

UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH107**

Sample Ref: **203**

Sample Type: **C**

Depth (m): **3.40**

Bulk Density (Mg/m^3): **2.25**

Dry Density (Mg/m^3): **2.09**

Moisture Content (%): **7.3**

Length (mm): **208.47**

Diameter (mm): **104.50**

Length/Diameter Ratio: **1.99**

Test Duration (mins:secs): **6**

Stress Rate (kN/min): **6.6**

Load at Failure (kN): **116.0**

UCS (MPa): **13.5**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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Date

M. Fisher

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RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Depth (m): **7.75**

Failure Type: **Shear**

Remarks: Non-standard notes: **Non Standard Test**

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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH107**

Sample Ref: **207**

Sample Type: **C**

Depth (m): **11.30**

Bulk Density (Mg/m^3): **2.20**

Dry Density (Mg/m^3): **1.98**

Moisture Content (%): **11**

Length (mm): **239.28**

Diameter (mm): **105.50**

Length/Diameter Ratio: **2.27**

Test Duration (mins:secs): **2.75**

Stress Rate (kN/min): **20**

Load at Failure (kN): **57.9**

UCS (MPa): **6.6**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Red brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No photographs available**

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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Depth (m): **8.24**

Failure Type: **Shear**

Non-standard notes: **Non-standard test**



Rear view (pre-test)



Rear view (post-test)

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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH108**

Sample Ref: **204**

Sample Type: **C**

Depth (m): **9.91**

Bulk Density (Mg/m^3): **2.24**

Dry Density (Mg/m^3): **2.04**

Moisture Content (%): **9.9**

Length (mm): **234.50**

Diameter (mm): **106.44**

Length/Diameter Ratio: **2.20**

Test Duration (mins:secs): **9.25**

Stress Rate (kN/min): **10**

Load at Failure (kN): **133.0**

UCS (MPa): **14.9**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH108**

Sample Ref: **210**

Sample Type: **C**

Depth (m): **19.08**

Bulk Density (Mg/m^3): **2.24**

Dry Density (Mg/m^3): **2.01**

Moisture Content (%): **11**

Length (mm): **212.73**

Diameter (mm): **106.45**

Length/Diameter Ratio: **2.00**

Test Duration (mins:secs): **4.75**

Stress Rate (kN/min): **10**

Load at Failure (kN): **76.3**

UCS (MPa): **8.6**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)



Depth (m): **32.70**

Failure Type: **Shear**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH108**

Sample Ref: **221**

Sample Type: **C**

Depth (m): **36.88**

Bulk Density (Mg/m^3): **2.30**

Dry Density (Mg/m^3): **2.16**

Moisture Content (%): **6.2**

Length (mm): **262.39**

Diameter (mm): **106.53**

Length/Diameter Ratio: **2.46**

Test Duration (mins:secs): **3**

Stress Rate (kN/min): **6.6**

Load at Failure (kN): **74.9**

UCS (MPa): **8.4**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No photographs available**

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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH109**

Sample Ref: **201**

Sample Type: **C**

Depth (m): **11.33**

Bulk Density (Mg/m^3): **2.20**

Dry Density (Mg/m^3): **2.03**

Moisture Content (%): **8.4**

Length (mm): **145.91**

Diameter (mm): **107.45**

Length/Diameter Ratio: **1.36**

Test Duration (mins:secs): **20**

Stress Rate (kN/min): **13**

Load at Failure (kN): **267.9**

UCS (MPa): **29.5**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description:

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No photographs available** Non-standard notes: **Non-standard test**

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Borehole: **BH109**

Sample Ref: **202**

Sample Type: **C**

Depth (m): **12.54**

Bulk Density (Mg/m^3): **2.13**

Dry Density (Mg/m^3): **2.00**

Moisture Content (%): **6.5**

Length (mm): **179.42**

Diameter (mm): **106.72**

Length/Diameter Ratio: **1.68**

Test Duration (mins:secs): **3**

Stress Rate (kN/min): **10**

Load at Failure (kN): **98.3**

UCS (MPa): **11.0**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No rear view photographs** Non-standard notes: **Non-standard test**



Pre-test front



Post-test front

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Borehole: **BH109**

Sample Ref: **203**

Sample Type: **C**

Depth (m): **14.12**

Bulk Density (Mg/m^3): **2.24**

Dry Density (Mg/m^3): **2.05**

Moisture Content (%): **9.1**

Length (mm): **221.62**

Diameter (mm): **107.01**

Length/Diameter Ratio: **2.07**

Test Duration (mins:secs): **8.75**

Stress Rate (kN/min): **16**

Load at Failure (kN): **155.2**

UCS (MPa): **17.3**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No photographs available**

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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH109**

Sample Ref: **208**

Sample Type: **C**

Depth (m): **21.83**

Bulk Density (Mg/m^3): **2.20**

Dry Density (Mg/m^3): **2.17**

Moisture Content (%): **1.1**

Length (mm): **145.91**

Diameter (mm): **107.45**

Length/Diameter Ratio: **1.36**

Test Duration (mins:secs): **20**

Stress Rate (kN/min): **13**

Load at Failure (kN): **267.9**

UCS (MPa): **29.5**

Failure Type: **Shear**

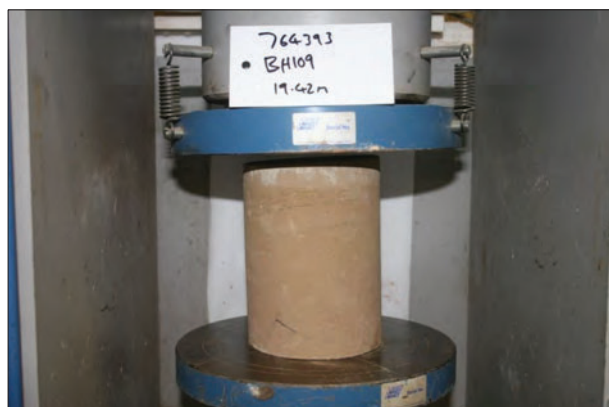
Note: **Axis of loading parallel to core axis**

Description: **Light brown LIMESTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Non-standard notes: **Non-standard test**



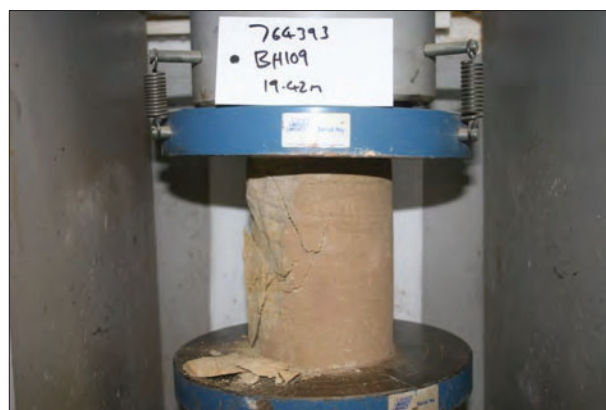
Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH109** Sample Ref: **211** Sample Type: **C** Depth (m): **25.20**

Bulk Density (Mg/m^3): **2.90** Dry Density (Mg/m^3): **2.66** Moisture Content (%): **8.9**
Length (mm): **203.46** Diameter (mm): **106.85** Length/Diameter Ratio: **1.90**
Test Duration (mins:secs): **10** Stress Rate (kN/min): **13** Load at Failure (kN): **123.7**
UCS (MPa): **13.8** Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**
Description: **Red/brown SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH110**

Sample Ref: **201**

Sample Type: **C**

Depth (m): **1.85**

Bulk Density (Mg/m^3): **2.18**

Dry Density (Mg/m^3): **2.05**

Moisture Content (%): **6.4**

Length (mm): **301.39**

Diameter (mm): **105.58**

Length/Diameter Ratio: **2.85**

Test Duration (mins:secs): **7.5**

Stress Rate (kN/min): **10**

Load at Failure (kN): **107.1**

UCS (MPa): **12.2**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH110**

Sample Ref: **205**

Sample Type: **C**

Depth (m): **7.60**

Bulk Density (Mg/m³): **2.24**

Dry Density (Mg/m³): **2.07**

Moisture Content (%): **8.3**

Length (mm): **300.87**

Diameter (mm): **106.16**

Length/Diameter Ratio: **2.83**

Test Duration (mins:secs): **7.25**

Stress Rate (kN/min): **6.6**

Load at Failure (kN): **122.9**

UCS (MPa): **13.9**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No photographs available**

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH110**

Sample Ref: **207**

Sample Type: **C**

Depth (m): **10.44**

Bulk Density (Mg/m^3): **2.15**

Dry Density (Mg/m^3): **1.97**

Moisture Content (%): **9.6**

Length (mm): **279.86**

Diameter (mm): **106.20**

Length/Diameter Ratio: **2.64**

Test Duration (mins:secs): **3**

Stress Rate (kN/min): **10**

Load at Failure (kN): **118.6**

UCS (MPa): **13.4**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



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Borehole: **BH110**

Sample Ref: **208**

Sample Type: **C**

Depth (m): **11.88**

Bulk Density (Mg/m³): **2.17**

Dry Density (Mg/m³): **1.96**

Moisture Content (%): **11**

Length (mm): **201.12**

Diameter (mm): **105.54**

Length/Diameter Ratio: **1.91**

Test Duration (mins:secs): **2.25**

Stress Rate (kN/min): **10**

Load at Failure (kN): **62.5**

UCS (MPa): **7.1**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No rear view photographs** Non-standard notes: **Non-standard test**



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RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH111**

Sample Ref: **215**

Sample Type: **C**

Depth (m): **29.02**

Bulk Density (Mg/m^3): **2.27**

Dry Density (Mg/m^3): **2.16**

Moisture Content (%): **5.2**

Length (mm): **223.24**

Diameter (mm): **105.92**

Length/Diameter Ratio: **2.11**

Test Duration (mins:secs): **4.25**

Stress Rate (kN/min): **10**

Load at Failure (kN): **32.0**

UCS (MPa): **3.6**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Light brown, dark brown, grey, green and yellow SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



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764393



UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH111**

Sample Ref: **216**

Sample Type: **C**

Depth (m): **29.73**

Bulk Density (Mg/m^3): **2.22**

Dry Density (Mg/m^3): **2.02**

Moisture Content (%): **10**

Length (mm): **171.00**

Diameter (mm): **105.59**

Length/Diameter Ratio: **1.62**

Test Duration (mins:secs): **1**

Stress Rate (kN/min): **16**

Load at Failure (kN): **32.3**

UCS (MPa): **3.7**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown/red SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Non-standard notes: **Non-standard test**



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



STRUCTURAL SOILS
The Potteries
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Compiled By

M. Fisher

MAUREEN FISHER

Date

30/05/18

Contract

Project Blue

Job No

764393



UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH111**

Sample Ref: **218**

Sample Type: **C**

Depth (m): **32.83**

Bulk Density (Mg/m^3): **2.10**

Dry Density (Mg/m^3): **1.95**

Moisture Content (%): **7.7**

Length (mm): **200.78**

Diameter (mm): **106.61**

Length/Diameter Ratio: **1.88**

Test Duration (mins:secs): **3**

Stress Rate (kN/min): **10**

Load at Failure (kN): **80.4**

UCS (MPa): **9.0**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: Non-standard notes: **Non Standard Test**



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
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UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH112**

