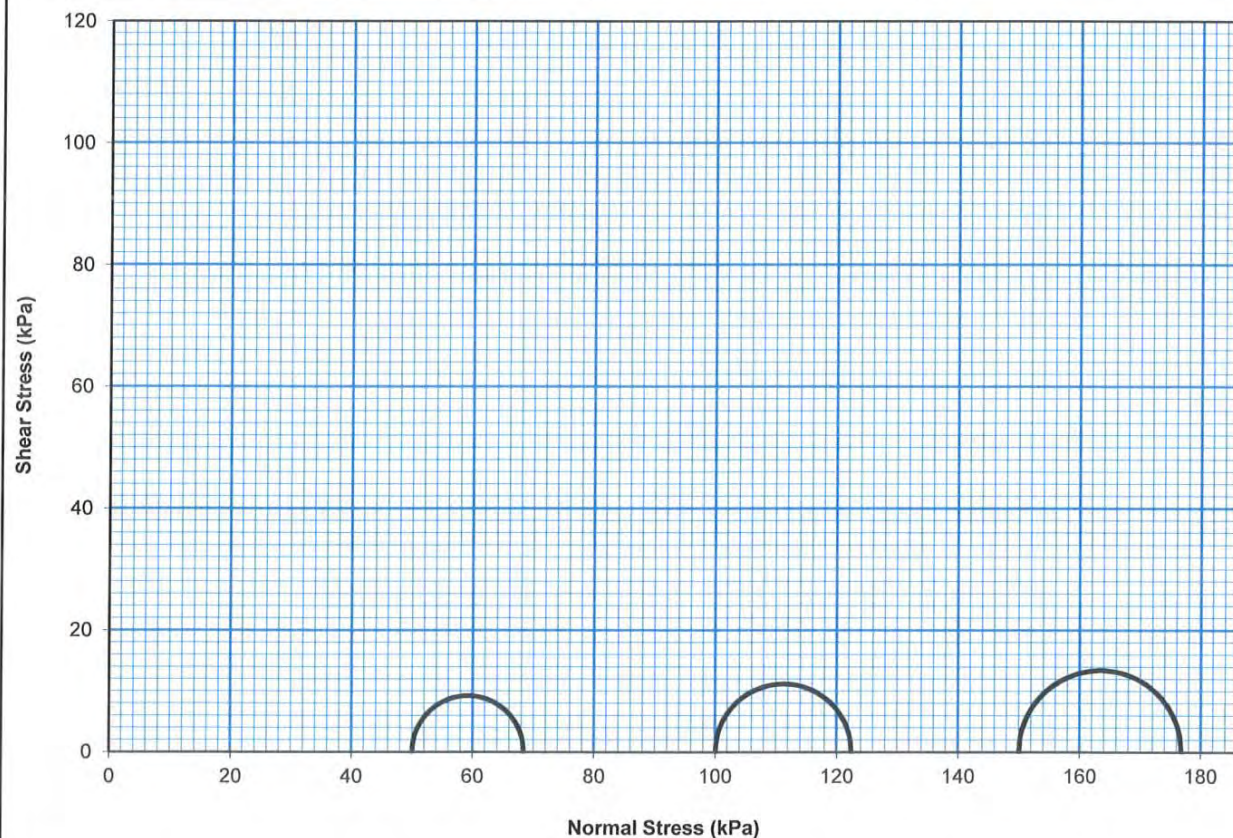


TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16166
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303493
Location/Sample ID :	BH1 003 (2.10 - 2.50m)	Sample No. :
Date of Test :	26/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	48.0 mm	Specimen Height :	94.5 mm
Initial Moisture Content :	69.3 %	Initial Saturation :	98 %
Initial Dry Density :	0.93 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	68	50	18	1.3
2	100	122	100	22	2.6
3	150	177	150	27	4.8

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mf*

Checked by *CH*

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Nick Farrer

Approved Signatory

29/8/13

Senior Technical Officer

NATA Accred. No. : 1961

Golder Form No. R19
RL1 - 29/01/08



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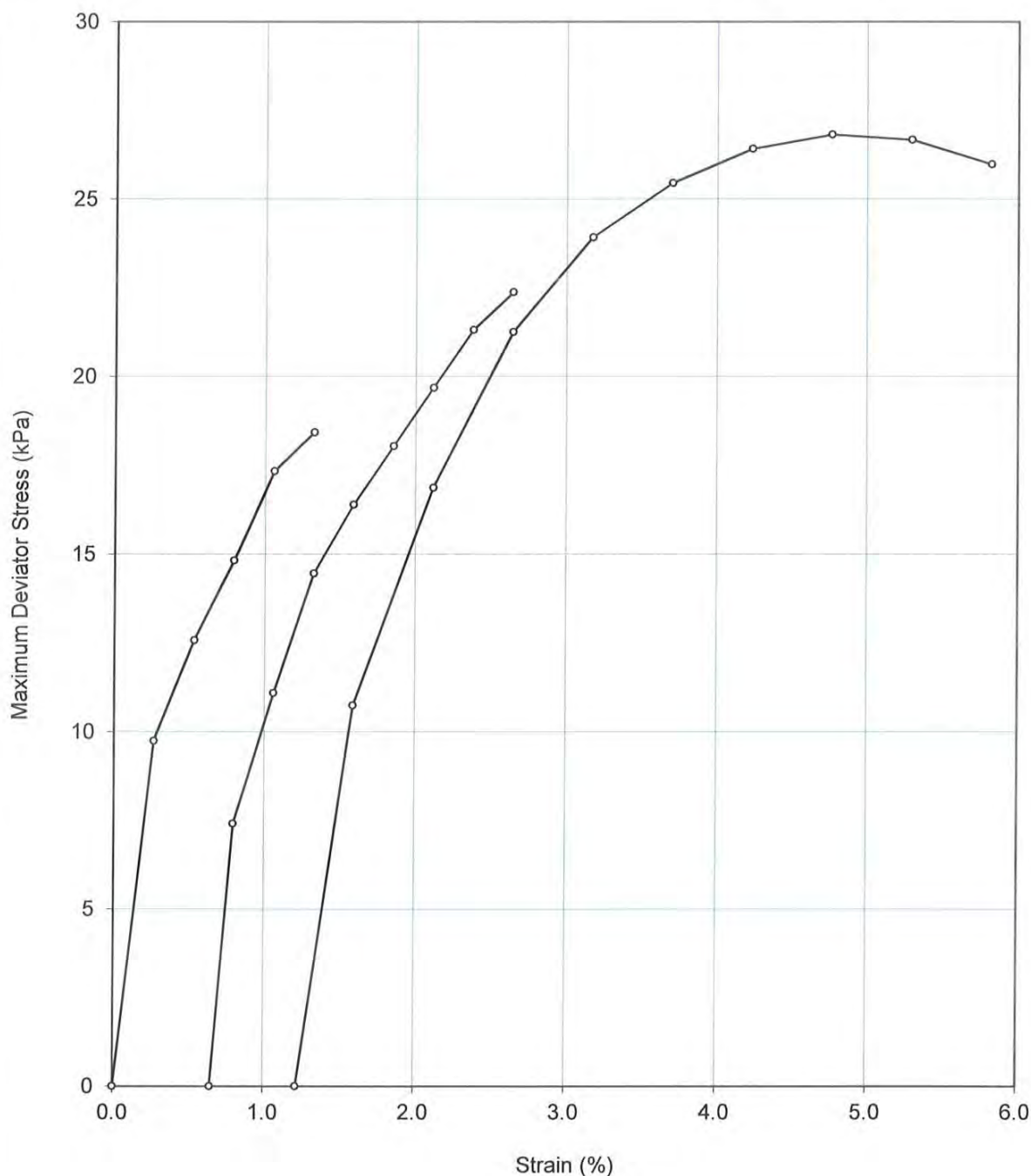
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH1 003 (2.10 - 2.50m)

Report No. : R16166
Job No. : 137632122
Reg'n No. : 13303493
Sample No. :
Sampled By : Client

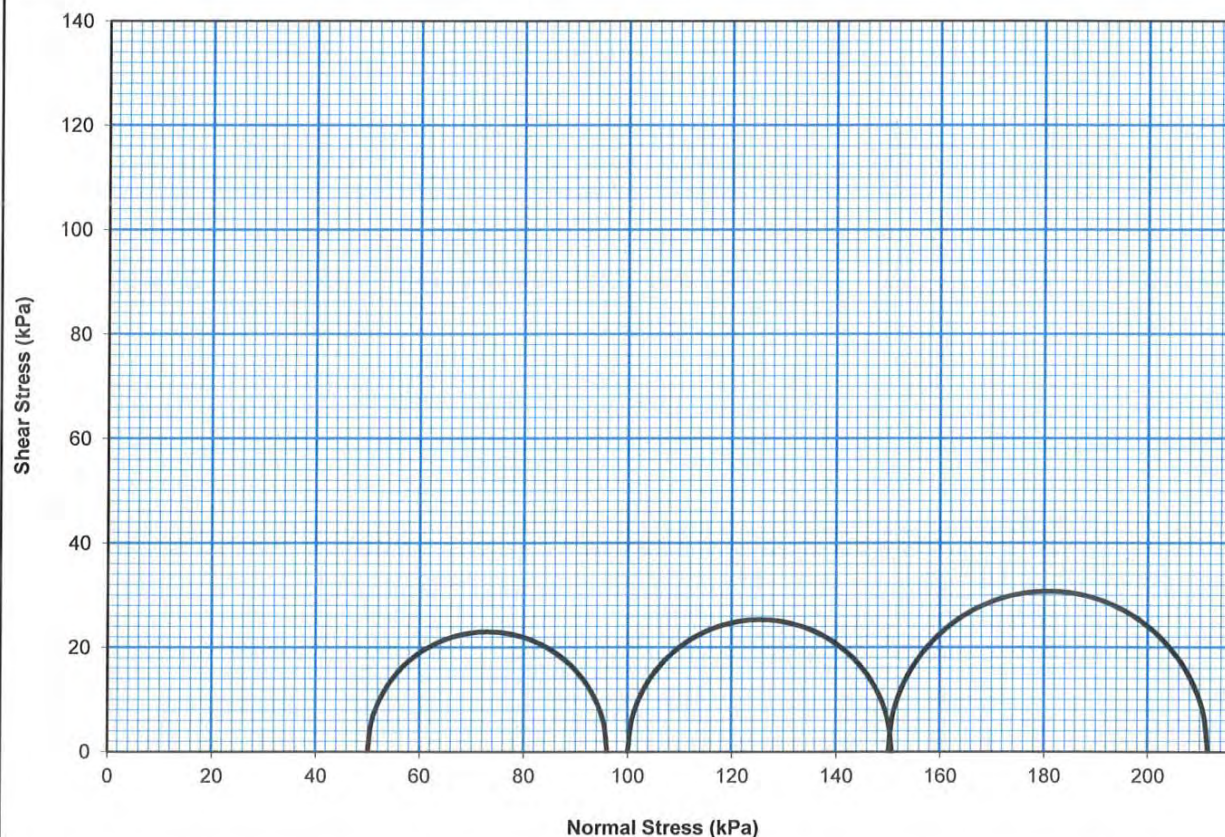


Prepared by *W*

Checked by *W*

TRIAxIAL SHEAR TEST

Client :	Ports North	Report No. :	R16167
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. :	137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. :	13303494
Location/Sample ID :	BH1 004 (3.10 - 3.50m)	Sample No. :	
Date of Test :	26/8/13	Sampled By :	Client
Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	48.0 mm	Specimen Height :	94.5 mm
Initial Moisture Content :	77.9 %	Initial Saturation :	97 %
Initial Dry Density :	0.85 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	96	50	46	2.4
2	100	151	100	51	3.2
3	150	212	150	62	5.3

Failure Criteria : Maximum Shear Stress

Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *NF*

Checked by *qf*

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NF 29/8/13 Senior Technical Officer

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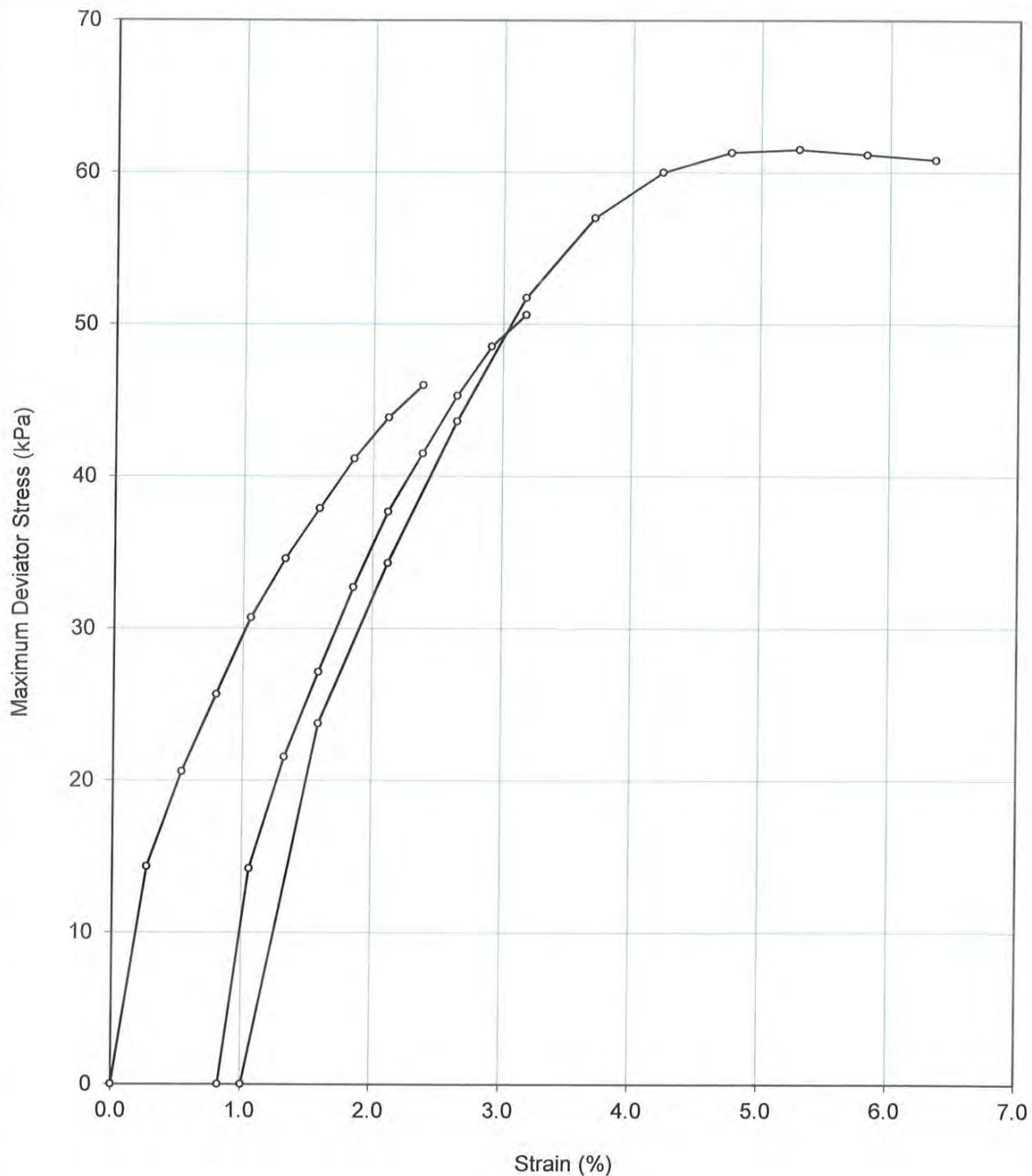
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TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH1 004 (3.10 - 3.50m)

