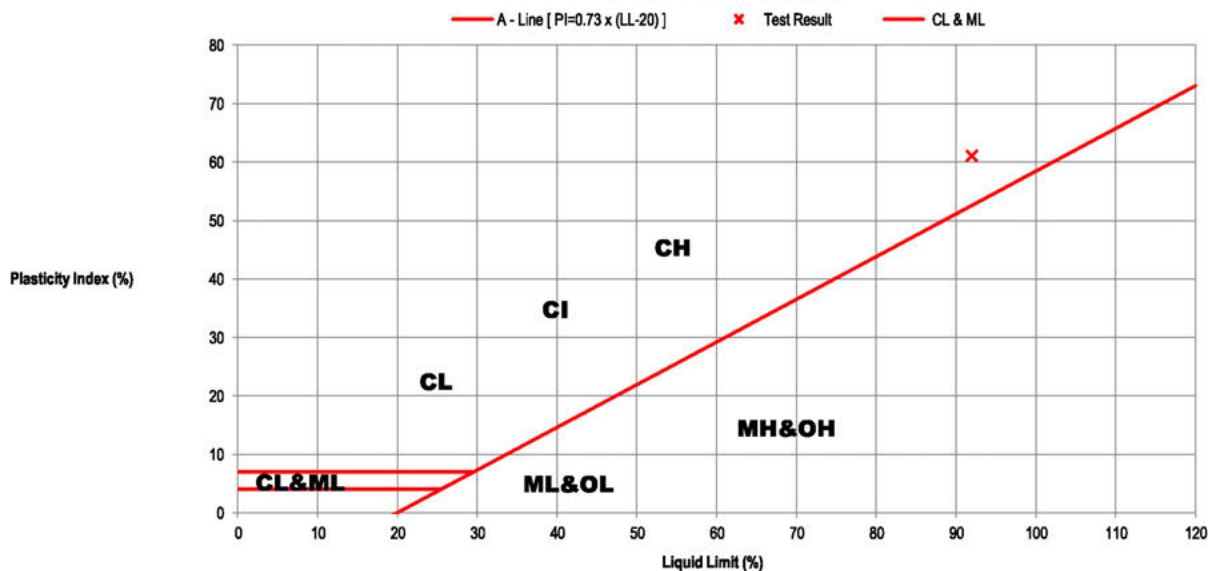
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101104-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4030
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-DH2543-S00050	Client Sample No.	310-01-DH2543
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	92	
Plastic Limit (%)	31	
Plasticity Index (%)	61	
Linear Shrinkage (%)	23.0	Cracking & Curling Occurred
Moisture Content (%)	22.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

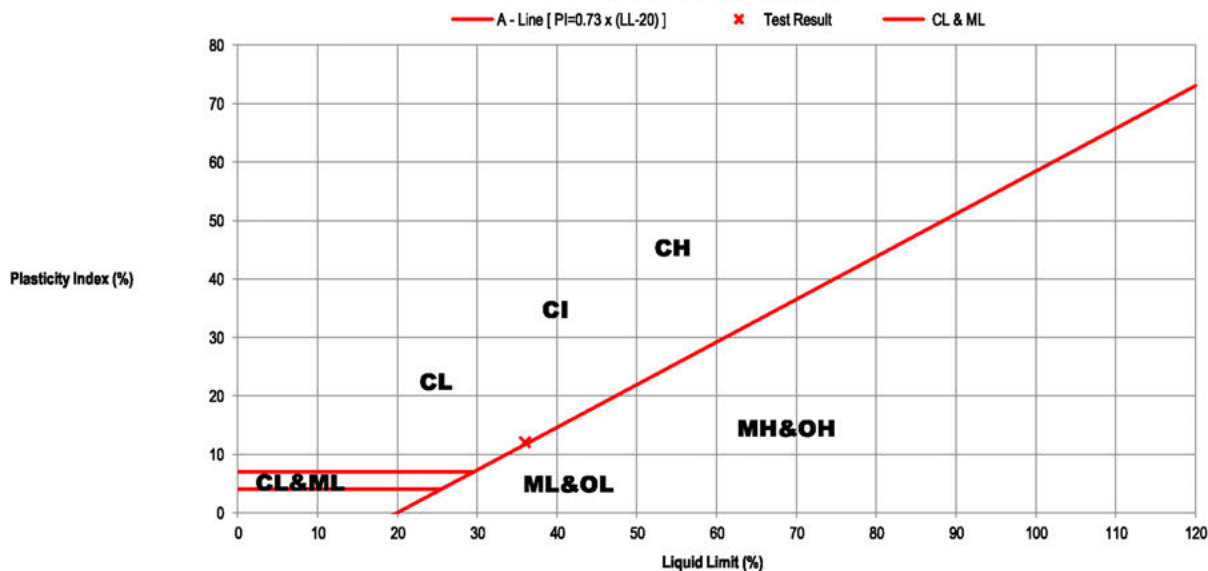
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101105-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	14/11/2018
Bore Hole	310-01-BH2201-S00200	Client Sample No.	310-01-BH2201
Description	SPT	Depth From (m)	2
		Depth To (m)	2.29

RESULTS OF TESTING

Liquid Limit (%)	36	
Plastic Limit (%)	24	
Plasticity Index (%)	12	
Linear Shrinkage (%)	5.0	Cracking & Curling Occurred
Moisture Content (%)	12.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

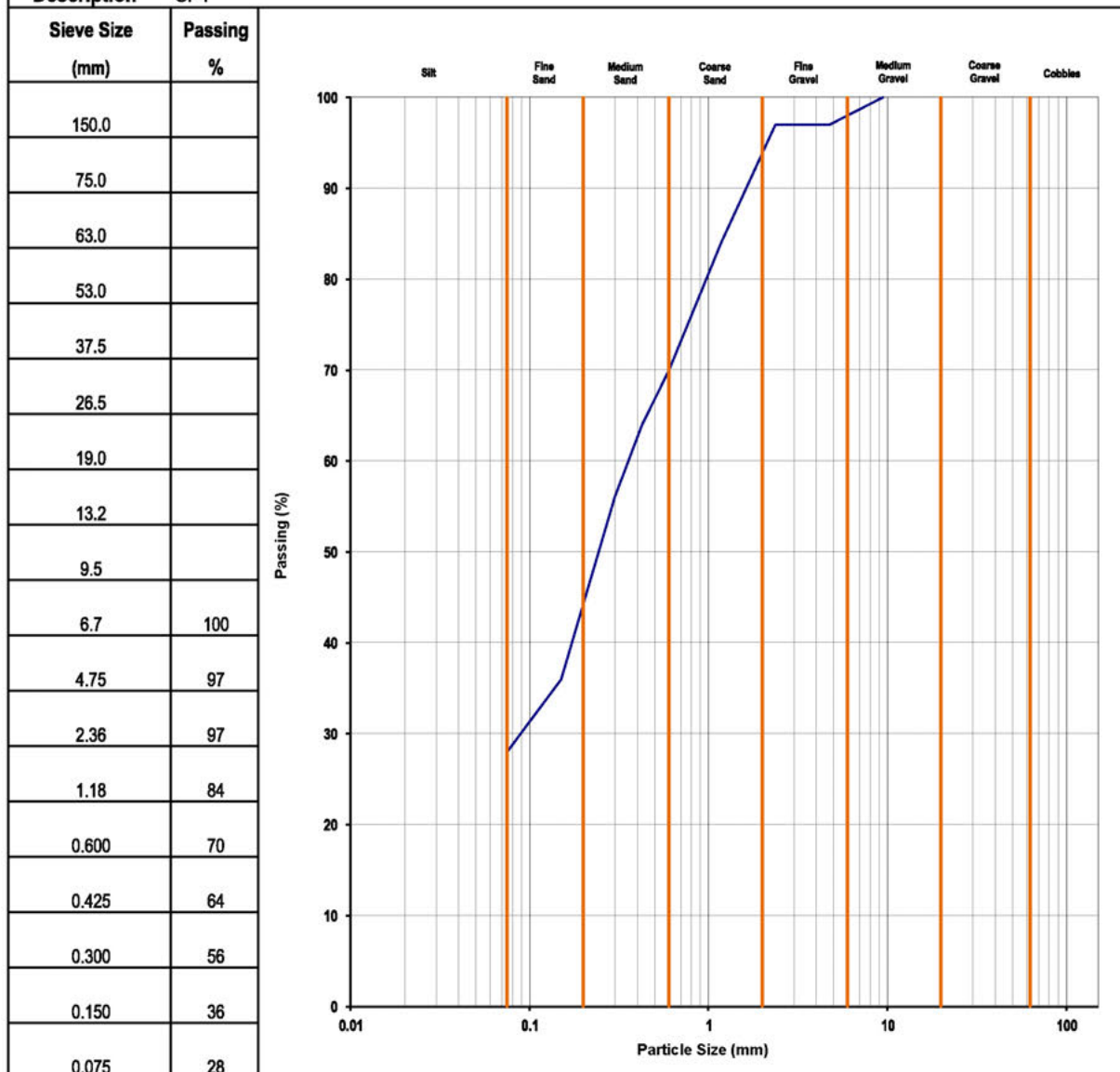
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101105-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	30/10/18-9/11/18
Project No	1897791	Client Sample No	310-01-BH2201
Bore Hole	310-01-BH2201-S00200	Depth From (m)	2
		Depth To (m)	2.29

Description SPT



NOTES/REMARKS:

-
Moisture Content 12.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

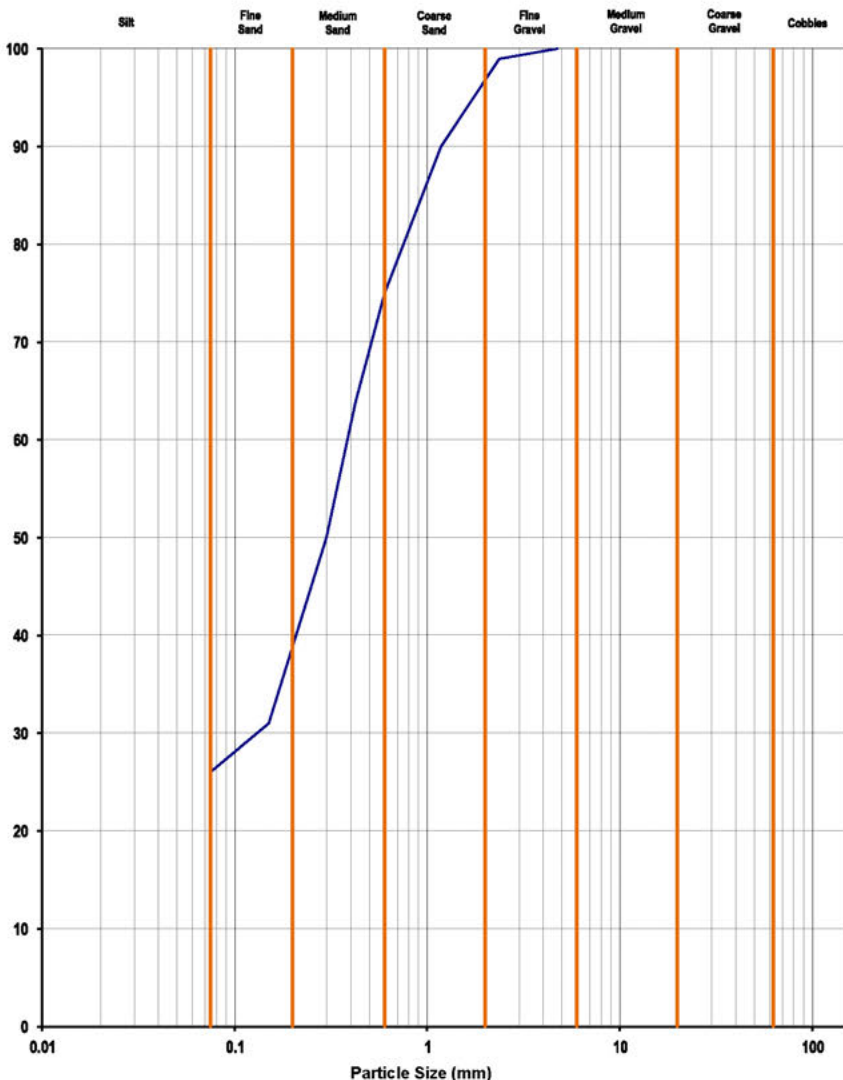
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101106-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2201		
Bore Hole	310-01-BH2201-S00213	Depth From (m)	2.13	Depth To (m)	2.34
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	100
2.36	99
1.18	90
0.600	75
0.425	64
0.300	50
0.150	31
0.075	26



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 26% passing for 0.075 mm and rises to 100% passing at 4.75 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 4.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

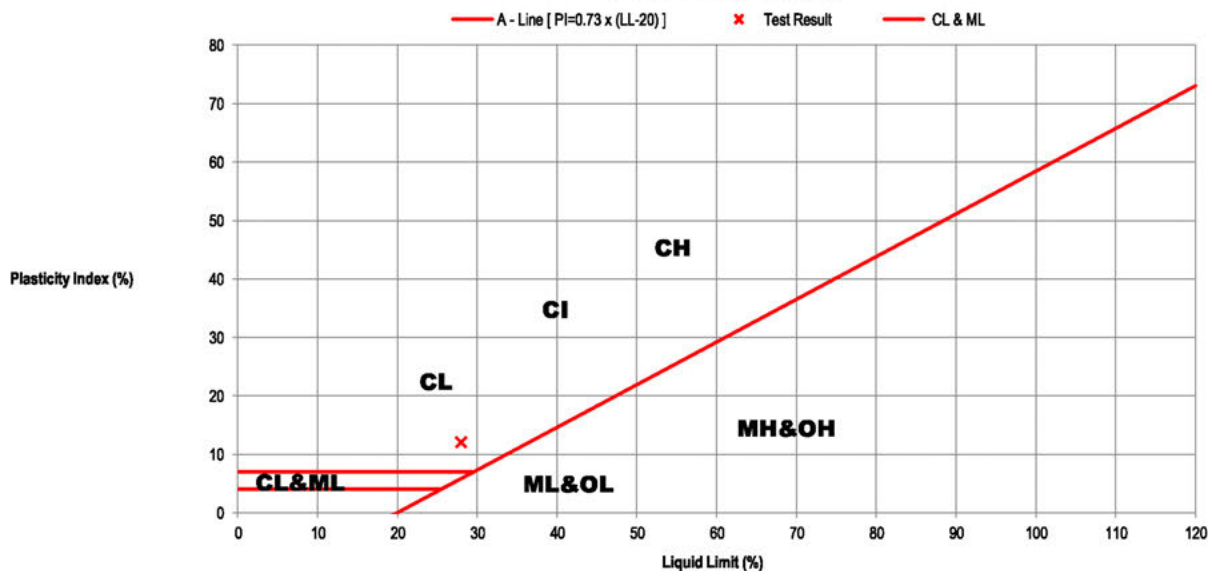
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101107-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	7/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2201-S00370	Client Sample No.	310-01-BH2201
Description	SPT	Depth From (m)	3.7
		Depth To (m)	4.15

RESULTS OF TESTING

Liquid Limit (%)	28	
Plastic Limit (%)	16	
Plasticity Index (%)	12	
Linear Shrinkage (%)	5.5	Curling Occurred
Moisture Content (%)	20.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

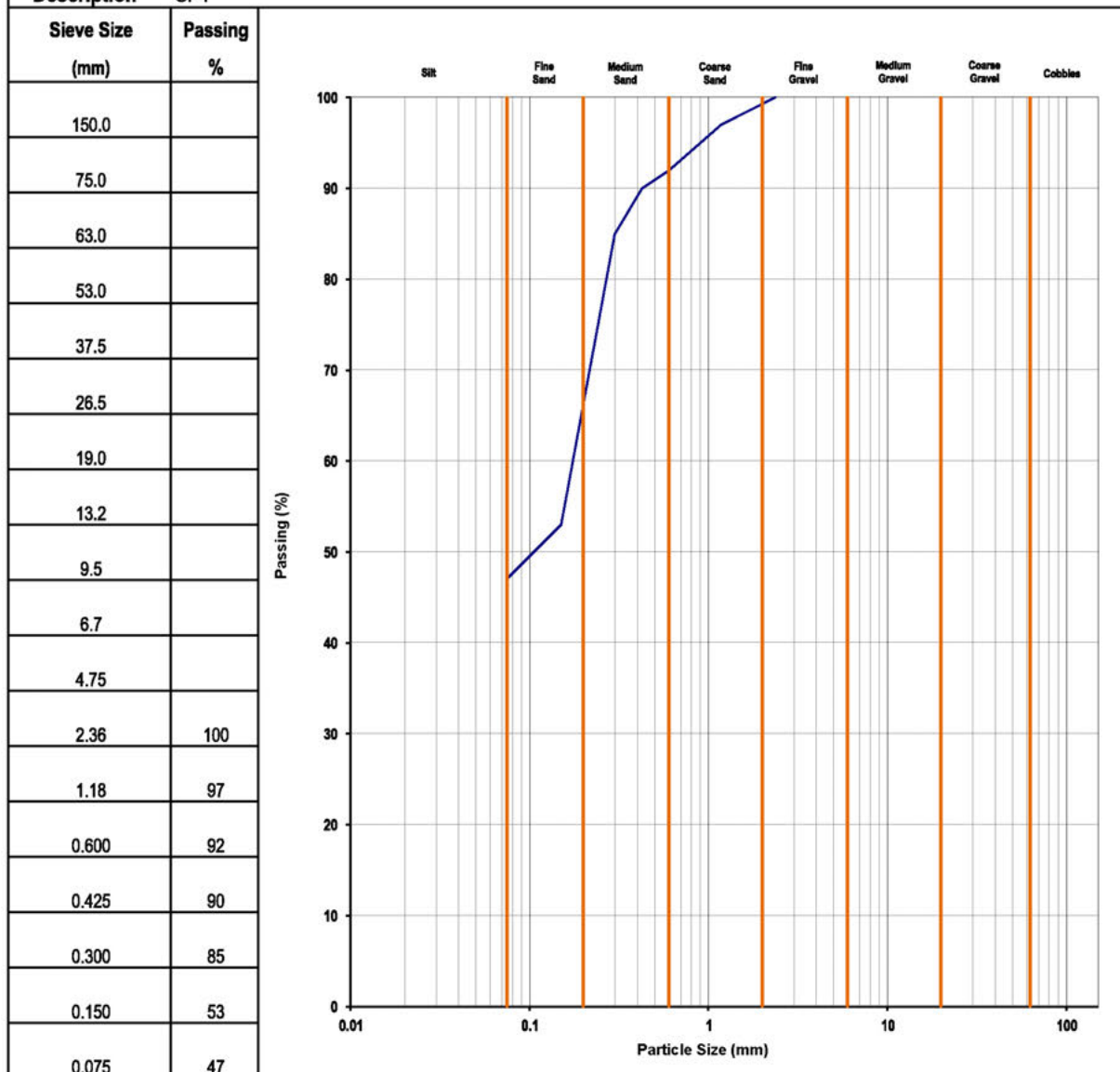
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101107-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	7/11/2018
Project No	1897791	Report Date	14/11/2018
Bore Hole	310-01-BH2201-S00370	Client Sample No	310-01-BH2201
Depth From (m)	3.7	Depth To (m)	4.15

Description SPT



NOTES/REMARKS:

-
Moisture Content 20.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.8.1

NOTES/REMARKS:

REP00402



NATA
 AUTHORIZED BY
TECHNICAL
 COUNCIL

Laboratory No. 9926

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

CERTIFICATE OF ANALYSIS

Work Order : **EB1826986**
Client : **TRILAB PTY LTD**
Contact : **MR CHRIS CHANNON**
Address : **346A BILSEN RD**
GEEBUNG QLD, AUSTRALIA 4031
Telephone : **+61 07 3265 5656**
Project : **1897791 Inland Rail B2G**
Order number : **1911014**
C-O-C number : **---**
Sampler : **---**
Site : **---**
Quote number : **EN/333**
No. of samples received : **14**
No. of samples analysed : **14**

Page : **1 of 5**
Laboratory : **Environmental Division Brisbane**
Contact : **Customer Services EB**
Address : **2 Byth Street Stafford QLD Australia 4053**
Telephone : **+61-7-3243 7222**
Date Samples Received : **07-Nov-2018 13:08**
Date Analysis Commenced : **07-Nov-2018**
Issue Date : **14-Nov-2018 15:39**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				101108 / 310-01-BH2201-S0052 0 / 5.20-5.65m	101110 / 310-01-BH2201-S0082 0 / 8.20-8.65m	101111 / 310-01-BH2201-S0112 0 / 11.20-11.33m	101117 / 310-01-BH2231-S0070 0 / 7.00-7.45m	101122 / 310-01-BH2231-S0190 0 / 19.00-19.45m
Client sampling date / time				[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]
Compound	CAS Number	LOR	Unit	EB1826986-001	EB1826986-002	EB1826986-003	EB1826986-004	EB1826986-005
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	9.2	9.1	9.3	8.9	8.4
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	13.3	13.1	17.1	22.4	17.1
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	<10	<10	30	<10
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	20	20	20	260	10



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				101125 / 310-01-BH2233-S0020 0 / 2.00-2.45m	101128 / 310-01-BH2233-S0070 0 / 7.00-7.45m	101130 / 310-01-BH2233-S0130 0 / 13.00-13.45m	101137 / 310-01-BH2235-S0068 0 / 6.80-7.25m	101140 / 310-01-BH2235-U0117 5 / 11.75-12.00m
Client sampling date / time				[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]
Compound	CAS Number	LOR	Unit	EB1826986-006	EB1826986-007	EB1826986-008	EB1826986-009	EB1826986-010
Result				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	9.3	8.9	8.0	8.8	8.6
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	15.1	13.7	19.8	9.8	25.8
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	100	<10	<10	10	<10
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	210	130	20	20	10



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

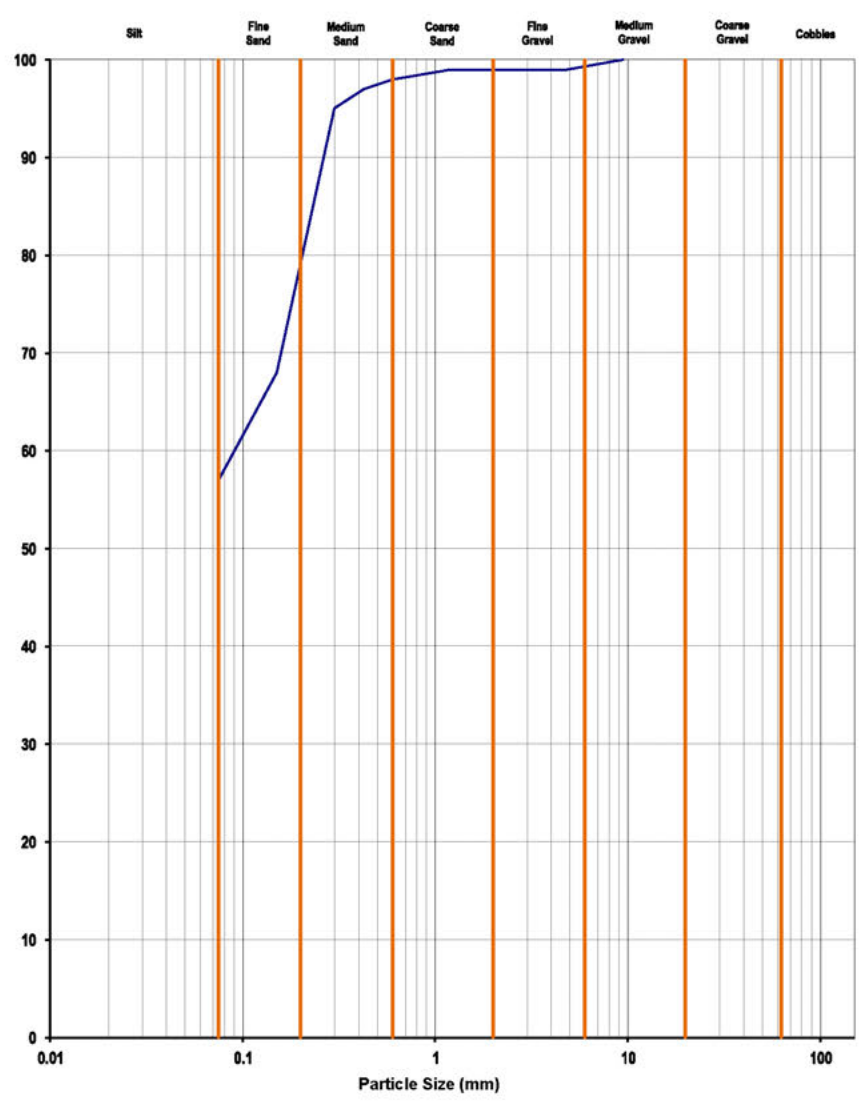
				101141 / 310-01-BH2235-S0158 0 / 15.80-16.25m	101147 / 310-01-BH2236-S0040 0 / 4.00-4.45m	101149 / 310-01-BH2236-S0100 0 / 10.00-10.45m	101151 / 310-01-BH2236-S0160 0 / 16.00-16.45m	----
Client sampling date / time				[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]	[06-Nov-2018]	----
Compound	CAS Number	LOR	Unit	EB1826986-011	EB1826986-012	EB1826986-013	EB1826986-014	-----
Result				Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	8.7	8.7	8.7	8.6	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	27.1	23.7	25.2	26.5	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	230	370	660	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	10	440	320	340	----

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101108-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2201		
Bore Hole	310-01-BH2201-S00520	Depth From (m)	5.2	Depth To (m)	5.65
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	100
6.7	99
4.75	99
2.36	99
1.18	99
0.600	98
0.425	97
0.300	95
0.150	68
0.075	57



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 57% passing for 0.075 mm and rises to 100% passing at 9.5 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 15.9%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

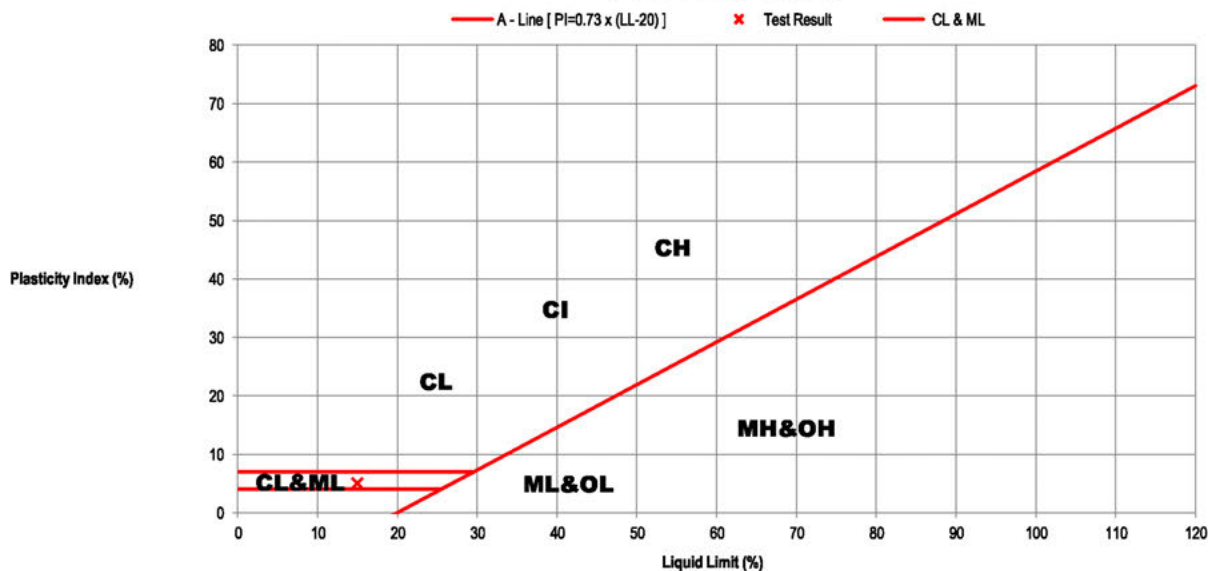
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101109-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	8/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2201-S00670	Client Sample No.	310-01-BH2201
Description	SPT	Depth From (m)	6.7
		Depth To (m)	7.15

RESULTS OF TESTING

Liquid Limit (%) 15
 Plastic Limit (%) 10
 Plasticity Index (%) 5
 Linear Shrinkage (%) 2.0 Curling Occurred
 Moisture Content (%) 11.3
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

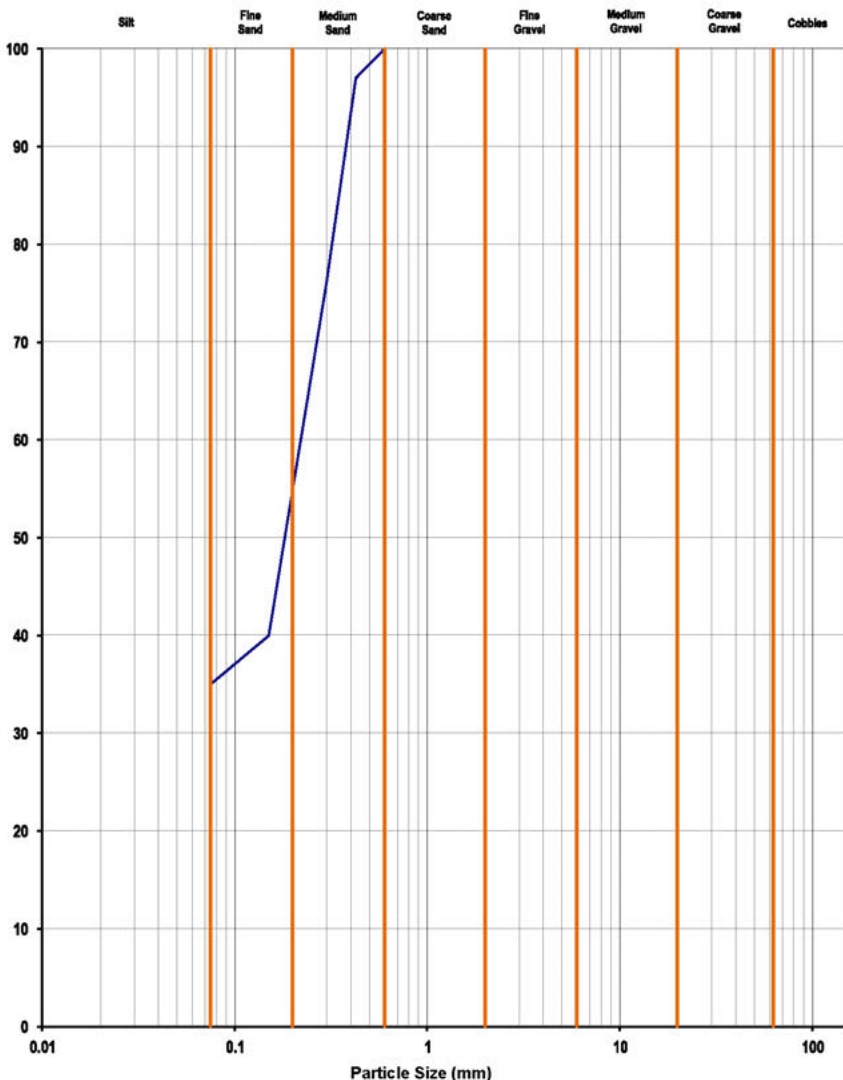
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101109-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2201		
Bore Hole	310-01-BH2201-S00670	Depth From (m)	6.7	Depth To (m)	7.15
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	100
0.425	97
0.300	76
0.150	40
0.075	35



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 35% passing for 0.075 mm, rises to 40% at 0.15 mm, 76% at 0.3 mm, 97% at 0.425 mm, and reaches 100% at 0.6 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.6 mm), Coarse Sand (0.6 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 11.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

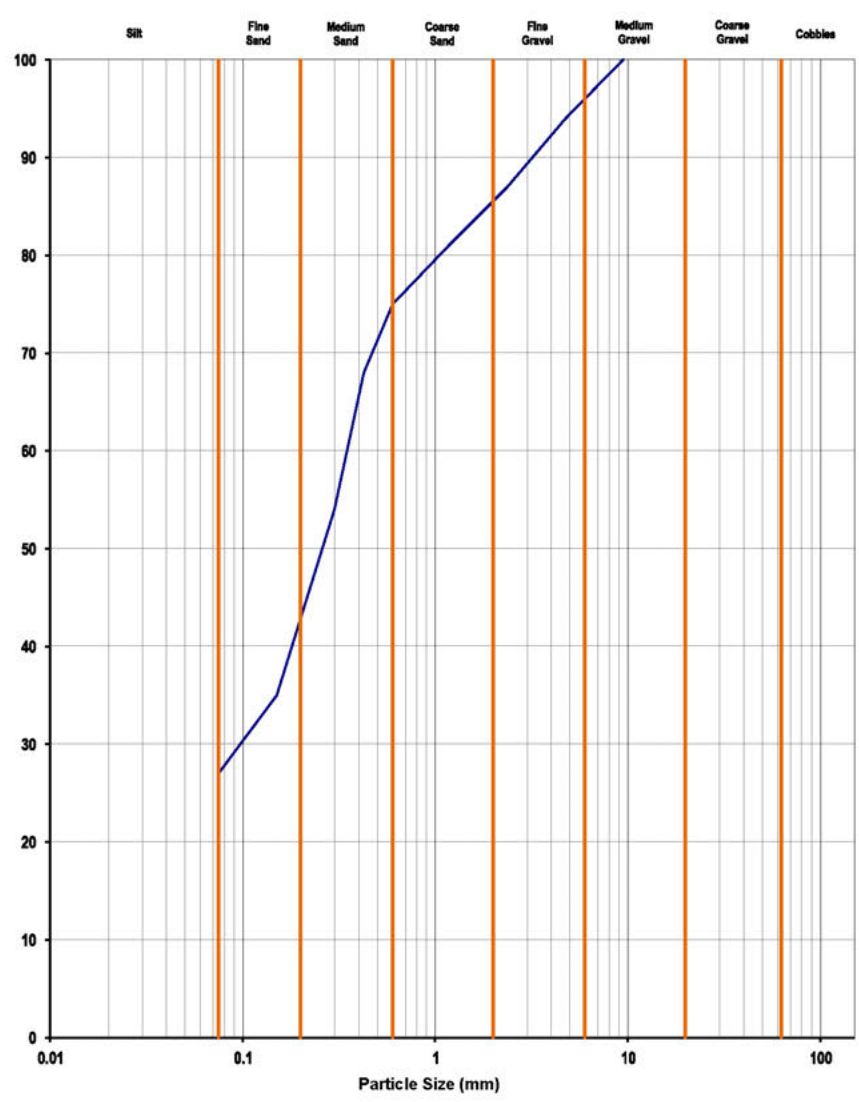
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101111-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2201		
Bore Hole	310-01-BH2201-S01120	Depth From (m)	11.2	Depth To (m)	11.33
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	100
6.7	97
4.75	94
2.36	87
1.18	81
0.600	75
0.425	68
0.300	54
0.150	35
0.075	27



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 27% passing for 0.075 mm and reaches 100% passing at 9.5 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 21.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

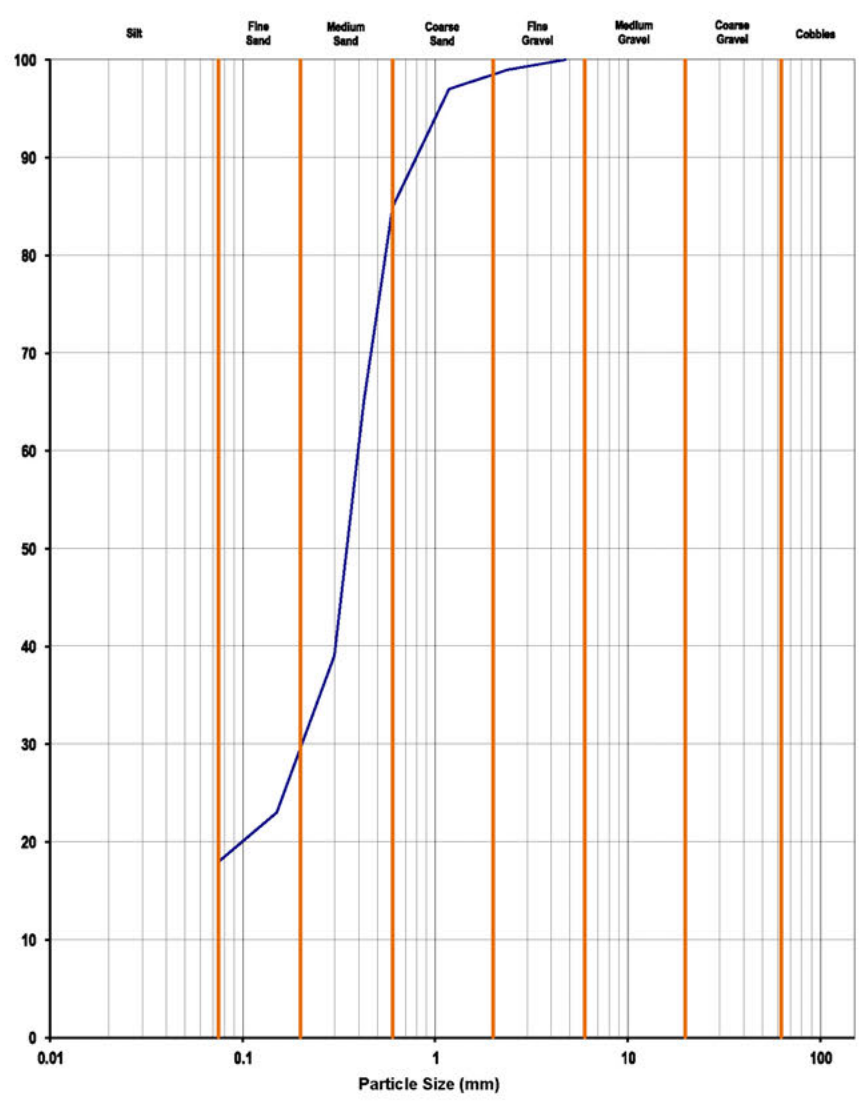
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101112-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2201		
Bore Hole	310-01-BH2201-S01570	Depth From (m)	15.7	Depth To (m)	15.85
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	100
2.36	99
1.18	97
0.600	85
0.425	65
0.300	39
0.150	23
0.075	18



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 18% passing for 0.075 mm and rises to 100% passing at 4.75 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 19.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

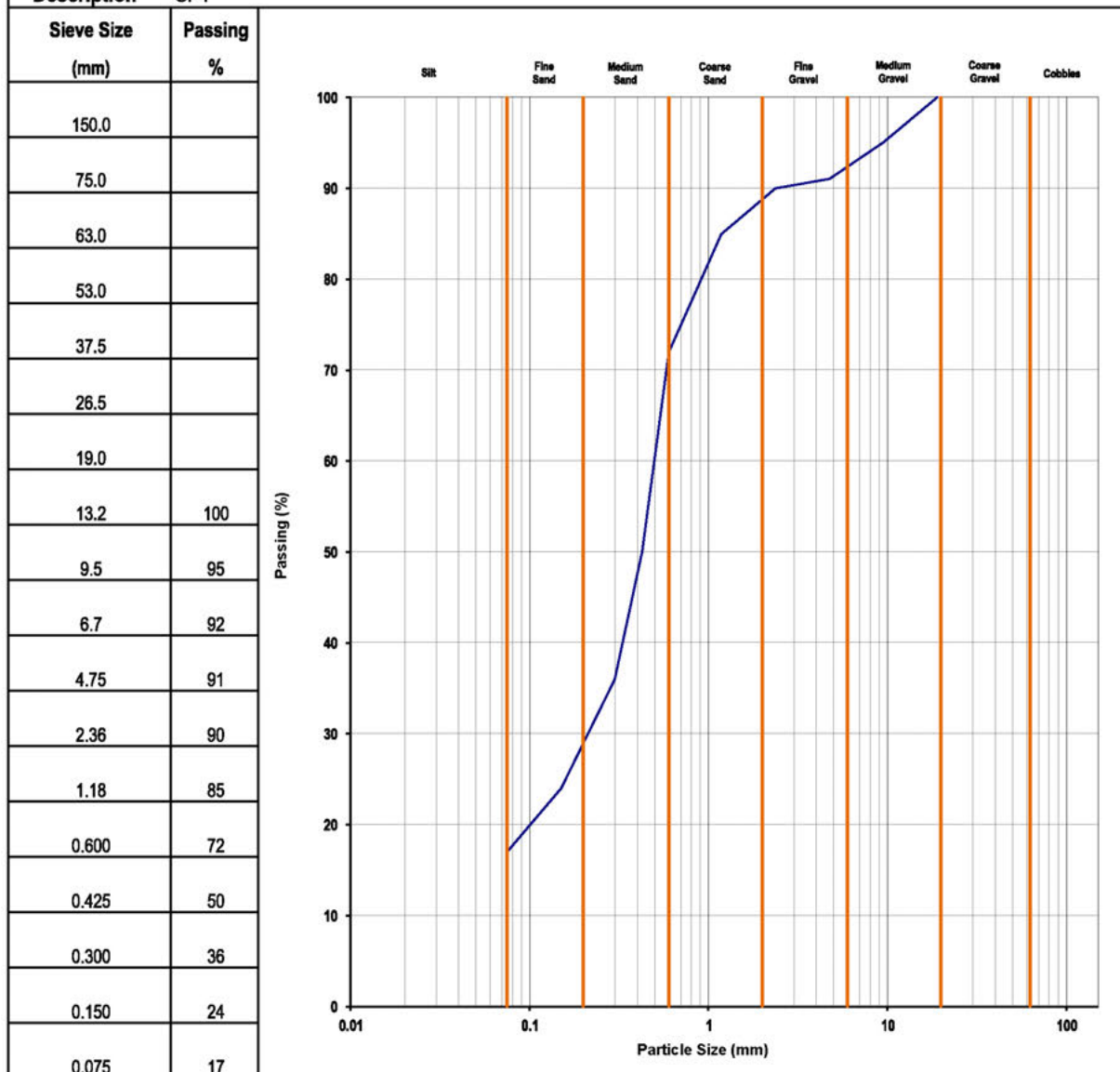
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101113-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	7/11/2018
Project No	1897791	Report Date	14/11/2018
Bore Hole	310-01-BH2201-S02470	Client Sample No	310-01-BH2201
Depth From (m)	24.7	Depth To (m)	24.78

Description SPT



NOTES/REMARKS:

-
Moisture Content 20%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

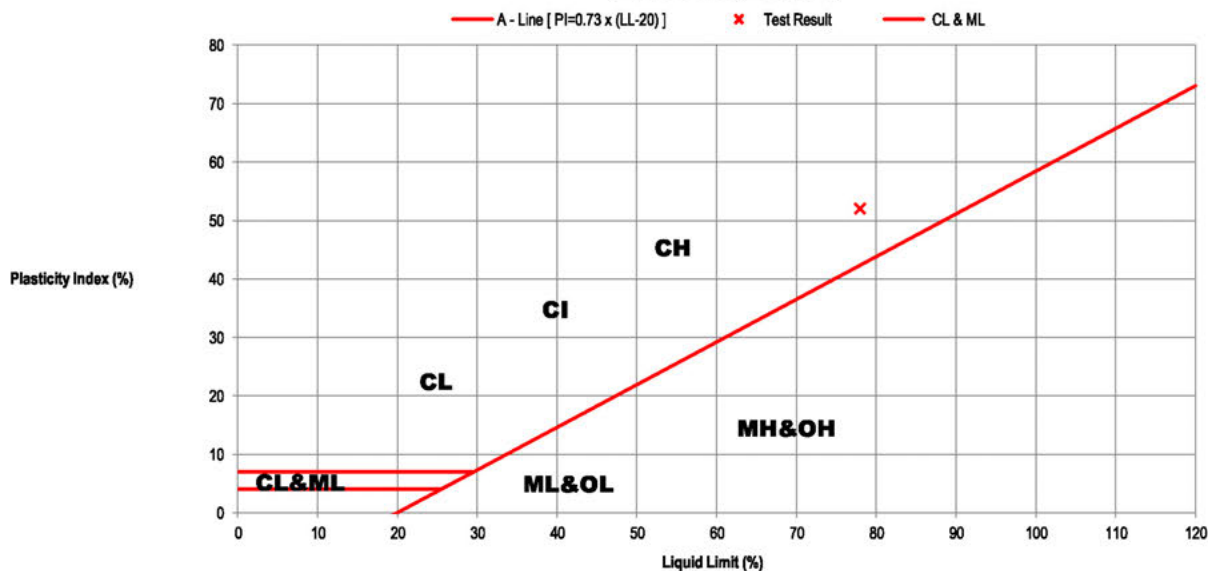
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101115-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	8/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2231-S00400	Client Sample No.	310-01-BH2231
Description	SPT	Depth From (m)	4
		Depth To (m)	4.45

RESULTS OF TESTING

Liquid Limit (%) 78
 Plastic Limit (%) 26
 Plasticity Index (%) 52
 Linear Shrinkage (%) 20.0 Curling Occurred
 Moisture Content (%) 34.4
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

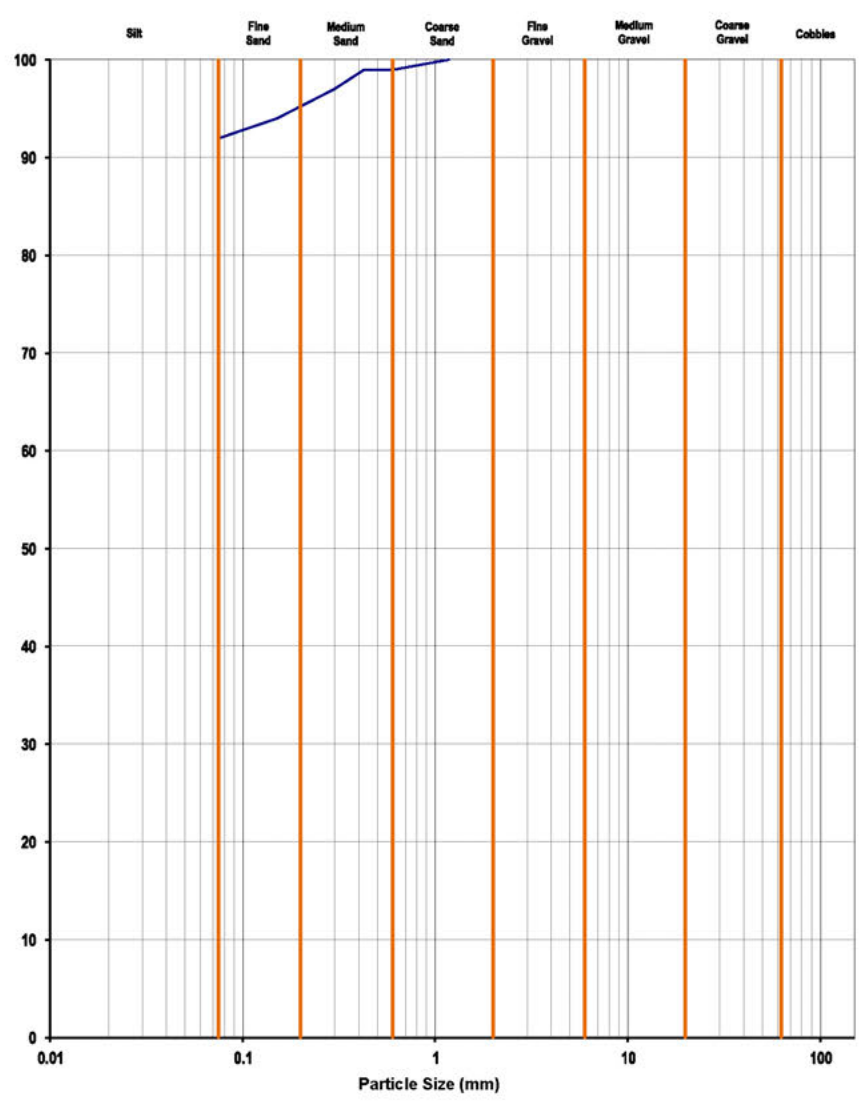
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101115-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2231		
Bore Hole	310-01-BH2231-S00400	Depth From (m)	4	Depth To (m)	4.45
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	99
0.300	97
0.150	94
0.075	92



