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Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

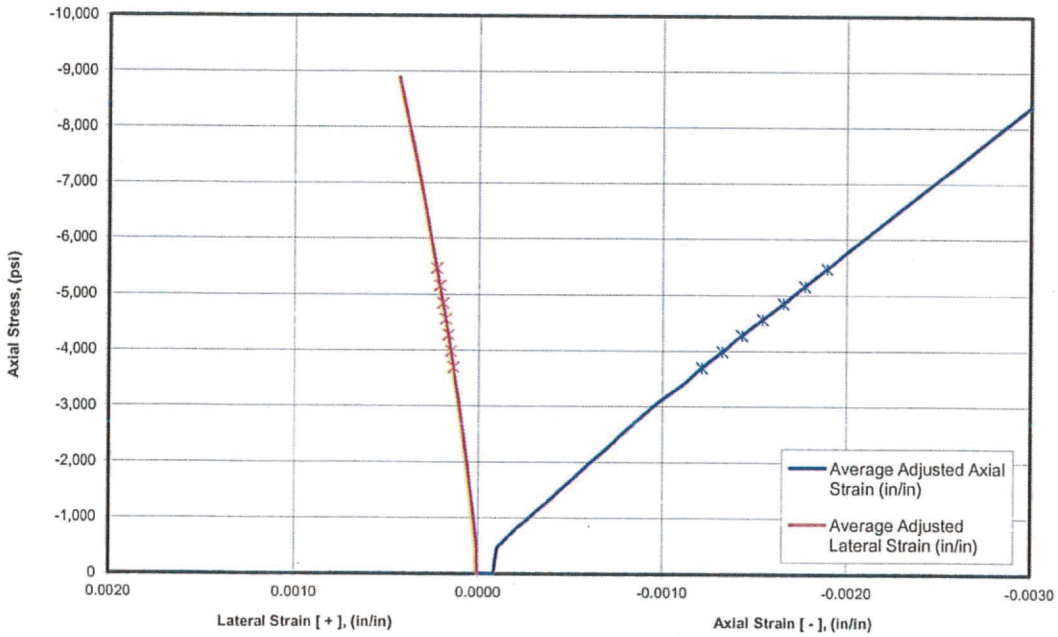
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

Sample No.: L7-3 BH
Boring No.: MP-203
Run. No.: N/A
Sample Depth (ft): 121.7-122.7

Tested By: Mike Hamilton MH
Test Date: 1/20/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/27/2014 2.3.14

Rock Type	(See boring log)
Moisture Condition	Laboratory Air-Dry
Specimen Diameter, (in)	2.40
Specimen Length, (in)	5.39
Length/Diameter Ratio	2.2
Specimen Conforms with Dimensional Requirements?	No (1)
As-Tested Unit Weight, (pcf)	~~166.7~~ 168 JD2 3/6/14
Loading Rate (lb/sec)	130
Test Duration to Failure, (min)	6.7
Uniaxial Compressive Strength, (psi)	9,190
Type of Break	Complete Break
Young's Modulus, (psi)	2,620,000
Poisson's Ratio	0.14



Comments:

Young's Modulus and Poisson's Ratio determined using linear least-squares of stress-strain data from 40% to 60% of the uniaxial compressive strength (data points used are indicated on the figure above).

Axial Strain is negative; Lateral Strain is positive. Load direction with respect to lithology: Vertical

(1) Specimen did not meet End Perpendicularity and End Flatness requirements of ASTM D4543-08. Authorization to proceed with test received from John Damm.

Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

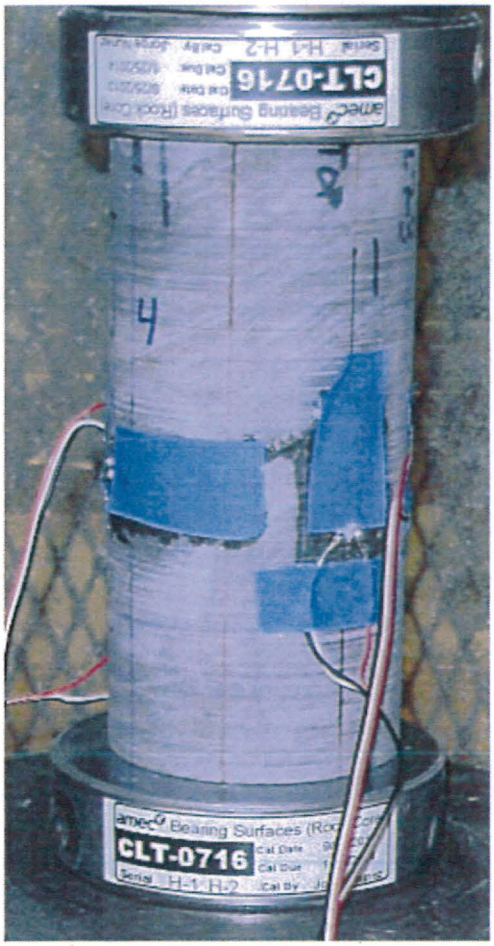
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