Sample Ref: **210**

Sample Type: **C**

Depth (m): **17.51**

Bulk Density (Mg/m^3): **2.03**

Dry Density (Mg/m^3): **2.02**

Moisture Content (%): **0.32**

Length (mm): **135.99**

Diameter (mm): **106.85**

Length/Diameter Ratio: **1.27**

Test Duration (mins:secs): **16**

Stress Rate (kN/min): **6.6**

Load at Failure (kN): **114.2**

UCS (MPa): **12.7**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Light brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Non-standard notes: **Non-standard test**



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH113A**

Sample Ref: **203**

Sample Type: **C**

Depth (m): **5.93**

Bulk Density (Mg/m^3): **2.07**

Dry Density (Mg/m^3): **2.04**

Moisture Content (%): **1.4**

Length (mm): **139.31**

Diameter (mm): **106.69**

Length/Diameter Ratio: **1.31**

Test Duration (mins:secs): **9**

Stress Rate (kN/min): **13**

Load at Failure (kN): **117.0**

UCS (MPa): **13.1**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Light brown/light red SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Non-standard notes: **Non-standard test**



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH113A**

Sample Ref: **205**

Sample Type: **C**

Depth (m): **7.35**

Bulk Density (Mg/m^3): **2.27**

Dry Density (Mg/m^3): **2.23**

Moisture Content (%): **1.7**

Length (mm): **143.00**

Diameter (mm): **104.34**

Length/Diameter Ratio: **1.37**

Test Duration (mins:secs): **52**

Stress Rate (kN/min): **4.2**

Load at Failure (kN): **222.8**

UCS (MPa): **26.1**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Light grey SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: Non-standard notes: **Non Standard Test**



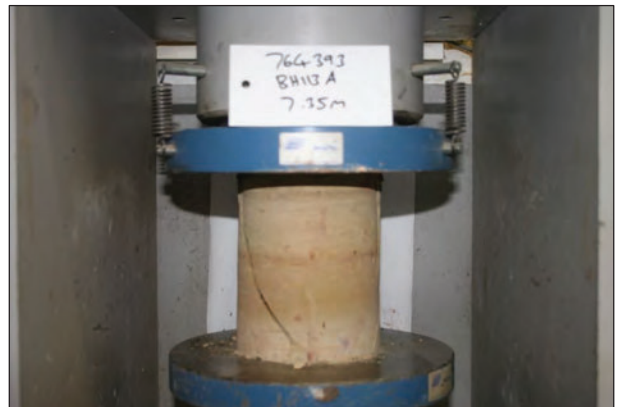
Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH113A**

Sample Ref: **207**

Sample Type: **C**

Depth (m): **10.51**

Bulk Density (Mg/m^3): **2.27**

Dry Density (Mg/m^3): **2.16**

Moisture Content (%): **4.8**

Length (mm): **208.08**

Diameter (mm): **106.07**

Length/Diameter Ratio: **1.96**

Test Duration (mins:secs): **2.5**

Stress Rate (kN/min): **6.6**

Load at Failure (kN): **55.3**

UCS (MPa): **6.3**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Red brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH114**

Sample Ref: **205**

Sample Type: **C**

Depth (m): **14.50**

Bulk Density (Mg/m^3): **2.16**

Dry Density (Mg/m^3): **1.94**

Moisture Content (%): **11**

Length (mm): **161.99**

Diameter (mm): **106.68**

Length/Diameter Ratio: **1.52**

Test Duration (mins:secs): **2.25**

Stress Rate (kN/min): **10**

Load at Failure (kN): **56.0**

UCS (MPa): **6.3**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: Non-standard notes: **Non Standard Test**



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH114**

Sample Ref: **207**

Sample Type: **C**

Depth (m): **17.90**

Bulk Density (Mg/m^3): **2.06**

Dry Density (Mg/m^3): **1.95**

Moisture Content (%): **5.2**

Length (mm): **192.08**

Diameter (mm): **105.88**

Length/Diameter Ratio: **1.81**

Test Duration (mins:secs): **1.5**

Stress Rate (kN/min): **10**

Load at Failure (kN): **54.7**

UCS (MPa): **6.2**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: Non-standard notes: **Non Standard Test**



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH114**

Sample Ref: **211**

Sample Type: **C**

Depth (m): **24.36**

Bulk Density (Mg/m^3): **2.11**

Dry Density (Mg/m^3): **1.94**

Moisture Content (%): **8.6**

Length (mm): **256.33**

Diameter (mm): **105.93**

Length/Diameter Ratio: **2.42**

Test Duration (mins:secs): **3**

Stress Rate (kN/min): **6.6**

Load at Failure (kN): **54.2**

UCS (MPa): **6.1**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **No post-test photographs**



Pre-test front view

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Depth (m): **29.03**

Failure Type: **Shear**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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UNCONFINED COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH114**

Sample Ref: **215**

Sample Type: **C**

Depth (m): **36.52**

Bulk Density (Mg/m^3): **2.23**

Dry Density (Mg/m^3): **2.13**

Moisture Content (%): **4.5**

Length (mm): **307.14**

Diameter (mm): **106.83**

Length/Diameter Ratio: **2.88**

Test Duration (mins:secs): **12.25**

Stress Rate (kN/min): **10**

Load at Failure (kN): **153.6**

UCS (MPa): **17.1**

Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**

Description: **Brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
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Job No

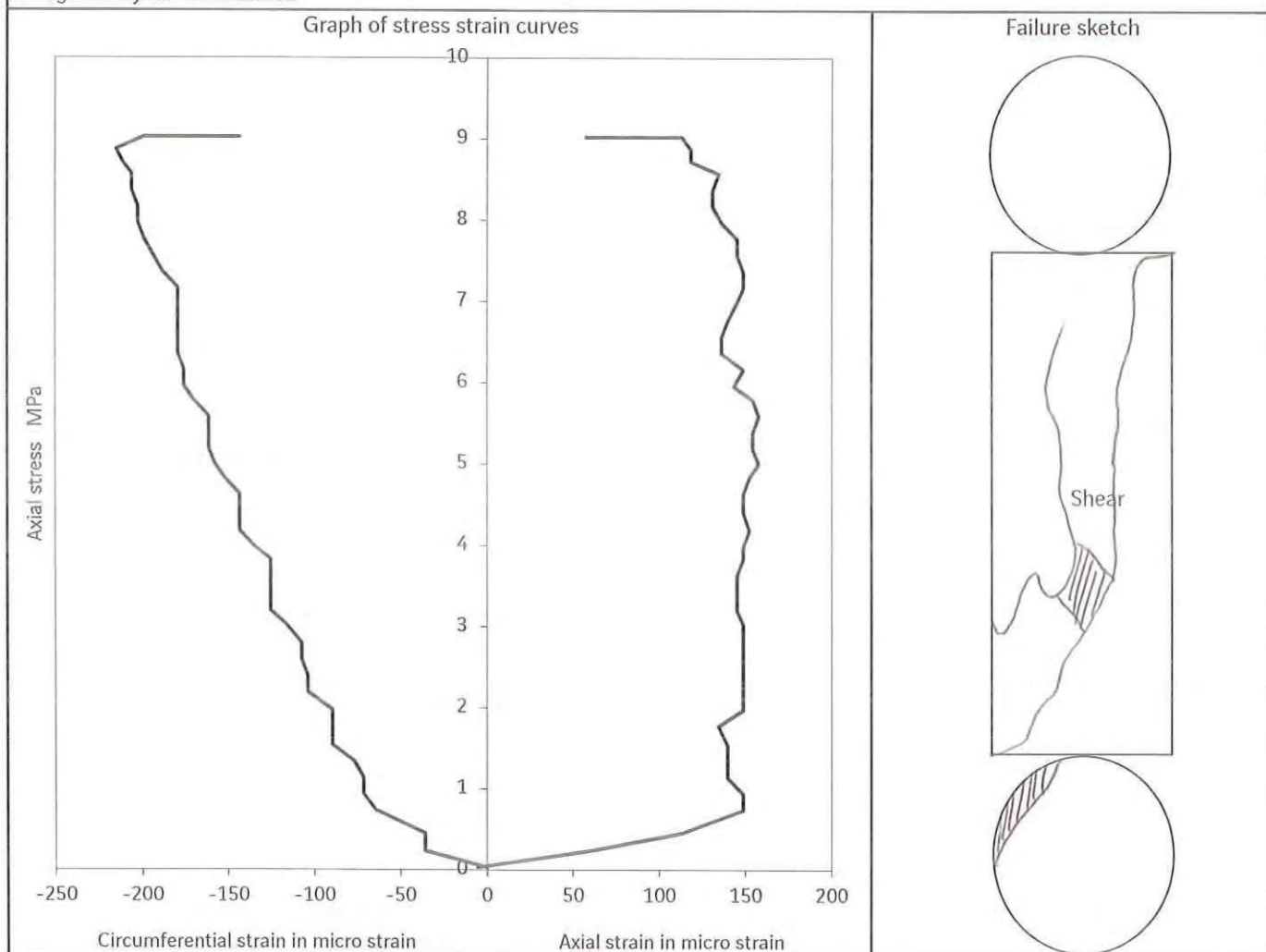
Project Blue

764393



Project Name	Project Blue	Unconfined Compressive Strength With Youngs Modulus And Poissons Ratio I.S.R.M. Suggested methods 1981	Hole ID	BH101
Project No.	LT1743/764393		Sample Depth	16.32m
Engineer	Buro Happold		Sample Number	206
Employer	Buro Happold		Sample Type	C
Description	Thinly laminated brown SANDSTONE.		Specimen Depth	16.32m
			Specimen Number	1

Date and method of sampling
Storage history and environment



Moisture content	%	12.7	Stress rate	MPa/s	0.04	Tangent modulus	Et	289	GPa	50	% stress
Length	mm	156.34	Test duration	min	03:52	Average modulus	Eave	226	GPa	17-62	% stress
Diameter	mm	105.86	U.C.S.	MPa	9.30	Secant modulus	Esec	49.1	GPa	0-50	% stress
Mass	g	2910.38	Type of machine	Controls 1300/Automax 5		Poissons ratio	v	1.01			
Bulk density	kg/m3	2120	(Determined using Average modulus)								
Dry density	kg/m3	1880									
Date	19/01/2018										