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at 100% passing for 0.075 mm and remains at 100% until approximately 0.15 mm, then drops to about 92% at 0.075 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 34.4%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

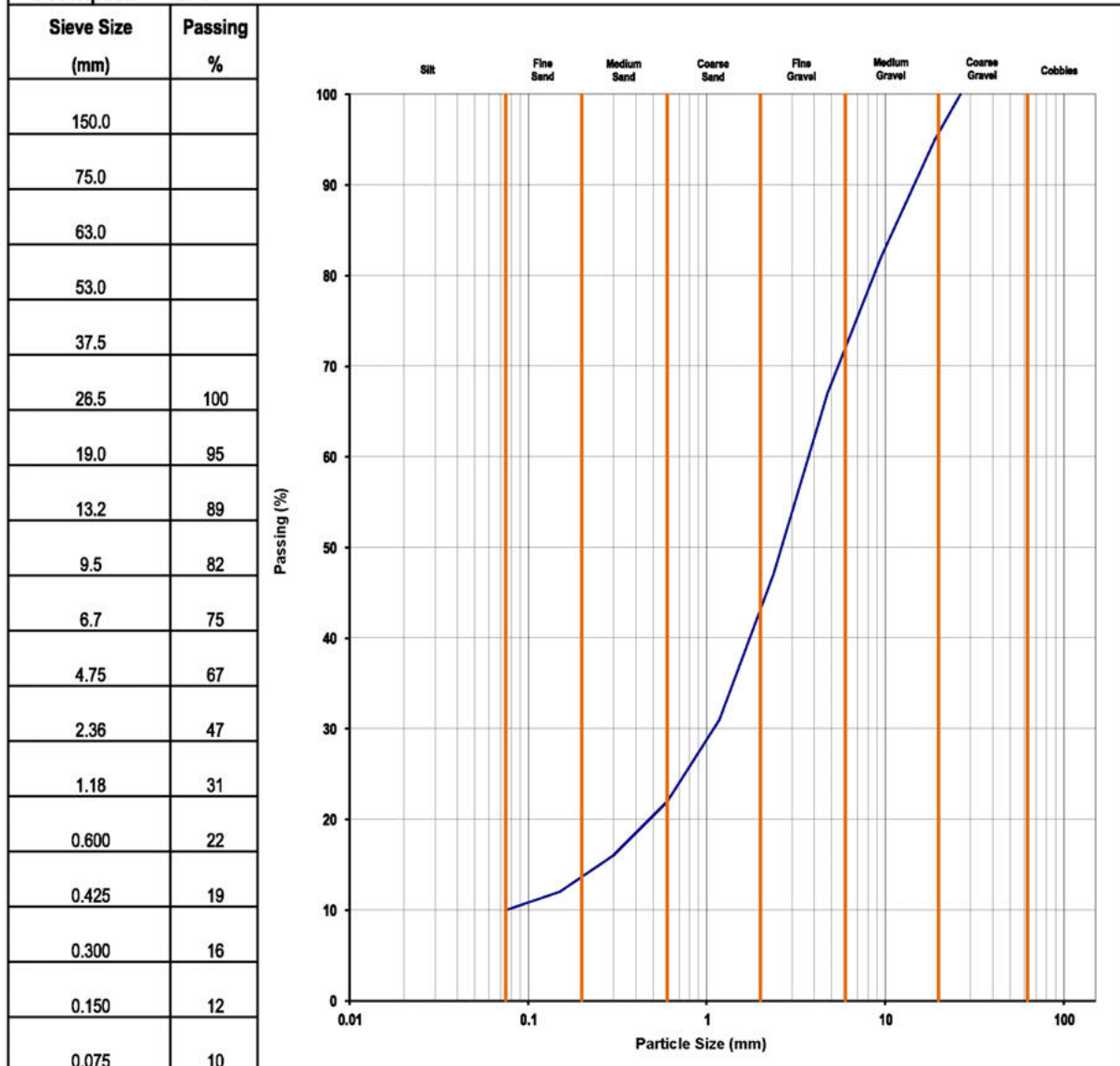
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101118-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
		Test Date	7/11/2018
		Report Date	14/11/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2231		
Bore Hole	310-01-BH2231-S00850	Depth From (m)	8.5	Depth To (m)	8.95
Description	SPT				



NOTES/REMARKS:

-
Moisture Content 13.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

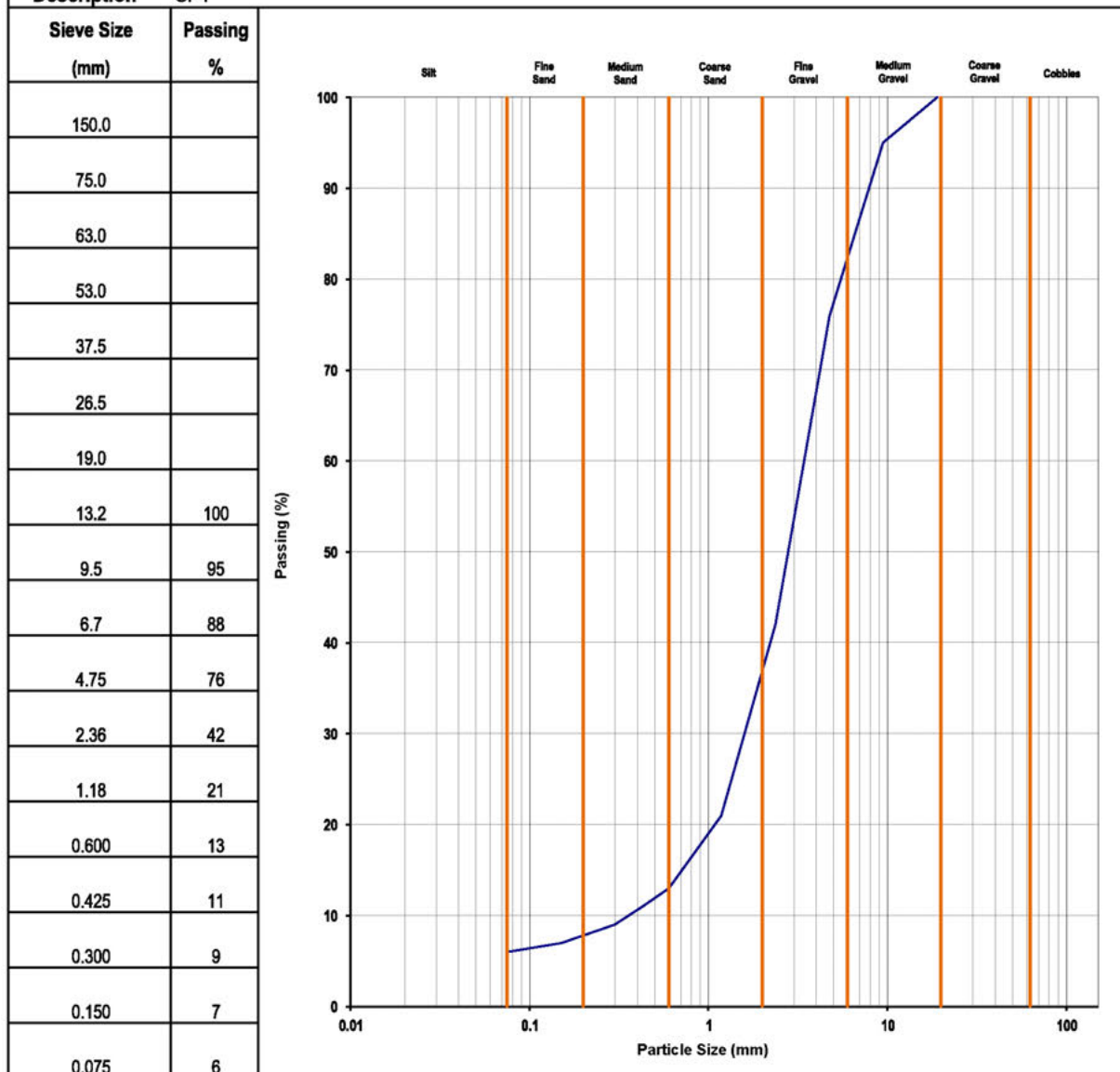
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101119-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	7/11/2018
Project No	1897791	Report Date	14/11/2018
Bore Hole	310-01-BH2231-S01300	Client Sample No	310-01-BH2231
Description	SPT	Depth From (m)	13
		Depth To (m)	13.45



NOTES/REMARKS:

-
Moisture Content 12.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

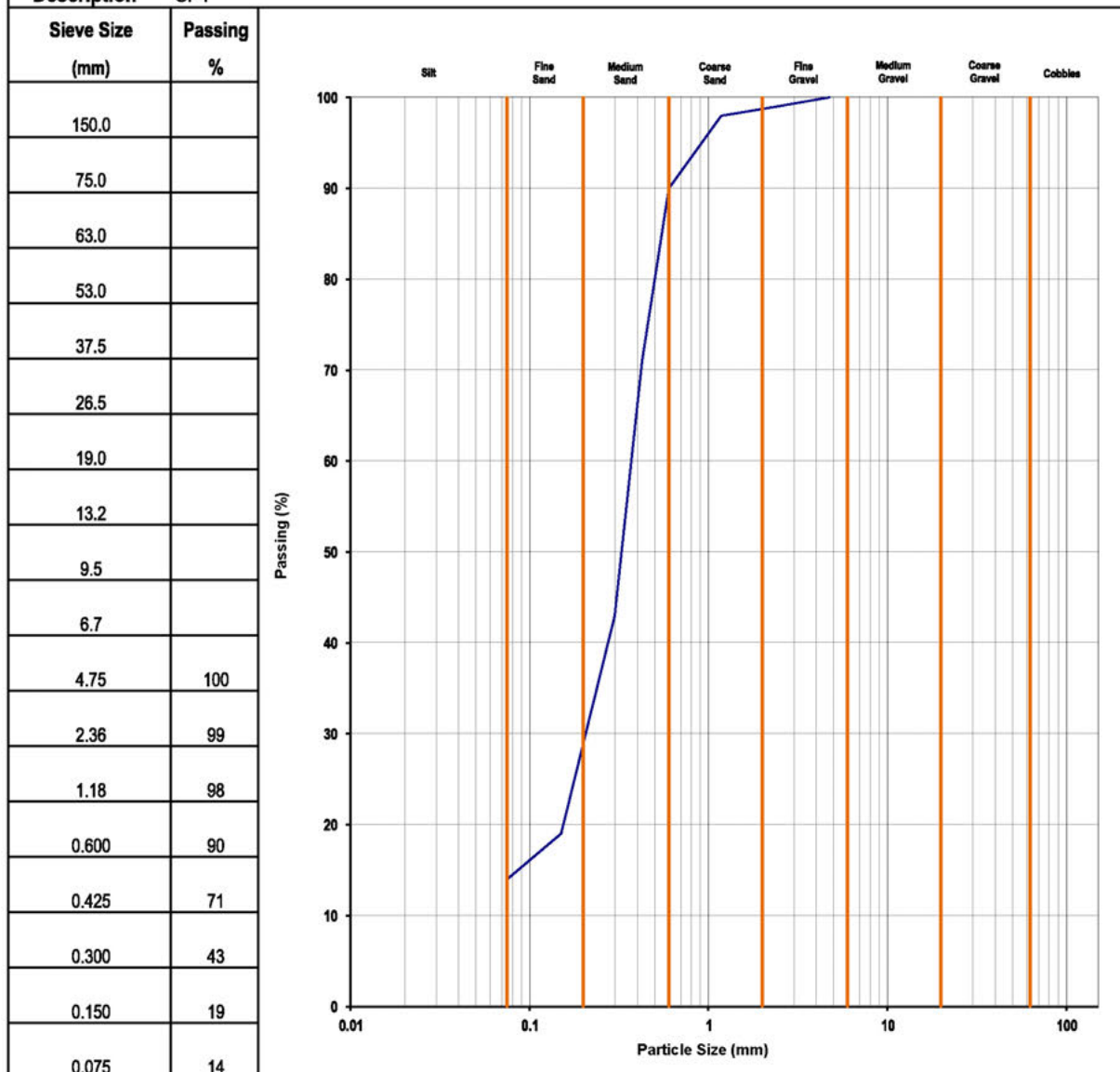
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101120-G
				Request No	R3_BH_Rev1_4040
Address	PO Box 1734 MILTON BC	QLD	4064	Test Date	31/10/18-8/11/18
				Report Date	8/11/2018
Project	Inland Rail B2G				
Project No	1897791		Client Sample No	310-01-BH2231	
Bore Hole	310-01-BH2231-S01450		Depth From (m)	14.5	Depth To (m) 14.95

Description SPT



NOTES/REMARKS:

-
Moisture Content 20.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

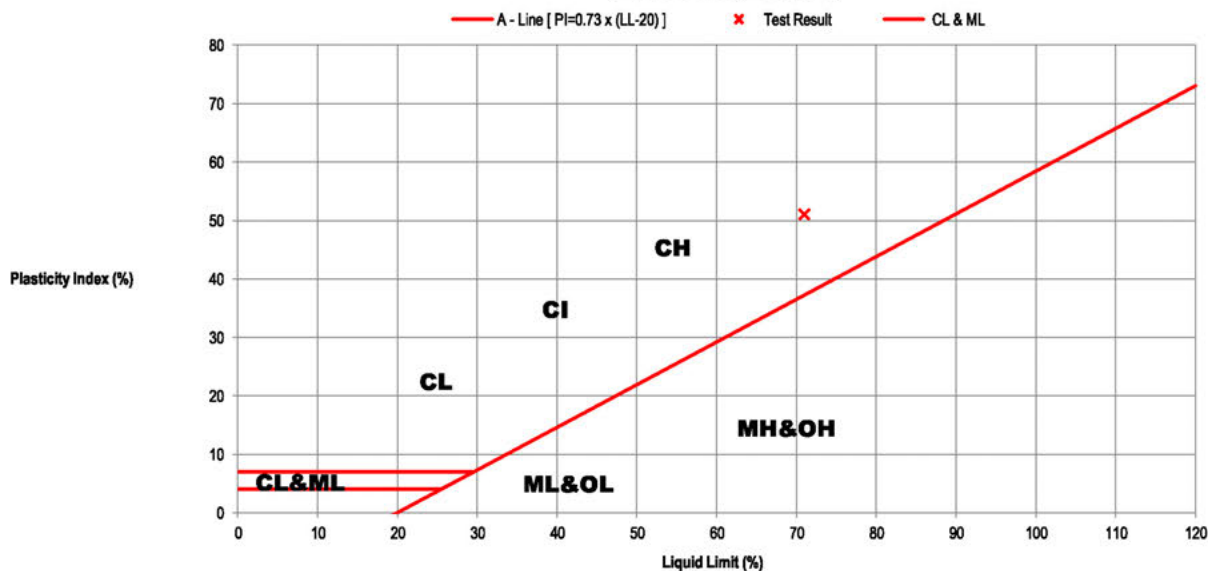
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101121-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	7/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2231-S01750	Client Sample No.	310-01-BH2231
Description	SPT	Depth From (m)	17.5
		Depth To (m)	17.95

RESULTS OF TESTING

Liquid Limit (%) 71
 Plastic Limit (%) 20
 Plasticity Index (%) 51
 Linear Shrinkage (%) 18.0 Curling Occurred
 Moisture Content (%) 23.8
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

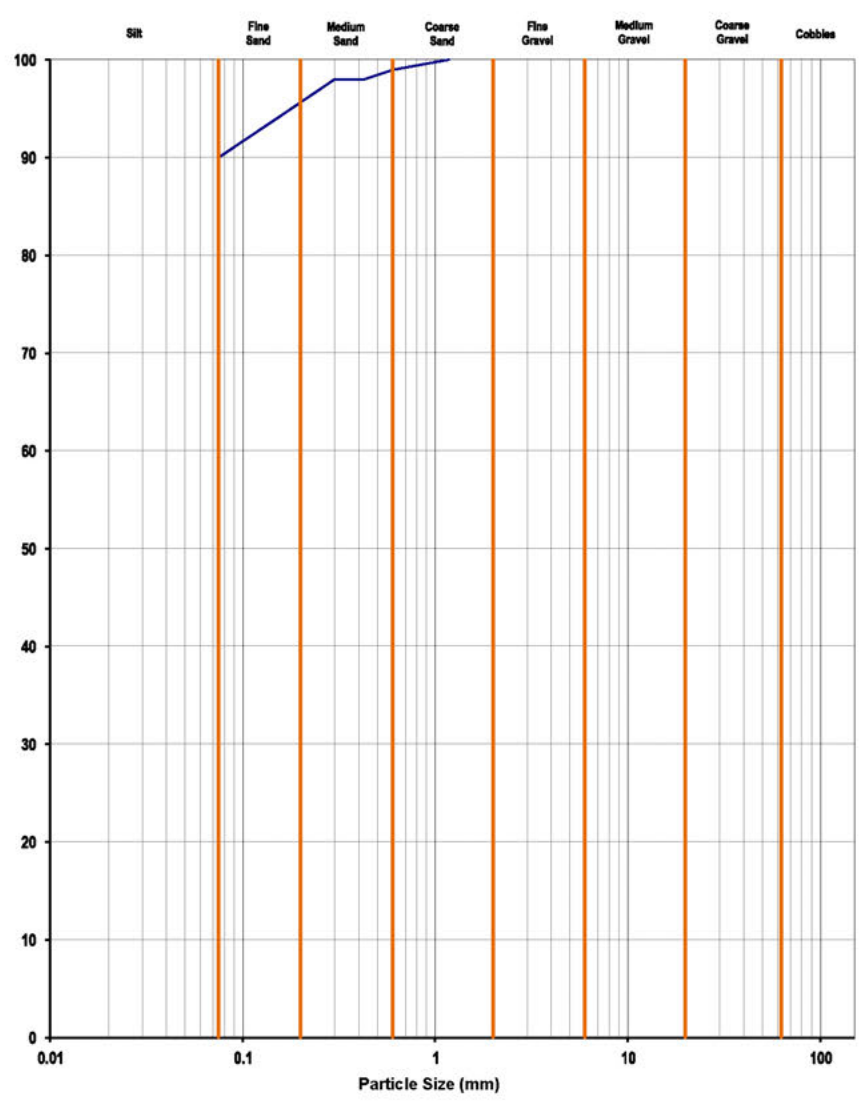
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101121-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2231		
Bore Hole	310-01-BH2231-S01750	Depth From (m)	17.5	Depth To (m)	17.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	98
0.300	98
0.150	94
0.075	90



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at 100% passing for 0.075 mm and remains at 100% until approximately 0.15 mm, then drops to 94% at 0.3 mm, 98% at 0.425 mm, 99% at 0.6 mm, and reaches 100% at 1.18 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 23.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

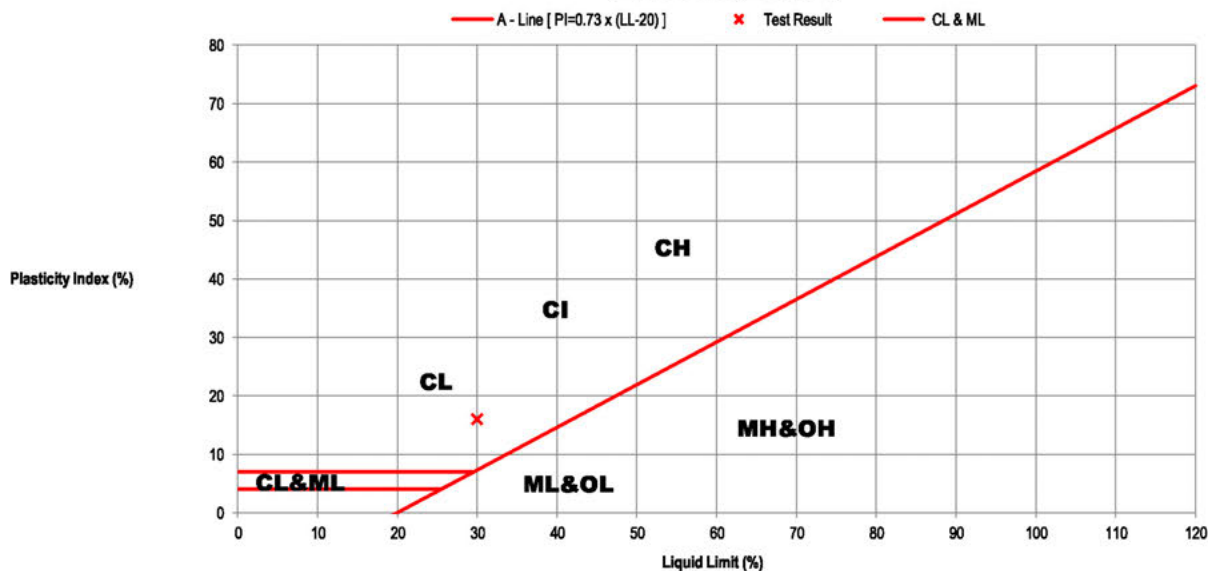
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101123-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	8/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2231-S02050	Client Sample No.	310-01-BH2231
Description	SPT	Depth From (m)	20.5
		Depth To (m)	20.95

RESULTS OF TESTING

Liquid Limit (%) 30
Plastic Limit (%) 14
Plasticity Index (%) 16
Linear Shrinkage (%) 8.5 **Curling Occurred**
Moisture Content (%) 16.7
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.6.1, 2.1.1

ATTERBERG LIMITS TEST REPORT

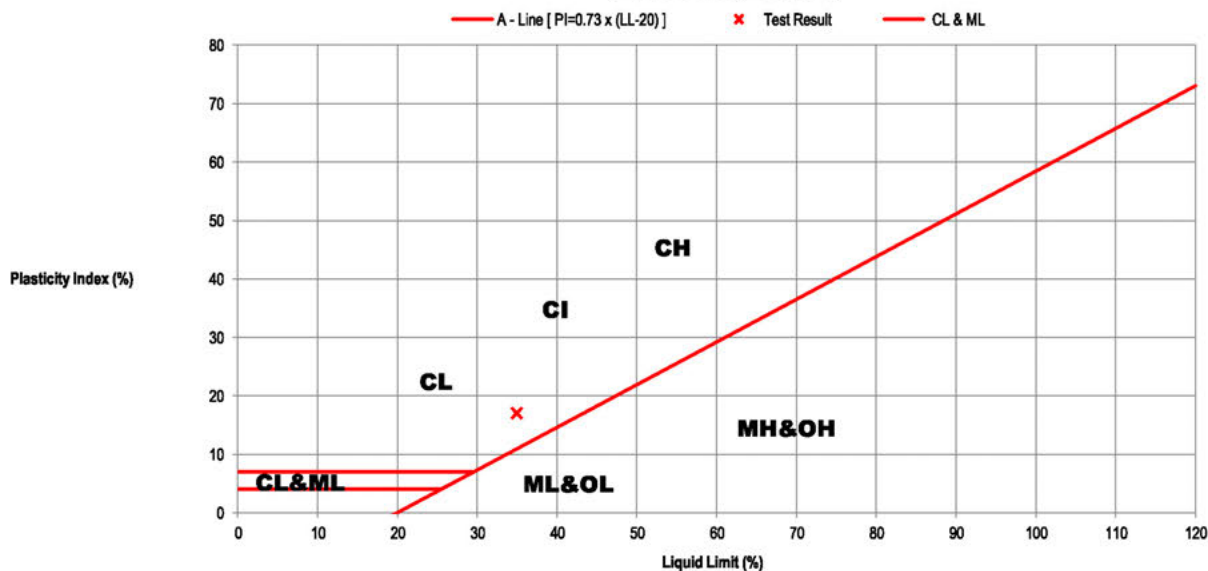
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101124-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	8/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2231-S02350	Client Sample No.	310-01-BH2231
Description	SPT	Depth From (m)	23.5
		Depth To (m)	23.91

RESULTS OF TESTING

Liquid Limit (%) 35
Plastic Limit (%) 18
Plasticity Index (%) 17
Linear Shrinkage (%) 9.5 **Curling Occurred**
Moisture Content (%) 16.5
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

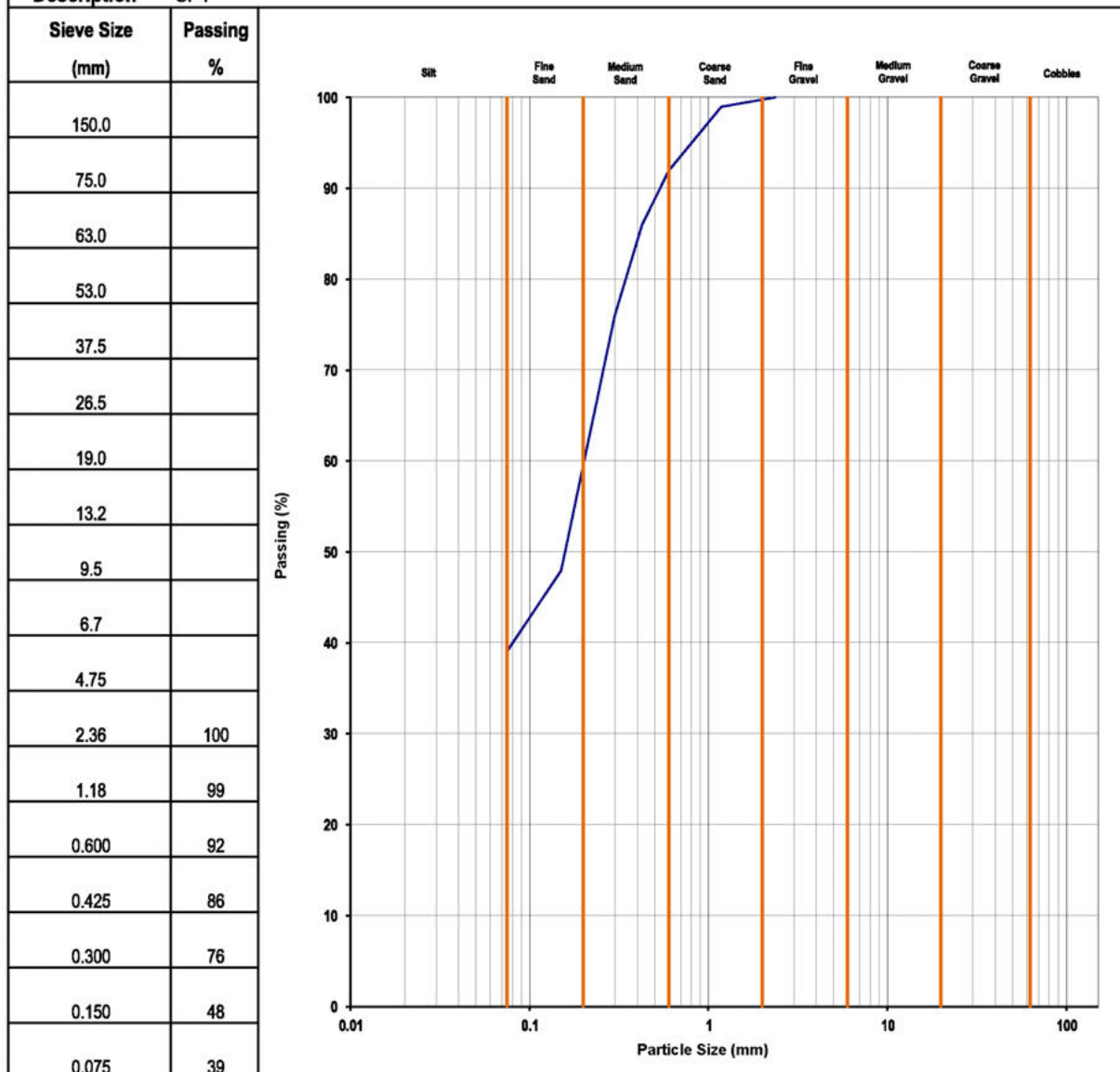
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101124-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
		Test Date	7/11/2018
		Report Date	14/11/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2231		
Bore Hole	310-01-BH2231-S02350	Depth From (m)	23.5	Depth To (m)	23.91

Description	SPT
--------------------	-----



NOTES/REMARKS:

-
Moisture Content 16.5%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

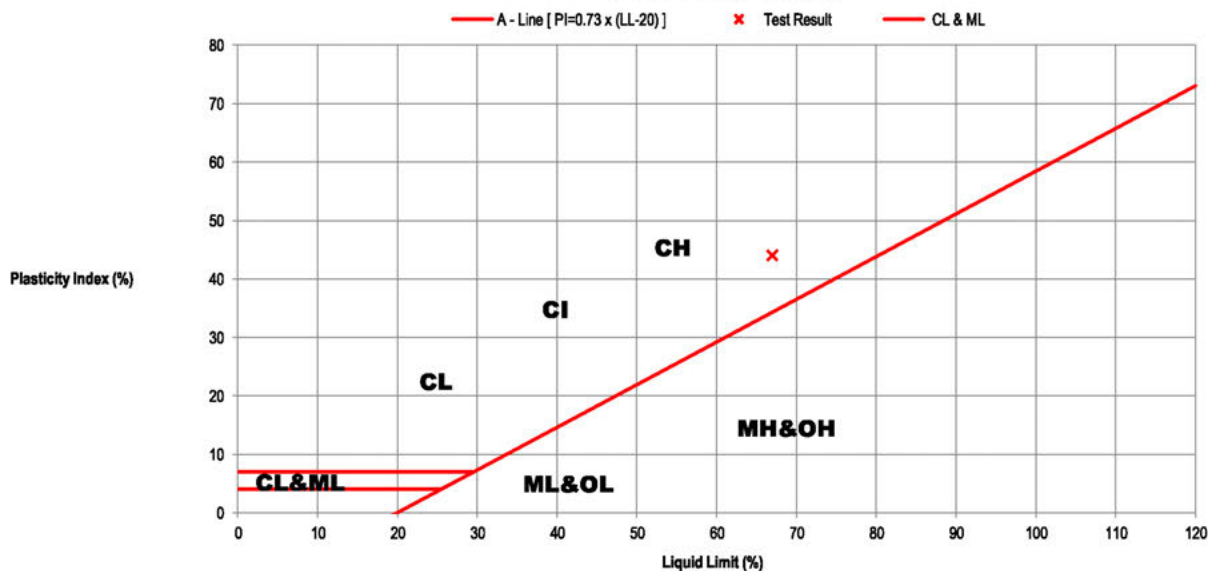
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101125-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4040
Project	Inland Rail B2G	Test Date	8/11/2018
Project No.	1897791	Report Date	12/11/2018
Bore Hole	310-01-BH2233-S00200	Client Sample No.	310-01-BH2233
Description	SPT	Depth From (m)	2
		Depth To (m)	2.45

RESULTS OF TESTING

Liquid Limit (%) 67
 Plastic Limit (%) 23
 Plasticity Index (%) 44
 Linear Shrinkage (%) 16.5 Curling Occurred
 Moisture Content (%) 15.1
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Tested as received

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

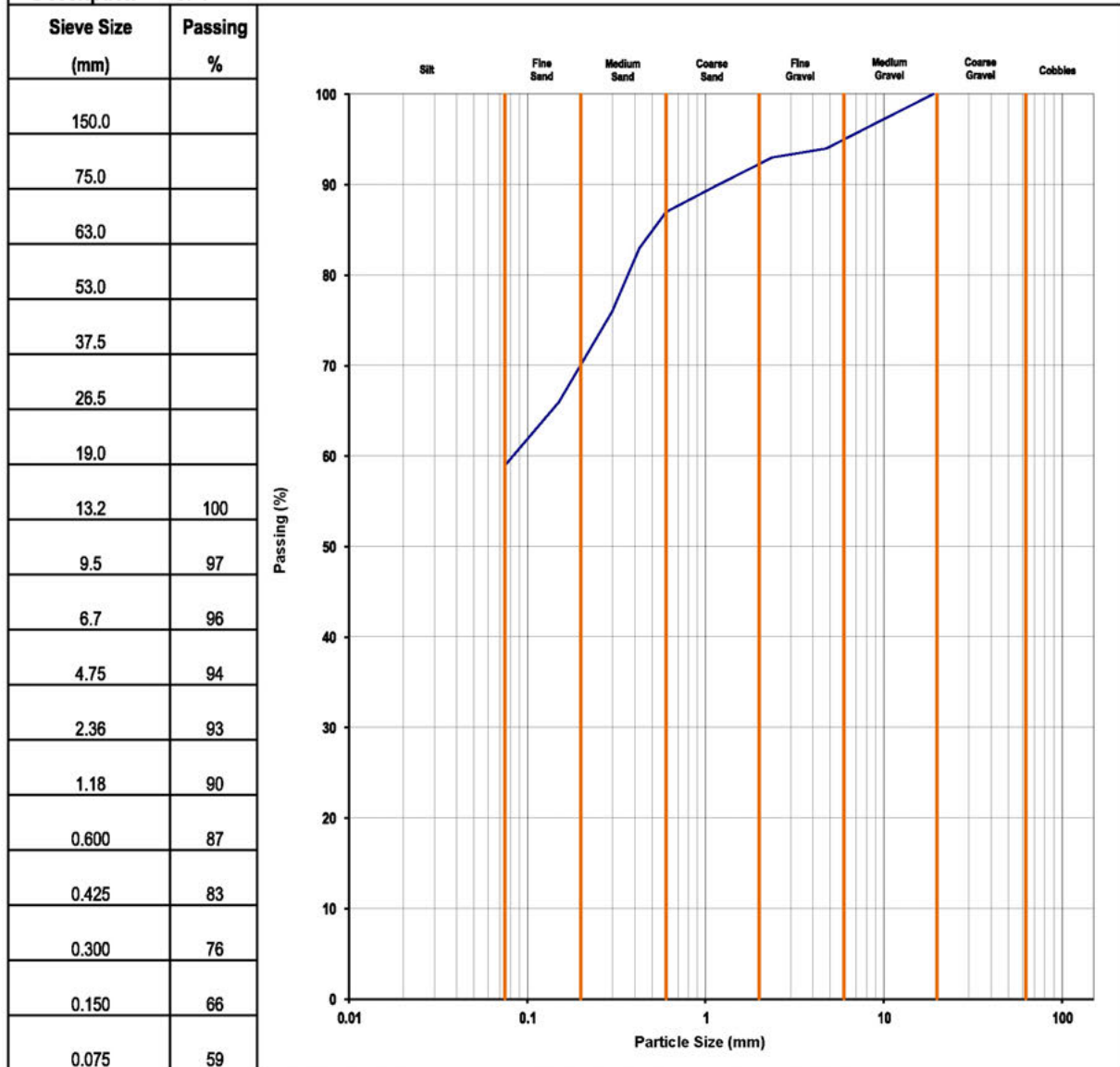
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101125-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4040
		Test Date	5/11/2018
		Report Date	14/11/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2233		
Bore Hole	310-01-BH2233-S00200	Depth From (m)	2	Depth To (m)	2.45
Description	SPT				



NOTES/REMARKS:

-
Moisture Content 15.1%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

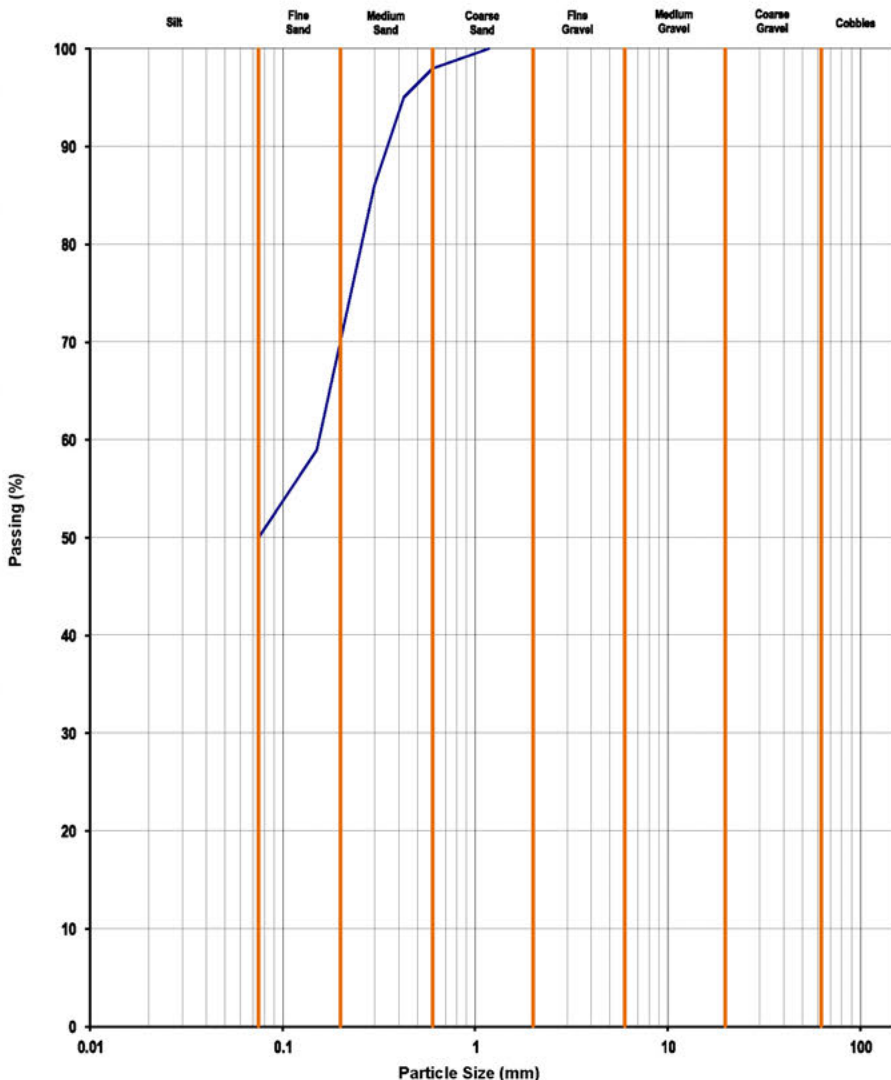
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101126-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2233		
Bore Hole	310-01-BH2233-S00400	Depth From (m)	4	Depth To (m)	4.45
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	98
0.425	95
0.300	86
0.150	59
0.075	50



NOTES/REMARKS:

-

Moisture Content 20.1%

Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

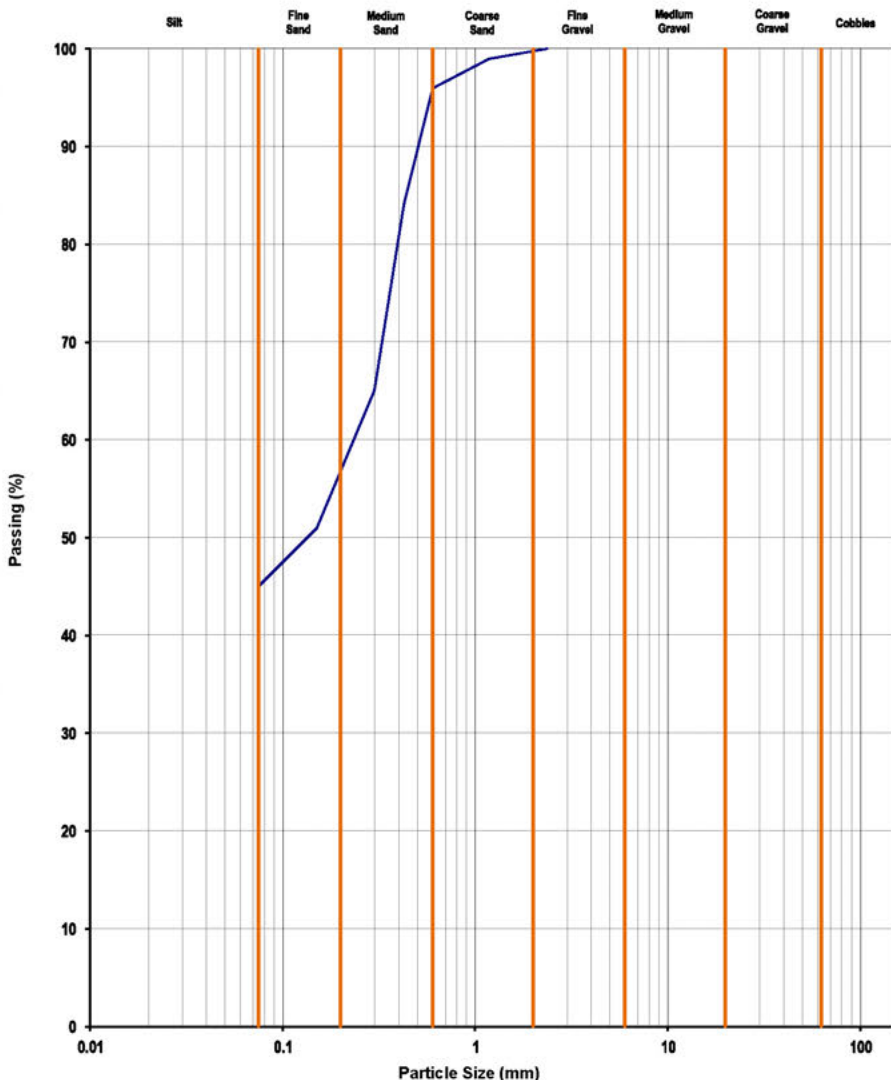
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101127-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2233		
Bore Hole	310-01-BH2233-S00550	Depth From (m)	5.5	Depth To (m)	5.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	96
0.425	84
0.300	65
0.150	51
0.075	45



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 45% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 20%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

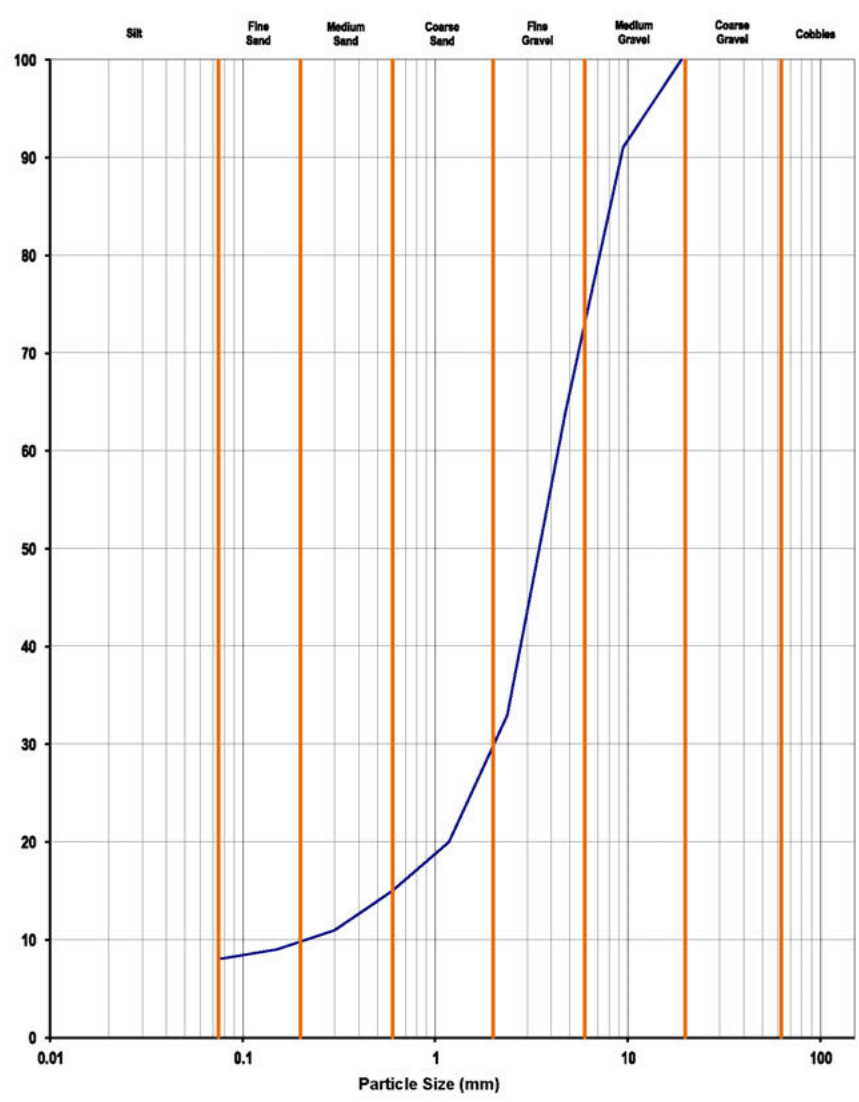
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101129-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2233		
Bore Hole	310-01-BH2233-S01000	Depth From (m)	10	Depth To (m)	10.45
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	100
13.2	96
9.5	91
6.7	83
4.75	64
2.36	33
1.18	20
0.600	15
0.425	13
0.300	11
0.150	9
0.075	8



NOTES/REMARKS:

-

Moisture Content 10.3%

Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

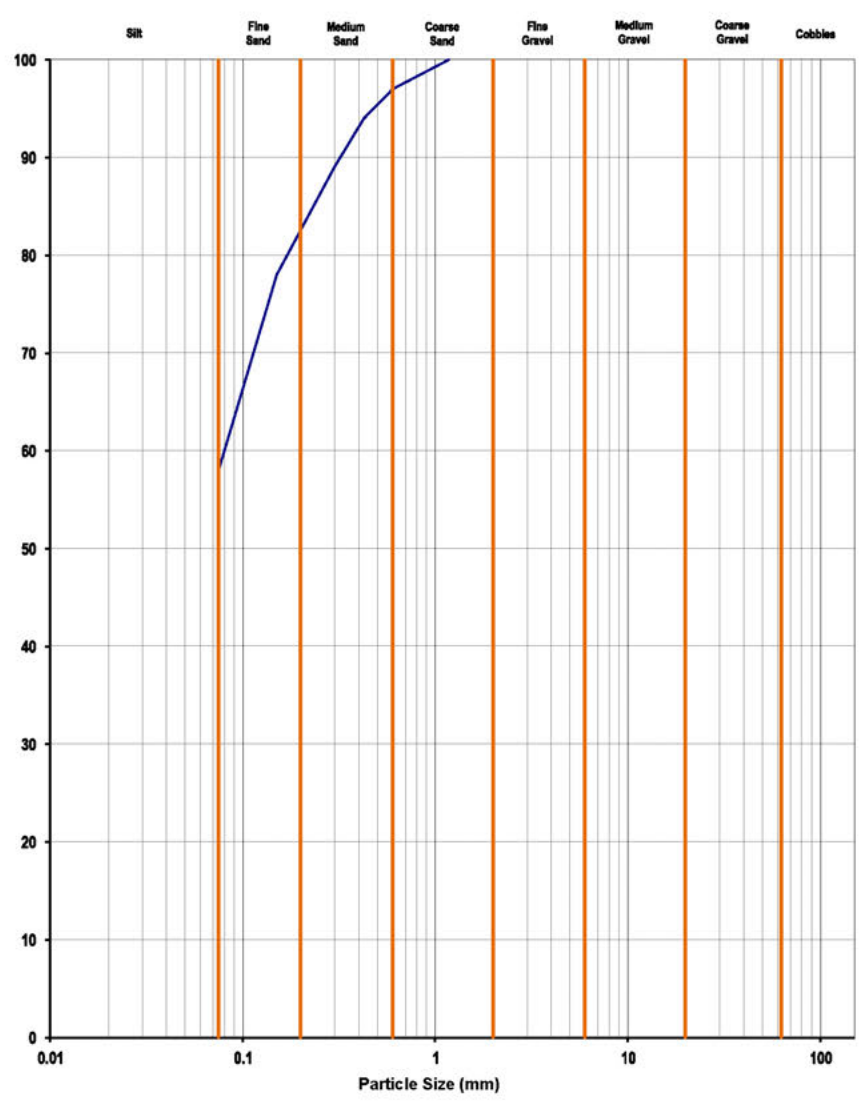
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101131-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2233		
Bore Hole	310-01-BH2233-S01450	Depth From (m)	14.5	Depth To (m)	14.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	97
0.425	94
0.300	89
0.150	78
0.075	58



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 58% passing for 0.075 mm and reaches 100% passing at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 34.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

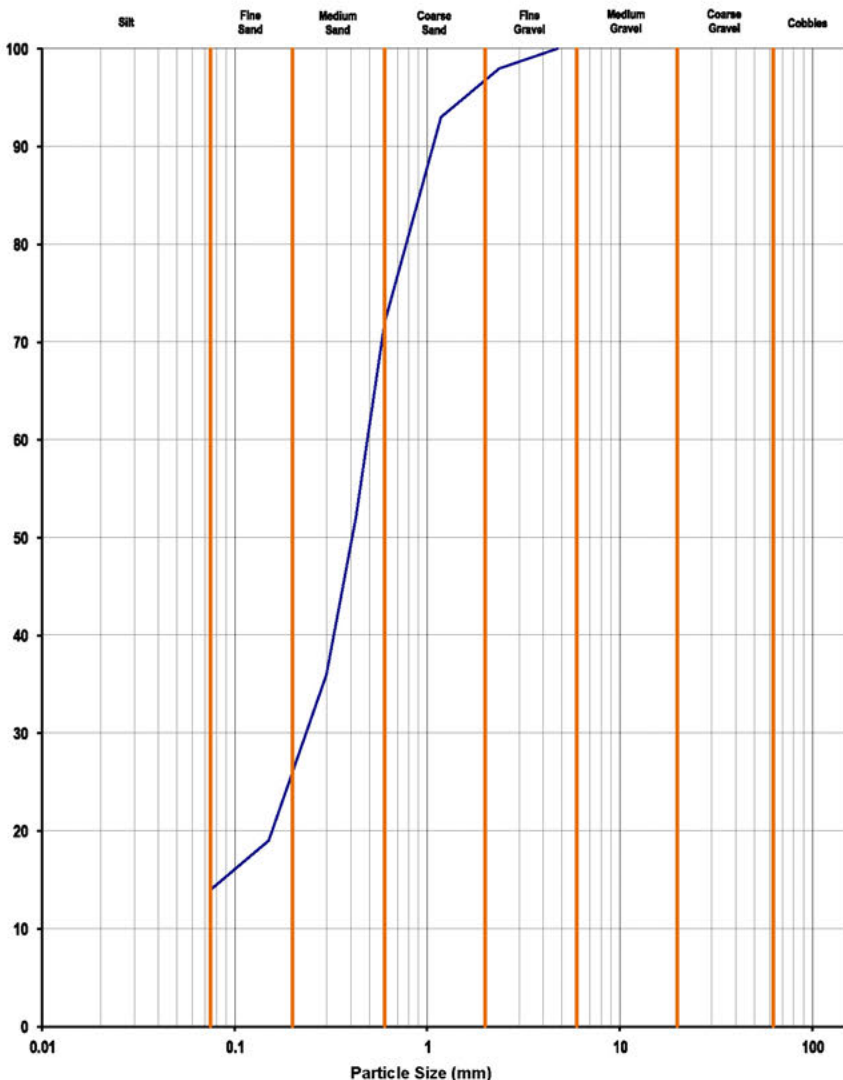
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101133-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R3_BH_Rev1_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2233		
Bore Hole	310-01-BH2233-S02050	Depth From (m)	20.5	Depth To (m)	20.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	100
2.36	98
1.18	93
0.600	72
0.425	52
0.300	36
0.150	19
0.075	14



The graph plots 'Passing (%)' on the y-axis (0 to 100) against 'Particle Size (mm)' on a logarithmic x-axis (0.01 to 100). Vertical lines indicate sieve sizes: 0.075, 0.150, 0.300, 0.425, 0.600, 1.18, 2.36, 4.75, 7.5, 15, 30, 60, 75, 150 mm. Soil texture regions are labeled: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 2.0 mm), Coarse Sand (2.0 - 4.75 mm), Fine Gravel (4.75 - 2.0 mm), Medium Gravel (2.0 - 7.5 mm), Coarse Gravel (7.5 - 20 mm), and Cobbles (> 20 mm). The test curve starts at 14% passing for 0.075 mm, rises to 36% at 0.300 mm, 72% at 0.600 mm, 93% at 1.18 mm, and reaches 100% at 4.75 mm.