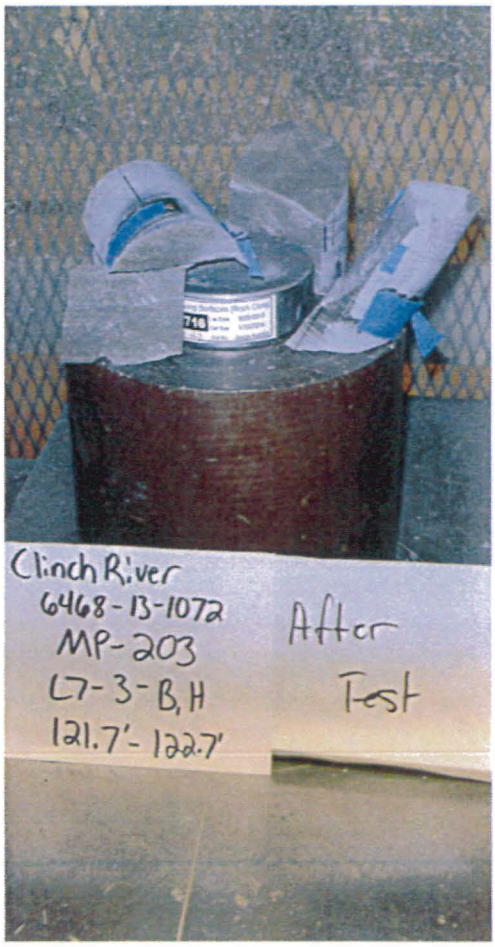
Sample No.: L7-3 BH
Boring No.: MP-203
Run. No.: N/A
Sample Depth (ft): 121.7-122.7

Tested By: Mike Hamilton MH
Test Date: 1/20/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/27/2014 1-27-14

Specimen Prior to Testing
("MP-203 L7-3 BH before test.jpg"):



Specimen After Testing
("MP-203 L7-3 BH after test.jpg"):



Comments:

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Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

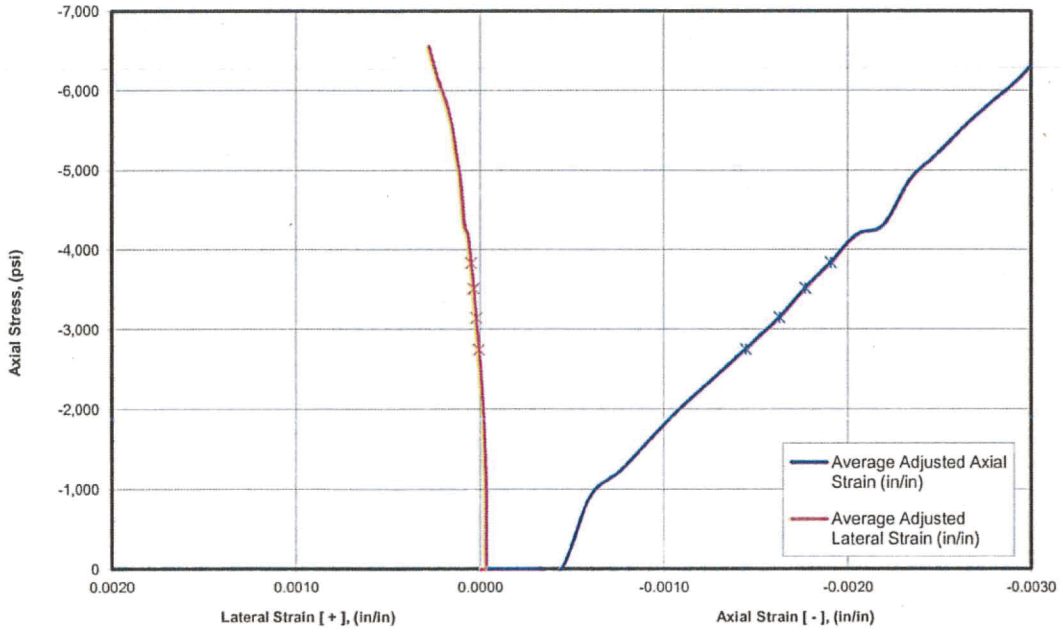
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

Sample No.: L3-32 BH
Boring No.: MP-205
Run. No.: N/A
Sample Depth (ft): 72.7-73.5