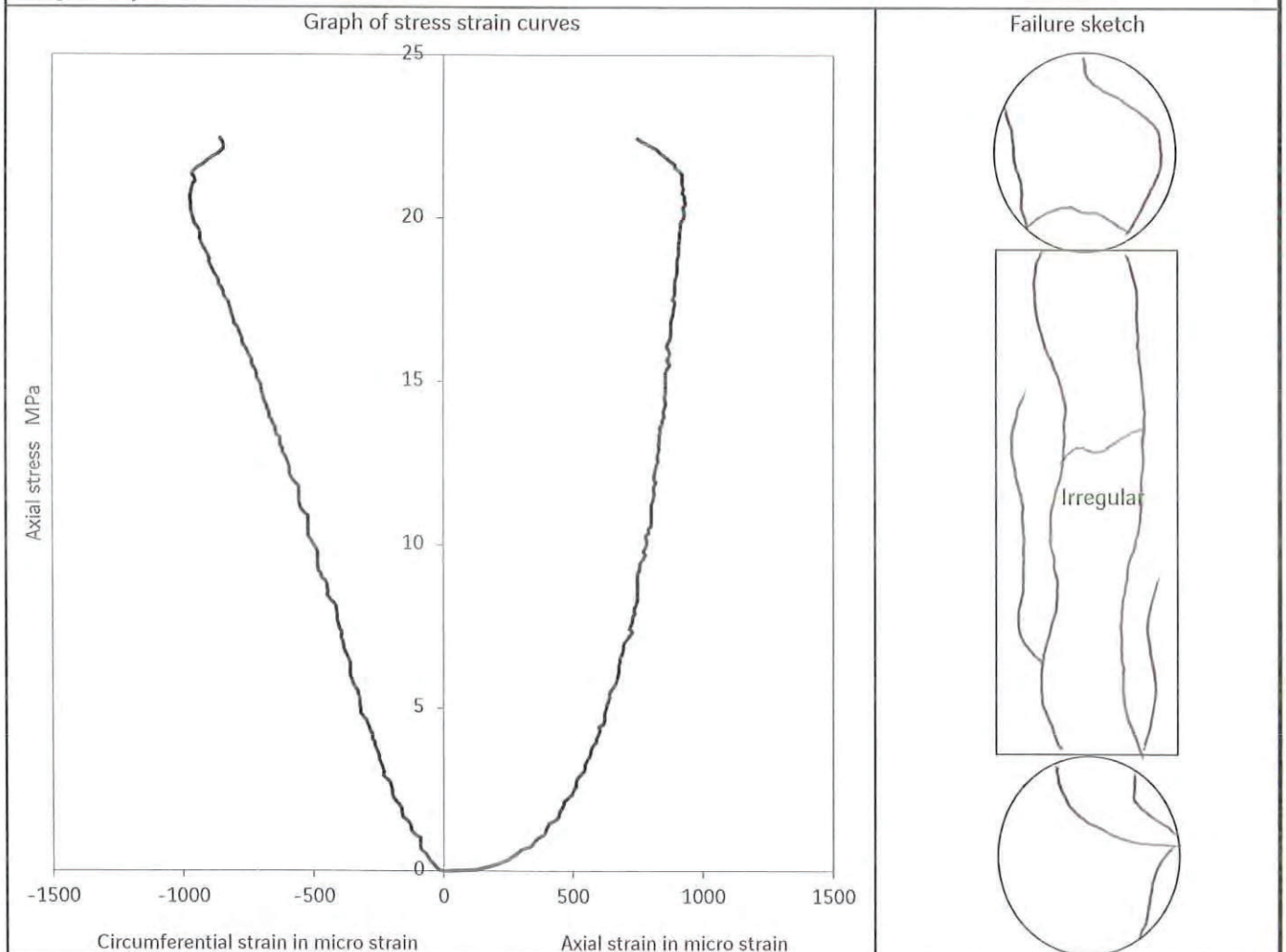
Test remarks Tested on specimen with length to diameter ratio outside 2.5-3.0 recommendation.

Specimen remarks

Approved by:	Leeds Laboratory	 SOIL ENGINEERING Part of the Bachy Soletanche Group
Sean Royle	Revision No. 2.06 Issue Date 20/11/2012 Print date 19/02/2018	

Project Name	Project Blue	Unconfined Compressive Strength With Youngs Modulus And Poissons Ratio I.S.R.M. Suggested methods 1981	Hole ID BH102
Project No.	LT1743/764393		Sample Depth 12.45m
Engineer	Buro Happold		Sample Number 203
Employer	Buro Happold		Sample Type C
Description	Brown SANDSTONE.	Specimen Depth 12.45m Specimen Number 1	

Date and method of sampling
Storage history and environment



Moisture content	%	7.5	Stress rate	MPa/s	0.02	Tangent modulus	Et	122	GPa	50	% stress
Length	mm	133.34	Test duration	min	17:13	Average modulus	Eave	62.1	GPa	33-91	% stress
Diameter	mm	106.32	U.C.S.	MPa	22.90	Secant modulus	Esec	14.2	GPa	0-50	% stress
Mass	g	2624.00	Type of machine	Controls 1300/Automax 5		Poissons ratio	v 0.602				
Bulk density	kg/m3	2220	(Determined using Average modulus)								
Dry density	kg/m3	2060									
Date	19/01/2018										

Test remarks Tested on specimen with length to diameter ratio outside 2.5-3.0 recommendation.

Specimen remarks

Approved by:	Leeds Laboratory		
Sean Royle		Print date	19/02/2018
Revision No.	2.06	Issue Date	20/11/2012

DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH101**

Sample Ref: **206**

Sample Type: **C**

Depth (m): **16.32**

Bulk Density (Mg/m^3): **2.24**

Dry Density (Mg/m^3): **2.01**

Moisture Content (%): **11**

Length (mm): **155.14**

Diameter (mm): **105.88**

Length/Diameter Ratio: **1.47**

Test Duration (mins:secs): **04:22**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **82.7**

UCS (MPa): **9.4**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **PASS**. Perpendicularity: **PASS**.

Remarks: **Non-standard length/diameter ratio**



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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Abby Mitchell

ABBY MITCHELL

Date

20/04/18

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Job No

764393





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1A Princess Street
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Test Date

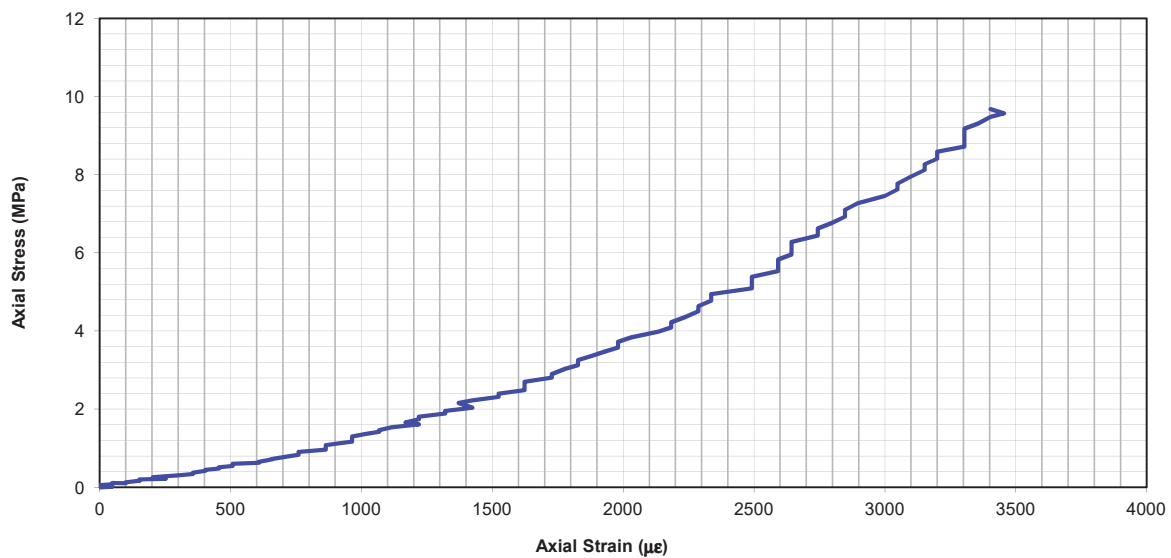
13/04/2018

UNIAXIAL COMPRESSION TEST with DEFORMATION

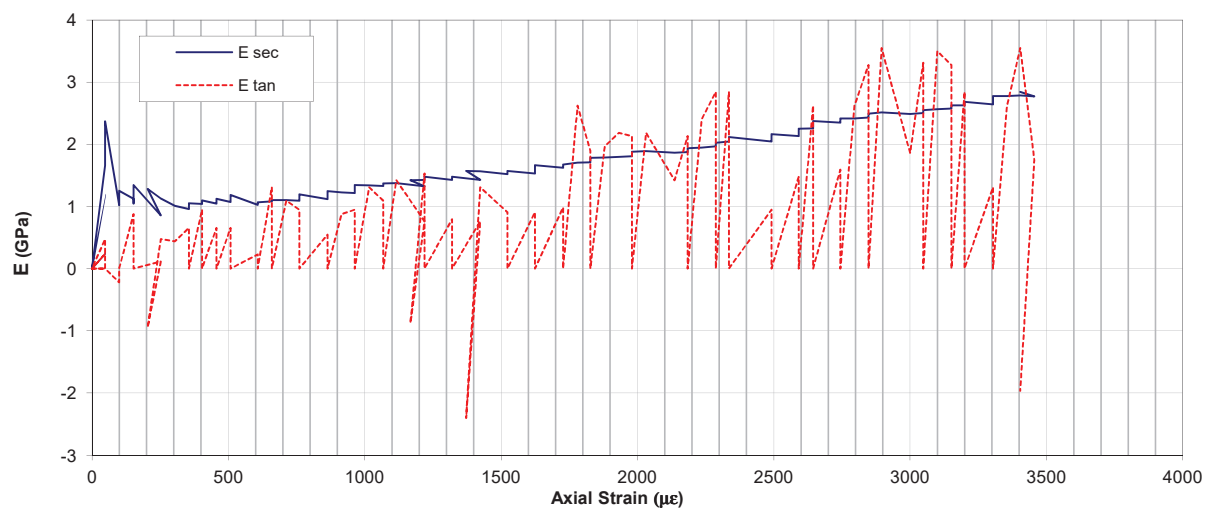
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	88.05 cm ²
Site		Height	154.14 mm
BH No	BH101	Max. strength	9.68 MPa
Specimen Depth	16.32-16.50m	E _{tan} (*)	-1.97 GPa
Specimen Type	C	E _{sec} (^)	2.84 GPa
(*) Calculated for axial σ = 9.68 MPa			
(^) Calculated for axial σ = 9.68 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH106**

Sample Ref: **206**

Sample Type: **C**

Depth (m): **8.90**

Bulk Density (Mg/m^3): **2.31**

Dry Density (Mg/m^3): **2.14**

Moisture Content (%): **7.6**

Length (mm): **213.87**

Diameter (mm): **104.84**

Length/Diameter Ratio: **2.04**

Test Duration (mins:secs): **5:08**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **276.2**

UCS (MPa): **32.0**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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Test Date