NOTES/REMARKS:

-
Moisture Content 18%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

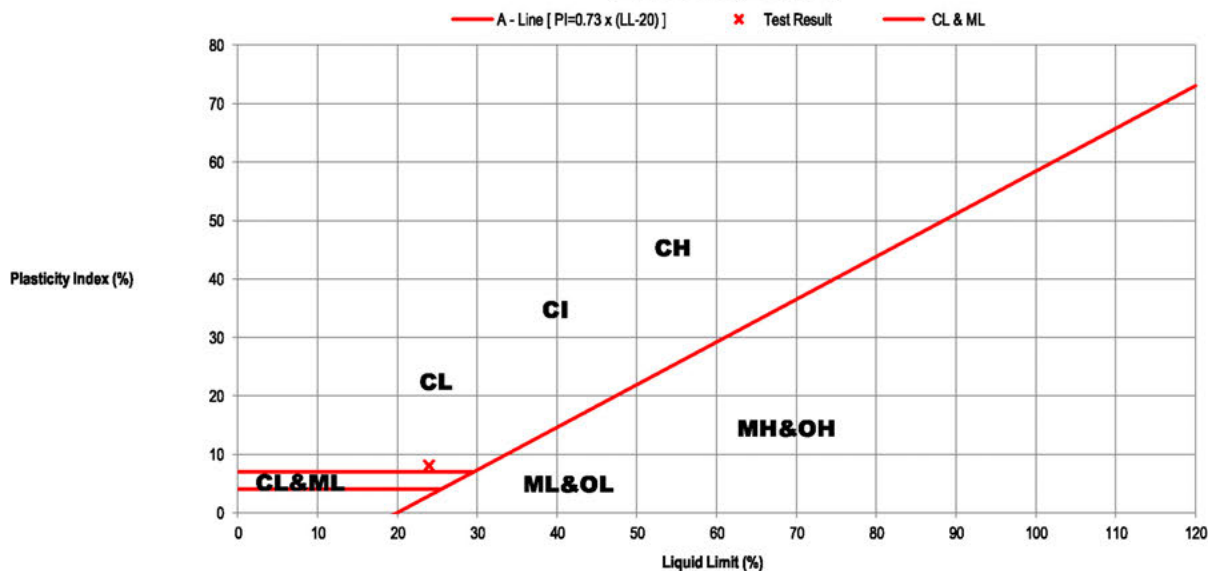
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101051-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2307-C00200	Client Sample No.	310-01-BH2307
Description	C	Depth From (m)	2
		Depth To (m)	3.1

RESULTS OF TESTING

Liquid Limit (%) 24
Plastic Limit (%) 16
Plasticity Index (%) 8
Linear Shrinkage (%) 3.5 **Curling Occurred**
Moisture Content (%) 11.0
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

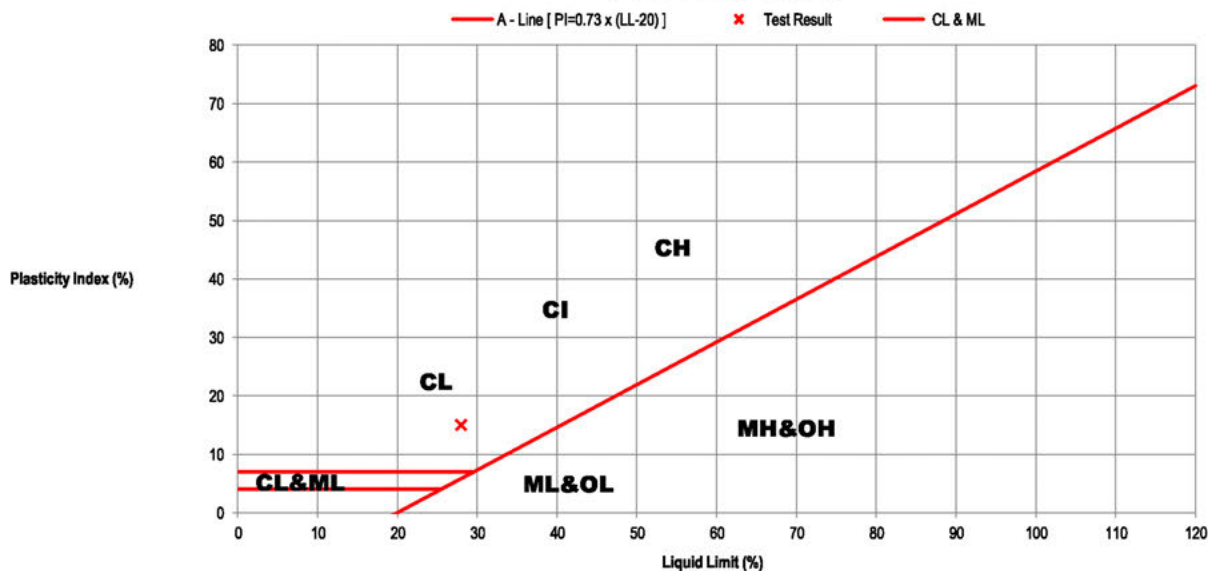
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101055-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2308-S00050	Client Sample No.	310-01-BH2308
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%) 28
Plastic Limit (%) 13
Plasticity Index (%) 15
Linear Shrinkage (%) 8.5 **Curling Occurred**
Moisture Content (%) 8.5
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

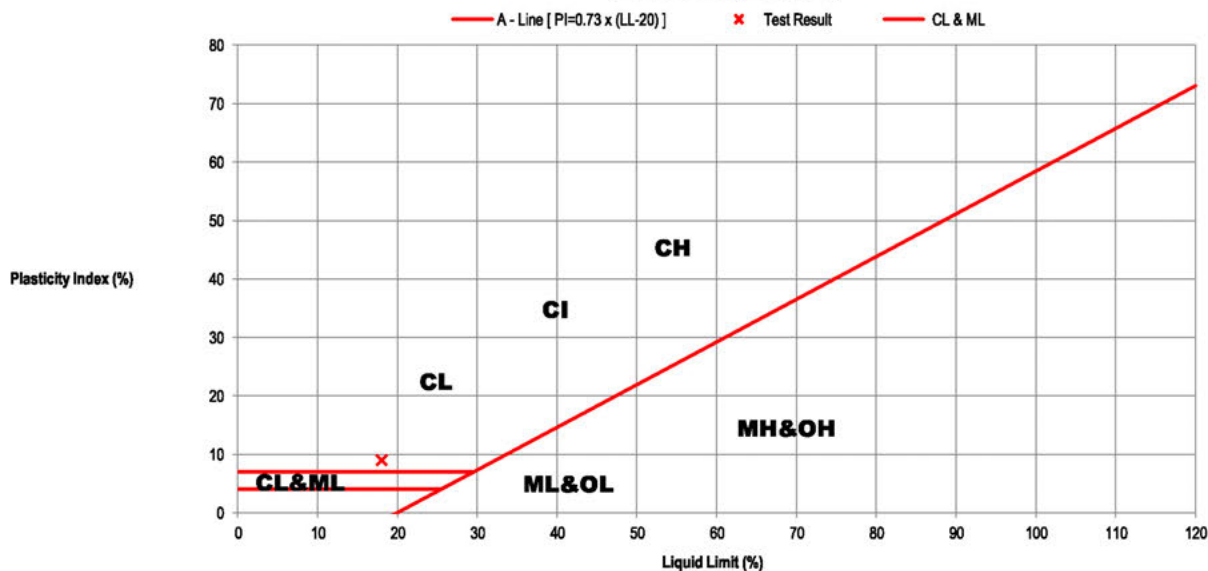
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101059-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2308-S01200	Client Sample No.	310-01-BH2308
Description	SPT	Depth From (m)	12
		Depth To (m)	12.1

RESULTS OF TESTING

Liquid Limit (%) 18
Plastic Limit (%) 9
Plasticity Index (%) 9
Linear Shrinkage (%) 3.0 **Curling Occurred**
Moisture Content (%) 11.9
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

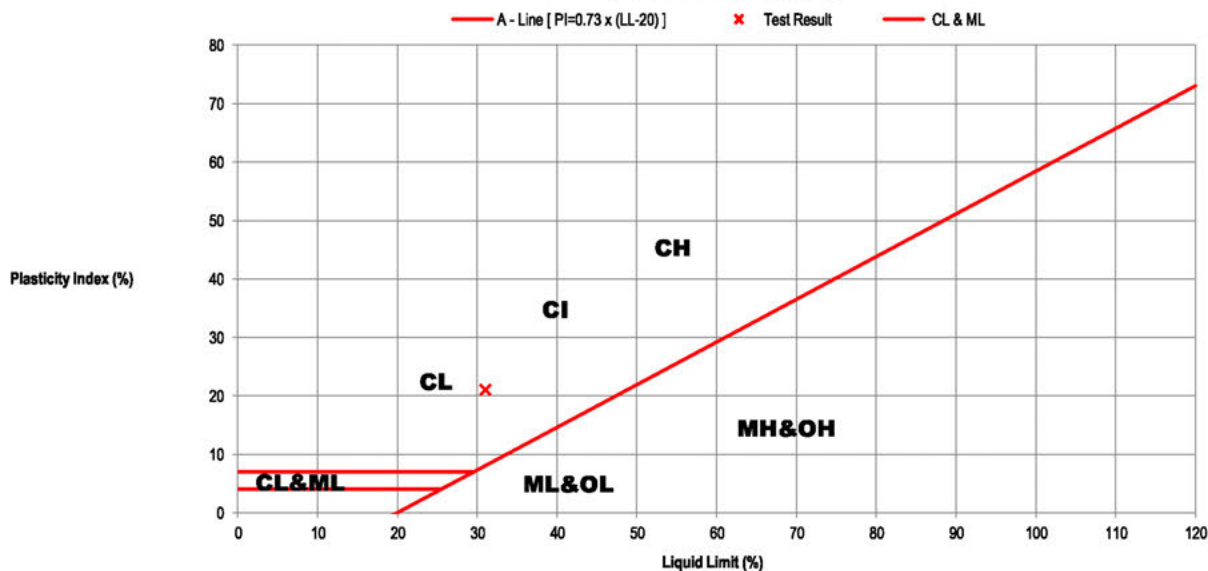
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101062-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2309-S00050	Client Sample No.	310-01-BH2309
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	31	
Plastic Limit (%)	10	
Plasticity Index (%)	21	
Linear Shrinkage (%)	8.5	Cracking & Curling Occurred
Moisture Content (%)	7.4	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

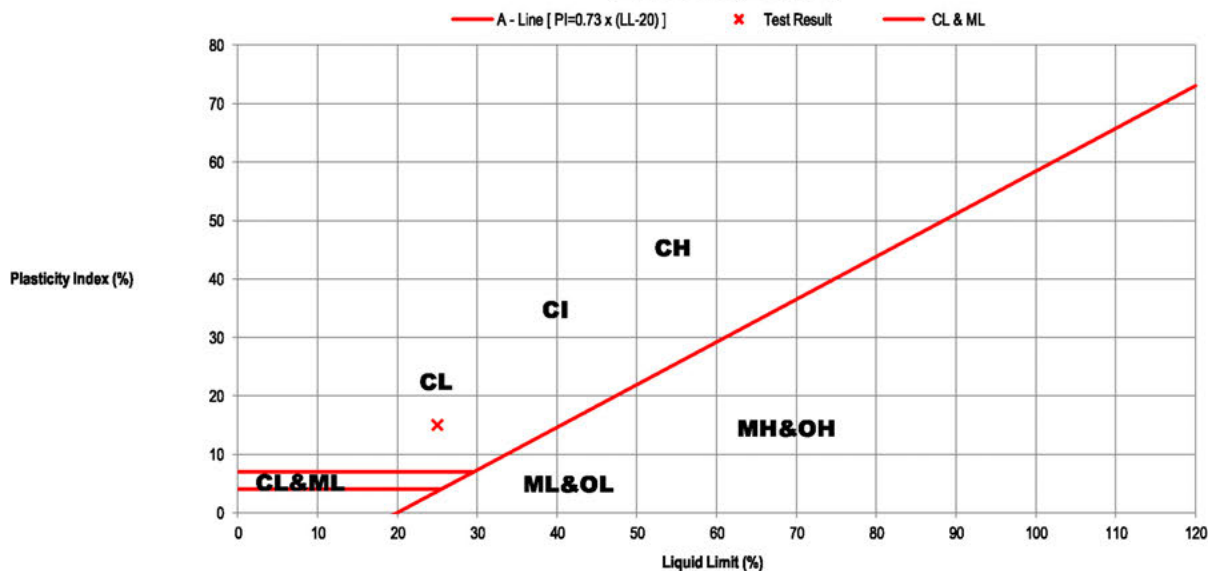
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101065-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2309-S00830	Client Sample No.	310-01-BH2309
Description	SPT	Depth From (m)	8.3
		Depth To (m)	8.73

RESULTS OF TESTING

Liquid Limit (%) 25
 Plastic Limit (%) 10
 Plasticity Index (%) 15
 Linear Shrinkage (%) 7.0 Curling Occurred
 Moisture Content (%) 12.3
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

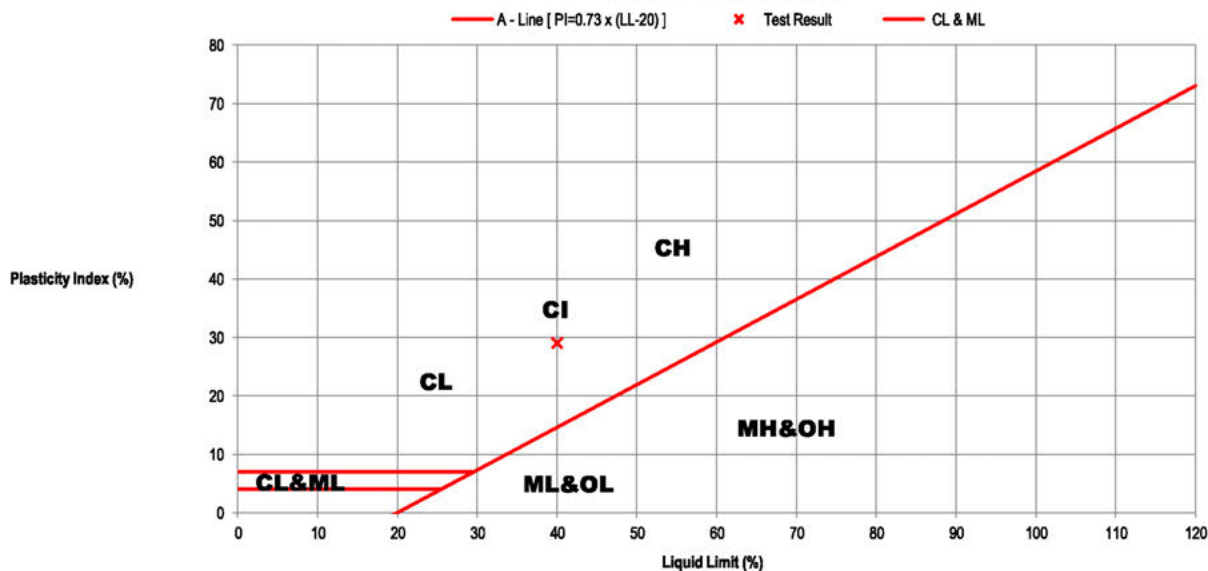
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101067-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2311-S00200	Client Sample No.	310-01-BH2311
Description	SPT	Depth From (m)	2
		Depth To (m)	2.45

RESULTS OF TESTING

Liquid Limit (%)	40	
Plastic Limit (%)	11	
Plasticity Index (%)	29	
Linear Shrinkage (%)	12.5	Curling Occurred
Moisture Content (%)	12.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

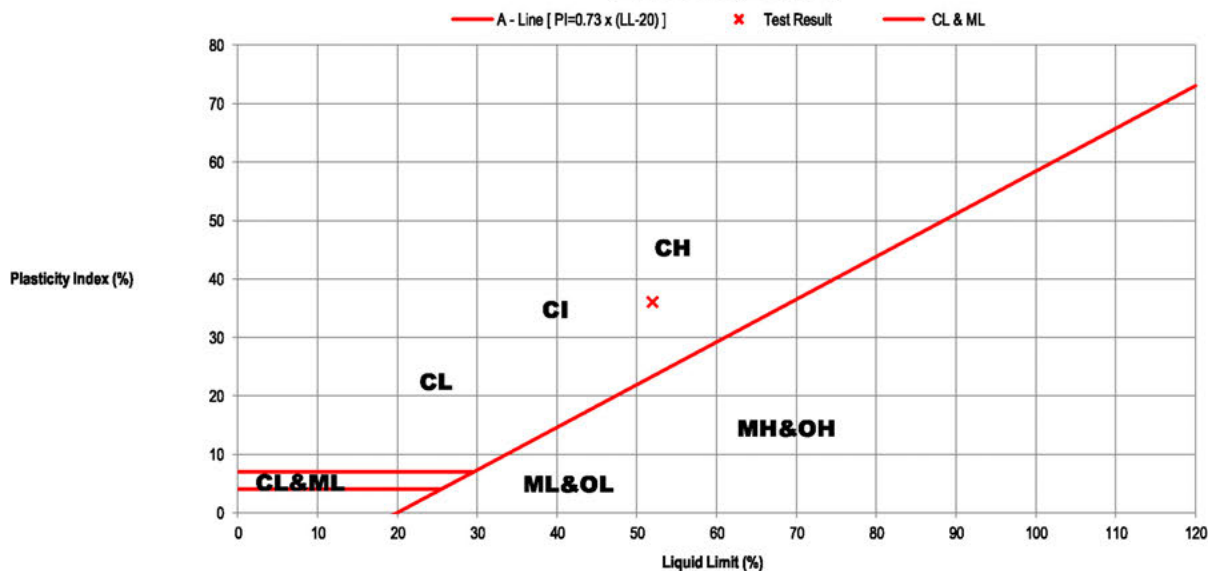
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101068-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2311-S00350	Client Sample No.	310-01-BH2311
Description	SPT	Depth From (m)	3.5
		Depth To (m)	3.95

RESULTS OF TESTING

Liquid Limit (%)	52	
Plastic Limit (%)	16	
Plasticity Index (%)	36	
Linear Shrinkage (%)	16.0	Curling Occurred
Moisture Content (%)	15.0	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

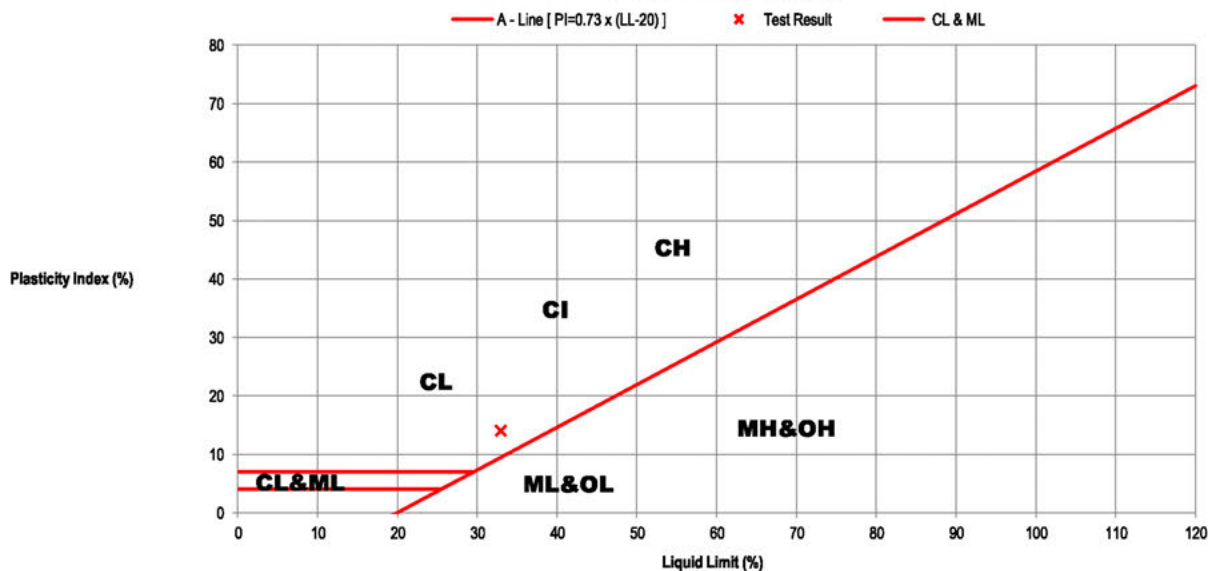
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101073-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	9/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2311-S01430	Client Sample No.	310-01-BH2311
Description	SPT	Depth From (m)	14.3
		Depth To (m)	14.75

RESULTS OF TESTING

Liquid Limit (%) 33
Plastic Limit (%) 19
Plasticity Index (%) 14
Linear Shrinkage (%) 6.5 **Curling Occurred**
Moisture Content (%) 22.2
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

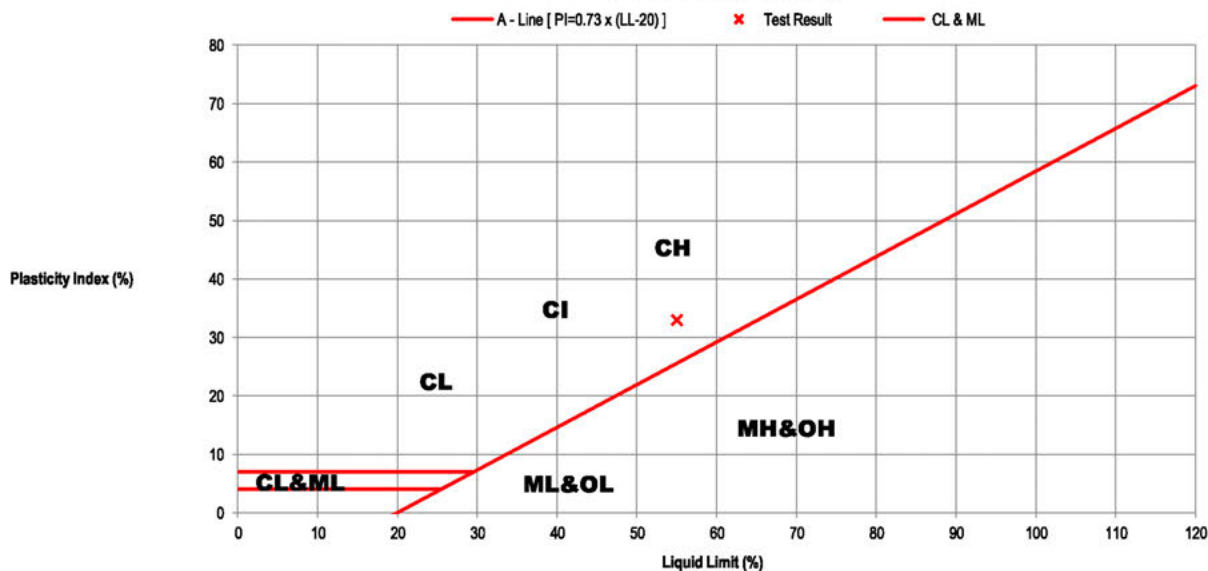
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101154-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2326-S00800	Client Sample No.	310-01-BH2326
Description	SPT	Depth From (m)	8
		Depth To (m)	8.25

RESULTS OF TESTING

Liquid Limit (%)	55	
Plastic Limit (%)	22	
Plasticity Index (%)	33	
Linear Shrinkage (%)	14.5	Curling Occurred
Moisture Content (%)	14.9	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory

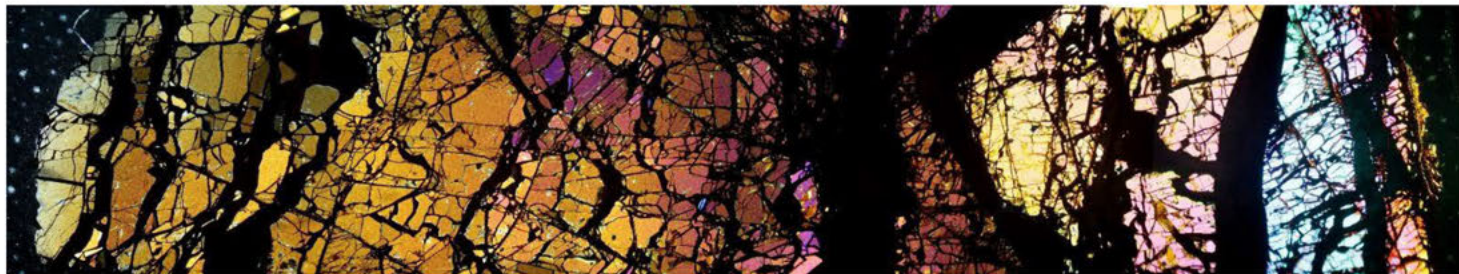


C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506



Geochempet Services

ABN 980 6945 3445

PETROLOGICAL and GEOCHEMICAL CONSULTANTS

Principals: K.E. Spring B.Sc. (Hons), MAppSc and H.M. Spring B.Sc.



5/14 Redcliffe Gardens Drive
Clontarf, QLD 4019

Telephone: (07) 3284 0020

Email: info@geochempet.com
www.geochempet.com

PETROGRAPHIC REPORT ON A DRILL CORE SAMPLE (101162) FOR THE INLAND RAIL PROJECT

prepared for

**TRILAB PTY LTD
BRISBANE OFFICE**

Purchase Order: BNE 1911010
Invoice Number: 00008469
Client Ref: Chris Channon

Issued by

K. E. Spring B.Sc.(Hons), MAppSc
23 November 2018

NOVEMBER, 2018

T1181103

Page 1 of 4

The material contained within this report may not be quoted other than in full. Extracts may be used only with expressed prior written approval of Geochempet Services.

GEOCHEMPET SERVICES, BRISBANE

<u>Sample ID:</u>	101162/310-01	<u>Date Sampled:</u>	Not Supplied
<u>Sample Type:</u>	Drill Core	<u>Date Received:</u>	07/11/2018
<u>Borehole:</u>	BH2344	<u>Depth:</u>	14.00 – 14.15 m
<u>Project ID:</u>	1897791 Inland Rail B2G		
<u>Work Requested</u>	Petrographic analysis		
<u>Methods</u>	Account taken of ASTM C295 Standard Guide for <i>Petrographic Assessment of Aggregates for Concrete</i> , and the AS2758.1 – 2014 <i>Aggregates and rock for engineering purposes part 1; Concrete aggregates (Appendix B)</i>		
<u>Identification</u>	Basalt Porphyry		

Description

The sample consisted of a drill core specimen of apparently robust, hard, fresh rock which gives an initial impression of being more coarsely crystalline than usually seen in basalts; closer inspection reveals a crystalline texture of porphyry style, characterised by an abundance of phenocrysts ranging up to about 1.5 mm in size in a very finely crystalline groundmass. The rock is medium to dark grey and granular with a thin darker interstitial quenched groundmass which contain irregular to ovoid vughs up to 7 mm in size lined or filled by zeolite crystals. A thin vein of zeolite is also observed in the core sample.



Plate 1. Photograph of the supplied drill core sample.

GEOCHEMPET SERVICES, BRISBANE

A thin section was prepared to permit detailed microscopic examination in transmitted polarised light from the drill core. An approximate composition of the rock, expressed in volume percent and based on a brief count of 100 widely spaced points falling within the thin section, is:

Primary components

41%	plagioclase
25%	clinopyroxene
8%	opaque oxide (magnetite and/or ilmenite)
2%	hematite
1%	apatite

Secondary minerals

13%	green to brown clays of smectite style
8%	zeolite
1%	celadonite
1%	leucoxene

In thin section, the rock displays crystalline textures of sub-volcanic porphyry style, involving an open framework of abundant feldspar and clinopyroxene phenocrysts (about 1 to 1.5 mm in size) in a finely crystalline and slightly glassy groundmass with grains mainly up to 0.2 mm in size but mostly finer.

The phenocrysts are mainly prisms of zoned, twinned, cracked plagioclase feldspar, now cut by cracks carrying traces of clay in ophitic intergrowths with anhedral clinopyroxene (light brown to mauve augite) phenocrysts. The groundmass consists mainly of thin laths of fresh plagioclase in an altered mesostasis now composed of leucoxene, hematite, green and brown smectite clay as well as greenish celadonite. The relatively common irregular to ovoid vughs is occupied by anisotropic and radial zeolite which are often rimmed by smectite clay.

Comments and Interpretations

The supplied drill core sample (labelled 101162) from the Inland Rail Project is considered to consist of unweathered basalt porphyry, a type of rock crystallized within a basic sub-volcanic intrusion. The zeolite filling vughs and veins are considered to be of hydrothermal style.

The rock in the supplied drill core sample may be summarised as:

- **basalt porphyry** (in this case apparently sub-volcanic basic igneous rock)
- finely holocrystalline and ophitic
- vuggy and zeolitized
- unweathered
- moderately altered
- secondary mineral content of about 23% soft, weak minerals comprising 13% smectite clay accompanied by 8% of zeolite, a water expansive mineral along with 1% each of celadonite and leucoxene
- **essentially hard**
- **moderately strong**

GEOCHEMPET SERVICES, BRISBANE

The rock is predicted to be **moderately durable**, because of its elevated secondary mineral content and it also contains about 8% of water expansive zeolite but they are enclosed in a robust crystalline groundmass.

Free Silica Content

Apparently nil.

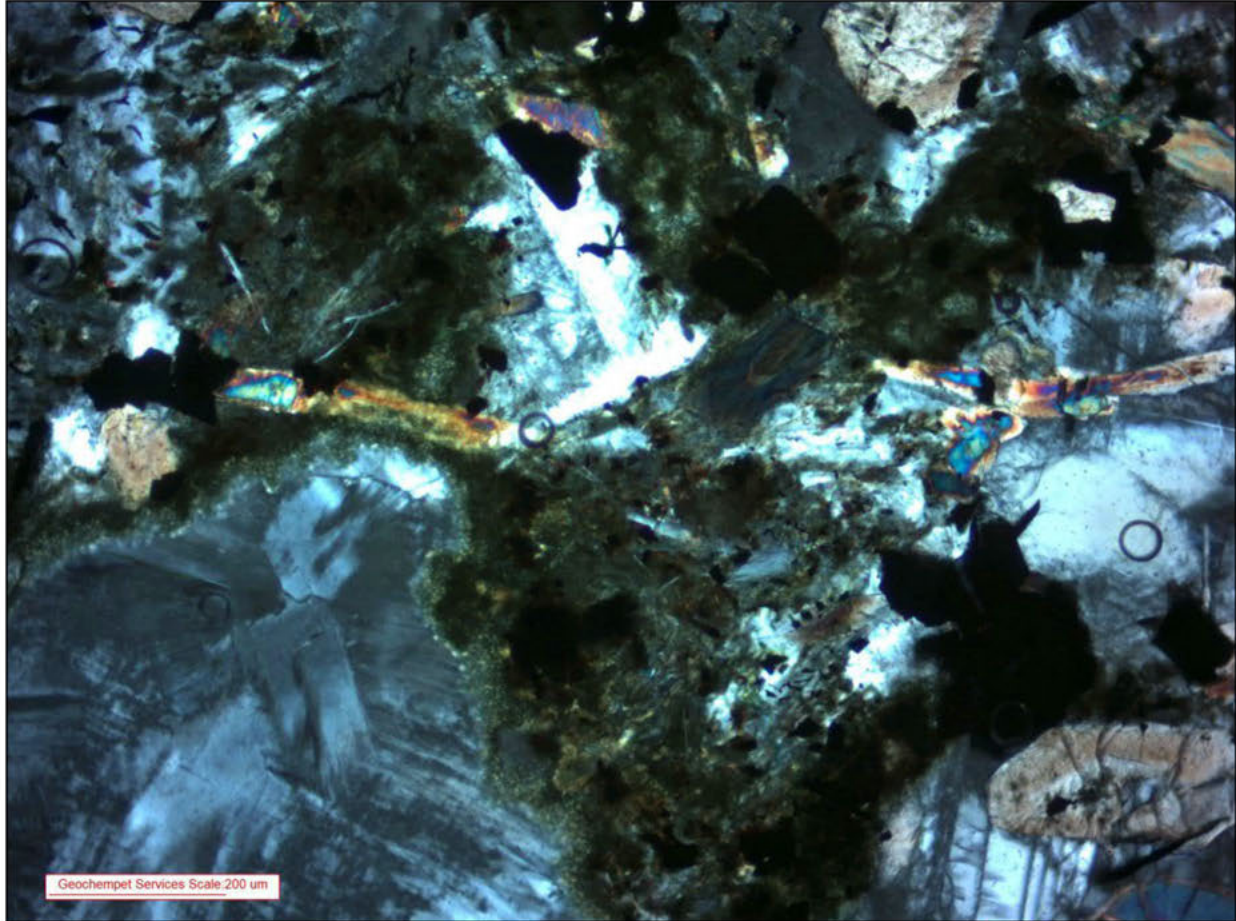


Plate 2. Image at medium magnification in cross polarised transmitted light. The view is dominated by pyroxene and feldspar phenocrysts enclosed in an altered interstitial mesostasis. The vugh in the left corner of image is filled by anisotropic zeolite crystals.

ATTERBERG LIMITS TEST REPORT

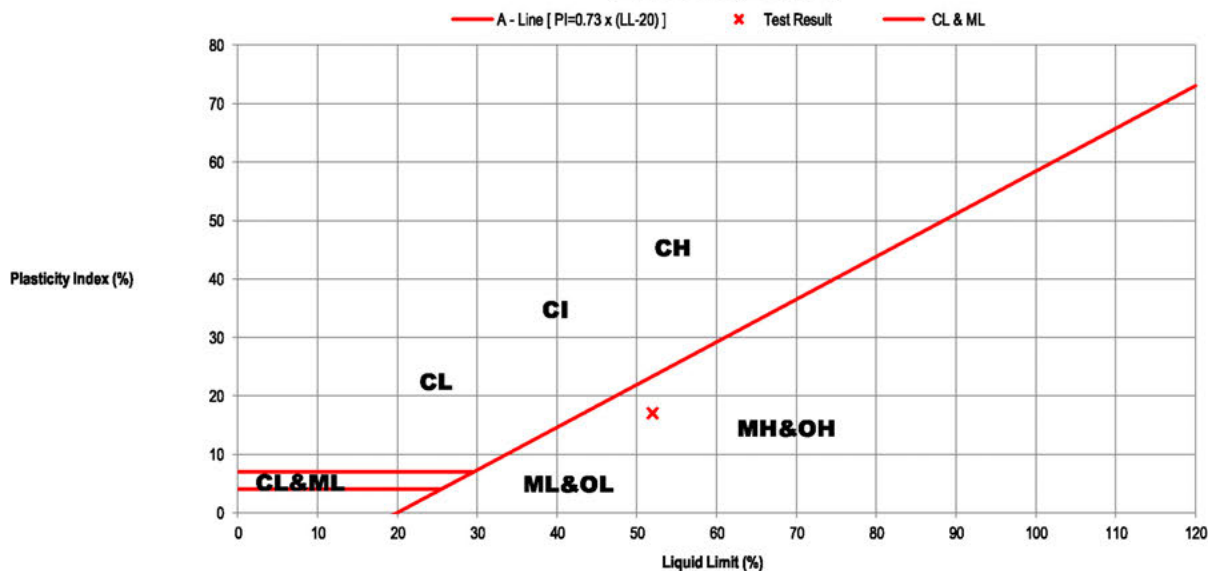
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101163-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2350-S00205	Client Sample No.	310-01-BH2350
Description	SPT	Depth From (m)	2.05
		Depth To (m)	2.45

RESULTS OF TESTING

Liquid Limit (%) 52
 Plastic Limit (%) 35
 Plasticity Index (%) 17
 Linear Shrinkage (%) 12.0 Curling Occurred
 Moisture Content (%) 17.9
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

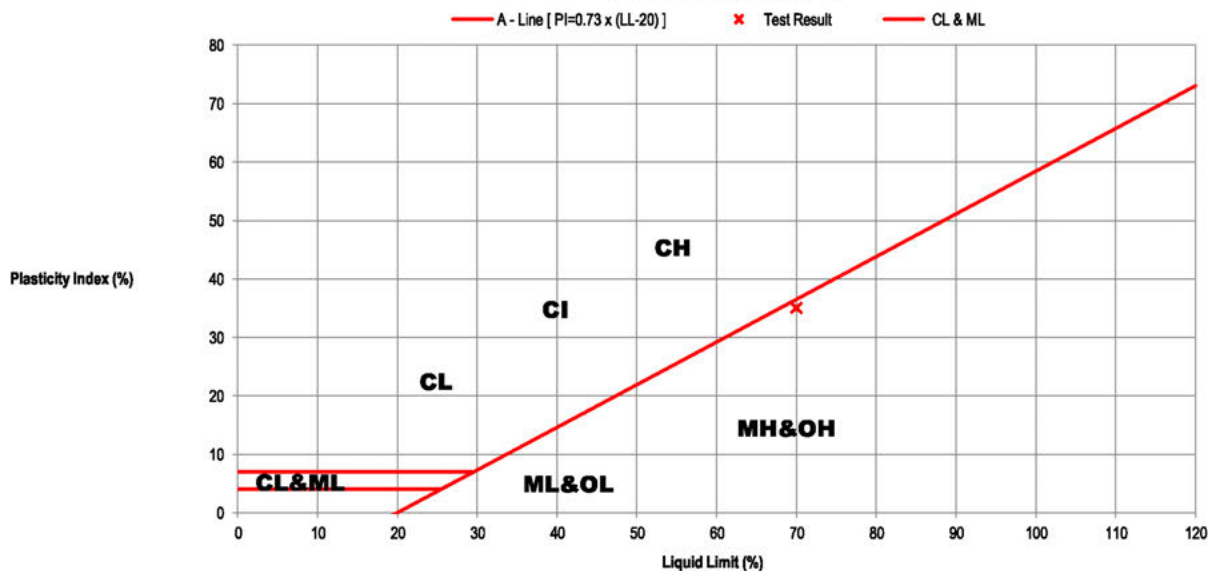
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101164-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2350-S00547	Client Sample No.	310-01-BH2350
Description	SPT	Depth From (m)	5.47
		Depth To (m)	5.58

RESULTS OF TESTING

Liquid Limit (%) 70
 Plastic Limit (%) 35
 Plasticity Index (%) 35
 Linear Shrinkage (%) 16.5 Curling Occurred
 Moisture Content (%) 34.2
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

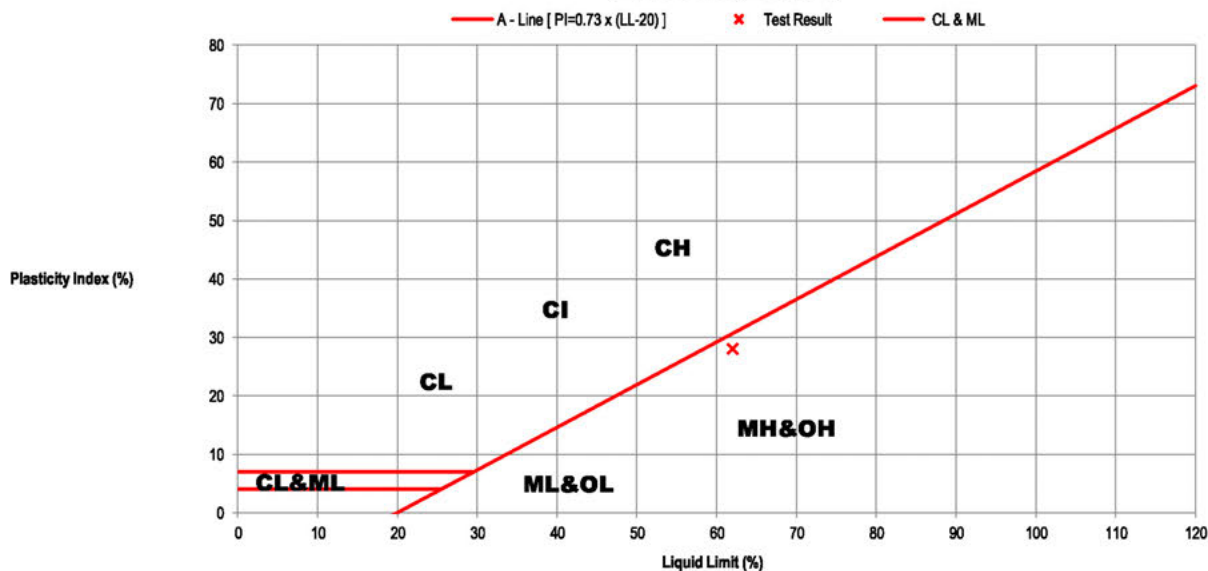
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101165-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2350-S00850	Client Sample No.	310-01-BH2350
Description	SPT	Depth From (m)	8.5
		Depth To (m)	8.75

RESULTS OF TESTING

Liquid Limit (%)	62	
Plastic Limit (%)	34	
Plasticity Index (%)	28	
Linear Shrinkage (%)	13.0	Cracking & Curling Occurred
Moisture Content (%)	26.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