Tested By: Mike Hamilton MH
Test Date: 1/27/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/30/2014 1-31-14

Rock Type	(See boring log)
Moisture Condition	Laboratory Air-Dry
Specimen Diameter, (in)	1.77
Specimen Length, (in)	3.96
Length/Diameter Ratio	2.2
Specimen Conforms with Dimensional Requirements?	No (1)
As-Tested Unit Weight, (pcf)	~~167.4~~ 167 JCS 3/6/14
Loading Rate (lb/sec)	90
Test Duration to Failure, (min)	5.3
Uniaxial Compressive Strength, (psi)	6,890
Type of Break	Columnar/Complete Break
Young's Modulus, (psi)	2,370,000
Poisson's Ratio	0.09



Comments:

Young's Modulus and Poisson's Ratio determined using linear least-squares of stress-strain data from 40% to 60% of the uniaxial compressive strength (data points used are indicated on the figure above).

Axial Strain is negative; Lateral Strain is positive. Load direction with respect to lithology: Vertical

(1) Specimen did not meet Side Straightness requirements of ASTM D4543-08. Authorization to proceed with test received from John Damm.

Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

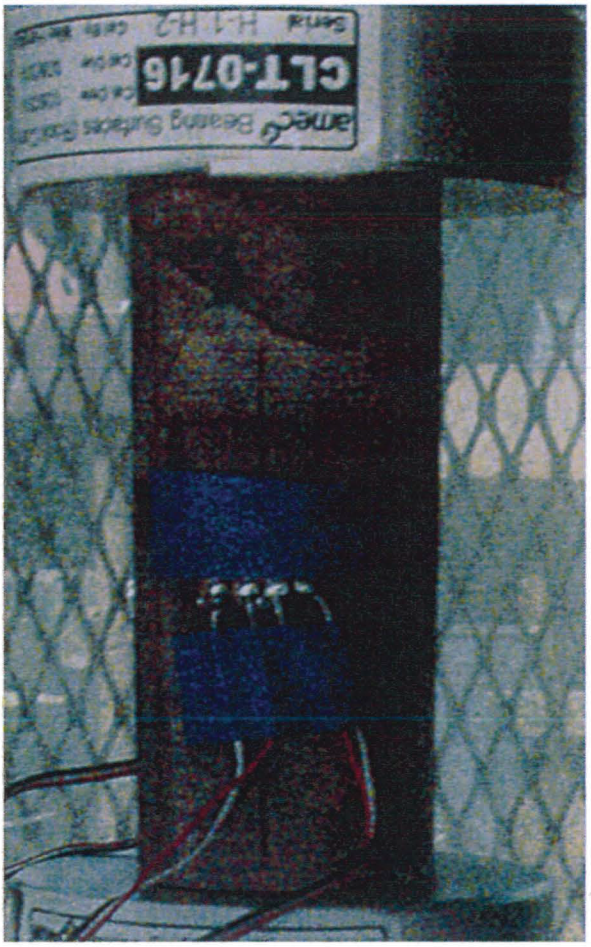
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

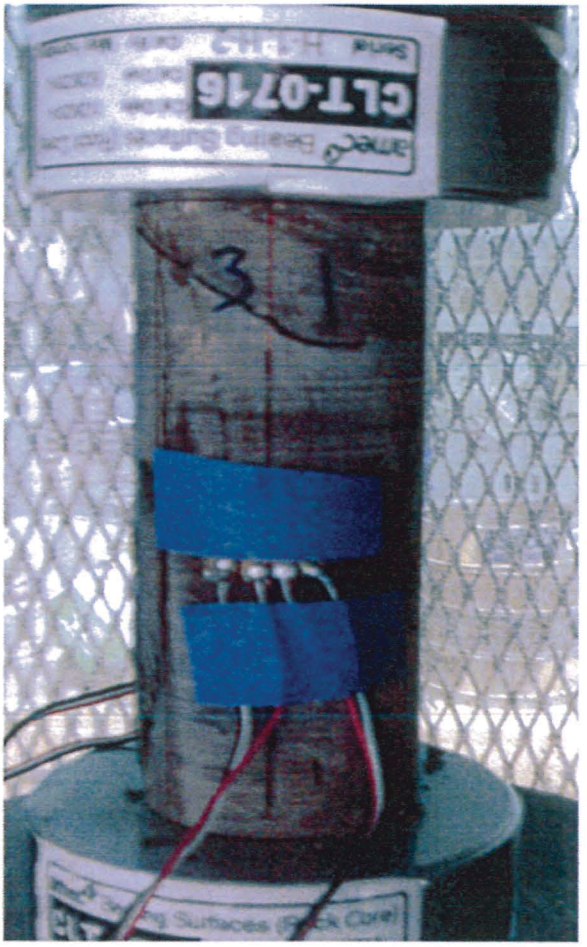
Sample No.: L3-32 BH
Boring No.: MP-205
Run. No.: N/A
Sample Depth (ft): 72.7-73.5

