



TEST CERTIFICATE

SGS Australia Pty Ltd
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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2011	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6196
Lab:	Bassendean	Sample ID:	A14453 J MET #13 (8.6 - 8.9m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 85.3

Length/Diameter Ratio: 2.6

Bulk Dry Density (t/m³): 2.655

Moisture Content (%): 1.2

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 4.13



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Axial failure

Duration of Tests: 5.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



Accredited for compliance with ISO/IEC 17025

Accreditation No.: 2418 Form No. PF-(AU)-[IND(MTE)]-TE-R300.LCER/A/01.01.2009
Client Address: 6 MacAdam Place Balcatta 6021

Site No.: 2411
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Page: 1 of 1



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6197
Lab:	Bassendean	Sample ID:	A14453 J MET #13 (25.10 - 25.44m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 85.5

Length/Diameter Ratio: 2.8

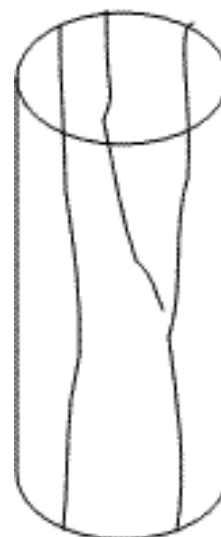
Bulk Dry Density (t/m³): 2.726

Moisture Content (%): 1.0

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 7.85



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Axial failure

Duration of Tests: 6. mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Page: 1 of 1



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Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6198
Lab:	Bassendean	Sample ID:	A14453 J MET #13 (43.75 - 44.00m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 85.6

Length/Diameter Ratio: 2.9

Bulk Dry Density (t/m3): 2.799

Moisture Content (%): 0.1

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 37.0**



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Axial failure

Duration of Tests 10.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Page: 1 of 1



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Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6199
Lab:	Bassendean	Sample ID:	A14453 J MET #13 (59.29 - 59.64m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 85.7

Length/Diameter Ratio: 2.7

Bulk Dry Density (t/m3): 2.988

Moisture Content (%): 0.2

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 41.5



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shear failure

Duration of Tests 10.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6200
Lab:	Bassendean	Sample ID:	A14453 J MET #13 (74.69 - 75.00m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 86.0

Length/Diameter Ratio: 2.8

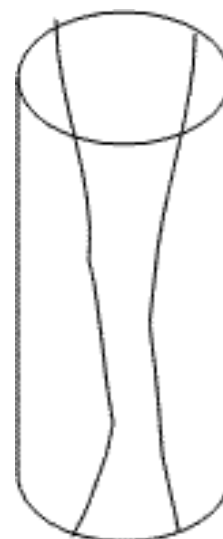
Bulk Dry Density (t/m³): 2.814

Moisture Content (%): 0.6

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 58.0



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Axial failure

Duration of Tests 11.3 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Page: 1 of 1



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6201
Lab:	Bassendean	Sample ID:	A14453 J MET #06 (78.18 - 78.42m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 61.0

Length/Diameter Ratio: 2.7

Bulk Dry Density (t/m3): 2.884

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 65.6



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Shear failure

Duration of Tests 12.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

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Page: 1 of 1



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6202
Lab:	Bassendean	Sample ID:	A14453 J MET #06 (83.56 - 83.76m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 60.8

Length/Diameter Ratio: 2.6

Bulk Dry Density (t/m3): 3.214

Moisture Content (%): 0.0

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 72.5



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shear failure

Duration of Tests 5.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Page: 1 of 1



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6203
Lab:	Bassendean	Sample ID:	A14453 J MET #06 (97.73 - 98.00m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 61.0

Length/Diameter Ratio: 2.8

Bulk Dry Density (t/m³): 3.244

Moisture Content (%): 0.1

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 35.0**



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shear failure

Duration of Tests 9.3 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6204
Lab:	Bassendean	Sample ID:	A14453 J MET #06 (103.51 - 103.73m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 61.0

Length/Diameter Ratio: 2.7

Bulk Dry Density (t/m³): 3.698

Moisture Content (%): 0.0

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 40.4



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Shear failure

Duration of Tests: 7.4 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6205
Lab:	Bassendean	Sample ID:	A14453 J MET #06 (111.57 - 111.86m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 61.0
Length/Diameter Ratio: 2.9

Bulk Dry Density (t/m³): 3.036

Moisture Content (%): 0.2

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 54.3**



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet
Mode of Failure: Shattered failure
Duration of Tests 11.4 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6206
Lab:	Bassendean	Sample ID:	A14453 J MET #06 (114.23 - 114.45m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 61.0

Length/Diameter Ratio: 2.8

Bulk Dry Density (t/m³): 3.262

Moisture Content (%): 0.1

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 26.5**



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Top end failure

Duration of Tests: 8.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Site No.: 2411
Cert No.: 12-MT-6206-R300
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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6207
Lab:	Bassendean	Sample ID:	A14453 J MET #08 (3.47 - 3.72m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 60.9
Length/Diameter Ratio: 2.3