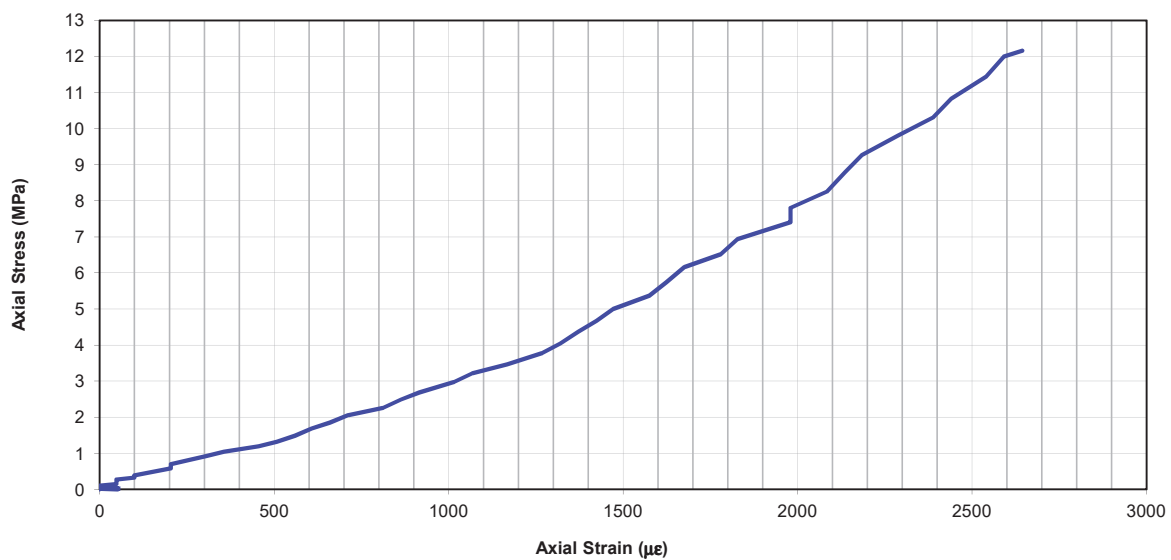
12/04/2018

UNIAXIAL COMPRESSION TEST with DEFORMATION

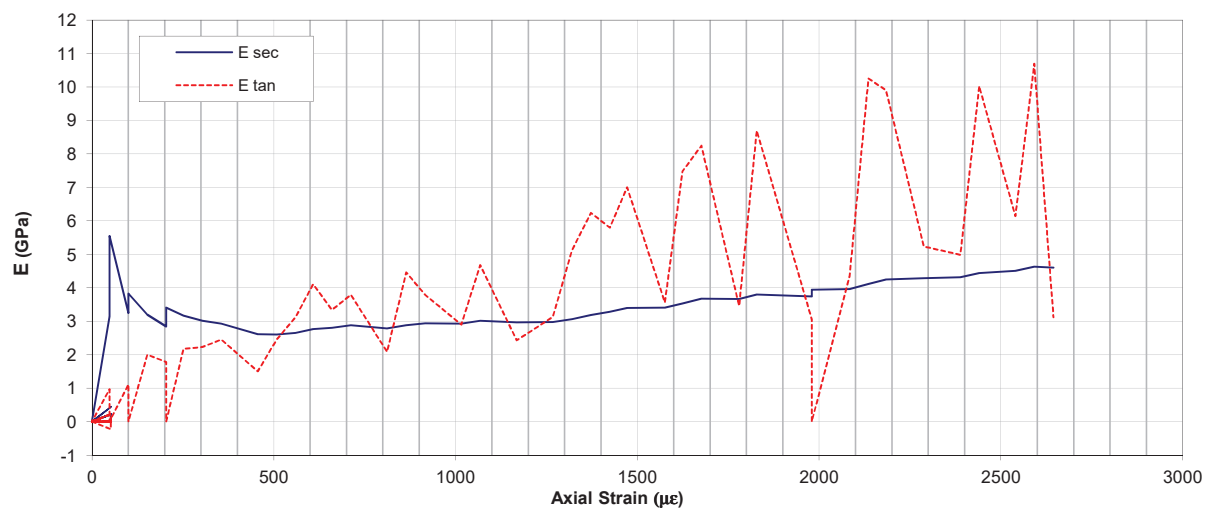
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	86.33 cm ²
Site		Height	213.87 mm
BH No	BH106	Max. strength	12.16 MPa
Specimen Depth	8.90-9.19m	E _{tan} (*)	3.12 GPa
Specimen Type	C	E _{sec} (^)	4.60 GPa
(*) Calculated for axial σ = 12.16 MPa			
(^) Calculated for axial σ = 12.16 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH106**

Sample Ref: **211**

Sample Type: **C**

Depth (m): **16.73**

Bulk Density (Mg/m^3): **2.28**

Dry Density (Mg/m^3): **2.11**

Moisture Content (%): **7.9**

Length (mm): **213.32**

Diameter (mm): **104.98**

Length/Diameter Ratio: **2.03**

Test Duration (mins:secs): **5:33**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **276.5**

UCS (MPa): **31.9**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **FAIL**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

Date

Abby Mitchell

ABBY MITCHELL

12/04/18

Contract

Job No

Project Blue

764393





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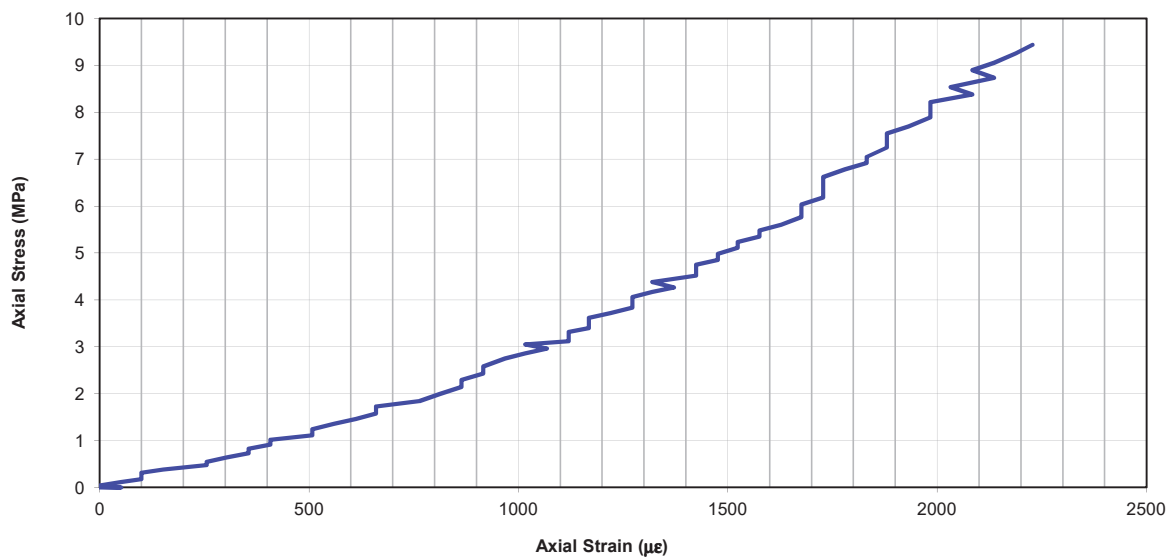
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UNIAXIAL COMPRESSION TEST with DEFORMATION

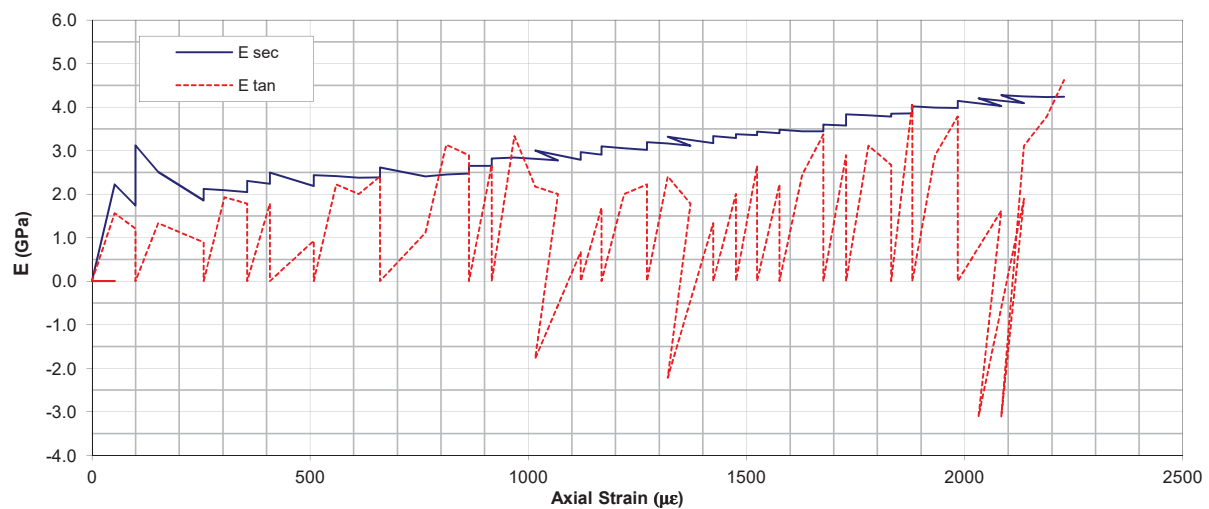
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	86.56 cm ²
Site		Height	213.32 mm
BH No	BH106	Max. strength	9.44 MPa
Specimen Depth	16.73-17.07m	E _{tan} (*)	4.62 GPa
Specimen Type	C	E _{sec} (^)	4.24 GPa
(*) Calculated for axial σ = 9.44 MPa			
(^) Calculated for axial σ = 9.44 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH106** Sample Ref: **217** Sample Type: **C** Depth (m): **27.58**

Bulk Density (Mg/m³): **2.26** Dry Density (Mg/m³): **2.05** Moisture Content (%): **10**
Length (mm): **194.32** Diameter (mm): **104.70** Length/Diameter Ratio: **1.86**
Test Duration (mins:secs): **5:01** Stress Rate (kN/min): **6.0** Load at Failure (kN): **224.3**
UCS (MPa): **26.1** Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**
Description: **Reddish brown SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **FAIL**. Flatness: **FAIL**. Perpendicularity: **FAIL**.
Remarks: **Non-standard length/diameter ratio.**



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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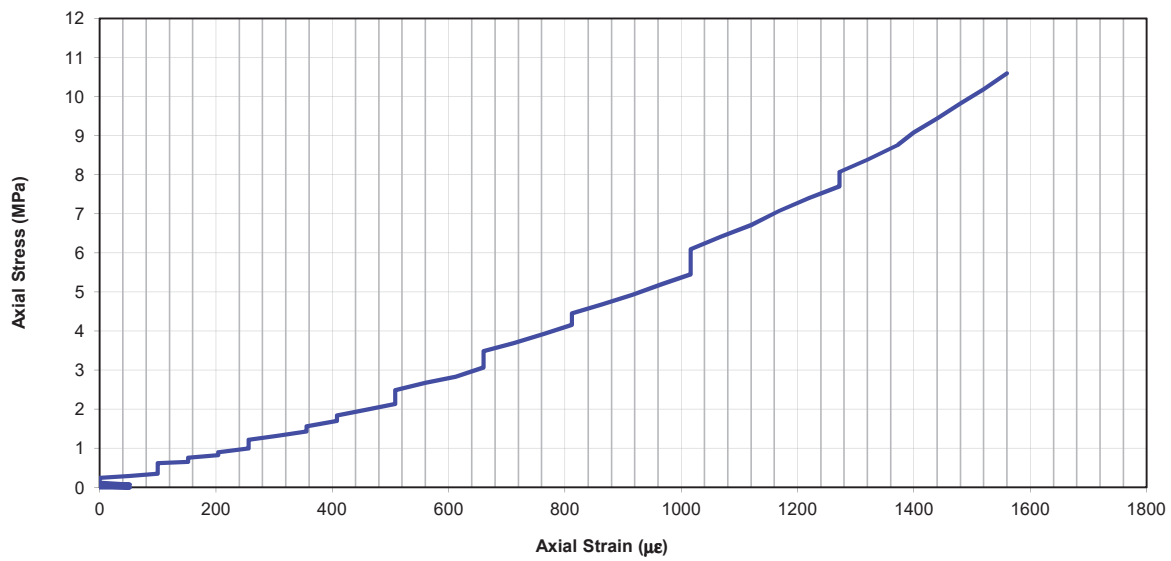
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UNIAXIAL COMPRESSION TEST with DEFORMATION