Tested By: Mike Hamilton MH
Test Date: 1/27/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/30/2014 1-31-14

Specimen Prior to Testing
("MP-205 L3-32-BH before test.jpg"):



Specimen After Testing
("MP-205 L3-32-BH after test (2).jpg"):



Comments:

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Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

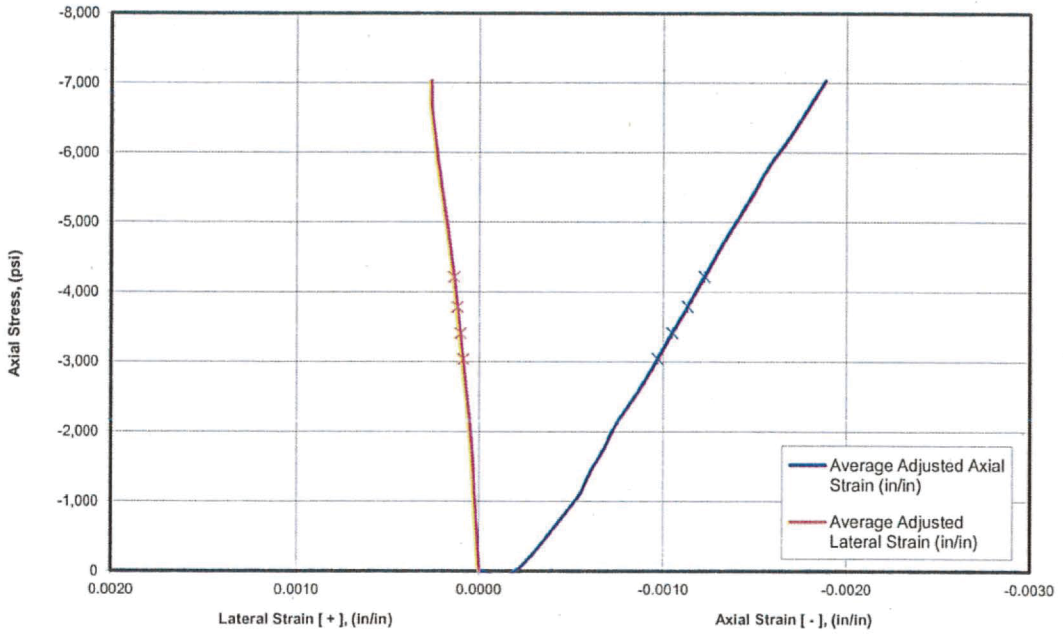
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

Sample No.: L3-36 BCH
Boring No.: MP-205
Run. No.: N/A
Sample Depth (ft): 162.6-163.4

Tested By: Mike Hamilton MH
Test Date: 1/26/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/30/2014 1-31-14

Rock Type	(See boring log)
Moisture Condition	Laboratory Air-Dry
Specimen Diameter, (in)	1.76
Specimen Length, (in)	3.86
Length/Diameter Ratio	2.2
Specimen Conforms with Dimensional Requirements?	No [1]
As-Tested Unit Weight, (pcf)	~~168.4~~ 168 JO2 3/6/14
Loading Rate (lb/sec)	90
Test Duration to Failure, (min)	4
Uniaxial Compressive Strength, (psi)	7,130
Type of Break	Columnar (Slight Shear)
Young's Modulus, (psi)	4,650,000
Poisson's Ratio	0.20



Comments:

Young's Modulus and Poisson's Ratio determined using linear least-squares of stress-strain data from 40% to 60% of the uniaxial compressive strength (data points used are indicated on the figure above).

Axial Strain is negative; Lateral Strain is positive. Load direction with respect to lithology: Vertical

[1] Specimen did not meet End Flatness requirements of ASTM D4543-08. Authorization to proceed with test received from John Damm.

Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

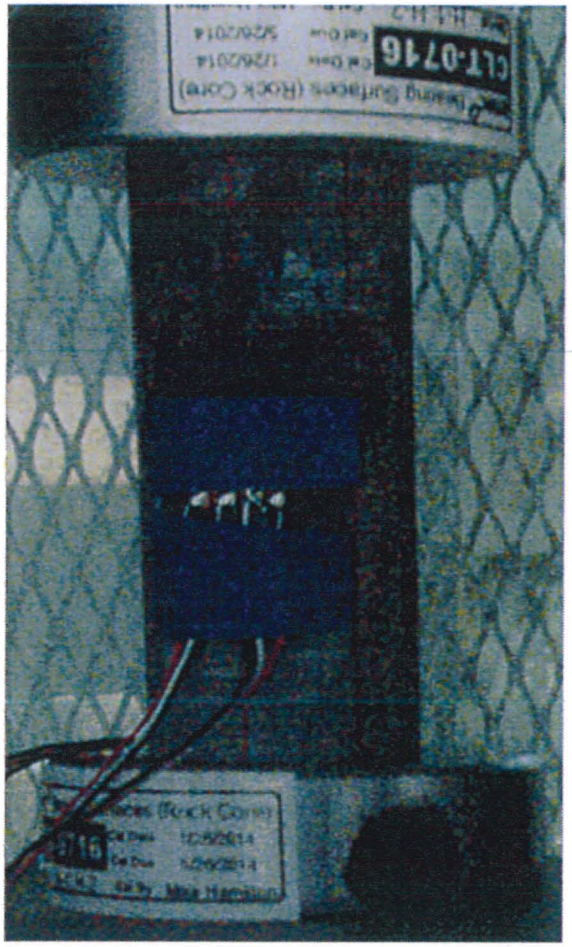
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

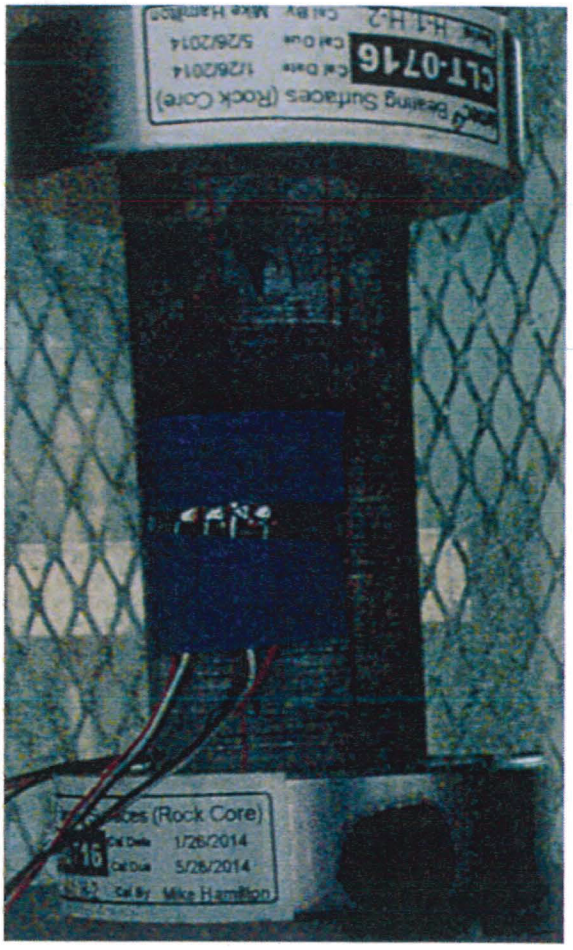
Tested By: Mike Hamilton MH
Test Date: 1/26/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/30/2014 1-30-14

Sample No.: L3-36 BCH
Boring No.: MP-205
Run. No.: N/A
Sample Depth (ft): 162.6-163.4

Specimen Prior to Testing
("MP-205 L3-36 BCH before test.jpg"):



Specimen After Testing
("MP-205 L3-36 BCH after test.jpg"):



Comments:

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Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