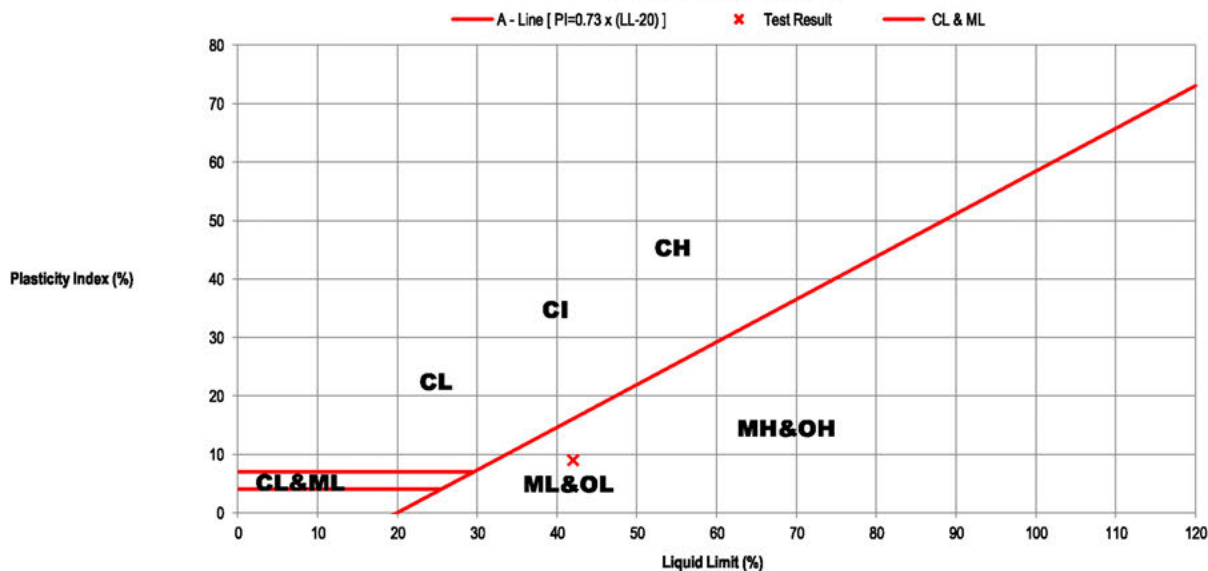
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101167-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2347-S00380	Client Sample No.	310-01-BH2347
Description	SPT	Depth From (m)	3.8
		Depth To (m)	4.25

RESULTS OF TESTING

Liquid Limit (%)	42	
Plastic Limit (%)	33	
Plasticity Index (%)	9	
Linear Shrinkage (%)	6.5	Cracking & Curling Occurred
Moisture Content (%)	18.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

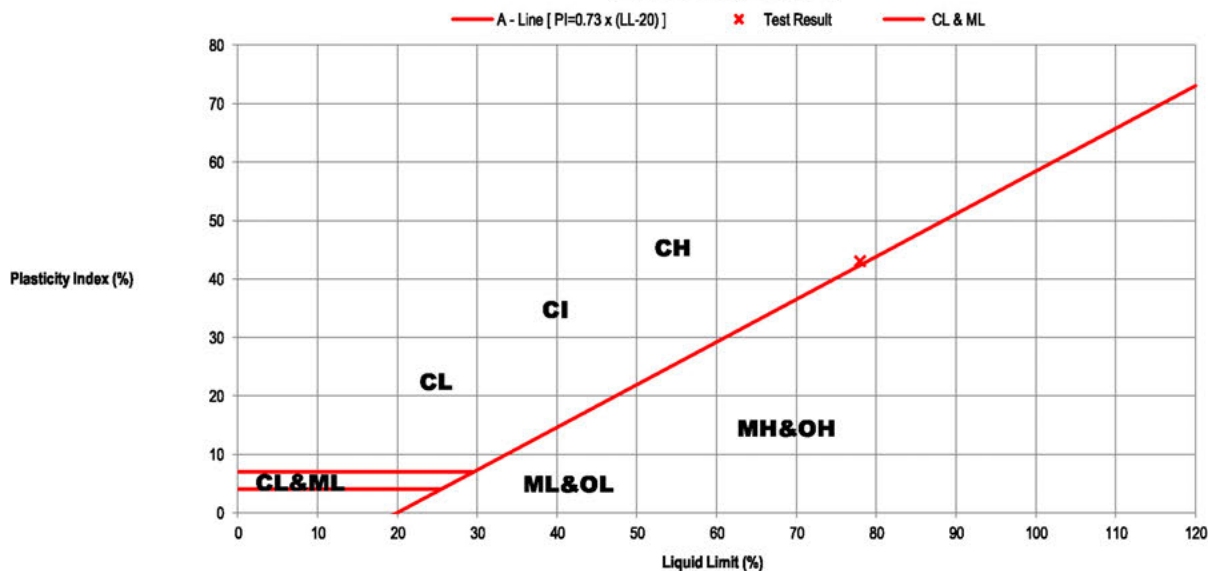
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101168-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	12/11/2018
Project No.	1897791	Report Date	16/11/2018
Bore Hole	310-01-BH2347-S01280	Client Sample No.	310-01-BH2347
Description	SPT	Depth From (m)	12.8
		Depth To (m)	13.25

RESULTS OF TESTING

Liquid Limit (%)	78	
Plastic Limit (%)	35	
Plasticity Index (%)	43	
Linear Shrinkage (%)	16.0	Cracking & Curling Occurred
Moisture Content (%)	36.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

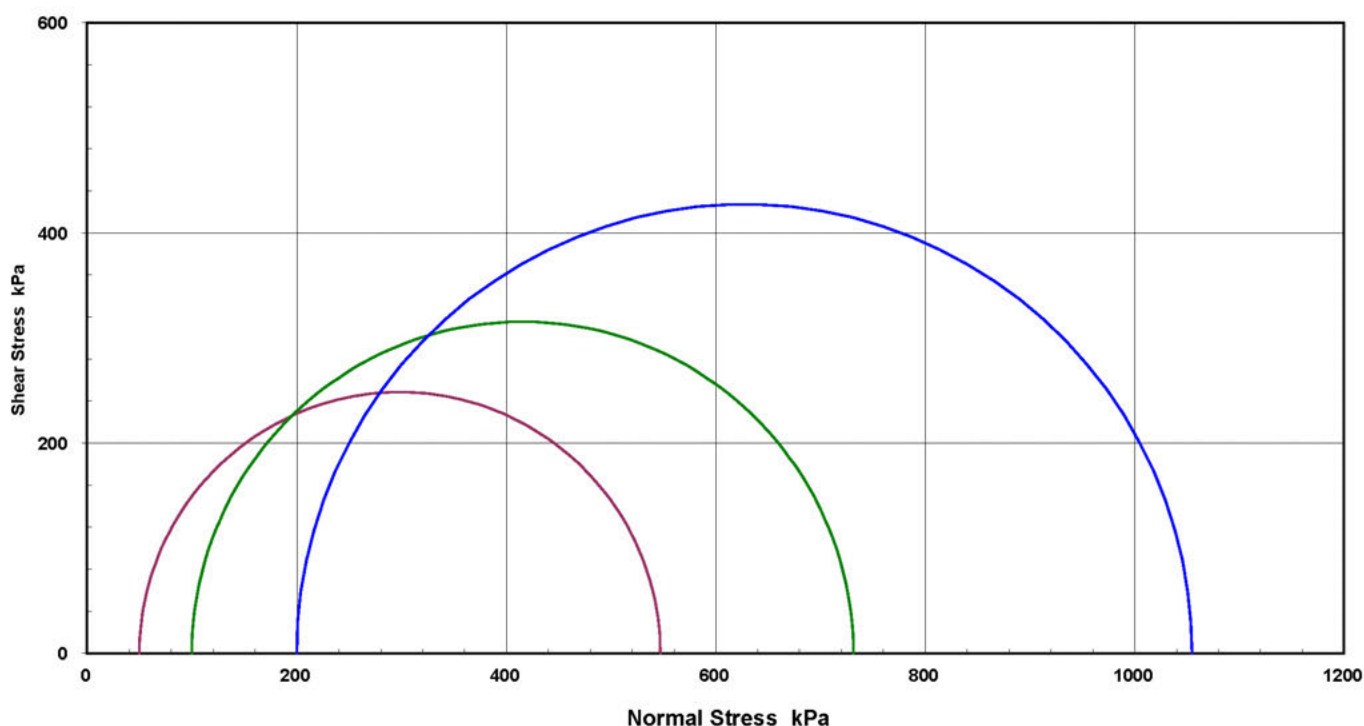
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client	101713	Report No.	GA101169- UU
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	21/11/2018
		Report Date	5/12/2018
Project No.	1897791	Client Sample No.	310-01-BH2347
BoreHole	310-01-BH2347-U01330	Depth From (m)	13.3
		Depth To (m)	13.68
Description	U	Sample Type	Single Individual Undisturbed Specimen

Mohr Circle Diagram



MOISTURE CONTENTS			Initial 36.7 %	Final 36.7 %	Failure Criteria		Maximum Deviator Stress	
SAMPLE & TEST DETAILS					FAILURE DETAILS			
Sample Details			Confining Pressure	Principal Stresses		Deviator Stress	Strain	
				s ₁	s ₃			
Initial Height	133.3	mm	50 kPa 100 kPa 200 kPa	547 kPa	50 kPa	497 kPa	1.62 %	
Initial Diameter	59.3	mm		732 kPa	100 kPa	632 kPa	2.00 %	
Wet Density	1.94	t/m ³		1055 kPa	200 kPa	855 kPa	2.74 %	
Dry Density	1.42	t/m ³						
Rate of Strain	0.375	% / min						

Notes/Remarks:

Graph not to scale

Tested as received

Page 1 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

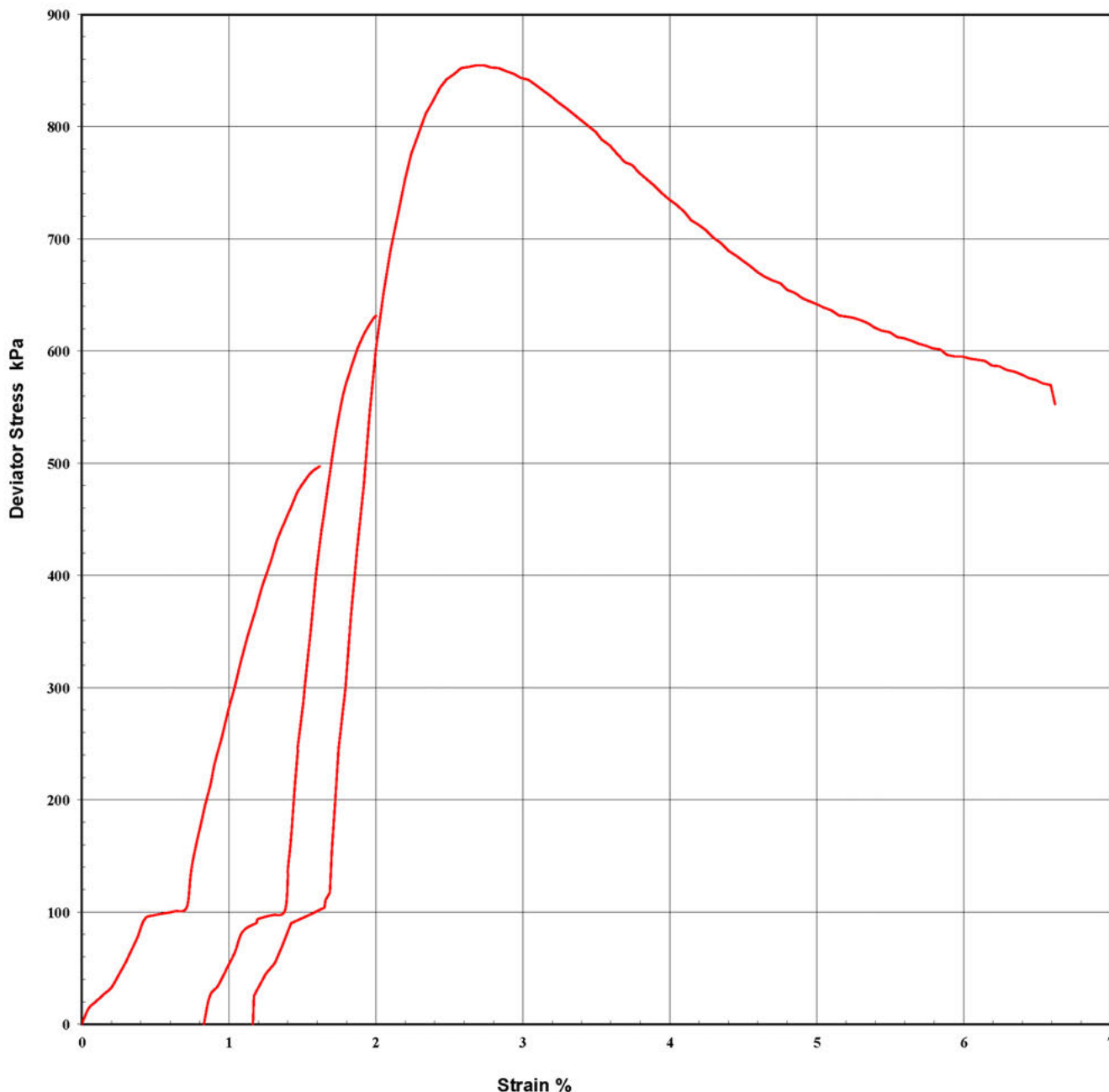
TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client 101713

Report No. GA101169- UU

Stress/Strain Diagram



Notes/Remarks:

Graph not to scale

Tested as received

Page 2 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

TRIAXIAL TEST REPORT

Test Method: AS1289.6.4.1

Client 101713

Report No. GA101169- UU

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101169	DATE: 24/10/18
BOREHOLE:	310-01-BH2347-U01330	DEPTH: 13.3



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101169	DATE: 21/11/18
BOREHOLE:	310-01-BH2347-U01330	DEPTH: 13.3



Notes/Remarks:
Graph not to scale

Photo not to scale
Tested as received

Page 3 of 3 REP2601

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



T. Lockhart



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

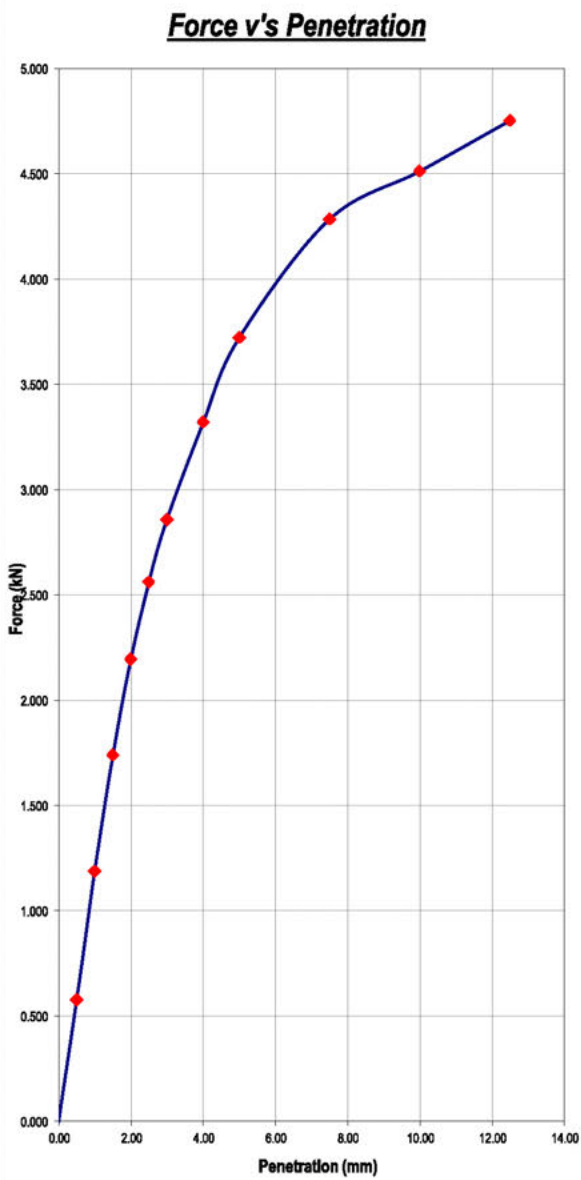
ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

CALIFORNIA BEARING RATIO TEST REPORT

Test Method: AS 1289.6.1.1 & AS 1289.2.1.1

Client	101713	Report No.	GA101037-CBR
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project No.	1897791	Test Date	4/12/18-10/12/18
Project	Inland Rail B2G	Report Date	10/12/2018

Test Results

Bore Hole/Test Pit	310-01-BH2302-C00310	 Force v's Penetration
Client Sample No.	310-01-BH2302	
Depth From/To(m)	3.10-4.60	
Description	Silty SAND - mottled orange/yellow/brown	
Compaction Criteria	Standard	
Condition of Specimen	Soaked	
Field Moisture Content (%)	13.0	
Maximum Dry Density (t/m³)	1.85	
Optimum Moisture Content (%)	13.2	
Nominated/Achieved Dry Density (t/m³)	1.76 / 1.76	
Nominated/Achieved Moisture Content (%)	13.2 / 13.3	
Laboratory Density Ratio (%)	94.9	
Laboratory Moisture Ratio (%)	100.8	
Percentage Retained 19 mm (%) (Not Included in Sample)	0	
Period of Soak (Days)	4	
Surcharge (kg)	4.5	
Swell (%)	0.1	
Moisture Content of Top 30 mm (%)	15.7	
Moisture Content of Remainder (%)	14.6	
CBR Penetration (mm)	2.5	
CBR VALUE (%)	20	

Notes/Remarks :

Sample/s supplied by the client

Page: 1 of 1 REP00304

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

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

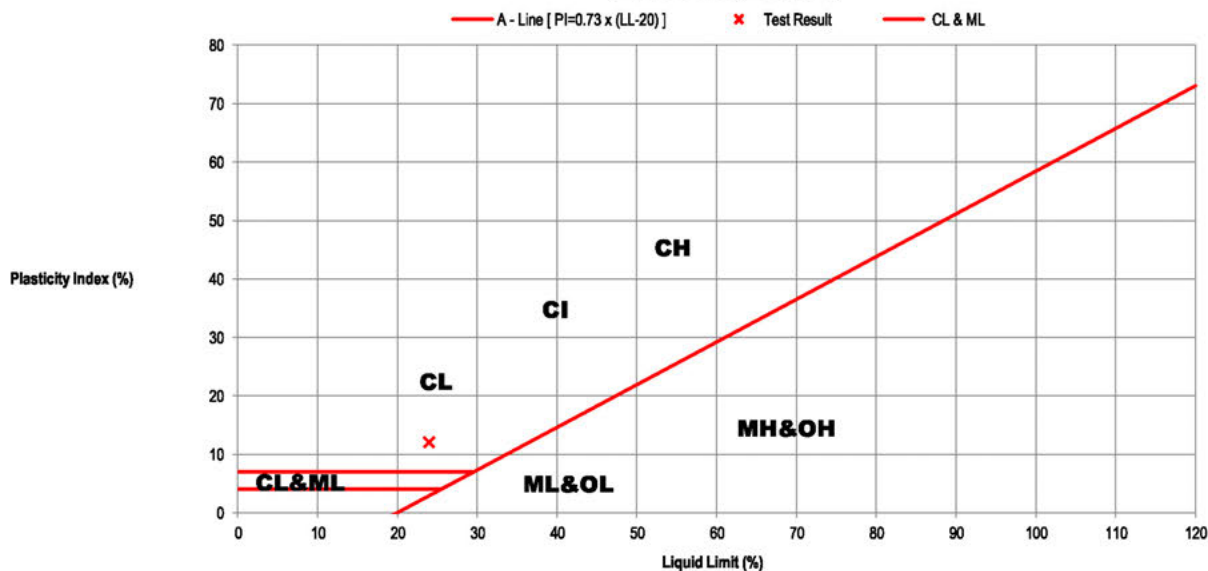
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101051-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R2_BH_Rev1_4060
Project	Inland Rail B2G	Test Date	6/12/2018
Project No.	1897791	Report Date	10/12/2018
Bore Hole	310-01-BH2307-C00200	Client Sample No.	310-01-BH2307
Description	C	Depth From (m)	2
		Depth To (m)	3.1

RESULTS OF TESTING

Liquid Limit (%) 24
Plastic Limit (%) 12
Plasticity Index (%) 12
Linear Shrinkage (%) 5.5 **Curling Occurred**
Moisture Content (%) 14.8
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks: The above specimen was pre-treated as per RMS T103 prior to testing as advised by the client

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

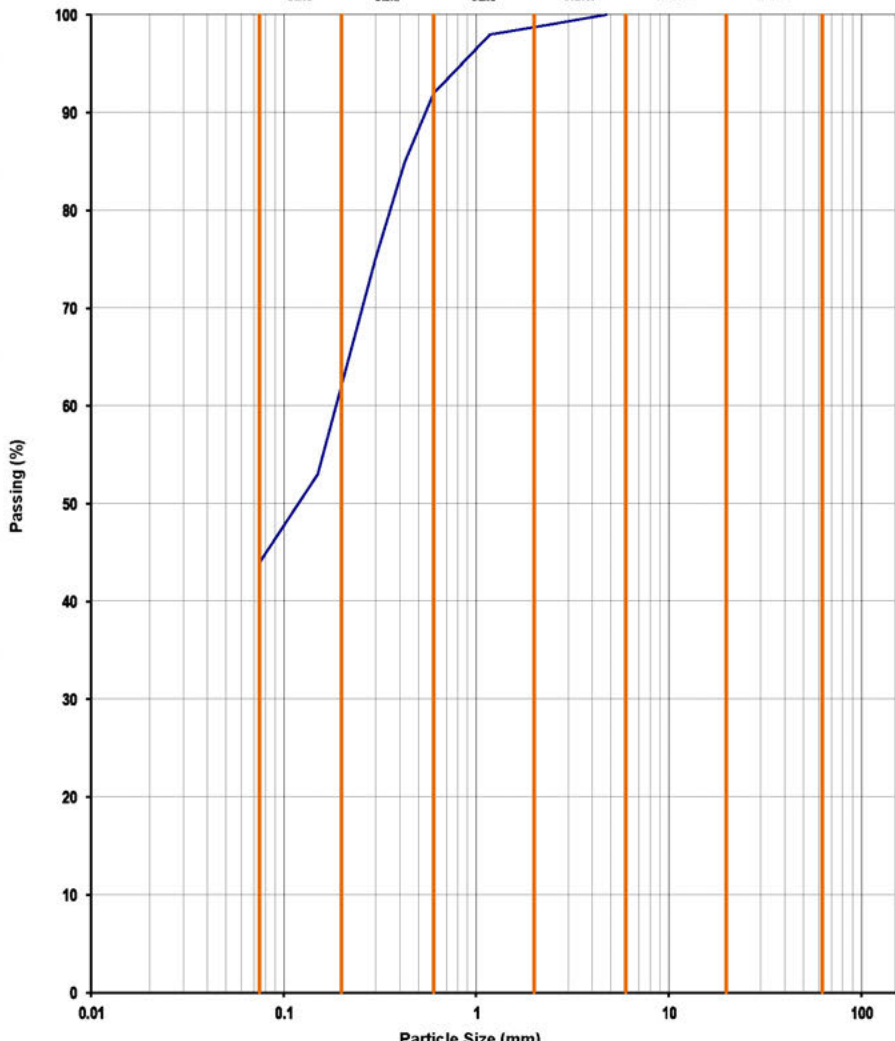
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101051-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R2_BH_Rev1_4060
		Test Date	7/12/2018
		Report Date	10/12/2018

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2307		
Bore Hole	310-01-BH2307-C00200	Depth From (m)	2	Depth To (m)	3.1

Description		C
Sieve Size (mm)	Passing %	 The graph shows the particle size distribution for sample C. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 45% passing for 0.075 mm, rises to 100% passing at 0.425 mm, and remains at 100% for all larger sieve sizes. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.
150.0		
75.0		
63.0		
53.0		
37.5		
26.5		
19.0		
13.2		
9.5		
6.7		
4.75	100	
2.36	99	
1.18	98	
0.600	92	
0.425	85	
0.300	75	
0.150	53	
0.075	44	

NOTES/REMARKS:	The above specimen was pre-treated as per RMS T103 prior to testing as advised by the client
	Moisture Content 14.8%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

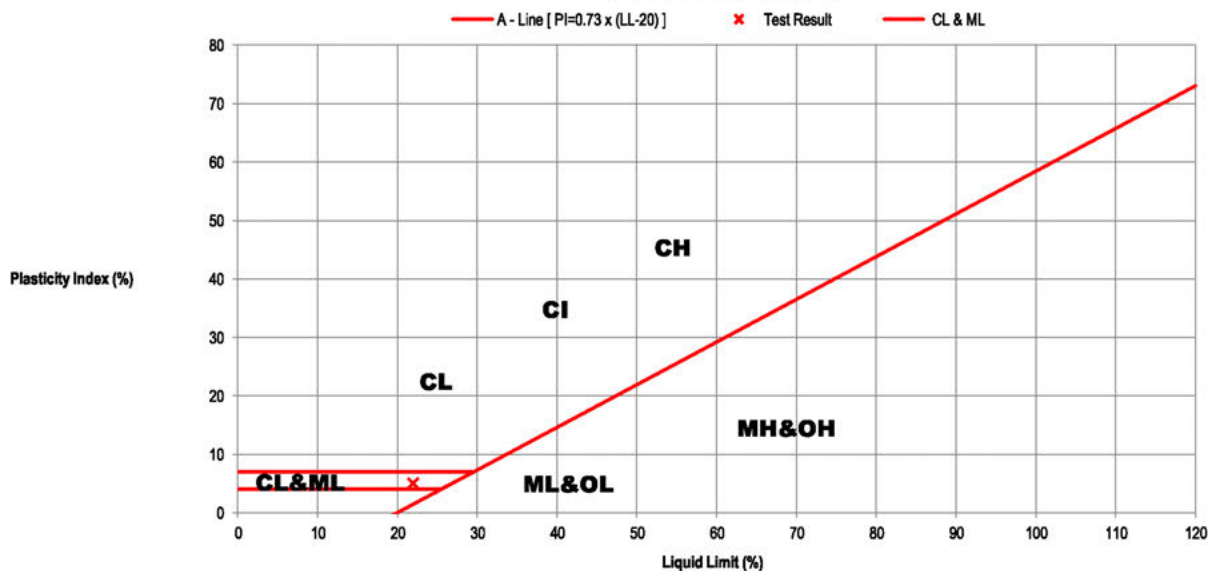
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101162-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	6/12/2018
Project No.	1897791	Report Date	10/12/2018
Bore Hole	310-01-BH2344-C01250	Client Sample No.	310-01-BH2344
Description	C	Depth From (m)	12.5
		Depth To (m)	15

RESULTS OF TESTING

Liquid Limit (%)	22	
Plastic Limit (%)	17	
Plasticity Index (%)	5	
Linear Shrinkage (%)	1.5	Curling Occurred
Moisture Content (%)	3.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks: The above specimen was pre-treated as per RMS T103 prior to testing as advised by the client

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

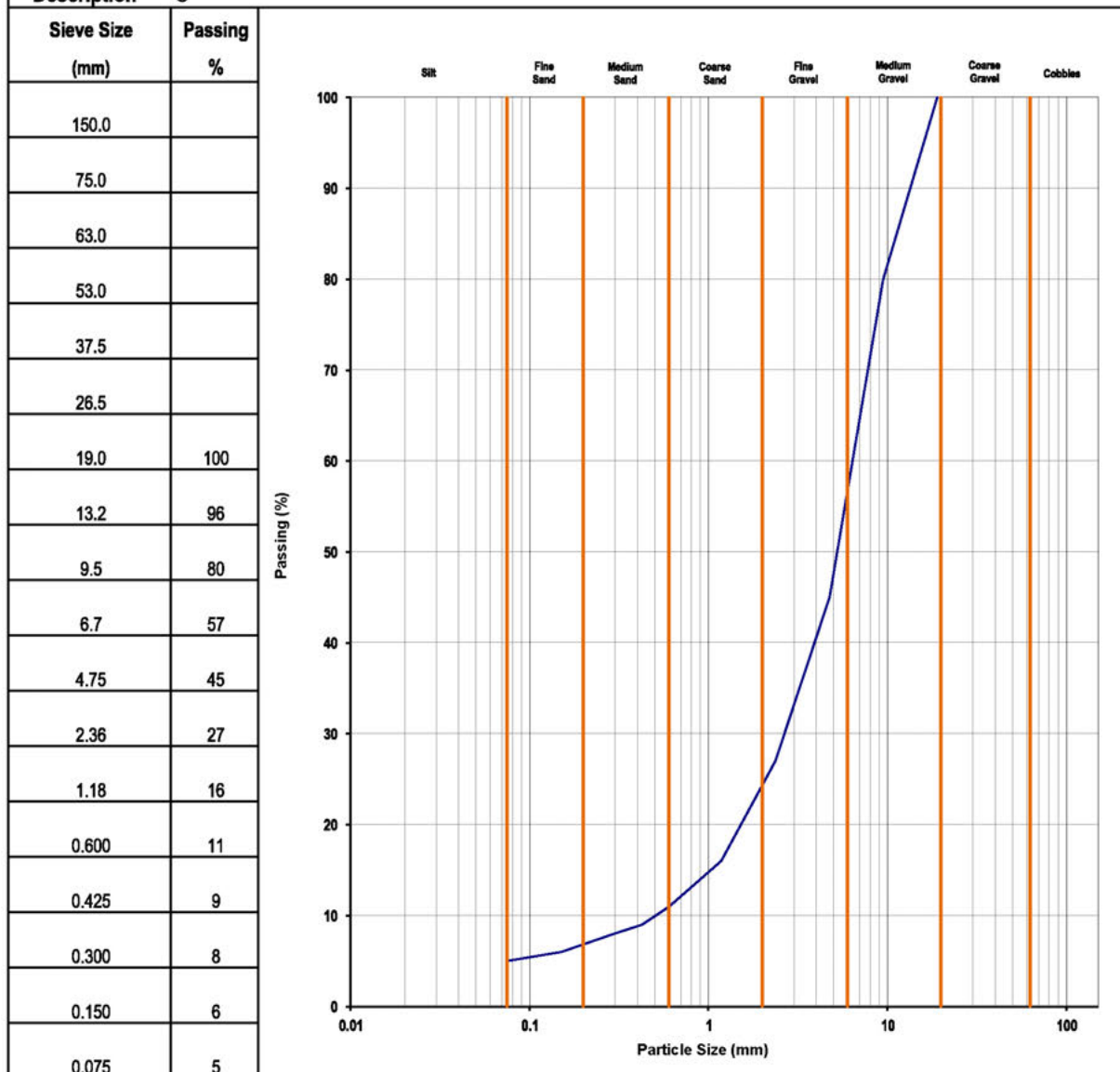
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101162-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R3_BH_Rev1_4050
Project	Inland Rail B2G	Test Date	7/12/2018
Project No	1897791	Report Date	10/12/2018
Bore Hole	310-01-BH2344-C01250	Client Sample No	310-01-BH2344
Depth From (m)	12.5	Depth To (m)	15

Description C



NOTES/REMARKS:

The above specimen was pre-treated as per RMS T103 prior to testing as advised by the client

Moisture Content 3.3%

Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

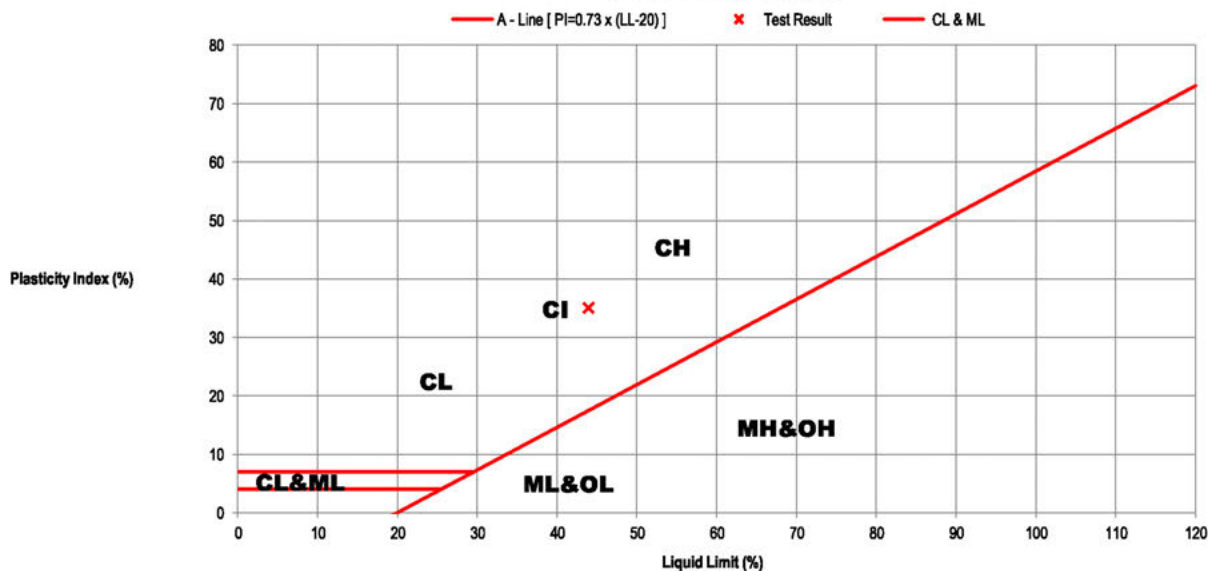
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101849-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2214	Client Sample No.	310-01-BH2214-S00500-ATT : 310-01-BH2214-S00500-MOI
Description	SPT	Depth From (m)	5
		Depth To (m)	5.45

RESULTS OF TESTING

Liquid Limit (%)	44	
Plastic Limit (%)	9	
Plasticity Index (%)	35	
Linear Shrinkage (%)	9.5	Curling Occurred
Moisture Content (%)	14.2	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.6.1, 2.1.1

ATTERBERG LIMITS TEST REPORT

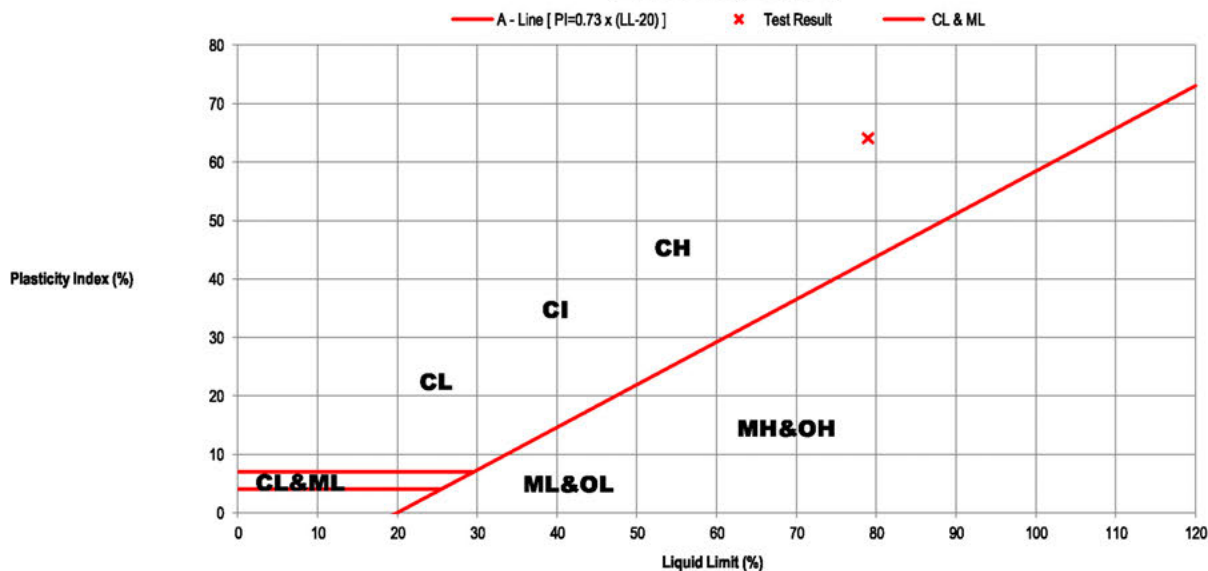
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101850-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	22/01/2019
Project No.	1897791	Report Date	29/01/2019
Bore Hole	310-01-BH2214	Client Sample No.	310-01-BH2214-S00830-ATT : 310-01-BH2214-S00830-MOI
Description	SPT	Depth From (m)	8.3
		Depth To (m)	8.75

RESULTS OF TESTING

Liquid Limit (%)	79	
Plastic Limit (%)	15	
Plasticity Index (%)	64	
Linear Shrinkage (%)	13.5	Curling Occurred
Moisture Content (%)	20.1	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

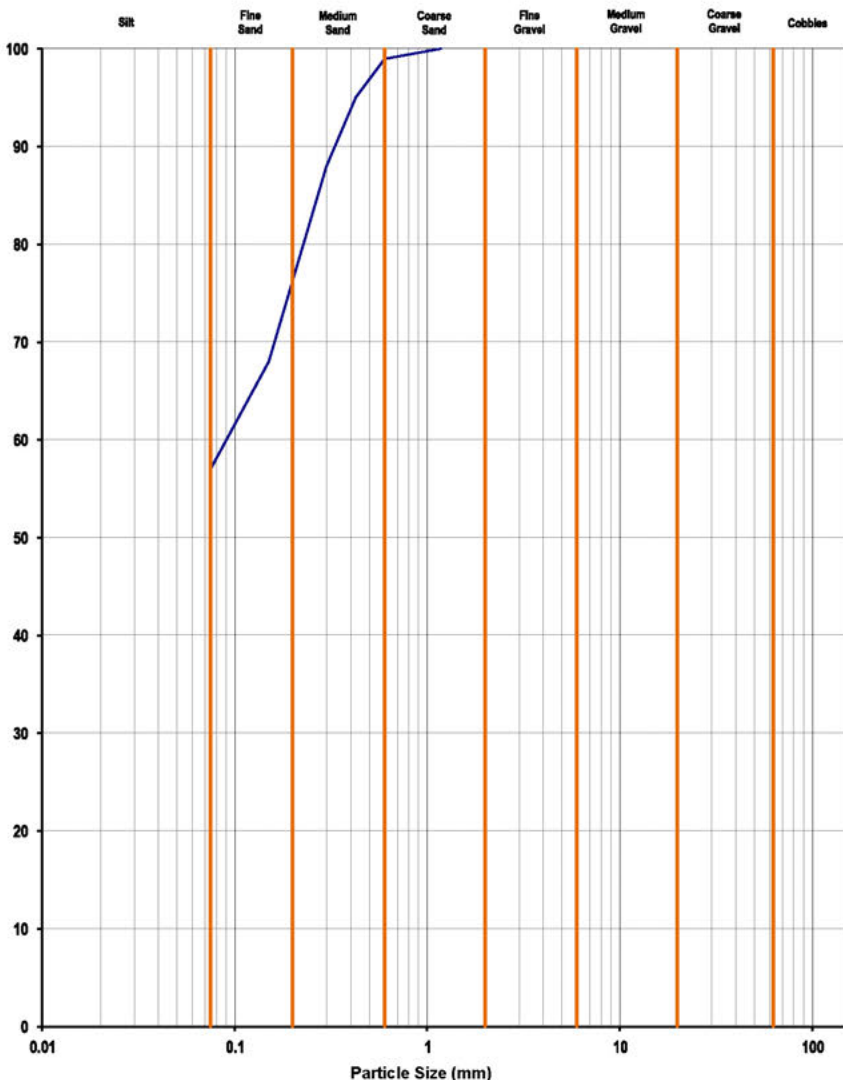
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101851-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2214-S01130		
Bore Hole	310-01-BH2214	Depth From (m)	11.3	Depth To (m)	11.75
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	95
0.300	88
0.150	68
0.075	57



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 57% passing for 0.075 mm and rises to 100% passing at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 15.9%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

CERTIFICATE OF ANALYSIS

Work Order : **EB1902042**
Client : **TRILAB PTY LTD**
Contact : **THE ADMIN RESULTS**
Address : **346A BILSEN RD**
GEEBUNG QLD, AUSTRALIA 4031
Telephone : **+61 07 3265 5656**
Project : **1897791 Inland Rail B2G**
Order number : **BNE 1901038**
C-O-C number : **---**
Sampler : **---**
Site : **---**
Quote number : **EN/333**
No. of samples received : **7**
No. of samples analysed : **7**

Page : **1 of 4**
Laboratory : **Environmental Division Brisbane**
Contact : **Customer Services EB**
Address : **2 Byth Street Stafford QLD Australia 4053**
Telephone : **+61-7-3243 7222**
Date Samples Received : **25-Jan-2019 13:01**
Date Analysis Commenced : **29-Jan-2019**
Issue Date : **04-Feb-2019 10:20**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- CORROSION ASSESSMENT: As per Australian Standard (AS2159-1995, section 6), the Exposure Classification for all samples is rated Non Aggressive. ALS is not NATA accredited for this comment.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				101852 / 310-01-BH2214-S0128 0 / 12.80-13.25m	101856 / 310-01-BH2214-S0188 0 / 18.80-19.25m	101864 / 310-01-BH2215-S0140 0 / 14.00-14.45m	101866 / 310-01-BH2215-S0204 0 / 20.40-20.85m	101867 / 310-01-BH2221-S0035 0 / 3.50-3.95m
Client sampling date / time				24-Jan-2019 00:00	24-Jan-2019 00:00	24-Jan-2019 00:00	24-Jan-2019 00:00	24-Jan-2019 00:00
Compound	CAS Number	LOR	Unit	EB1902042-001	EB1902042-002	EB1902042-003	EB1902042-004	EB1902042-005
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	8.3	8.3	7.1	7.6	9.2
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	22.0	14.6	21.4	23.4	15.3
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	100	60	120	100	30
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	620	390	630	640	60



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Client sample ID

				101878 / 310-01-BH2228-S0114 0 / 11.40-11.64m	101882 / 310-01-BH2228-S0214 0 / 21.40-21.465m	----	----	----
Client sampling date / time				24-Jan-2019 00:00	24-Jan-2019 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1902042-006	EB1902042-007	-----	-----	-----
				Result	Result	---	---	---
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	8.8	9.6	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	13.9	16.7	---	---	---
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	10	120	---	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	150	140	---	---	---

QUALITY CONTROL REPORT

Work Order	: EB1902042	Page	: 1 of 3
Client	: TRILAB PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: THE ADMIN RESULTS	Contact	: Customer Services EB
Address	: 346A BILSEN RD GEEBUNG QLD, AUSTRALIA 4031	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3265 5656	Telephone	: +61-7-3243 7222
Project	: 1897791 Inland Rail B2G	Date Samples Received	: 25-Jan-2019
Order number	: BNE 1901038	Date Analysis Commenced	: 29-Jan-2019
C-O-C number	: ---	Issue Date	: 04-Feb-2019
Sampler	: ---		
Site	: ---		
Quote number	: EN/333		
No. of samples received	: 7		
No. of samples analysed	: 7		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA002: pH 1:5 (Soils) (QC Lot: 2159200)									
EB1902042-001	101852 / 310-01-BH2214-S01280 / 12.80-13.25m	EA002: pH Value	----	0.1	pH Unit	8.3	8.4	0.00	0% - 20%
EB1902045-004	Anonymous	EA002: pH Value	----	0.1	pH Unit	9.1	9.1	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2159206)									
EB1902042-001	101852 / 310-01-BH2214-S01280 / 12.80-13.25m	EA055: Moisture Content	----	0.1	%	22.0	22.4	1.79	0% - 20%
EB1902045-004	Anonymous	EA055: Moisture Content	----	0.1	%	13.7	13.4	2.23	0% - 50%
ED040S: Soluble Major Anions (QC Lot: 2159201)									
EB1902042-001	101852 / 310-01-BH2214-S01280 / 12.80-13.25m	ED040S: Sulfate as SO ₄ 2-	14808-79-8	10	mg/kg	100	100	0.00	0% - 50%
EB1902045-004	Anonymous	ED040S: Sulfate as SO ₄ 2-	14808-79-8	10	mg/kg	<10	<10	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2159202)									
EB1902042-001	101852 / 310-01-BH2214-S01280 / 12.80-13.25m	ED045G: Chloride	16887-00-6	10	mg/kg	620	620	0.00	0% - 20%
EB1902045-004	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	50	50	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA002: pH 1:5 (Soils) (QCLot: 2159200)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	100	98	102
				----	7 pH Unit	100	98	102
ED040S: Soluble Major Anions (QCLot: 2159201)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	500 mg/kg	98.3	90	114
ED045G: Chloride by Discrete Analyser (QCLot: 2159202)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	101	83	119
				<10	5000 mg/kg	104	83	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1902042	Page	: 1 of 4
Client	: TRILAB PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: THE ADMIN RESULTS	Telephone	: +61-7-3243 7222
Project	: 1897791 Inland Rail B2G	Date Samples Received	: 25-Jan-2019
Site	: ----	Issue Date	: 04-Feb-2019
Sampler	: ----	No. of samples received	: 7
Order number	: BNE 1901038	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA002: pH 1:5 (Soils)									
Snap Lock Bag (EA002) 101852 / 310-01-BH2214-S01280 / 12.80-13.25m, 101864 / 310-01-BH2215-S01400 / 14.00-14.45m, 101867 / 310-01-BH2221-S00350 / 3.50-3.95m, 101882 / 310-01-BH2228-S02140 / 21.40-21.465m		101856 / 310-01-BH2214-S01880 / 18.80-19.25m, 101866 / 310-01-BH2215-S02040 / 20.40-20.85m, 101878 / 310-01-BH2228-S01140 / 11.40-11.64m,	24-Jan-2019	30-Jan-2019	31-Jan-2019	✓	30-Jan-2019	30-Jan-2019	✓
EA055: Moisture Content (Dried @ 105-110°C)									
Snap Lock Bag (EA055) 101852 / 310-01-BH2214-S01280 / 12.80-13.25m, 101864 / 310-01-BH2215-S01400 / 14.00-14.45m, 101867 / 310-01-BH2221-S00350 / 3.50-3.95m, 101882 / 310-01-BH2228-S02140 / 21.40-21.465m		101856 / 310-01-BH2214-S01880 / 18.80-19.25m, 101866 / 310-01-BH2215-S02040 / 20.40-20.85m, 101878 / 310-01-BH2228-S01140 / 11.40-11.64m,	24-Jan-2019	---	---	---	29-Jan-2019	07-Feb-2019	✓
ED040S : Soluble Sulfate by ICPAES									
Snap Lock Bag (ED040S) 101852 / 310-01-BH2214-S01280 / 12.80-13.25m, 101864 / 310-01-BH2215-S01400 / 14.00-14.45m, 101867 / 310-01-BH2221-S00350 / 3.50-3.95m, 101882 / 310-01-BH2228-S02140 / 21.40-21.465m		101856 / 310-01-BH2214-S01880 / 18.80-19.25m, 101866 / 310-01-BH2215-S02040 / 20.40-20.85m, 101878 / 310-01-BH2228-S01140 / 11.40-11.64m,	24-Jan-2019	30-Jan-2019	21-Feb-2019	✓	31-Jan-2019	27-Feb-2019	✓
ED045G: Chloride by Discrete Analyser									
Snap Lock Bag (ED045G) 101852 / 310-01-BH2214-S01280 / 12.80-13.25m, 101864 / 310-01-BH2215-S01400 / 14.00-14.45m, 101867 / 310-01-BH2221-S00350 / 3.50-3.95m, 101882 / 310-01-BH2228-S02140 / 21.40-21.465m		101856 / 310-01-BH2214-S01880 / 18.80-19.25m, 101866 / 310-01-BH2215-S02040 / 20.40-20.85m, 101878 / 310-01-BH2228-S01140 / 11.40-11.64m,	24-Jan-2019	30-Jan-2019	21-Feb-2019	✓	31-Jan-2019	27-Feb-2019	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Chloride Soluble By Discrete Analyser	ED045G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