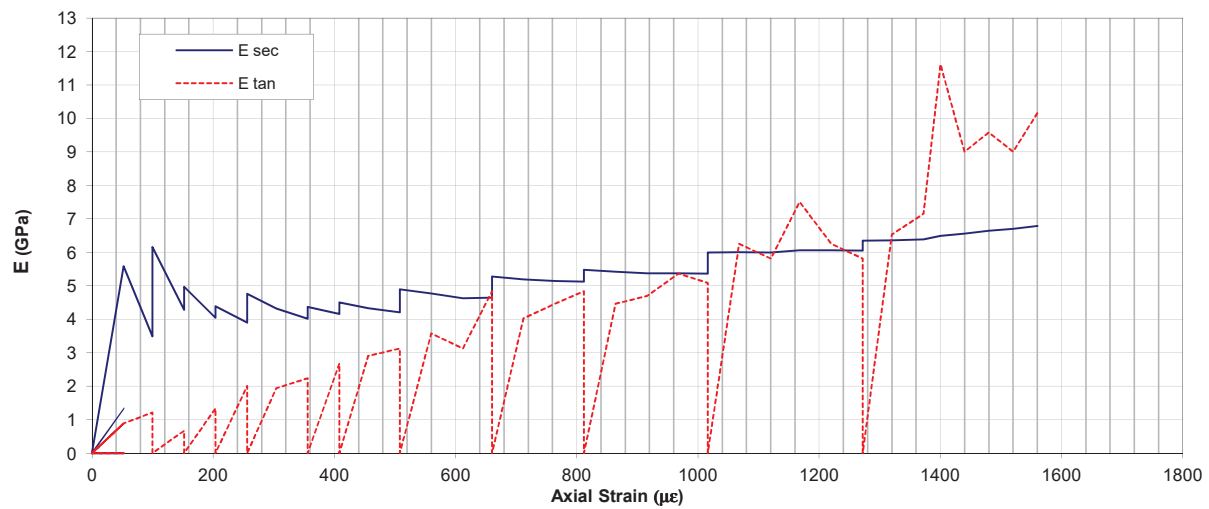
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	86.10 cm ²
Site		Height	194.32 mm
BH No	BH106	Max. strength	10.59 MPa
Specimen Depth	27.58-27.78m	E _{tan} (*)	10.16 GPa
Specimen Type	C	E _{sec} (^)	6.79 GPa
(*) Calculated for axial σ = 10.59 MPa			
(^) Calculated for axial σ = 10.59 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH108**

Sample Ref: **214**

Sample Type: **C**

Depth (m): **24.86**

Bulk Density (Mg/m^3): **2.30**

Dry Density (Mg/m^3): **2.10**

Moisture Content (%): **9.6**

Length (mm): **216.31**

Diameter (mm): **106.32**

Length/Diameter Ratio: **2.03**

Test Duration (mins:secs): **7:22**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **241.2**

UCS (MPa): **27.2**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **FAIL**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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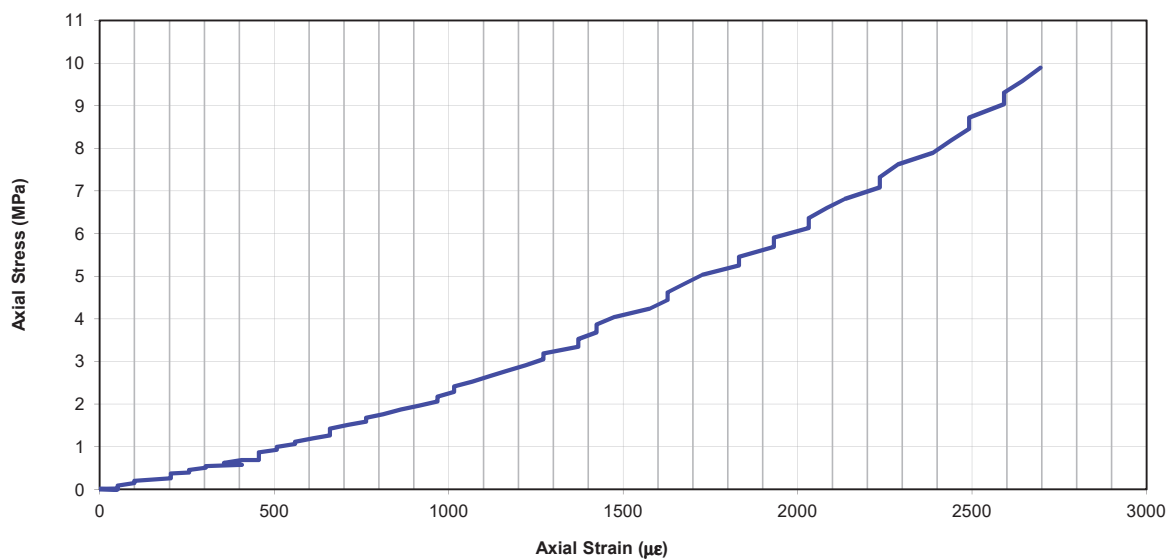
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UNIAXIAL COMPRESSION TEST with DEFORMATION

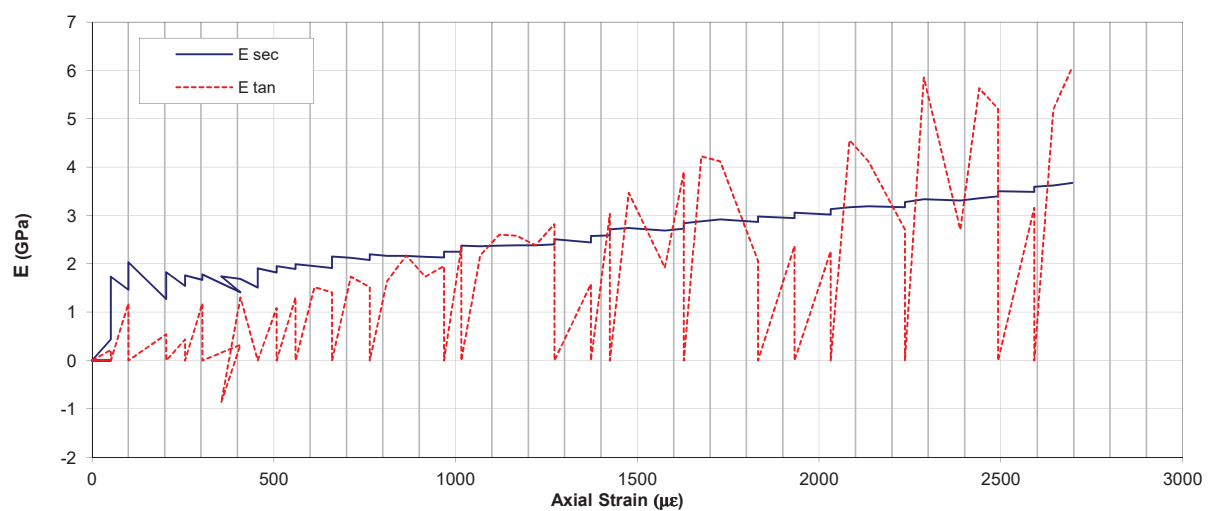
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	88.78 cm ²
Site		Height	216.31 mm
BH No	BH108	Max. strength	9.89 MPa
Specimen Depth	24.86-25.15m	E _{tan} (*)	6.07 GPa
Specimen Type	C	E _{sec} (^)	3.67 GPa
(*) Calculated for axial σ = 9.89 MPa			
(^) Calculated for axial σ = 9.89 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH108**

Sample Ref: **216**

Sample Type: **C**

Depth (m): **29.75**

Bulk Density (Mg/m^3): **2.26**

Dry Density (Mg/m^3): **2.04**

Moisture Content (%): **11**

Length (mm): **216.48**

Diameter (mm): **106.25**

Length/Diameter Ratio: **2.04**

Test Duration (mins:secs): **4:36**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **180.4**

UCS (MPa): **20.3**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **PASS**. Flatness: **FAIL**. Perpendicularity: **FAIL**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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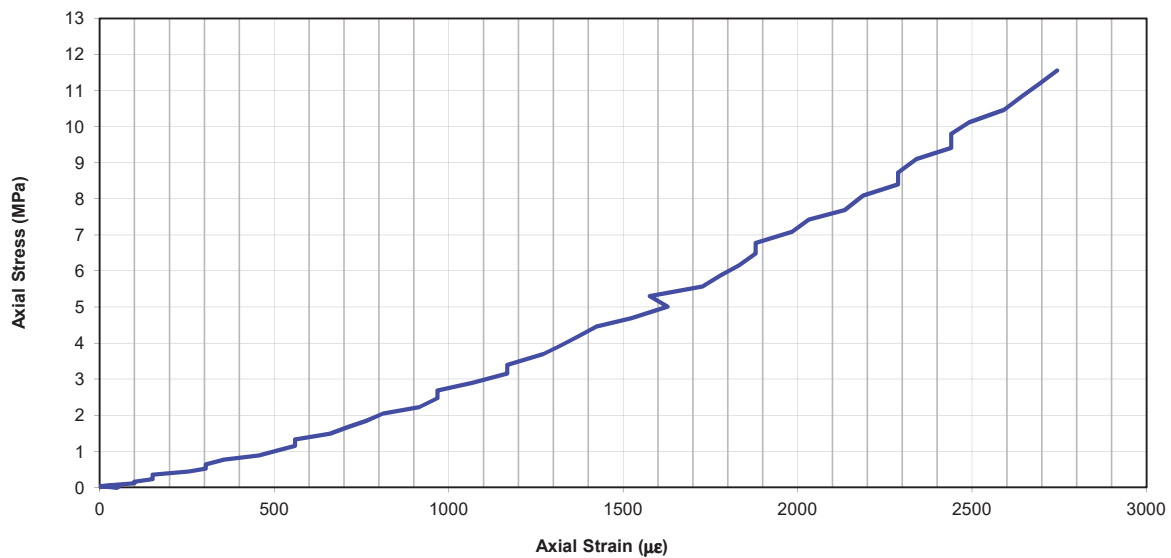
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UNIAXIAL COMPRESSION TEST with DEFORMATION

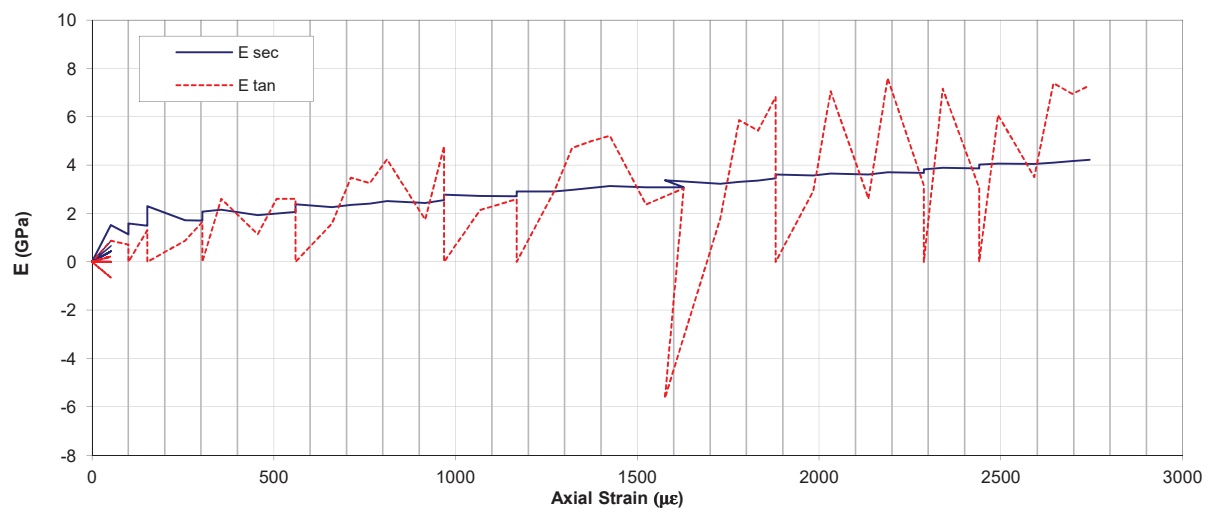
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	88.66 cm ²
Site		Height	216.48 mm
BH No	BH108	Max. strength	11.56 MPa
Specimen Depth	29.75-30.44m	E _{tan} (*)	7.28 GPa
Specimen Type	C	E _{sec} (^)	4.21 GPa
(*) Calculated for axial σ = 11.56 MPa			
(^) Calculated for axial σ = 11.56 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH109**