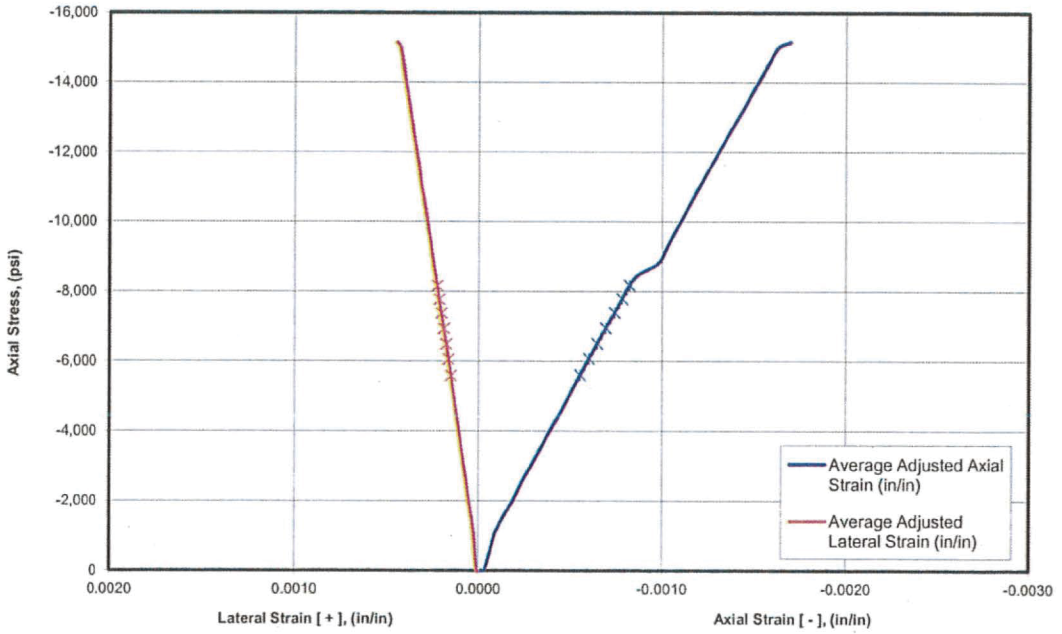
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

Sample No.: L3-37 BH
Boring No.: MP-205
Run. No.: N/A
Sample Depth (ft): 208.5-209.0

Tested By: Mike Hamilton MH
Test Date: 1/26/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/30/2014 1-31-14

Rock Type	(See boring log)
Moisture Condition	Laboratory Air-Dry
Specimen Diameter, (in)	1.75
Specimen Length, (in)	4.10
Length/Diameter Ratio	2.3
Specimen Conforms with Dimensional Requirements?	No (1)
As-Tested Unit Weight, (pcf)	~~168.1~~ 168 JD 3/4/14
Loading Rate (lb/sec)	90
Test Duration to Failure, (min)	6.7
Uniaxial Compressive Strength, (psi)	15,310
Type of Break	Shear with Columnar
Young's Modulus, (psi)	9,530,000
Poisson's Ratio	0.28



Comments:

Young's Modulus and Poisson's Ratio determined using linear least-squares of stress-strain data from 35% to 55% of the uniaxial compressive strength (data points used are indicated on the figure above).

Axial Strain is negative; Lateral Strain is positive. Load direction with respect to lithology: Vertical

(1) Specimen did not meet End Flatness requirements of ASTM D4543-08. Authorization to proceed with test received from John Damm.

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Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

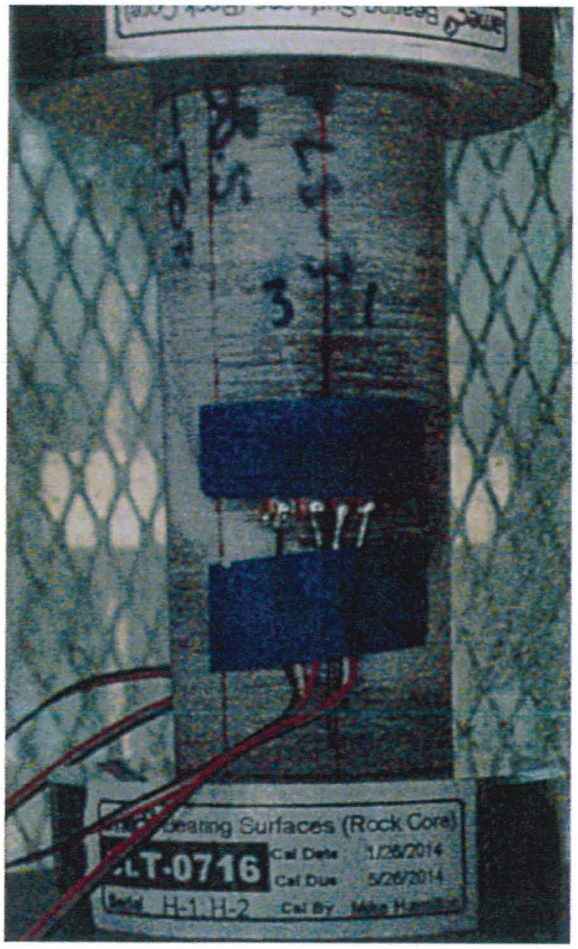
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