ATTERBERG LIMITS TEST REPORT

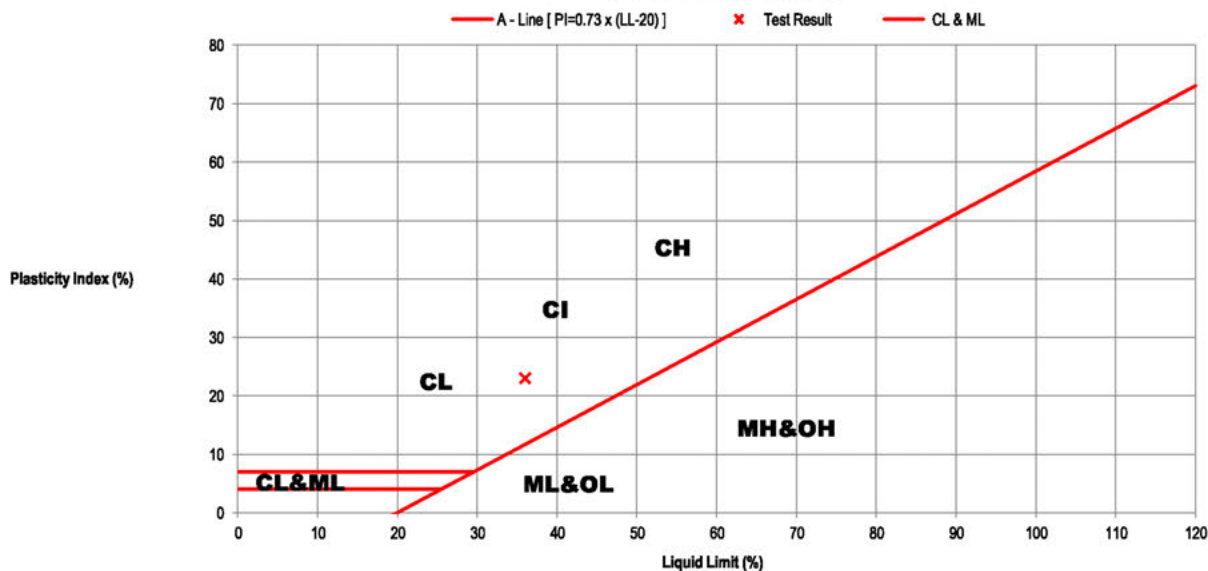
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101854-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	22/01/2019
Project No.	1897791	Report Date	29/01/2019
Bore Hole	310-01-BH2214	Client Sample No.	310-01-BH2214-S01580-ATT : 310-01-BH2214-S01580-MOI
Description	SPT	Depth From (m)	15.8
		Depth To (m)	16.25

RESULTS OF TESTING

Liquid Limit (%) 36
Plastic Limit (%) 13
Plasticity Index (%) 23
Linear Shrinkage (%) 8.0 **Curling Occurred**
Moisture Content (%) 14.9
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

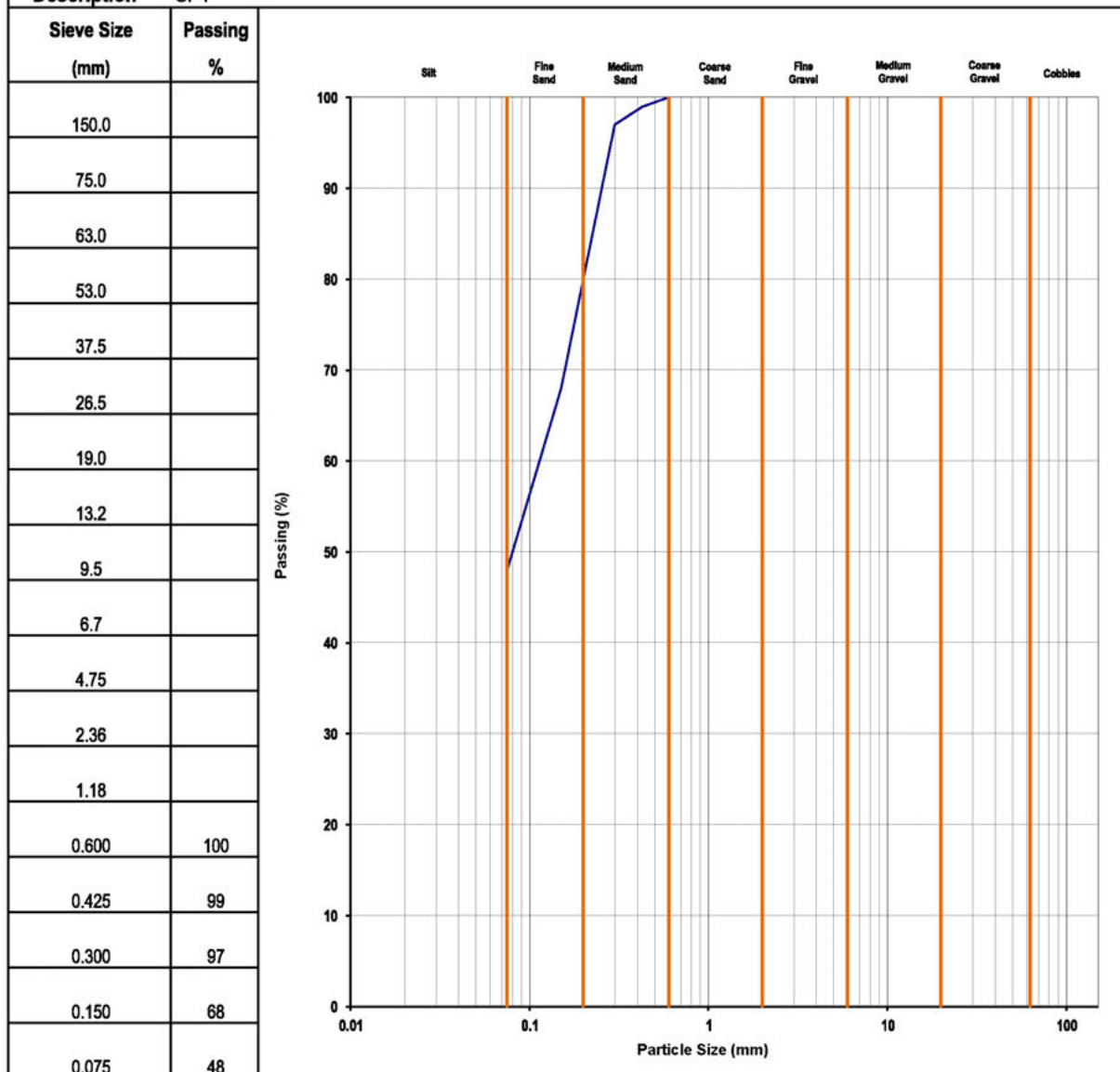
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101854-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4040
		Test Date	19/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2214-S01580		
Bore Hole	310-01-BH2214	Depth From (m)	15.8	Depth To (m)	16.25

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 14.9%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

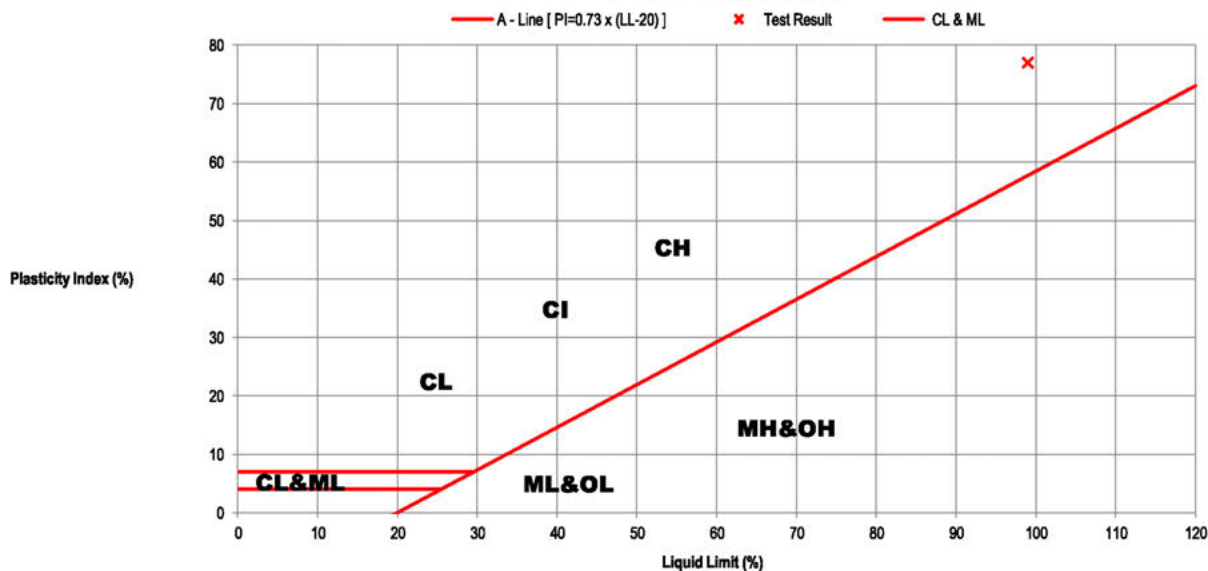
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101860-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	22/01/2019
Project No.	1897791	Report Date	29/01/2019
Bore Hole	310-01-BH2214	Client Sample No.	310-01-BH2214-S02630-ATT : 310-01-BH2214-S02630-MOI
Description	SPT	Depth From (m)	26.3
		Depth To (m)	26.75

RESULTS OF TESTING

Liquid Limit (%)	99	
Plastic Limit (%)	22	
Plasticity Index (%)	77	
Linear Shrinkage (%)	15.0	Cracking & Curling Occurred
Moisture Content (%)	26.1	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

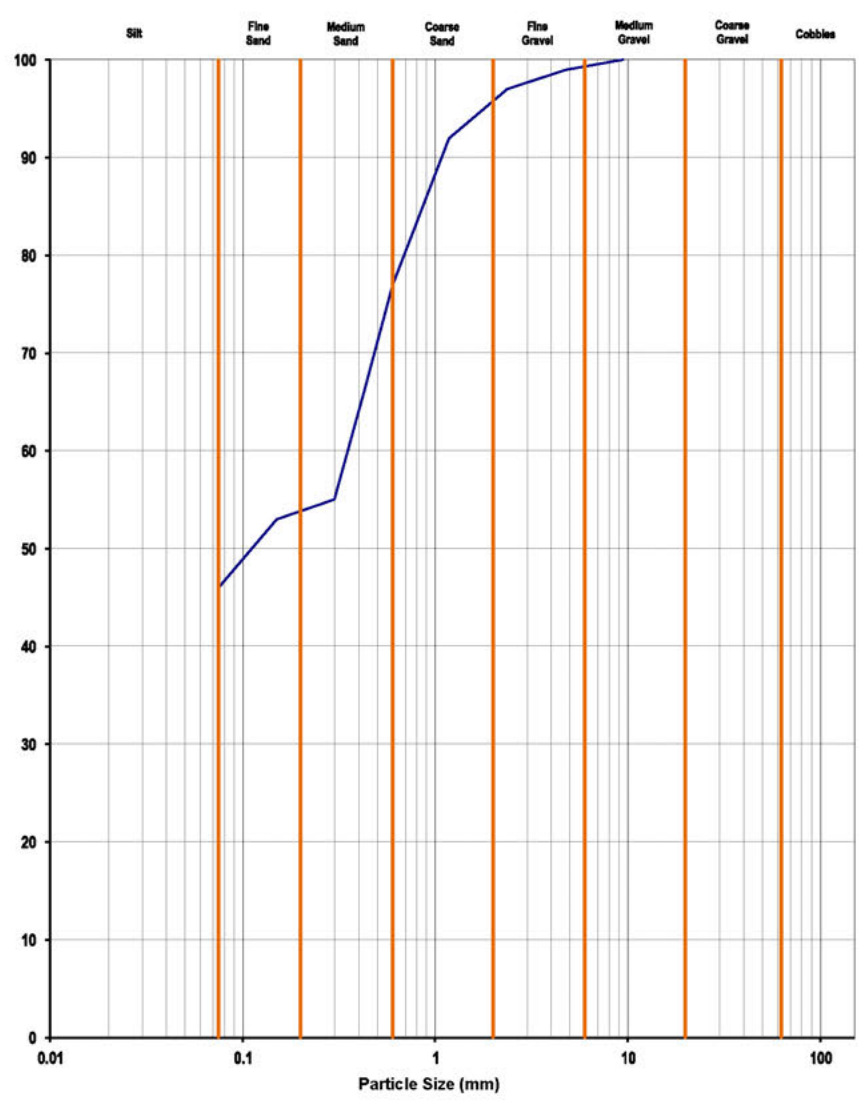
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101861-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2215-S00350		
Bore Hole	310-01-BH2215	Depth From (m)	3.5	Depth To (m)	3.94
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	100
4.75	99
2.36	97
1.18	92
0.600	77
0.425	66
0.300	55
0.150	53
0.075	46



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 46% passing for 0.075 mm and rises to 100% passing at 6.7 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 11.6%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

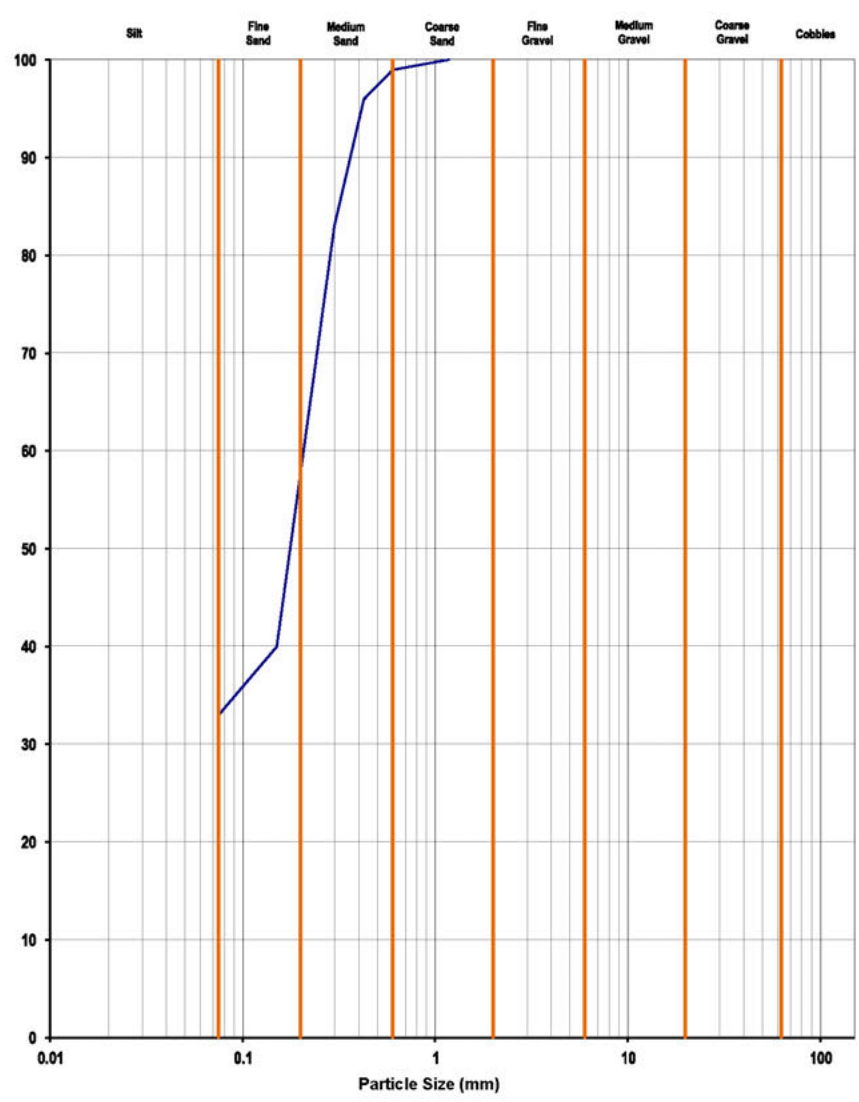
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101862-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2215-S00950		
Bore Hole	310-01-BH2215	Depth From (m)	9.5	Depth To (m)	9.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	96
0.300	83
0.150	40
0.075	33



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 33% passing for 0.075 mm, rises to 40% at 0.150 mm, 83% at 0.300 mm, 96% at 0.425 mm, and reaches 100% at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 10%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

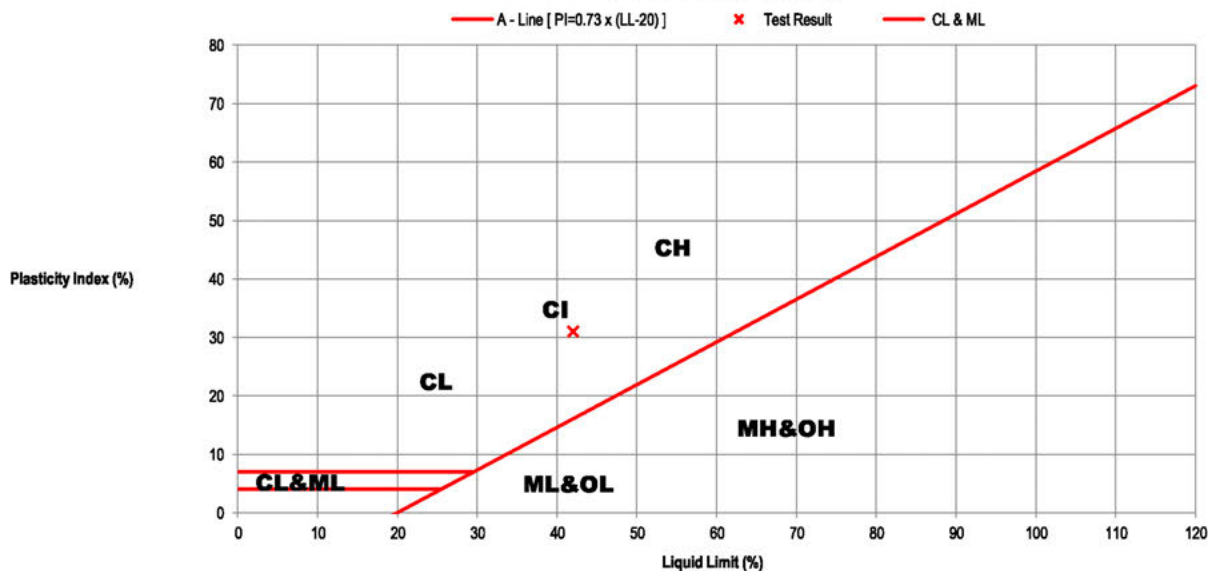
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101863-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2215	Client Sample No.	310-01-BH2215-S01250-ATT : 310-01-BH2215-S01250-MOI
Description	SPT	Depth From (m)	12.5
		Depth To (m)	12.95

RESULTS OF TESTING

Liquid Limit (%)	42	
Plastic Limit (%)	11	
Plasticity Index (%)	31	
Linear Shrinkage (%)	10.5	Curling Occurred
Moisture Content (%)	14.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

SHRINK SWELL INDEX TEST REPORT

Test Method AS 1289 7.1.1

Client	Golder Associates Pty Limited	Report No.	GA101865-ISS
		Request No.	R4_BH_Rev0_4040
Address	PO Box 1734 MILTON BC QLD 4064	Test Date	18/1/19-25/1/19
		Report Date	29/01/2019

Project	Inland Rail B2G
Description	CLAY-brown/grey

Sample No.	310-01-BH2215-U01790
Client ID	310-01-BH2215
Depth (m)	17.9-18.53

RESULTS OF TESTING

SWELL SPECIMEN

Swell Pressure (kPa) *	300
Wet Density (t/m³)	1.80
Initial Moisture Content (%)	30.8
Final Moisture Content (%)	40.0
Swell (%)	8.4

SHRINKAGE SPECIMEN

Estimated Inert Inclusions (%)	10-20
Extent of Crumbling	Slight
Extent of Cracking	High-Extreme
Moisture (%)	30.8
Shrinkage (%)	6.7

SHRINK SWELL INDEX (Iss) (%)	6.0
-------------------------------------	------------

Notes/Remarks:

* Swell pressure determination in accordance with test method AS4133.3.3

Sample/s supplied by client

Tested as received

Page: 1 of 1 REP02304

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

Tested at Trilab Brisbane Laboratory

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

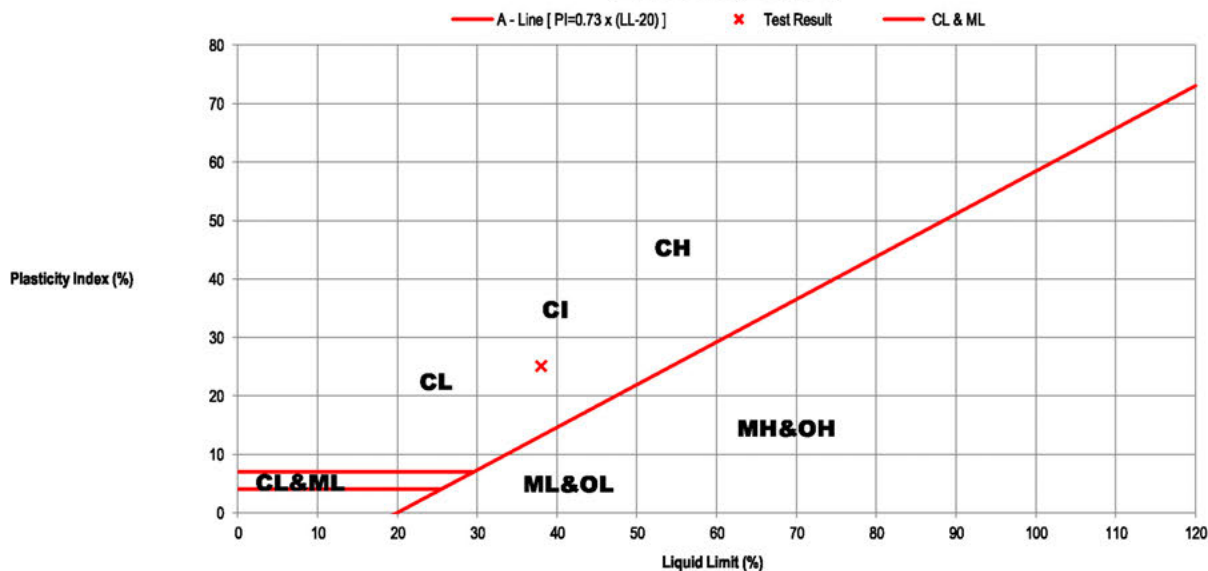
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101868-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2221	Client Sample No.	310-01-BH2221-S00500-ATT : 310-01-BH2221-S00500-MOI
Description	SPT	Depth From (m)	5
		Depth To (m)	5.45

RESULTS OF TESTING

Liquid Limit (%)	38	
Plastic Limit (%)	13	
Plasticity Index (%)	25	
Linear Shrinkage (%)	9.5	Curling Occurred
Moisture Content (%)	17.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

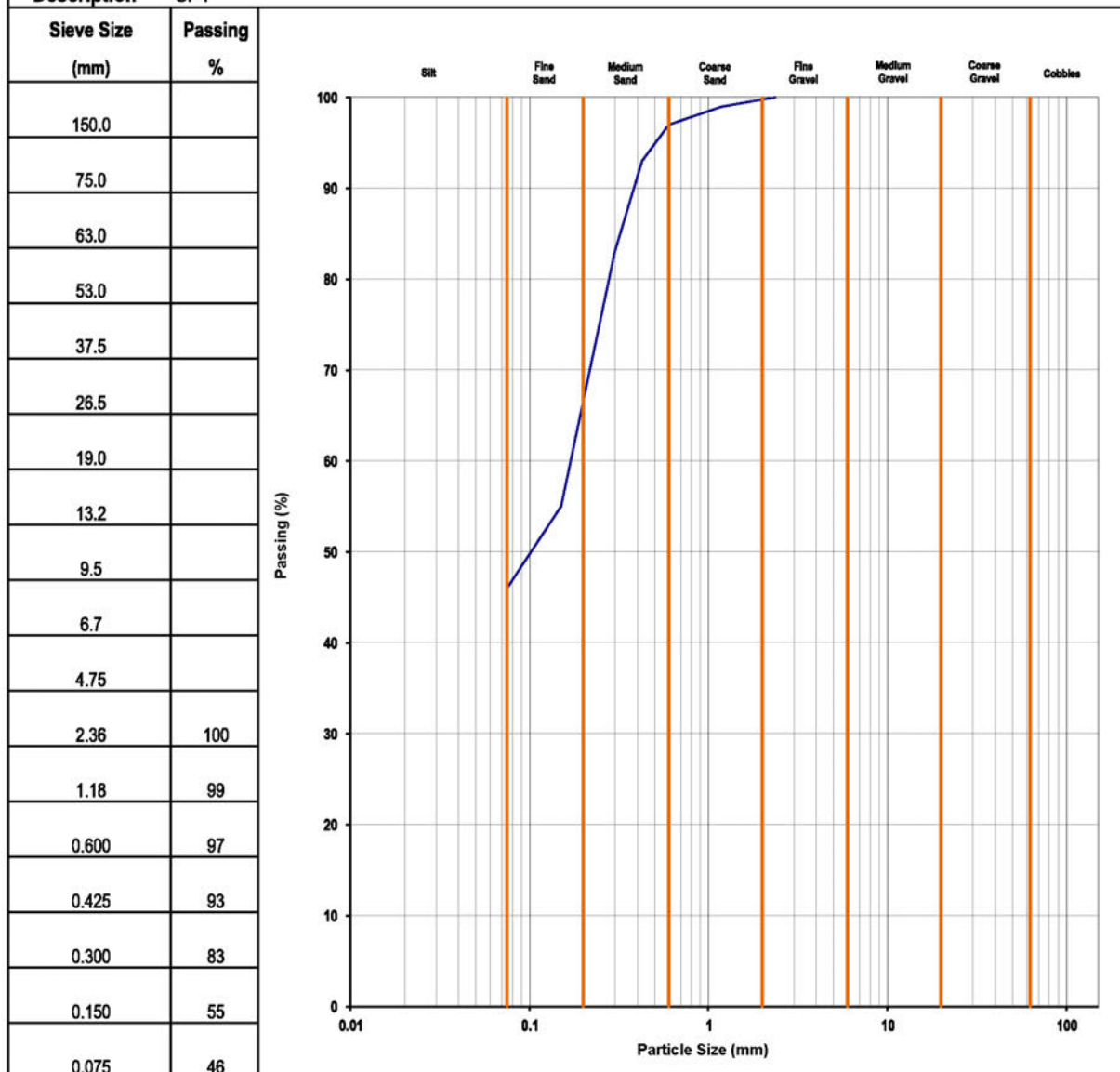
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101868-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4040
		Test Date	19/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2221-S00500		
Bore Hole	310-01-BH2221	Depth From (m)	5	Depth To (m)	5.45

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 17.3%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

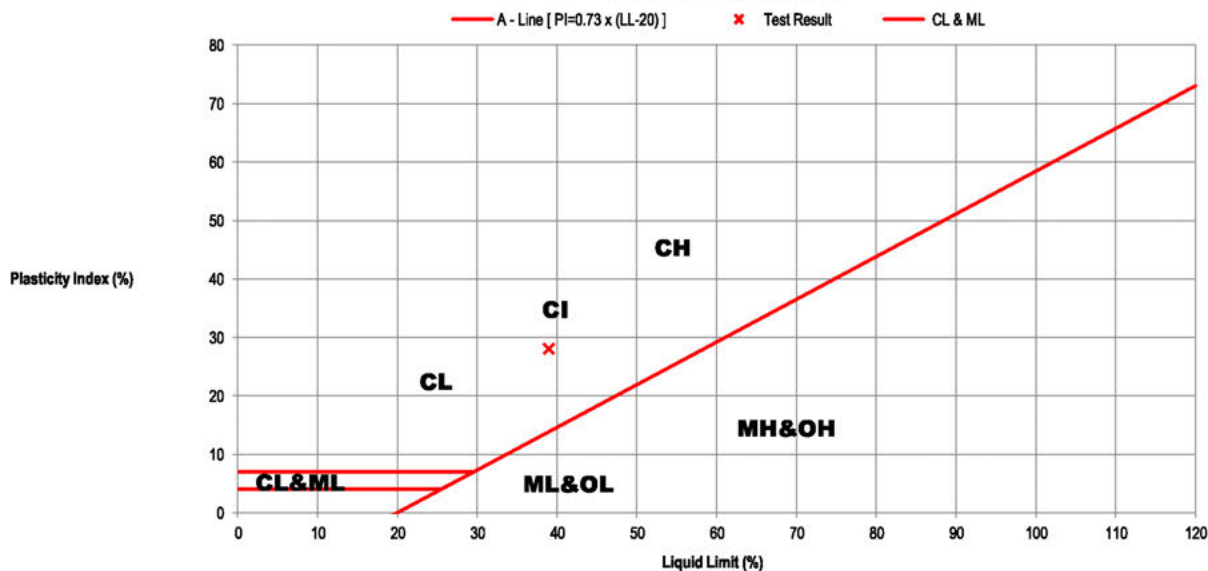
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101871-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2221	Client Sample No.	310-01-BH2221-S01140-ATT : 310-01-BH2221-S01140-MOI
Description	SPT	Depth From (m)	11.4
		Depth To (m)	11.85

RESULTS OF TESTING

Liquid Limit (%)	39	
Plastic Limit (%)	11	
Plasticity Index (%)	28	
Linear Shrinkage (%)	10.5	Curling Occurred
Moisture Content (%)	16.1	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

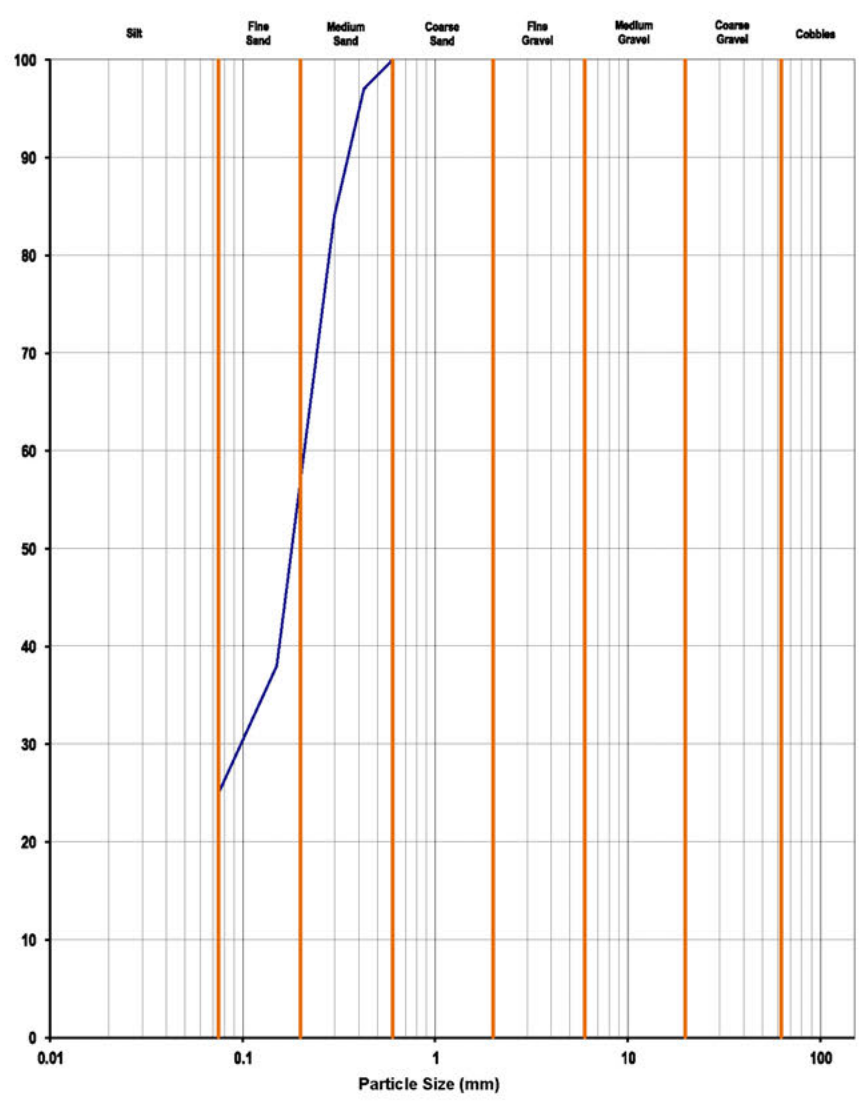
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101873-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2221-S01590		
Bore Hole	310-01-BH2221	Depth From (m)	15.9	Depth To (m)	16.35
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	
0.600	100
0.425	97
0.300	84
0.150	38
0.075	25



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 25% passing for 0.075 mm and rises to 100% passing at 0.600 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.850 mm), Coarse Sand (0.850 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 20.7%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

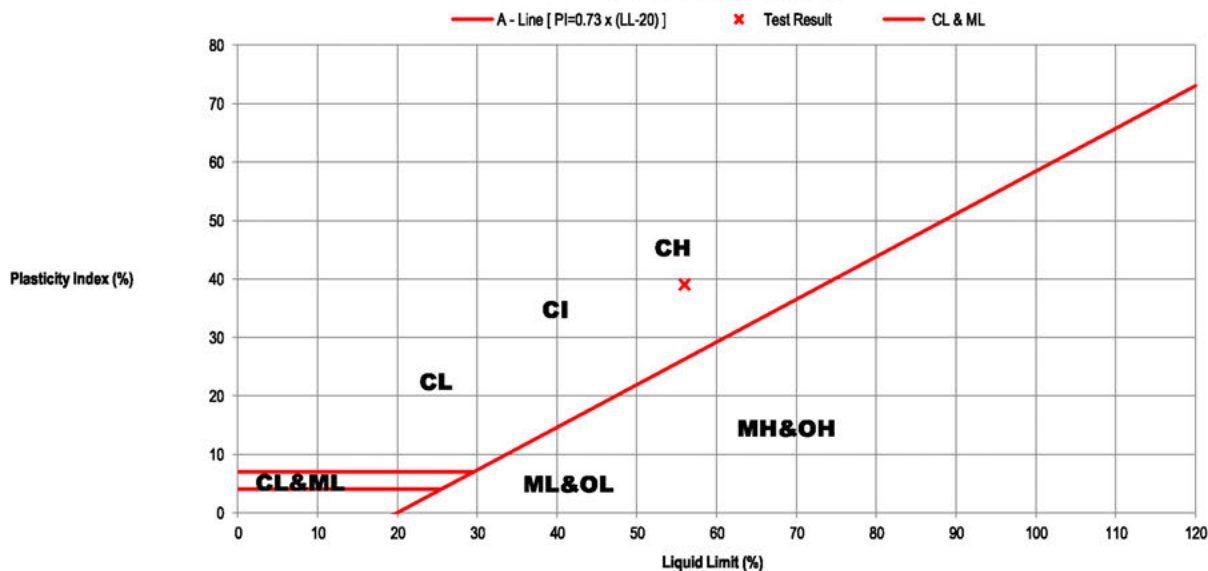
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101874-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2228	Client Sample No.	310-01-BH2228-S00050-ATT : 310-01-BH2228-S00050-MOI
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	56	
Plastic Limit (%)	17	
Plasticity Index (%)	39	
Linear Shrinkage (%)	16.0	Curling Occurred
Moisture Content (%)	21.2	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

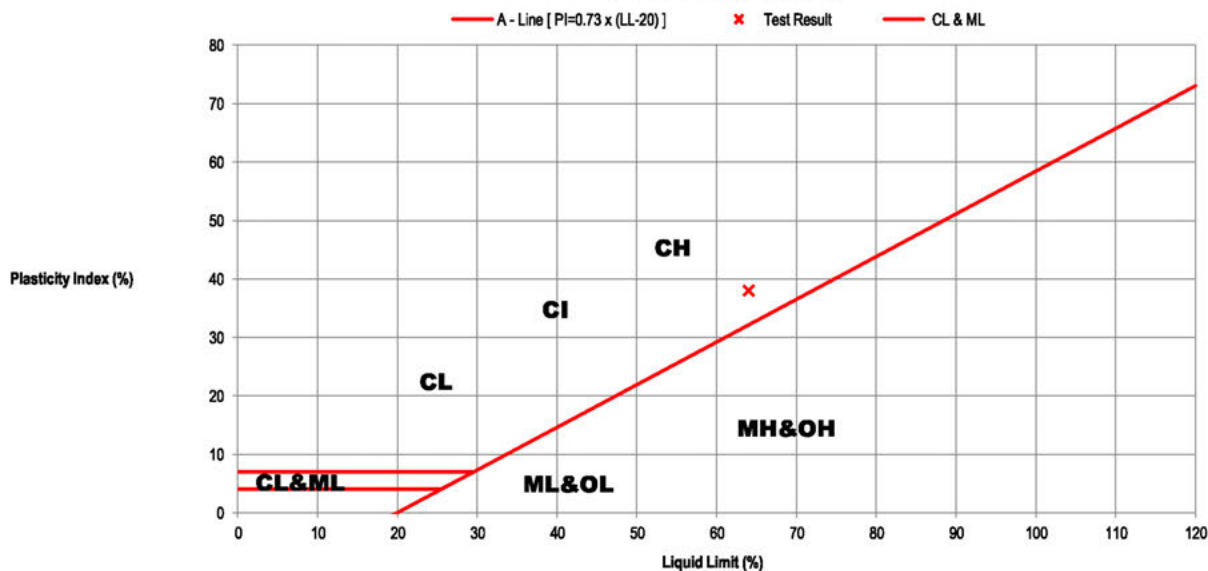
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101875-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2228	Client Sample No.	310-01-BH2228-S00500-ATT : 310-01-BH2228-S00500-MOI
Description	SPT	Depth From (m)	5
		Depth To (m)	5.45

RESULTS OF TESTING

Liquid Limit (%)	64	
Plastic Limit (%)	26	
Plasticity Index (%)	38	
Linear Shrinkage (%)	16.0	Curling Occurred
Moisture Content (%)	16.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

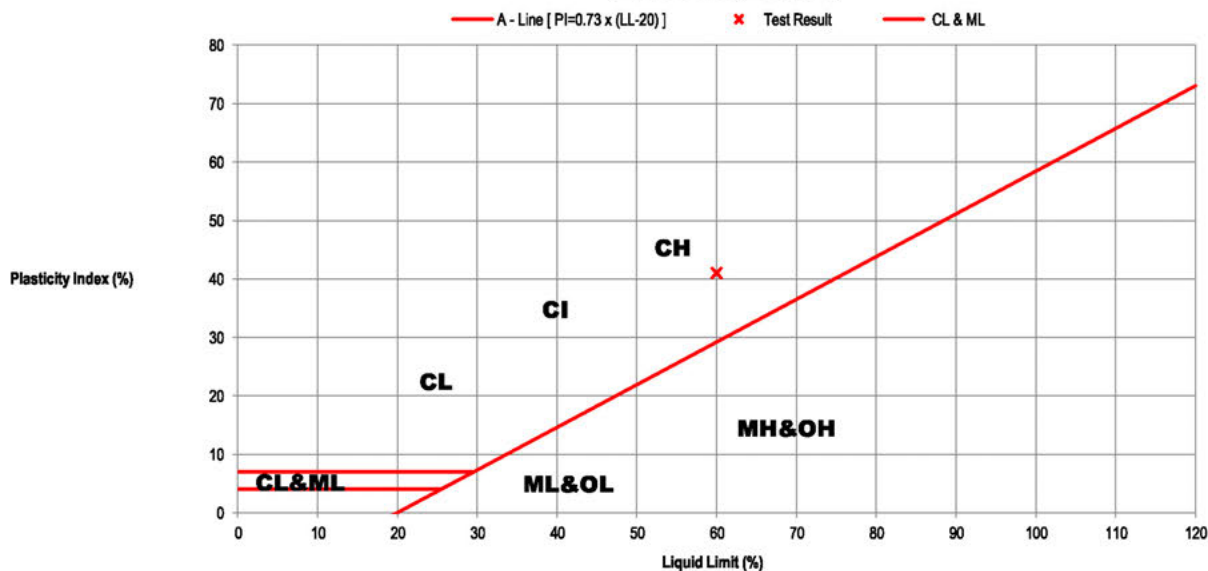
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101876-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2228	Client Sample No.	310-01-BH2228-C00758-ATT : 310-01-BH2228-C00758-MOI
Description	C	Depth From (m)	7.58
		Depth To (m)	9

RESULTS OF TESTING

Liquid Limit (%)	60	
Plastic Limit (%)	19	
Plasticity Index (%)	41	
Linear Shrinkage (%)	15.0	Curling Occurred
Moisture Content (%)	9.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

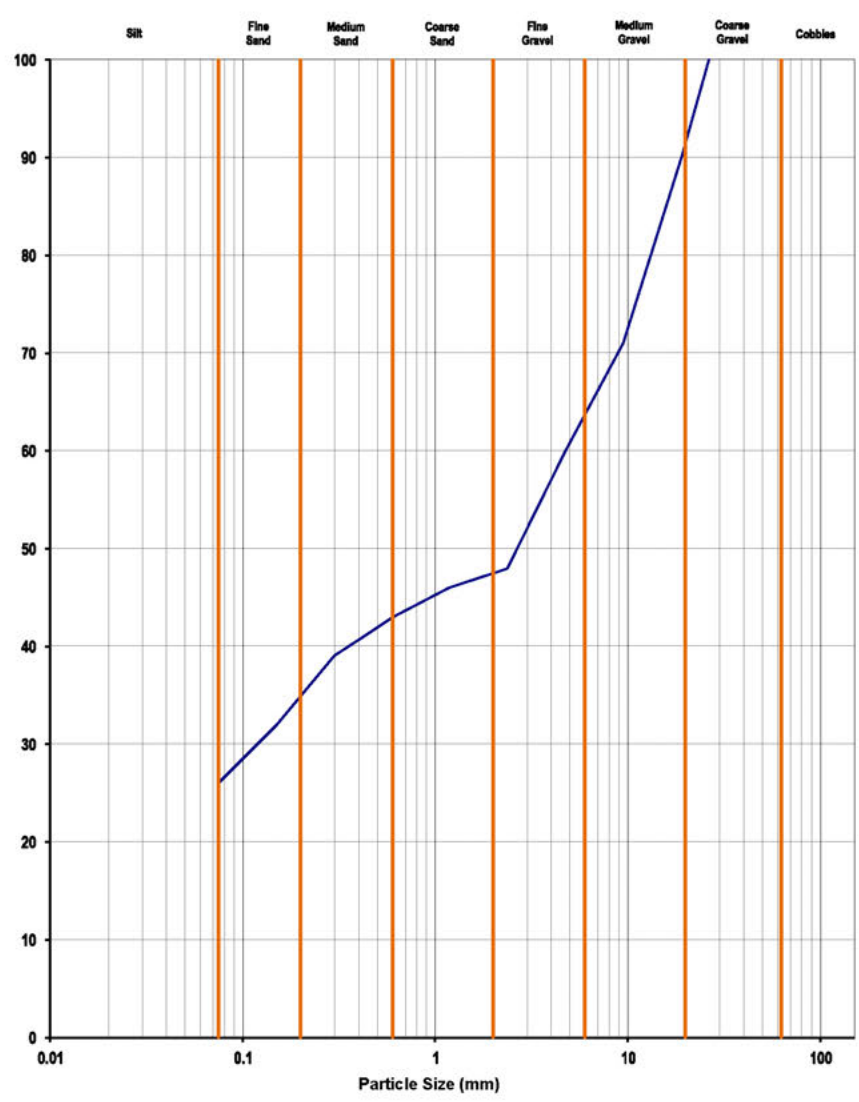
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101876-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2228-C00758		
Bore Hole	310-01-BH2228	Depth From (m)	7.58	Depth To (m)	9
Description	C				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	100
19.0	90
13.2	76
9.5	71
6.7	65
4.75	60
2.36	48
1.18	46
0.600	43
0.425	41
0.300	39
0.150	32
0.075	26



The graph shows the particle size distribution curve for sample C. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 26% passing for 0.075 mm and rises to 100% passing at 26.5 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 2.0 mm), Coarse Sand (2.0 - 4.75 mm), Fine Gravel (4.75 - 2.0 mm), Medium Gravel (2.0 - 4.75 mm), Coarse Gravel (4.75 - 20 mm), and Cobbles (> 20 mm).