Bulk Dry Density (t/m3): 2.877

Moisture Content (%): 0.2

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 10.9**



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet
Deviation from Standard: Less than required minimum
L/D Ratio of 2.5
Mode of Failure: Shattered failure
Duration of Tests: 5.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6208
Lab:	Bassendean	Sample ID:	A14453 J MET #08 (19.42 - 19.74m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 60.7

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m3): 2.877

Moisture Content (%): 0.3

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 34.6



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Shear failure

Duration of Tests 9.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6209
Lab:	Bassendean	Sample ID:	A14453 J MET #08 (21.62 - 21.89m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 60.7

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m3): 2.828

Moisture Content (%): 0.1

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 30.5**



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Shear failure

Duration of Tests 8.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6210
Lab:	Bassendean	Sample ID:	A14453 J MET #08 (28.62 - 28.86m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 60.7

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m³): 2.561

Moisture Content (%): 0.8

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 11.7



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Irregular failure

Duration of Tests 5.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6212
Lab:	Bassendean	Sample ID:	A14453 J MET #08 (46.44 - 46.73m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ3 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 60.9

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m3): 2.699

Moisture Content (%): 0.8

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 25.3



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Shear failure

Duration of Tests 9.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6213
Lab:	Bassendean	Sample ID:	A14390 HCTW-01 (38.0 - 39.5m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.0

Length/Diameter Ratio: 2.0

Bulk Dry Density (t/m3): 2.850

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 175



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Wedge failure

Duration of Tests 13.3 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6214
Lab:	Bassendean	Sample ID:	A14390 HCTW-01 (50.0 - 51.3m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.2

Length/Diameter Ratio: 2.5

Bulk Dry Density (t/m3): 2.914

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 135



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shattered failure

Duration of Tests 10.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6217
Lab:	Bassendean	Sample ID:	A14390 HCTW-03 (49.45 - 51.0m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.4

Length/Diameter Ratio: 2.6

Bulk Dry Density (t/m3): 2.592

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 238



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shattered failure

Duration of Tests 14.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



Accredited for compliance with ISO/IEC 17025

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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6218
Lab:	Bassendean	Sample ID:	A14390 HCTW-03 (63.0 - 64.0m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.2

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m³): 2.882

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 42.4



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Shear failure

Duration of Tests 7.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



Accredited for compliance with ISO/IEC 17025

Accreditation No.: 2418 Form No. PF-(AU)-[IND(MTE)]-TE-R300.LCER/A/01.01.2009
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Site No.: 2411
Cert No.: 12-MT-6218-R300
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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6219
Lab:	Bassendean	Sample ID:	A14390 HCTW-04 (54.65 - 56.76m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.2

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m³): 2.656

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 182



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet
Deviation from Standard: Less than required minimum
L/D Ratio of 2.5
Mode of Failure: Shattered failure

Duration of Tests 13.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Accreditation No.: 2418 Form No. PF-(AU)-[IND(MTE)]-TE-R300.LCER/A/01.01.2009
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Site No.: 2411
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TEST CERTIFICATE

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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6220
Lab:	Bassendean	Sample ID:	A14390 HCTW-04 (95.42 - 95.90m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.3

Length/Diameter Ratio: 2.2

Bulk Dry Density (t/m3): 2.777

Moisture Content (%): 0.0

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 184



Accreditation No. 2418

Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Shattered failure

Duration of Tests 13.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



Accredited for compliance with ISO/IEC 17025

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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6221
Lab:	Bassendean	Sample ID:	A14390 HCTW-05 (105.0 - 106.5m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.3

Length/Diameter Ratio: 2.3

Bulk Dry Density (t/m3): 2.710

Moisture Content (%): 0.1

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 175**



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Axial failure

Duration of Tests 14.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6222
Lab:	Bassendean	Sample ID:	A14390 HCTW-05 (136.6 - 138.4m)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: HQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 63.5

Length/Diameter Ratio: 2.3

Bulk Dry Density (t/m³): 2.636

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 199



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Deviation from Standard: Less than required minimum

Mode of Failure: L/D Ratio of 2.5

Mode of Failure: Irregular failure

Duration of Tests 14.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6224
Lab:	Bassendean	Sample ID:	A14085 MNP0215 DM (UCS 2)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: #N/A

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 67.4

Length/Diameter Ratio: 2.5

Bulk Dry Density (t/m³): 3.729

Moisture Content (%): 0.3

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 6.90



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shattered failure

Duration of Tests 5.3 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6225
Lab:	Bassendean	Sample ID:	A14085 MNP0215 DM (UCS 3)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: #N/A

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 67.0

Length/Diameter Ratio: 2.6

Bulk Dry Density (t/m³): 3.502

Moisture Content (%): 0.5

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 12.7



Accreditation No. 2418

Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Shattered failure

Duration of Tests 6.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6226
Lab:	Bassendean	Sample ID:	A14085 MNP0215 DM (UCS 4)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: #N/A

INITIAL SPECIMEN DETAILS

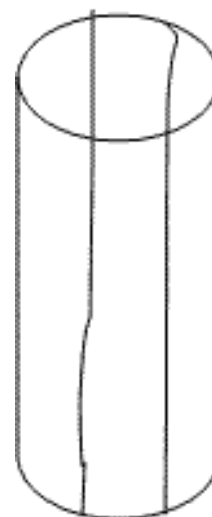
Core Diameter (mm): 67.3

Length/Diameter Ratio: 2.6

Bulk Dry Density (t/m3): 3.485

Moisture Content (%): 0.5

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 33.5**



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Axial failure

Duration of Tests 7.6 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6229
Lab:	Bassendean	Sample ID:	A14085 MNP0212 DM (UCS 2)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 84.4

Length/Diameter Ratio: 2.0

Bulk Dry Density (t/m³): 2.837

Moisture Content (%): 3.0

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 8.05



Moisture Condition:	Specimen prepared at the moisture condition as received. Polished wet
Deviation from Standard:	Less than required minimum L/D Ratio of 2.5
Deviation from Standard:	Non-uniformity of sides exceeds limits of test method
Mode of Failure:	Shear failure
Duration of Tests	5.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6230
Lab:	Bassendean	Sample ID:	A14085 MNP0212 DM (UCS 3)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 84.8

Length/Diameter Ratio: 2.4

Bulk Dry Density (t/m³): 3.555

Moisture Content (%): 2.0

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 33.7**



Moisture Condition:	Specimen prepared at the moisture condition as received. Polished wet
Deviation from Standard:	Less than required minimum L/D Ratio of 2.5
Deviation from Standard:	Non-uniformity of sides exceeds limits of test method
Mode of Failure:	Axial failure
Duration of Tests	9.1 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	9/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6233
Lab:	Bassendean	Sample ID:	A14085 MNP0212 DM (UCS 6)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: PQ Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 84.7

Length/Diameter Ratio: 2.5

Bulk Dry Density (t/m³): 2.978

Moisture Content (%): 2.4

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 22.1



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Irregular failure

Duration of Tests: 6.4 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Accreditation No.: 2418 Form No. PF-(AU)-[IND(MTE)]-TE-R300.LCER/A/01.01.2009
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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6234
Lab:	Bassendean	Sample ID:	A14085 MNP0212 DM (UCS 7)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:

Indicative Only

Sample Type: NQ2 Core

INITIAL SPECIMEN DETAILS

Core Diameter (mm): 50.4

Length/Diameter Ratio: 2.9

Bulk Dry Density (t/m3): 3.234

Moisture Content (%): 0.1

UNIAXIAL

COMPRESSIVE

STRENGTH (MPa): 68.5



Moisture Condition: Specimen prepared at the moisture condition as received. Polished wet

Mode of Failure: Shear failure

Duration of Tests 5.2 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



Accredited for compliance with ISO/IEC 17025

Accreditation No.: 2418 Form No. PF-(AU)-[IND(MTE)]-TE-R300.LCER/A/01.01.2009
Client Address: 6 MacAdam Place Balcatta 6021

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Client:	Ammtec Ltd	Client Job No:	
Order No:	104003	Project:	Submitted Sample
Tested Date:	10/07/2012	Location:	
SGS Job Number:	12-01-1267	Sample No:	12-MT-6236
Lab:	Bassendean	Sample ID:	A14085 MNP0212 DM (UCS 9)

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

AS4133.4.2.1

Failure Diagram not to scale:
Indicative Only

Sample Type: NQ2 Core

INITIAL SPECIMEN DETAILS

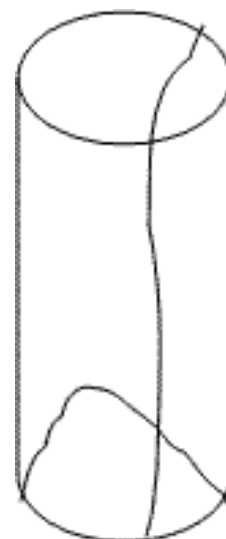
Core Diameter (mm): 50.0

Length/Diameter Ratio: 3.0

Bulk Dry Density (t/m3): 3.599

Moisture Content (%): 0.0

**UNIAXIAL
COMPRESSIVE
STRENGTH (MPa): 147**



Moisture Condition: Specimen prepared at the
moisture condition as
received. Polished wet

Mode of Failure: Axial failure

Duration of Tests 6.5 mins

Note: Sample supplied by client.

Bulk Density value was determined by the Calliper method

Dimensions & Mass for bulk density calculation were determined on the specimen immediately before loading. Dry mass was calculated from the moisture content (AS 4133.1.1.1) taken from the UCS specimen

Bulk Density was not immersed hence Porosity has not been reported. Bulk Dry Density has been reported. Full immersion would have affected the pre-test condition.

Tested on a hydraulic compression machine

Approved Signatory: *Slobodanka Petkovic* (Slobodanka.Petkovic)

Date: 11/07/2012



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Page: 1 of 1