Sample Ref: **206**

Sample Type: **C**

Depth (m): **17.95**

Bulk Density (Mg/m^3): **2.22**

Dry Density (Mg/m^3): **2.02**

Moisture Content (%): **9.9**

Length (mm): **214.09**

Diameter (mm): **105.94**

Length/Diameter Ratio: **2.02**

Test Duration (mins:secs): **6:13**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **200.9**

UCS (MPa): **22.8**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **FAIL**. Perpendicularity: **FAIL**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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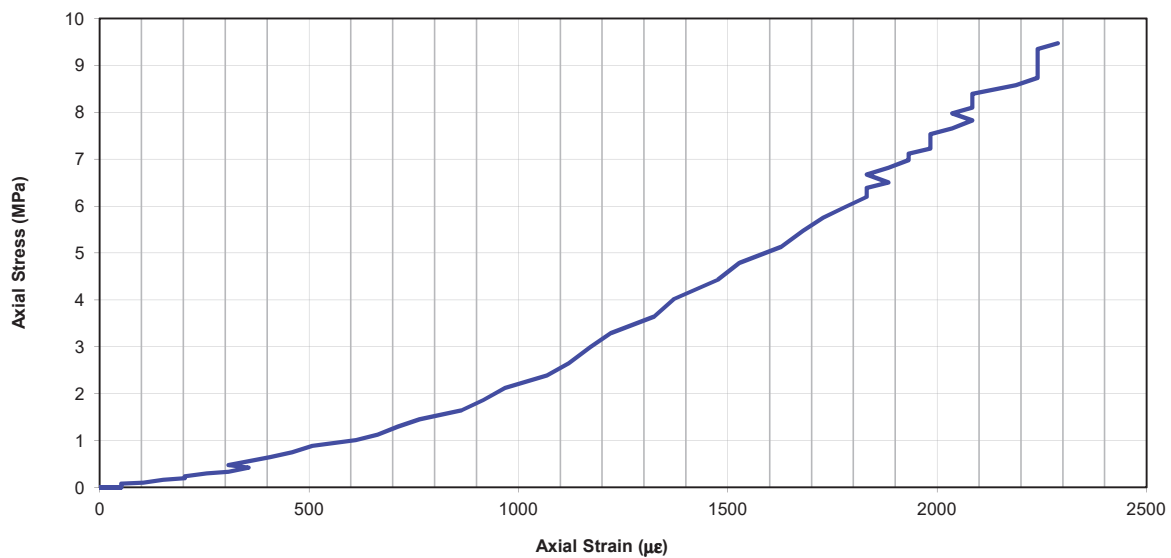
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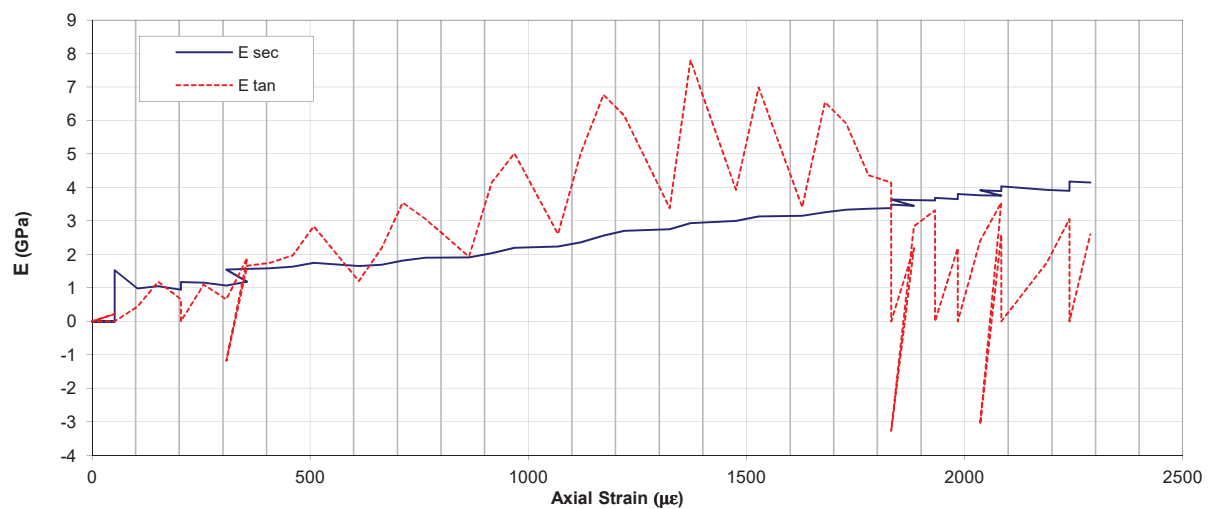
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	88.15 cm ²
Site		Height	214.09 mm
BH No	BH109	Max. strength	9.47 MPa
Specimen Depth	17.95-18.21m	E _{tan} (*)	2.60 GPa
Specimen Type	C	E _{sec} (^)	4.14 GPa
(*) Calculated for axial σ = 9.47 MPa			
(^) Calculated for axial σ = 9.47 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH114**

Sample Ref: **203**

Sample Type: **C**

Depth (m): **9.56**

Bulk Density (Mg/m³): **2.17**

Dry Density (Mg/m³): **1.93**

Moisture Content (%): **12**

Length (mm): **208.52**

Diameter (mm): **106.21**

Length/Diameter Ratio: **1.96**

Test Duration (mins:secs): **4:16**

Stress Rate (kN/min): **6.0**

Load at Failure (kN): **102.0**

UCS (MPa): **11.5**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

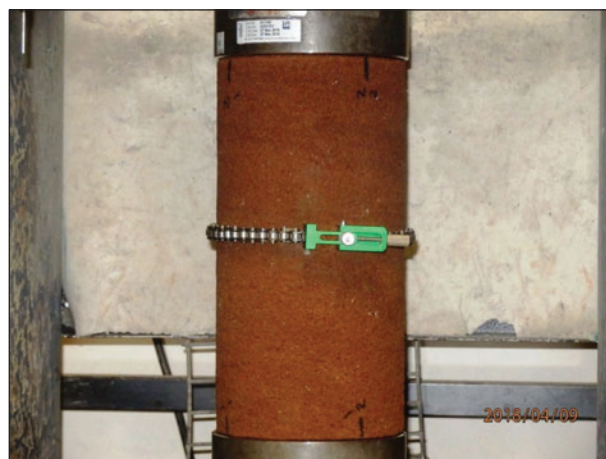
Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **FAIL**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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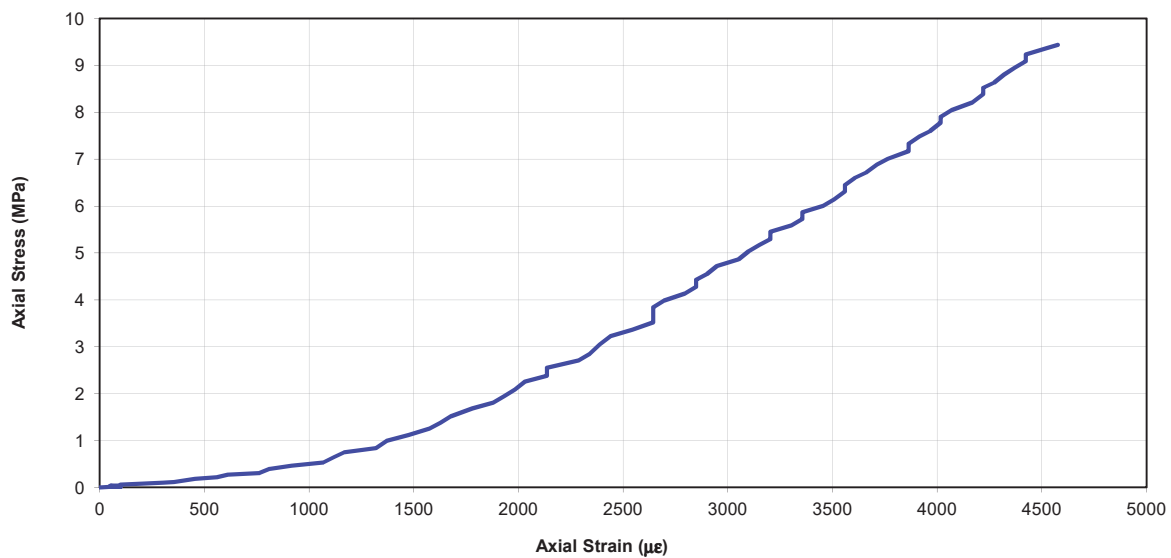
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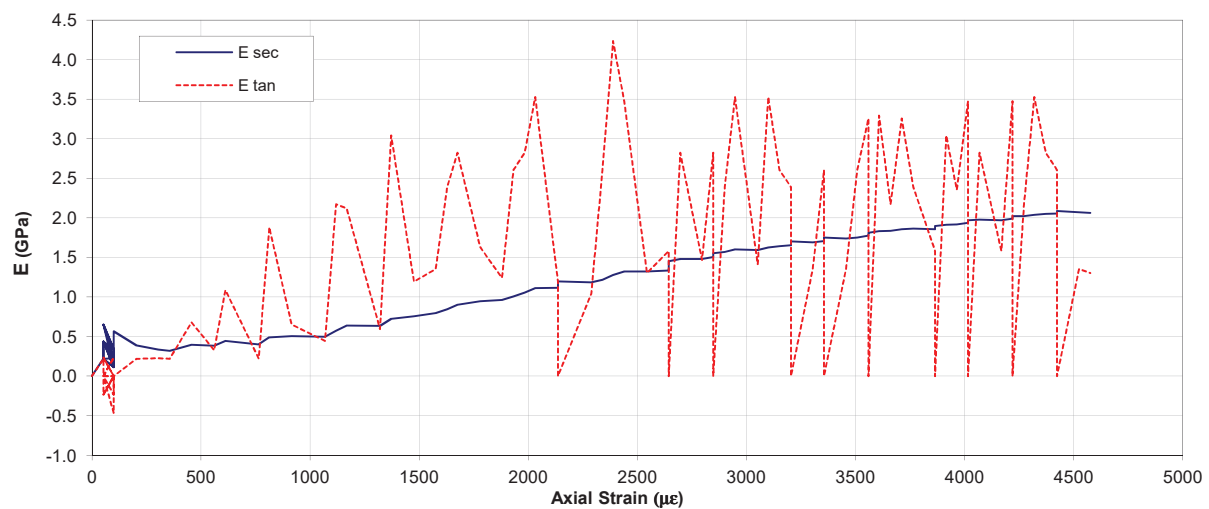
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	88.60 cm ²
Site		Height	208.52 mm
BH No	BH114	Max. strength	9.44 MPa
Specimen Depth	9.56-9.80m	E _{tan} (*)	1.30 GPa
Specimen Type	C	E _{sec} (^)	2.06 GPa
(*) Calculated for axial σ = 9.44 MPa			
(^) Calculated for axial σ = 9.44 MPa			

Compression Curve



Strain Modulus



DEFORMABILITY OF ROCK IN UNIAXIAL COMPRESSION

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT07 UCS of Rock with Deformation (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **BH114**

Sample Ref: **209**

Sample Type: **C**

Depth (m): **21.51**

Bulk Density (Mg/m^3): **2.25**

Dry Density (Mg/m^3): **2.05**

Moisture Content (%): **9.4**

Length (mm): **208.51**

Diameter (mm): **105.67**

Length/Diameter Ratio: **1.97**

Test Duration (mins:secs): **2:41**

Stress Rate (kN/min): **12**

Load at Failure (kN): **153.7**

UCS (MPa): **17.5**

Failure Type: **Axial cleavage**

Note: **Axis of loading parallel to core axis**

Description: **Reddish brown SANDSTONE**

Specimen Preparation: **Specimen was not recored.**

Sample tolerance checks: Straightness: **FAIL**. Flatness: **FAIL**. Perpendicularity: **PASS**.