NOTES/REMARKS:

-
Moisture Content 9.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

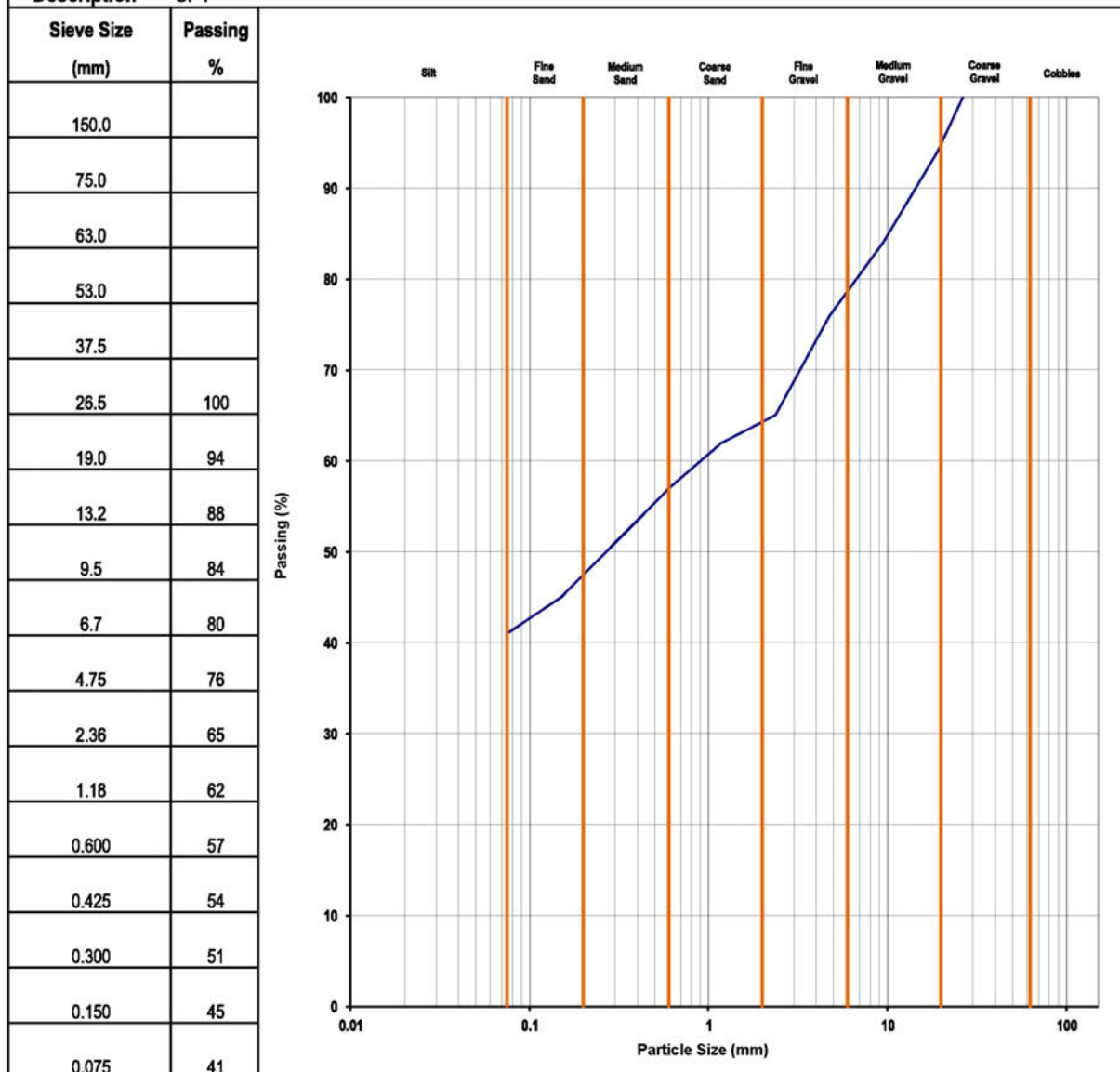
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101877-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4040
		Test Date	19/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2228-S00990		
Bore Hole	310-01-BH2228	Depth From (m)	9.9	Depth To (m)	10.35

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 22.5%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

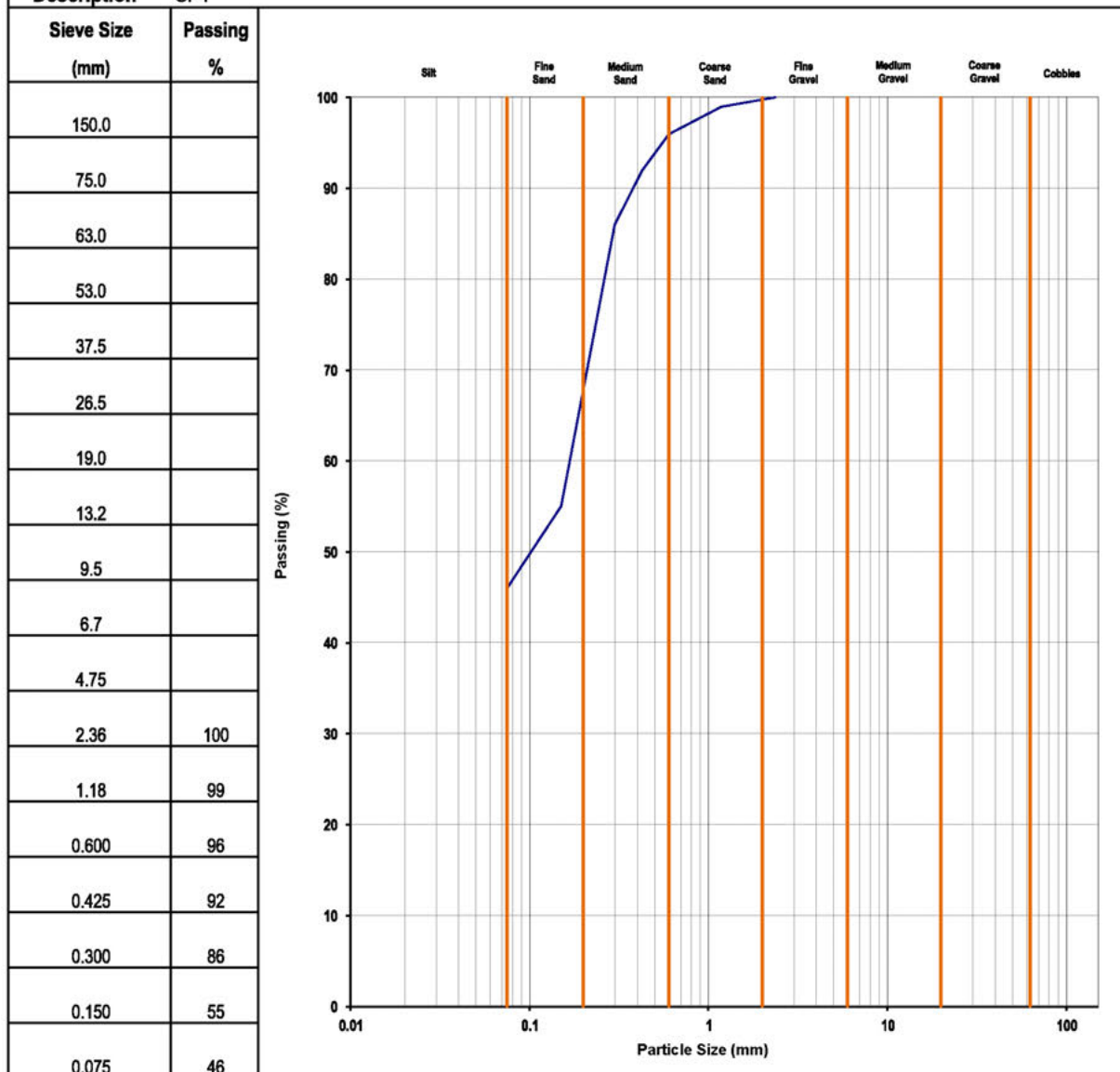
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101879-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4040
		Test Date	19/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2228-S01580		
Bore Hole	310-01-BH2228	Depth From (m)	15.8	Depth To (m)	18.905
Description	SPT				



NOTES/REMARKS:

-
Moisture Content 16.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

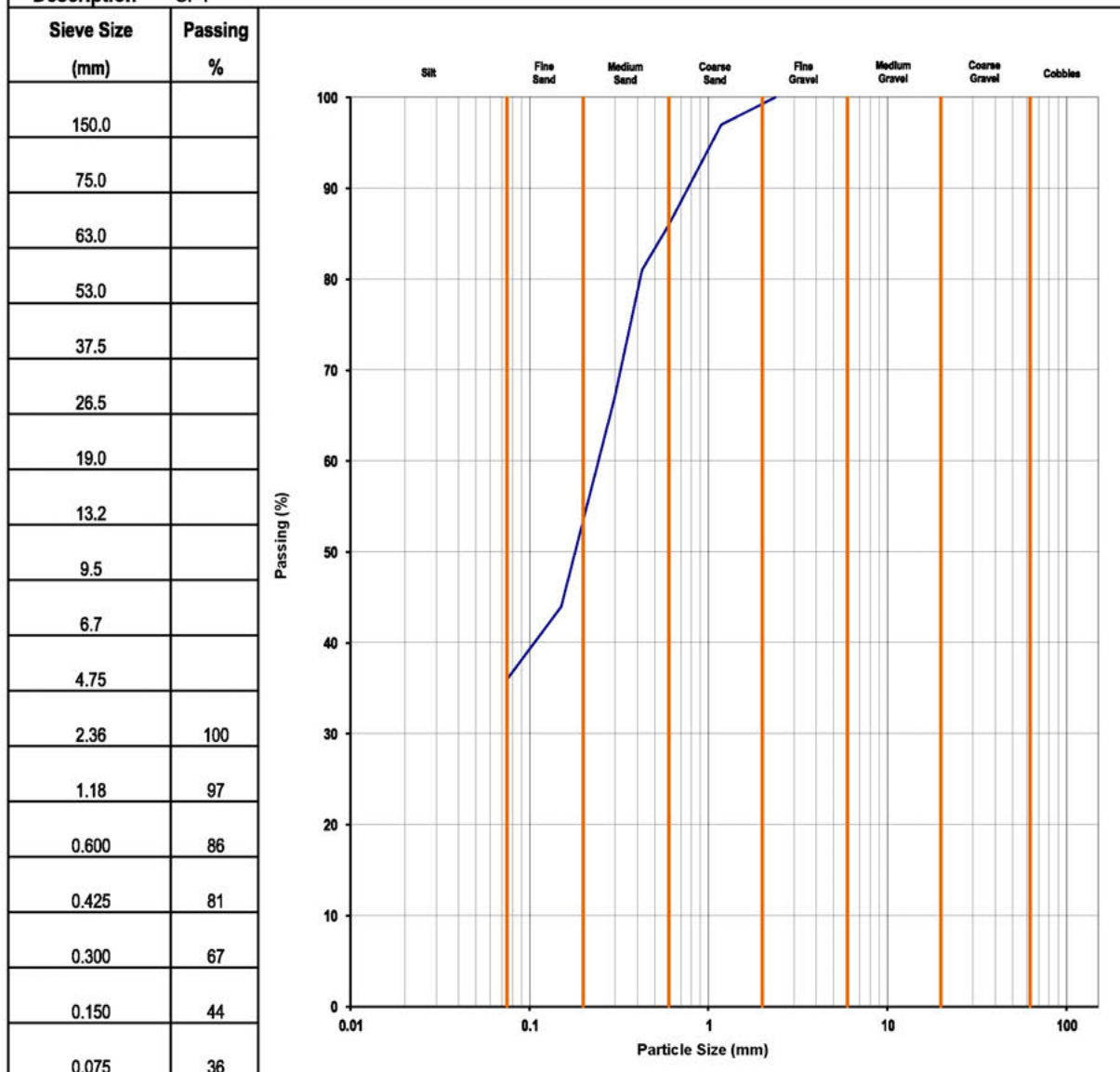
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101883-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4040
		Test Date	19/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2228-S02290		
Bore Hole	310-01-BH2228	Depth From (m)	22.9	Depth To (m)	25.945

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 13.7%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

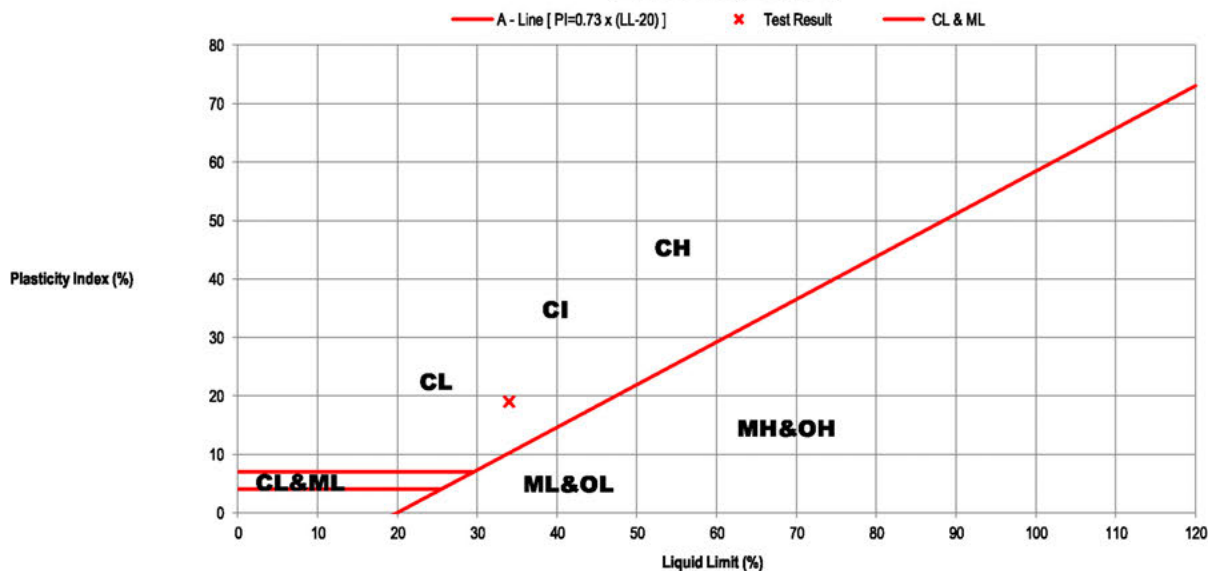
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101886-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	29/01/2019
Bore Hole	310-01-BH2251	Client Sample No.	310-01-BH2251-S00300-ATT : 310-01-BH2251-S00300-MOI
Description	SPT	Depth From (m)	3
		Depth To (m)	6.22

RESULTS OF TESTING

Liquid Limit (%)	34	
Plastic Limit (%)	15	
Plasticity Index (%)	19	
Linear Shrinkage (%)	7.5	Curling Occurred
Moisture Content (%)	11.5	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

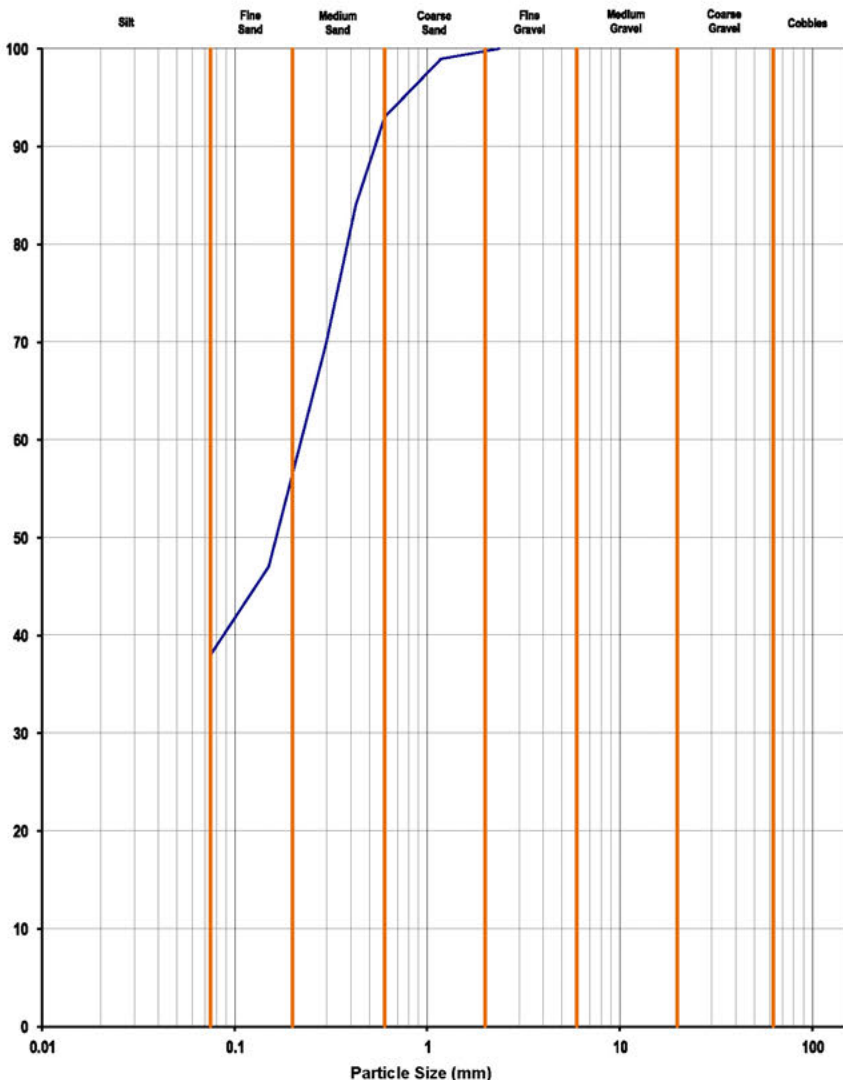
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101886-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2251-S00300		
Bore Hole	310-01-BH2251	Depth From (m)	3	Depth To (m)	6.22
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	93
0.425	84
0.300	70
0.150	47
0.075	38



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 38% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 11.5%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.8.1

Project No 1897791

[illegible]

REP00402



ACCREDITED FOR
TECHNICAL
EVALUATION

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

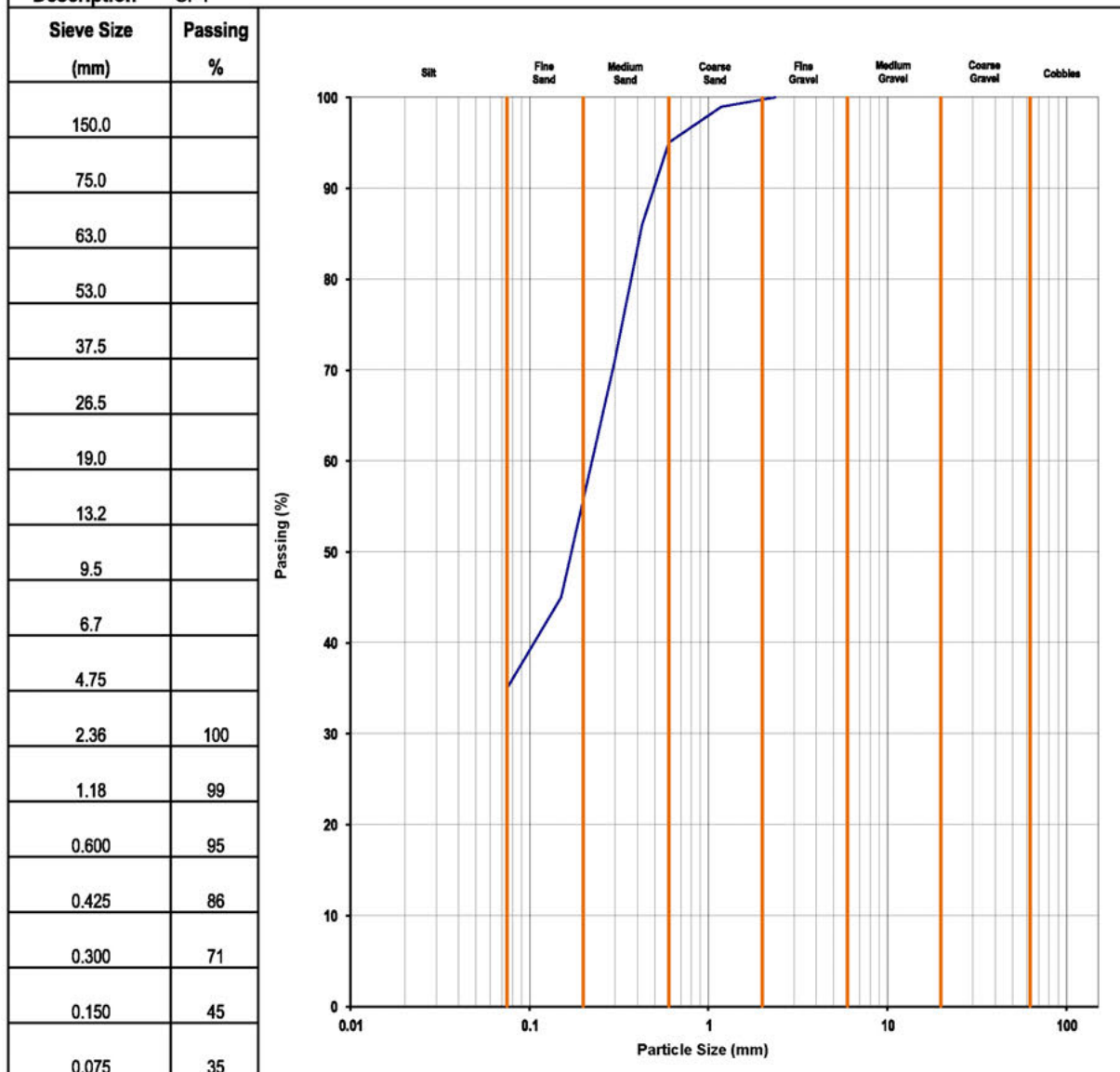
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101890-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4040
		Test Date	19/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2251-S01500		
Bore Hole	310-01-BH2251	Depth From (m)	15	Depth To (m)	16.75

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 10.2%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

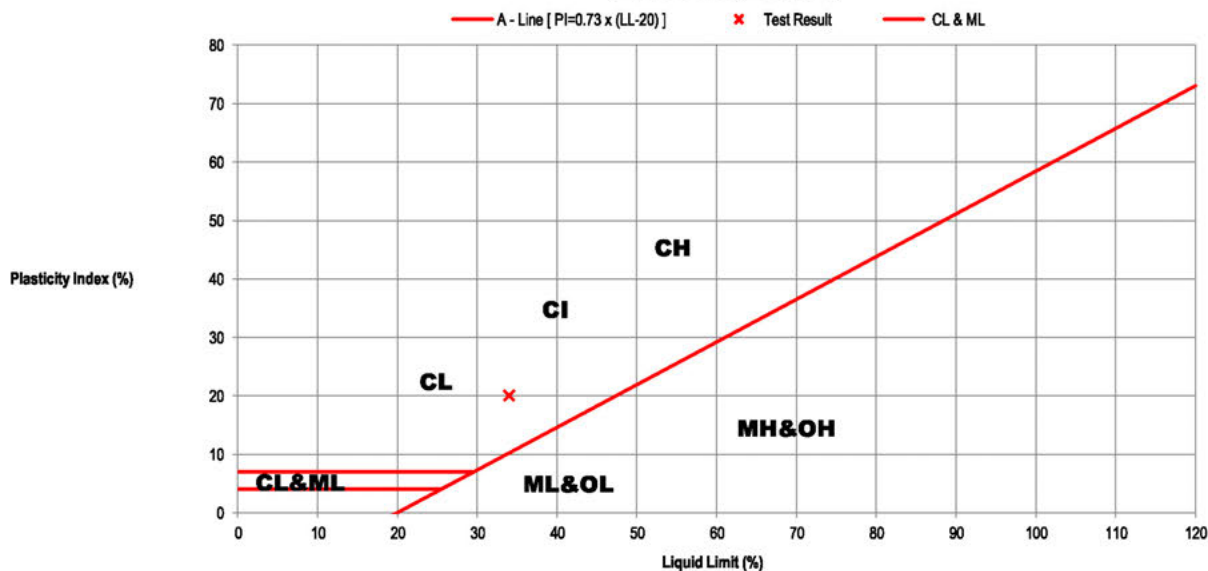
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101893-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4040
Project	Inland Rail B2G	Test Date	24/01/2019
Project No.	1897791	Report Date	30/01/2019
Bore Hole	310-01-BH2251	Client Sample No.	310-01-BH2251-S02100-ATT : 310-01-BH2251-S02100-MOI
Description	SPT	Depth From (m)	21
		Depth To (m)	21.45

RESULTS OF TESTING

Liquid Limit (%)	34	
Plastic Limit (%)	14	
Plasticity Index (%)	20	
Linear Shrinkage (%)	8.0	Curling Occurred
Moisture Content (%)	12.9	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101893-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4040
				Test Date	19/1/19-22/1/19
				Report Date	22/1/2019
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2251-S02100		
Bore Hole	310-01-BH2251	Depth From (m)	21	Depth To (m)	21.45
Description	SPT				
Sieve Size (mm)	Passing %				

ATTERBERG LIMITS TEST REPORT

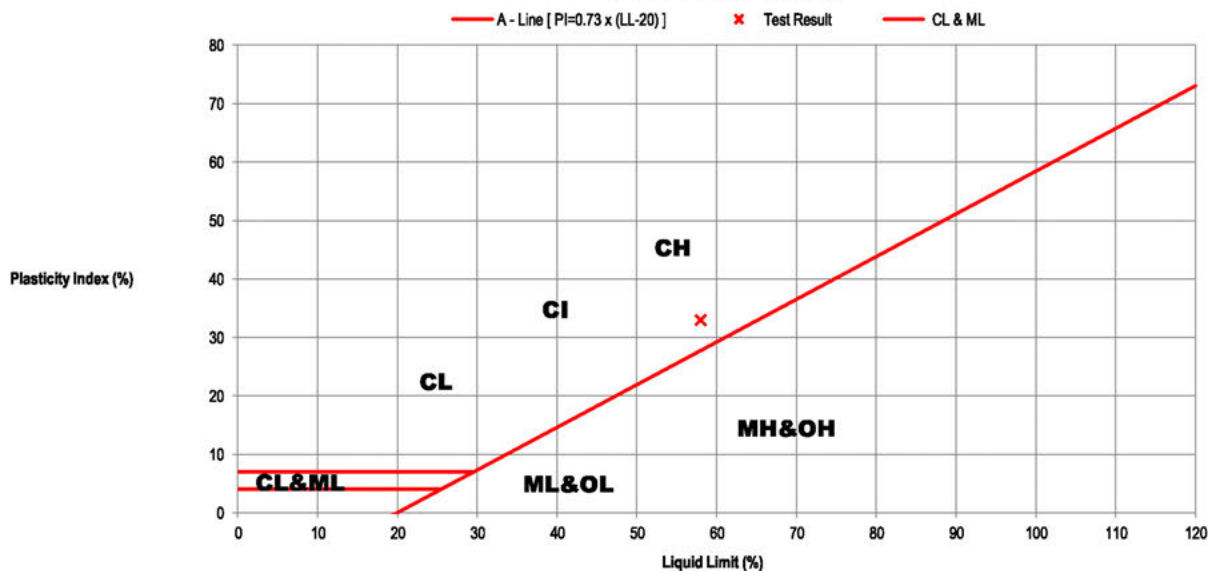
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101895-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	21/01/2019
Project No.	1897791	Report Date	23/01/2019
Bore Hole	310-01-BH2327	Client Sample No.	310-01-BH2327-S00200-ATT : 310-01-BH2327-S00200-MOI
Description	SPT	Depth From (m)	2
		Depth To (m)	2.45

RESULTS OF TESTING

Liquid Limit (%)	58	
Plastic Limit (%)	25	
Plasticity Index (%)	33	
Linear Shrinkage (%)	15.0	Curling Occurred
Moisture Content (%)	16.6	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.8.1

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

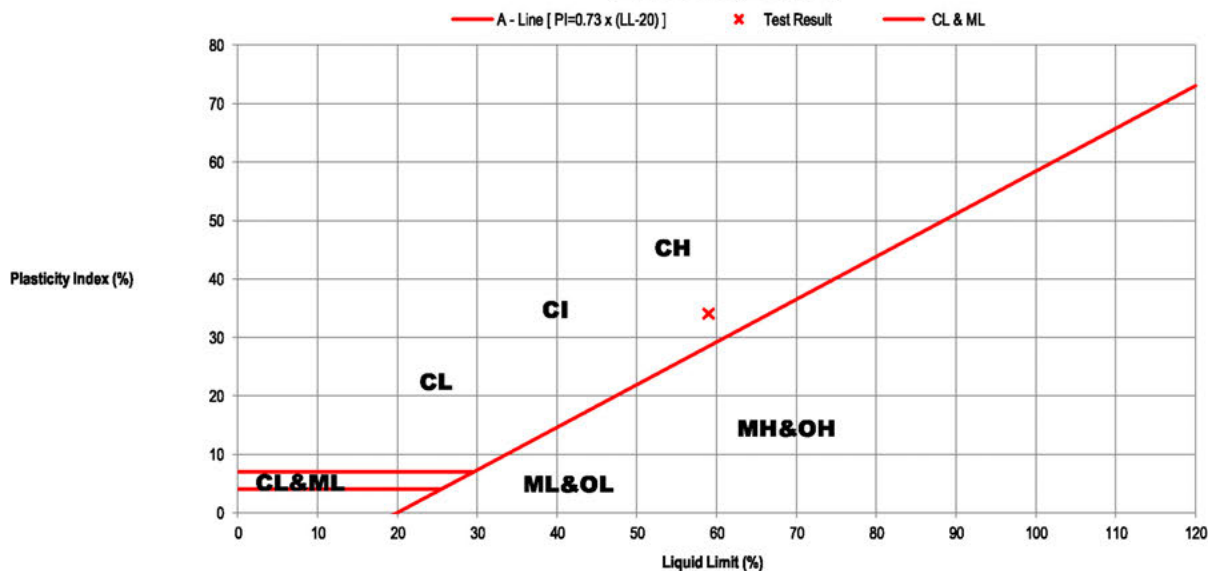
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101899-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	21/01/2019
Project No.	1897791	Report Date	23/01/2019
Bore Hole	310-01-BH2327	Client Sample No.	310-01-BH2327-S01100-ATT : 310-01-BH2327-S01100-MOI
Description	SPT	Depth From (m)	11
		Depth To (m)	11.13

RESULTS OF TESTING

Liquid Limit (%)	59	
Plastic Limit (%)	25	
Plasticity Index (%)	34	
Linear Shrinkage (%)	10.5	Curling Occurred
Moisture Content (%)	9.5	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101901-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No	1897791	Report Date	22/01/2019
		Client Sample No.	310-01-BH2345-C00198

Sample No.	101901
BoreHole	310-01-BH2345
Depth From (m)	1.98
Depth To (m)	3.25
Description	C
Slake Durability (1st cycle) (%)	99.1
Slake Durability (2nd cycle) (%)	98.1
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	28.8
Appearance of fragments retained in the drum	Original Form
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

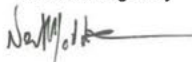
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101903-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No	1897791	Report Date	22/01/2019
		Client Sample No.	310-01-BH2345-C00810

Sample No.	101903
BoreHole	310-01-BH2345
Depth From (m)	8.1
Depth To (m)	8.94
Description	C
Slake Durability (1st cycle) (%)	99.5
Slake Durability (2nd cycle) (%)	98.9
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	27.5
Appearance of fragments retained in the drum	Original Form
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

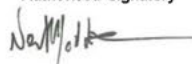
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

POINT LOAD TEST REPORT

Test Method: AS 4133.4.1

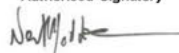
Client Golder Associates Pty Limited	Report No. GA101904-101931-PL			
	Request No R4_BH_Rev0_4050			
Address PO Box 1734 MILTON BC QLD 4064	Test Date 17/01/2019			
	Report Date 22/01/2019			
Project Inland Rail B2G				
Project No 1897791				
Trilab Sample No.	101904	101906	101907	101926
Client Sample No	310-01-BH2345-C01040	310-01-BH2345-C01785	310-01-BH2345-C02085	310-01-BH2356-C00680
Bore Hole	310-01-BH2345	310-01-BH2345	310-01-BH2345	310-01-BH2356
Depth From/To (m)	10.79-10.86	19.4-19.58	21.2-21.28	7.15-7.23
Description	C	C	C	C
Is (MPa)	0.50	6.58	3.52	0.27
Is(50) (MPa)	0.54	6.93	3.72	0.28
Load Direction	Diametral	Diametral	Diametral	Diametral
Trilab Sample No.	101929	101931	101904	101906
Client Sample No	310-01-BH2356-C01202	310-01-BH2356-C01960	310-01-BH2345-C01040	310-01-BH2345-C01785
Bore Hole	310-01-BH2356	310-01-BH2356	310-01-BH2345	310-01-BH2345
Depth From/To (m)	13.20-13.27	19.83-19.92	10.75-10.79	19.35-19.40
Description	C	C	C	C
Is (MPa)	0.34	0.20	1.61	5.65
Is(50) (MPa)	0.35	0.21	1.55	6.08
Load Direction	Diametral	Diametral	Axial	Axial
NOTES/REMARKS: Tested as received				
Sample/s supplied by the client				

Page 1 of 2

REP02102

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025 - Testing. The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
 Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

POINT LOAD TEST REPORT

Test Method: AS 4133.4.1

Client	Golder Associates Pty Limited	Report No.	GA101904-101931-PL
		Request No	R4_BH_Rev0_4050
Address	PO Box 1734 MILTON BC QLD 4064	Test Date	17/01/2019
		Report Date	22/01/2019

Project	Inland Rail B2G
Project No	1897791

Trilab Sample No.	101907	101926	101929	101931
Client Sample No	310-01-BH2345-C02085	310-01-BH2356-C00680	310-01-BH2356-C01202	310-01-BH2356-C01960
Bore Hole	310-01-BH2345	310-01-BH2356	310-01-BH2356	310-01-BH2356
Depth From/To (m)	21.10-21.15	7.10-7.15	13.15-13.20	19.78-19.83
Description	C	C	C	C
Is (MPa)	3.90	0.39	0.33	0.27
Is(50) (MPa)	4.01	0.39	0.34	0.29
Load Direction	Axial	Axial	Axial	Axial

Trilab Sample No.				
Client Sample No				
Bore Hole				
Depth From/To (m)				
Description				
Is (MPa)				
Is(50) (MPa)				
Load Direction				

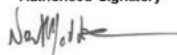
NOTES/REMARKS: Tested as received

Sample/s supplied by the client

Page 2 of 2 REP02102

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025 - Testing. The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Golder Associates Pty Limited	Report No.	GA101905-MOD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No.	1897791	Client Sample No.	310-01-BH2345-C01440
Bore Hole	310-01-BH2345	Depth From (m)	14.7
		Depth To (m)	14.87
Description	C		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 57.8 MPa

Young's Modulus

Tangent 29.3 GPa

Secant 27.9 GPa

Poisson Ratio

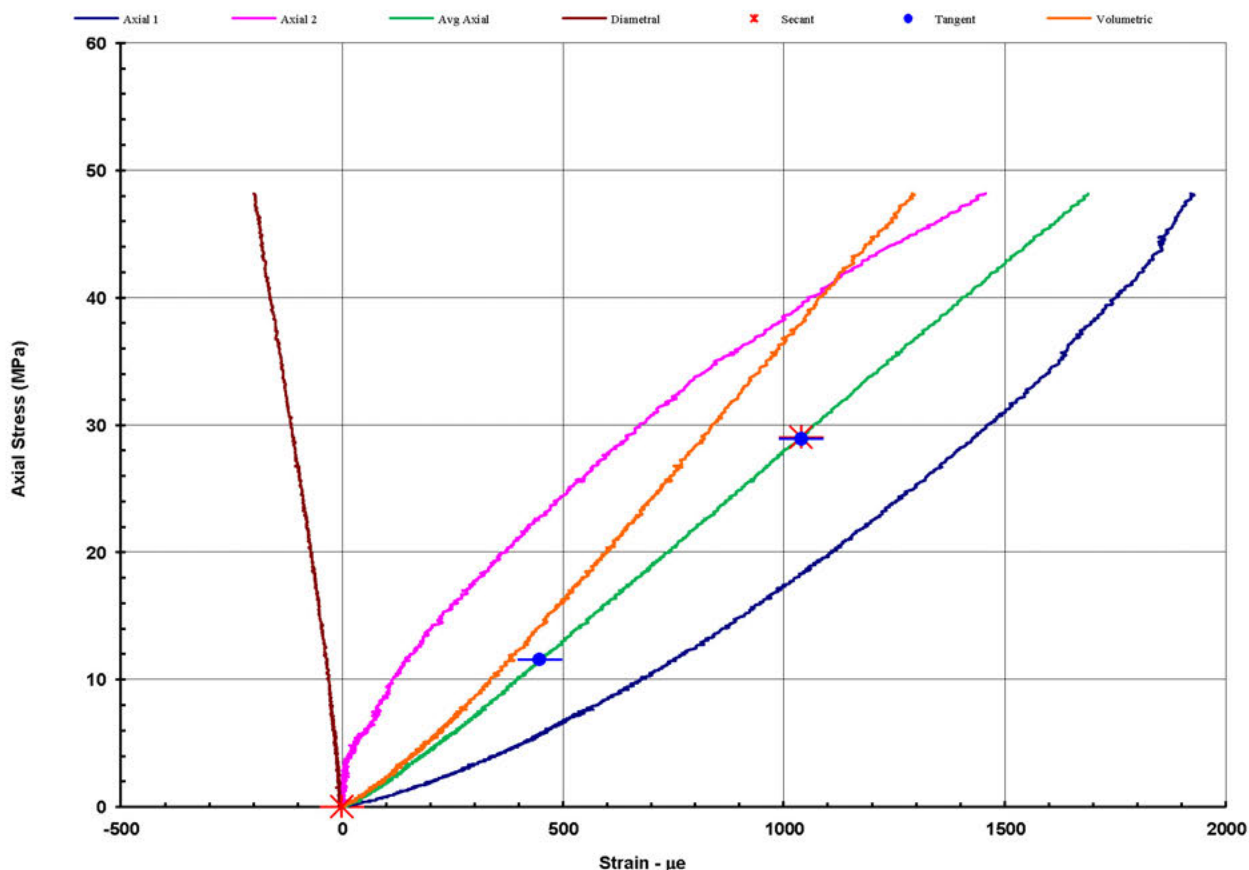
0.104

0.106

from 20 % to 50 % of Max UCS

from 0 % to 50 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

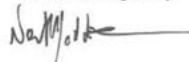
Tested as received.

Page 1 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Golder Associates Pty Limited	Report No.	GA101905-MOD
Average Sample Diameter (mm)	60.4	Moisture Content (%)	3.6
Sample Height (mm)	159.4	Wet Density (t/m ³)	2.60
Duration of Test (min)	8.07	Dry Density (t/m ³)	2.51
Rate of Loading (MPa/min)	7.16	Bedding (°)	Nil
Mode of Failure	Conical	Test Apparatus	Kelba 1000kN Load Cell

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101905	DATE: 17/01/19
BOREHOLE:	310-01-BH2345	DEPTH: 14.4 14.70-14.87



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101905	DATE: 17/01/19
BOREHOLE:	310-01-BH2345	DEPTH: 14.4 14.70-14.87



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

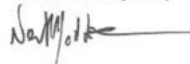
Tested as received.

Page 2 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101905-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No	1897791	Report Date	22/01/2019
		Client Sample No.	310-01-BH2345-C01440

Sample No.	101905
BoreHole	310-01-BH2345
Depth From (m)	14.4
Depth To (m)	17.4
Description	C
Slake Durability (1st cycle) (%)	99.3
Slake Durability (2nd cycle) (%)	98.7
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	27.5
Appearance of fragments retained in the drum	Original Form
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

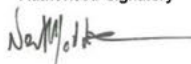
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Golder Associates Pty Limited	Report No.	GA101908-MOD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No.	1897791	Client Sample No.	310-01-BH2345-C02385
Bore Hole	310-01-BH2345	Depth From (m)	24.26
		Depth To (m)	24.44
Description	C		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 59.1 MPa

Young's Modulus

Tangent 34.9 GPa

Secant 28.5 GPa

Poisson Ratio

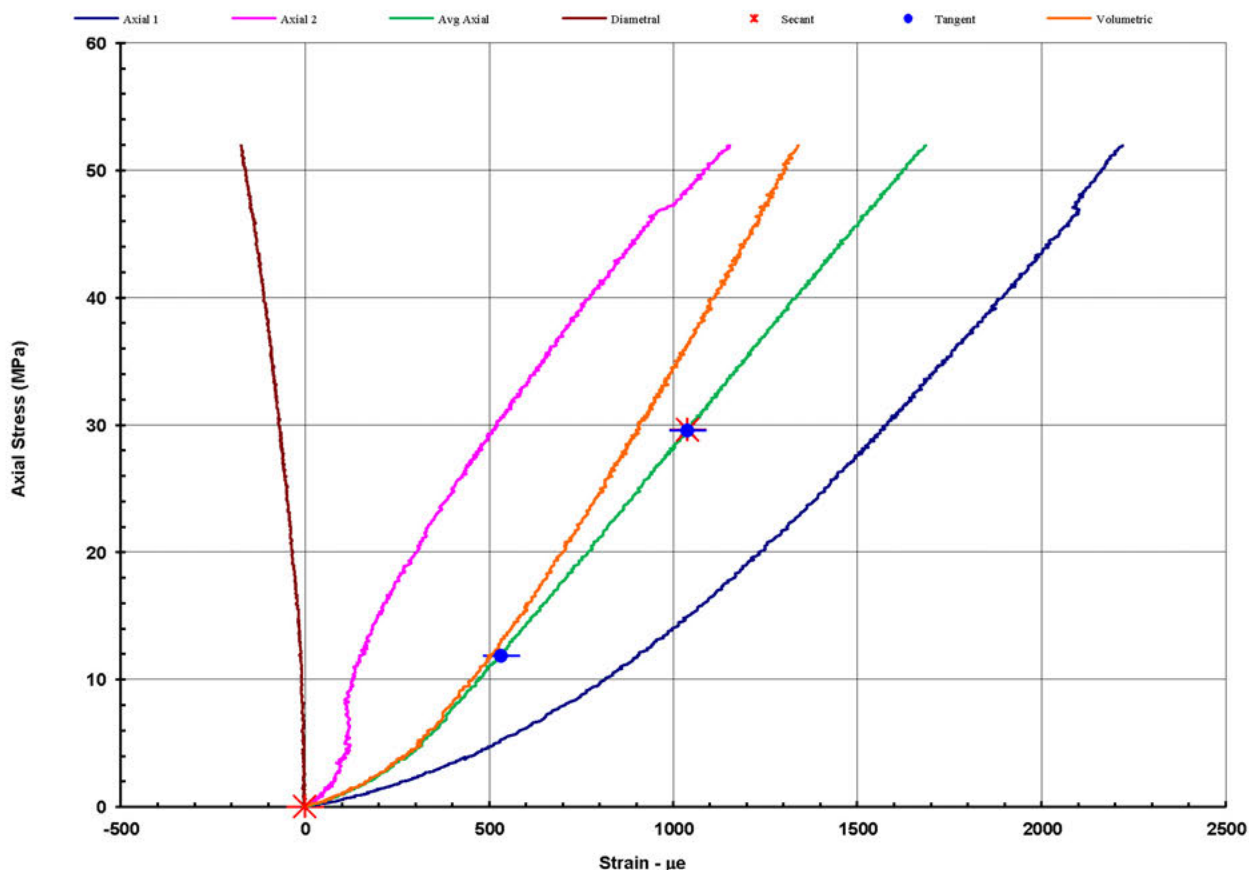
0.066

0.066

from 20 % to 50 % of Max UCS

from 0 % to 50 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

Tested as received.

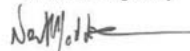
Page 1 of 2

REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client Golder Associates Pty Limited		Report No. GA101908-MOD	
Average Sample Diameter (mm)	60.6	Moisture Content (%)	2.2
Sample Height (mm)	164.9	Wet Density (t/m ³)	2.71
Duration of Test (min)	6.60	Dry Density (t/m ³)	2.65
Rate of Loading (MPa/min)	8.96	Bedding (°)	5
Mode of Failure	End Splitting	Test Apparatus	Kelba 1000kN Load Cell

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101908	DATE: 17/01/19
BOREHOLE:	310-01-BH2345	DEPTH: 23.85 24.26 - 24.44



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101908	DATE: 17/01/19
BOREHOLE:	310-01-BH2345	DEPTH: 23.85 24.26 - 24.44



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

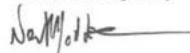
Tested as received.

Page 2 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

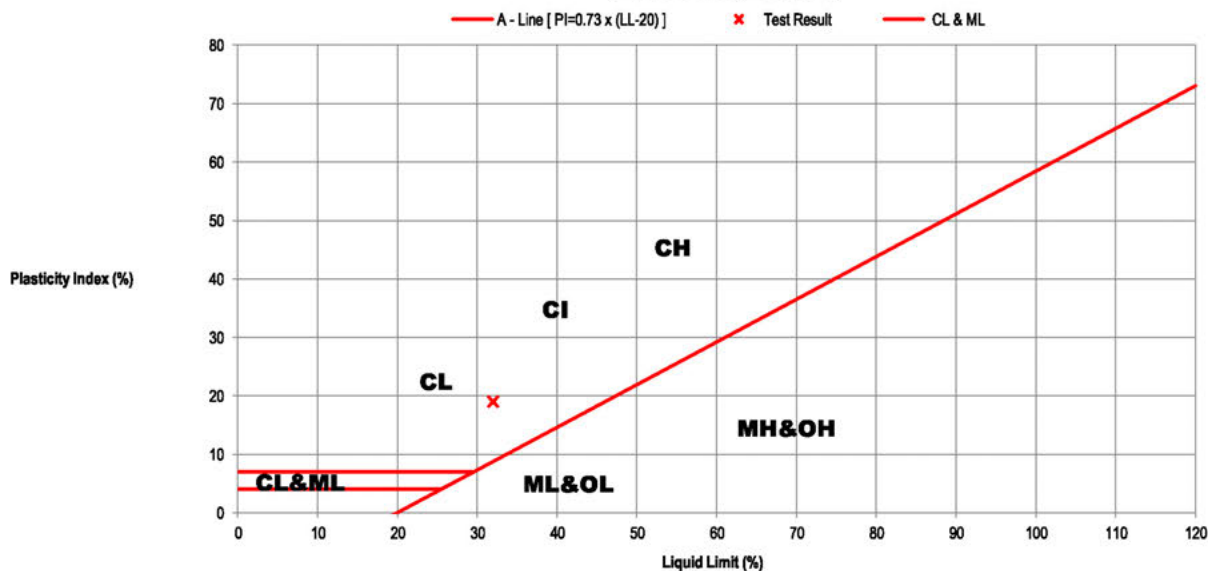
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101909-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	21/01/2019
Project No.	1897791	Report Date	29/01/2019
Bore Hole	310-01-BH2353	Client Sample No.	310-01-BH2353-S00050-ATT : 310-01-BH2353-S00050-MOI
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	32	
Plastic Limit (%)	13	
Plasticity Index (%)	19	
Linear Shrinkage (%)	9.0	Curling Occurred
Moisture Content (%)	8.1	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

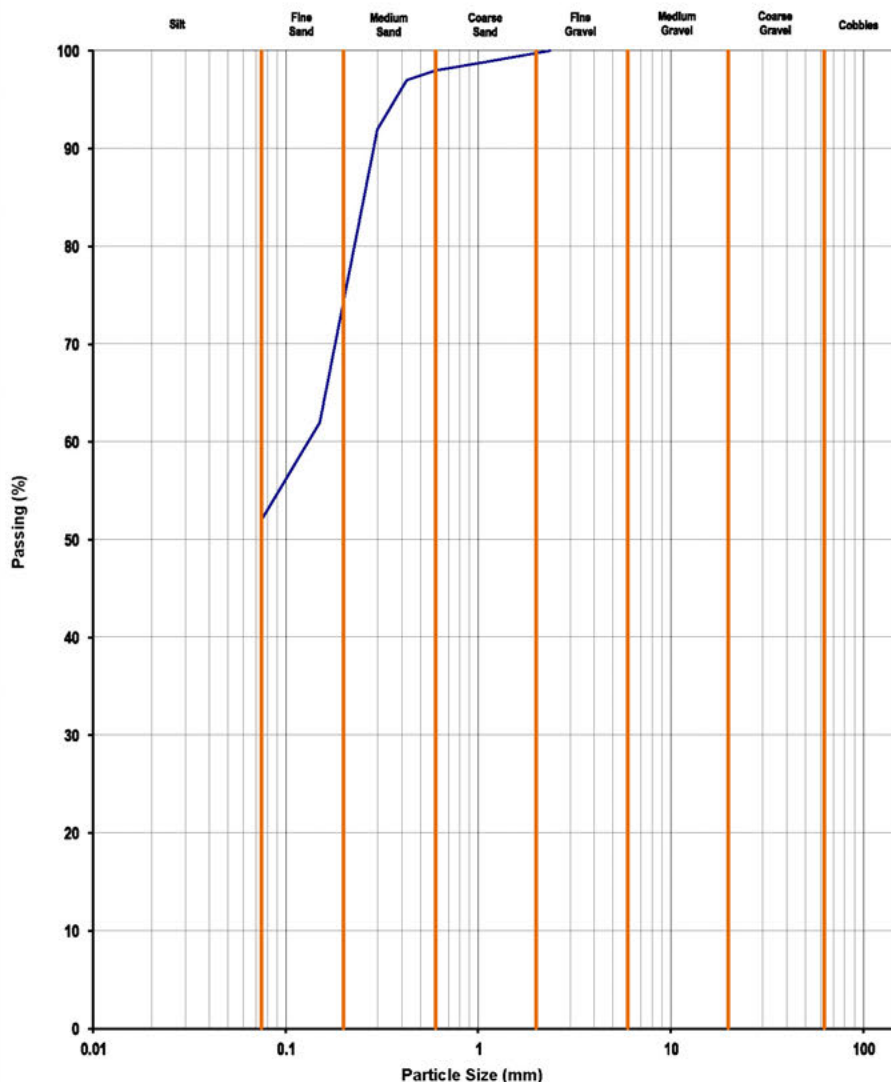
Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101909-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	19/1/19-21/1/19
Project No	1897791	Report Date	21/1/2019
Bore Hole	310-01-BH2353	Client Sample No	310-01-BH2353-S00050
Depth From (m)	0.5	Depth To (m)	0.95

Description		SPT
Sieve Size	Passing	
(mm)	%	
150.0		
75.0		
63.0		
53.0		
37.5		
26.5		
19.0		
13.2		
9.5		
6.7		
4.75		
2.36	100	
1.18	99	
0.600	98	
0.425	97	
0.300	92	
0.150	62	
0.075	52	

Grain size distribution curve showing passing percentage versus particle size (mm) on a semi-logarithmic scale. The curve starts at 52% passing for 0.075 mm and reaches 100% passing at 2.36 mm. Vertical lines indicate soil texture boundaries: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.850 mm), Coarse Sand (0.850 - 2.36 mm), Fine Gravel (2.36 - 4.75 mm), Medium Gravel (4.75 - 9.5 mm), Coarse Gravel (9.5 - 20 mm), and Cobbles (> 20 mm).