Report No. : R16167
Job No. : 137632122
Reg'n No. : 13303494
Sample No. :
Sampled By : Client



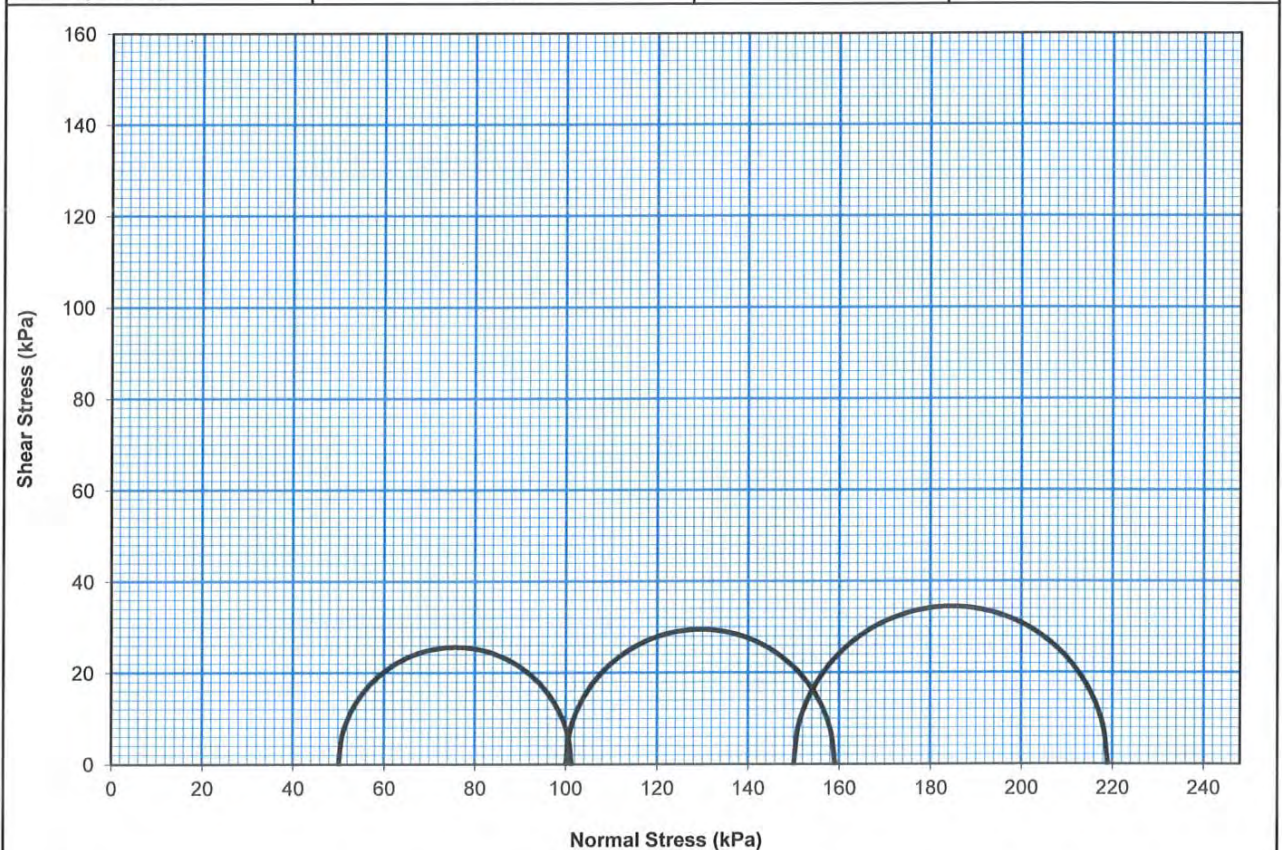
Prepared by *mk*

Checked by *gh*

TRIAxIAL SHEAR TEST

Client :	Ports North	Report No. : R16168
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303495
Location/Sample ID :	BH1 005 (4.10 - 4.50m)	Sample No. :
Date of Test :	27/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.7 mm	Specimen Height :	95.2 mm
Initial Moisture Content :	25.9 %	Initial Saturation :	100 %
Initial Dry Density :	1.61 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	101	50	51	1.1
2	100	159	100	59	1.6
3	150	219	150	69	3.7

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *MA*

Checked by *AK*

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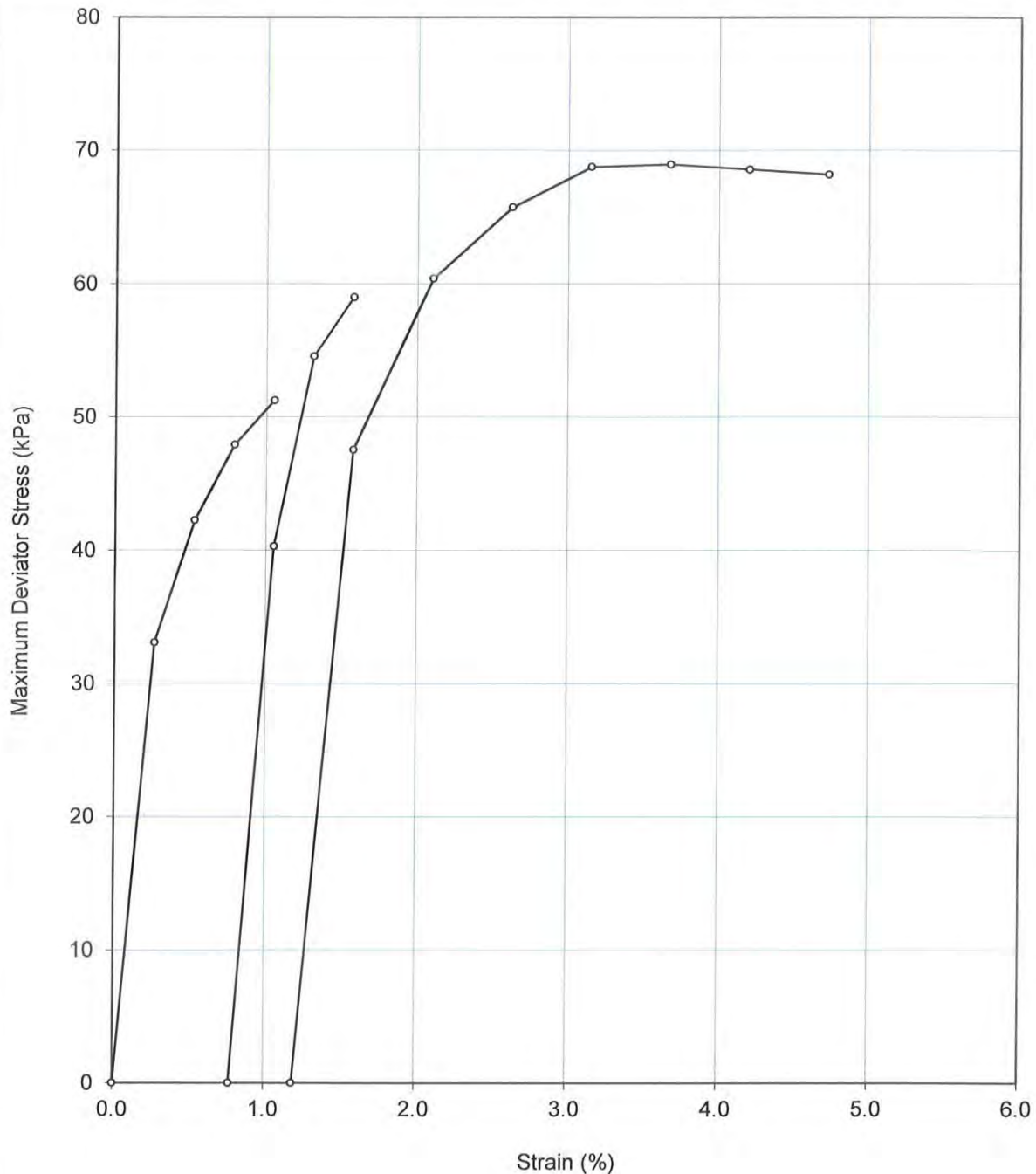
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Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH1 005 (4.10 - 4.50m)

Report No. : R16168
Job No. : 137632122
Reg'n No. : 13303495
Sample No. :
Sampled By : Client



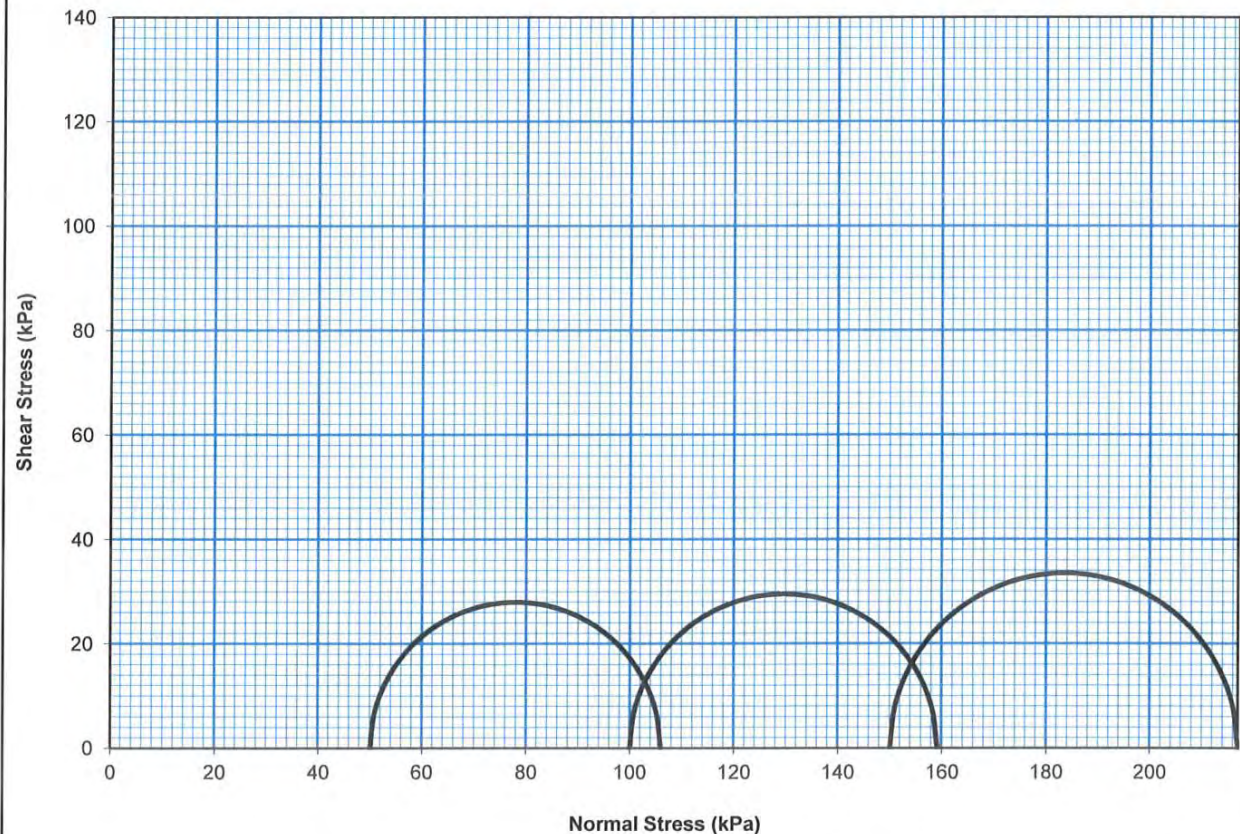
Prepared by *mf*

Checked by *mf*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16169
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303497
Location/Sample ID :	BH2 002 (2.10 - 2.50m)	Sample No. :
Date of Test :	27/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.6 mm	Specimen Height :	95.2 mm
Initial Moisture Content :	31.1 %	Initial Saturation :	100 %
Initial Dry Density :	1.47 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	106	50	56	1.3
2	100	159	100	59	1.8
3	150	217	150	67	3.7

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mf*

Checked by *hth*

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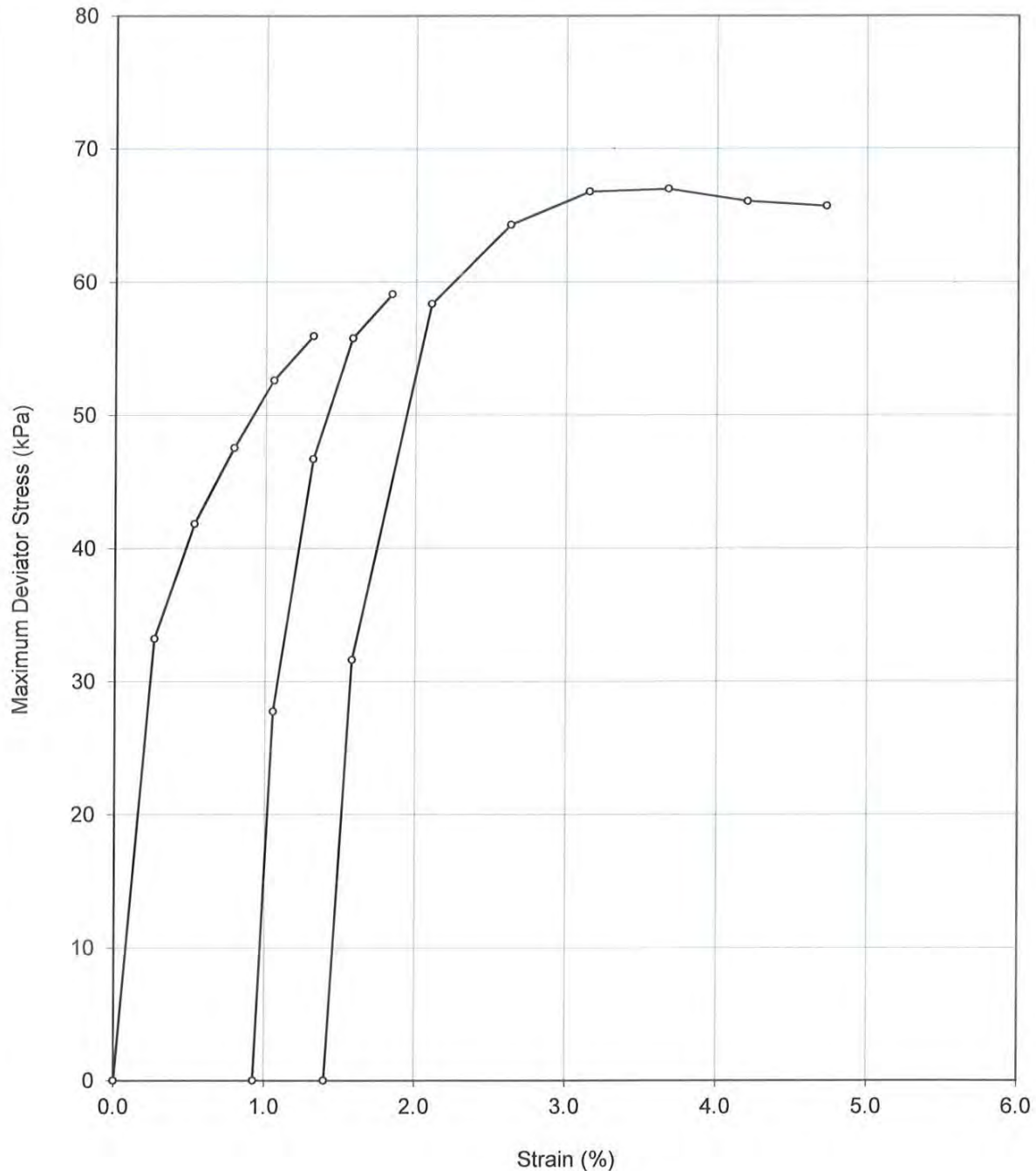
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH2 002 (2.10 - 2.50m)

Report No. : R16169
Job No. : 137632122
Reg'n No. : 13303497
Sample No. :
Sampled By : Client



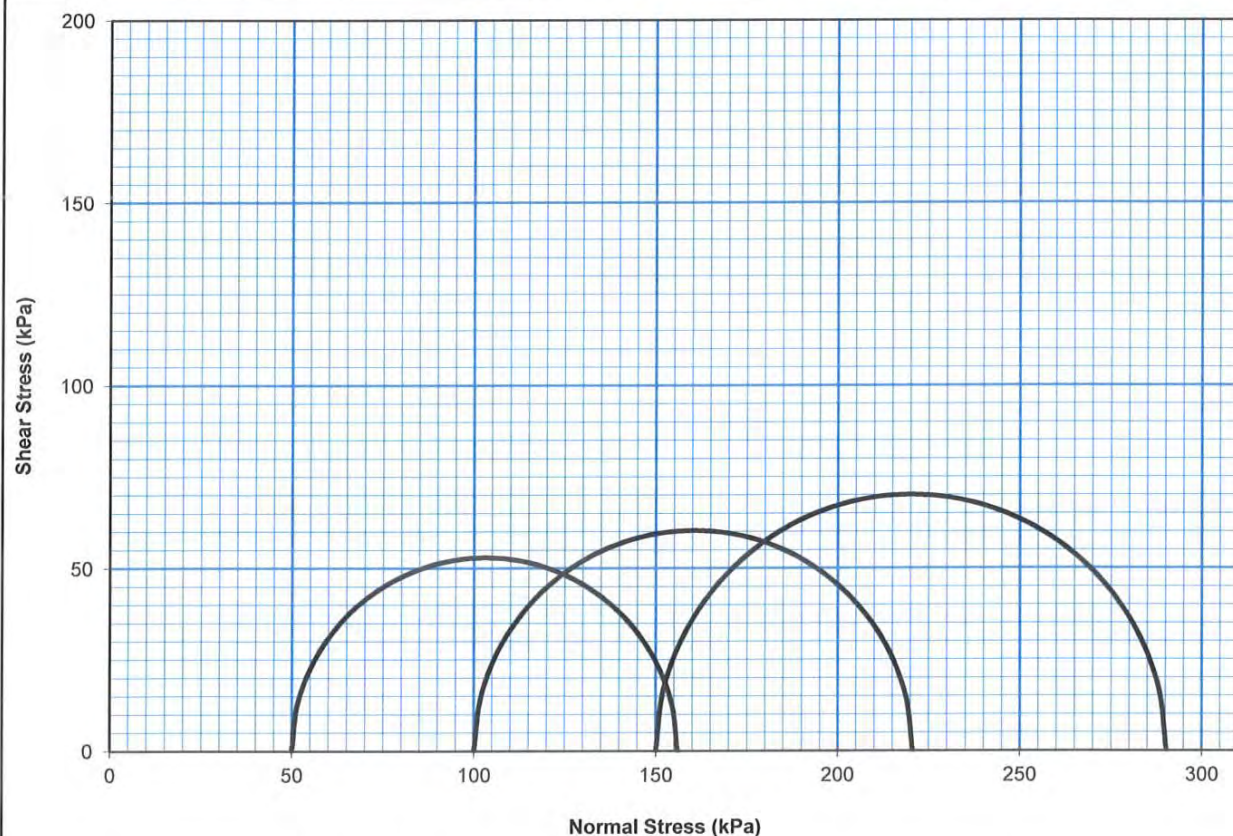
Prepared by *mf*

Checked by *ct*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16170
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303499
Location/Sample ID :	BH3 001 (0.40 - 0.80m)	Sample No. :
Date of Test :	27/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.9 mm	Specimen Height :	95.3 mm
Initial Moisture Content :	27.4 %	Initial Saturation :	99 %
Initial Dry Density :	1.54 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	156	50	106	1.3
2	100	221	100	121	1.8
3	150	290	150	140	4.7

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *nt*

Checked by *nt*

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nt 29/8/13

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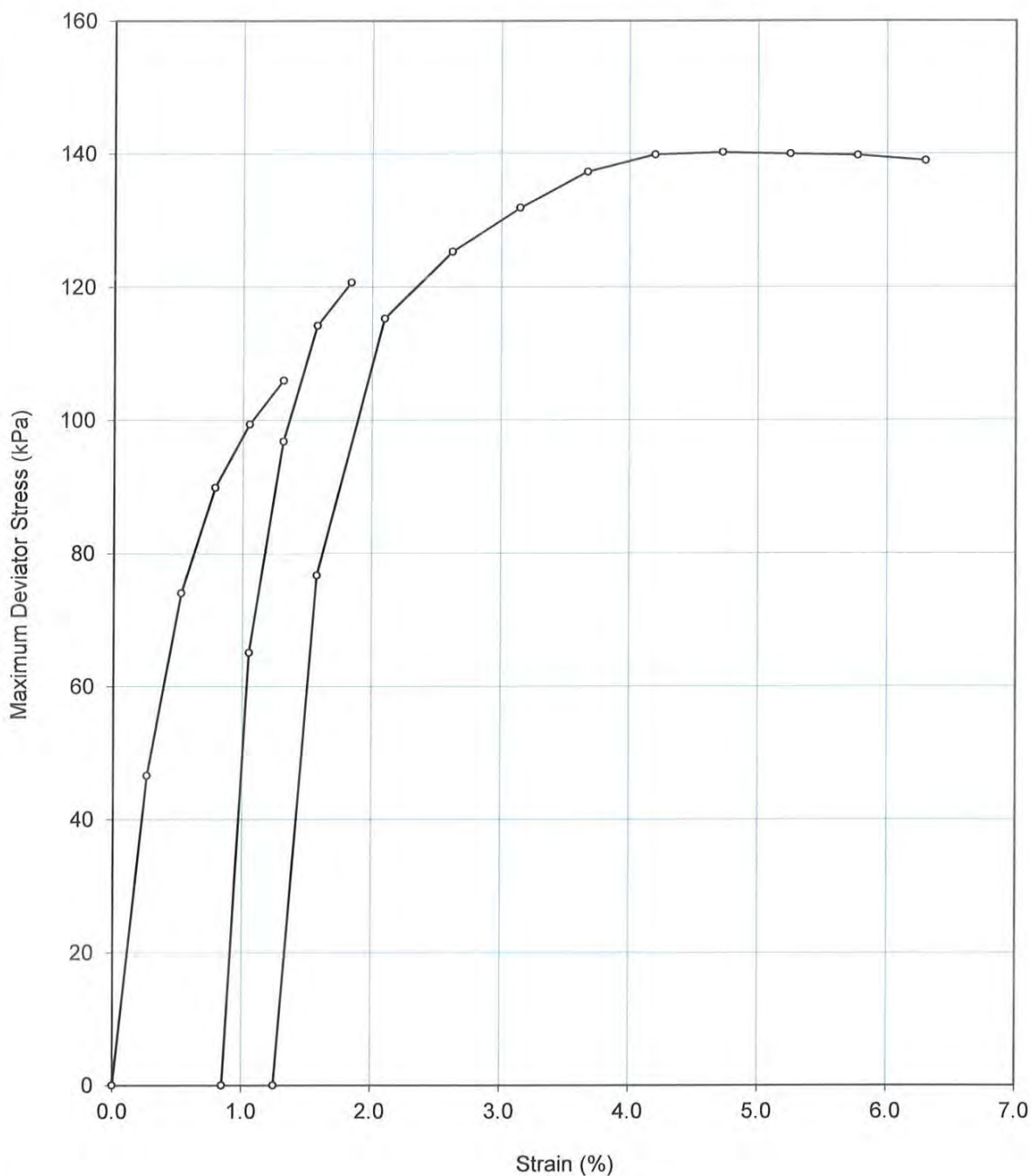
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH3 001 (0.40 - 0.80m)

Report No. : R16170
Job No. : 137632122
Reg'n No. : 13303499
Sample No. :
Sampled By : Client



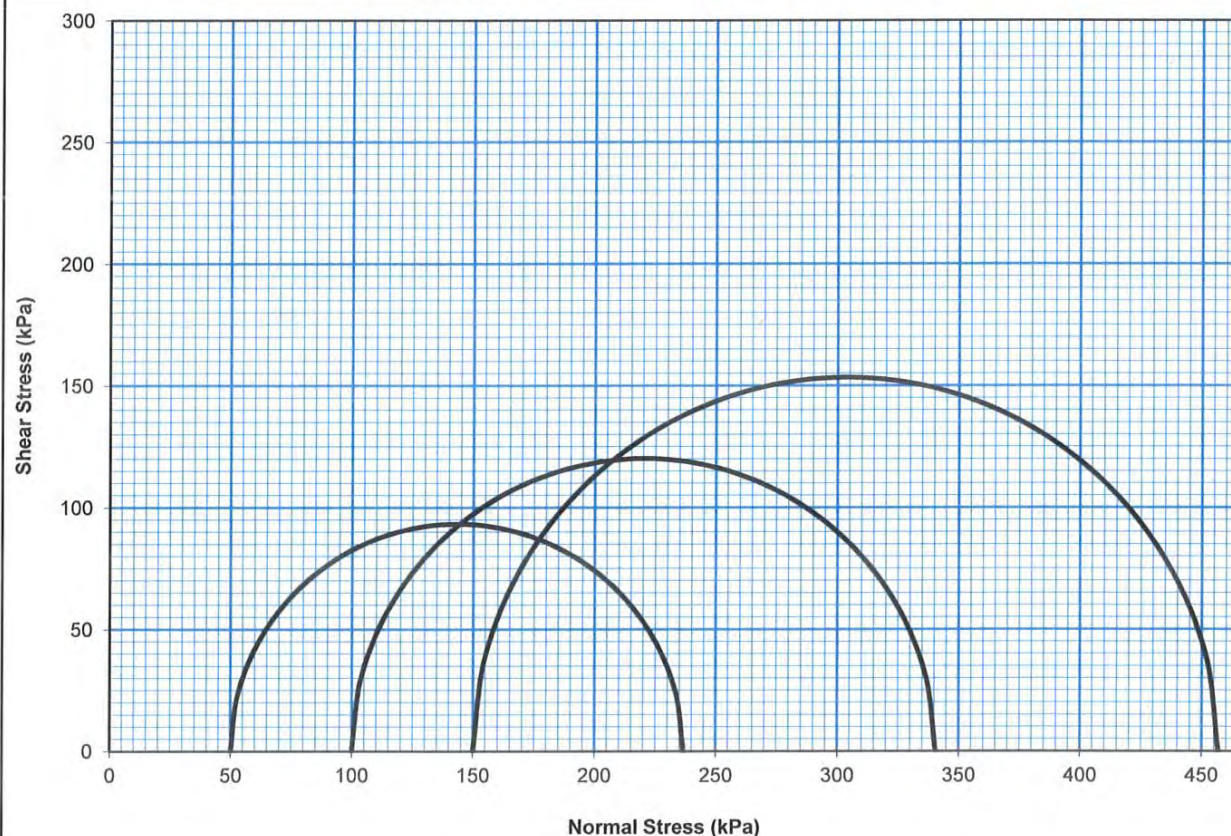
Prepared by *mt*

Checked by *Wb*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16171
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303500
Location/Sample ID :	BH3 002 (1.40 - 1.80m)	Sample No. :
Date of Test :	27/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.8 mm	Specimen Height :	95.0 mm
Initial Moisture Content :	24.5 %	Initial Saturation :	100 %
Initial Dry Density :	1.63 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	237	50	187	1.8
2	100	340	100	240	2.6
3	150	457	150	307	5.8

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mf*

Checked by *GH*

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mf 29/8/13

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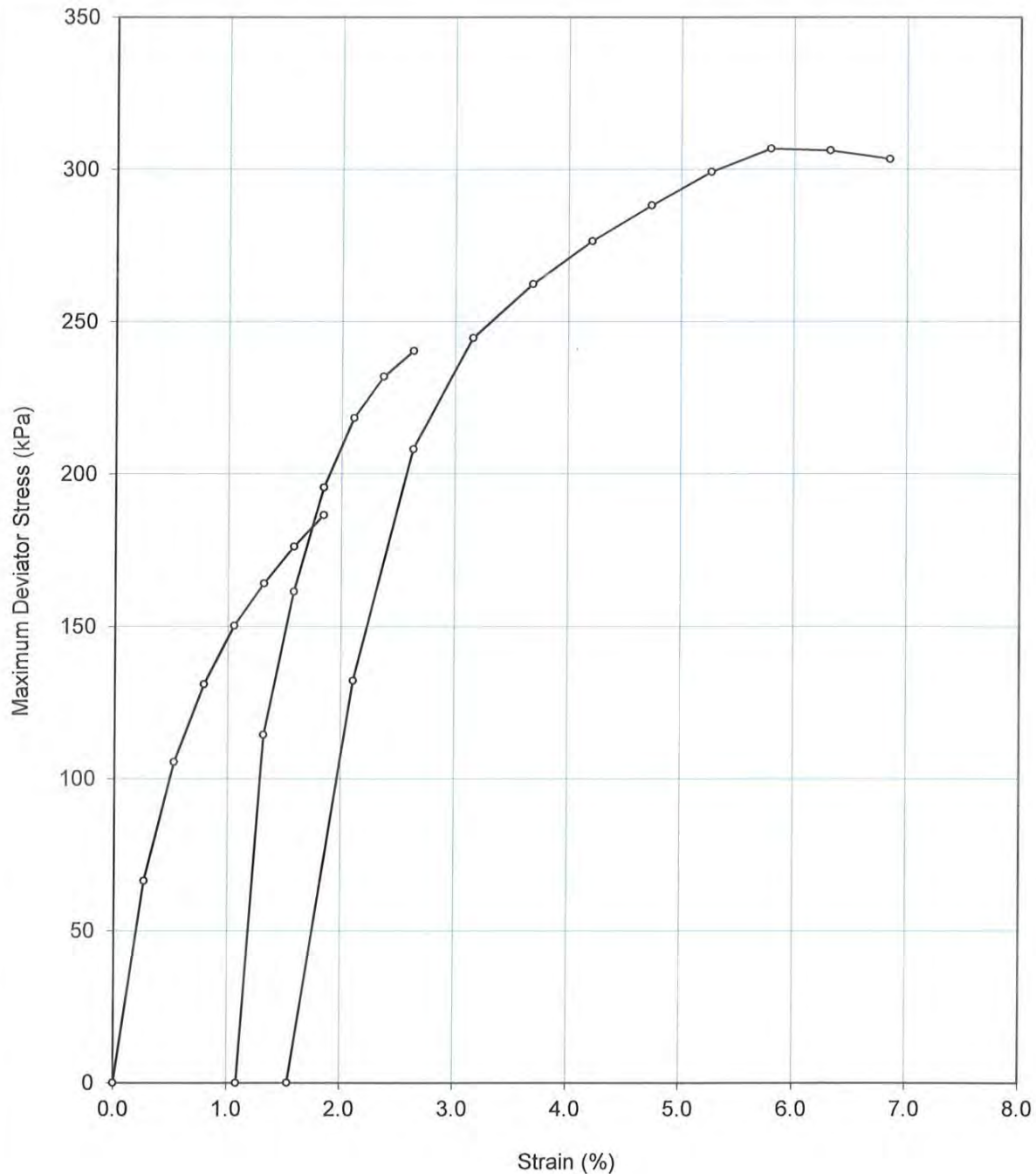
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH3 002 (1.40 - 1.80m)

Report No. : R16171
Job No. : 137632122
Reg'n No. : 13303500
Sample No. :
Sampled By : Client



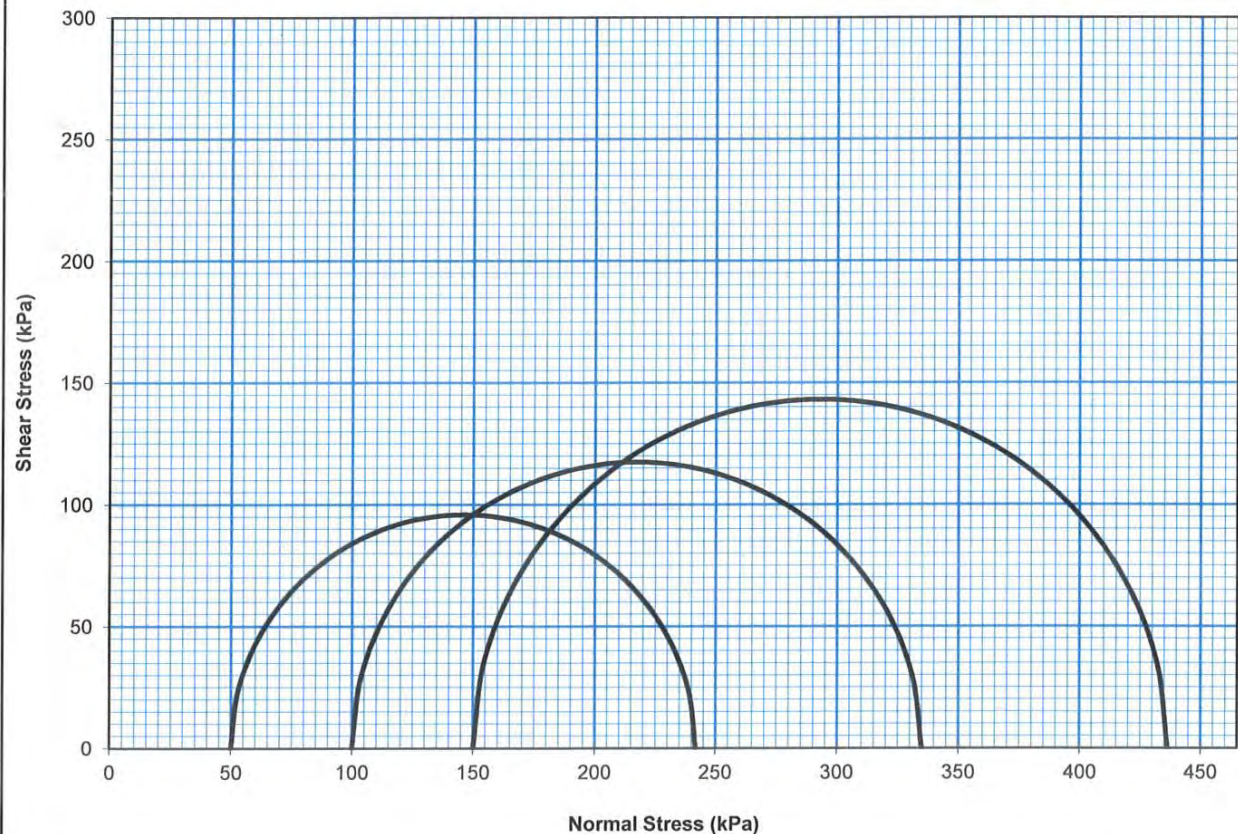
Prepared by *mk*

Checked by *els*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16172
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303502
Location/Sample ID :	BH3 003 (2.40 - 2.63m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.9 mm	Specimen Height :	95.0 mm
Initial Moisture Content :	24.7 %	Initial Saturation :	98 %
Initial Dry Density :	1.61 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	242	50	192	1.3
2	100	335	100	235	2.4
3	150	436	150	286	4.2

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *nt*

Checked by *cts*



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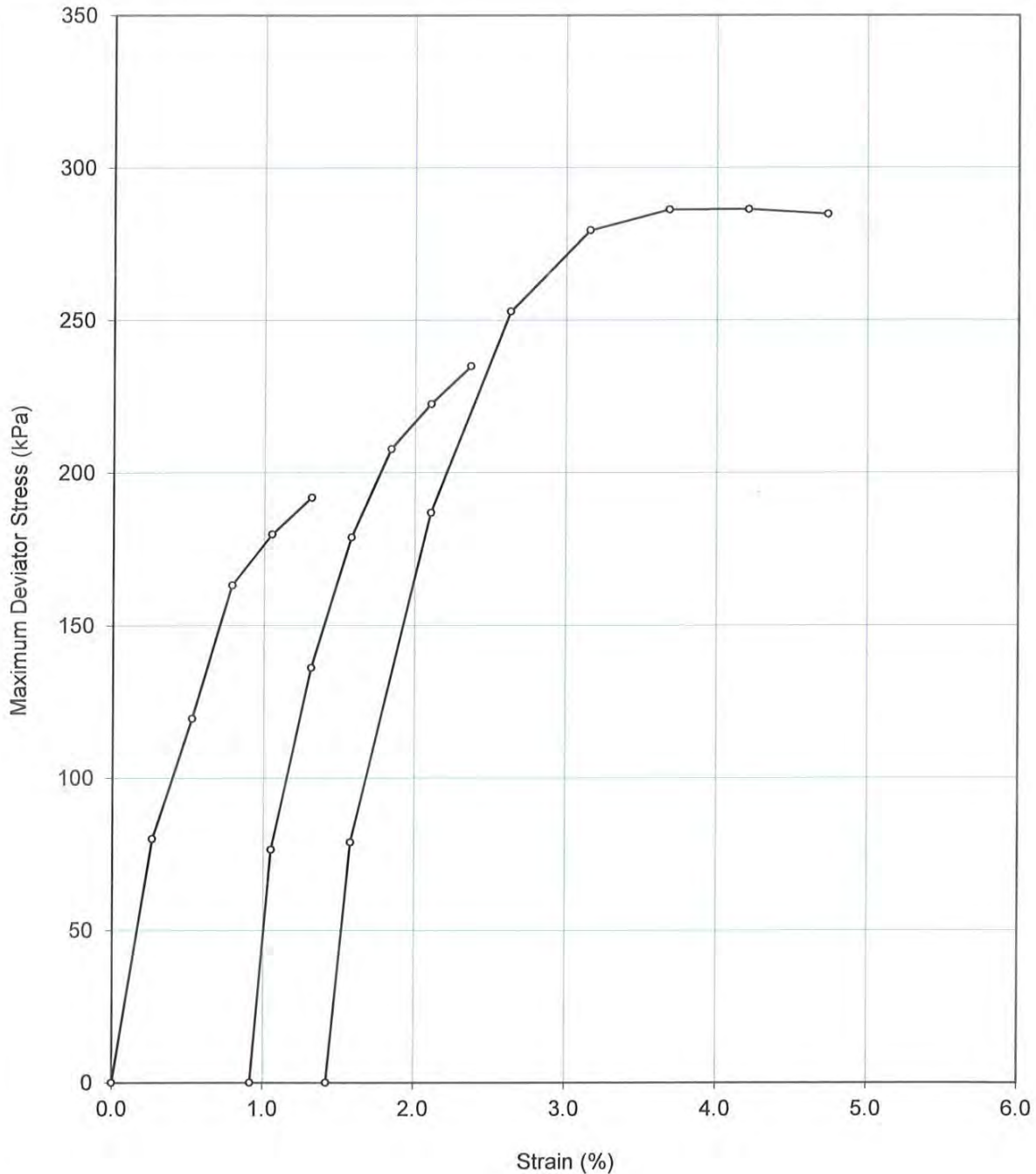
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH3 003 (2.40 - 2.63m)

Report No. : R16172
Job No. : 137632122
Reg'n No. : 13303502
Sample No. :
Sampled By : Client



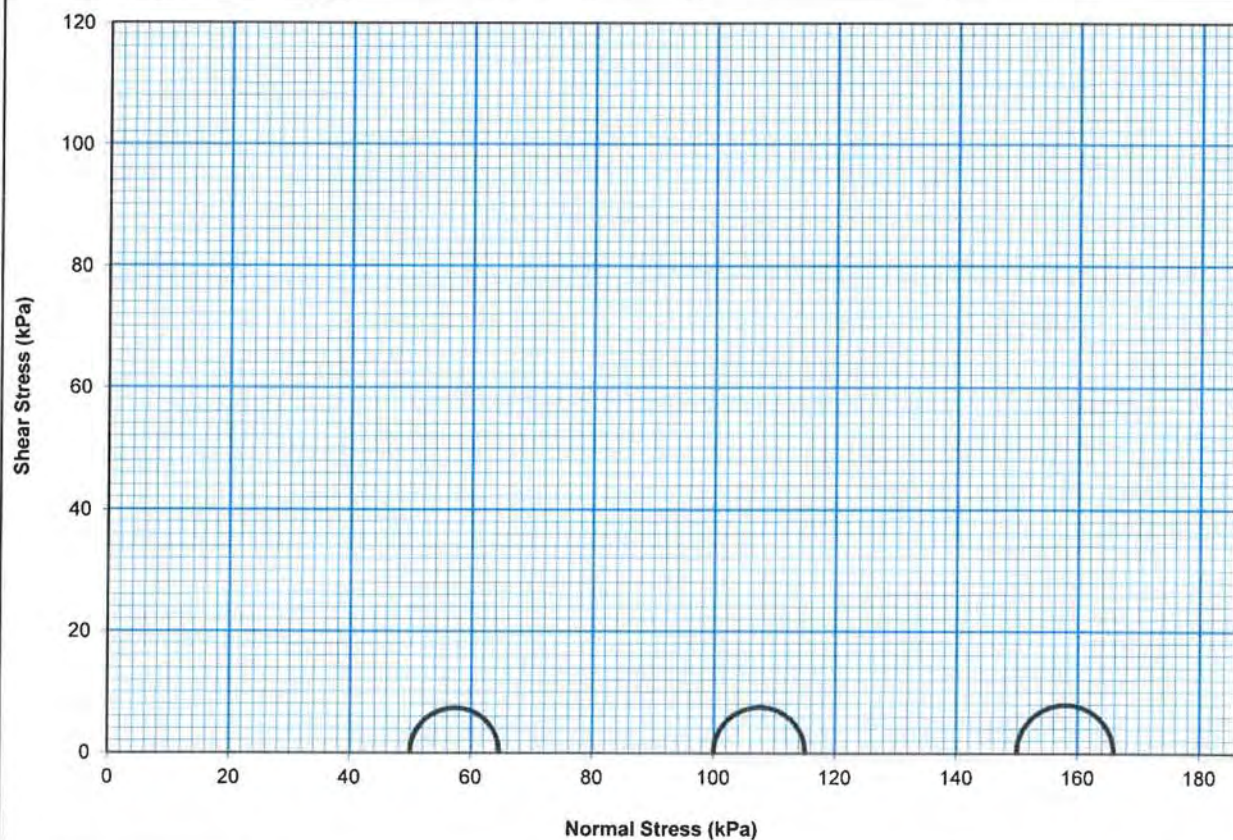
Prepared by *ML*

Checked by *GN*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16173
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303503
Location/Sample ID :	BH4 001 (2.40 - 2.80m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	48.0 mm	Specimen Height :	93.8 mm
Initial Moisture Content :	59.7 %	Initial Saturation :	98 %
Initial Dry Density :	1.02 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	65	50	15	1.3
2	100	115	100	15	2.7
3	150	166	150	16	4.3

Failure Criteria :	Maximum Shear Stress	
Remarks :	This amended report replaces the Report No. R16173 page 1 of 2 dated 29/08/2013	

Test Procedure :	AS1289.6.4.1
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Prepared by 

Checked by 



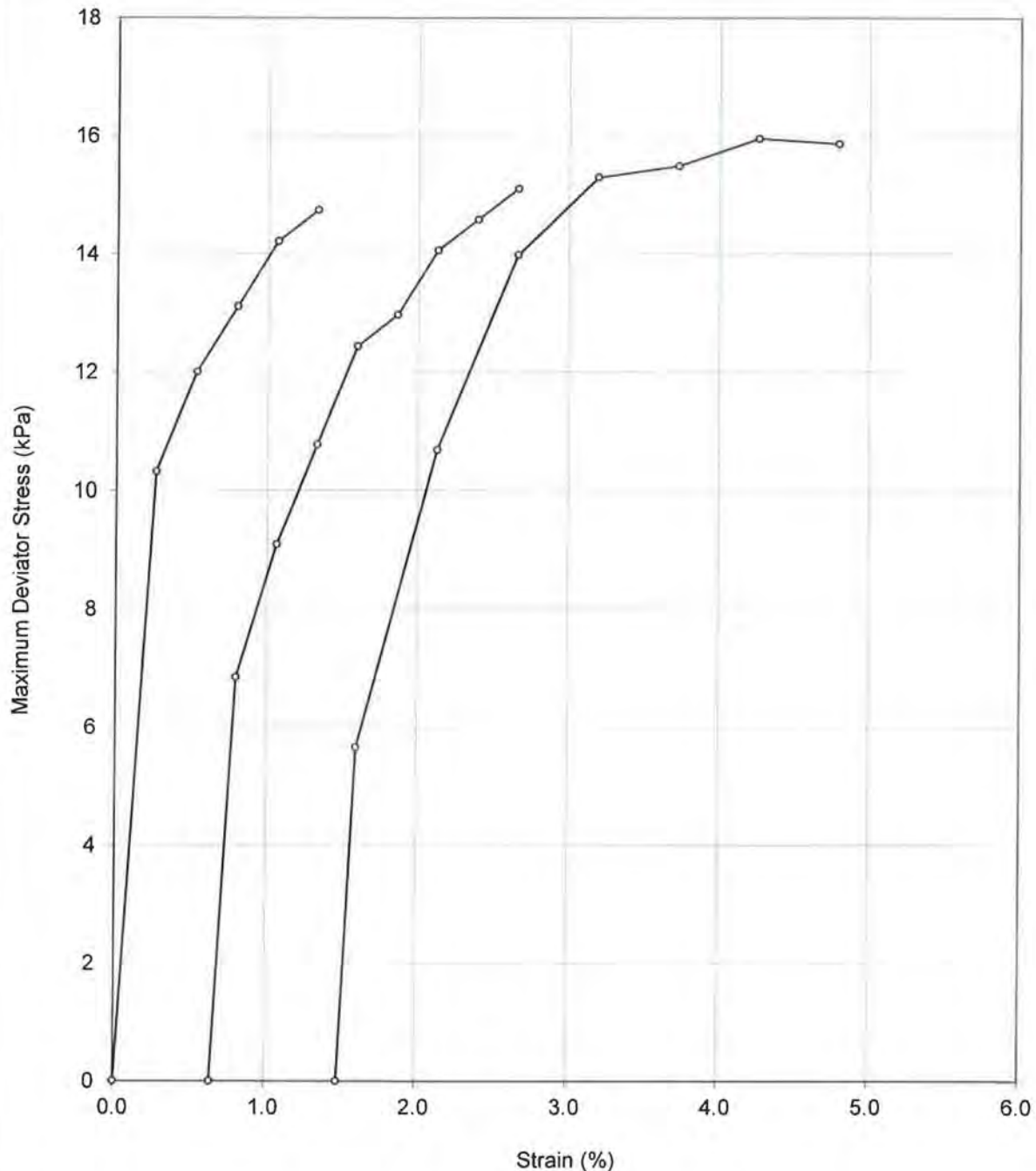
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PO Box 3427 Sth Brisbane BC QLD 4101
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Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH4 001 (2.40 - 2.80m)

Report No. : R16173
Job No. : 137632122
Reg'n No. : 13303503
Sample No. :
Sampled By : Client



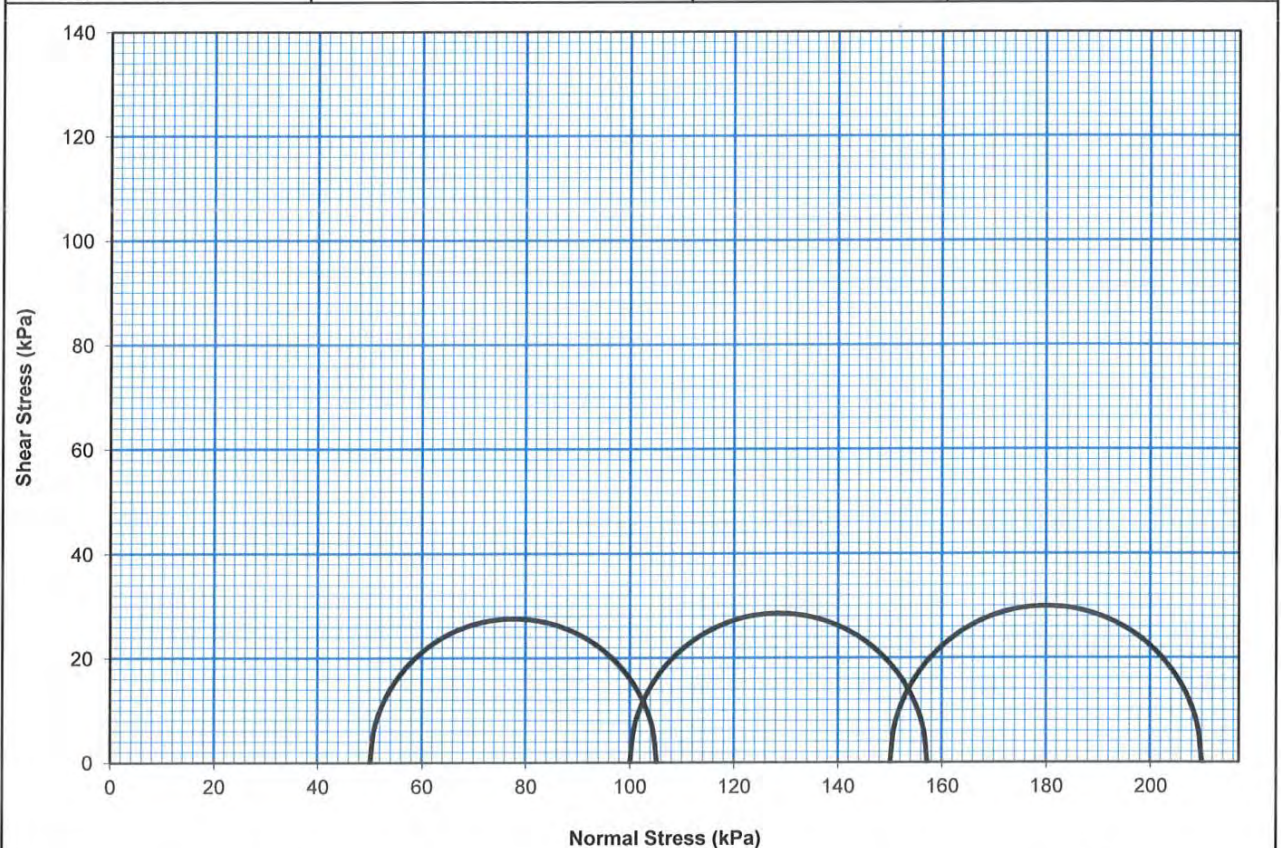
Prepared by

Checked by

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16174
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303505
Location/Sample ID :	BH4 003 (4.40 - 4.80m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.7 mm	Specimen Height :	95.0 mm
Initial Moisture Content :	24.2 %	Initial Saturation :	100 %
Initial Dry Density :	1.65 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	105	50	55	1.3
2	100	157	100	57	1.8
3	150	210	150	60	4.7

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *ML*

Checked by *CF*

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Nick Farrer

Approved Signatory

ML 29/8/13

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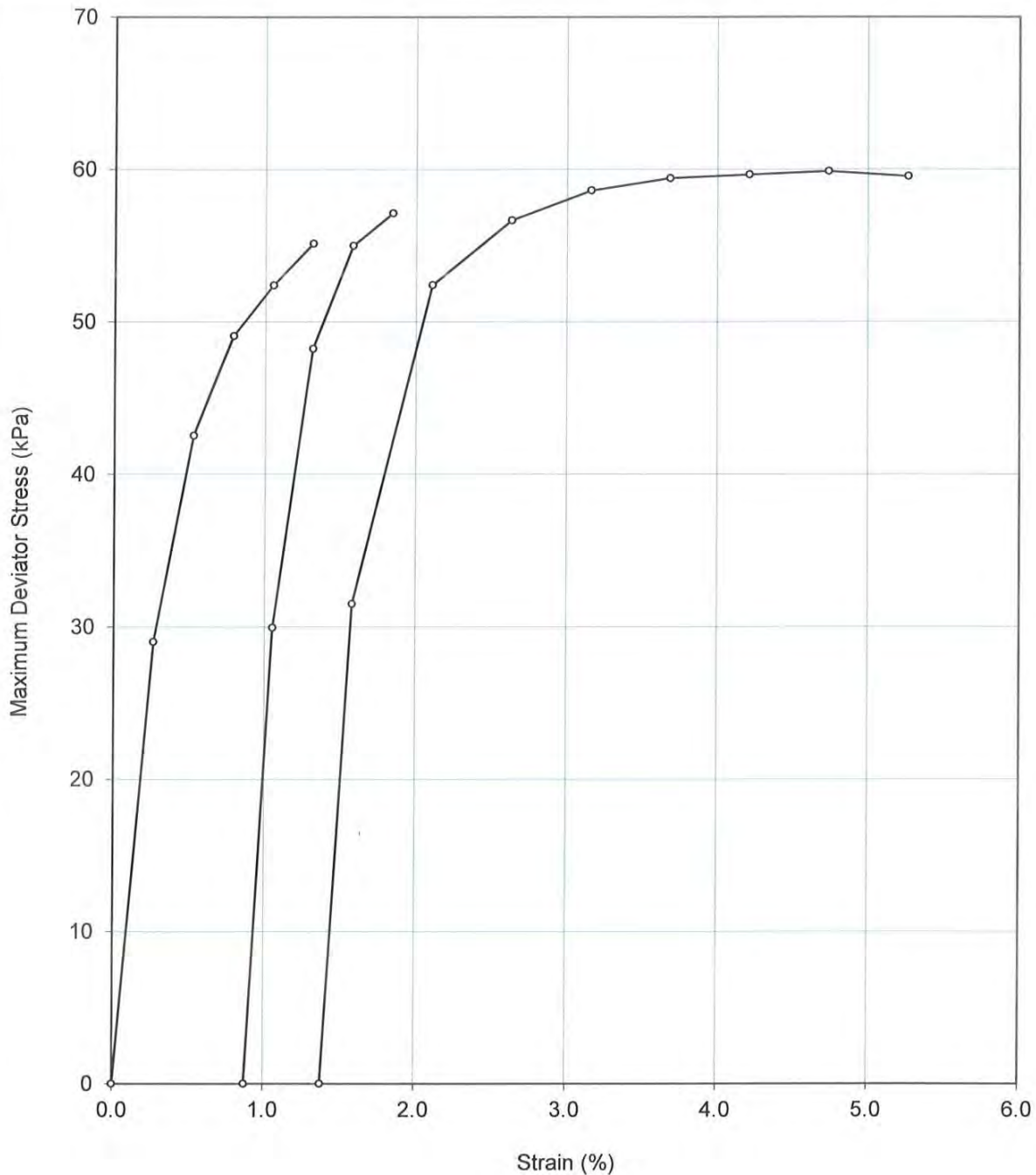
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH4 003 (4.40 - 4.80m)

Report No. : R16174
Job No. : 137632122
Reg'n No. : 13303505
Sample No. :
Sampled By : Client



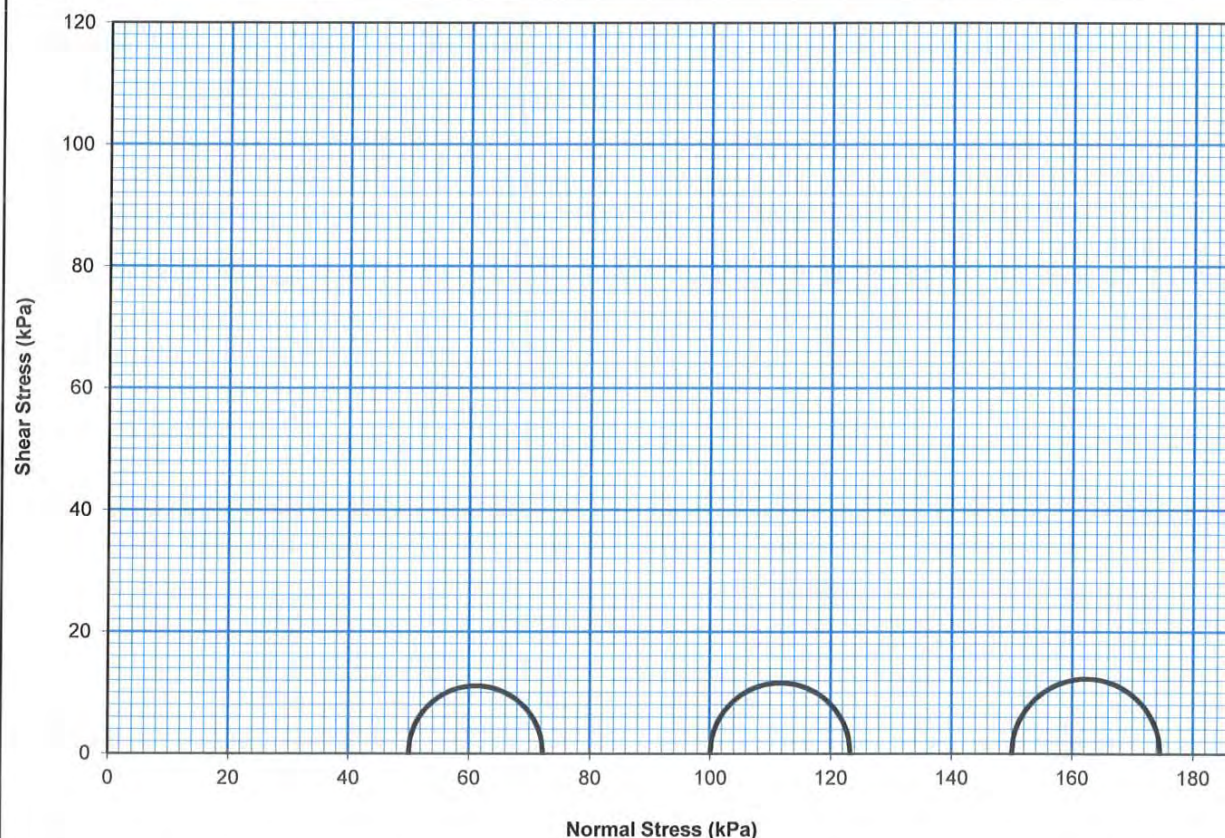
Prepared by *mf*

Checked by *ti*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16175
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303509
Location/Sample ID :	BH5 006 (7.40 - 7.90m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.9 mm	Specimen Height :	94.8 mm
Initial Moisture Content :	66.8 %	Initial Saturation :	98 %
Initial Dry Density :	0.95 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	72	50	22	1.3
2	100	123	100	23	1.8
3	150	175	150	25	3.2

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mf*

Checked by *lv*

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Approved Signatory

Mmm 29/8/13

Senior Technical Officer
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28 Bank Street, West End QLD 4101

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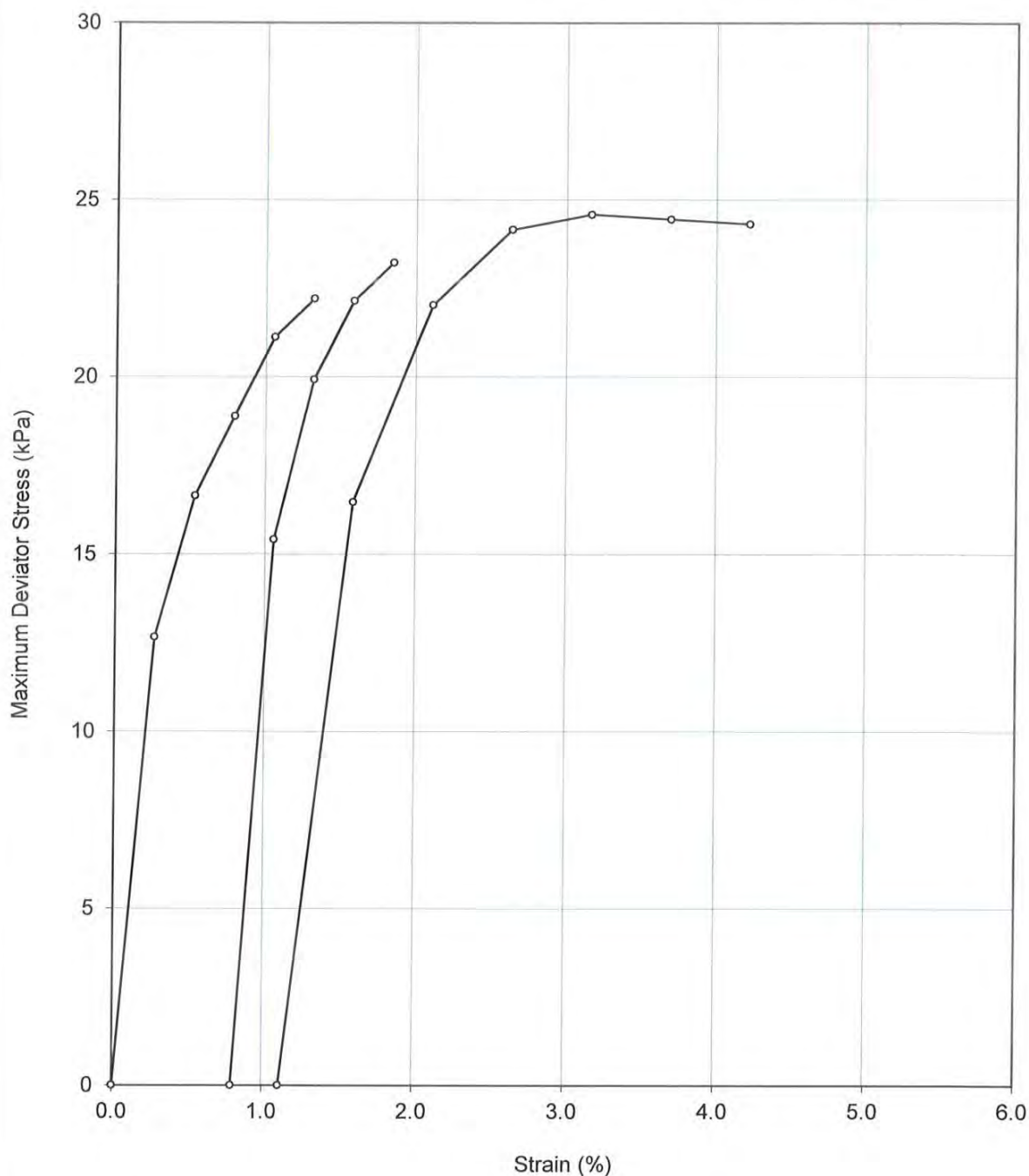
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH5 006 (7.40 - 7.90m)

Report No. : R16175
Job No. : 137632122
Reg'n No. : 13303509
Sample No. :
Sampled By : Client



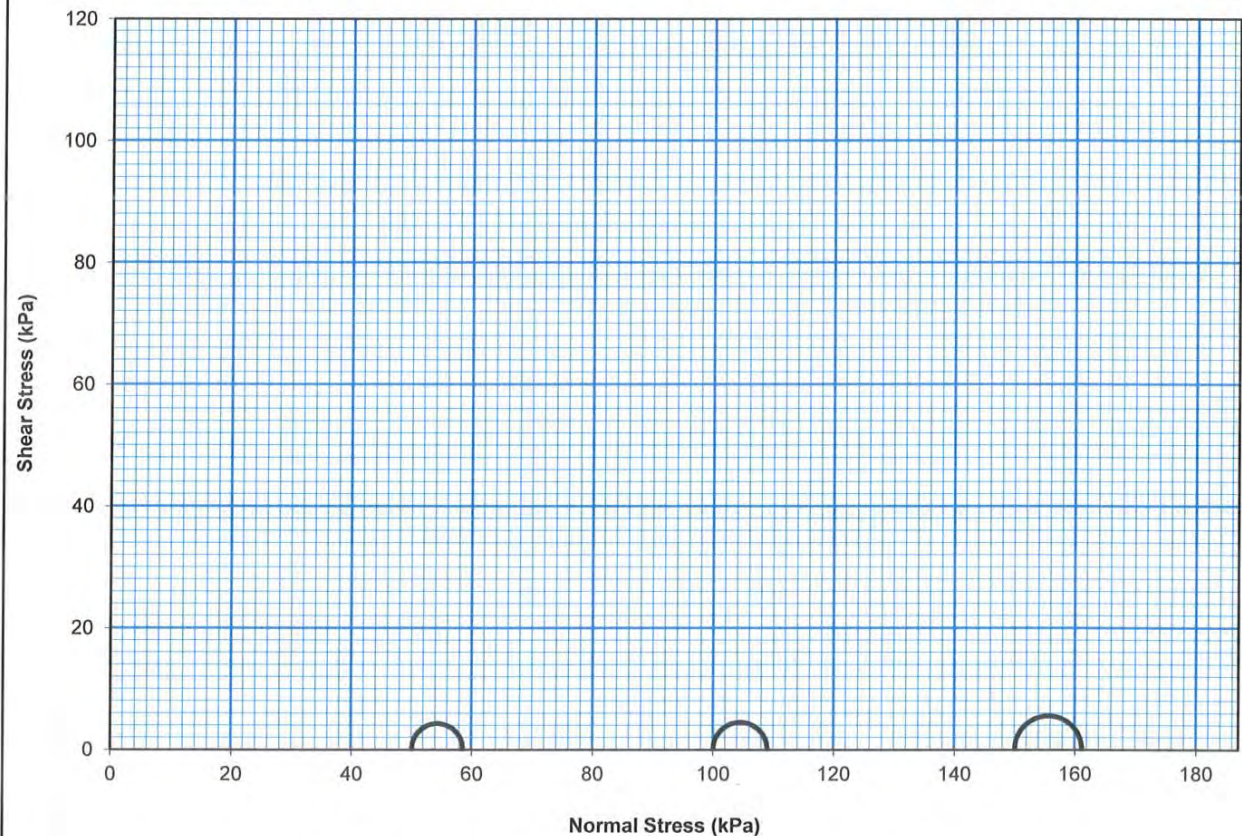
Prepared by *mt*

Checked by *lt*

TRIAxIAL SHEAR TEST

Client :	Ports North	Report No. : R16176
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303512
Location/Sample ID :	BH6 003 (2.00 - 2.40m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.9 mm	Specimen Height :	94.5 mm
Initial Moisture Content :	48.3 %	Initial Saturation :	100 %
Initial Dry Density :	1.18 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	59	50	9	1.1
2	100	109	100	9	2.4
3	150	161	150	11	3.7

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *nt*

Checked by *Ln*



**BRISBANE
LABORATORY**

ABN 64 006 107 857

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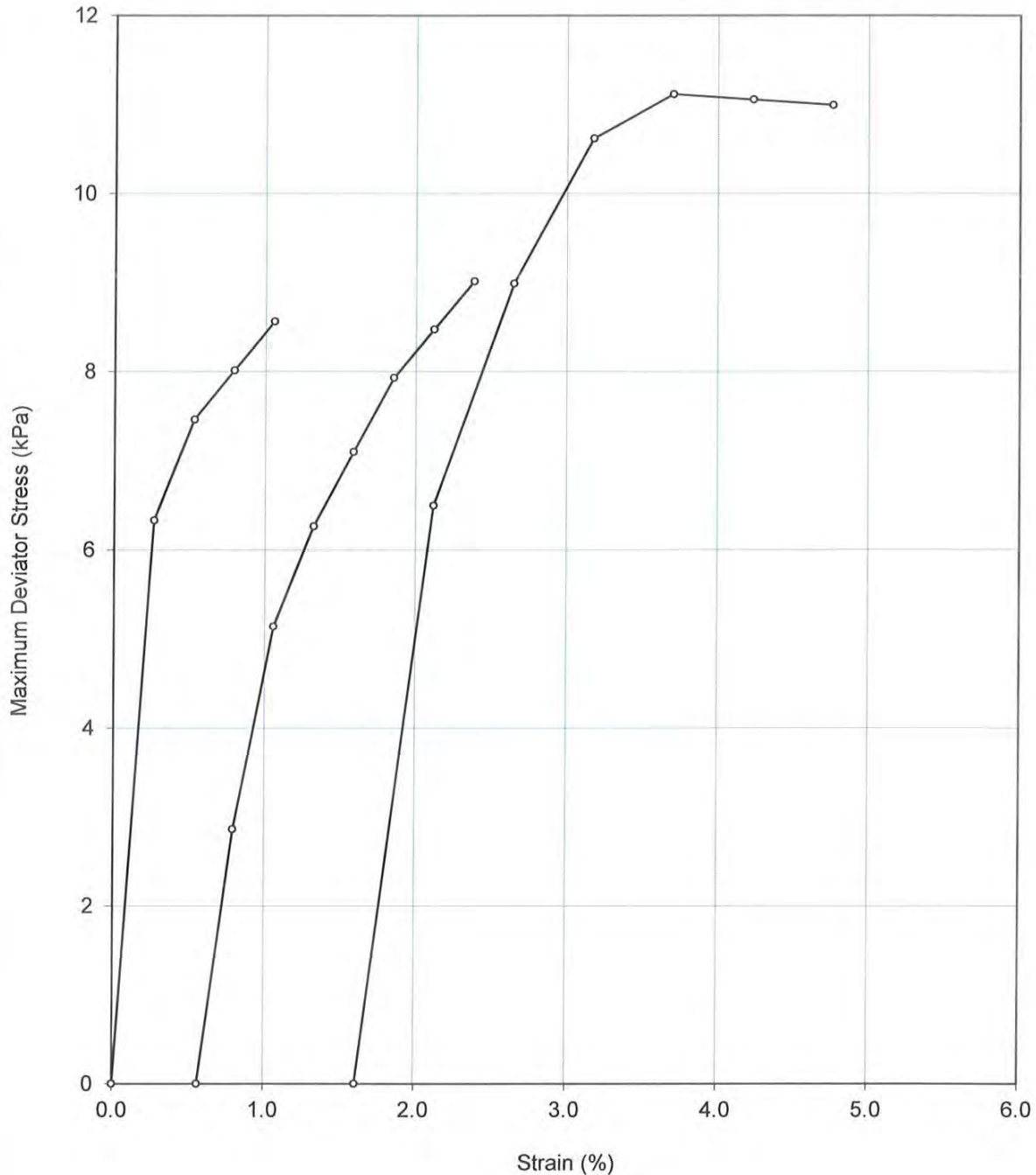
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH6 003 (2.00 - 2.40m)

Report No. : R16176
Job No. : 137632122
Reg'n No. : 13303512
Sample No. :
Sampled By : Client



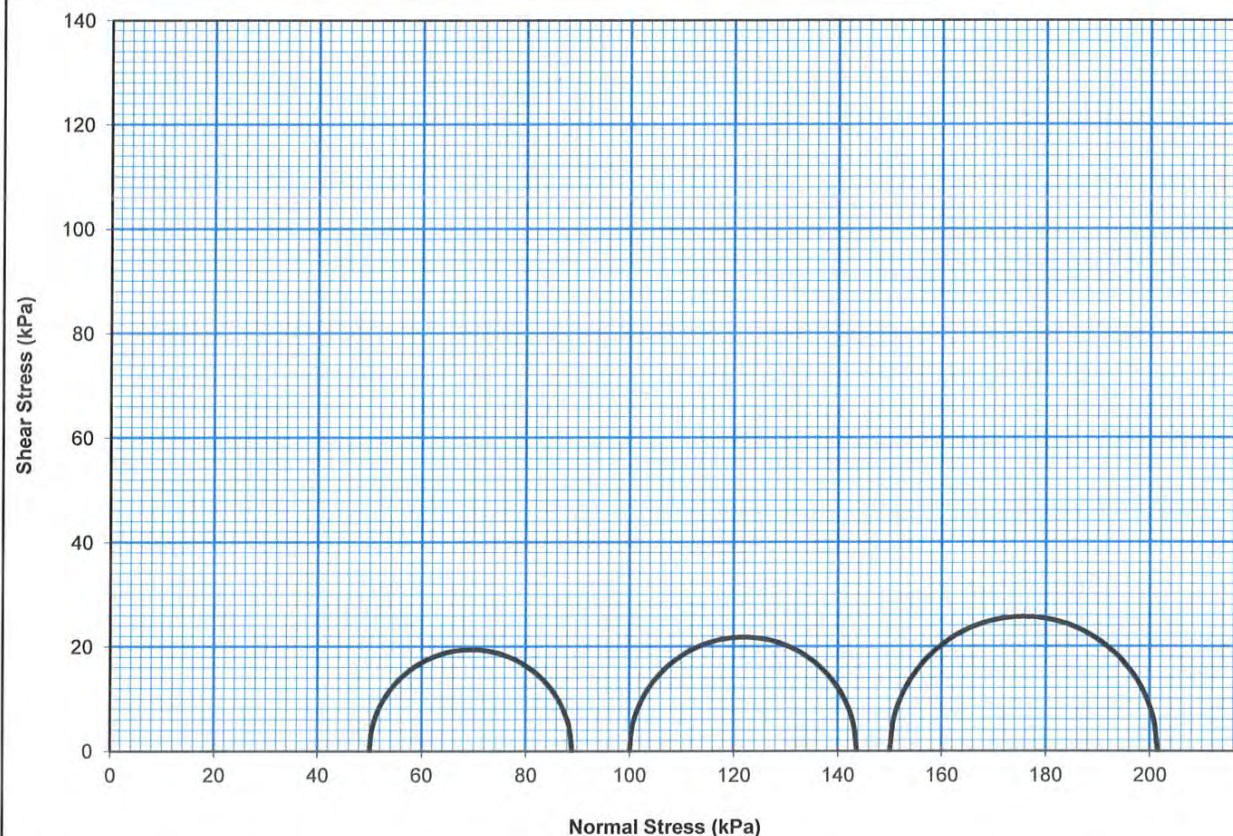
Prepared by *ML*

Checked by *ML*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16177
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303513
Location/Sample ID :	BH6 006 (5.00 - 5.40m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	48.0 mm	Specimen Height :	94.4 mm
Initial Moisture Content :	80.8 %	Initial Saturation :	98 %
Initial Dry Density :	0.84 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	89	50	39	1.9
2	100	144	100	44	2.6
3	150	201	150	51	4.8