Remarks: **No rear view photographs available.**



Front view (pre-test)



Front view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures $>4^{\circ}\text{C}$
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076



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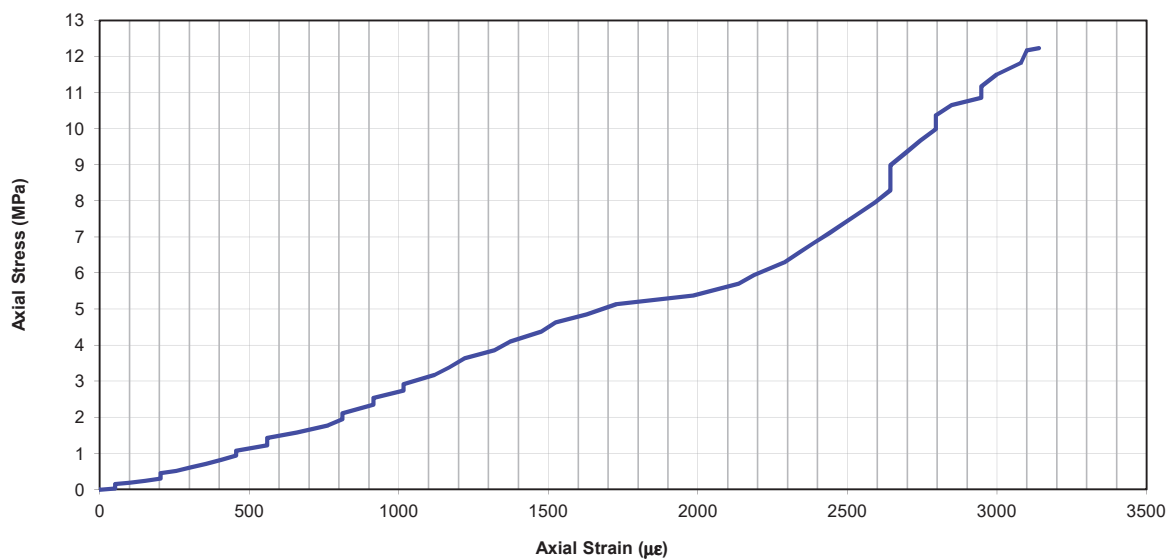
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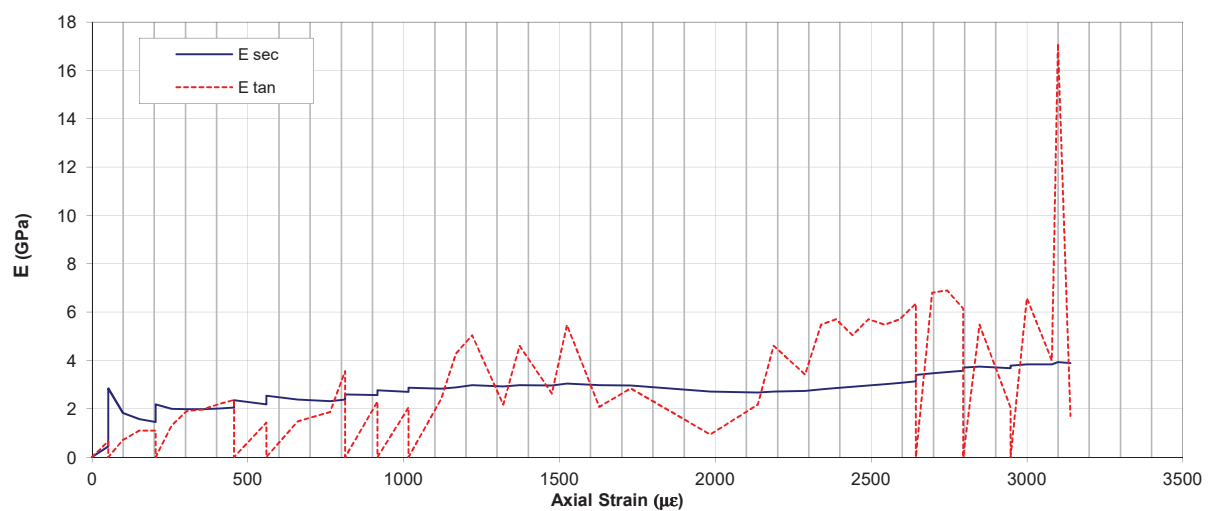
Inhouse method based on: ISRM, ASTM and Eurocode 7 Part 2 W.1.1

Job No	764393	Cross section	87.70 cm ²
Site		Height	208.51 mm
BH No	BH114	Max. strength	12.24 MPa
Specimen Depth	21.51-21.83m	E _{tan} (*)	1.71 GPa
Specimen Type	C	E _{sec} (^)	3.90 GPa
(*) Calculated for axial σ = 12.24 MPa			
(^) Calculated for axial σ = 12.24 MPa			

Compression Curve



Strain Modulus



RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.64** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.57** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.12** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Unable to calculate I₀(50) Strength Anisotropy Index from this dataset.

Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.69** MN/m²
 Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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	Compiled By	Date
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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.65** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.02** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **30.61** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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30.05.18

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Unable to calculate I₀(50) Strength Anisotropy Index from this dataset.

Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.94** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.59** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.6** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pm}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

TABLE 1

$I_s(50)$ Mean Axial tests = 0.63 MN/m ²
$I_s(50)$ Mean Diametral tests = 0.46 MN/m ²
$I_s(50)$ Strength Anisotropy Index = 1.37 (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results


Unable to calculate I₀(50) Strength Anisotropy Index from this dataset.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column:: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, NC denotes Non-standard Test.

(NS) = corrected from standard error; Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T =

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results


Unable to calculate I₀(50) Strength Anisotropy Index from this dataset.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column:: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, NC denotes Non-standard Test.

(NS) = corrected from standard error; Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T =

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	Project Blue	
	Compiled By	Date
M. Fisher.	MAUREEN FISHER	30.05.18

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **1.18** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.59** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.98** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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STRUCTURAL SOILS

**The Potteries
Pottery Street
Castleford**

W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.56** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.42** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.33** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pi}{180}$ denotes Non-standard Test.
^(NS) Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Table 1

Parameter	Value
$I_s(50)$ Mean Axial tests	0.48 MN/m ²
$I_{ss}(50)$ Mean Diametral tests	0.33 MN/m ²
$I_{sa}(50)$ Strength Anisotropy Index	1.45 (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F)	calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\%}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_a is equivalent core diameter). Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.55** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.53** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.04** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **1.5** MN/m²
 Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pm}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

TABLE 1

$I_s/50$	Mean Axial tests = 0.42 MN/m ²
$I_s/50$	Mean Diametral tests = 0.21 MN/m ²
$I_a/50$	Strength Anisotropy Index = 2.03 (calculated from highest and lowest diametral and axial $I_s/50$)
ratio)	Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.75** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.38** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.99** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pm}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Mean Axial tests = **0.33** MN/mm²
 Mean Diametral tests = **0.32** MN/mm²
 Strength Anisotropy Index = **1.71** (calculated from highest and lowest diametral and axial I_s(50) ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_a is equivalent core diameter)



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.78** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.52** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.49** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{1}{\sqrt{N}}$ denotes Non-standard Test.

Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.83** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.25** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **3.37** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)


Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pm}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column: A = Axial
[NS] denotes Non-standard Test.

Point Load Index column: (\sqrt{V}) = included in mean calculations, (χ) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.8** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.48** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.68** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Key

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

I_s(50) Mean Axial tests = **0.48 MN/m²**
I_s(50) Mean Diametral tests = **0.28 MN/m²**
I_a(50) Strength Anisotropy Index = **1.71** (calculated from highest and lowest diametral and axial I_s(50) ratio)
 Note: Size Correction Factor (*F*) calculated using $F = (D_r/50)^{0.45}$ (where *D_r* is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.7** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.34** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **2.1** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{150 \times 150}{100}$ denotes Non-standard Test.
^(NS) Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

TABLE 1

$I_s/50$	Mean Axial tests = 0.97 MN/m ²
$I_s/50$	Mean Diametral tests = 0.71 MN/m ²
$I_a/50$	Strength Anisotropy Index = 1.38 (calculated from highest and lowest diametral and axial $I_s/50$)
ratio)	Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Legend

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^(NS) denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Notes

I₍₅₀₎ Mean Axial tests = **0.99** MN/m²

I₍₅₀₎ Mean Diametral tests = **0.57** MN/m²

I₍₅₀₎ Strength Anisotropy Index = **1.73** (calculated from highest and lowest diametral and axial I₍₅₀₎ ratio)

Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **1.21** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.78** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.55** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **1.21** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.86** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.4** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.57** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.38** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.49** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Unable to calculate $I_{\sigma}(50)$ Strength Anisotropy Index from this dataset.

Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter).

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, Test
denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations (NS) = non-significant, N = number of subjects.

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M. Fisher.	MAUREEN FISHER	30.05.18

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.43** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.25** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.7** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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	<p><i>M. Fisher</i></p> <p>MAUREEN FISHER</p>	<p>Compiled By</p> <p>Date</p> <p>30.05.18</p>

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.55** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.37** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.47** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, \overline{NSI} denotes Non-standard Test.
 Point Load Index column: (\sqrt{V}) = included in mean calculations, (χ) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results	Key
<p>$I_s(50)$ Mean Axial tests = 0.64 MN/m²</p> <p>Unable to calculate $I_s(50)$ Strength Anisotropy Index from this dataset.</p> <p><u>Note:</u> Size Correction Factor (F) calculated using $F = (D_o/D)^{0.45}$ (where D_o is equivalent core diameter).</p>	<p>Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^(NS) denotes Non-standard Test.</p> <p>Point Load Index column: ($\sqrt{}$) = included in mean calculations, (∇) = excluded from mean calculations</p> <p>Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)</p>

Contract	A.S. Inc	Compiled By
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ALAN FROST	Date
	27.03.18

ject Blue

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.5** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.3** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.68** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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STRUCTURAL SOILS

**The Potteries
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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **1.69** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.27** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **6.18** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.38** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.38** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.01** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.95** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.53** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.79** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.93** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.5** MN/m²
 $I_{s(50)}$ Strength Anisotropy Index = **1.86** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pi}{180}$ denotes Non-standard Test.
 Point Load Index column: (\sqrt{V}) = included in mean calculations, (χ) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter). Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.