Particle Size (mm)	Passing (%)
0.075	52
0.150	62
0.300	92
0.425	97
0.600	98
1.18	99
2.36	100



NOTES/REMARKS:

-
Moisture Content 8.1%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory

C. Park

C. Park



Laboratory No. 9926

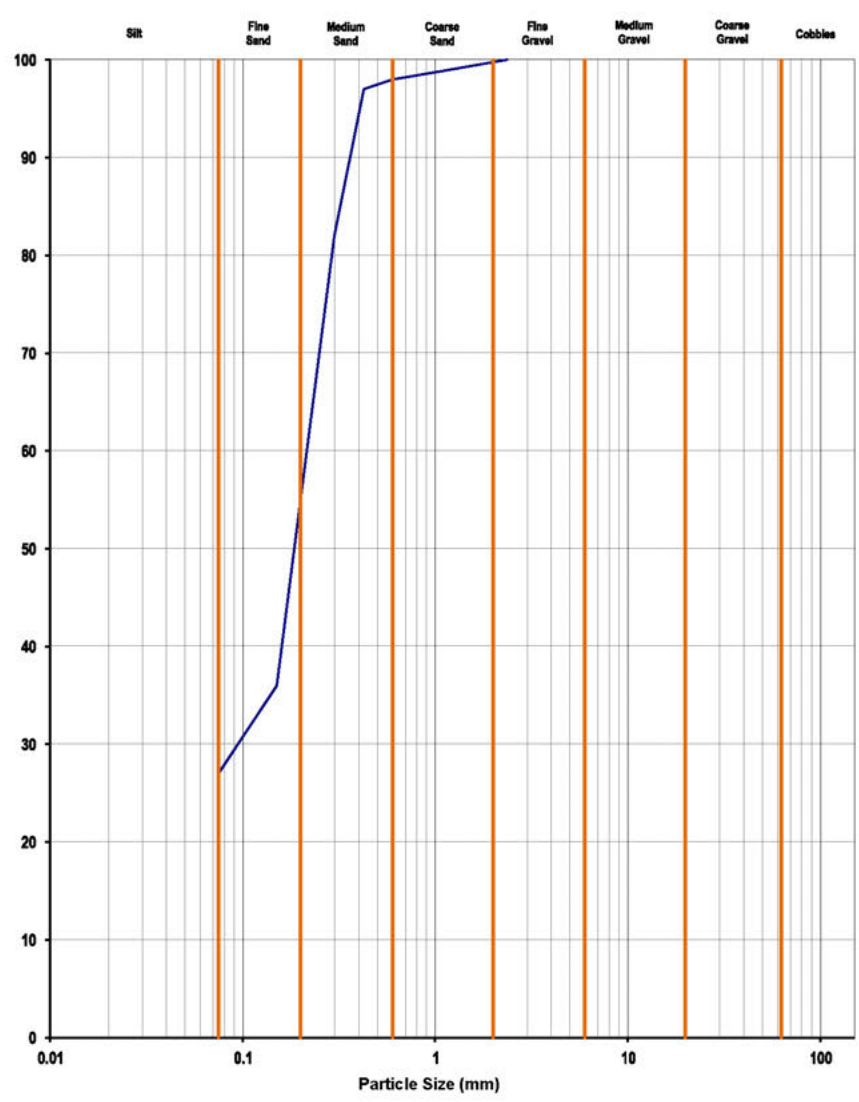
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101911-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4050
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2353-S01100		
Bore Hole	310-01-BH2353	Depth From (m)	11	Depth To (m)	12.86
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	98
0.425	97
0.300	82
0.150	36
0.075	27



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 27% passing for 0.075 mm and rises to 100% passing at 2.36 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 9.4%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

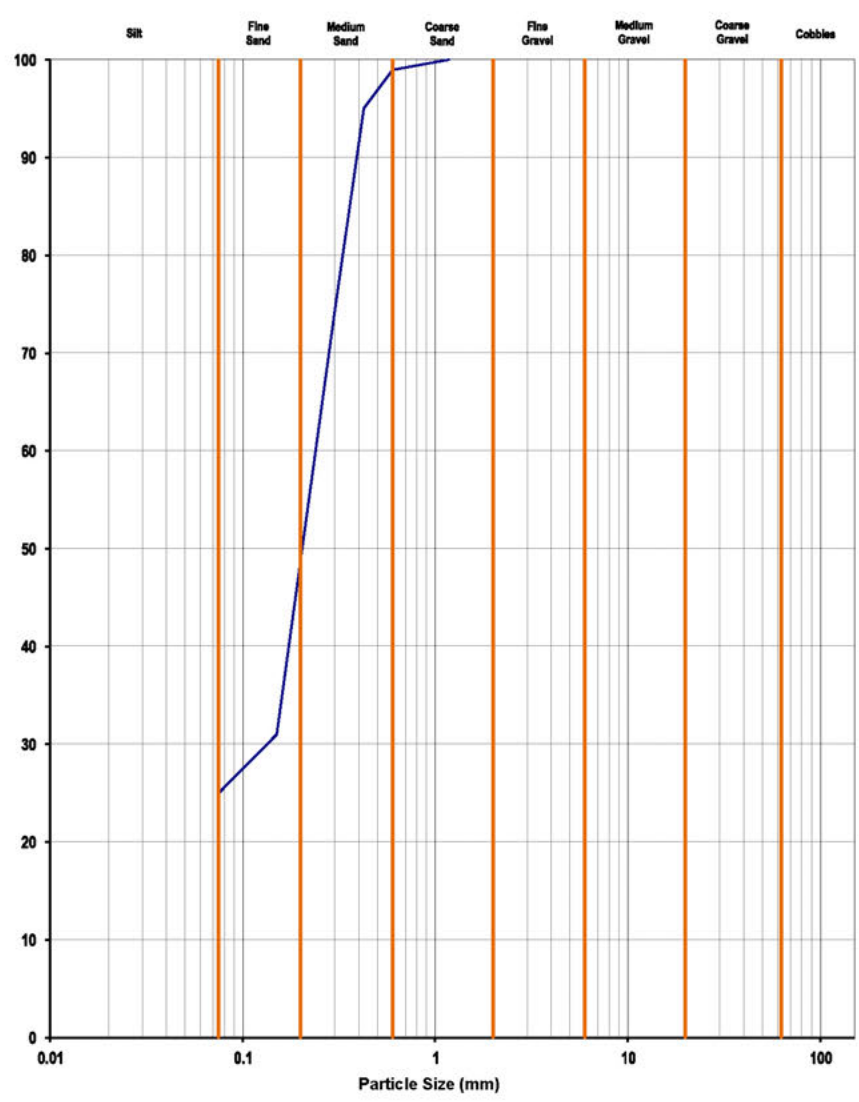
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101913-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4050
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2353-S01580		
Bore Hole	310-01-BH2353	Depth From (m)	15.8	Depth To (m)	18.86
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	99
0.425	95
0.300	74
0.150	31
0.075	25



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 25% passing for 0.075 mm, rises to 31% at 0.150 mm, 74% at 0.300 mm, 95% at 0.425 mm, 99% at 0.600 mm, and reaches 100% at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.850 mm), Coarse Sand (0.850 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 15%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

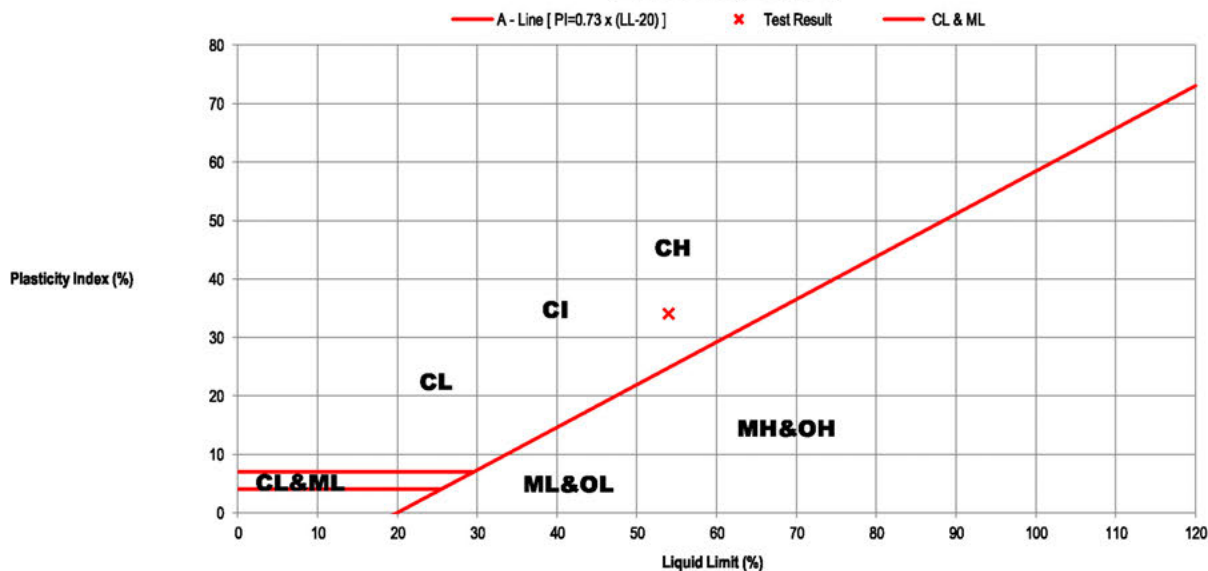
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101916-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	21/01/2019
Project No.	1897791	Report Date	29/01/2019
Bore Hole	310-01-BH2355	Client Sample No.	310-01-BH2355-S00050-ATT : 310-01-BH2355-S00050-MOI
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	54	
Plastic Limit (%)	20	
Plasticity Index (%)	34	
Linear Shrinkage (%)	15.0	Curling Occurred
Moisture Content (%)	11.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

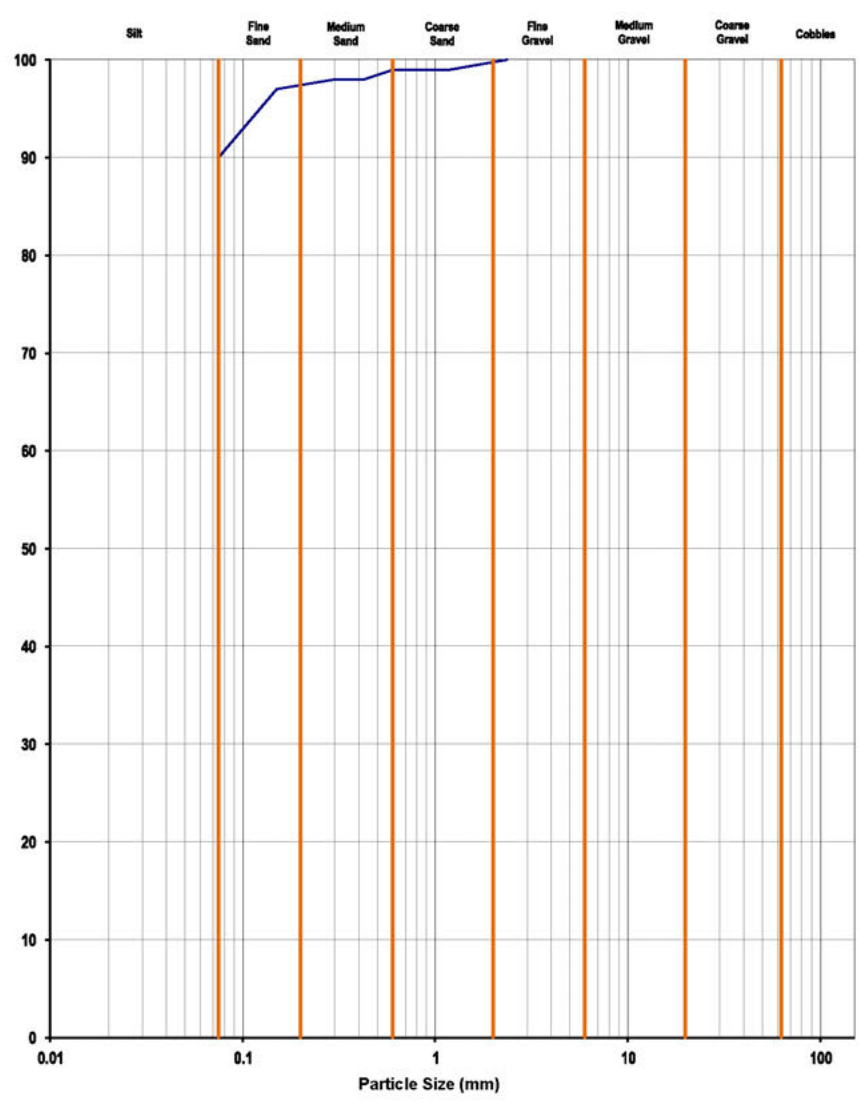
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101916-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4050
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2355-S00050		
Bore Hole	310-01-BH2355	Depth From (m)	0.5	Depth To (m)	0.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	100
1.18	99
0.600	99
0.425	98
0.300	98
0.150	97
0.075	90



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at 100% passing for 0.075 mm and remains at 100% until approximately 0.25 mm, then drops to about 90% at 0.300 mm, and continues to decrease gradually to about 9% at 150.0 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 11.3%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

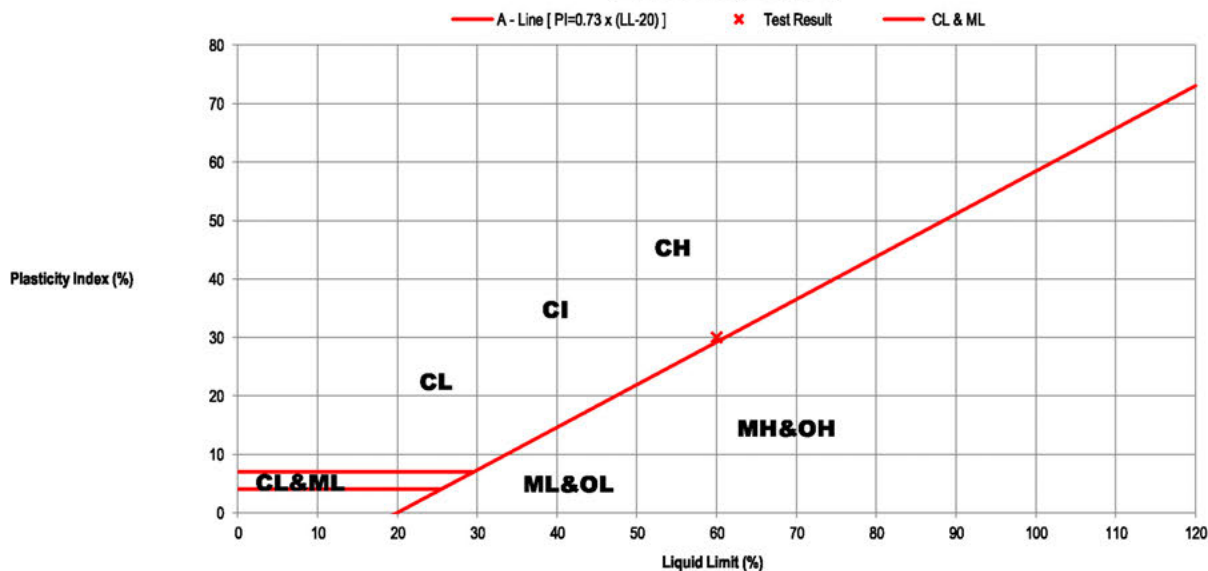
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101917-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	21/01/2019
Project No.	1897791	Report Date	23/01/2019
Bore Hole	310-01-BH2355	Client Sample No.	310-01-BH2355-S00500-ATT : 310-01-BH2355-S00500-MOI
Description	SPT	Depth From (m)	5
		Depth To (m)	5.45

RESULTS OF TESTING

Liquid Limit (%) 60
Plastic Limit (%) 30
Plasticity Index (%) 30
Linear Shrinkage (%) 14.0 **Curling Occurred**
Moisture Content (%) 21.0
Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

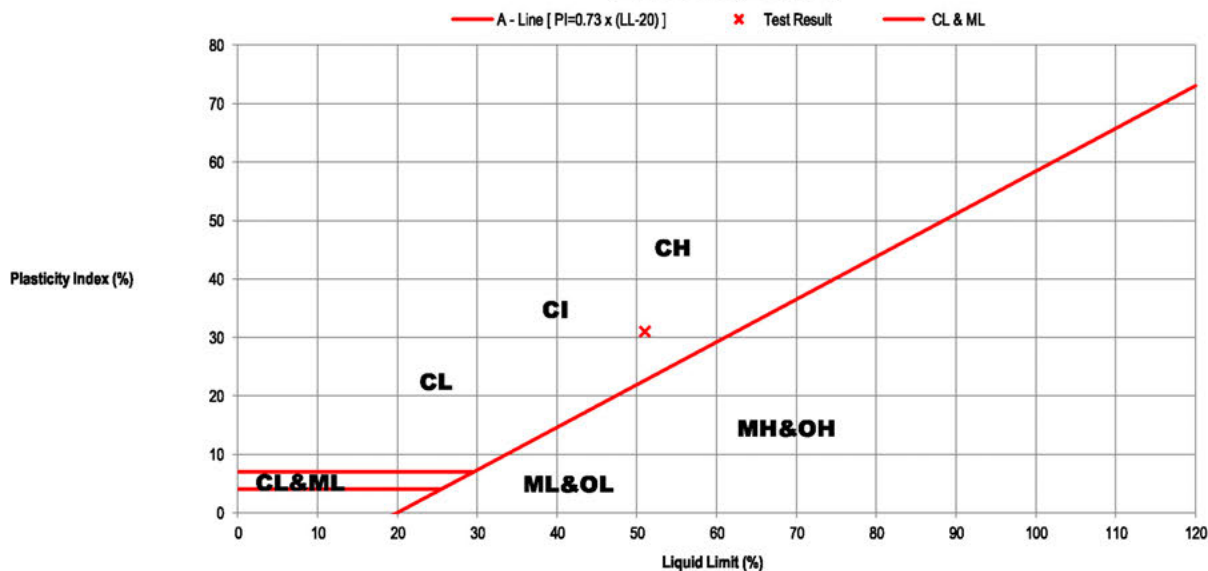
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101918-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	21/01/2019
Project No.	1897791	Report Date	23/01/2019
Bore Hole	310-01-BH2355	Client Sample No.	310-01-BH2355-S00800-ATT : 310-01-BH2355-S00800-MOI
Description	SPT	Depth From (m)	8
		Depth To (m)	8.22

RESULTS OF TESTING

Liquid Limit (%)	51	
Plastic Limit (%)	20	
Plasticity Index (%)	31	
Linear Shrinkage (%)	14.0	Curling Occurred
Moisture Content (%)	10.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park

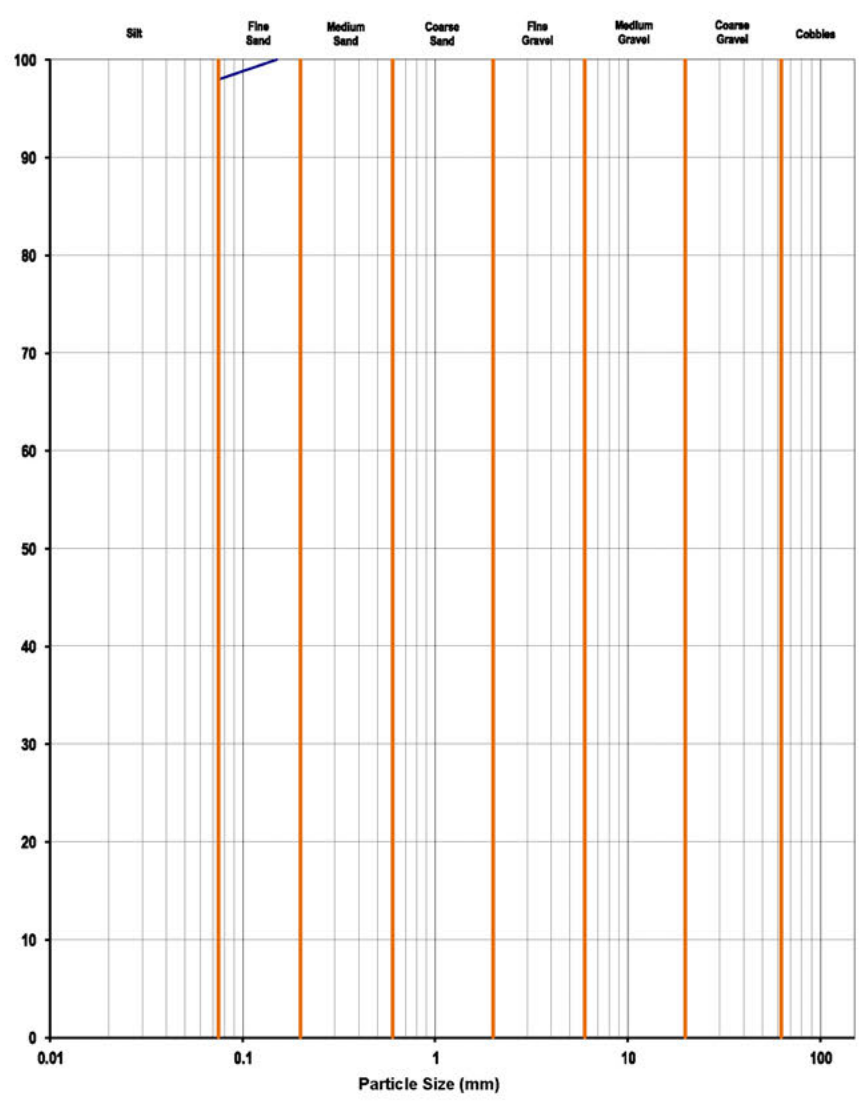


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101918-G		
Address	PO Box 1734 MILTON BC QLD 4064			Request No	R4_BH_Rev0_4050		
Project	Inland Rail B2G						
Project No	1897791		Client Sample No	310-01-BH2355-S00800			
Bore Hole	310-01-BH2355		Depth From (m)	8	Depth To (m)	8.22	
Description	SPT						
Sieve Size (mm)	Passing %	 The graph shows the particle size distribution for sample 310-01-BH2355-S00800. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. Vertical lines indicate the boundaries for different soil types: Silt (0.075 mm), Fine Sand (0.075 mm), Medium Sand (0.25 mm), Coarse Sand (0.6 mm), Fine Gravel (2 mm), Medium Gravel (4.75 mm), Coarse Gravel (9.5 mm), and Cobbles (47.5 mm). The data curve starts at 100% passing for 0.150 mm and drops to 98% passing for 0.075 mm.					
150.0							
75.0							
63.0							
53.0							
37.5							
26.5							
19.0							
13.2							
9.5							
6.7							
4.75							
2.36							
1.18							
0.600							
0.425							
0.300							
0.150	100						
0.075	98						
NOTES/REMARKS:		- Moisture Content 11.1% Sample/s supplied by the client					

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Golder Associates Pty Limited	Report No.	GA101921-MOD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No.	1897791	Report Date	18/01/2019
Bore Hole	310-01-BH2355	Client Sample No.	310-01-BH2355-C01370
Depth From (m)	13.77	Depth To (m)	13.92
Description	C		
Sample Type	Single Individual Rock Core Specimen		
Uniaxial Compressive Strength 124 MPa			

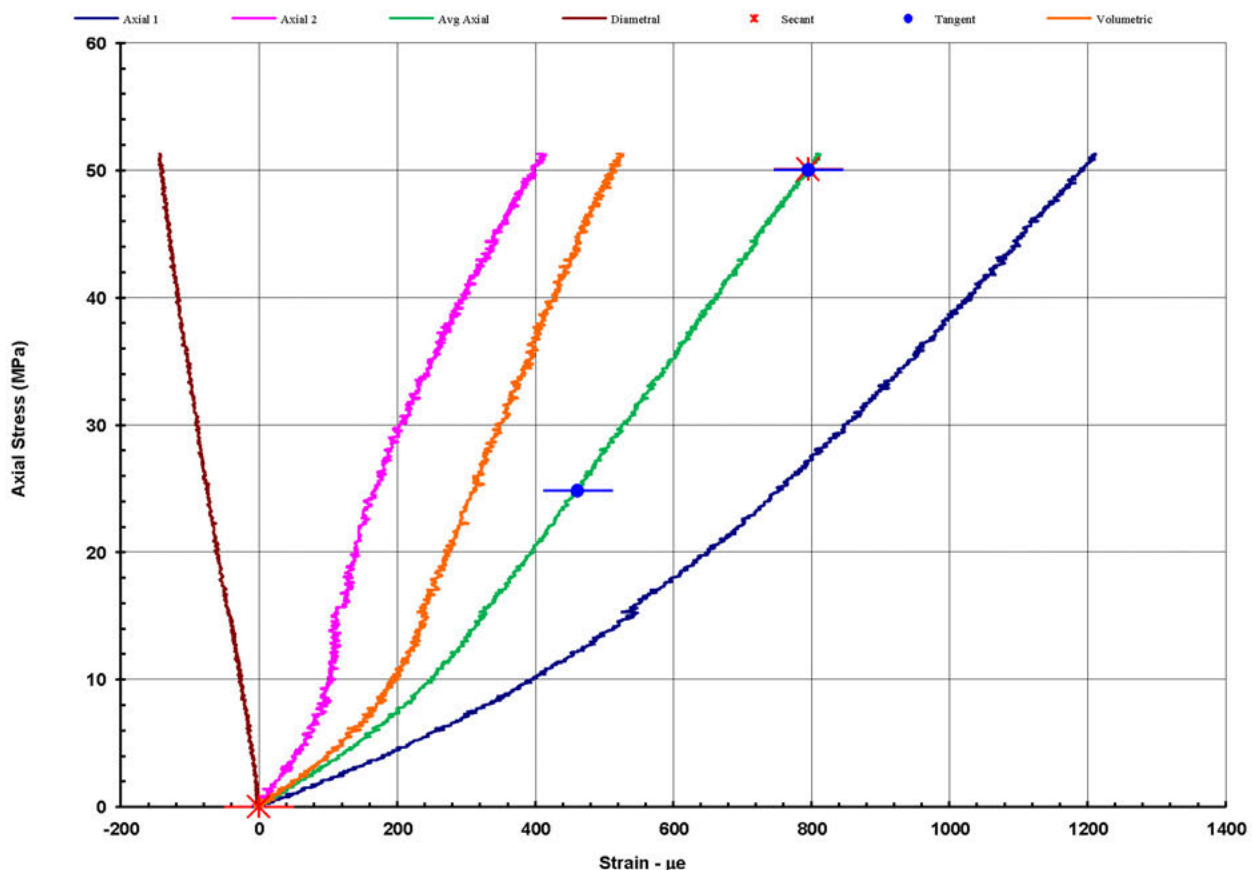
Young's Modulus

Tangent 75.5 GPa
Secant 63.0 GPa

Poisson Ratio

0.176 from 20 % to 40 % of Max UCS
0.176 from 0 % to 40 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

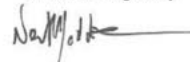
Tested as received.

Page 1 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client Golder Associates Pty Limited		Report No. GA101921-MOD	
Average Sample Diameter (mm)	60.8	Moisture Content (%)	0.6
Sample Height (mm)	154.6	Wet Density (t/m ³)	2.84
Duration of Test (min)	11.63	Dry Density (t/m ³)	2.82
Rate of Loading (MPa/min)	10.65	Bedding (°)	Nil
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell

CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	BEFORE TEST
LAB SAMPLE No.	101921	DATE: 17/10/19
BOREHOLE:	310-01-BH2355	DEPTH: 13.77-13.92



CLIENT:	Golder Associates Pty Limited	
PROJECT:	Inland Rail B2G	AFTER TEST
LAB SAMPLE No.	101921	DATE: 17/10/19
BOREHOLE:	310-01-BH2355	DEPTH: 13.77-13.92



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

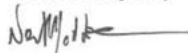
Tested as received.

Page 2 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101922-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No	1897791	Report Date	22/01/2019
		Client Sample No.	310-01-BH2355-C01536

Sample No.	101922
BoreHole	310-01-BH2355
Depth From (m)	15.36
Depth To (m)	16.12
Description	C
Slake Durability (1st cycle) (%)	98.3
Slake Durability (2nd cycle) (%)	97.5
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	27.5
Appearance of fragments retained in the drum	Original Form
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

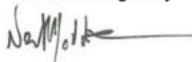
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101924-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No	1897791	Report Date	22/01/2019
		Client Sample No.	310-01-BH2355-C01775

Sample No.	101924
BoreHole	310-01-BH2355
Depth From (m)	17.75
Depth To (m)	18.64
Description	C
Slake Durability (1st cycle) (%)	78.9
Slake Durability (2nd cycle) (%)	30.4
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	28.8
Appearance of fragments retained in the drum	Moderate Deterioration
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

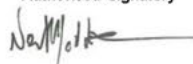
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101927-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No	1897791	Report Date	22/01/2019
		Client Sample No.	310-01-BH2356-C00753

Sample No.	101927
BoreHole	310-01-BH2356
Depth From (m)	7.53
Depth To (m)	9
Description	C
Slake Durability (1st cycle) (%)	73.0
Slake Durability (2nd cycle) (%)	56.8
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	27.5
Appearance of fragments retained in the drum	Moderate Deterioration
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

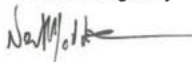
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.2 & AS 4133.1.1.1

Client	Golder Associates Pty Limited	Report No.	GA101928-MOD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No.	1897791	Report Date	18/01/2019
Bore Hole	310-01-BH2356	Client Sample No.	310-01-BH2356-C00900
Depth From (m)	9.2	Depth To (m)	9.37
Description	C		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 4.99 MPa

Young's Modulus

Tangent 6.68 GPa

Secant 6.42 GPa

Poisson Ratio

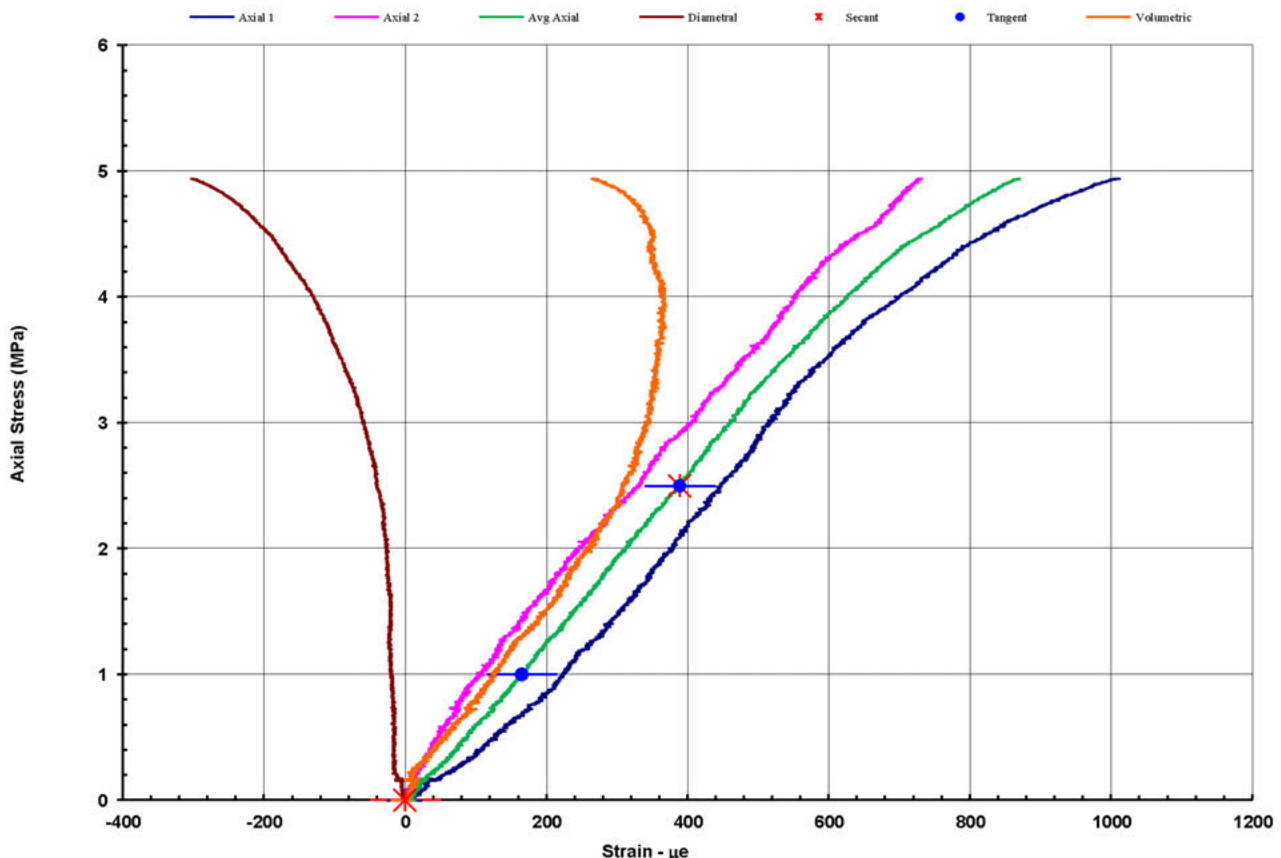
0.103

from 20 % to 50 % of Max UCS

0.103

from 0 % to 50 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

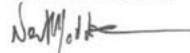
Tested as received.

Page 1 of 2 P13402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.2 & AS 4133.1.1.1

Client	Golder Associates Pty Limited	Report No.	GA101928-MOD
Average Sample Diameter (mm)	59.9	Moisture Content (%)	11.6
Sample Height (mm)	160.4	Wet Density (t/m ³)	1.90
Duration of Test (min)	16.50	Dry Density (t/m ³)	1.70
Rate of Displacement (mm/min)	0.10	Bedding (°)	30
Mode of Failure	Shear	Test Apparatus	100kN Compression Machine

CLIENT:	Golder Associates Pty Limited
PROJECT:	Inland Rail B2G
LAB SAMPLE No.	101928
BOREHOLE:	310-01-BH2356
BEFORE TEST	
DATE:	17/01/19
DEPTH:	9.20-9.37



CLIENT:	Golder Associates Pty Limited
PROJECT:	Inland Rail B2G
LAB SAMPLE No.	101928
BOREHOLE:	310-01-BH2356
AFTER TEST	
DATE:	17/01/19
DEPTH:	9.20-9.37



Notes/Remarks:

Sample/s supplied by client

Photo not to scale

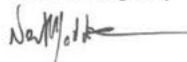
Tested as received.

Page 2 of 2 REP13402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.2 & AS 4133.1.1.1

Client	Golder Associates Pty Limited	Report No.	GA101930-MOD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4050
Project	Inland Rail B2G	Test Date	17/01/2019
Project No.	1897791	Report Date	18/01/2019
Client Sample No.	310-01-BH2356-C01660		
Bore Hole	310-01-BH2356	Depth From (m)	17.63
		Depth To (m)	17.8
Description	C		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 3.02 MPa

Young's Modulus

Tangent 3.77 GPa

Secant 4.00 GPa

Poisson Ratio

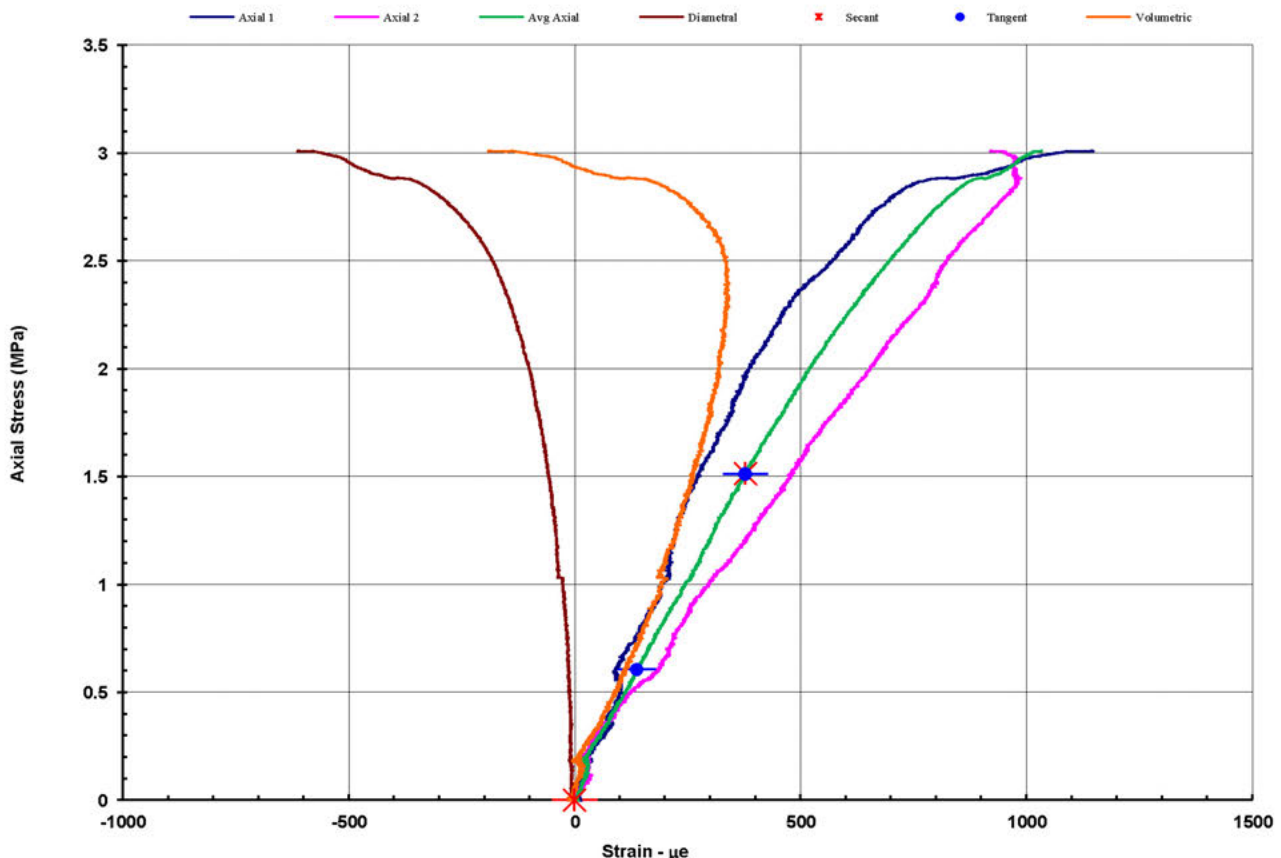
0.152

from 20 % to 50 % of Max UCS

0.155

from 0 % to 50 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

The length to diameter ratio falls outside the test method limits of 2.5:1 to 3.0:1.

Sample/s supplied by client

Graph not to scale

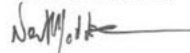
Tested as received.

Page 1 of 2 P13402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd

ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.2 & AS 4133.1.1.1

Client	Golder Associates Pty Limited	Report No.	GA101930-MOD
Average Sample Diameter (mm)	60.0	Moisture Content (%)	10.2
Sample Height (mm)	140.7	Wet Density (t/m ³)	1.94
Duration of Test (min)	17.78	Dry Density (t/m ³)	1.76
Rate of Displacement (mm/min)	0.10	Bedding (°)	Nil
Mode of Failure	Shear	Test Apparatus	100kN Compression Machine

CLIENT:	Golder Associates Pty Limited
PROJECT:	Inland Rail B2G
LAB SAMPLE No.	101930
BOREHOLE:	310-01-BH2356
BEFORE TEST	
DATE:	17/01/19
DEPTH:	16.6 17.63-17.80



CLIENT:	Golder Associates Pty Limited
PROJECT:	Inland Rail B2G
LAB SAMPLE No.	101930
BOREHOLE:	310-01-BH2356
AFTER TEST	
DATE:	17/01/19
DEPTH:	16.6 17.63-17.80



Notes/Remarks:

The length to diameter ratio falls outside the test method limits of 2.5:1 to 3.0:1.

Sample/s supplied by client

Photo not to scale

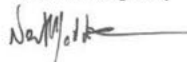
Tested as received.

Page 2 of 2 REP13402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

Test Method: AS 1289 3.8.1

Client	Golder Associates Pty Limited			Report No.	GA101935 - 101935-EM
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4060
Project	Inland Rail B2G			Test Date	19/01/2019
				Report Date	22/01/2019
				Project No	1897791

RESULTS OF TESTING

[illegible]

NOTES/REMARKS:

Sample/s supplied by the client

Tested with Distilled water at 22°C

Page 1 of 1

REP00402

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

Authorized Signatory

Leah

C. Park

Tested at Trilab Brisbane Laboratory.



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

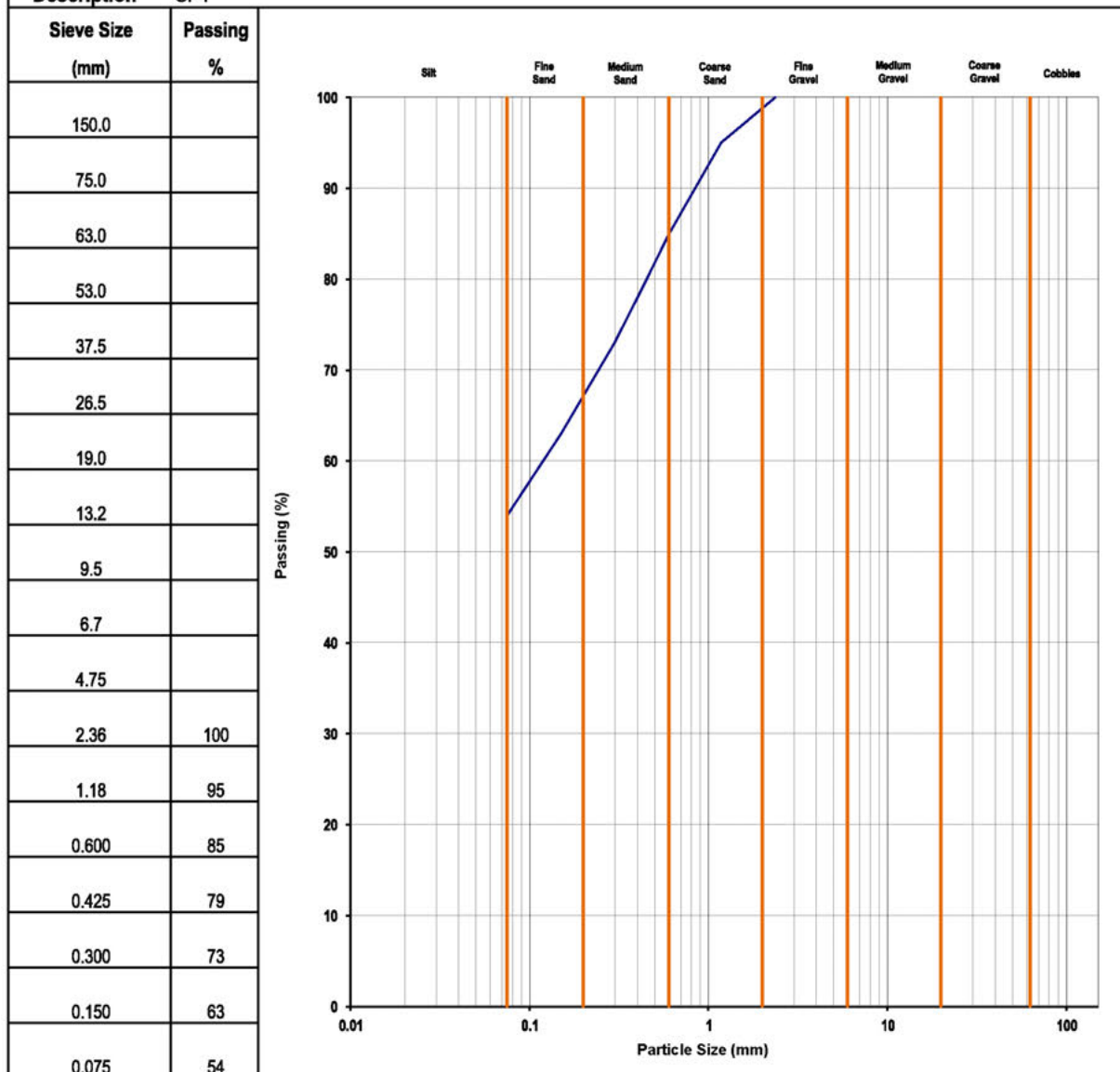
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101936-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4060
		Test Date	21/1/19-23/1/19
		Report Date	23/1/2019

Project	Inland Rail B2G				
Project No	1897791	Sample No	310-01-BH2343-S00650-PSD : 310-01-BH2343-S00650-MOI		
Bore Hole	310-01-BH2343	Depth From (m)	6.5	Depth To (m)	8.1

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 11%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

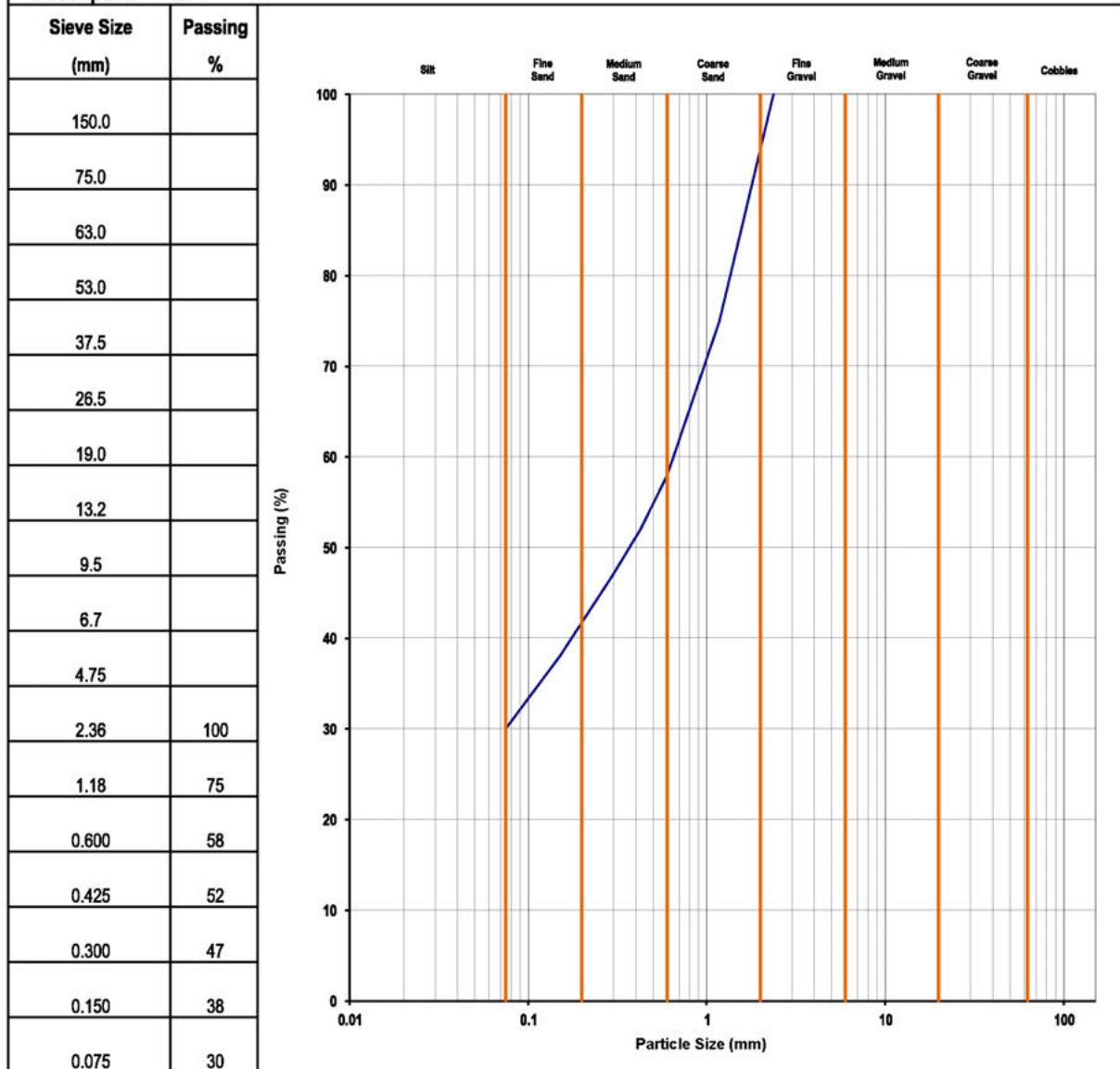
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101938-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4060
		Test Date	21/1/19-23/1/19
		Report Date	23/1/2019

Project	Inland Rail B2G				
Project No	1897791	Sample No	310-01-BH2343-S00810-PSD : 310-01-BH2343-S00810-MOI		
Bore Hole	310-01-BH2343	Depth From (m)	8.1	Depth To (m)	8.15
Description	SPT				



NOTES/REMARKS:

-
Moisture Content 10.1%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

POINT LOAD TEST REPORT

Test Method: AS 4133.4.1

Client	Golder Associates Pty Limited	Report No.	GA101939-101940-PL
		Request No	R4_BH_Rev0_4060
Address	PO Box 1734 MILTON BC QLD 4064	Test Date	18/01/2019
		Report Date	21/01/2019

Project	Inland Rail B2G
Project No	1897791

Trilab Sample No.	101939	101940	101939	101940
Client Sample No	310-01-BH2343-C01030	310-01-BH2343-C01220	310-01-BH2343-C01030	310-01-BH2343-C01220
Bore Hole	310-01-BH2343	310-01-BH2343	310-01-BH2343	310-01-BH2343
Depth From/To (m)	11.45-11.54	13.90-14.0	11.55-11.60	13.85-13.89
Description	C	C	C	C
Is (MPa)	7.00	2.74	5.64	1.75
Is(50) (MPa)	7.45	2.84	6.18	1.65
Load Direction	Diametral	Diametral	Axial	Axial

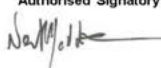
Trilab Sample No.				
Client Sample No				
Bore Hole				
Depth From/To (m)				
Description				
Is (MPa)				
Is(50) (MPa)				
Load Direction				

NOTES/REMARKS: Tested as received

Sample/s supplied by the client

Page 1 of 1 REP02102

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025 - Testing. The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

Authorised Signatory

 N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
 Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

SLAKE DURABILITY INDEX TEST REPORT

Test Method: AS 4133.3.4

Client	Golder Associates Pty Limited	Report No.	GA101939-SD
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4060
Project	Inland Rail B2G	Test Date	21/01/2019
Project No	1897791	Report Date	23/01/2019
		Client Sample No.	310-01-BH2343-C01030

Sample No.	101939
BoreHole	310-01-BH2343
Depth From (m)	10.3
Depth To (m)	12.2
Description	C
Slake Durability (1st cycle) (%)	94.0
Slake Durability (2nd cycle) (%)	89.6
Slake Durability (3rd cycle) (%)	-
Slake Durability (4th cycle) (%)	-
Water Used	Tap Water
Temperature (°C)	29.6
Appearance of fragments retained in the drum	Slight Deterioration
Appearance of fragments passing through the drum	Fragments & Fines

NOTES/REMARKS:

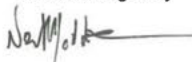
Sample/s supplied by the client

Page 1 of 1 REP02402

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


 N. Maddison


Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Golder Associates Pty Limited			Report No.	GA101940-MOD
Address	PO Box 1734 MILTON BC QLD 4064			Request No.	R4_BH_Rev0_4060
				Test Date	24/01/2019
Project	Inland Rail B2G			Report Date	25/01/2019
Project No.	1897791		Client Sample No. 310-01-BH2343-C01220		
Bore Hole	310-01-BH2343	Depth From (m)	12.21	Depth To (m)	12.37
Description	C				
Sample Type	Single Individual Rock Core Specimen				
Uniaxial Compressive Strength 193 MPa					

Young's Modulus

Poisson Ratio

Tangent 70.9 GPa

0.082

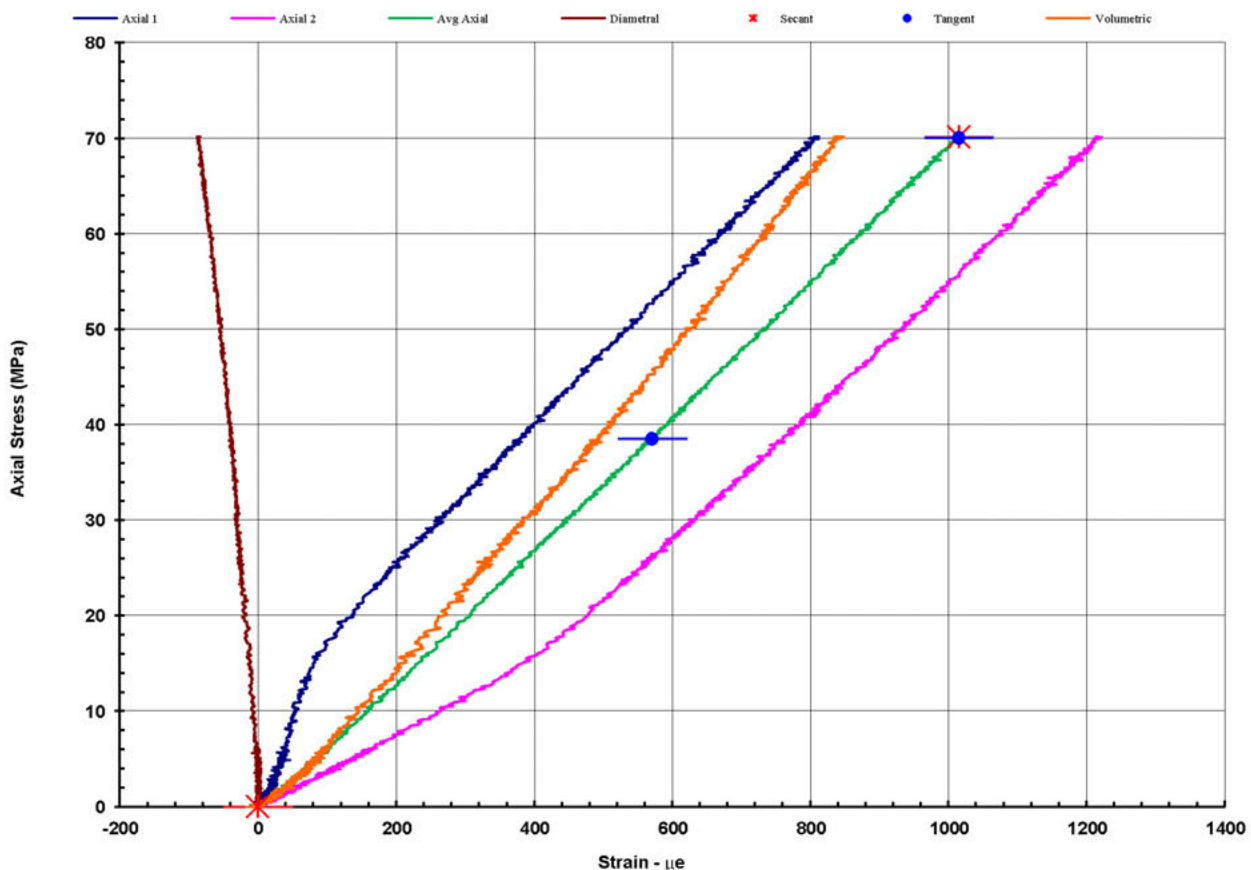
from 20 % to 36 % of Max UCS

Secant 69.1 GPa

0.085

from 0 % to 36 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

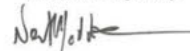
Tested as received.

Page 1 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client Golder Associates Pty Limited		Report No. GA101940-MOD	
Average Sample Diameter (mm)	60.6	Moisture Content (%)	0.6
Sample Height (mm)	161.3	Wet Density (t/m ³)	2.87
Duration of Test (min)	12.47	Dry Density (t/m ³)	2.86
Rate of Loading (MPa/min)	15.44	Bedding (°)	5
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell

CLIENT: Golder Associates Pty Limited	
PROJECT: Inland Rail B2G	BEFORE TEST
LAB SAMPLE No. 101940	DATE: 24/01/19
BOREHOLE: 310-01-BH2343	DEPTH: 12.2



CLIENT: Golder Associates Pty Limited	
PROJECT: Inland Rail B2G	AFTER TEST
LAB SAMPLE No. 101940	DATE: 24/01/19
BOREHOLE: 310-01-BH2343	DEPTH: 12.2



Notes/Remarks:

Sample/s supplied by client

Graph not to scale

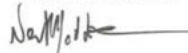
Tested as received.

Page 2 of 2 REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory


N. Maddison



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

ATTERBERG LIMITS TEST REPORT

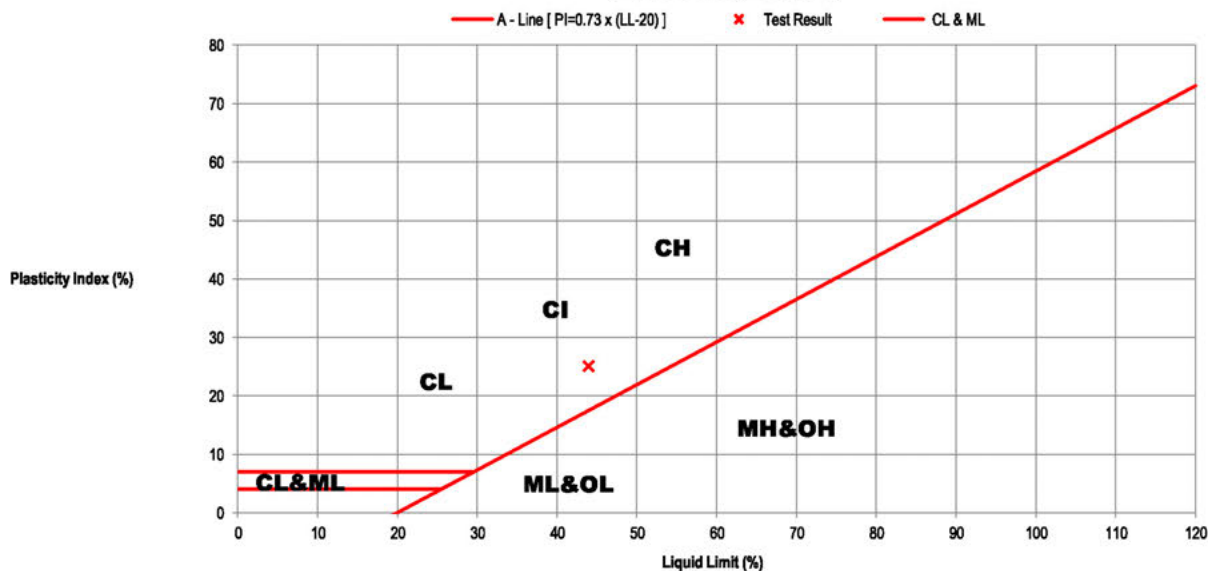
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101941-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4070
Project	Inland Rail B2G	Test Date	31/01/2019
Project No.	1897791	Report Date	4/02/2019
Bore Hole	310-01-BH2612	Client Sample No.	310-01-BH2612-S00050-ATT : 310-01-BH2612-S00050-MOI
Description	SPT	Depth From (m)	0.5
		Depth To (m)	0.95

RESULTS OF TESTING

Liquid Limit (%)	44	
Plastic Limit (%)	19	
Plasticity Index (%)	25	
Linear Shrinkage (%)	9.5	Cracking & Curling Occurred
Moisture Content (%)	14.9	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

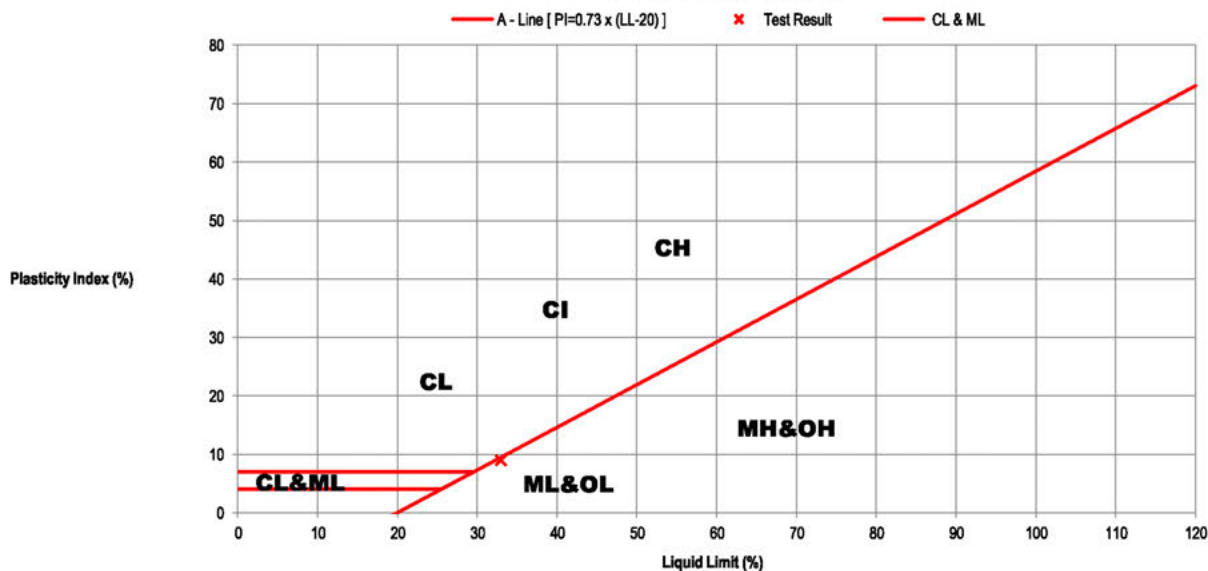
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101948-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4070
Project	Inland Rail B2G	Test Date	31/01/2019
Project No.	1897791	Report Date	4/02/2019
Bore Hole	310-01-BH2612	Client Sample No.	310-01-BH2612-S01100-ATT : 310-01-BH2612-S01100-MOI
Description	SPT	Depth From (m)	11
		Depth To (m)	14.06

RESULTS OF TESTING

Liquid Limit (%)	33	
Plastic Limit (%)	24	
Plasticity Index (%)	9	
Linear Shrinkage (%)	3.0	Curling Occurred
Moisture Content (%)	13.8	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

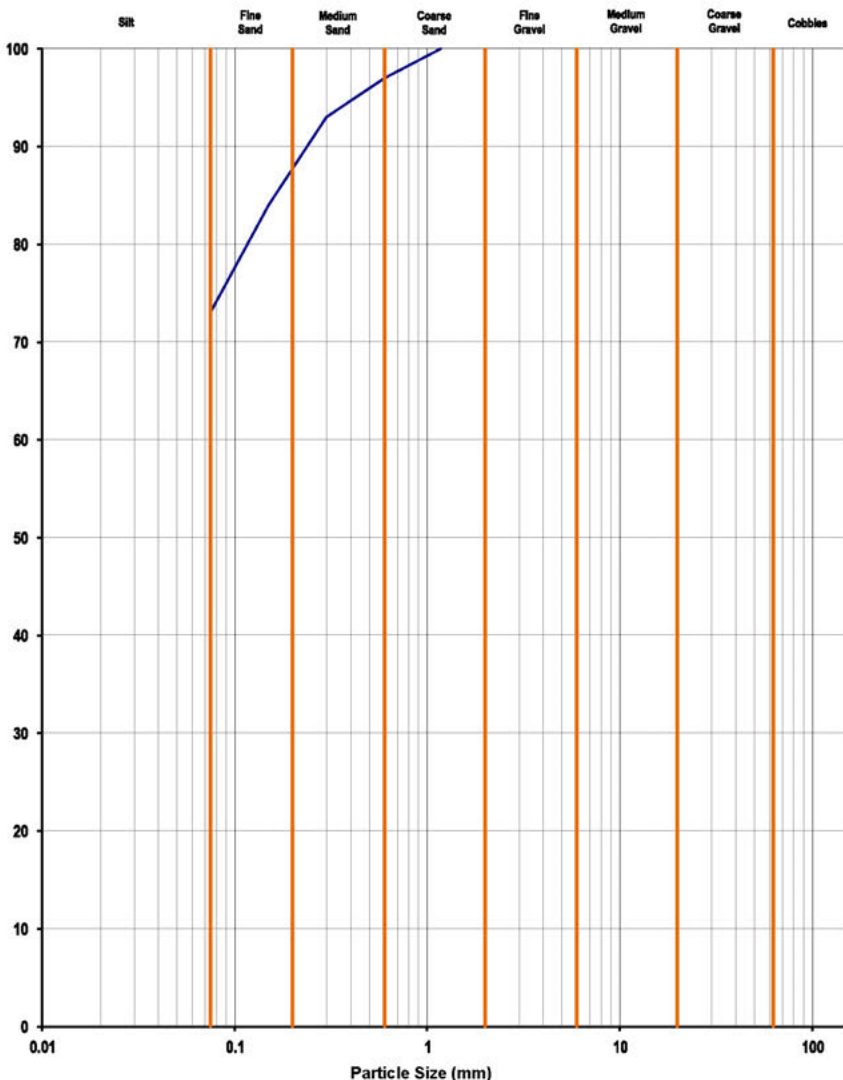
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101948-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4070
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2612-S01100		
Bore Hole	310-01-BH2612	Depth From (m)	11	Depth To (m)	14.06
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	
2.36	
1.18	100
0.600	97
0.425	95
0.300	93
0.150	84
0.075	73



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 73% passing for 0.075 mm and reaches 100% passing at 1.18 mm. Vertical lines indicate the boundaries for soil classification: Silt (< 0.075 mm), Fine Sand (0.075 - 0.425 mm), Medium Sand (0.425 - 0.85 mm), Coarse Sand (0.85 - 2.0 mm), Fine Gravel (2.0 - 4.75 mm), Medium Gravel (4.75 - 20 mm), Coarse Gravel (20 - 60 mm), and Cobbles (> 60 mm).

NOTES/REMARKS:

-
Moisture Content 13.8%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

Test Method: AS 1289 3.8.1

Project No 1897791

[illegible]

REP00402



ACCREDITED FOR
TECHNICAL

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

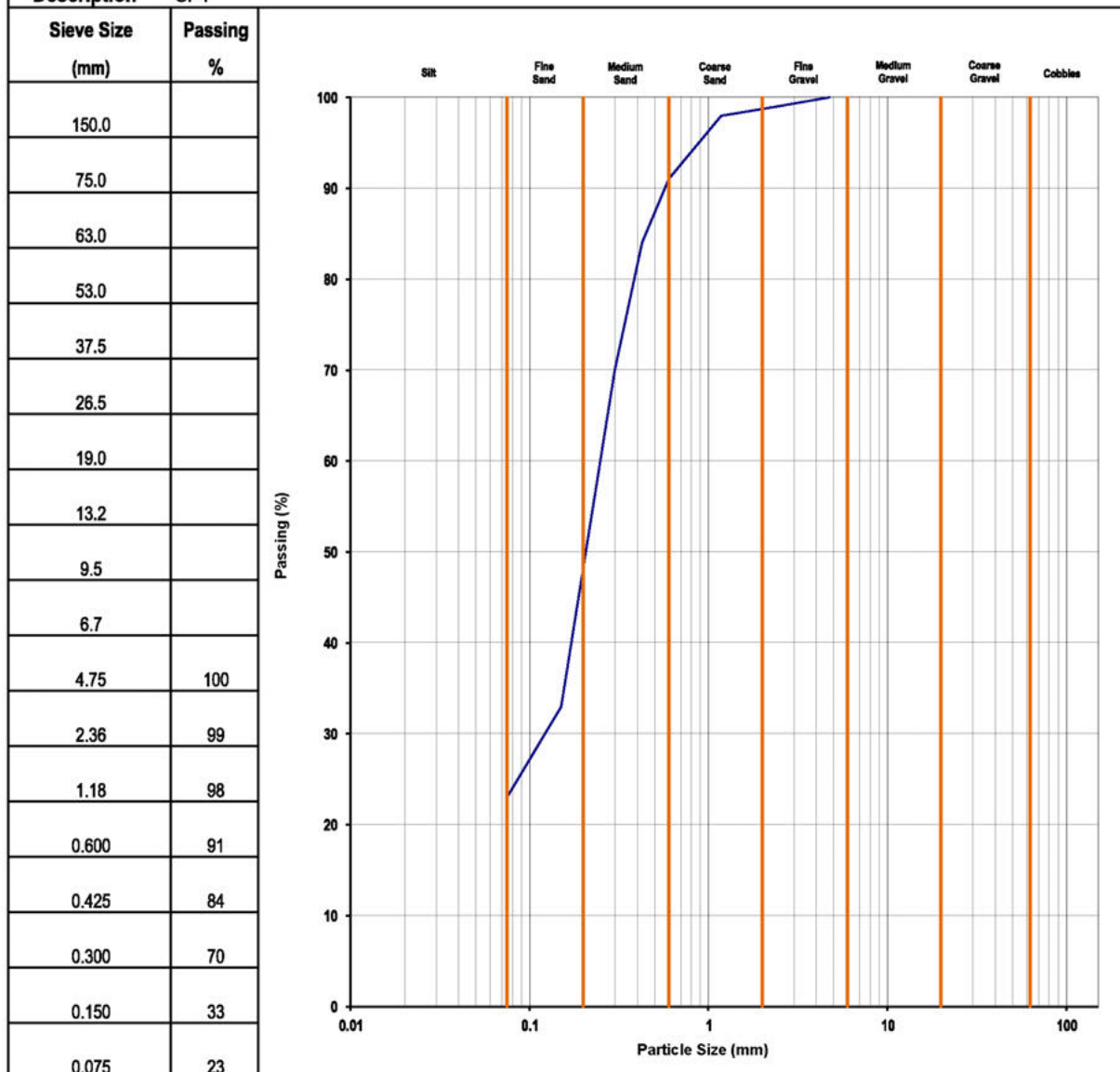
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101951-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4070
		Test Date	21/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2613-S00200		
Bore Hole	310-01-BH2613	Depth From (m)	2	Depth To (m)	2.45

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 4.8%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

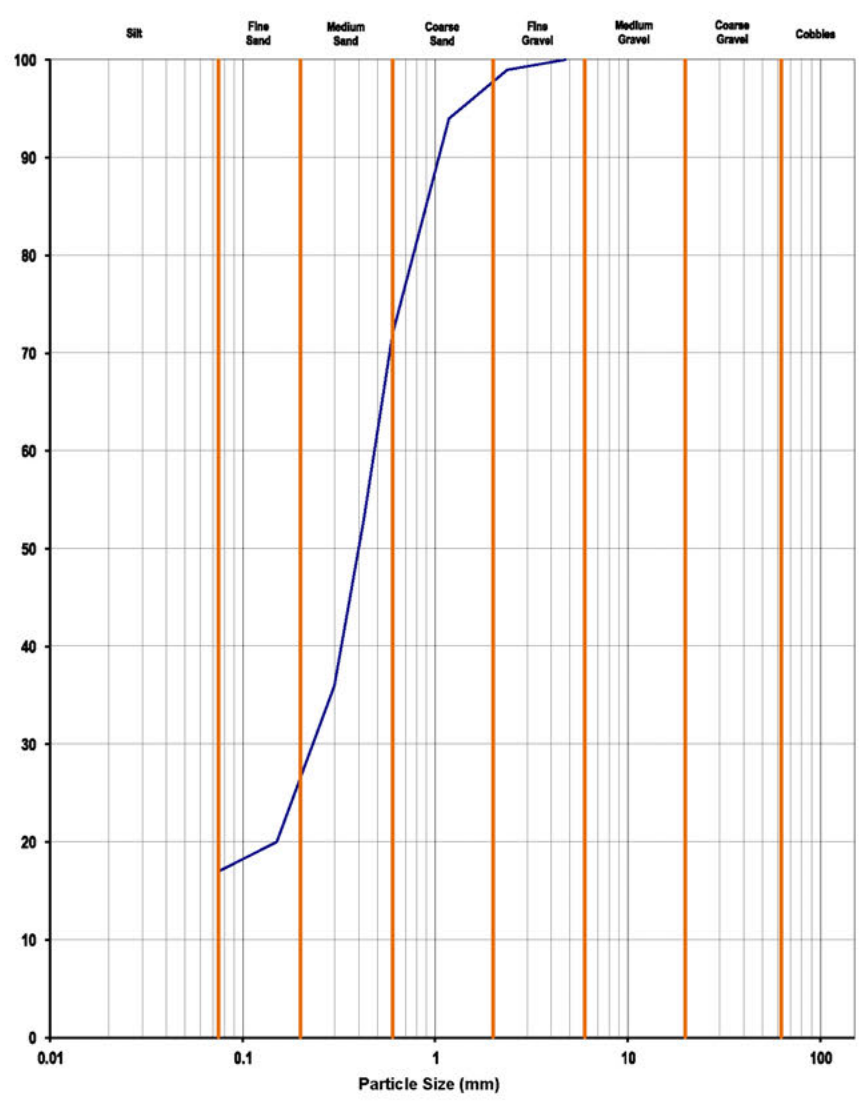
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Golder Associates Pty Limited			Report No.	GA101952-G
Address	PO Box 1734 MILTON BC	QLD	4064	Request No	R4_BH_Rev0_4070
Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2613-S00650		
Bore Hole	310-01-BH2613	Depth From (m)	6.5	Depth To (m)	6.95
Description	SPT				

Sieve Size (mm)	Passing %
150.0	
75.0	
63.0	
53.0	
37.5	
26.5	
19.0	
13.2	
9.5	
6.7	
4.75	100
2.36	99
1.18	94
0.600	72
0.425	53
0.300	36
0.150	20
0.075	17



The graph shows the particle size distribution curve for the sample. The x-axis represents Particle Size (mm) on a logarithmic scale from 0.01 to 100. The y-axis represents Passing (%) from 0 to 100. The curve starts at approximately 17% passing for 0.075 mm and rises to 100% passing at 4.75 mm. Vertical lines indicate the boundaries for Soil, Fine Sand, Medium Sand, Coarse Sand, Fine Gravel, Medium Gravel, Coarse Gravel, and Cobbles.

NOTES/REMARKS:

-
Moisture Content 4.7%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

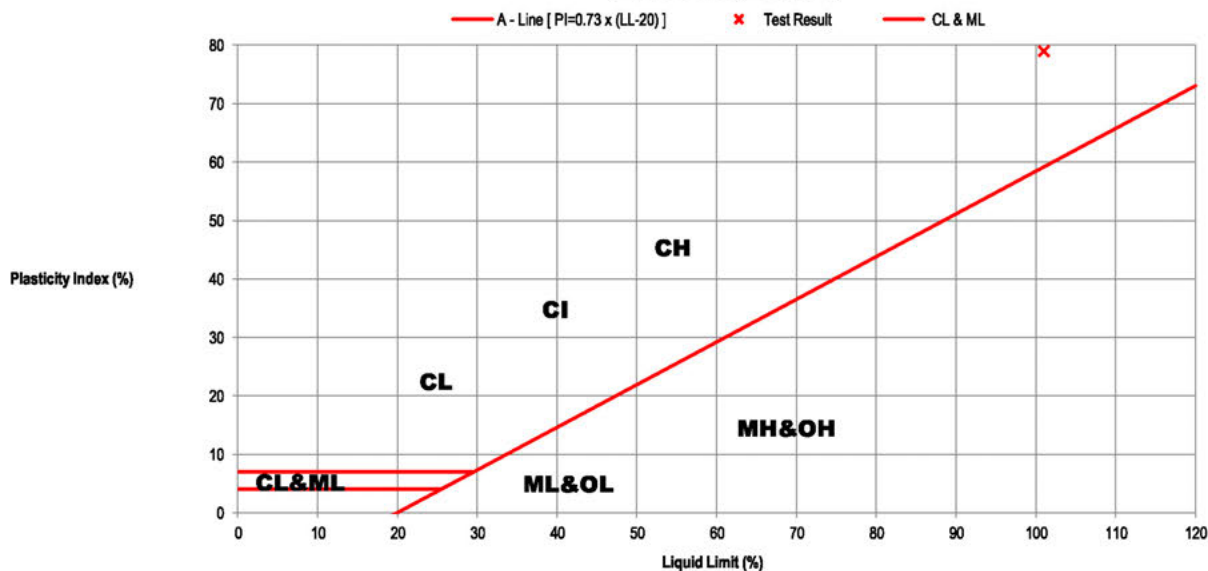
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101953-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4070
Project	Inland Rail B2G	Test Date	31/01/2019
Project No.	1897791	Report Date	4/02/2019
Bore Hole	310-01-BH2613	Client Sample No.	310-01-BH2613-S01100-ATT : 310-01-BH2613-S01100-MOI
Description	SPT	Depth From (m)	11
		Depth To (m)	11.45

RESULTS OF TESTING

Liquid Limit (%)	101	
Plastic Limit (%)	22	
Plasticity Index (%)	79	
Linear Shrinkage (%)	16.5	Curling Occurred
Moisture Content (%)	20.3	
Preparation Method	Dry Sieved and Oven Dried	

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

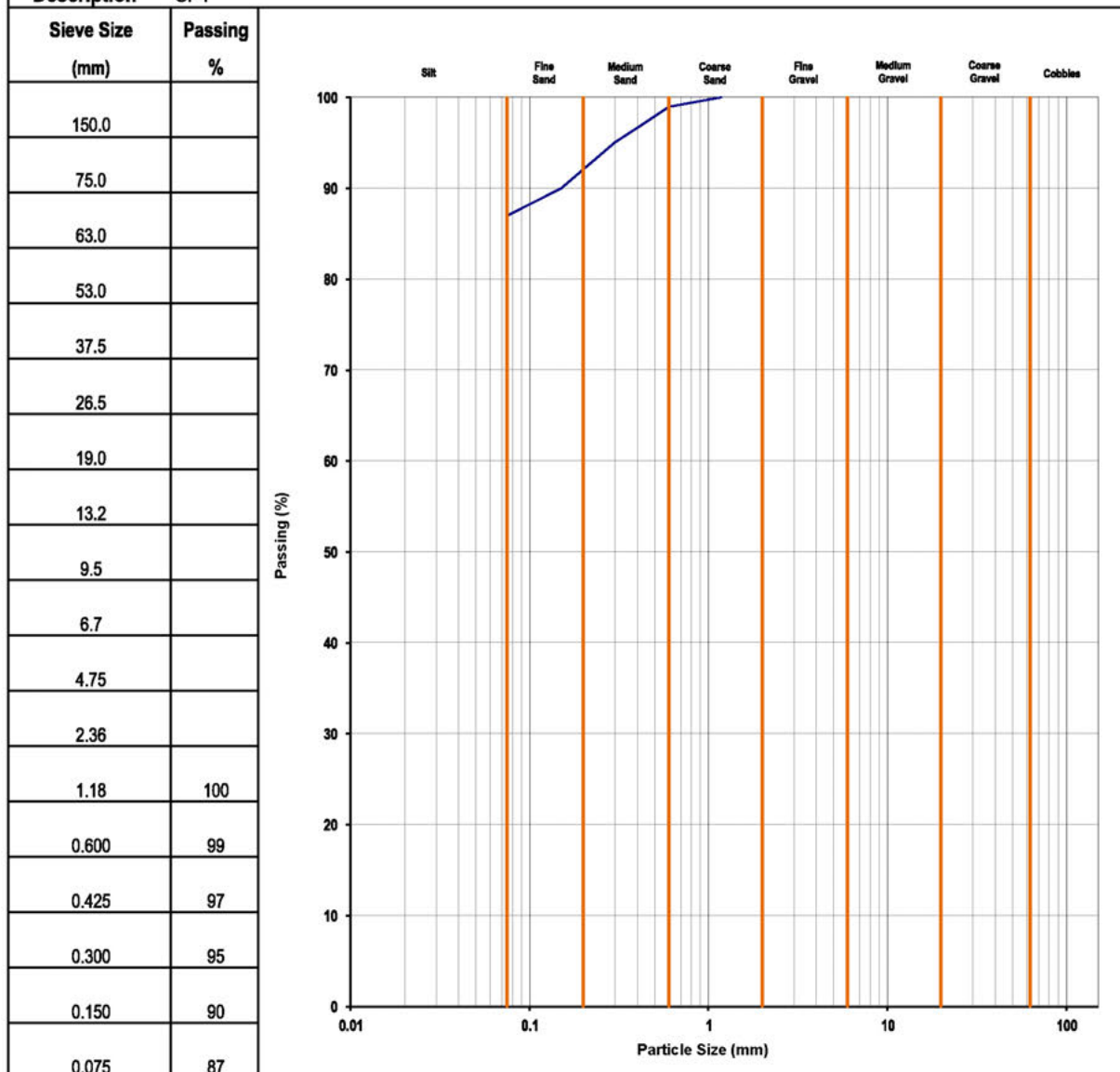
PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101953-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4070
		Test Date	21/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2613-S01100		
Bore Hole	310-01-BH2613	Depth From (m)	11	Depth To (m)	11.45

Description	SPT
--------------------	-----



NOTES/REMARKS:	-
	Moisture Content 20.3%
	Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.

Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.

Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

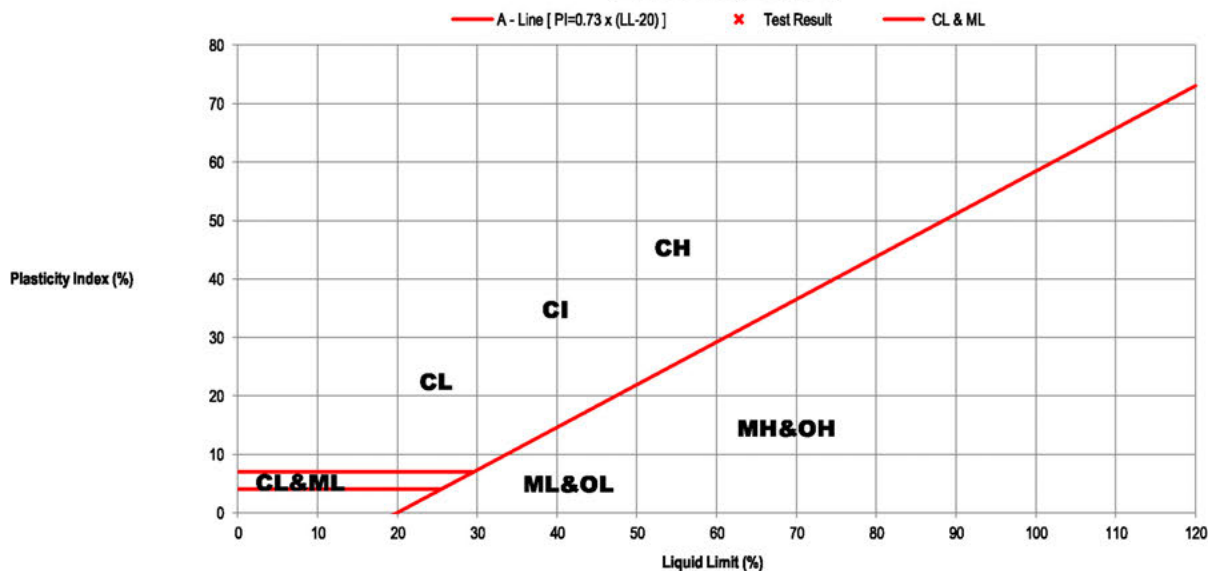
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101954-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4070
Project	Inland Rail B2G	Test Date	31/01/2019
Project No.	1897791	Report Date	4/02/2019
Bore Hole	310-01-BH2613	Client Sample No.	310-01-BH2613-S01400-ATT : 310-01-BH2613-S01400-MOI
Description	SPT	Depth From (m)	14
		Depth To (m)	14.45

RESULTS OF TESTING

Liquid Limit (%) 113
 Plastic Limit (%) 25
 Plasticity Index (%) 88
 Linear Shrinkage (%) 17.5 Curling Occurred
 Moisture Content (%) 22.3
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ATTERBERG LIMITS TEST REPORT

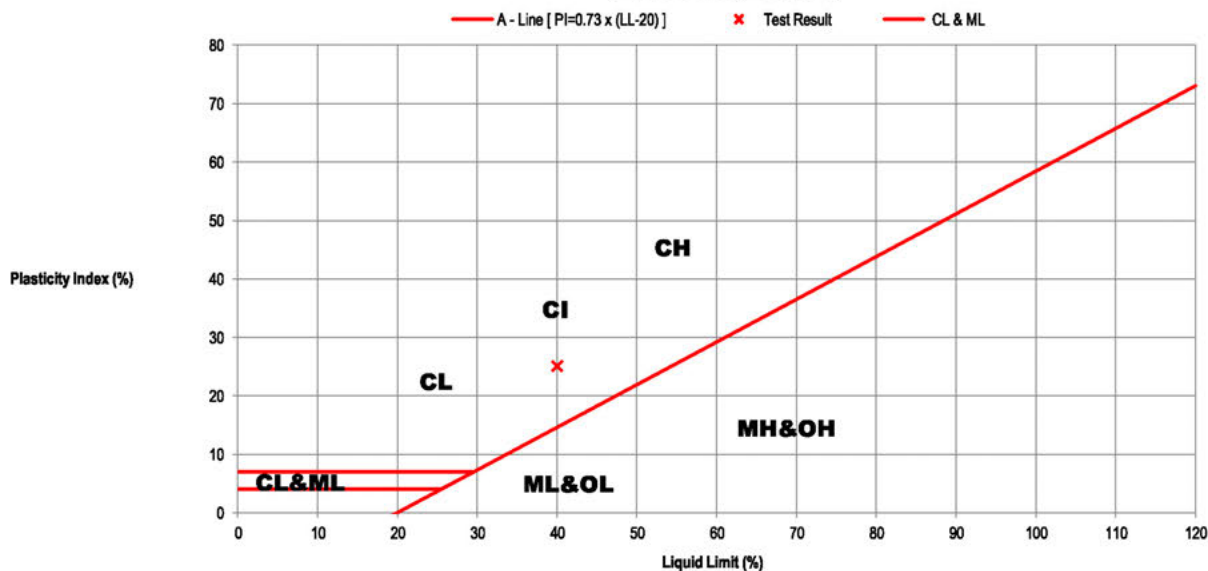
Test Method: AS 1289 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	Golder Associates Pty Limited	Report No.	GA101955-AL
Address	PO Box 1734 MILTON BC QLD 4064	Request No.	R4_BH_Rev0_4070
Project	Inland Rail B2G	Test Date	31/01/2019
Project No.	1897791	Report Date	4/02/2019
Bore Hole	310-01-BH2624	Client Sample No.	310-01-BH2624-S00205-ATT : 310-01-BH2624-S00205-MOI
Description	SPT	Depth From (m)	2.05
		Depth To (m)	2.45

RESULTS OF TESTING

Liquid Limit (%) 40
 Plastic Limit (%) 15
 Plasticity Index (%) 25
 Linear Shrinkage (%) 12.0 Curling Occurred
 Moisture Content (%) 9.2
 Preparation Method Dry Sieved and Oven Dried

Plasticity Chart



Remarks:

Sample/s supplied by client

Page: 1 of 1

REP00102

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

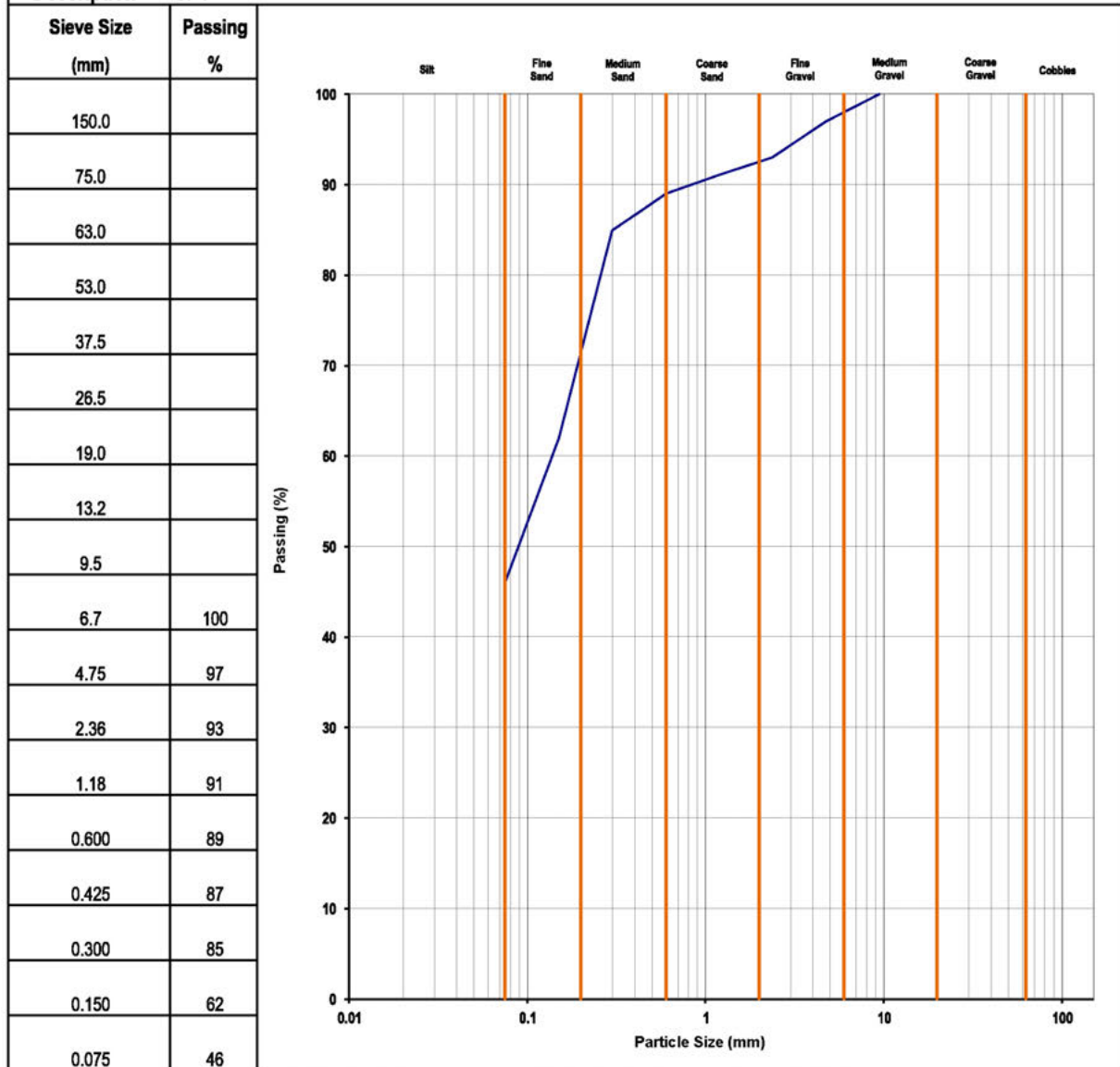
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

PARTICLE SIZE DISTRIBUTION TEST REPORT

Test Method: AS 1289 3.6.1, 2.1.1

Client	Goldier Associates Pty Limited	Report No.	GA101955-G
Address	PO Box 1734 MILTON BC QLD 4064	Request No	R4_BH_Rev0_4070
		Test Date	21/1/19-22/1/19
		Report Date	22/1/2019

Project	Inland Rail B2G				
Project No	1897791	Client Sample No	310-01-BH2624-S00205		
Bore Hole	310-01-BH2624	Depth From (m)	2.05	Depth To (m)	2.45
Description	SPT				



NOTES/REMARKS:

-
Moisture Content 9.2%
Sample/s supplied by the client

Page 1 of 1 REP03903

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory



C. Park



Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506