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mf*

Checked by *C.H.*



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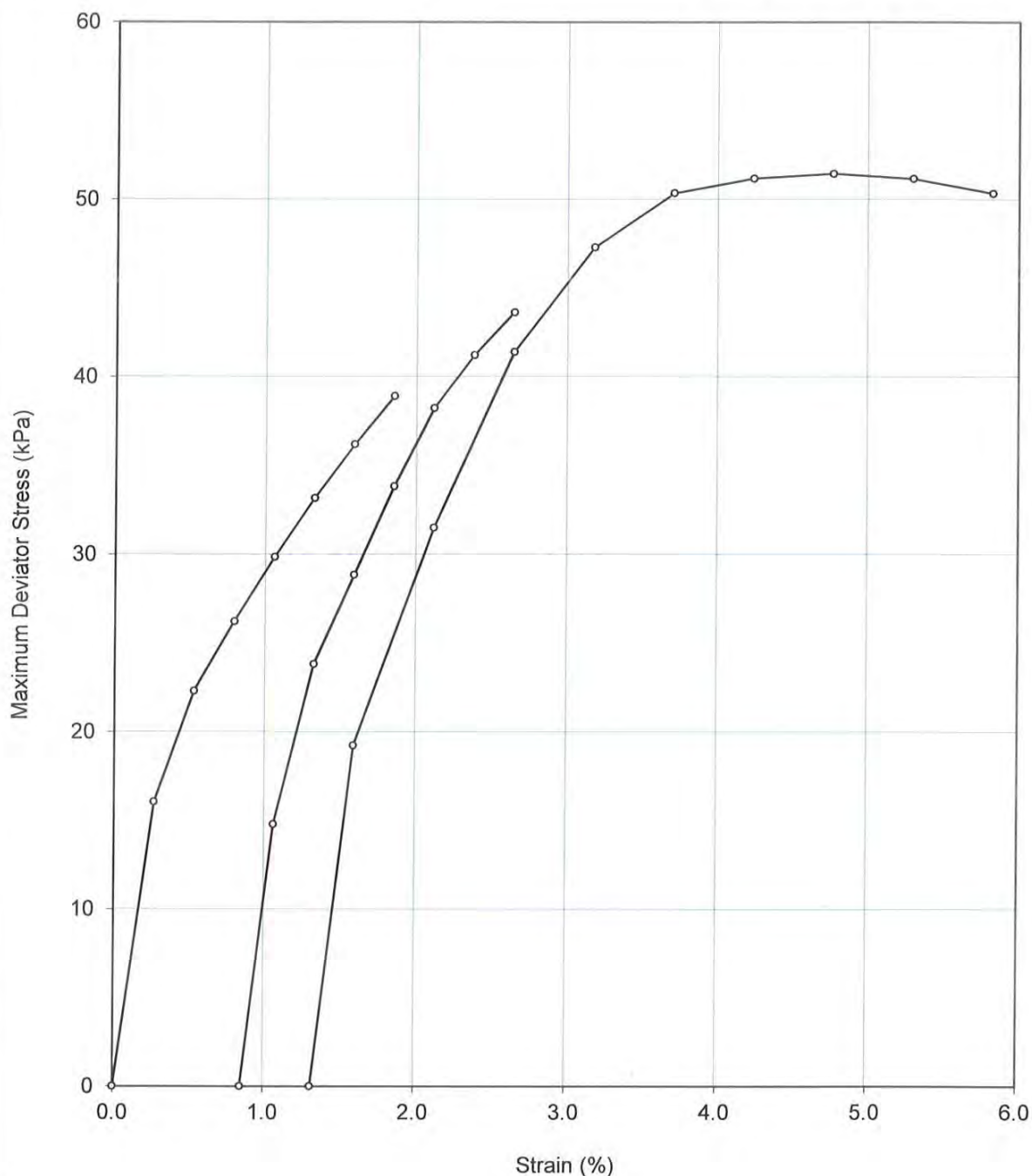
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH6 006 (5.00 - 5.40m)

Report No. : R16177
Job No. : 137632122
Reg'n No. : 13303513
Sample No. :
Sampled By : Client



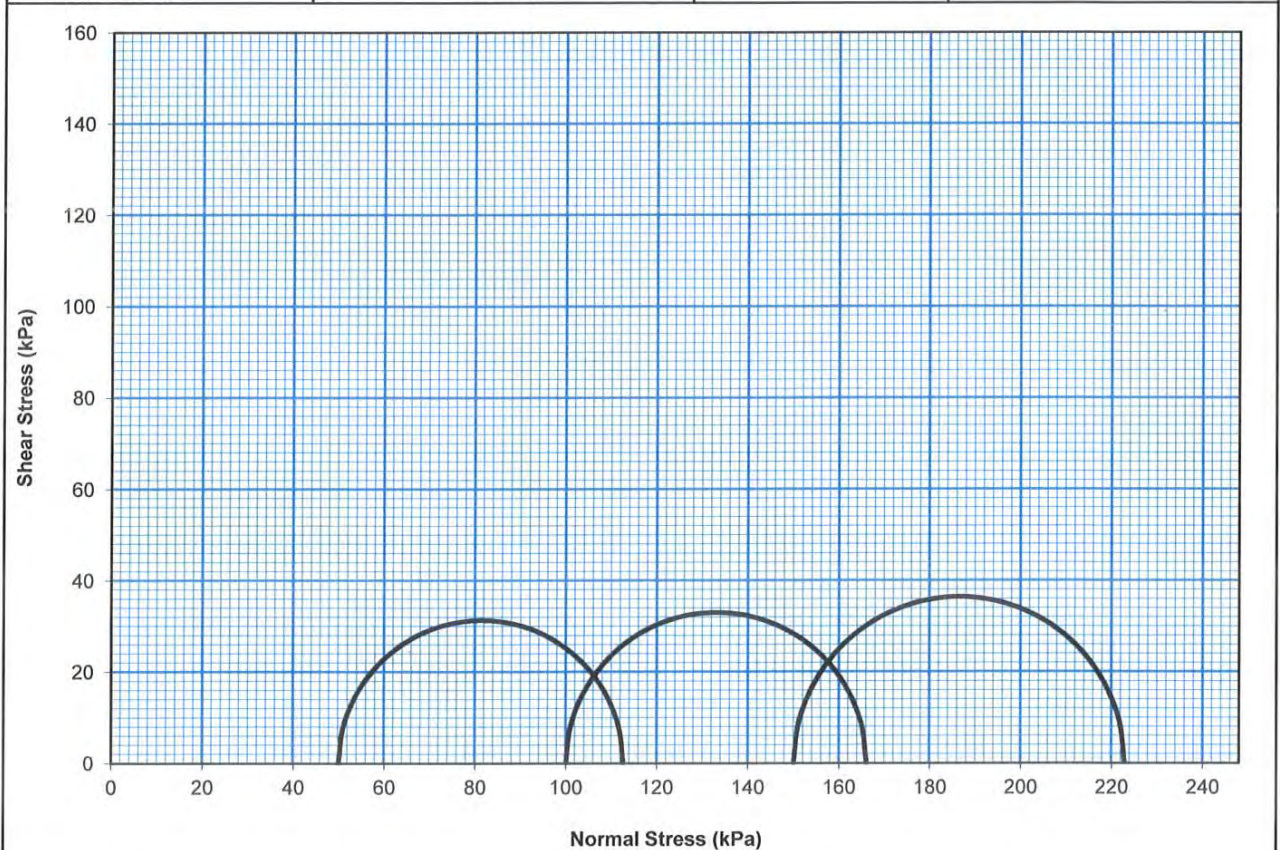
Prepared by *mt*

Checked by *gt*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16178
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303514
Location/Sample ID :	BH6 007 (6.00 - 6.40m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	48.0 mm	Specimen Height :	96.0 mm
Initial Moisture Content :	29.5 %	Initial Saturation :	96 %
Initial Dry Density :	1.48 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	113	50	63	1.8
2	100	166	100	66	2.6
3	150	223	150	73	4.7

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *MF*

Checked by *LIN*



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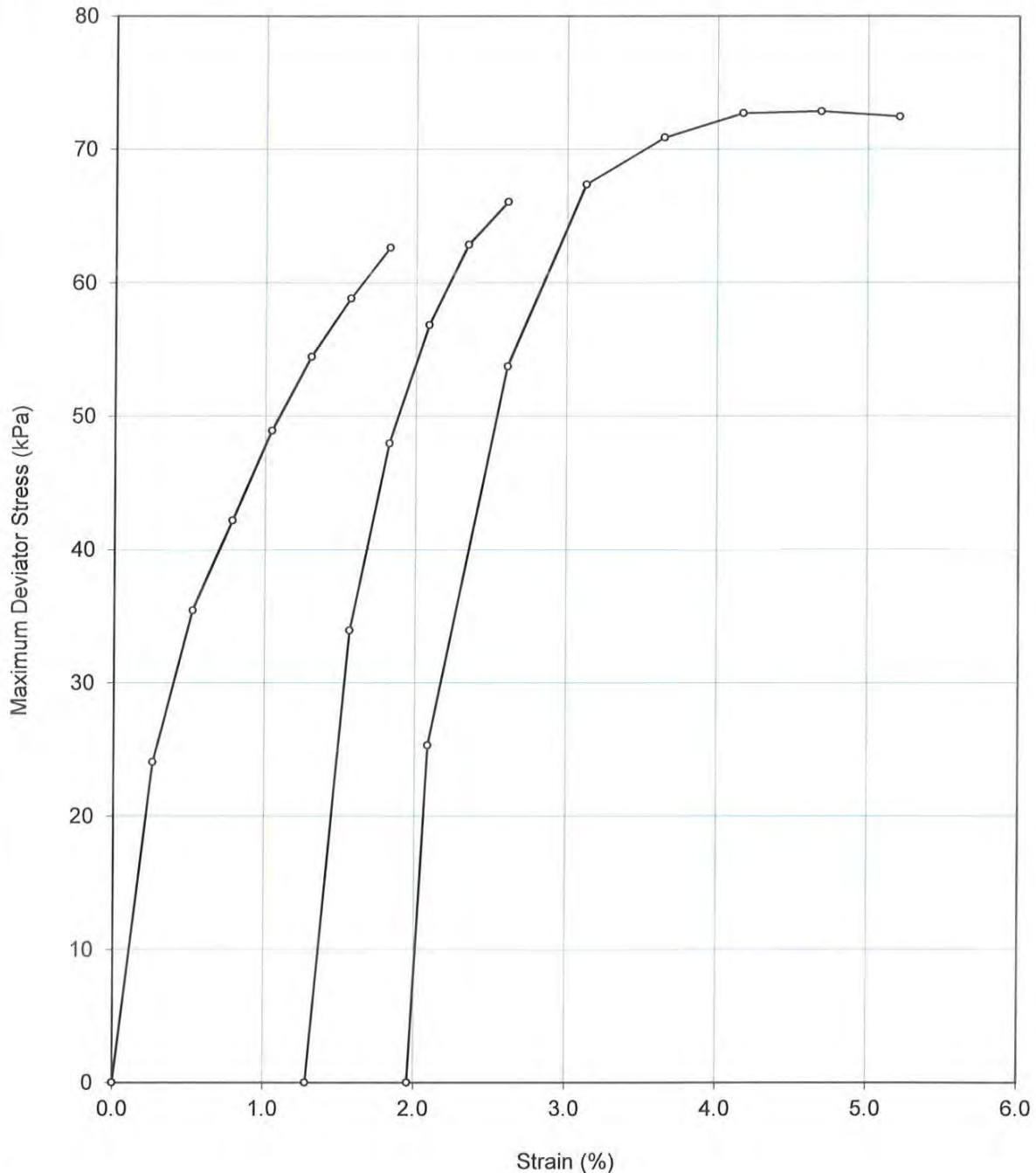
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH6 007 (6.00 - 6.40m)

Report No. : R16178
Job No. : 137632122
Reg'n No. : 13303514
Sample No. :
Sampled By : Client



Prepared by *me*

Checked by *GB*


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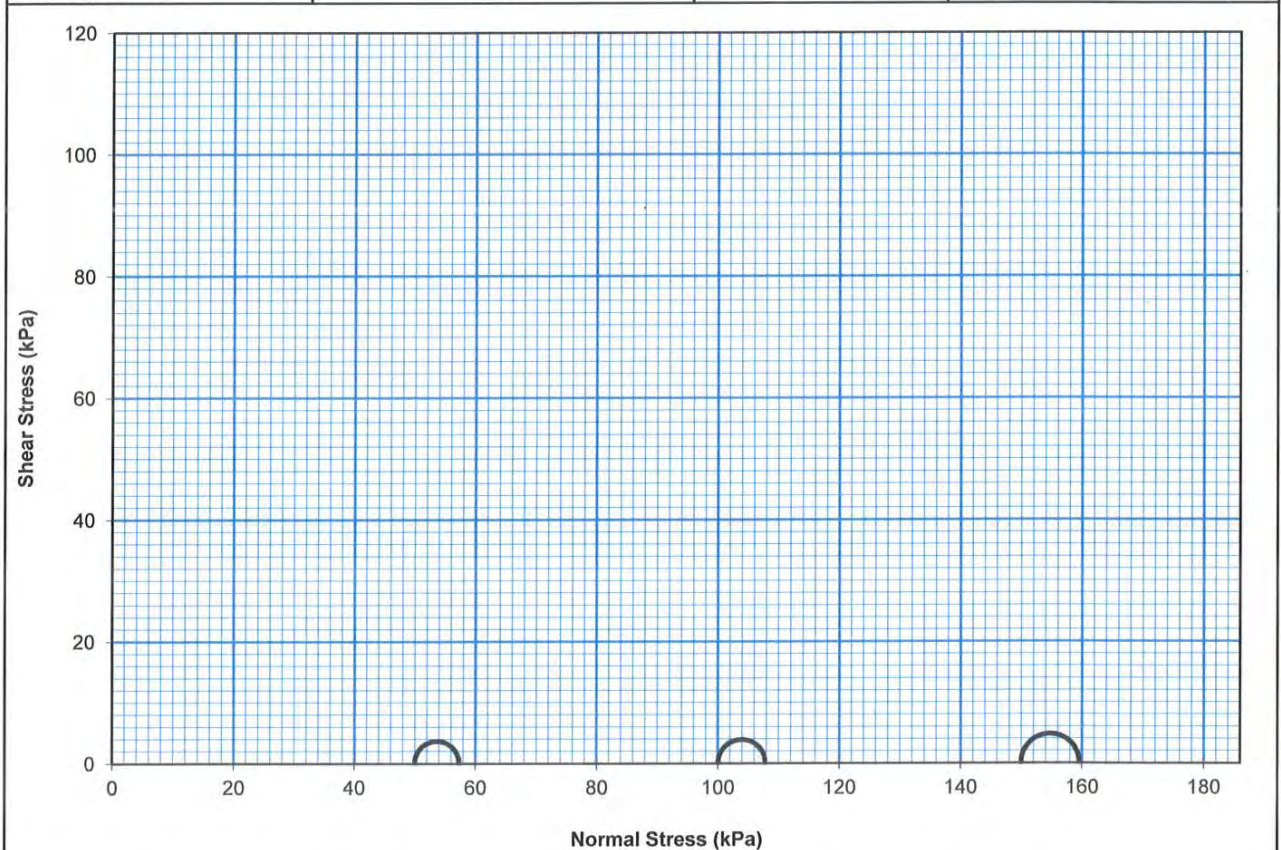
Phone : (07) 3840 9500

Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16179
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303516
Location/Sample ID :	BH7 002 (3.20 - 3.60m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	48.0 mm	Specimen Height :	96.0 mm
Initial Moisture Content :	54.1 %	Initial Saturation :	99 %
Initial Dry Density :	1.09 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	57	50	7	1.6
2	100	108	100	8	3.1
3	150	160	150	10	4.7

Failure Criteria : Maximum Shear Stress

Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mf*Checked by *mf*

This document is issued in accordance with NATA's accreditation requirements.



Nick Farrer

Approved Signatory

mf 29/8/13

Senior Technical Officer

NATA Accred. No. : 1961

Golder Form No. R19
RL1 - 29/01/08



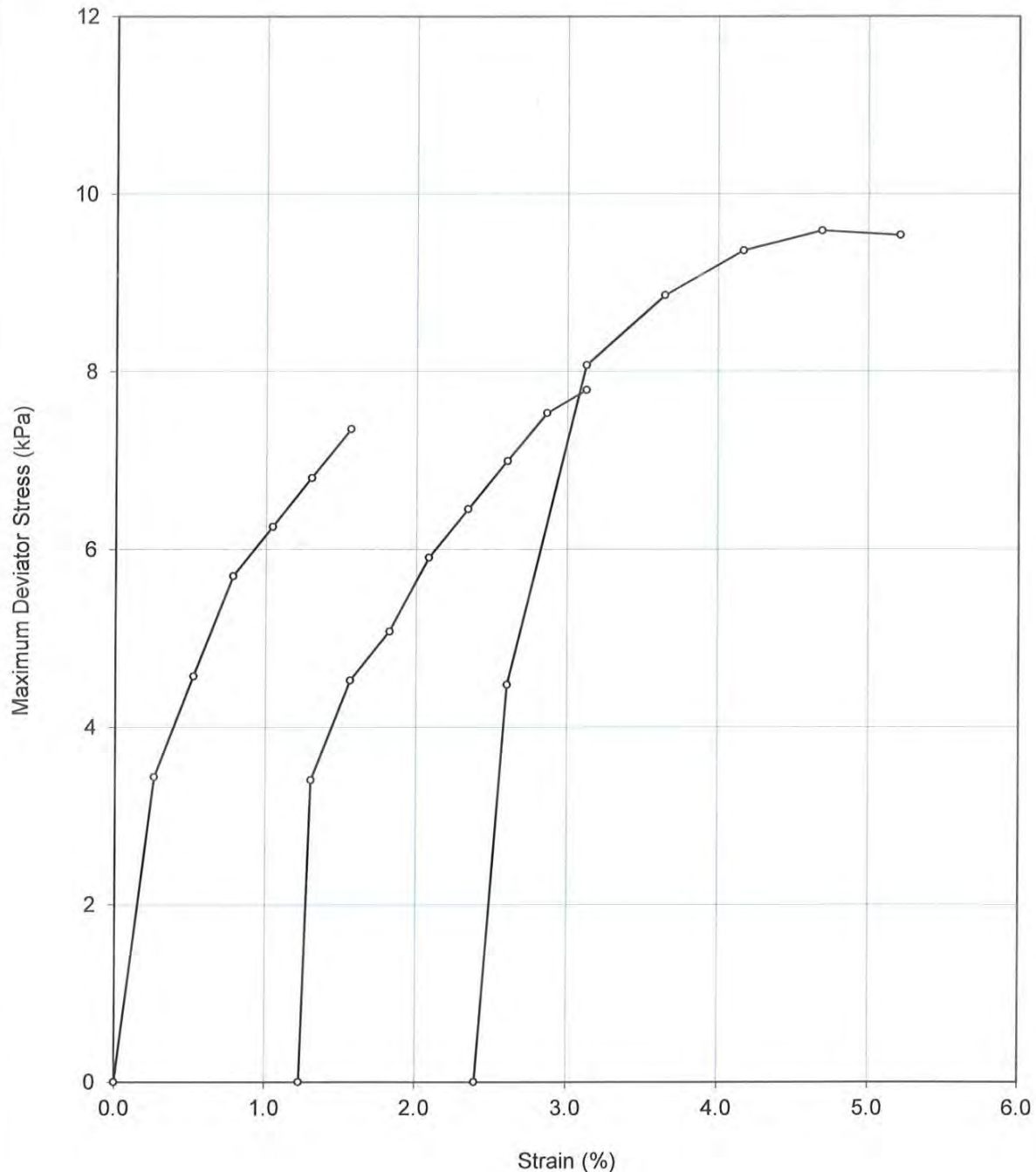
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Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH7 002 (3.20 - 3.60m)

Report No. : R16179
Job No. : 137632122
Reg'n No. : 13303516
Sample No. :
Sampled By : Client



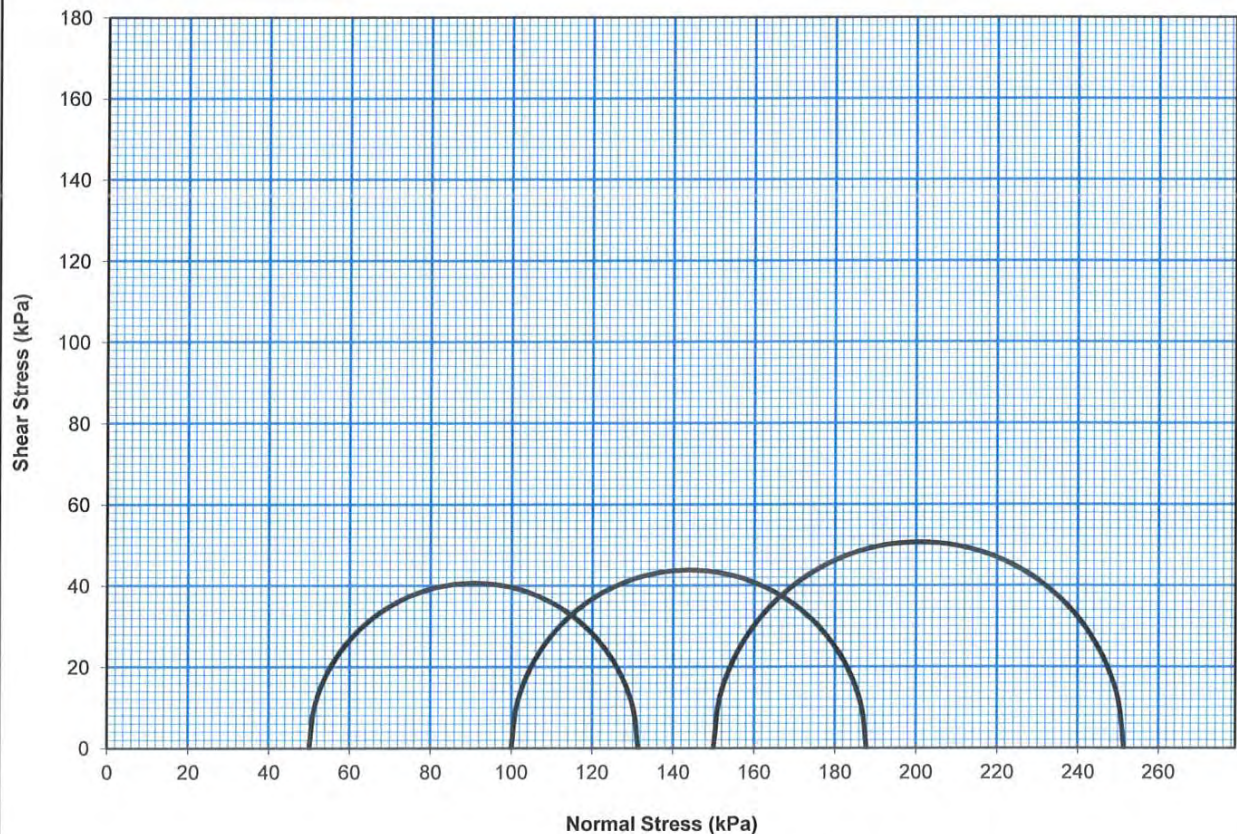
Prepared by *AK*

Checked by *GL*

TRIAXIAL SHEAR TEST

Client :	Ports North	Report No. : R16180
Address :	Cnr Grafton & Hartley Streets, Cairns	Job No. : 137632122
Project :	Cairns Shipping Development Project EIS	Reg'n No. : 13303517
Location/Sample ID :	BH7 003 (4.20 - 4.60m)	Sample No. :
Date of Test :	28/8/13	Sampled By : Client

Type of test :	Unsaturated, Unconsolidated, Undrained, Staged		
Sample Type :	Undisturbed	Strain Rate :	0.50 mm/min
Specimen Diameter :	47.7 mm	Specimen Height :	95.0 mm
Initial Moisture Content :	30.5 %	Initial Saturation :	100 %
Initial Dry Density :	1.49 t/m ³		



Stage	Initial Cell Pressure (kPa)	Maximum Principal Stress (kPa) σ_1	Minimum Principal Stress (kPa) σ_3	Maximum Deviator Stress (kPa)	Failure Strain (%)
1	50	131	50	81	1.6
2	100	188	100	88	2.1
3	150	251	150	101	4.2

Failure Criteria : Maximum Shear Stress
Remarks :

Test Procedure : AS1289.6.4.1

Prepared by *mk*

Checked by *ck*

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Nick Farrer
Approved Signatory

Mmm 29/8/13
Senior Technical Officer
NATA Accred. No. : 1961



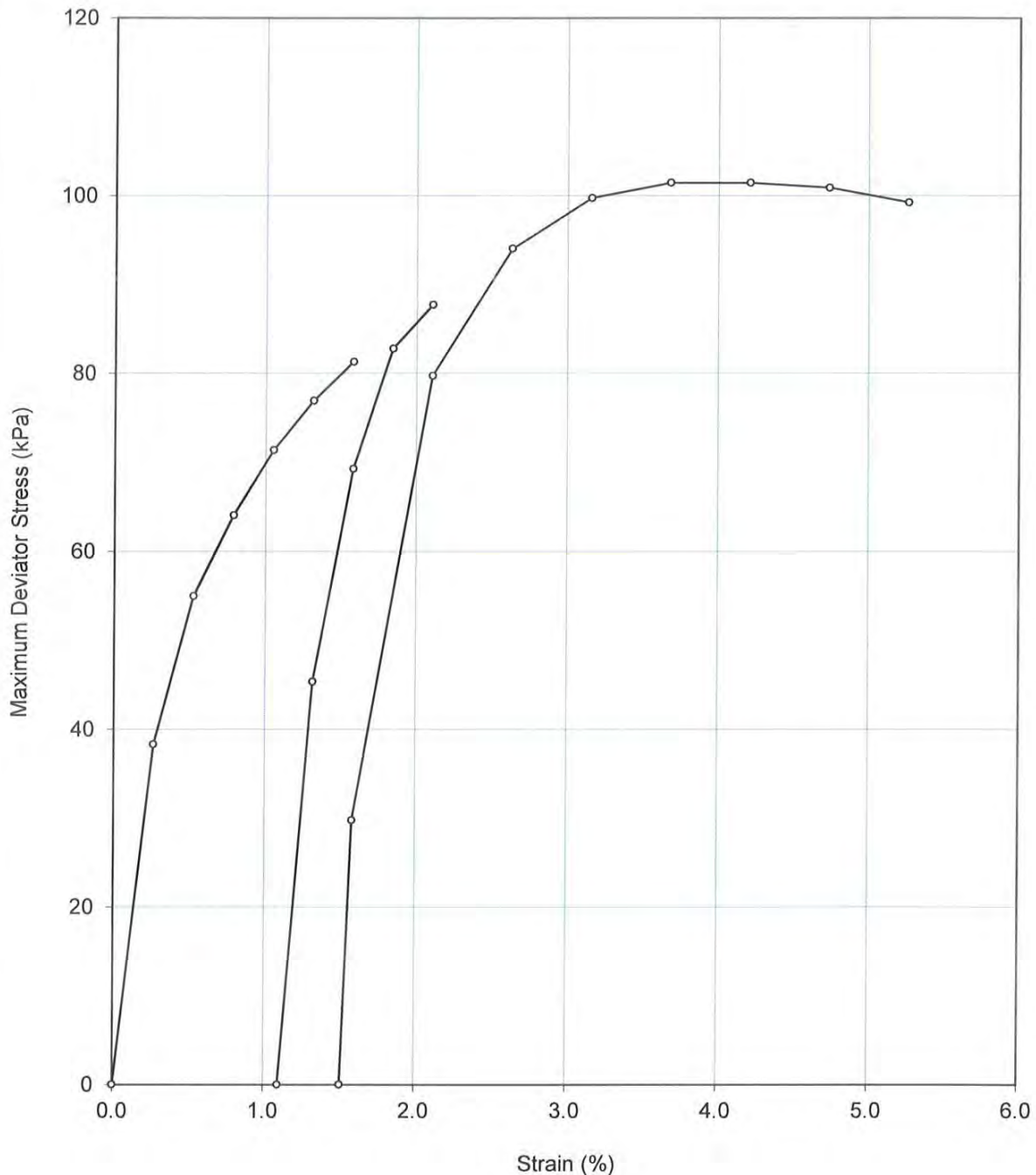
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Email : bnelab@golder.com.au

TRIAXIAL SHEAR TEST (STRESS STRAIN GRAPH)

Client : Ports North
Address : Cnr Grafton & Hartley Streets, Cairns
Project : Cairns Shipping Development Project EIS
Location/Sample ID : BH7 003 (4.20 - 4.60m)

Report No. : R16180
Job No. : 137632122
Reg'n No. : 13303517
Sample No. :
Sampled By : Client



Prepared by *mk*

Checked by *ms*