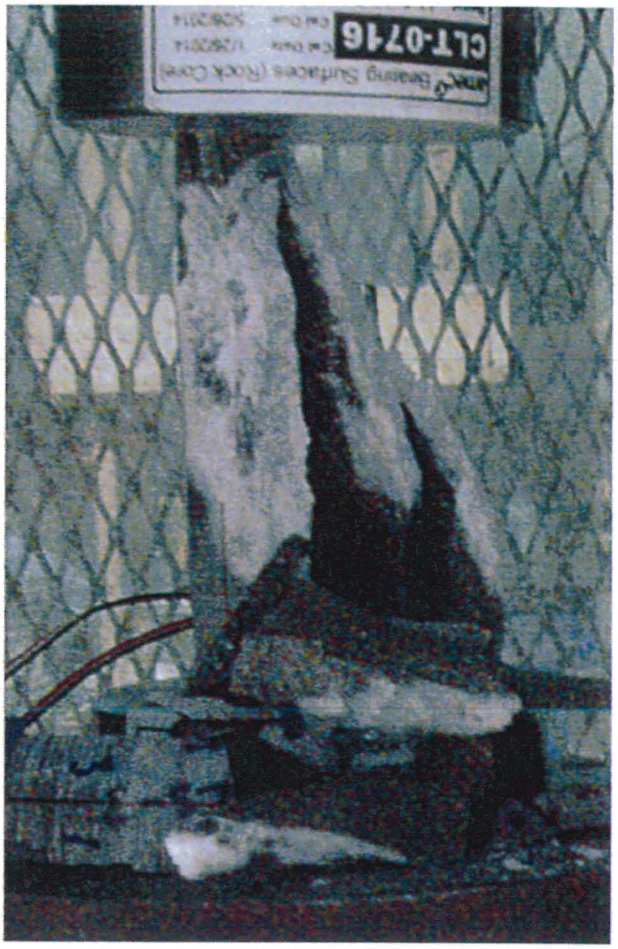
Sample No.: L3-37 BH
Boring No.: MP-205
Run. No.: N/A
Sample Depth (ft): 208.5-209.0

Tested By: Mike Hamilton mh
Test Date: 1/26/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/30/2014 1-30-14

Specimen Prior to Testing
("MP-205 L3-37 BH before test.jpg"):



Specimen After Testing
("MP-205 L3-37 BH after test.jpg"):



Comments:

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Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

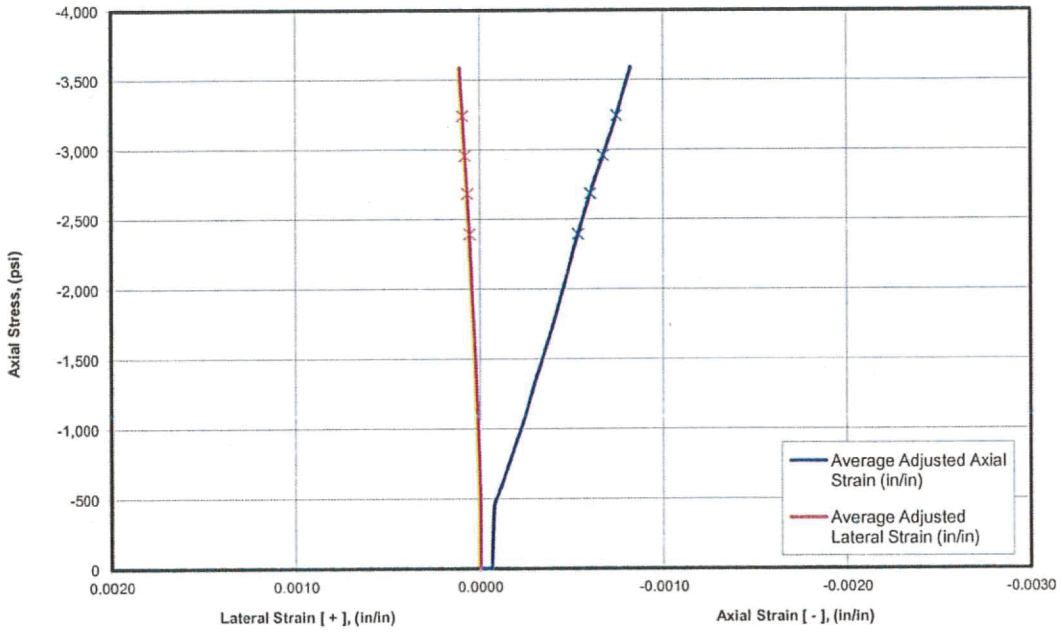
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

Sample No.: L7-6 BH
Boring No.: MP-207
Run. No.: N/A
Sample Depth (ft): 70.7-71.7

Tested By: Mike Hamilton MH
Test Date: 1/20/2014 1/27/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/27/2014 2-3-14

Rock Type	(See boring log)
Moisture Condition	Laboratory Air-Dry
Specimen Diameter, (in)	2.36
Specimen Length, (in)	5.34
Length/Diameter Ratio	2.3
Specimen Conforms with Dimensional Requirements?	No (1)
As-Tested Unit Weight, (pcf)	~~167.2~~ 167 JDJ 3/6/14
Loading Rate (lb/sec)	130
Test Duration to Failure, (min)	4.7
Uniaxial Compressive Strength, (psi)	5,970
Type of Break	Columnar with slight shear
Young's Modulus, (psi)	4,040,000
Poisson's Ratio	0.18



Comments:

Young's Modulus and Poisson's Ratio determined using linear least-squares of stress-strain data from 40% to 60% of the uniaxial compressive strength (data points used are indicated on the figure above).