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	<i>M. Fisher</i>	MAUREEN FISHER

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.97** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.67** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.44** (calculated from highest and lowest diametral and axial $I_{s(50)}$ values)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **1.18** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.51** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **2.32** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **1.98** MN/m²
 $I_s(50)$ Mean Diametral tests = **1.18** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.69** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.63** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.52** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.22** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Table 1. Test parameters and results.

Test	Test Column	A = Axial	D = Diametral	I = Irregular	B = Block	L = Parallel	P = Perpendicular
I _s (50)	Mean Axial tests	0.66 MN/m ²					
I _s (50)	Mean Diametral tests	0.16 MN/m ²					
I _a (50)	Strength Anisotropy Index	4.17	(calculated from highest and lowest diametral and axial I _s (50) tests)				
Note	Size Correction Factor (F)	calculated using $F = (D_a/50)^{0.45}$	(where D _a is equivalent core diameter).				

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.49** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.32** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.52** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter).



RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.29** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.16** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.81** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.3** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.29** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.02** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



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Compiled By

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pi}{180}$ denotes Non-standard Test.
^(NS) Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

$I_s(50)$ Mean Axial tests = **1.26** MN/m²
 $I_{ss}(50)$ Mean Diametral tests = **1.03** MN/m²
 $I_{sa}(50)$ Strength Anisotropy Index = **1.22** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.61** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.54** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.13** (calculated from highest and lowest diametral and axial $I_{s(50)}$ values)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.87** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.61** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.43** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.87** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.79** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **1.1** (calculated from highest and lowest diametral and axial $I_{s(50)}$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **2.16** MN/m²
 Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.73** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.44** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.68** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, NS denotes Non-standard Test.
 Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.05** MN/m²
 $I_s(50)$ Mean Diametral tests = **0** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **23.38** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)


Results

Location

$I_s(50)$ Mean Axial tests = **0.16** MN/m²
Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

Type

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^{NSI} denotes Non-standard Test.
Point Load Index column: (\checkmark) = included in mean calculations, (\times) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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Results

$I_s(50)$ Mean Axial tests = **0.08** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.01** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **6.92** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Unable to calculate $I_{\sigma}(50)$ Strength Anisotropy Index from this dataset.


Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter).

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^{test} denotes Non-standard Test.

Point Load Index column: (\checkmark) = included in mean calculations, (χ) = excluded from mean calculations (NS) = non-significant, N = number of trials. χ^2 = chi-square test, P = probability, df = degrees of freedom.

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pi}{180}$ denotes Non-standard Test.
^(NS) Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

TABLE 1

$I_s(50)$ Mean Axial tests = 0.13 MN/m ²
$I_s(50)$ Mean Diametral tests = 0.11 MN/m ²
$I_{sa}(50)$ Strength Anisotropy Index = 1.17 (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_a is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.05** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.02** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **3.1** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_o/50)^{0.45}$ (where D_o is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\%}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_a is equivalent core diameter). Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.15** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.07** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **2.22** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results


Unable to calculate $I_{\sigma}(50)$ Strength Anisotropy Index from this dataset.

Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^{100%} denotes Non-standard Test.

(NS) selected over standard 1000. χ^2 = excluded from mean calculations
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (χ) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **2.84** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.05** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **53.61** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.2** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.02** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **8.89** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.32** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.34** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.04** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pm}{NS}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Unable to calculate $I_{\sigma}(50)$ Strength Anisotropy Index from this dataset.


Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^{test} denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations (NS).
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T =

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Results

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pi}{180}$ denotes Non-standard Test.
^(NS) Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

$I_s(50)$ Mean Axial tests = **0.27** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.01** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **18.71** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_a is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_{s(50)}$ Mean Axial tests = **0.36** MN/m²
 $I_{s(50)}$ Mean Diametral tests = **0.14** MN/m²
 $I_{sa(50)}$ Strength Anisotropy Index = **2.49** (calculated from highest and lowest diametral and axial $I_{s(50)}$ values)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, NS denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

$I_s(50)$ Mean Diametral tests = **0.42** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **2.68** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_a is equivalent core diameter)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.43** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.16** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **2.63** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

Type of Test column.: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, $\frac{100\pi}{180}$ denotes Non-standard Test.
 Point Load Index column: ($\sqrt{}$) = included in mean calculations, (\times) = excluded from mean calculations
 Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter). Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.

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Results

Unable to calculate $I_{\sigma}(50)$ Strength Anisotropy Index from this dataset.


Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column:: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, NC denotes Non-standard Test.

(NS) = corrected from standard error; Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T =

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.52** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.16** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **3.15** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.57** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.67** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.18** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

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Results

Unable to calculate $I_{(50)}$ Strength Anisotropy Index from this dataset.


Note: Size Correction Factor (F) calculated using $F = (D_a/50)^{0.45}$ (where D_e is equivalent core diameter).

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, (N) denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Telford (TF1 1TH)

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RT03 Point Load Testing (in accordance with ISRM 2007)

Results	Key
<p>$I_s(50)$ Mean Axial tests = 0.21 MN/m²</p> <p>Unable to calculate $I_s(50)$ Strength Anisotropy Index from this dataset.</p> <p><u>Note:</u> Size Correction Factor (F) calculated using $F = (D_o/D)^{0.45}$ (where D_o is equivalent core diameter).</p>	<p>Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, ^(NS) denotes Non-standard Test.</p> <p>Point Load Index column: ($\sqrt{}$) = included in mean calculations, (∇) = excluded from mean calculations</p> <p>Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)</p>

Contract	MDStreaves	Compiled By
Pr		

MICHAEL STROWGER	Date
	12.04.18

ject Blue

Contract Ref:

764393



RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.8** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.76** MN/m²
 $I_s(50)$ Strength Anisotropy Index = **1.06** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_s/50)^{0.45}$ (where D_s is equivalent core diameter).

Contract Ref:

Compiled By

Date: _____

30.05.18

764393



W. Yorkshire WF10 1NJ

RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.8** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.66** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.21** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).

Contract Ref:

Compiled By

Date: _____

30.05.18

764393



RT03 Point Load Testing (in accordance with ISRM 2007)

Results

$I_s(50)$ Mean Axial tests = **0.61** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.31** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.93** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
 Note: Size Correction Factor (F) calculated using $F = (D_c/50)^{0.45}$ (where D_c is equivalent core diameter).



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Compiled By

M. Fisher.

MAUREEN FISHER

Project Blue

Contract Ref:

Date _____

30.05.18

764393



FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/00310

Issue Number: 1

Date: 18 January, 2018

Client: Structural Soils Limited (Castleford Lab)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Mark Athorne

Project Name: Project Blue

Project Ref: 764393

Order No: N/A

Date Samples Received: 04/01/18

Date Instructions Received: 16/01/18

Date Analysis Completed: 18/01/18

Prepared by:

A handwritten signature in blue ink that reads "M Marshall".

Melanie Marshall
Laboratory Coordinator

Approved by:

A handwritten signature in blue ink that reads "G King".

Georgia King
Admin & Client Services Supervisor

Envirolab Job Number: 18/00310

Client Project Name: Project Blue

Client Project Ref: 764393

Lab Sample ID	18/00310/1								Units	Method ref
Client Sample No										
Client Sample ID	BH101									
Depth to Top	9.60									
Depth To Bottom										
Date Sampled										
Sample Type	Soil									
Sample Matrix Code	5A									
% Stones >10mm _A	<0.1								% w/w	A-T-044
pH BRE _D	8.89								pH	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	342								mg/l	A-T-026s

REPORT NOTES

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/01219
Issue Number: 1

Date: 23 February, 2018

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

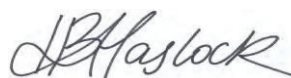
Project Manager: Mark Athorne
Project Name: Project Blue
Project Ref: 764393
Order No: N/A
Date Samples Received: 16/02/18
Date Instructions Received: 19/02/18
Date Analysis Completed: 23/02/18

Prepared by:



Holly Neary-King
Administrative Assistant

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 18/01219

Client Project Name: Project Blue

Client Project Ref: 764393

Lab Sample ID	18/01219/1	18/01219/2	18/01219/3	18/01219/4					Units	Method ref
Client Sample No										
Client Sample ID	BH111	BH109	BH101	BH108						
Depth to Top	10.30	9.20	1.20	6.00						
Depth To Bottom	10.75	9.65		6.45						
Date Sampled										
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	3A	1A	6A	6						
% Stones >10mm _A	10.1	2.1	19.0	<0.1					% w/w	A-T-044
pH BRE _D	8.02	7.11	7.43	7.45					pH	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	<10	22	<10	29					mg/l	A-T-026s

REPORT NOTES

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/01383
Issue Number: 1
Date: 01 March, 2018

Client: Structural Soils Limited (Castleford Lab)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Mark Athorne
Project Name: Project Blue
Project Ref: 764393
Order No: N/A
Date Samples Received: 22/02/18
Date Instructions Received: 23/02/18
Date Analysis Completed: 01/03/18

Prepared by:



Richard Wong
Client Manager

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 18/01383

Client Project Name: Project Blue

Client Project Ref: 764393

Lab Sample ID	18/01383/1								Units	Method ref
Client Sample No	1									
Client Sample ID	BH105									
Depth to Top	15.61									
Depth To Bottom										
Date Sampled										
Sample Type	Solid									
Sample Matrix Code	7									
% Stones >10mm _A	<0.1								% w/w	A-T-044
pH BRE _D	8.72								pH	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	88								mg/l	A-T-026s

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/01404
Issue Number: 1

Date: 01 March, 2018

Client: Structural Soils Limited (Bristol Lab)
Unit 1a
Princess Street
Bedminster
Bristol
UK
BS3 4AG

Project Manager: Lisa Frost
Project Name: Project Blue
Project Ref: 764393
Order No: N/A
Date Samples Received: 22/02/18
Date Instructions Received: 23/02/18
Date Analysis Completed: 01/03/18

Prepared by:



Richard Wong
Client Manager

Approved by:



John Gustafson
Director

Envirolab Job Number: 18/01404

Client Project Name: Project Blue

Client Project Ref: 764393

Lab Sample ID	18/01404/1								Units	Method ref
Client Sample No	1									
Client Sample ID	BH103									
Depth to Top	0.55									
Depth To Bottom										
Date Sampled										
Sample Type	Soil - P									
Sample Matrix Code	6									
% Stones >10mm _A	<0.1								% w/w	A-T-044
pH BRE _D	8.01								pH	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	1370								mg/l	A-T-026s

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/01441
Issue Number: 1

Date: 02 March, 2018

Client: Structural Soils Limited (Castleford Lab)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Mark Athorne
Project Name: Project Blue
Project Ref: 764393
Order No: N/A
Date Samples Received: 26/02/18
Date Instructions Received: 26/02/18
Date Analysis Completed: 02/03/18

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 18/01441

Client Project Name: Project Blue

Client Project Ref: 764393

Lab Sample ID	18/01441/1								Units	Method ref
Client Sample No	1									
Client Sample ID	BH105									
Depth to Top	1.75									
Depth To Bottom										
Date Sampled										
Sample Type	Solid									
Sample Matrix Code	7									
% Stones >10mm _A	<0.1								% w/w	A-T-044
pH BRE _D	8.56								pH	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	158								mg/l	A-T-026s

REPORT NOTES

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If results are in italic font they are associated with an AQC failure and there is insufficient sample to repeat the analysis. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

APPENDIX E - GEOENVIRONMENTAL TESTING

- (i) Laboratory Test Results
- (ii) Laboratory UKAS Accreditation Certificate