Axial Strain is negative; Lateral Strain is positive. Load direction with respect to lithology: Vertical

(1) Specimen did not meet End Perpendicularity and end flatness requirements of ASTM D4543-08. Authorization to proceed with test received from John Damm.

Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

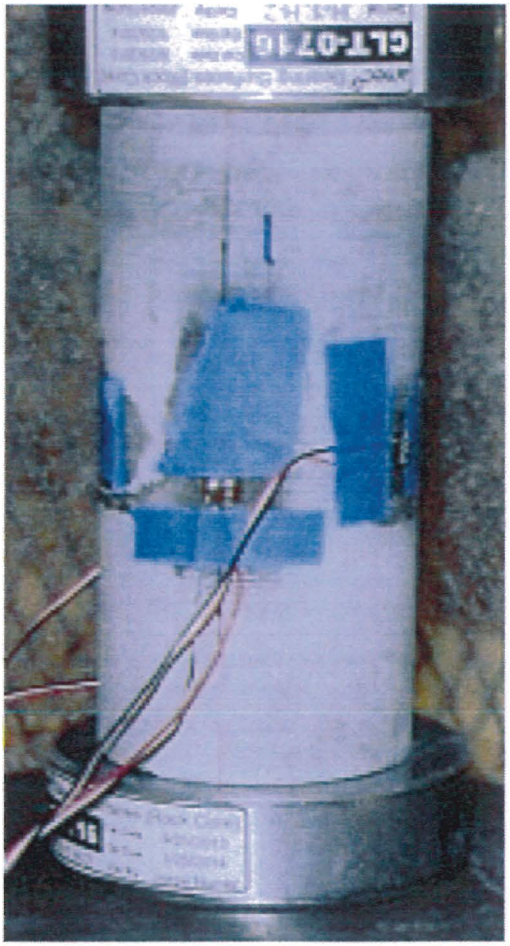
ASTM D7012-10

Project Name: Clinch River SMR
Project Number: 6468-13-1072

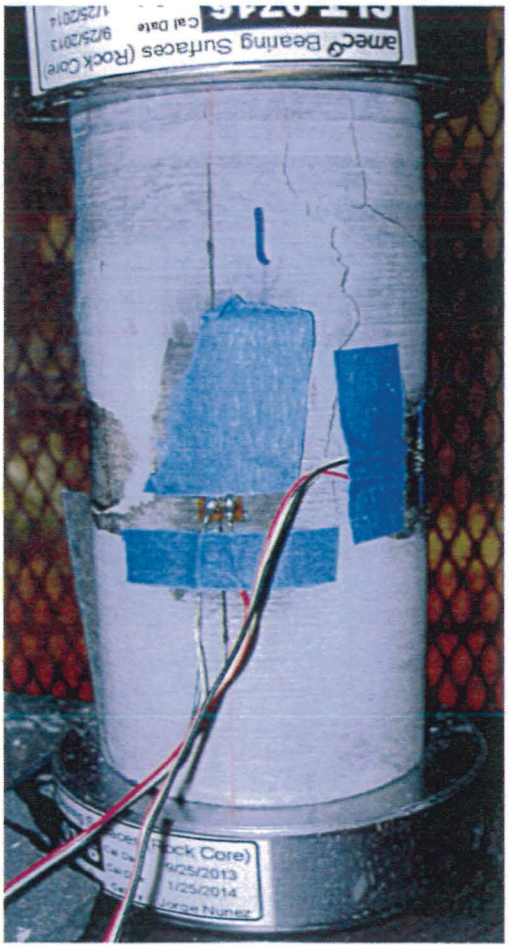
Tested By: Mike Hamilton MH
Test Date: 1/20/2014 1/31/14
Reviewed By: Allen Cottingham MAC
Review Date: 1/27/2014 1-27-14

Sample No.: L7-6 BH
Boring No.: MP-207
Run. No.: N/A
Sample Depth (ft): 70.7-71.7

Specimen Prior to Testing
("MP-207 L7-6 BH before test.jpg"):



Specimen After Testing
("MP-207 L7-6 BH after test.jpg"):



Comments: