Geotechnical
Environmental and
Water Resources
Engineering

GEI Consultants

Transfer of Fugro RCTS Report
Transmittal Letter No. 2

Via Areva ftp Site

July 2, 2008
Project 07223

Mr. Frank X. Bellini
Field Project Manager
AREVA NP, INC.
Solomon Pond Park
400 Donald Lynch Boulevard
Marlborough, MA 01752

Dear Mr. Bellini:

Re: Transmittal No. 2 – Resonant Column Cyclic Torsional Shear Tests (RCTS) Report
Nine Mile Point Site Characterization
Oswego, New York

The purpose of this letter is to document GEI Consultants, Inc.'s transmittal (via your ftp site) of the Fugro RCTS Test Report dated June 20, 2008, which also includes some revisions/corrections to pages 55 - 85 dated 6/30/08. This document replaces Areva Document No. 38-9084289-000. This Transmittal is being prepared according to the AREVA NP, INC. Purchase Order and Scope of Work provided in our proposal dated July 6, 2007, which is the basis of our current contract with AREVA.

Documents

This Letter of Transmittal No. 2 transfers Fugro RCTS Tests Reports dated June 20, 2008 (and corrected pages dated June 30, 2008) for the Nine Mile Point Site Characterization Project; it includes one document containing two RCTS tests (RCTS#A and RCTS#B) and two reports.

1. **Resonant Column Cyclic Torsional Shear Tests (RCTS) Report.**

All test samples were managed and tested in accordance with the following AREVA-approved procedures:

- 38-9058206-004: GEI Procedure 124 R4 - Transportation and Tracking of Soil and Rock Samples.
- 38-9080235-000: GEI Procedure 109 - Resonant Column Cyclic Torsional Shear CCyTS).
- 38-9065537-001: GEI Procedure 101 R1 - Water Content Measurement.

Prior to testing, all Fugro personnel involved in the work were trained to the procedures.

Please call me, Tom Kahl or Robert Lambe if you have questions regarding this Transmittal Letter.

Sincerely,

GEI CONSULTANTS, INC.

Herbert Scribner
Electronic signature inserted by D. Bishop per email approval from Herbert Scribner 7/2/08

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, Massachusetts 01801
781.721.4000 fax 781.721.4073

FUGRO CONSULTANTS, INC.

6100 Hillcroft (77081)
P.O. Box 740010
Houston, Texas 77274
Tel: 713-369-5400
Fax: 713-369-5518

June 20, 2008

Mr. Thomas W. Kahl
Senior Vice President
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

Dear Mr. Kahl:

RE: Letter of Transmittal
Resonant Column Cyclic Torsional Shear Tests
Backfill Samples
Nine Mile Point Unit 3
Oswego, New York

Test Results Summary

Fugro performed two RCTS tests on remolded specimens of sand and gravel backfill samples provided by GEI Consultants, Inc. The **final** reports of the tests along with Dr. Kenneth Stokoe's approval sheet are presented in Attachment A.

Test Procedures

All test samples were managed and tested in accordance with the following AREVA-approved procedures:

- 38-9058206-004: GEI Procedure 124 R4- Transportation and Tracking of Soil and Rock Samples
- 38-9080235-000: GEI Procedure 109- Resonant Column Cyclic Torsional Shear (RCCyTS)
- 38-9065537-001: GEI Procedure 101 R1- Water Content Measurement

Prior to testing, all Fugro personnel involved in the work were trained to the procedures.

Test Documents

Copies of completed test forms related to the testing required by the above-referenced procedures are contained in Attachment B.

Please call me at if you have any questions.

Sincerely,

Jiewu Meng, PhD, P.E.
Project Engineer

Bill DeGroff, P.E.
Laboratory Department Manager

Enclosure(s)

RCTS TEST APROVAL

PROJECT SITE/NAME	Nine-Mile Point

Test ID	Sample ID	Depth B.S. (Ft)	Approved By (Initials)	Date
RCTS#A	Pad 1-1	---	KHS	18 June '08
RCTS#B	Pad 1-2		KHS	18 June '08

Two RCTS tests for the site referenced above were tested, and two reports were prepared, by Fugro Consultants, Inc.

I have reviewed the data and associated results listed above and found them to be reasonable.

Approved By:

K. H. Stokoe

Dr. Kenneth Stokoe

ATTACHMENT A

Fugro # 0411-08-1696

APPENDIX A

Remolded Specimen Pad 1-1
Sample Location: Streeter Rathburn Road

Borehole ---NA
Sample ---NA
Depth = --- ft (--- m)
Total Unit Weight = 125.2 lb/ft^3
Water Content = 7.8 %
Estimated In-Situ Mean Effective
Stress = 13 psi

FUGRO JOB #: 0411-08-1696
Testing Station: RC7

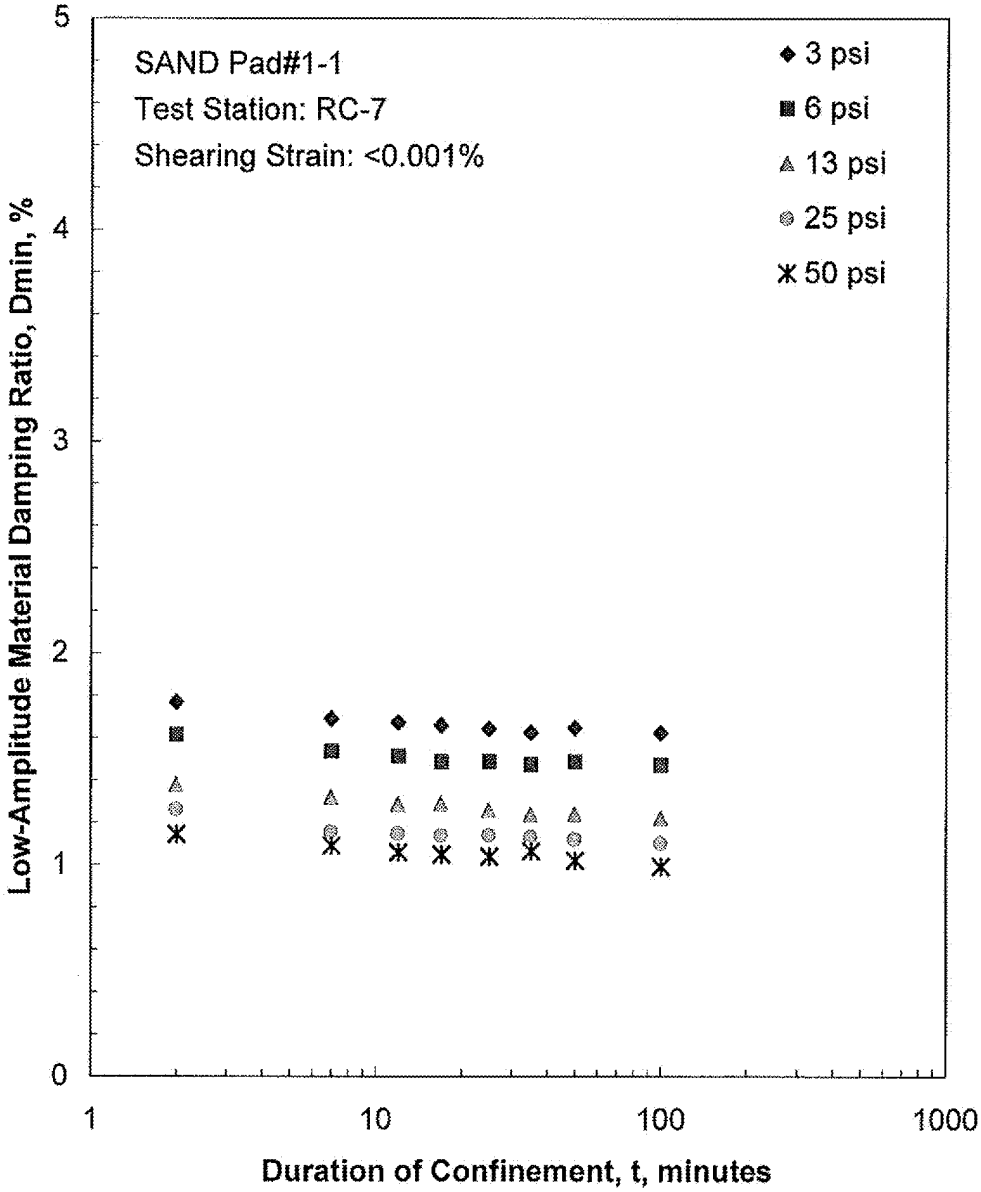


Figure A.2 Variation in Low-Amplitude Material Damping Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

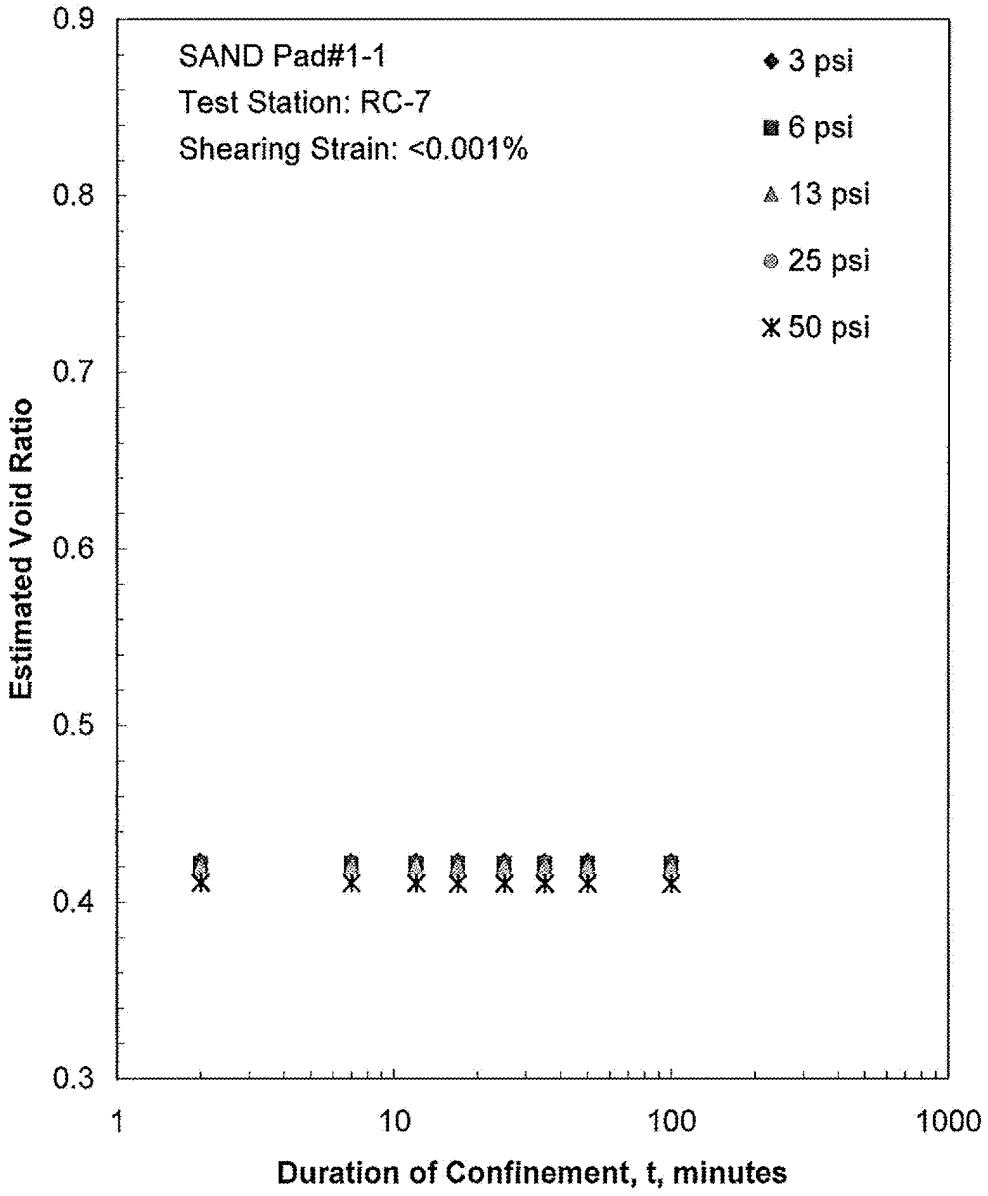


Figure A.3 Variation in Estimated Void Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

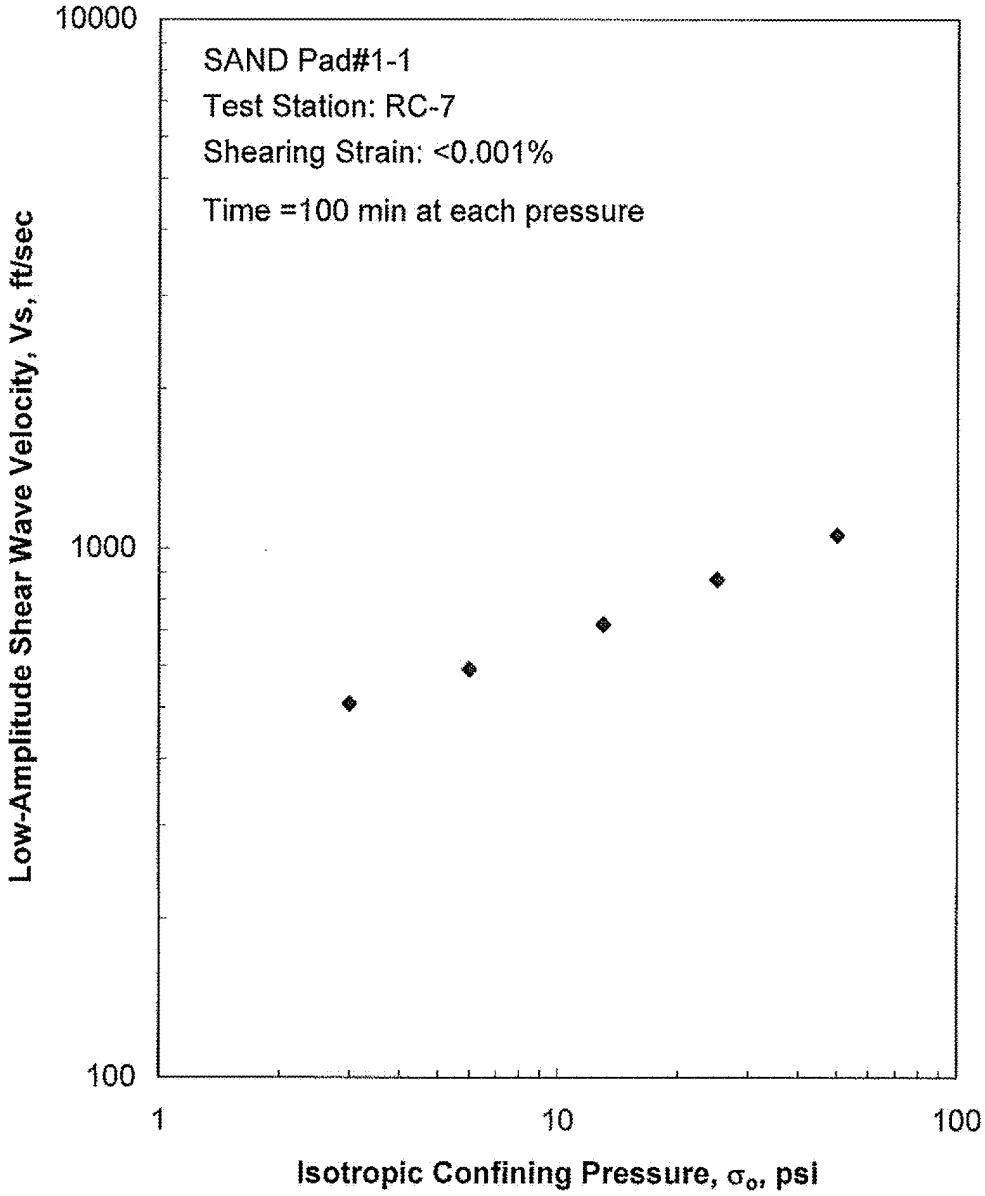


Figure A.4 Variation in Low-Amplitude Shear Wave Velocity with Isotropic Confining Pressure from Resonant Column Tests

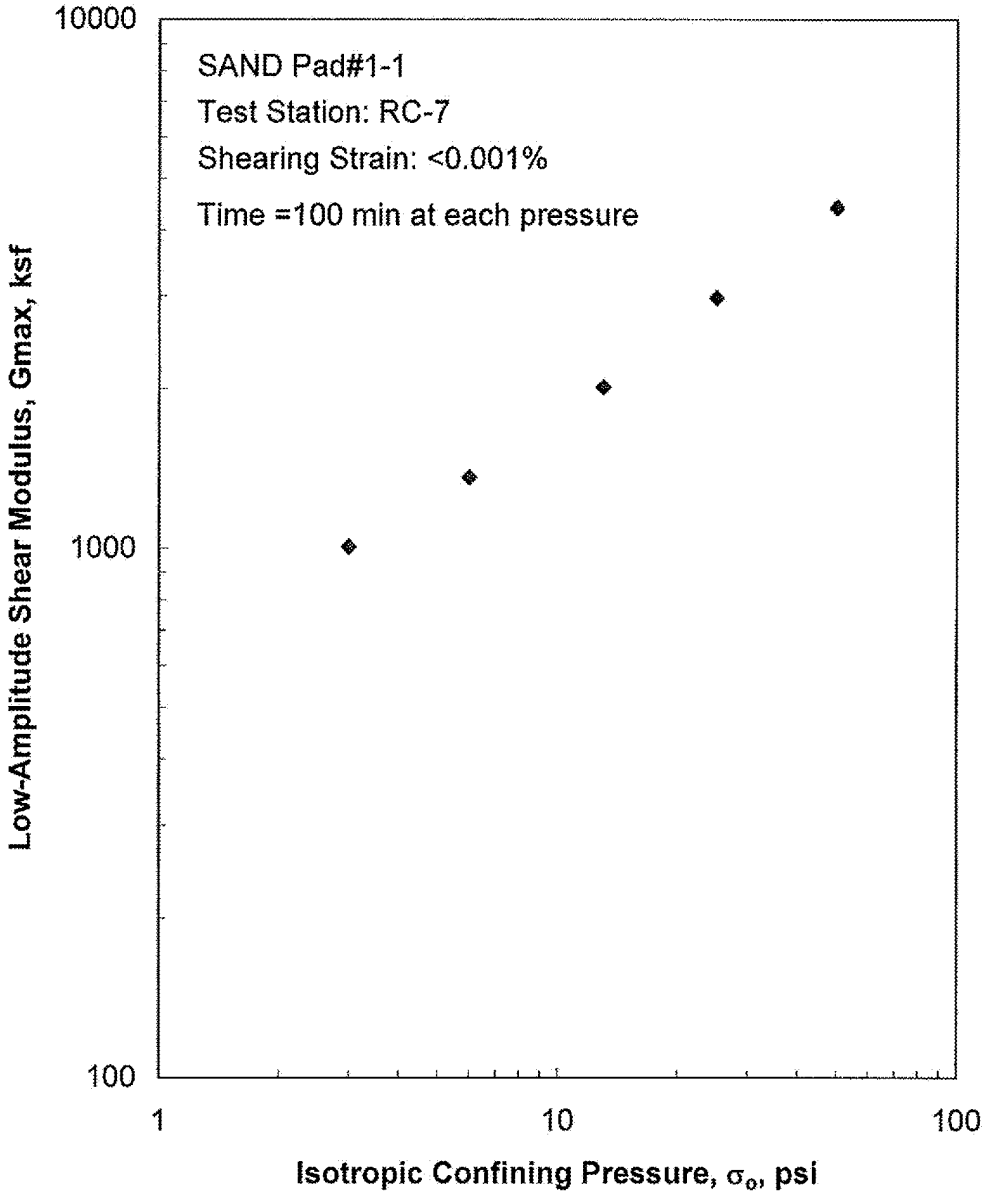


Figure A.5 Variation in Low-Amplitude Shear Modulus with Isotropic Confining Pressure from Resonant Column Tests

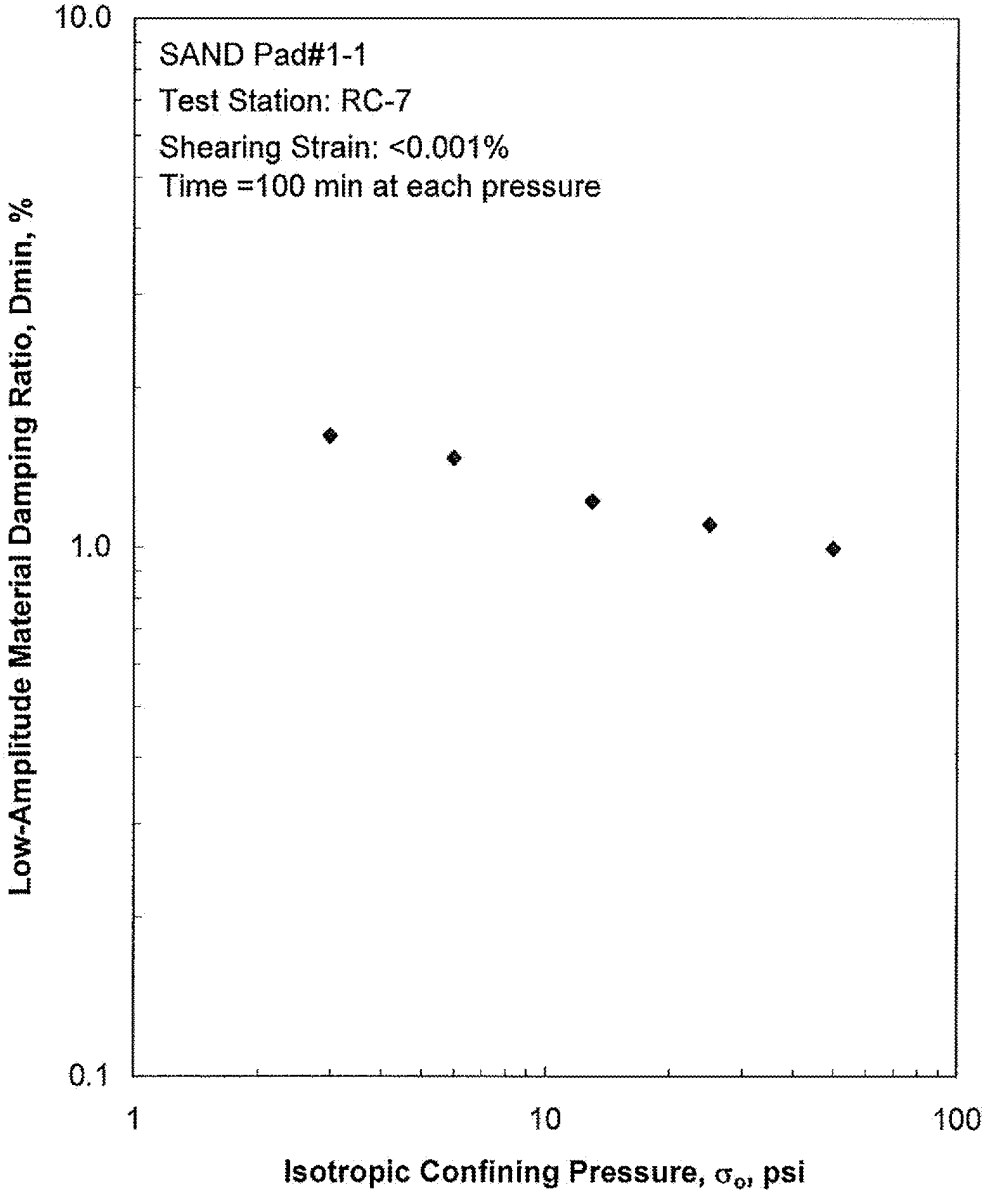


Figure A.6 Variation in Low-Amplitude Material Damping Ratio with Isotropic Confining Pressure from Resonant Column Tests

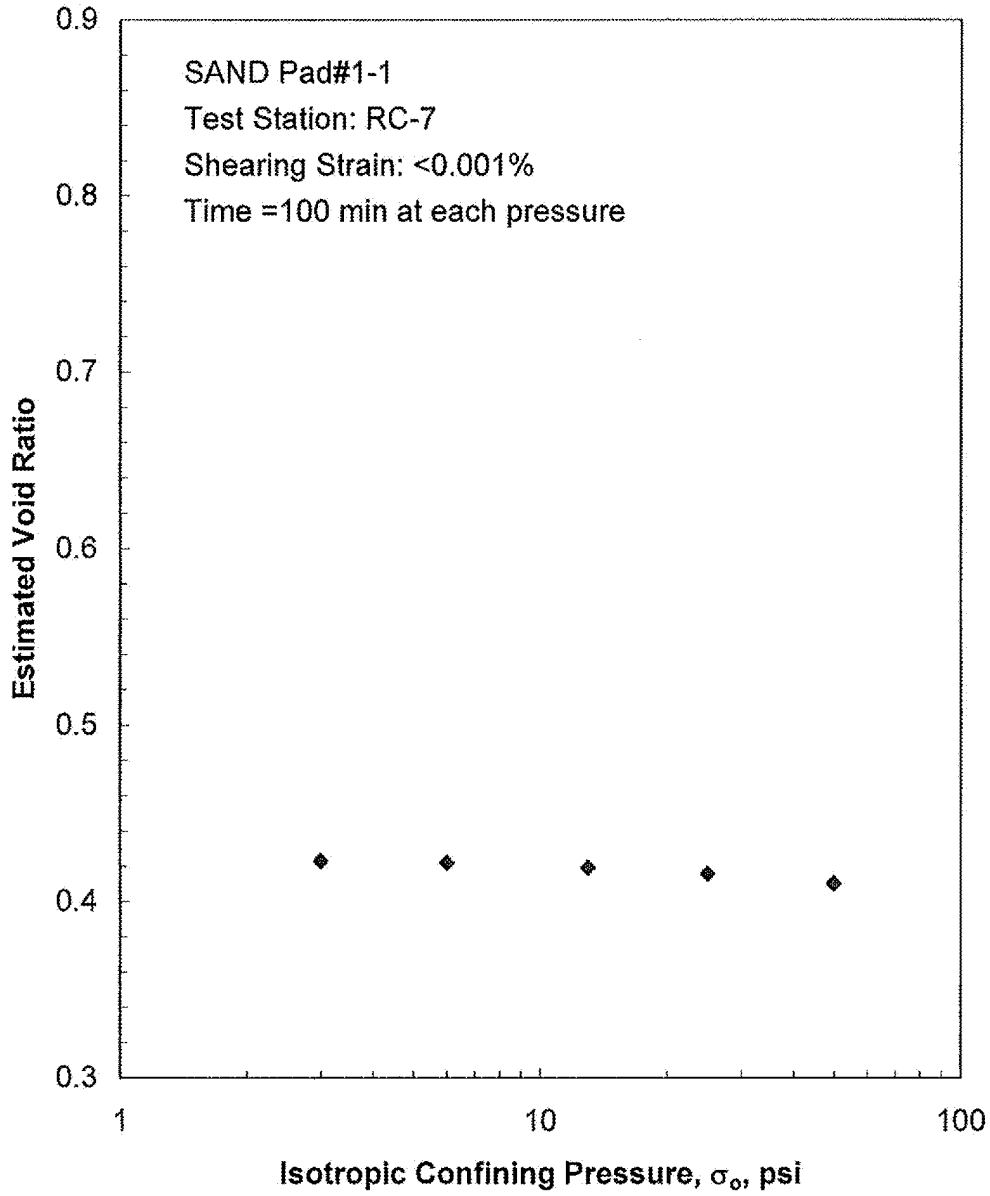


Figure A.7 Variation in Estimated Void Ratio with Isotropic Confining Pressure from Resonant Column Tests

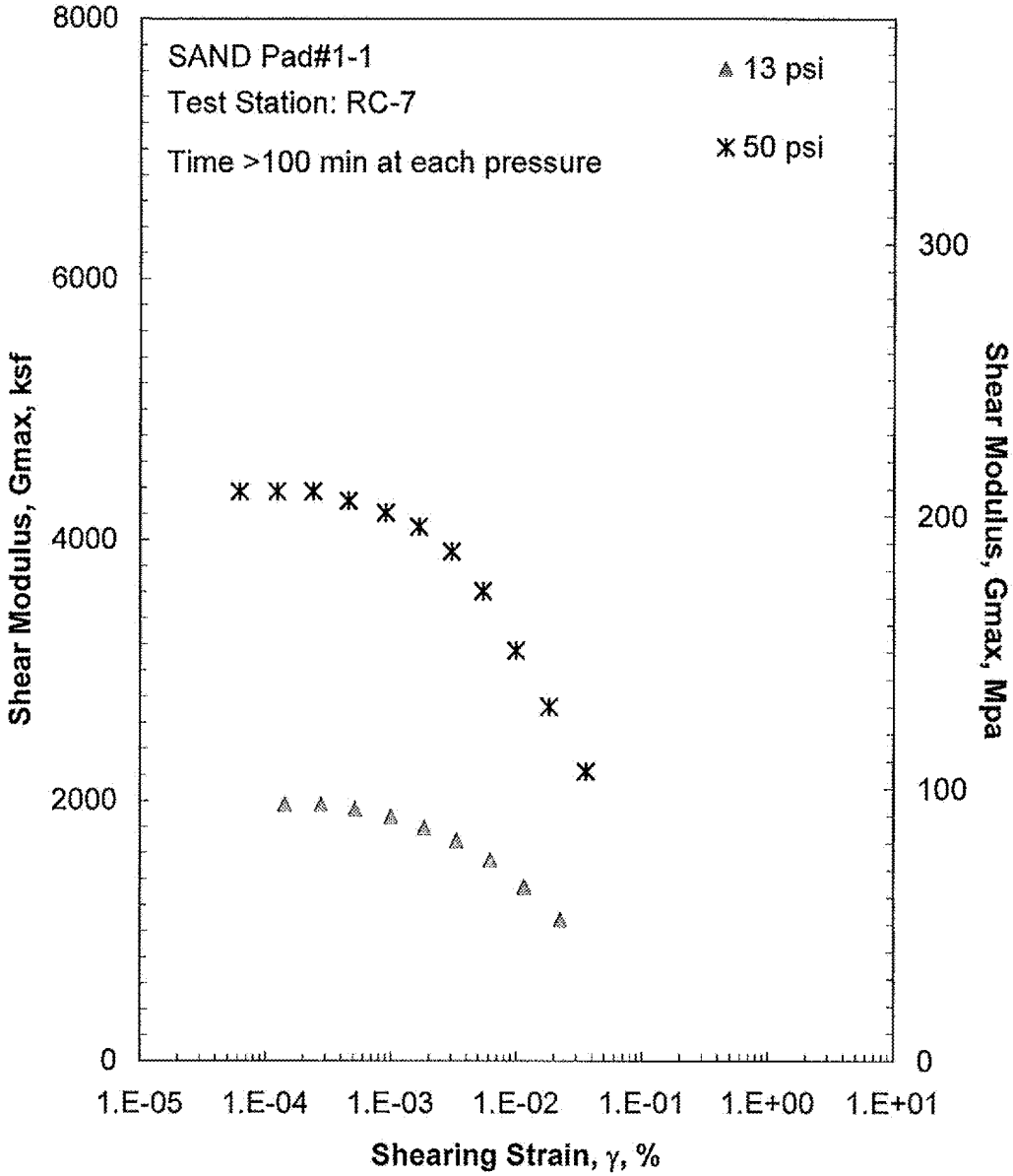


Figure A.8 Comparison of the Variation in Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

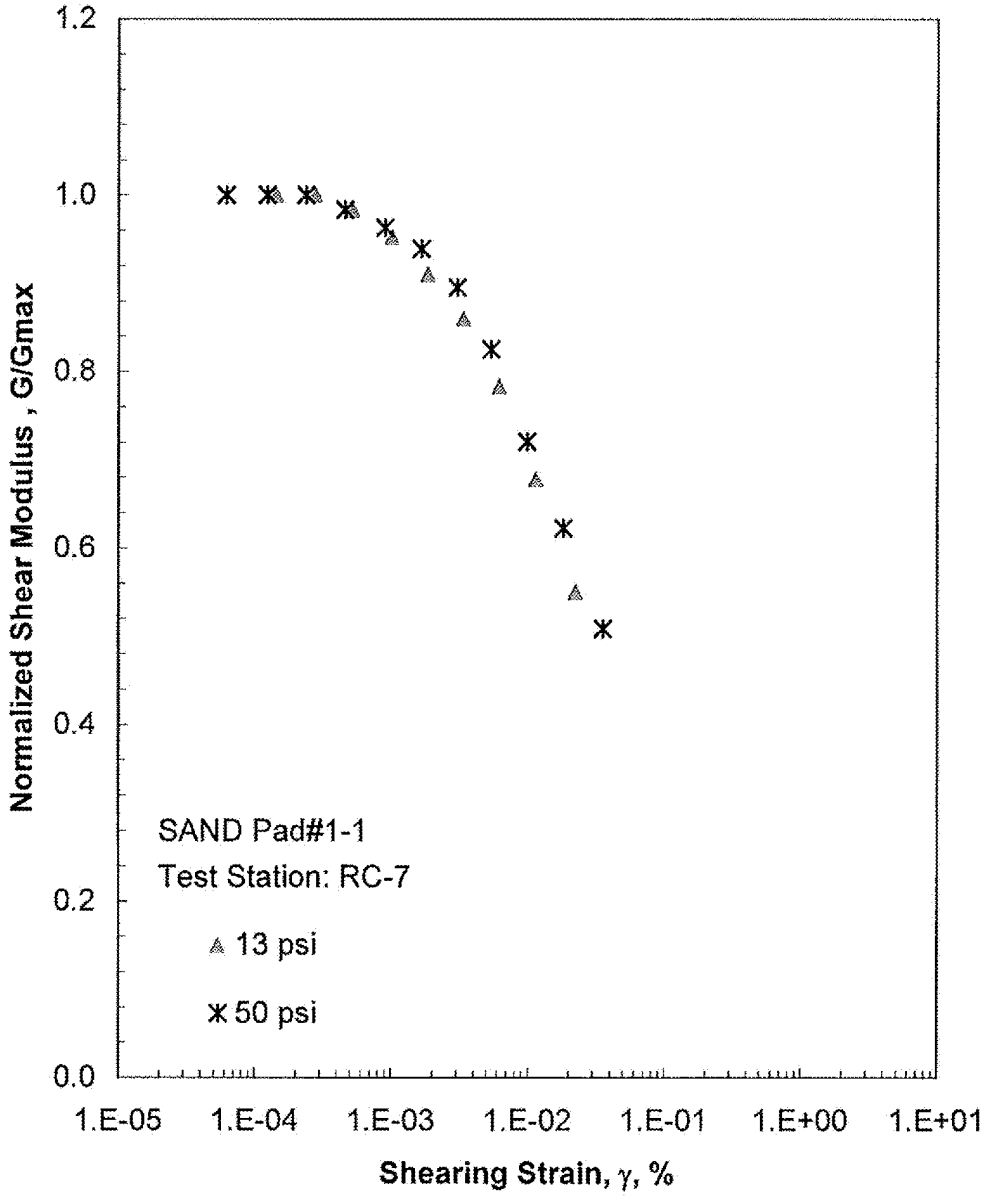


Figure A.9 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

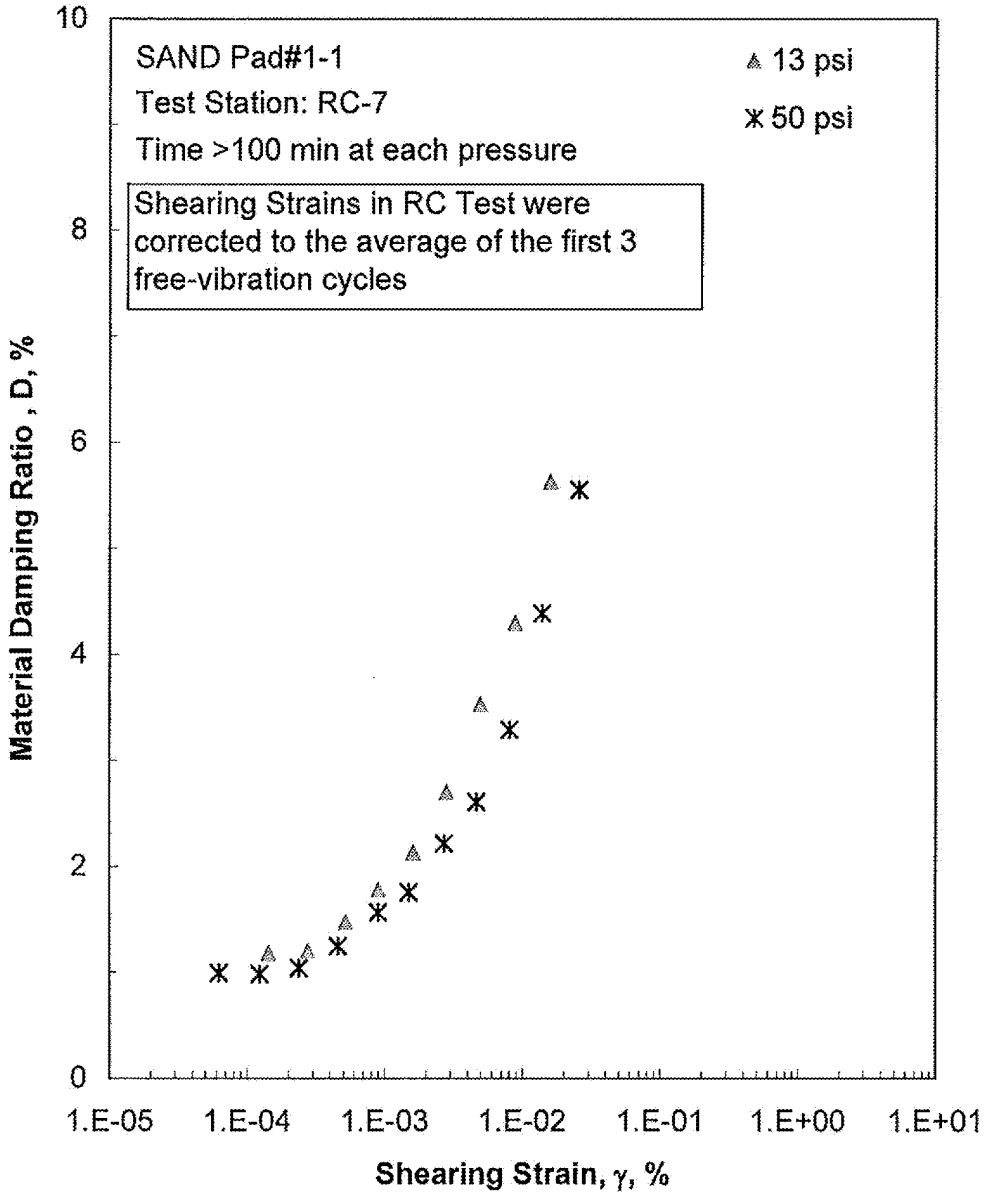


Figure A.10 Comparison of the Variation in Material Damping Ratio with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

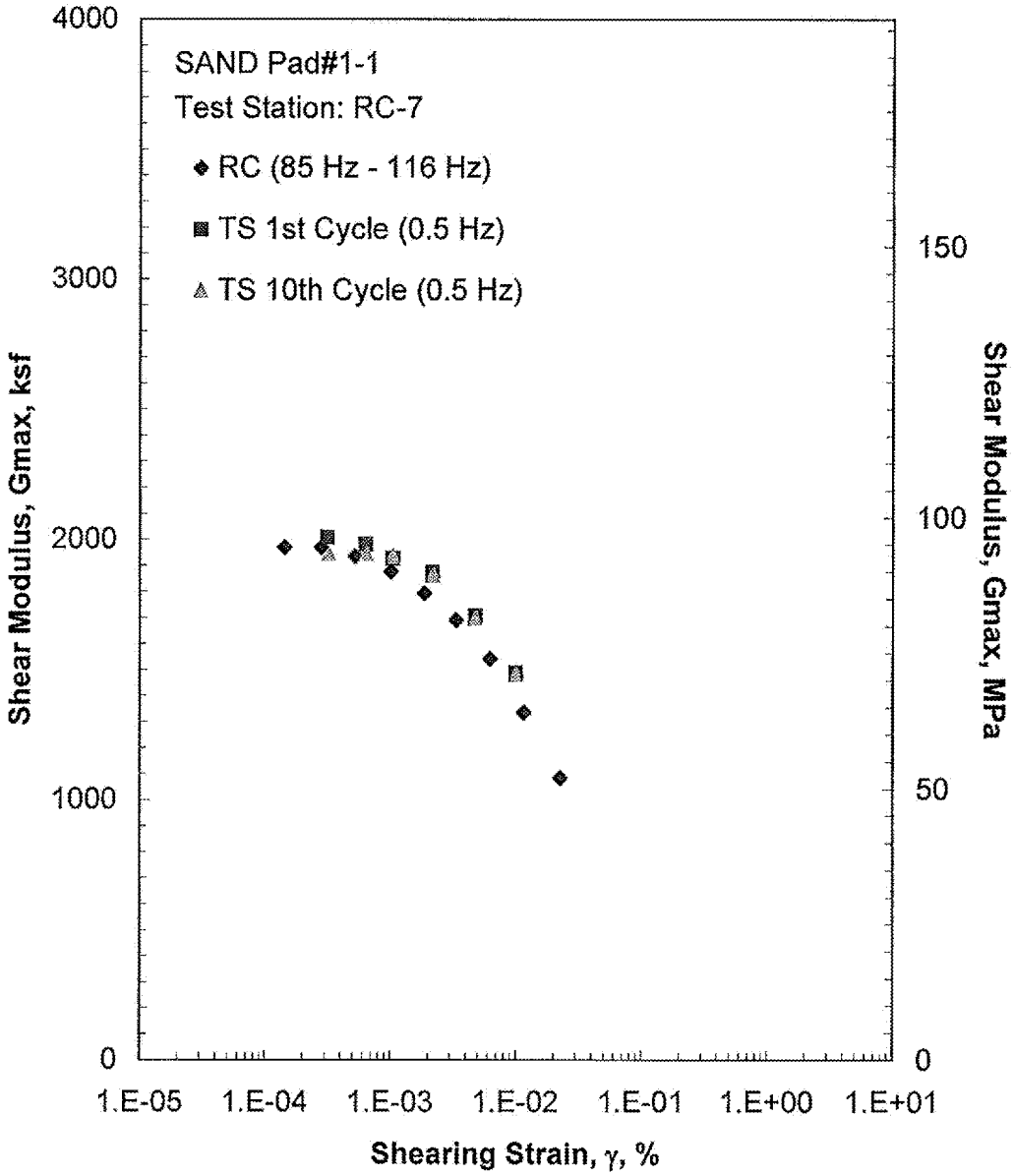


Figure A.11 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

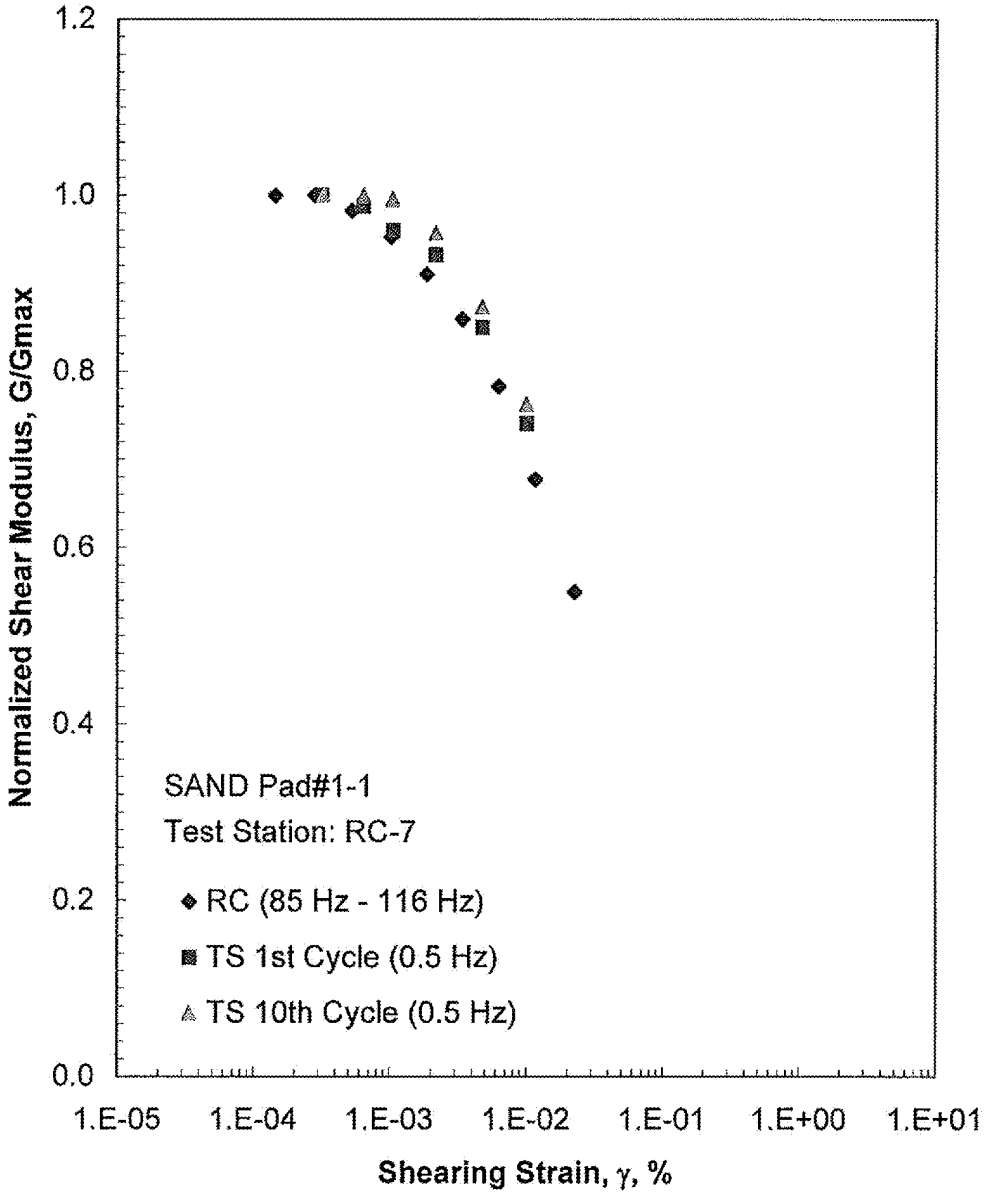


Figure A.12 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

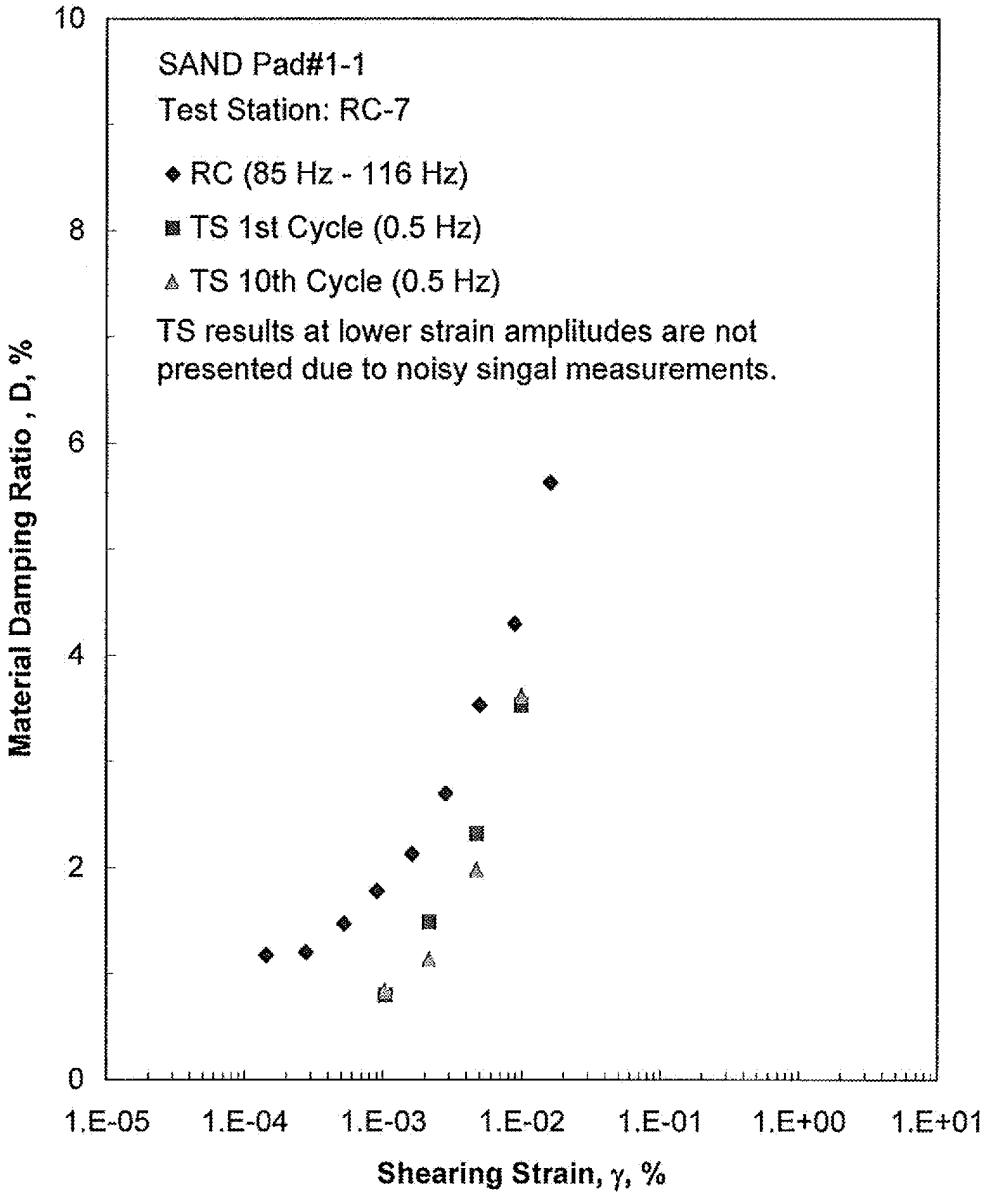


Figure A.13 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

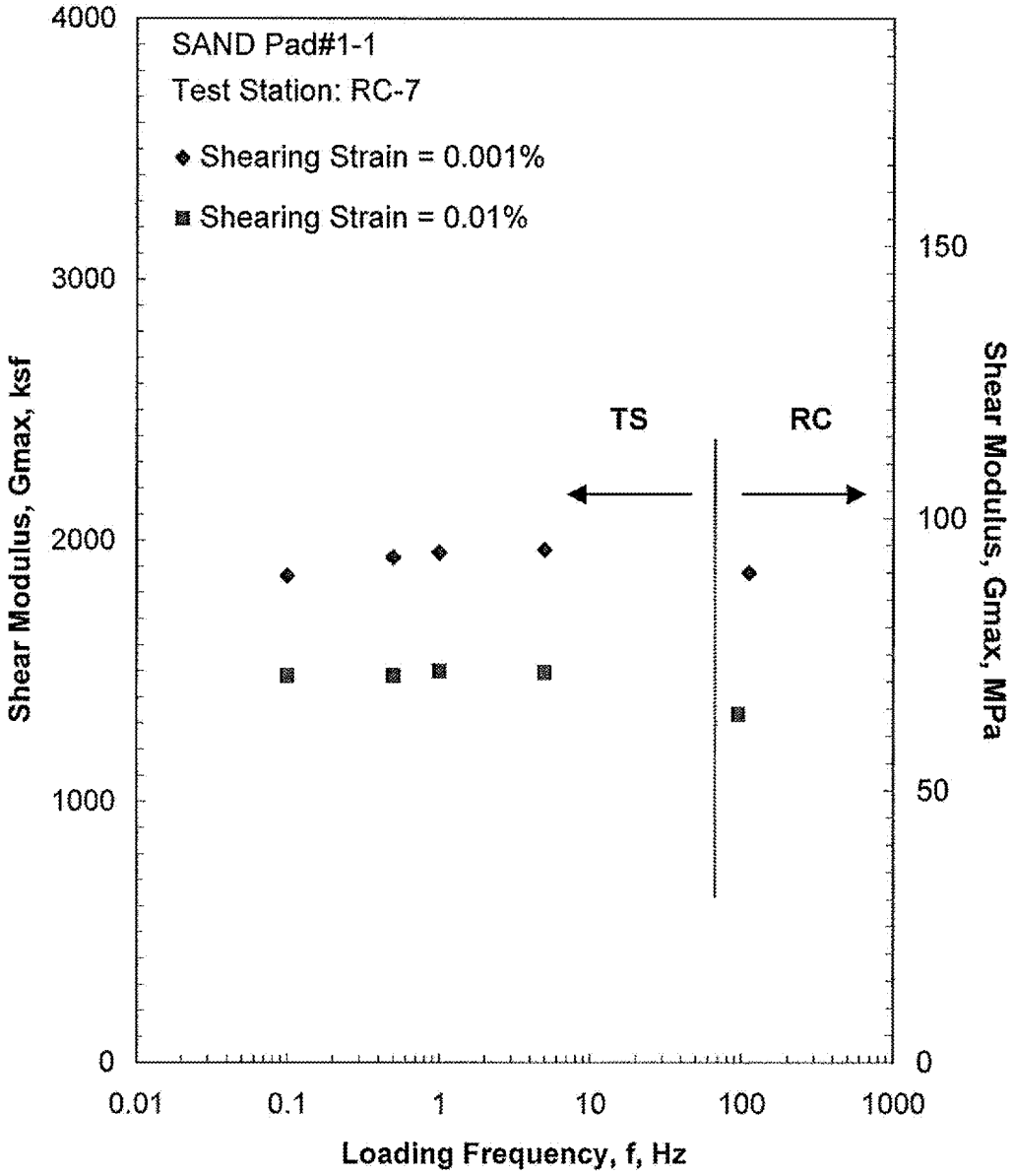


Figure A.14 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

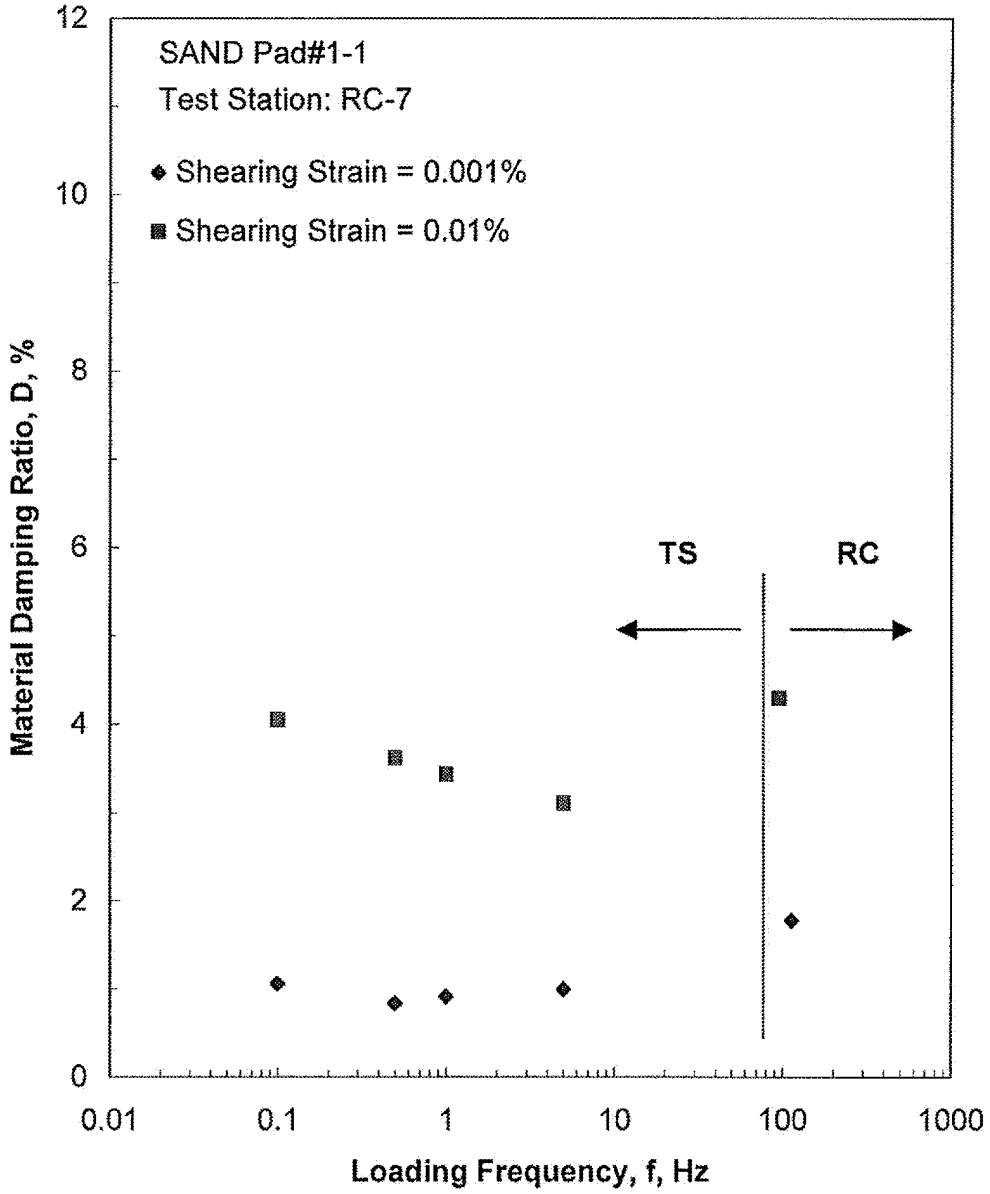


Figure A.15 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

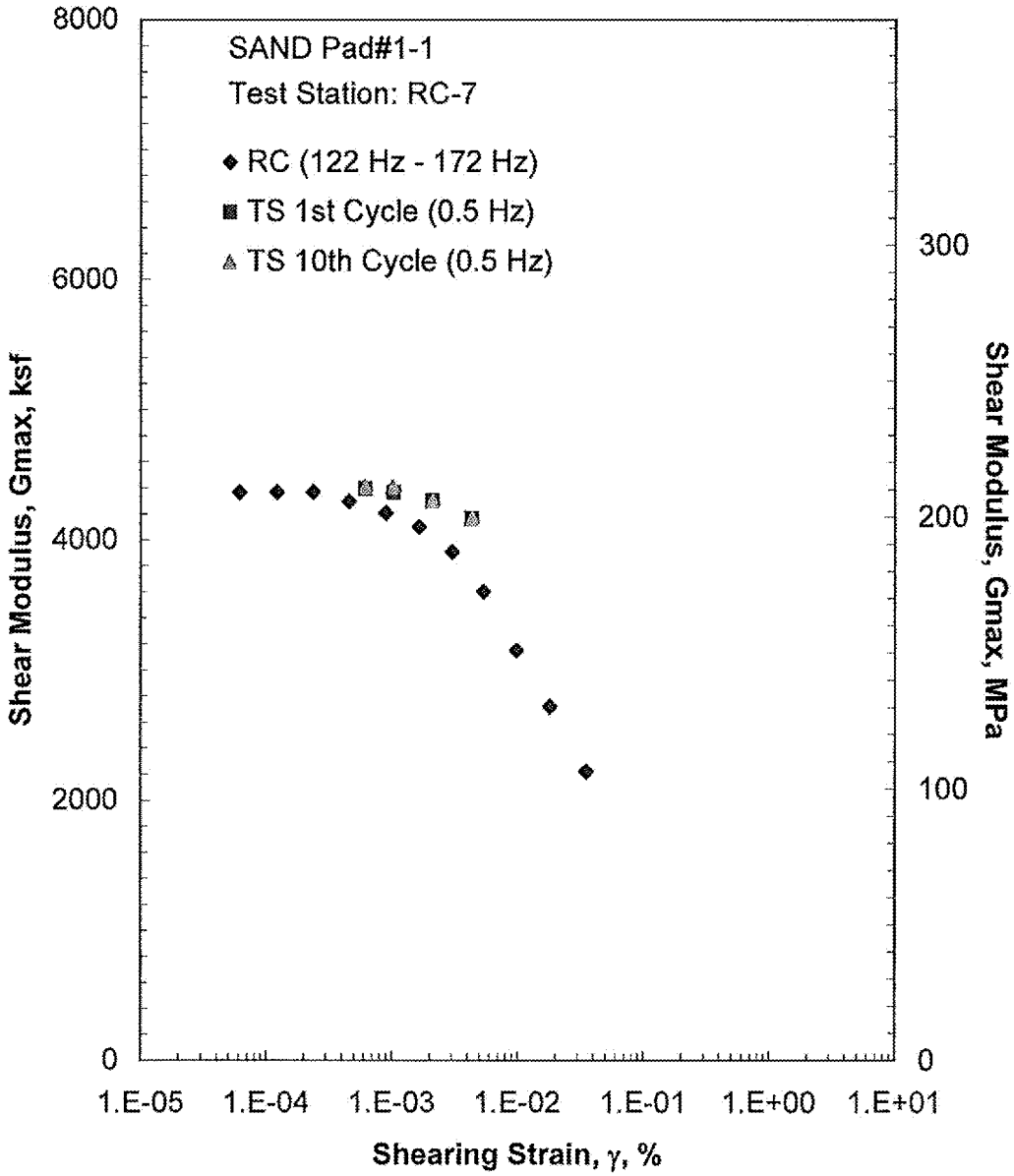


Figure A.16 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

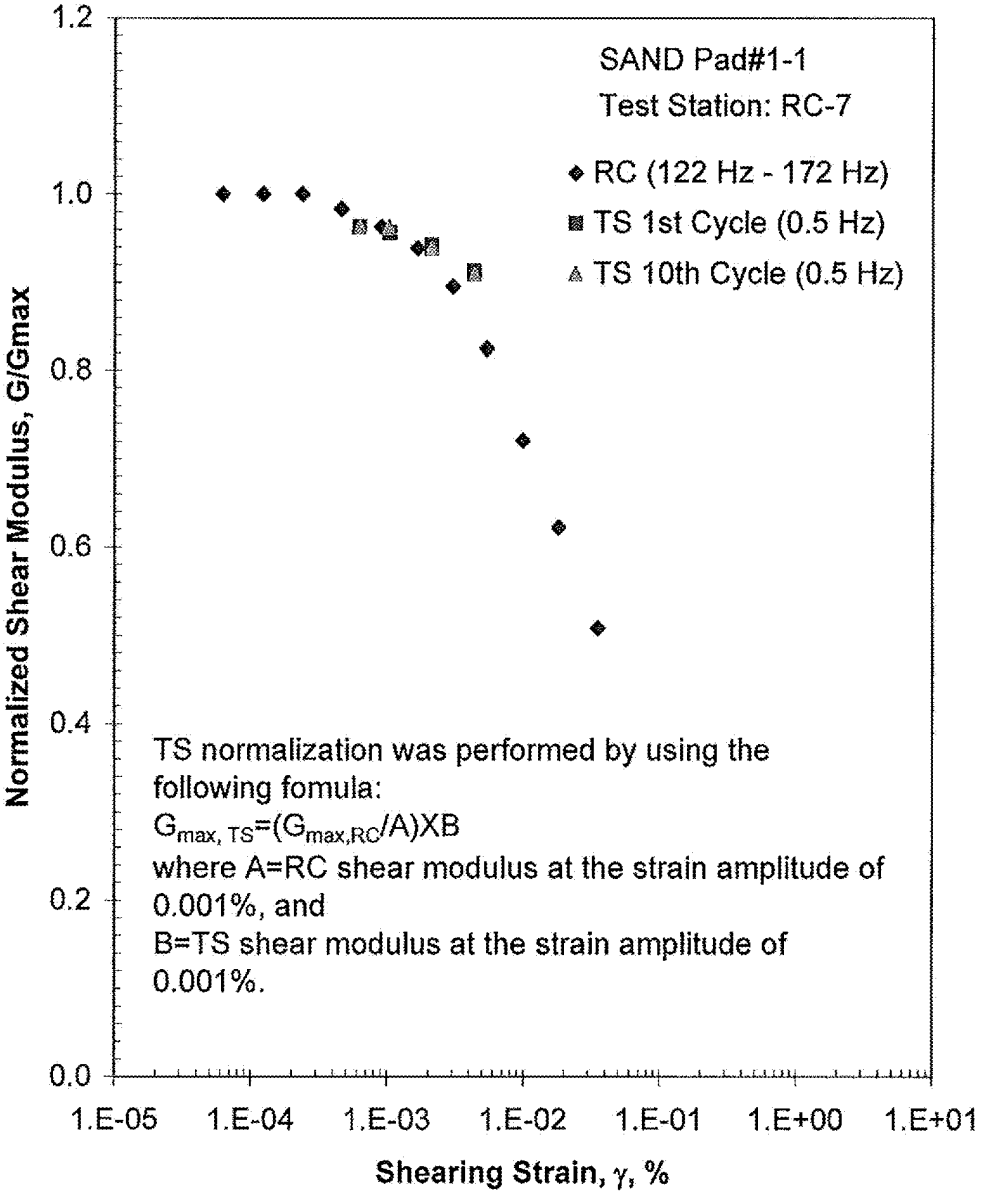


Figure A.17 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

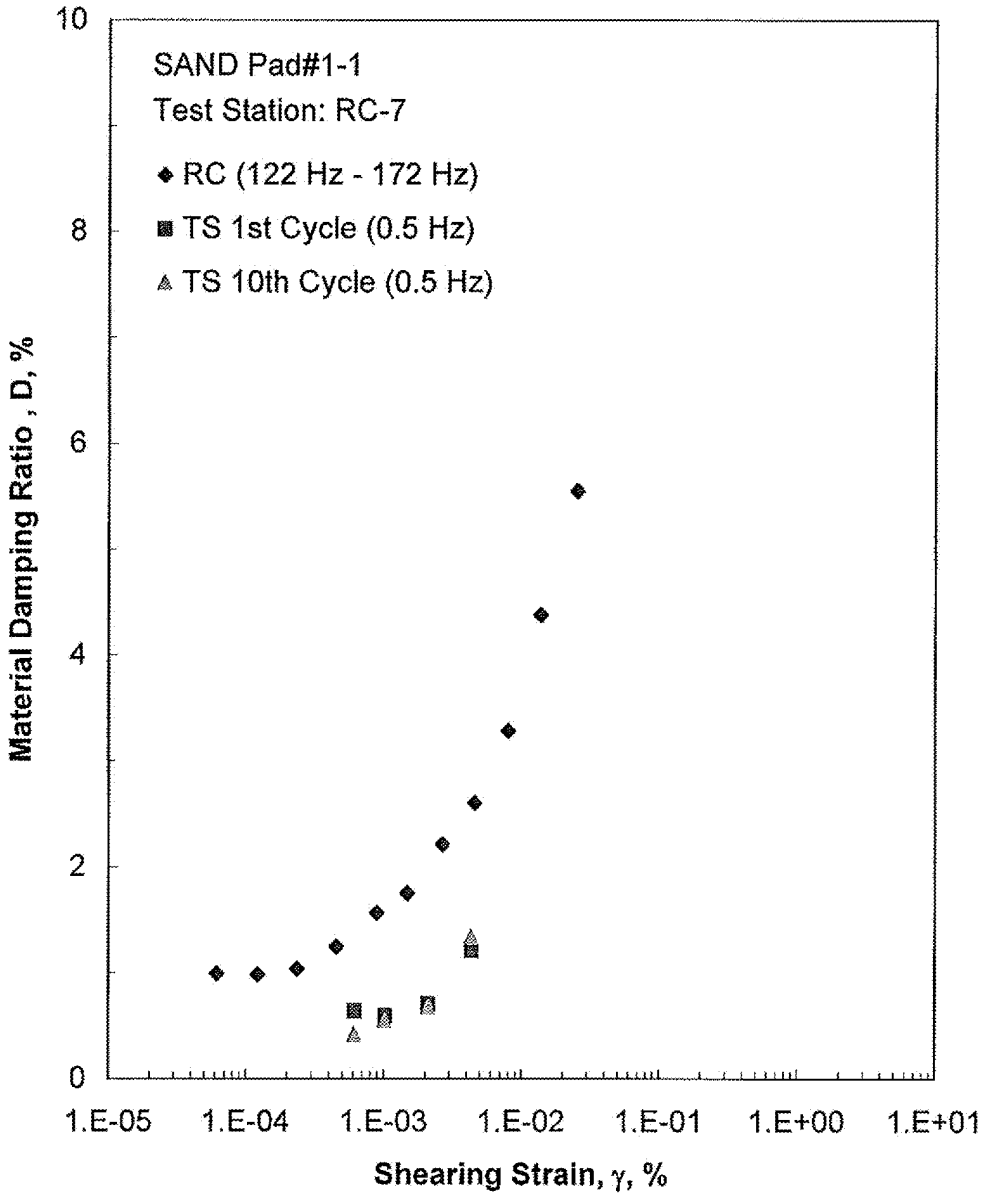


Figure A.18 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

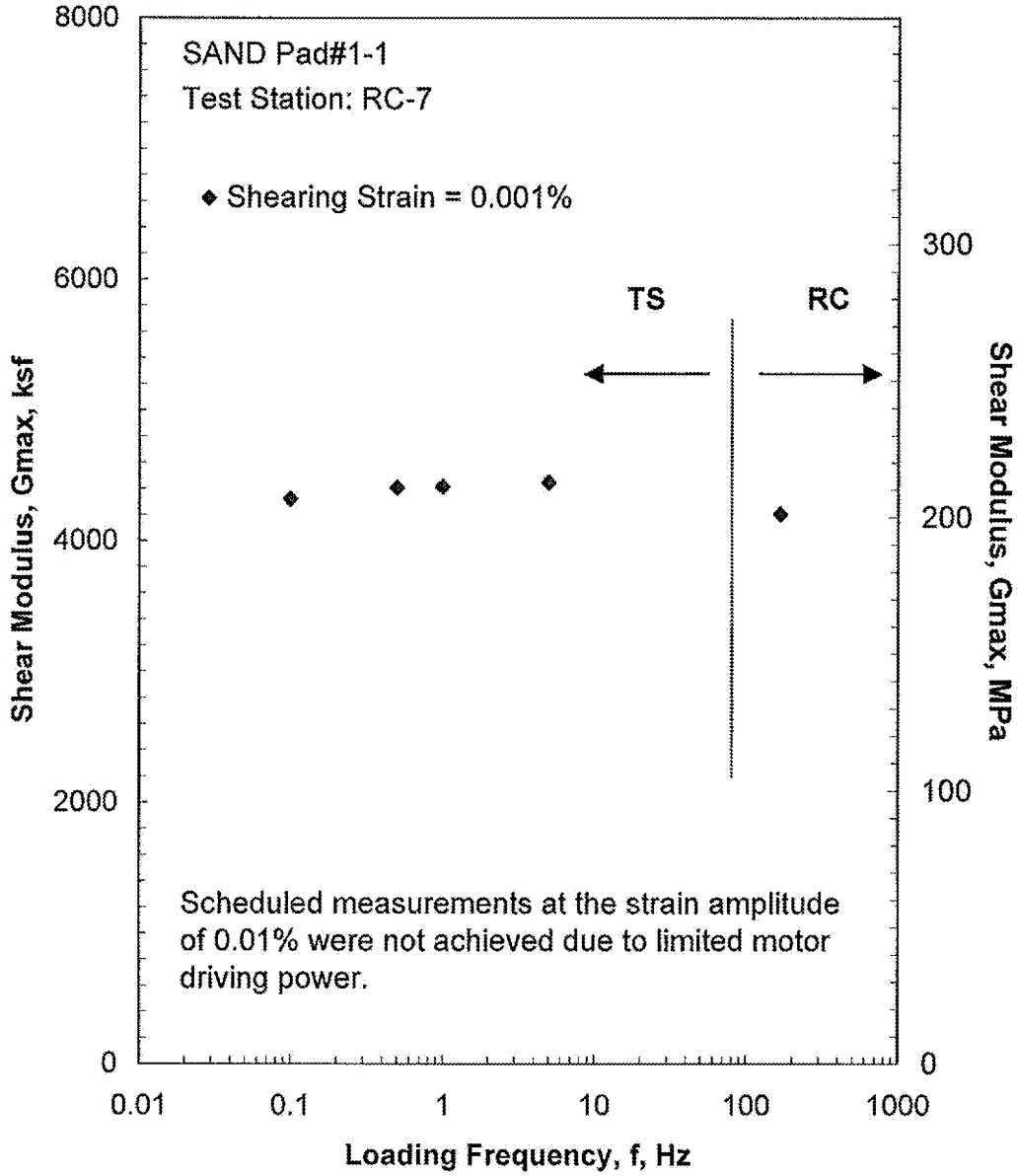


Figure A.19 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

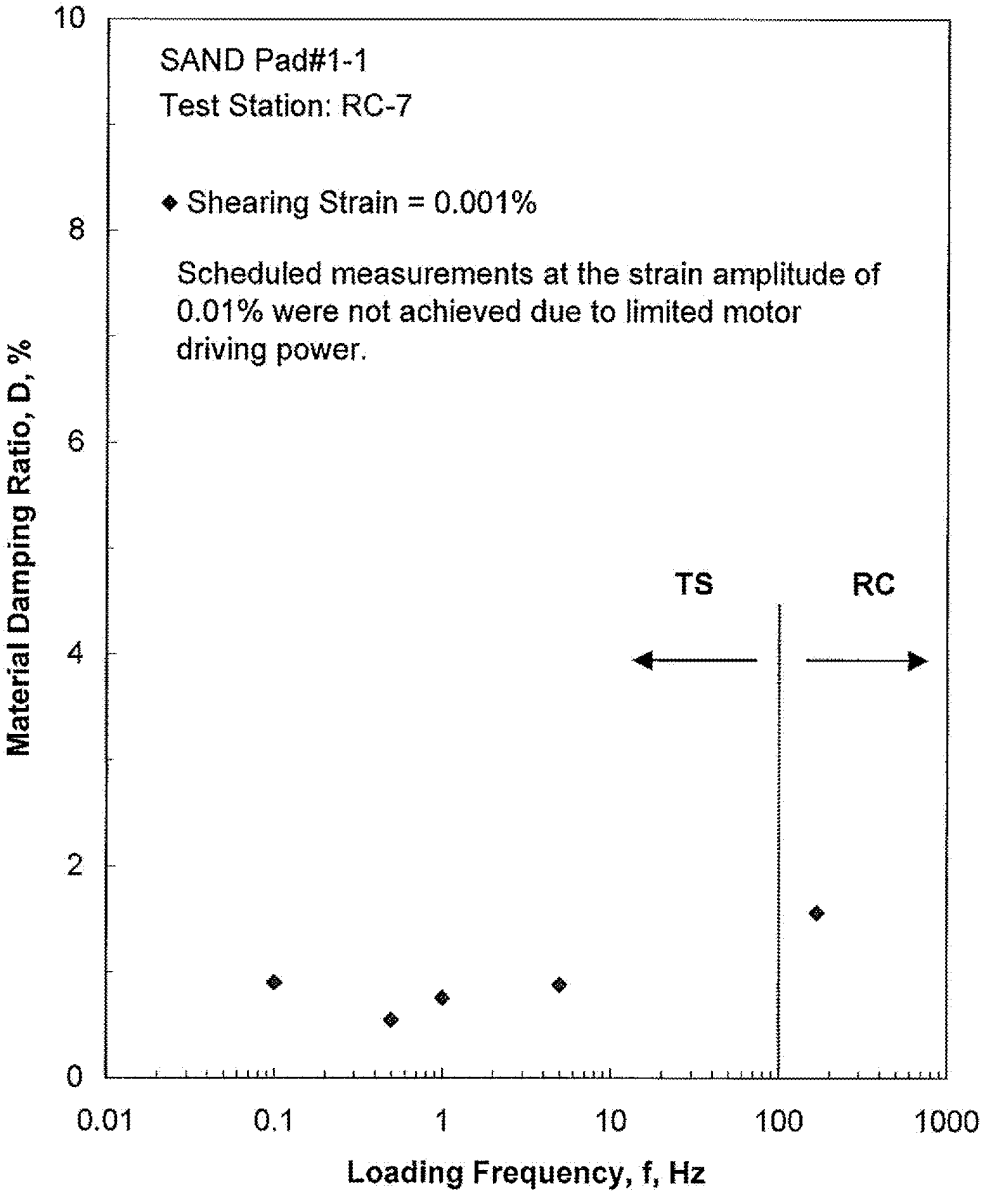


Figure A.20 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

Table A.1 Variation in Low-Amplitude Shear Wave Velocity, Low-Amplitude Shear Modulus, Low-Amplitude Material Damping Ratio and Estimated Void Ratio with Isotropic Confining Pressure from RC Tests of Specimen Pad 1-1

Isotropic Confining Pressure, σ_o			Low-Amplitude Shear Modulus, G_{max}		Low-Amplitude Shear Wave Velocity, Vs	Low-Amplitude Material Damping Ratio, Dmin	Estimated Void Ratio, e
(psi)	(psf)	(kPa)	(ksf)	(MPa)	(fps)	(%)	
3	432	21	1007	48	508.6	1.62	0.42
6	864	41	1363	65	591.3	1.47	0.42
13	1872	90	2016	97	718.7	1.22	0.42
25	3600	172	2976	143	872.0	1.10	0.42
50	7200	345	4405	211	1058.9	0.99	0.41

Table A.2 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad 1-1; Isoptropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
1.44E-04	1969	1.00	1.44E-04	1.18
2.80E-04	1969	1.00	2.80E-04	1.21
5.24E-04	1935	0.98	5.24E-04	1.47
1.01E-03	1876	0.95	9.11E-04	1.78
1.87E-03	1793	0.91	1.62E-03	2.13
3.38E-03	1692	0.86	2.84E-03	2.70
6.24E-03	1542	0.78	5.00E-03	3.53
1.16E-02	1335	0.68	8.92E-03	4.30
2.26E-02	1083	0.55	1.61E-02	5.63

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table A.3 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad 1-1; Isotropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
3.13E-04	2007	1.00	0.76	3.24E-04	1945	1.00	0.20
6.35E-04	1982	0.99	1.05	6.46E-04	1945	1.00	0.59
1.05E-03	1927	0.96	0.80	1.04E-03	1936	1.00	0.84
2.16E-03	1873	0.93	1.49	2.17E-03	1861	0.96	1.14
4.74E-03	1707	0.85	2.32	4.77E-03	1698	0.87	1.98
9.98E-03	1488	0.74	3.53	1.00E-02	1483	0.76	3.62

Table A.4 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad 1-1; Isoptropic Confining Pressure, σ_o= 50 psi (7.2 ksf = 345 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
6.20E-05	4367	1.00	6.20E-05	0.99
1.23E-04	4367	1.00	1.23E-04	0.98
2.38E-04	4367	1.00	2.38E-04	1.04
4.57E-04	4294	0.98	4.57E-04	1.25
8.98E-04	4205	0.96	8.98E-04	1.57
1.66E-03	4100	0.94	1.49E-03	1.75
3.04E-03	3909	0.90	2.68E-03	2.22
5.40E-03	3602	0.83	4.59E-03	2.61
9.90E-03	3148	0.72	8.01E-03	3.29
1.82E-02	2719	0.62	1.38E-02	4.38
3.54E-02	2222	0.51	2.55E-02	5.55

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table A.5 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad 1-1; Isotropic Confining Pressure, σ_o= 50 psi (7.2 ksf = 345 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
6.18E-04	4392	0.96	0.64	6.16E-04	4408	0.96	0.42
1.04E-03	4364	0.96	0.60	1.03E-03	4406	0.96	0.55
2.10E-03	4299	0.94	0.71	2.11E-03	4297	0.94	0.68
4.35E-03	4167	0.91	1.21	4.35E-03	4161	0.91	1.34

APPENDIX B

Remolded Specimen Pad 1-2
Sample Location: Streeter Rathburn Road

Borehole ---NA
Sample ---NA
Depth = --- ft (--- m)
Total Unit Weight = 125.2 lb/ft^3
Water Content = 8.2%
Estimated In-Situ Mean Effective
Stress = 13 psi

FUGRO JOB #: 0411-08-1696
Testing Station: RC7

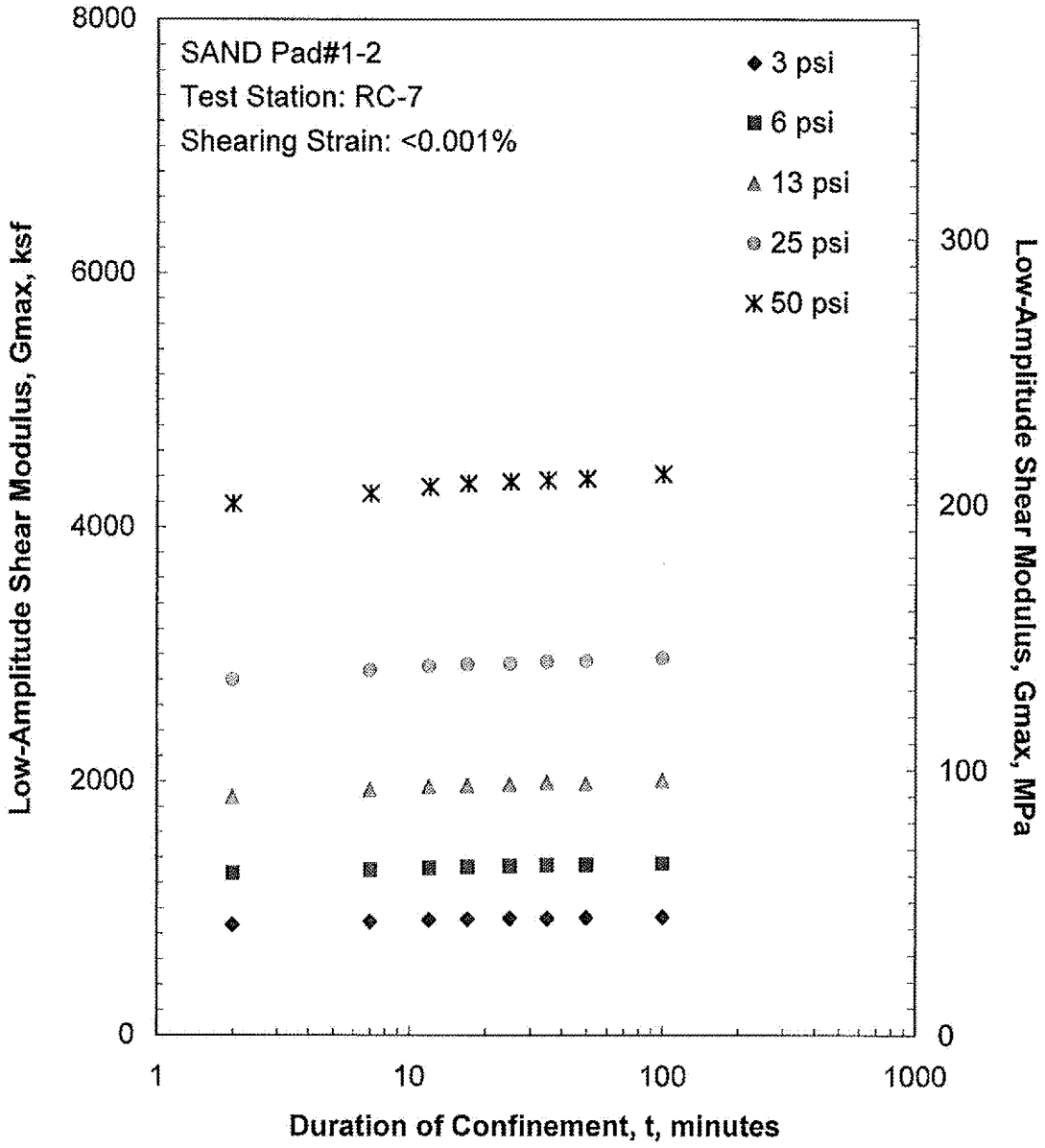


Figure B.1 Variation in Low-Amplitude Shear Modulus with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

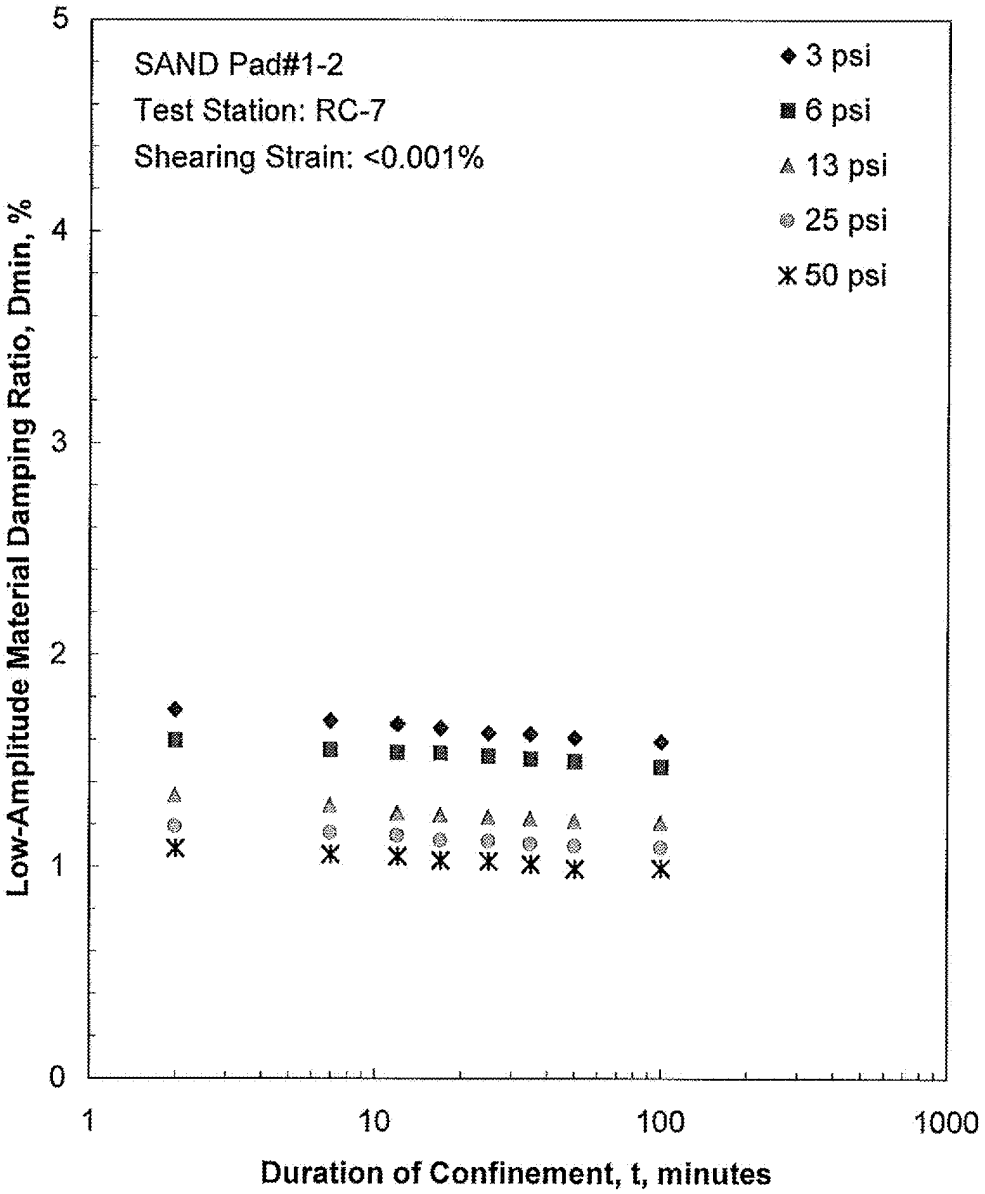


Figure B.2 Variation in Low-Amplitude Material Damping Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

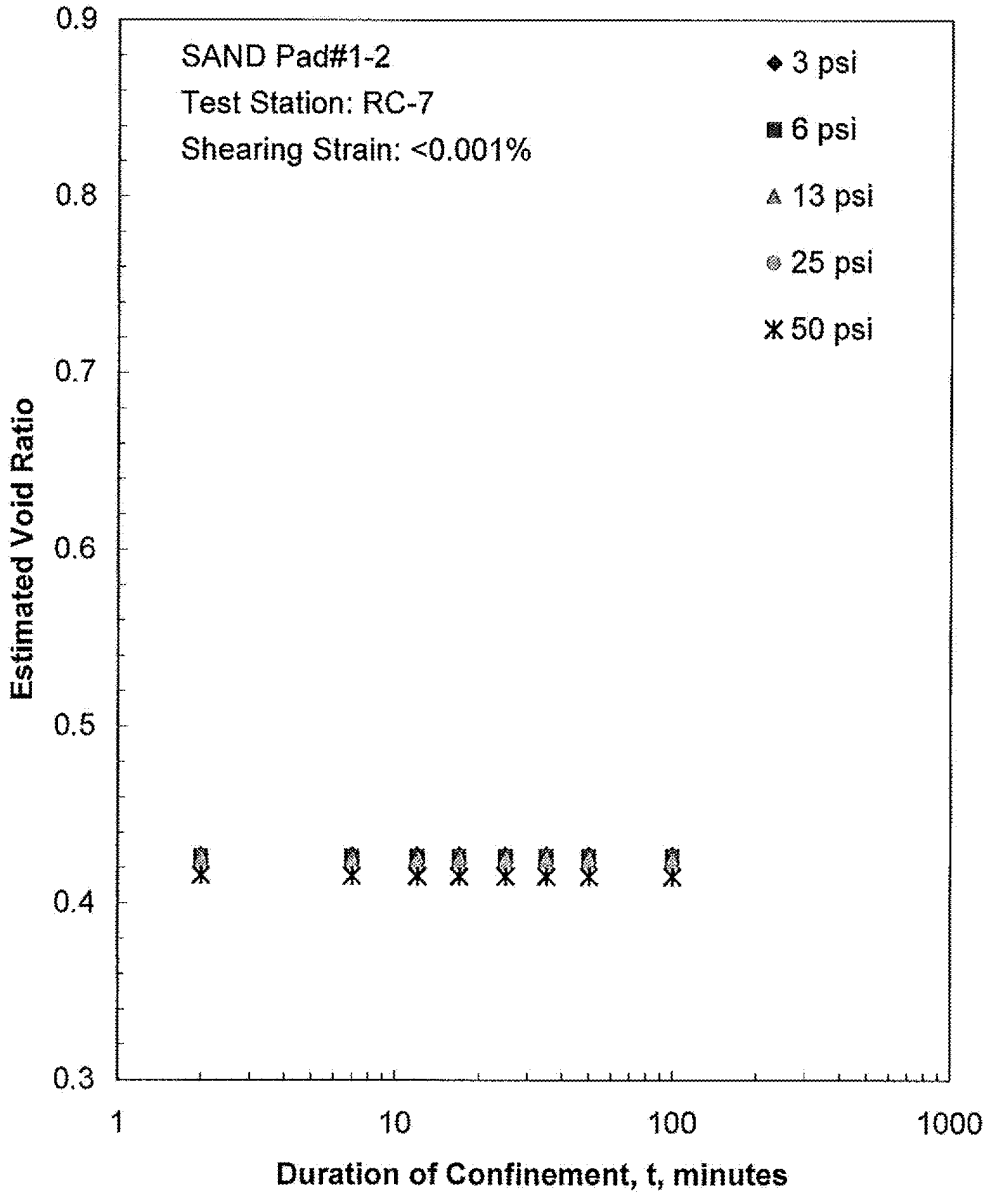


Figure B.3 Variation in Estimated Void Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

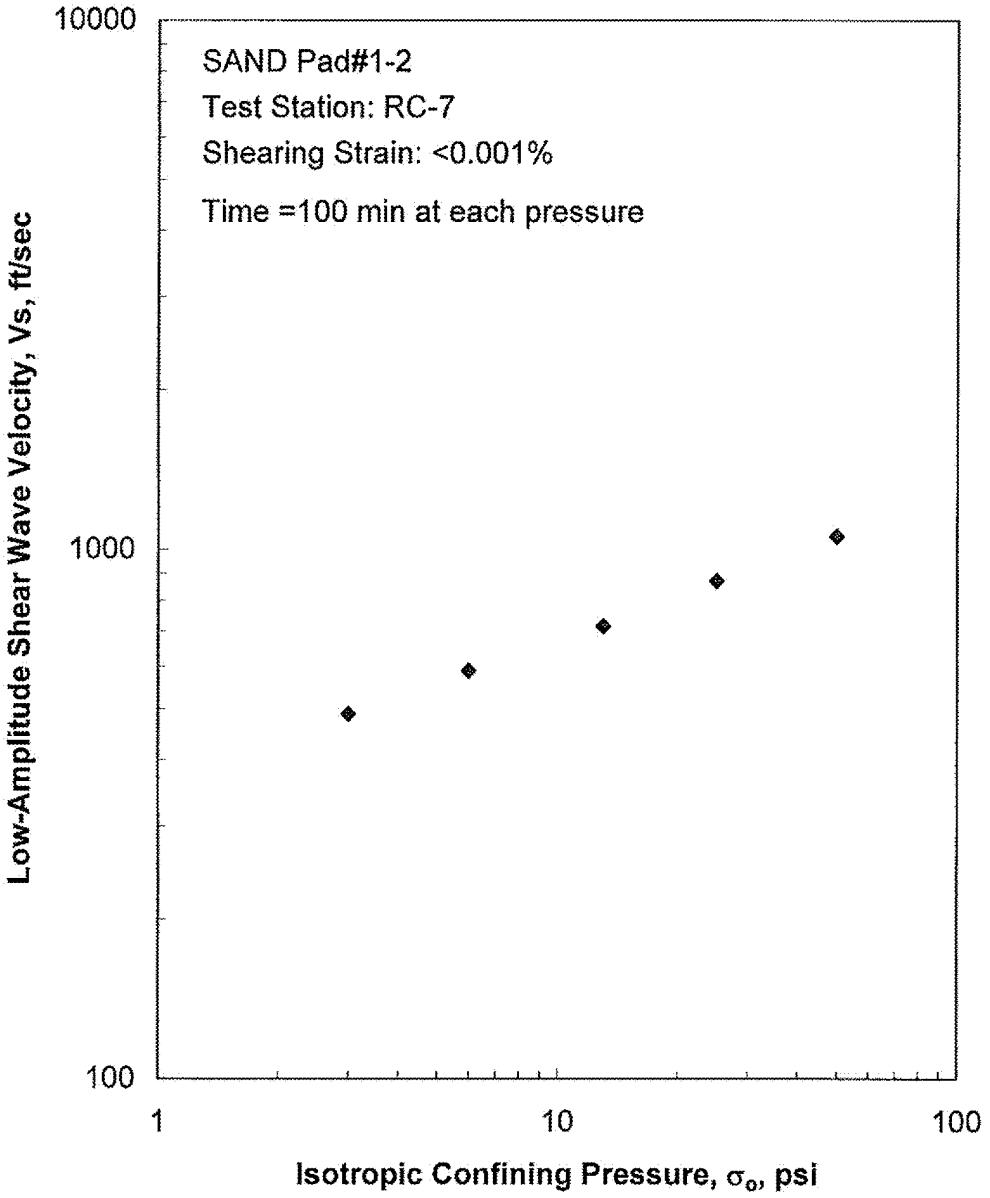


Figure B.4 Variation in Low-Amplitude Shear Wave Velocity with Isotropic Confining Pressure from Resonant Column Tests

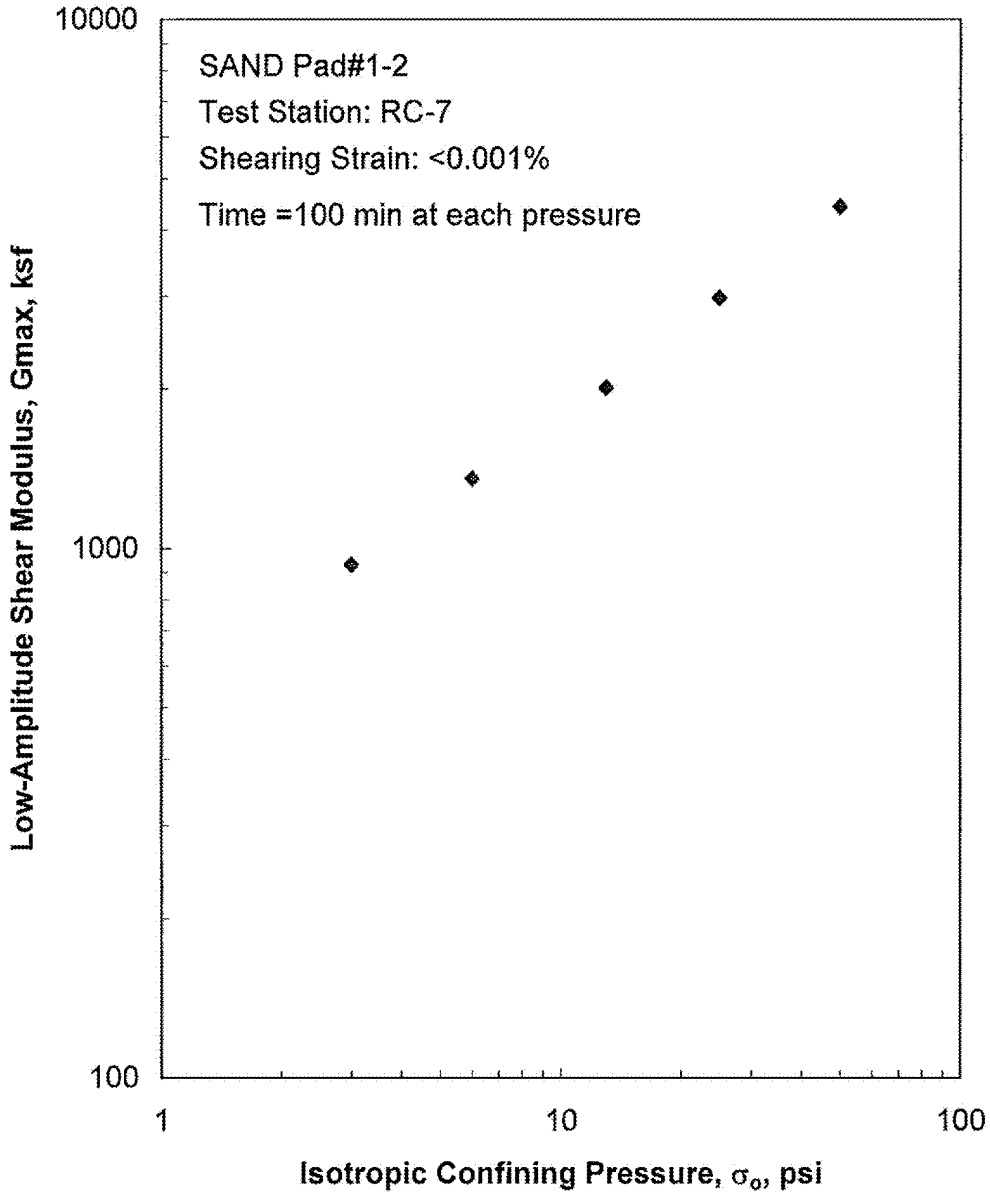


Figure B.5 Variation in Low-Amplitude Shear Modulus with Isotropic Confining Pressure from Resonant Column Tests

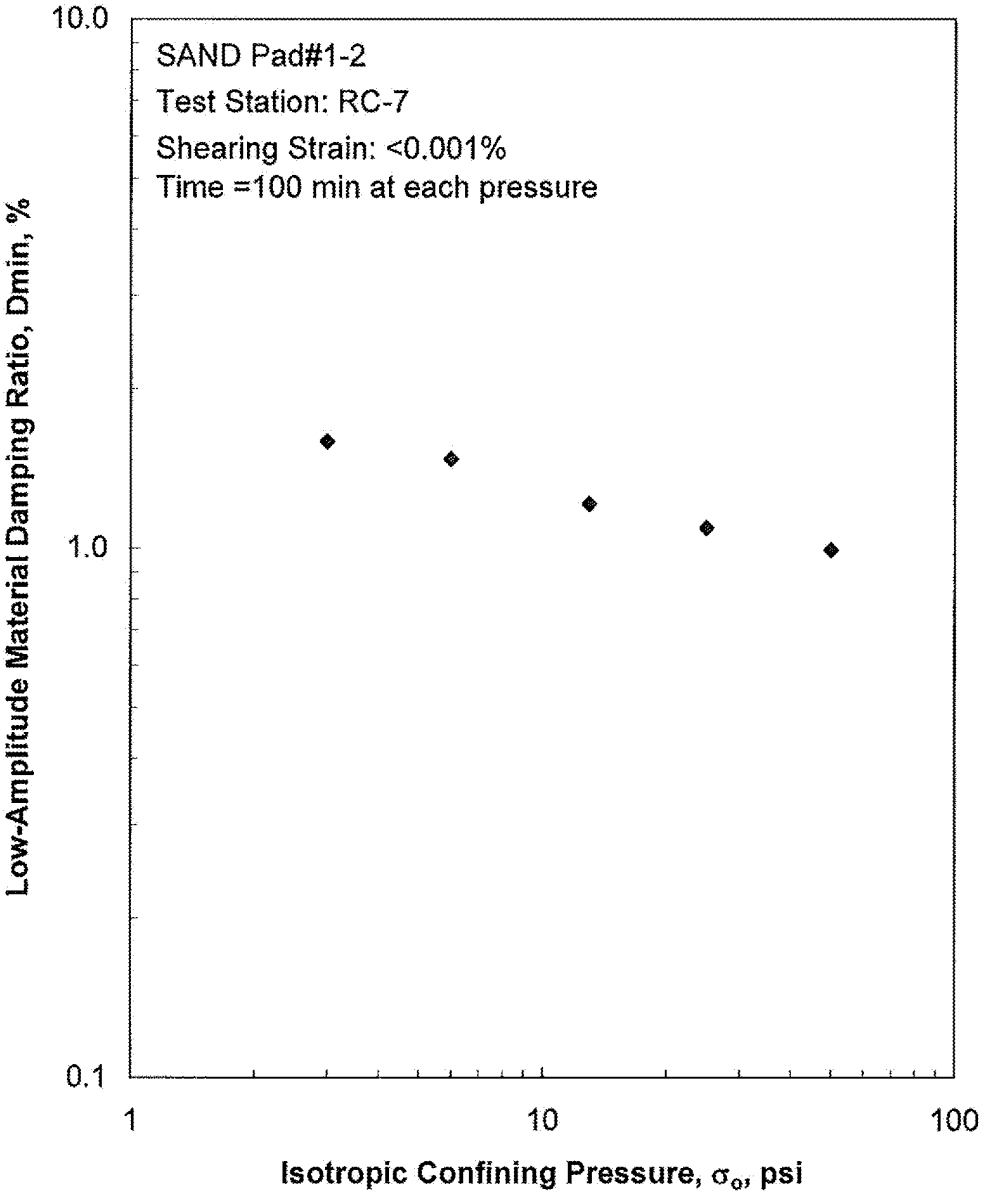


Figure B.6 Variation in Low-Amplitude Material Damping Ratio with Isotropic Confining Pressure from Resonant Column Tests

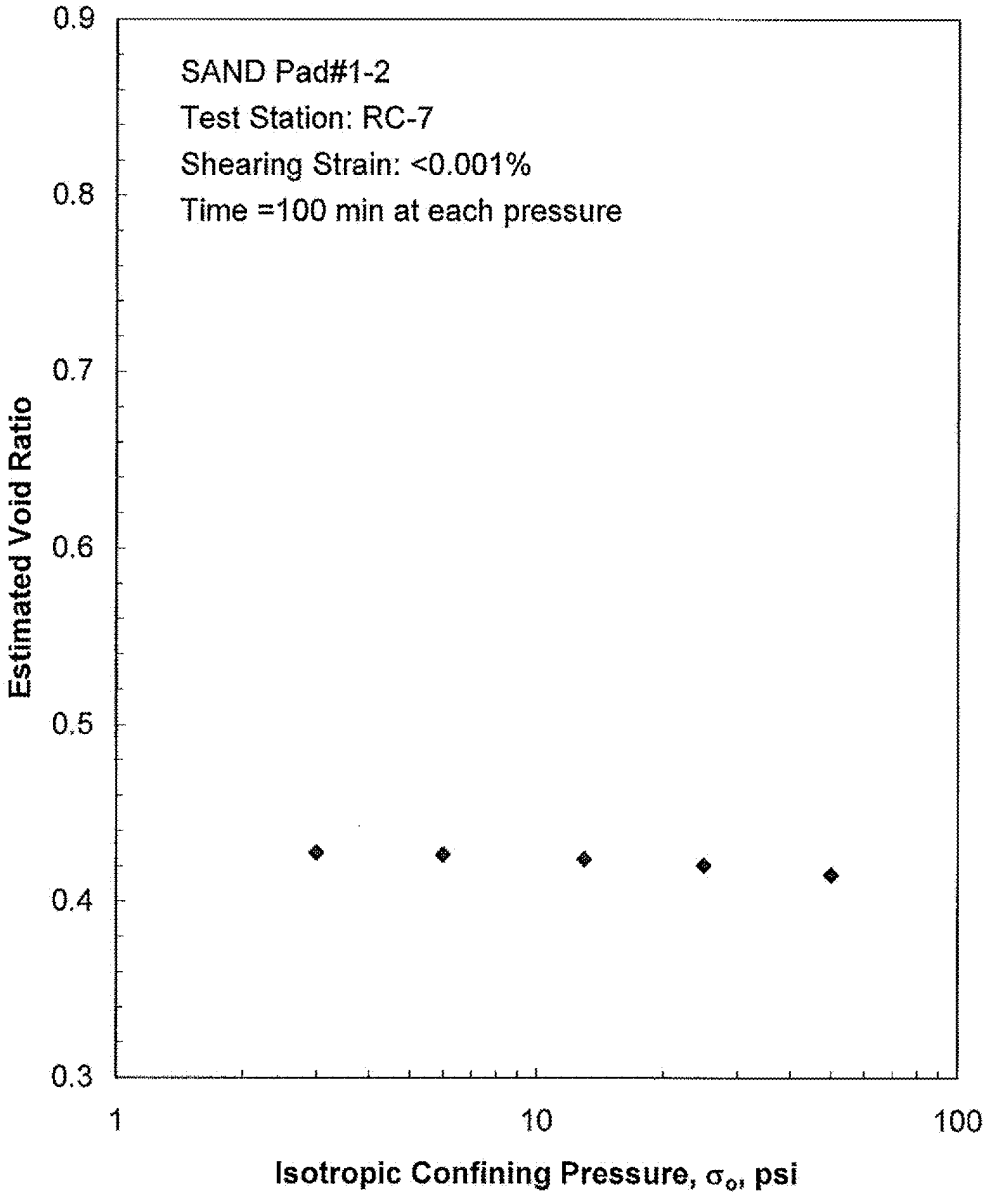


Figure B.7 Variation in Estimated Void Ratio with Isotropic Confining Pressure from Resonant Column Tests

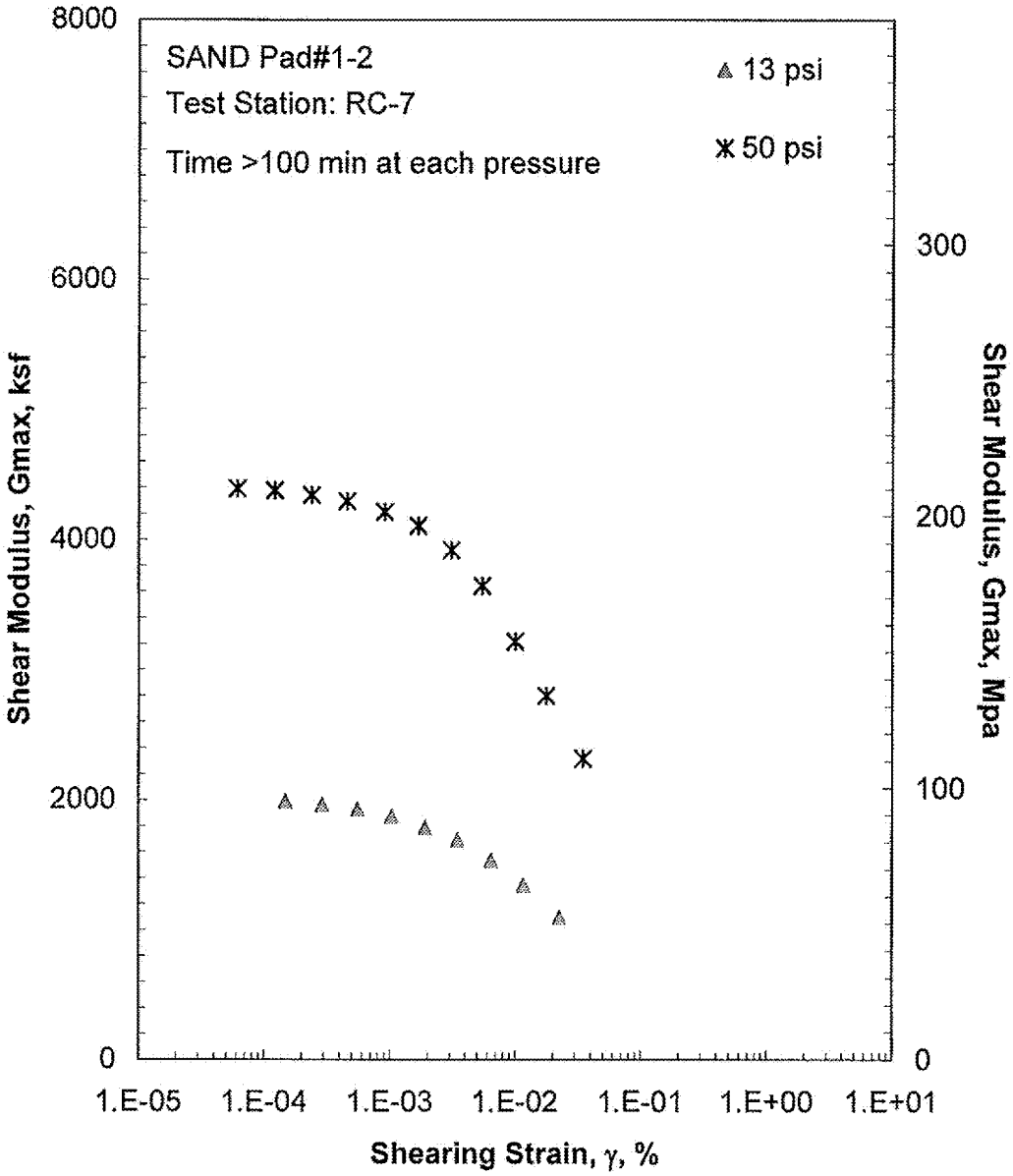


Figure B.8 Comparison of the Variation in Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

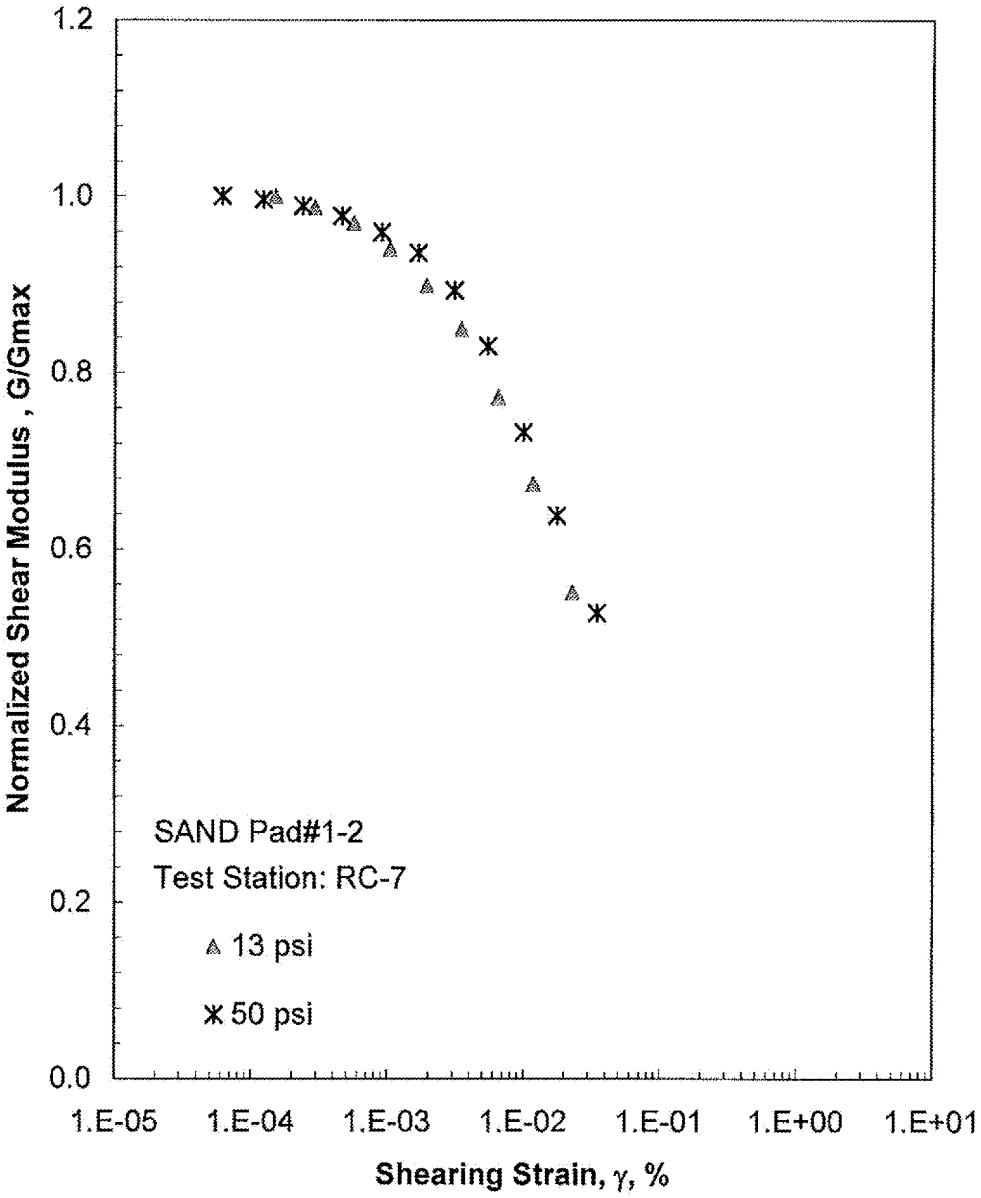


Figure B.9 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

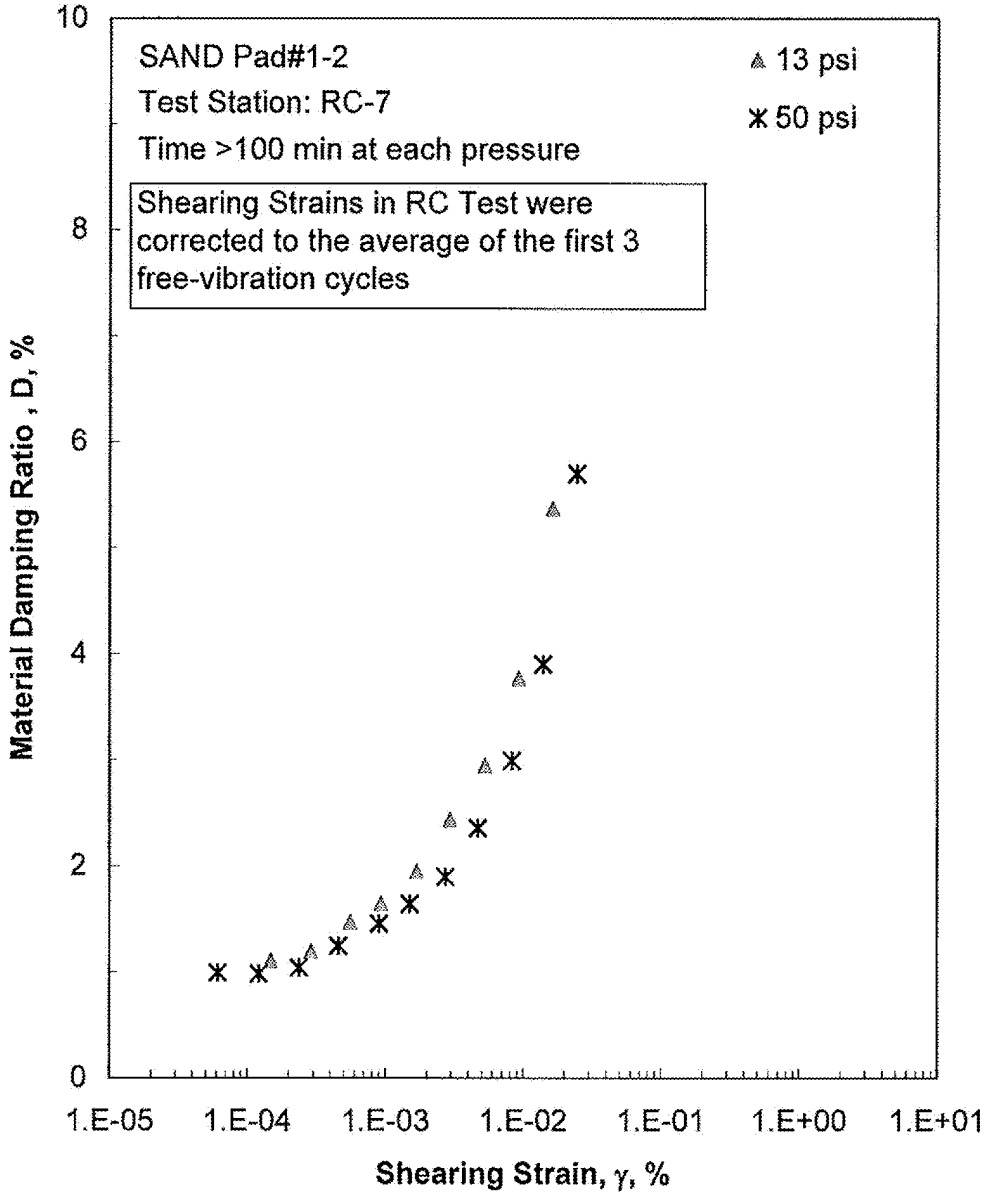


Figure B.10 Comparison of the Variation in Material Damping Ratio with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

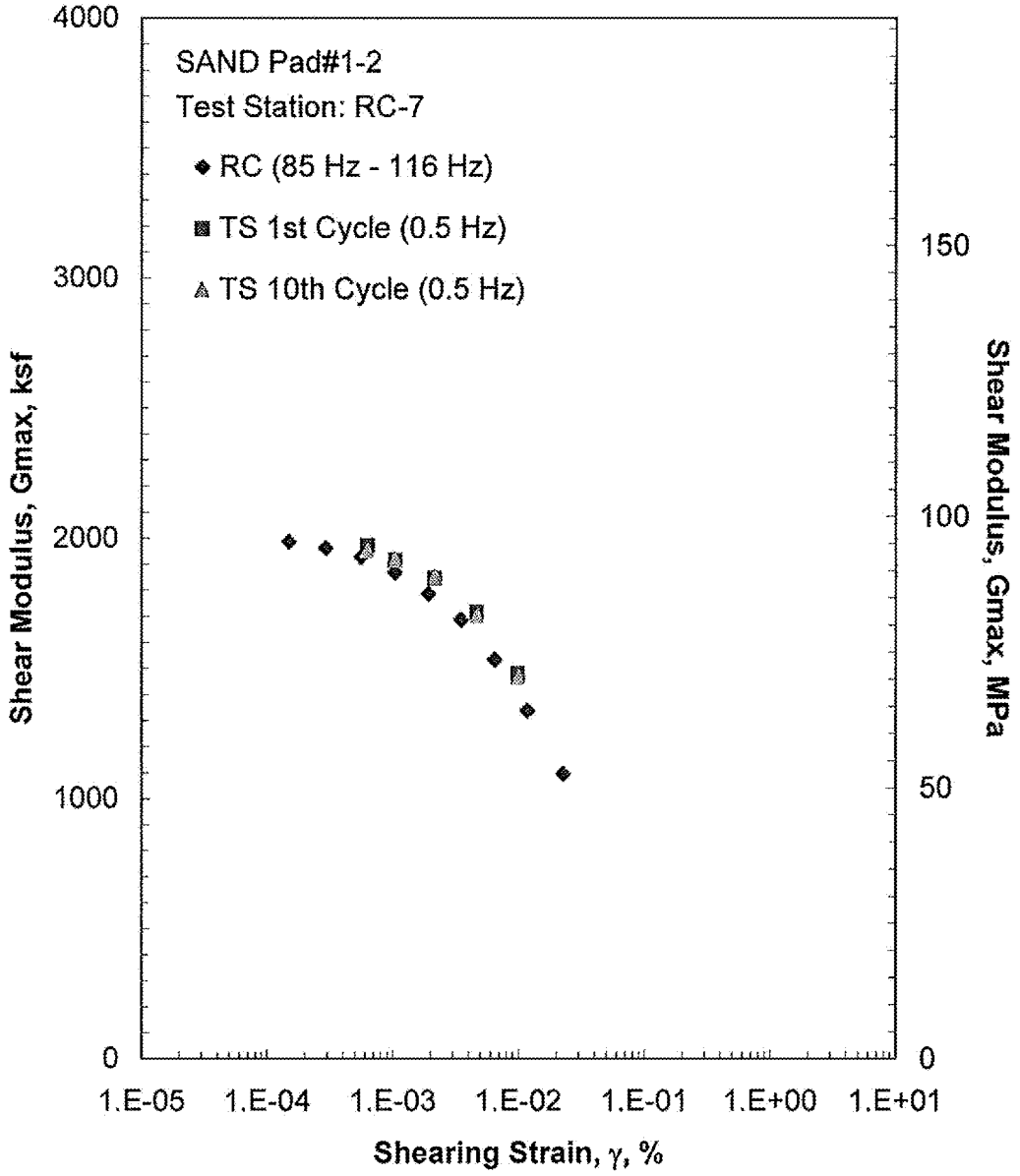


Figure B.11 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

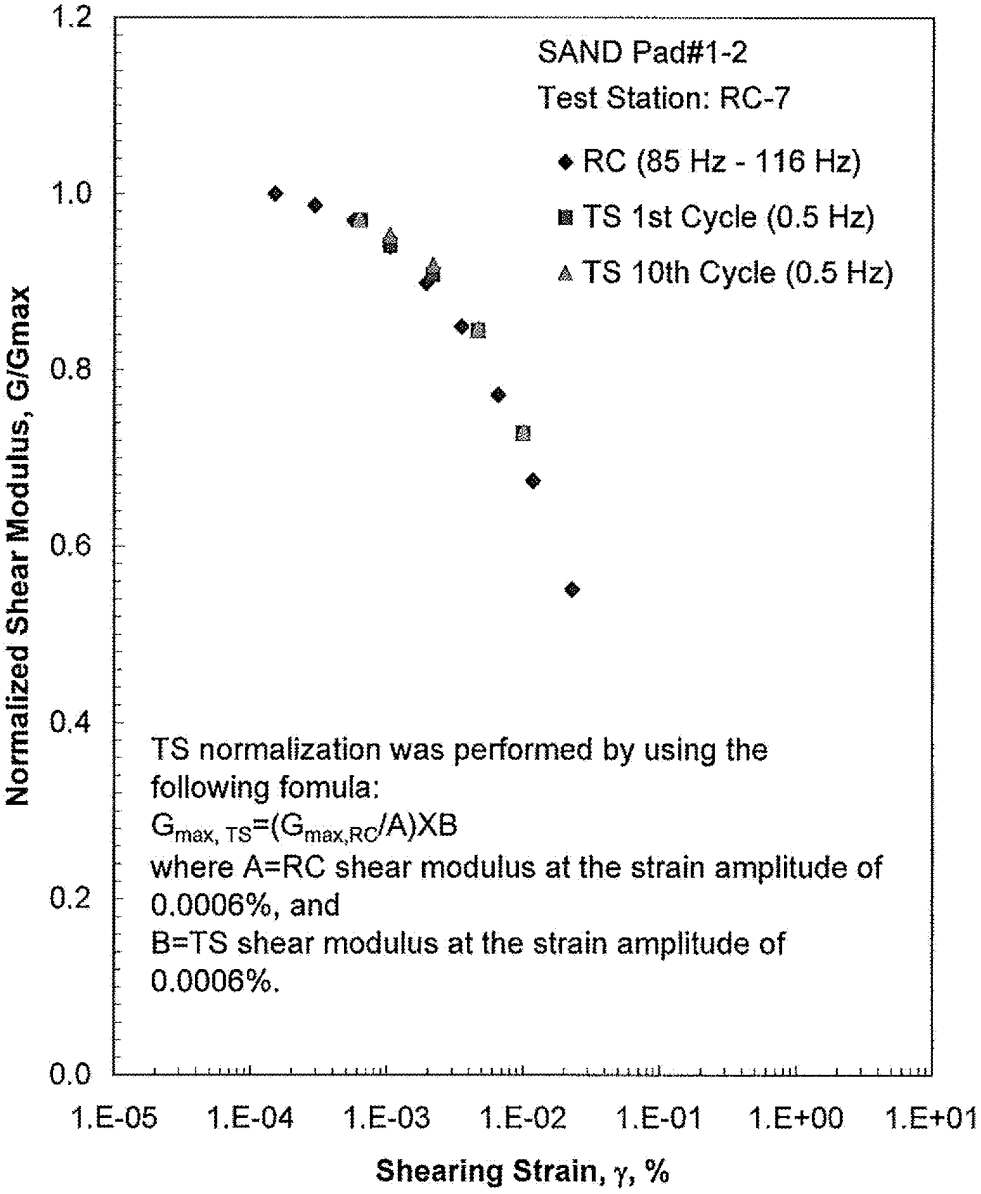


Figure B.12 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

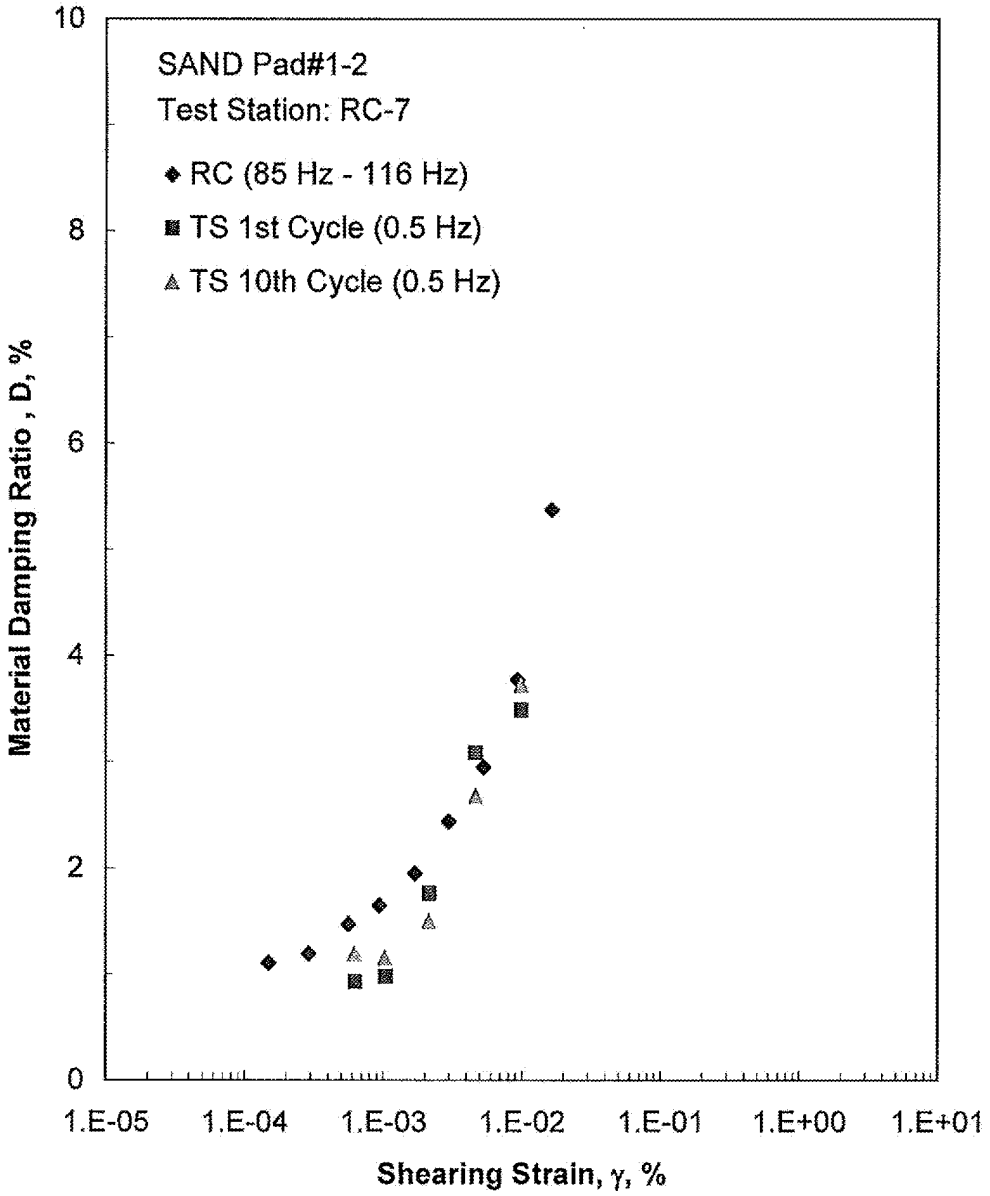


Figure B.13 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

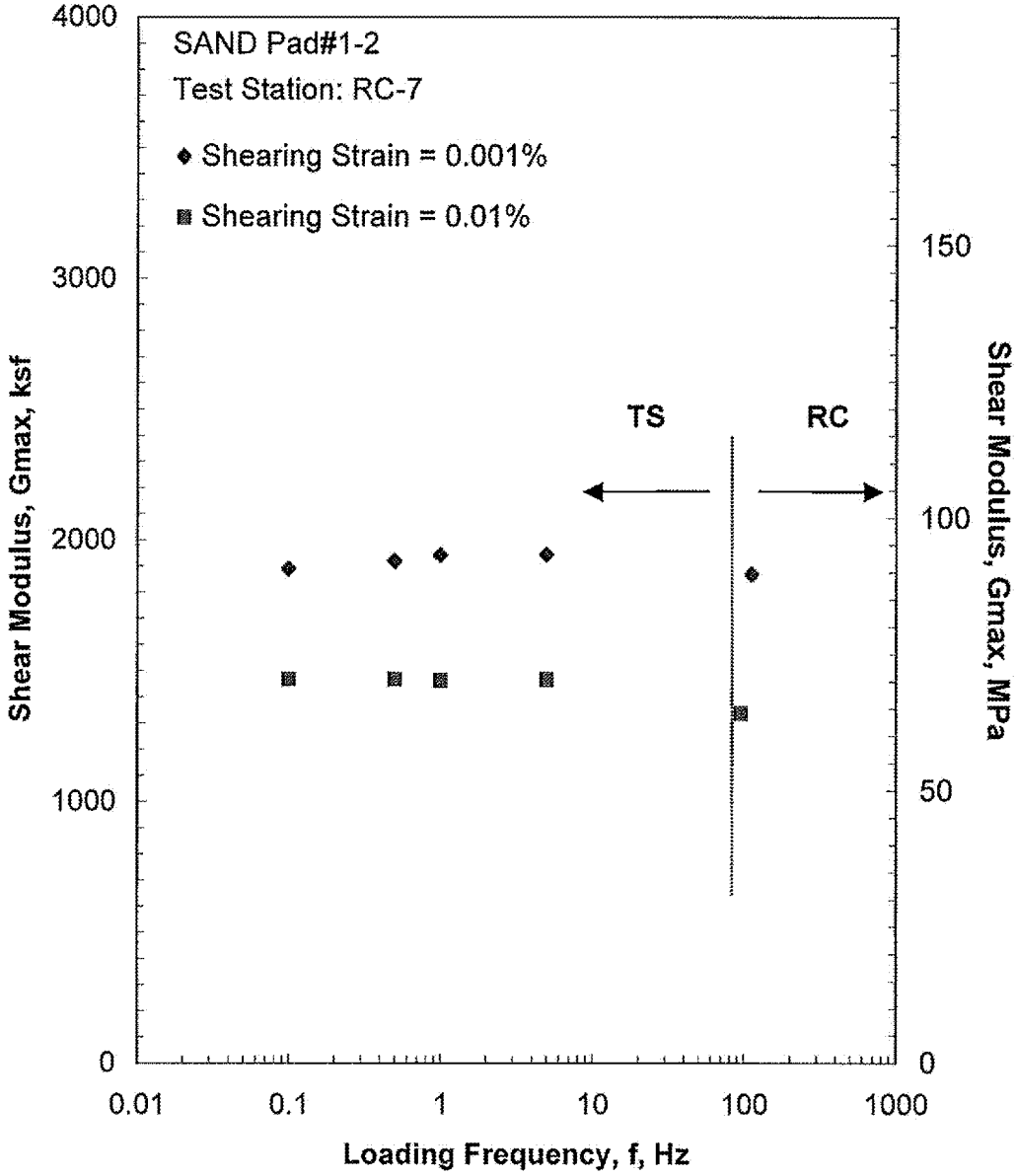


Figure B.14 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

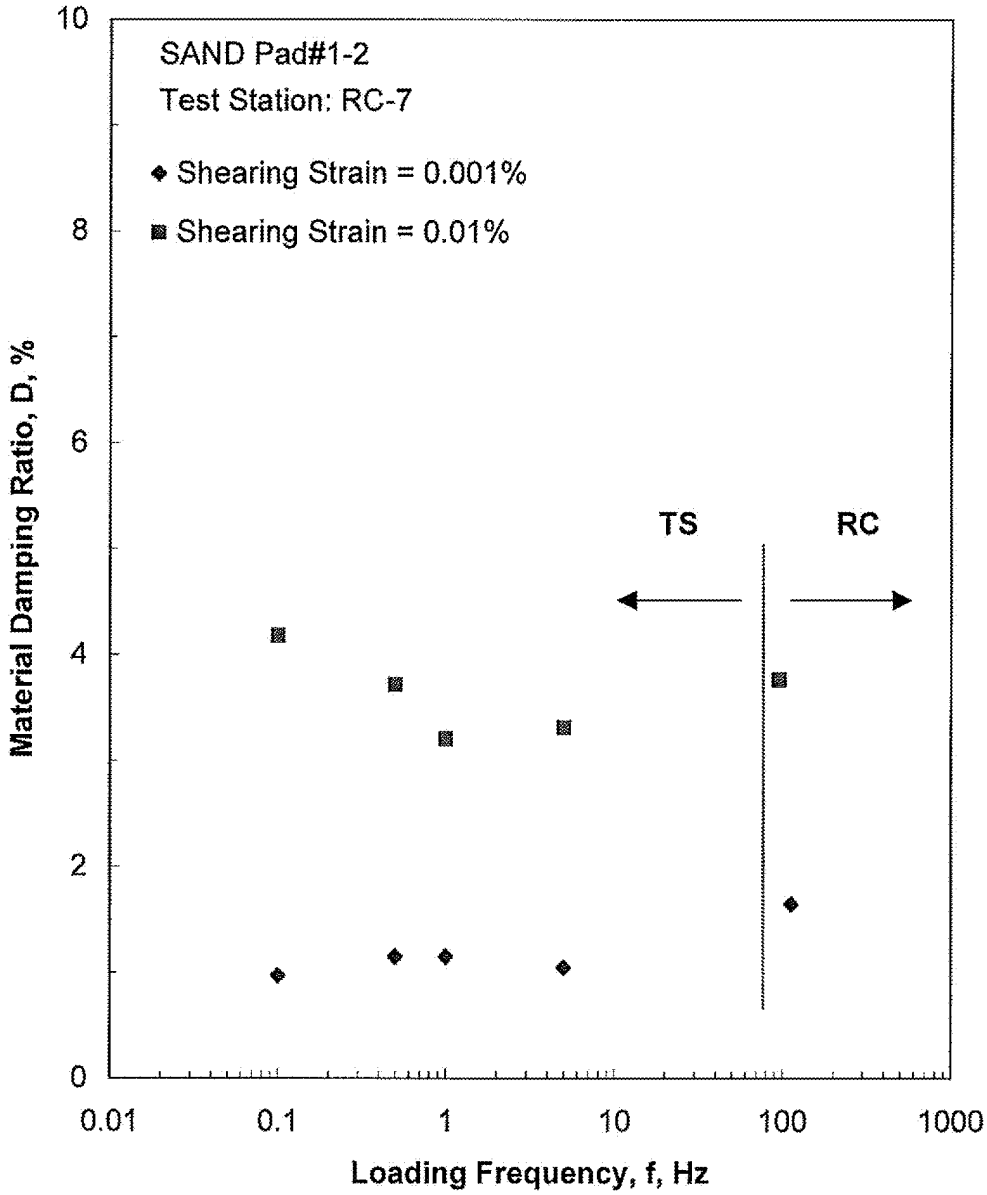


Figure B.15 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

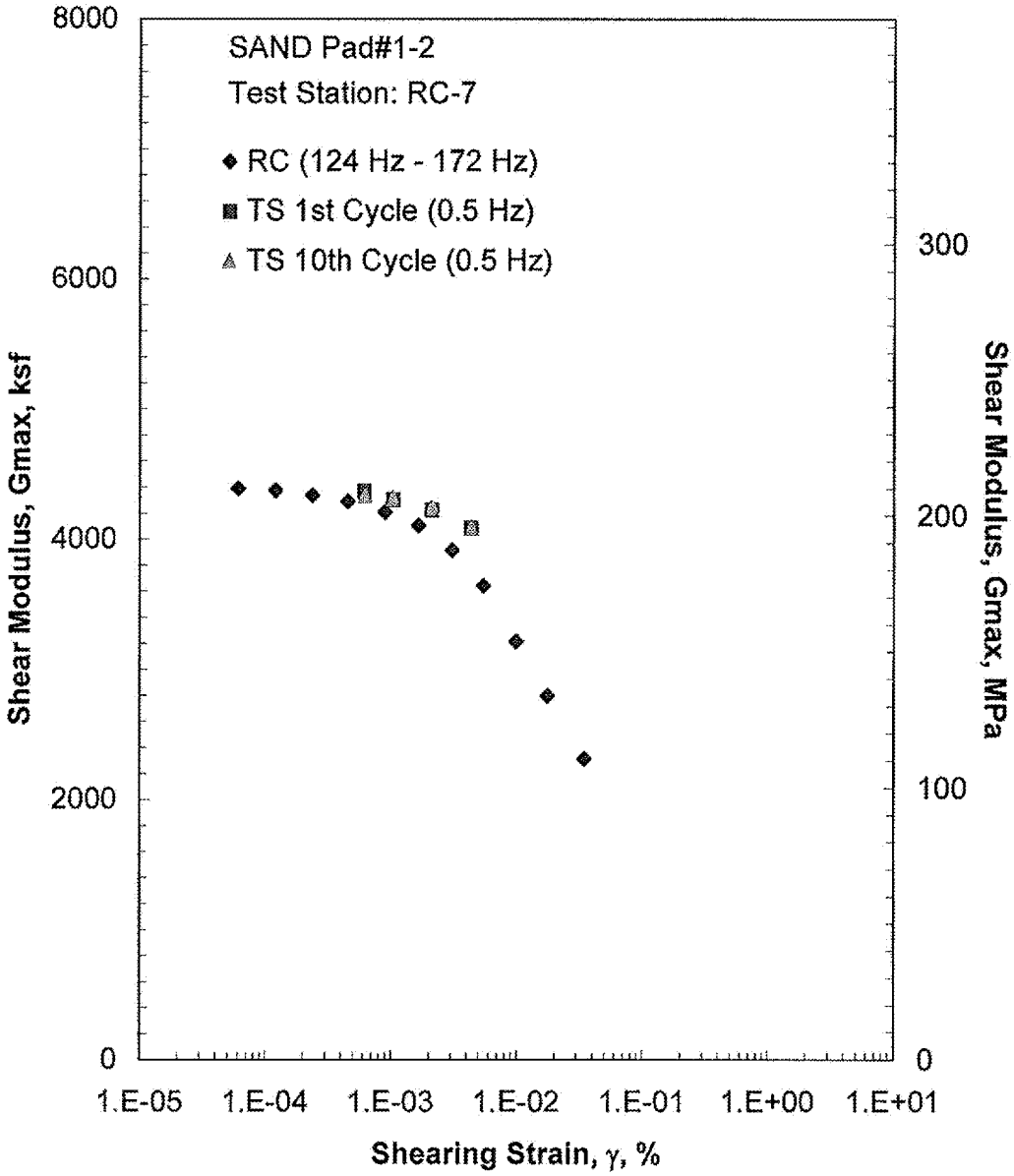


Figure B.16 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

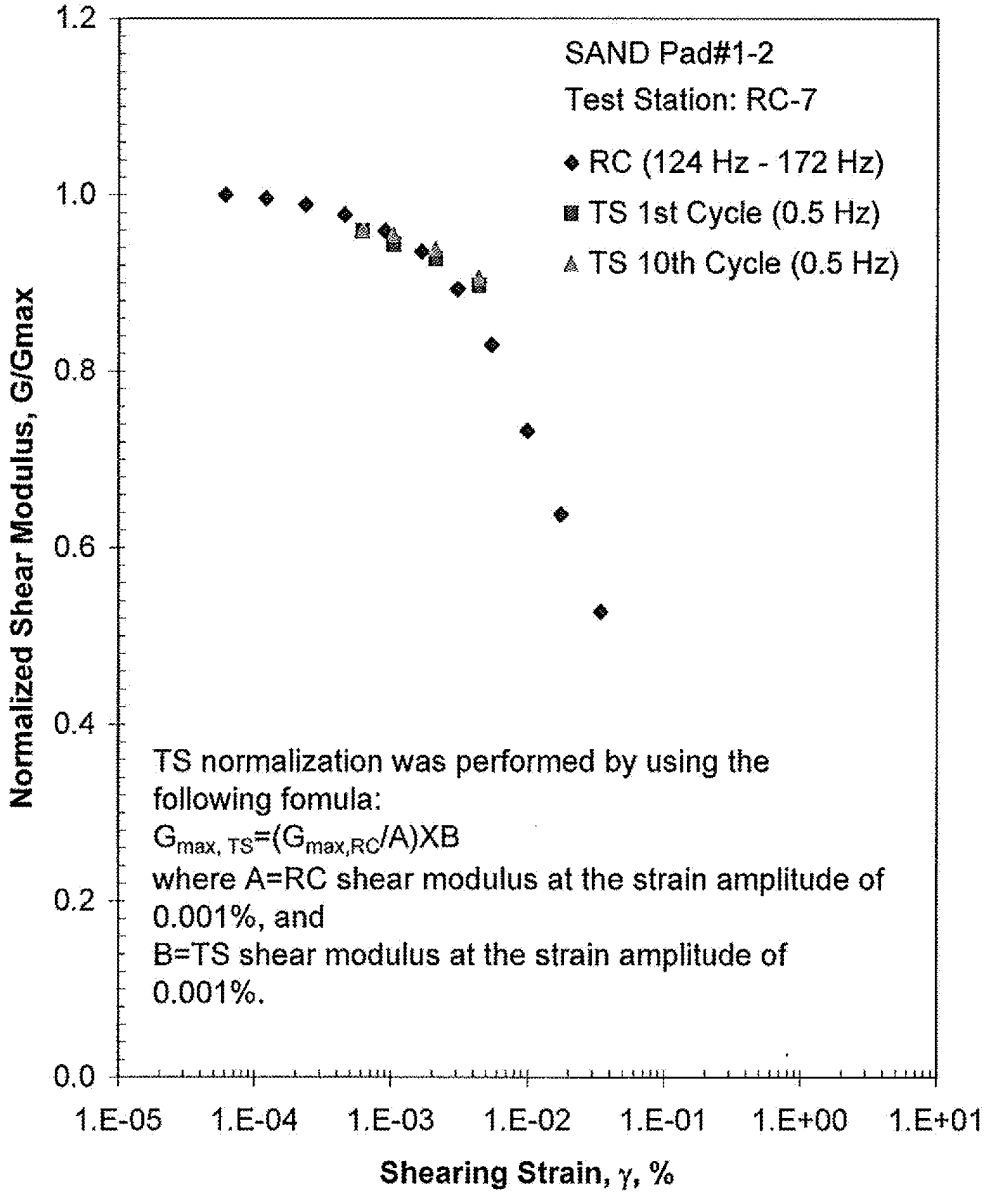


Figure B.17 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

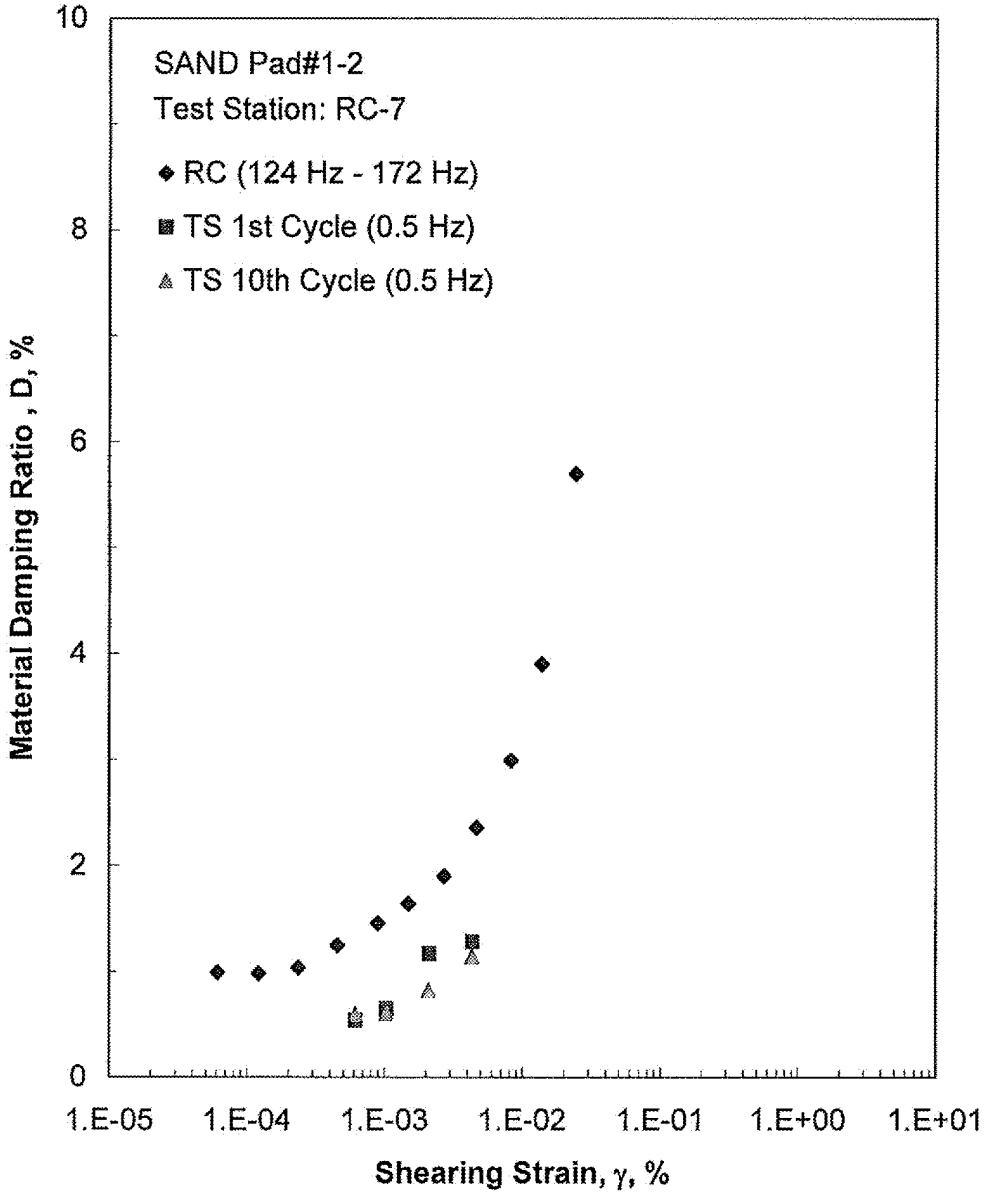


Figure B.18 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

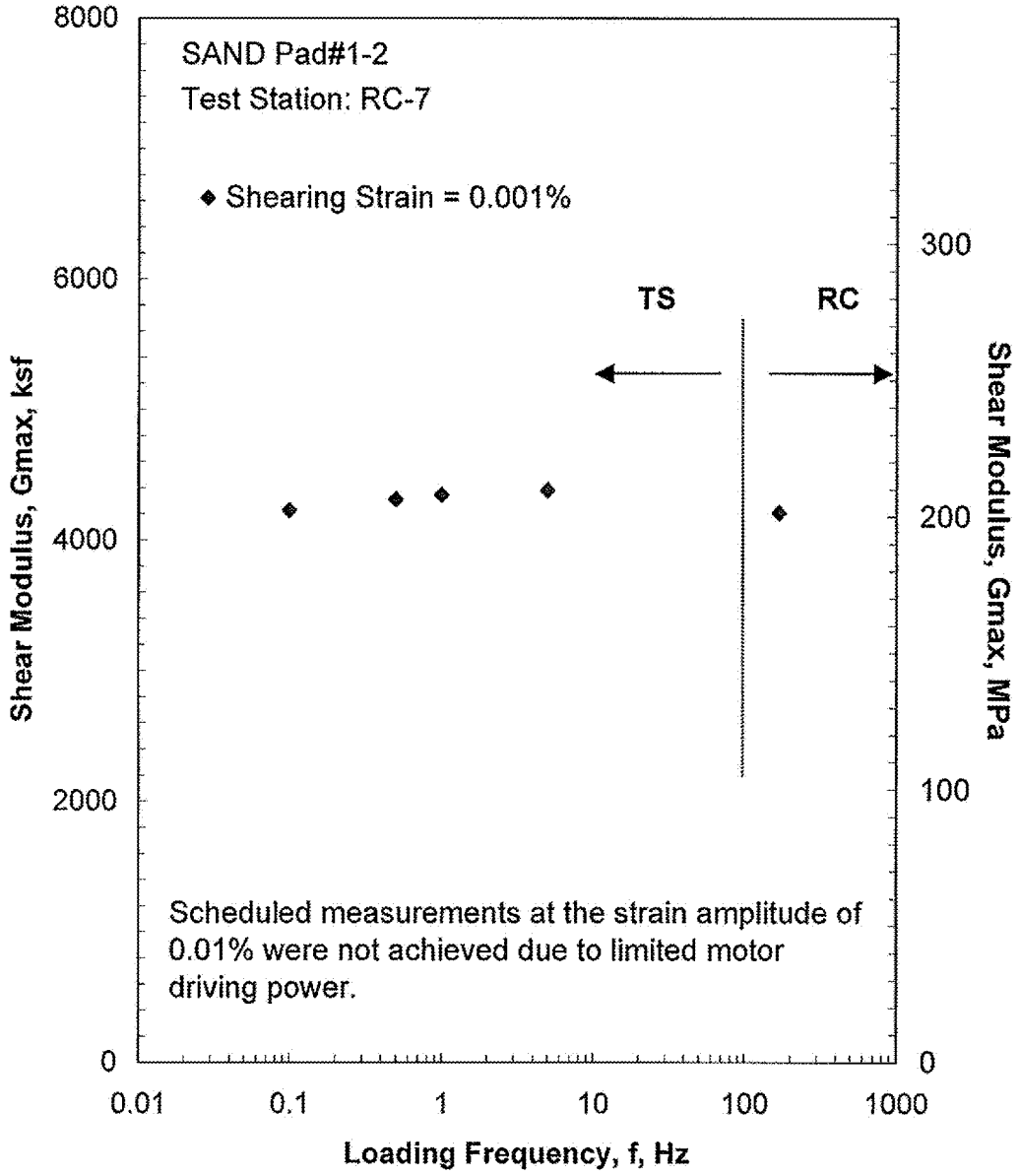


Figure B.19 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

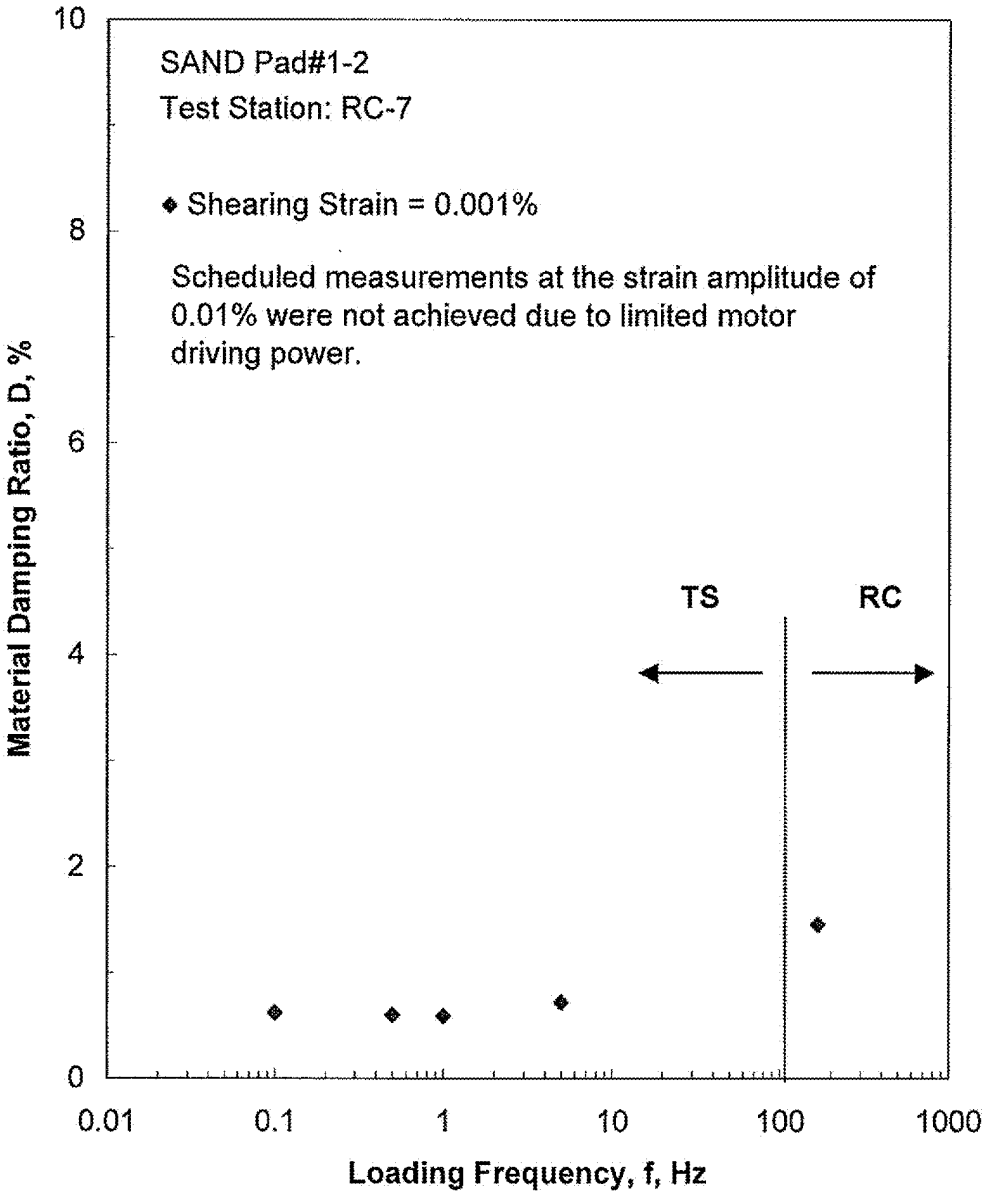


Figure B.20 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

Table B.1 Variation in Low-Amplitude Shear Wave Velocity, Low-Amplitude Shear Modulus, Low-Amplitude Material Damping Ratio and Estimated Void Ratio with Isotropic Confining Pressure from RC Tests of Specimen Pad 1-2

Isotropic Confining Pressure, σ_o			Low-Amplitude Shear Modulus, G_{max}		Low-Amplitude Shear Wave Velocity, Vs	Low-Amplitude Material Damping Ratio, Dmin	Estimated Void Ratio, e
(psi)	(psf)	(kPa)	(ksf)	(MPa)	(fps)	(%)	
3	432	21	932	45	489.0	1.59	0.43
6	864	41	1355	65	589.6	1.47	0.43
13	1872	90	2010	96	717.4	1.21	0.42
25	3600	172	2971	143	871.1	1.09	0.42
50	7200	345	4415	212	1059.9	0.99	0.42

Table B.2 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad1-2; Isoptropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
1.50E-04	1988	1.00	1.50E-04	1.11
2.93E-04	1962	0.99	2.93E-04	1.20
5.63E-04	1928	0.97	5.63E-04	1.47
1.05E-03	1869	0.94	9.43E-04	1.65
1.93E-03	1786	0.90	1.70E-03	1.95
3.51E-03	1688	0.85	2.98E-03	2.44
6.51E-03	1534	0.77	5.33E-03	2.95
1.18E-02	1339	0.67	9.33E-03	3.77
2.29E-02	1095	0.55	1.65E-02	5.37

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table B.3 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad1-2; Isotropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
6.31E-04	1972	0.97	0.93	6.26E-04	1953	0.97	1.19
1.04E-03	1915	0.94	0.98	1.04E-03	1919	0.95	1.15
2.17E-03	1847	0.91	1.76	2.16E-03	1851	0.92	1.50
4.66E-03	1717	0.84	3.09	4.70E-03	1703	0.85	2.68
9.91E-03	1480	0.73	3.49	1.00E-02	1467	0.73	3.72

Table B.4 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad 1-2; Isoptropic Confining Pressure, σ_o= 50 psi (7.2 ksf = 345 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
6.10E-05	4389	1.00	6.10E-05	0.99
1.21E-04	4373	1.00	1.21E-04	0.98
2.37E-04	4340	0.99	2.37E-04	1.04
4.56E-04	4291	0.98	4.56E-04	1.25
8.98E-04	4211	0.96	8.98E-04	1.46
1.67E-03	4107	0.94	1.50E-03	1.64
3.06E-03	3918	0.89	2.72E-03	1.90
5.44E-03	3643	0.83	4.68E-03	2.36
9.94E-03	3215	0.73	8.25E-03	2.99
1.76E-02	2799	0.64	1.39E-02	3.90
3.46E-02	2316	0.53	2.45E-02	5.70

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table B.5 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad 1-2; Isotropic Confining Pressure, σ_c= 50 psi (7.2 ksf = 345 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
6.14E-04	4370	0.96	0.54	6.19E-04	4335	0.96	0.60
1.04E-03	4301	0.94	0.65	1.04E-03	4314	0.95	0.60
2.12E-03	4225	0.93	1.17	2.11E-03	4242	0.94	0.82
4.38E-03	4088	0.90	1.28	4.38E-03	4091	0.91	1.14

ATTACHMENT B

Fugro # 0411-08-1696

Geotechnical
Environmental &
Water Resources
Engineering

GEI Consultants

LETTER OF TRANSMITTAL

400 Unicorn Park Drive
Woburn, MA 01801
Phone: (781) 721-4000
Fax: (781) 721-4073
www.geiconsultants.com

To:	Bill DeGroff	Date:	April 17, 2008
	Fugro Consultants, Inc. 6100 Hillcroft (77081)	GEI Project No.	07223, Task 1003
		Re:	Nine Mile Point
	Houston, TX 77081		

We are sending you the following enclosures:

No.	Type	Description
1		Bag sample of borrow soil: Streeter Rathburn Road, Sample Pad #1 (<3/4-inch material) for RCTS testing
2		Modified Compaction and Grain Size Distribution Curves
3		Chain-of-Custody Form

These are transmitted as checked below:

☐ For Approval ☐ For Your Use ☐ For Review/Comment ☐ As Requested ☐ Other

Message:

Bill,

Enclosed is the soil sample for the RCTS testing, along with the proctor and grain size results. When not in use, please keep the soil locked up. Also, please return a signed copy by PDF or fax of the Chain-of-Custody Form.

Thanks for your help.

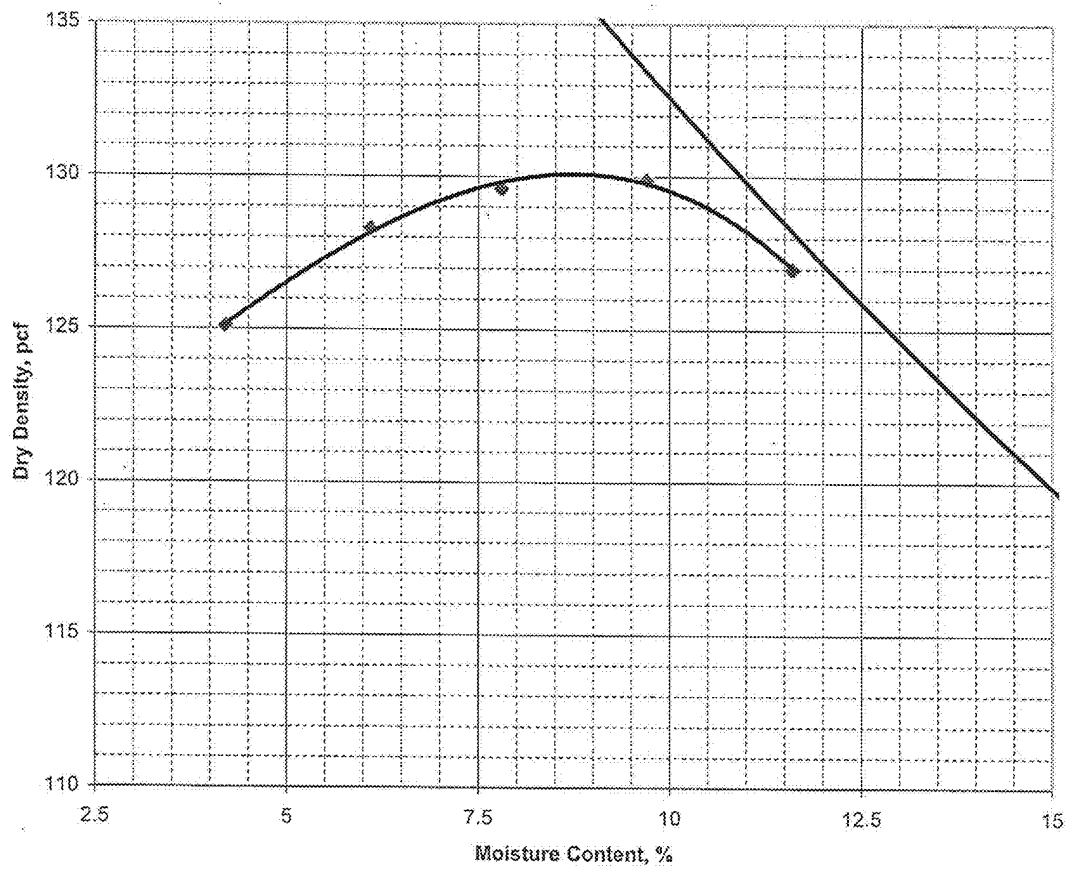
Copy to:
Project Files

Signed: Doug Aghjayan

Doug Aghjayan
Ext. 4031

If enclosures are not as noted, kindly notify us at once.

Point	Moisture Content, percent	Dry Unit Wt. lb/ft^3
1	4.2	125.1
2	6.1	128.3
3	7.8	129.6
4	9.7	129.9
5	11.6	127
6	NM	NM

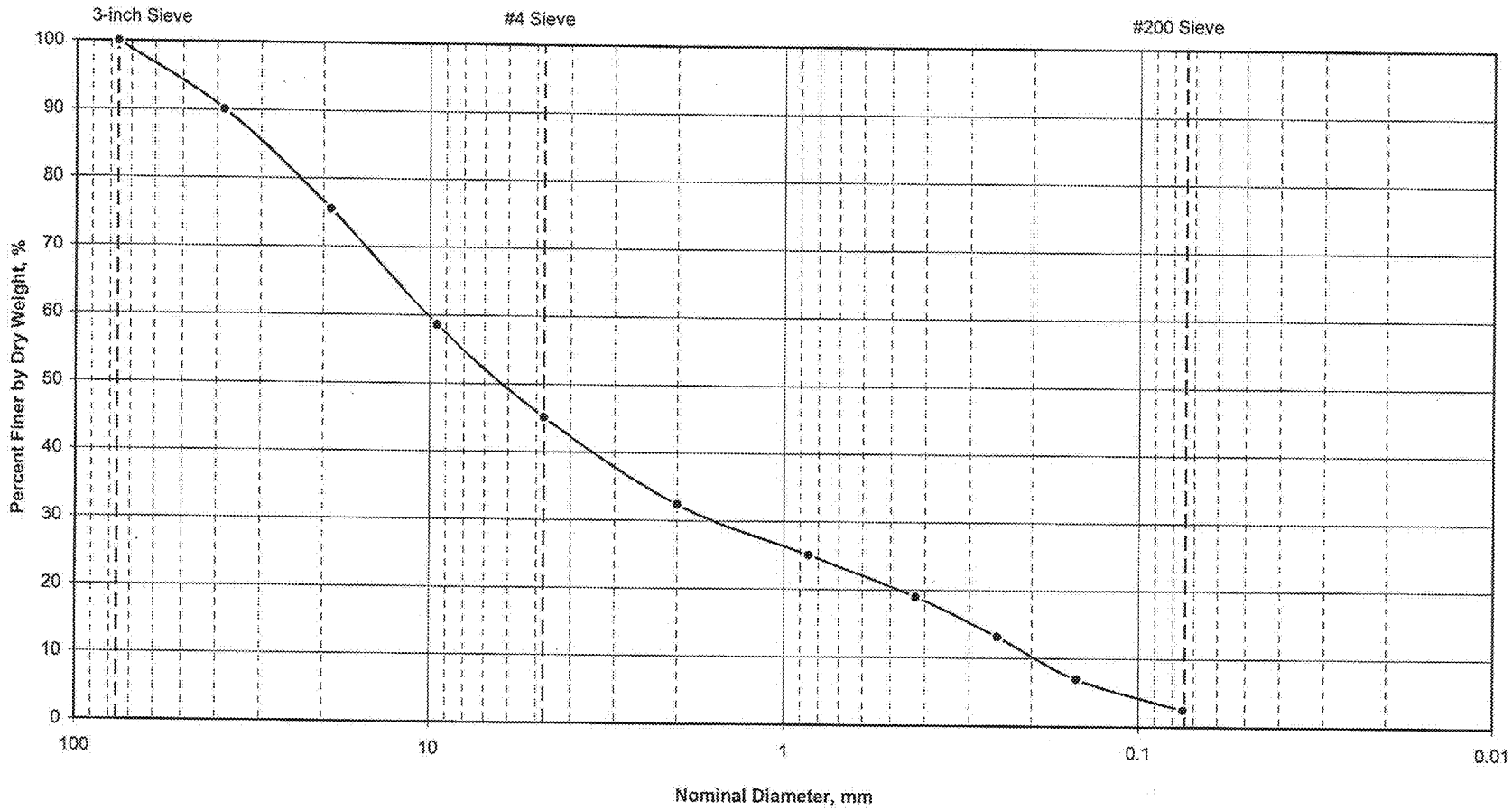


Specific Gravity for Zero Air Voids Curve	2.698
Maximum Dry Density, pcf	130.3
Optimum Moisture Content, %	9.0

Note: Maximum dry density and optimum moisture content are NOT corrected for oversize gravel.

Compaction Test Method (A, B, or C):	C
Max Particle Size in Test:	3/4 in.
Percent Oversize Particles >3/4 in.	24.5

Nine Mile Point Unit 3 Site Characterization Oswego, NY	GEI Consultants	**Moisture - Density Curve Modified Compaction**
	Project 07223	Source: Streeter Rathburn Rd.
		Sample: Sample Pad #1
		Form 111.0 rev. 0 (page 3 of 3)



%+3"	% Gravel	% Sand	% Fines
0.0	54.9	42.6	2.5

Nine Mile Point Site Characterization **Oswego, NY**	GEI Consultants	**Grain Size Curve** Boring/Test Pit No. : Streeter Rathburn Rd Sample No. : Sample Pad #1
	Project 07223	Form 105.2 rev. 1 (page 2 of 2)

file OSWEGO 5.13.08

RCCyTS Functional Check w/Aluminum Specimen(s)

Performed by: S. Jupic Date: 5.13.07 5/13/07
Checked by: J Meng Date: 5.13/08
Station # RC-7
Aluminum # MS02

RC Check

Items	Expected Range	Before, B	After, A	Variation, % (B-A)/A*100%	Notes
Input voltage (mV)	NA	40	40	NA	
Power amplification	NA	10	10	NA	
Strain amplitude	NA	5.1×10^{-5}	5.2×10^{-5}	NA	
Charge amplification	NA	1	1	NA	
Resonant freq (Hz)	NA	56.9	57	-0.2%	
Sweeping width (Hz)	NA	18	18	NA	
# of excitation cycles	NA	160	160	NA	JS 6/20/08
File name	NA	MS-2-0513B ~~MS-2-0513A~~		NA	MS-2-0513A
Damping ratio	NA	0.94%	0.87%	~~0.1%~~ 1.2% JM 06/20/08	

TS Check

Items	Expected Range	Before, B	After, A	Variation, % (B-A)/A*100%	Notes
Input voltage (mV)	NA	4000	4000	NA	
Power amplification	NA	10	10	NA	
Excitation frequency	NA	0.5	0.5	NA	
# of excitation cycles	NA	11	11	NA	
Strain amplitude	NA	0.6×10^{-4}	0.56×10^{-4}	NA	JS 6/20/08
File name	NA	MS-2-0513TS B * ~~MS-2-0513TSA~~		NA	MS-2-0513TSA
Shear modulus	27,600 MPa ± 10%	27,989	26,610	5.2%	
Damping ratio	NA	0.053	0.048	<0.01%	use difference

NA = not applicable

Functional check is acceptable if measured values are within the expected range, and if the variation in the values measured before and after the project testing is less than 10%.

~~* MS-2-0513TS B~~
~~-B1~~
~~-B2~~ JM 06/20/08

Form No. N/A Rev. 0

RESONANT COLUMN CYCLIC TORSIONAL SHEAR (RCCyTS) TEST
Specimen Setup / Take Down

Project No: 0411-08-1696 Test Type: RCTS Cell No.: RC7 File Name: N/A
Project Name: GEI Test Stress(es), σ' = 3.1, 6.2, 12.5, 25 & 50 psi (1)
Task No.: N/A Stokoe Resonant Column Device Gs = N/A ☐ Meas.; ☐ Assumed
Test No.: N/A Test Series No.: N/A Top Cap ID: 002

Assig. Remarks: (SR.RO) AS 6/20/08

☐ Tube ☐ Field Extruded ☐ Liner ☐ N/A
Boring No.: STEETER PATH A ☐ Reconstituted
Sample No.: PAD #1-1 Compostite No.: N/A
Depth (ft): N/A Specimen No.: A
☐ Spec. Selection by X-ray; ☐ Geomarine Sample

Specimen Preparation (for reconstituted samples)
Target Dry Density 115.7 Lift Thickness 29.92 mm No. Lifts 5
Final Ht. 148.77 Final Area 40.489 cm² Final Vol. 602.36 cm³
Final Total Mass 1207.87 Water Cont. 7.76

Type Consolidation:		
	☒ Isotropic	☐ Ko stress path
	☐ Anisotropic	☐ 45o stress path

Water Content (WC);	Initial - Trimming Location: Top (Wo,1)	Bottom (Wo,2)	Sides (Wo,3)	Final (Wat) (see below)
Container No	823			7A
Mass Moist Soil + Cont. (g)	200.35		AS 6/14/05	388.97
Mass Dry Soil + Cont. (g)	188.25			372.19
Mass Container (g)	32.23			139.34
Water Content, Wo,n (%)	7.76	N/A	N/A	7.21
Avg. Initial WC, Wo,avg (%)	7.76	Final (Wat);	☐ Slice;	Whole Spec.

SOIL MASSES:	Initial	Final
Moist + Tare (etc.)(g):	1804.47	1338.77
Tare (etc.) (g):	596.60	139.34
Spec. Moist Mass (g):	1207.87	1199.43

EXCESS DRY SOIL (stuck to membrane, filters stones, etc.)

Container No:	N/A
Mass Dry Soil + Container (g):	N/A
Mass Container (g):	N/A
Mass Excess Dry Soil (g):	N/A

Specimen Dimensions

Height (mm)	Initial (Ho)	Final (Hat)	Diameter (mm)	Initial (Do)	Final (Dat)
GB	127		T	72.0	
1	21.770		M	71.9	
2	21.774		B	71.6	NA*
3	21.757	NA*	T'		AS 6/11/08
4	21.768		M'	AS 6/19	
5	21.763		B'		
Avg	148.77		Avg	71.8	

Measuring Devices: 2.82 Ao (cm2) = N/A
5.85 Pi Tape: ☒ Dia. Vo (cm3) = N/A
Calipers: ☐ Ht. ☐ Dia. Aat (cm2)= N/A
Dial Comparator: ☒ Ht. ☐ Dia. Vat (cm3) = N/A

Estimated Initial Unit Weight:
Total, gt,o (lb/ft3) = N/A Dry, gd,o (lb/ft3)= N/A

Membrane / Filter Paper / Apparatus

Membrane (mm):	Top	Bottom
Number: = 1 ☐ Single; ☒ Double	N/A	N/A
Thickness:	0.61	0.78
Circumference (Crm,o)	214	216

(1) Total thickness, if 2+ membranes	Thickness (1)	Dia.(Crm,o/p)
Average:	N/A	N/A

Filter Paper: Top + Bottom: ☐ Yes ; ✓ No
Filter Strips: ☐ Yes ; ✓ No Number =
If yes number = — Vertical: ¼" & Whatman #54 or N/A
" or = N/A or Sprial: ¼" & Whatman #1 or
Mass Drive Plate & Cap, Mdpc = N/A g, N/A lbf

NA - Not Applicable; UK - Unknown; GB - Gage Block
* SAMPLE CRASHED DURING TAKING DOWN. (INITIAL LVDT READING - 3.45594)
Note: (1) Each Test Stress is identified as a Test Stage or Sequence on other data sheets.
Final Specimen Description (USCS group name & symbol, color, layering, max. part. size, slickensided, fissured, blocky, honeycombed, etc.):
Md to Coarse Sa, Br ~~Gray~~ w/ gr
AS

☐ Photo taken (internal sliced surface & outside surface) ~~6/~~ AS 5/14/08
Other Remarks

Resonant Column Cyclic Torsional Shear (RCCyTS) Signature & Equipment Page	Boring: n/a
	Sample: PAD #1 (1)
	Depth (ft): n/a
	Test No. n/a

Project: Nine Mile Point Site Characterization Location: Oswego, New York	Fugro Project No.: 0411-08-1696

SIGNATURES

Specimen Trimmed/Recompacted by:	Date: 5/14/08
Specimen Setup by:	Date: 5.14.08
Test Performed by: (per GEI Procedure 109 rev. ___)	Date: 5.14.08
Specimen Takedown by:	Date: 05/19/08
Preliminary Calculations by:	Date: 5/21/08
Calculated by:	Date: 5/21/08
Reviewed by:	Date: 6/13/08

EQUIPMENT USED

RCCyTS Workstation No.: RC7	Balance ID: BA-006
Caliper ID: VA-10838	PI Tape ID: VH-10822
Oven ID: #14	Scalping Sieve Size & ID: 3/8" B-31
Other (specify) ID: —	Other (specify) ID: —

Comments/Notes: —

Water Content Measurement

Project Name: Nine Mile Point Site Characterization, Oswego, NY

Project No.: 07223 0411-08-1696

Performed by, per Proc 101, rev ( ): DANIEL NYARKO AS

Checked By: N/A AS 5/16/08 Date: 5/14/08

AS 6/18/08

Determination No.	07223					
Boring	STREETER RATHBUN RD.					
Sample	PAD #1					
Oven ID	# 14					
Balance ID	BA 006					
Date/Time in Oven	6/13/08					
Date/Time Out of Oven	5/14/08					
Tare No.	PAN 1					
(a) Wet Wt. + Tare	912.74 g	g	g	g	g	g
(b) Dry Wt. + Tare	856.60 g	g	g	g	g	g
(c) Wt. Tare	138.99 g	g	g	g	g	g
(d) Wt. Water (a – b)	56.14 g	g	g	g	g	g
Wt. Wet Solids (a – c)	773.75 g	g	g	g	g	g
(e) Wt. Dry Solids (b – c)	717.61 g	g	g	g	g	g
Water Content (d/e) x 100, %	7.8					
Is Wet Wt. Enough for Method B? (yes/no)	YES					

AS 6/18/08

Remarks:

Test Notes:
1. Oven dry at 110°C (±5°C) for 12 hours minimum.
2. Cool in desiccator for a minimum of 30 minutes before weighing.

GEI Consultants

Form 101.1, rev. 1

RCTS Testing Record (Page 1 of 10)

Project #: 0411-08-1696 Project: Nine Mile Point Unit 3, Oswego, New York
Specimen #: PAD #1 Specimen Description: Fill to Coarse Sand, Dry G. w/ Gravel
Tested By, per GEI Procedure 109 rev (0): [illegible] Date: 5.14.08
Checked By: [illegible] Date: 6/21/08
DS 6/18/08

Test Station: RC7

Confining Pressure: 3.1 psi **Testing Stage: X0.25**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	1:07	PAD#1-P3-T_0	4	1	77.9	
PM	2:43	PAD#1-P3-T_7	4	1	82.6	
END	~~END~~		~~4~~	~~1~~	~~82.6~~	

DS 6/18/08 SI 6.19.08 CJ SI 6.19.08

RC Strain Amplitude Effect Tests

DS 6/18/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 2 of 10)

Station:_____ Date:_____ Tested by:_____ JS 6/10/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.25**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 3 of 10)

13
6.19.08

Station: RC 7 Date: 5.14.08 Tested by: AA Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: STREETER MATW.RI Specimen #: PAD #1
Confining Pressure: 6.2 psi **Testing Stage: X0.5**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PA	2:47	PAD #1 - P6 - 7.0	6	1	92.6	
PA	4:26	PAD #1 - P6 - 7.7	6	1	96.1	
END	~~[illegible]~~		~~6~~	~~1~~	~~96.1~~	

DS 6/18/08 SJ 6.18.08 SJ SJ. 6.18.08

RC Strain Amplitude Effect Tests

DS 6/18/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 4 of 10)

Station:_____ Date:_____ Tested by:_____ 5 6/10/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.5**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

SI
19
6.19.08

RCTS Testing Record (Page 5 of 10)

Station: RC7 Date: 5.14.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GET
Boring #: CREETER MTHRL Specimen #: PAD#1
Confining Pressure: 12.5 psi **Testing Stage: X1**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	4:34	PAD#1-P12-T-0	6	1	113.6	
PM	5:12	PAD#1-P12-T-7	6	1	116.8	
END	END		~~6~~	~~1~~	~~116.8~~	
	AS 6/18/08		SI	SI 6.19.08	SI 6.19.08	

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	8:35	PAD#1-P12-S-0	3	1	115.6	
	8:36	PAD#1-P12-S-1	6	1	115.1	
	8:36	PAD#1-P12-S-2	12	1	114.4	
	8:36	PAD#1-P12-S-3	24	1	112.6	
	8:37	PAD#1-P12-S-4	48	1	110.1	
	8:38	PAD#1-P12-SA-0	96	10	106.8	
	8:38	PAD#1-P12-SA-1	192	10	101.9	
	8:39	PAD#1-P12-SB-0	384	10	95	
PM	8:40	PAD#1-P12-SC-0	768	10	84.9	
		END				

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min) SI 6.19.08	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
~~AS~~	PAD#1-P12-SCR	6	1	104.8	

PM 8:41

RCTS Testing Record (Page 6 of 10)

SJ
6.19.08

Station: RCT Date: 5.14.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: MREETHER PATH 2 Specimen #: PAD #1
Confining Pressure: 12.5 PSI **Testing Stage: X1**

TS Tests (prior to tests, fr= 116.8 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-P12-TS 01	0.07	1.39	1.6-6	
0.5	PAD#1-P12-TS 02	0.14	2.78	3.2-6	
0.5	PAD#1-P12-TS 03	0.28	5.56	0.62-5	
0.5	PAD#1-P12-TS 04	0.45	8.94	1.03-5	
0.1	PAD#1-P12-TS 05	0.45	8.94	1.06-5	
0.5	PAD#1-P12-TS 06			1.06-5	
1	PAD#1-P12-TS 07			1.03-5	
5	PAD#1-P12-TS 08			1.02-5	
10	PAD#1-P12-TS 09	0.45	8.94	1.02-5	
0.5	PAD#1-P12-TS 10	0.90	17.89	2.16-5	
0.5	PAD#1-P12-TS 11	1.8	35.79	4.6-5	
0.5	PAD#1-P12-TS 12	3.3	65.65	1-4	
0.1	PAD#1-P12-TS 13	3.3	65.65	1.01-4	
0.5	PAD#1-P12-TS 14			1-4	
1	PAD#1-P12-TS 15			0.99-4	
5	PAD#1-P12-TS 16			0.99-4	
10	PAD#1-P12-TS 17	3.3	65.65	0.99.4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	8:05	PAD#1-P12-TSCK	6	1	108.5	
	N/A					
5.16.08	8:32 PM	N/A	6	1	115.4	
END						

RCTS Testing Record (Page 7 of 10)

CJ
6.19.08

Station: RC7 Date: 5.15.08 Tested by: Surad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: [illegible] Specimen #: PAD #1
Confining Pressure: 25 psi **Testing Stage: X2**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	8:49	PAD#1-P25-T.0	8	1	137.9	
PM	10:27	PAD#1-P25-T.7	8	1	141.8	
END	~~END~~					

BS 6/18/08

RC Strain Amplitude Effect Tests

BS 6/18/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 8 of 10)

Station:_____ Date:_____ Tested by:_____ DS 6/18/08
Project #:_____ Project Name:_____
Boring #:_____ Specimen #:_____
Confining Pressure:_____ **Testing Stage: X2**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

SJ
6.19.08

RCTS Testing Record (Page 9 of 10)

Station: RC7 Date: 6.17.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: SDEFTHER AATH RA Specimen #: PAD#1
Confining Pressure: 50 psi **Testing Stage: X4**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	10:30	PAD#1-P50-T-0	8	1	167.3	
AM	12:08	PAD#1-P50-T-7	8	1	172.37	
END						

AS 6/18/08

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	1:37	PAD#1-P50-S-0	4	1	171.9	
	1:37	PAD#1-P50-S-1	8	1	171.6	
	1:37	PAD#1-P50-S-2	16	1	171.1	
	1:37	PAD#1-P50-S-3	32	1	170.1	
	1:38	PAD#1-P50-S-4	64	1	168.3	
	1:39	PAD#1-P50-SA-0	128	10	166	
	1:39	PAD#1-P50-SA-1	256	10	162.1	
	1:40	PAD#1-P50-SB-0	512	10	155.7	
	1:41	PAD#1-P50-SC-0	1024	10	145.6	
	1:42	PAD#1-P50-SD-0	2048	10	134.4	
AM	1:43	PAD#1-P50-SE-0	4000	10	121.5	

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	1:44	PAD#1-P50-SCK	8	1	154.3	

CJ
6/19.08

RCTS Testing Record (Page 10 of 10)

Station: RC 7 Date: 5.15.08 Tested by: Lt Suvad Jupic
Project #: 0411-08-1696 Project Name: GSI
Boring #: STRETCHED PATH 1 Specimen #: PAD #1
Confining Pressure: 50 psi **Testing Stage: X4**

TS Tests (prior to tests, fr=172.3 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-P50-TS01	0.15	2.98	1.6-6	
0.5	PAD#1-P50-TS02	0.30	5.96	3.1-6	
0.5	PAD#1-P50-TS03	0.60	11.93	0.6-5	
0.5	PAD#1-P50-TS04	1.0	19.88	1.03-5	
0.1	PAD#1-P50-TS05	1.0	19.88	1.05-5	
0.5	PAD#1-P50-TS06			1.04-5	
1	PAD#1-P50-TS07			1.025-5	
5	PAD#1-P50-TS08			1.01-5	
10	PAD#1-P50-TS09	1.0	19.88	1-5	
0.5	PAD#1-P50-TS10	2.0	39.76	2.1-5	
0.5	PAD#1-P50-TS11	4.0	79.59	4.35-5	
0.5	PAD#1-P50-TS12	4.7	93.57	0.51-4	
0.1	PAD#1-P50-TS13	4.7	93.57	0.51-4	
0.5	PAD#1-P50-TS14			0.49-4	
1	PAD#1-P50-TS15			0.49-4	
5	PAD#1-P50-TS16			0.49-4	
10	PAD#1-P50-TS17	4.7	93.57	0.485-4	
0.5	CMD				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	12:35	PAD#1-P50-TSCK	8	1	168.8	
AM	1:35	NA	8	1	171.4	
END						

RESONANT COLUMN CYCLIC TORSIONAL SHEAR (RCCyTS) TEST
Specimen Setup / Take Down

Project No: 0411-08-1696 Test Type: RCTS Cell No.: RC7 File Name: N/A
Project Name: (.C) Test Stress(es), σ' = 3.1 , 6.2 , 12.5 , 25 & 50 psi (1)
Task No.: N/A Stokoe Resonant Column Device Gs = N/A [ ] Meas.; [ ] Assumed
Test No.: N/A Test Series No.: N/A Top Cap ID: 002

Assig. Remarks: (SR,RD) 6/30 05/N/A

[ ] Tube [ ] Field Extruded [ ] Liner [ ] N/A
Boring No.: [illegible] [X] Reconstituted
Sample No.: PAD #1-2 Compostite No.: N/A
Depth (ft): N/A Specimen No.: b
[ ] Spec. Selection by X-ray; [ ] Geomarine Sample

Specimen Preparation (for reconstituted samples)
Target Dry Density 115.7 Lift Thickness 29.92 mm 5/19/08 No. Lifts 5
Final Ht. 148.77 Final Area 40.523 cm² Final Vol. 602.86 cm³
Final Total Mass 1208.92 Water Cont. 8.17 %

Type	[X] Isotropic	[ ] Ko stress path
Consolidation:	[ ] Anisotropic	[ ] 45o stress path

Water Content (WC);	Initial - Trimming Location: Top (Wo,1)	Bottom (Wo,2)	Sides (Wo,3)	Final (Wat) (see below)
Container No	163	N/A	N/A	PA
Mass Moist Soil + Cont. (g)	154.59			181.74
Mass Dry Soil + Cont. (g)	145.22			169.69
Mass Container (g)	30.49			15.91
Water Content, Wo,n (%)	8.17	N/A	N/A	7.84
Avg. Initial WC, Wo,avg (%)	8.17	Final (Wat);	[ ] Slice;	[ ] Whole Spec.

SOIL MASSES:	Initial	Final
Moist + Tare (etc.)(g):	1805.52	1204.7
Tare (etc.) (g):	596.60	0
Spec. Moist Mass (g):	1208.92	1204.7
EXCESS DRY SOIL (stuck to membrane, filters stones, etc.)		
Container No:	N/A	
Mass Dry Soil + Container (g):	N/A	
Mass Container (g):	N/A	
Mass Excess Dry Soil (g):	N/A	

Specimen Dimensions

Height (mm)	Initial (Ho)	Final (Hat)	Diameter (mm)	Initial (Do)	Final (Dat)
GB	127		T	71.9	72.2
1	+ 21.759	147.51	M	71.8	72.2
2	+ 21.768	148.65	B	71.8	72.4
3	+ 21.777	148.27	T'		
4	21.767	148.01	M'		
5	21.771	148.03	B'		
Avg	148.76	147.97	Avg	71.83	72.26

DS 6/17/08

Measuring Devices:
5.80" Pi Tape: [X] Dia. 2.82
Calipers: [ ] Ht. [ ] Dia.
Dial Comparator: [X] Ht. [ ] Dia.

Ao (cm2) = N/A
Vo (cm3) = N/A
Aat (cm2)= N/A
Vat (cm3) = N/A

Estimated Initial Unit Weight:
Total, gt,o (lb/ft3) = N/A Dry, gd,o (lb/ft3)= N/A

Membrane / Filter Paper / Apparatus

Membrane (mm):	Top	Bottom
Number: = 1 Thickness: [ ] Single; [X] Double	N/A	N/A
	0.70	0.60
Circumference (Crm,o)	216	216
(1) Total thickness, if 2+ membranes	Thickness (1)	Dia.(Crm,o/p)
Average:		

Filter Paper: Top + Bottom: [ ] Yes ; [✓] No
Filter Strips: [ ] Yes ; [ ] No Number =
If yes number = — Vertical: ¼" & Whatman #54 or N/A
" or = or Sprial: ¼" & Whatman #1 or
Mass Drive Plate & Cap, Mdpc = N/A g, N/A lbf

NA - Not Applicable; UK - Unknown; GB - Gage Block

Note: (1) Each Test Stress is identified as a Test Stage or Sequence on other data sheets. (INTIAL LVDT READING) 7.7579

Final Specimen Description (USCS group name & symbol, color, layering, max. part. size, slickensided, fissured, blocky, honeycombed, etc.):
Med. to Coarse Sand Brown w/ many gravel

[ ] Photo taken (internal sliced surface & outside surface)
Other Remarks

Resonant Column Cyclic Torsional Shear (RCCyTS) Signature & Equipment Page	Boring: N/A
	Sample: PAD #1 (a)
	Depth (ft): N/A
	Test No. N/A

Project: Nine Mile Point Site Characterization Location: Oswego, New York	Fugro Project No.: 0411-08-1696

SIGNATURES

Specimen Trimmed/Recompacted by:	Date: 5/19/08
Specimen Setup by:	Date: 5.19.08
Test Performed by: (per GEI Procedure 109 rev. ___)	Date: 5/19/08
Specimen Takedown by:	Date: 5/21/08
Preliminary Calculations by:	Date: 5/23/08
Calculated by:	Date: 5/23/08
Reviewed by:	Date: 6/13/08

EQUIPMENT USED

RCCyTS Workstation No.: RC-7	Balance ID: BA-066
Caliper ID: VH-10838	PI Tape ID: VH-10822
Oven ID: #14	Scalping Sieve Size & ID: 3/8" B-31
Other (specify) ID: —	Other (specify) ID: —

Comments/Notes: —

Water Content Measurement

Project Name: Nine Mile Point Site Characterization, Oswego, NY

Project No.: 07223 0411-08-1696

Performed by, per Proc 101, rev ( ): DANIEL NYARKO

Checked By: [illegible] Date: ~~5/14/08~~ 6/18/08

6/18/08

Determination No.	07223					
Boring	STREETER RATHBUN RD.					
Sample	PAD #1-2					
Oven ID	# 14					
Balance ID	BA 006					
Date/Time in Oven	5/13/08					
Date/Time Out of Oven	5/14/08					
Tare No.	PAN 1					
(a) Wet Wt. + Tare	912.74 g	g	g	g	g	g
(b) Dry Wt. + Tare	856.60 g	g	g	g	g	g
(c) Wt. Tare	138.99 g	g	g	g	g	g
(d) Wt. Water (a – b)	56.14 g	g	g	g	g	g
Wt. Wet Solids (a – c)	773.75 g	g	g	g	g	g
(e) Wt. Dry Solids (b – c)	717.61 g	g	g	g	g	g
Water Content (d/e) x 100, %	7.8					
Is Wet Wt. Enough for Method B? (yes/no)	YES					

6/18/08

Remarks:

Test Notes:
1. Oven dry at 110°C (±5°C) for 12 hours minimum.
2. Cool in desiccator for a minimum of 30 minutes before weighing.

GEI Consultants

Form 101.1, rev. 1

Md to corse Sand Br w/many gravels

RCTS Testing Record (Page 1 of 10)

Project #: 0411-08-1696 Project: Nine Mile Point Unit 3, Oswego, New York SJ 6.31.08
Specimen #: PAD # 1-2 Specimen Description: ~~Md to corse Sand Br w/many gravels~~
Tested By, per GEI Procedure 109 rev (0): Triple C Date: 5.19.08
Checked By: [signature] Date: 5/23/08

Test Station: RC 7

Confining Pressure: 3.1 psi **Testing Stage: X0.25**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	4:14	PAD # 1-2 - P3 - T.0	4	1	76.9	
PM	5:52	PAD # 1-2 - P3 - T.7	4	1	79.6	
END	~~6:00~~		~~4~~ SJ	+ SJ	~~79.6~~ SJ	

AS 6/18/08 6.19.08 6.19.08

RC Strain Amplitude Effect Tests

AS 5/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

AS 5/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 2 of 10)

Station:_____ Date:_____ Tested by:_____ AS 5/27/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.25**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 3 of 10)

6.19.08

RC7 C.J. 5/20/08

Station: ~~0411-08-1696~~ Date: 5.20.08 Tested by: ~~ft~~ Suvad Jupic

Project #: 0411-08-1696 Project Name: GEI

Boring #: SRR1 Specimen #: PAD # 1-2

Confining Pressure: 6.2 PSI **Testing Stage: X0.5**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	7:29	PAD#1-2-P6-T-0	6	1	93.1	
AM	9:06	PAD#1-2-P6-T-7	6	1	95.9	
END	~~[illegible]~~					

AS 6/18/08

RC Strain Amplitude Effect Tests

AS 5/28/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 4 of 10)

Station:_____ Date:_____ Tested by:_____ 5/27/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.5**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 5 of 10) 6.19.08 SJ

Station: RC7 Date: 6.20.08 Tested by: Suvad Jupic

Project #: 0411-08-16986 6.20.08 Project Name: GEI

Boring #: SK R1 Specimen #: PAD#1-2

Confining Pressure: 12.5 psi **Testing Stage: X1**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	9:20	PAD#1-2-P12-T-0	6	1	112.9	
PM	11:01	PAD#1-2-P12-T-1	6	1	116.6	
END	~~END~~					

SJ 6/19/08

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	5:47	PAD#1-2-P12-S-0	3	1	116.1	
	5:48	PAD#1-2-P12-S-1	6	1	115.4	
	5:48	PAD#1-2-P12-S-2	12	1	114.4	
	5:48	PAD#1-2-P12-S-3	24	1	112.6	
	5:49	PAD#1-2-P12-S-4	48	1	110.1	
	5:50	PAD#1-2-P12-SA-0	96	10	106.9	
	5:50	PAD#1-2-P12-SA-1	192	10	101.9	
	5:52	PAD#1-2-P12-SB-0	384	10	95.2	
PM	5:53	PAD#1-2-P12-SC-0	768	10	85.3	
		~~PAD#1-2-P12~~ END				
		SJ 6.20.08				

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	5:54	PAD#1-2-P12-SCK	6	1	105.1	

RCTS Testing Record (Page 6 of 10) 6.19.08 SI

Station: RC7 Date: 5.20.08 Tested by: Surad Supic

Project #: 0941-08-169 ~~06~~ SI 5.20.08 Project Name: GEI

Boring #: SP P4 Specimen #: P4D #1-2

Confining Pressure: 12.5 PSI **Testing Stage: X1**

TS Tests (prior to tests, fr=116.6 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-2-P12-TS01	0.07	1.39	1.6-6	
0.5	PAD#1-2-P12-TS02	0.14	2.78	3.2-6	
0.5	PAD#1-2-P12-TS03	0.28	5.56	0.63-5	
0.5	PAD#1-2-P12-TS04	0.45	8.94	1.03-5	
0.1	PAD#1-2-P12-TS05	0.45	8.94	1.06-5	
0.5	PAD#1-2-P12-TS06	↓	↓	1.04-5	
1	PAD#1-2-P12-TS07			1.04-5	
5	PAD#1-2-P12-TS08			1.02-5	
10	PAD#1-2-P12-TS09	0.45	8.94	1.01-5	
0.5	PAD#1-2-P12-TS10	0.9	17.90	2.16-5	
0.5	PAD#1-2-P12-TS11	1.8	35.8	4.67-5	
0.5	PAD#1-2-P12-TS12	3.3	65.66	1-4	
0.1	PAD#1-2-P12-TS13	3.3	65.66	1.01-4	
0.5	PAD#1-2-P12-TS14	↓	↓	0.99-4	
1	PAD#1-2-P12-TS15			0.99-4	
5	PAD#1-2-P12-TS16			0.99-4	
10	PAD#1-2-P12-TS17	3.3	65.66	1-4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	11:24	PAD#1-2-P12-TSCK	6	1	109	
PM	5:43	N/A	6	1	115.6	
END		N/A	N/A	N/A	N/A	

6/19.08
RI

RCTS Testing Record (Page 7 of 10)

Station: RC7 Date: 5.21.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: SR1d Specimen #: PAD#1-2
Confining Pressure: 25 psi **Testing Stage: X2**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	7:49	PAD#1-2-P25-T0	8	1	137.6	
AM	9:29	PAD#1-2-P25-T7	8	1	141.9	
END	~~T20~~		~			

DS 6/18/08

RC Strain Amplitude Effect Tests

DS 6/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 8 of 10)

Station:_____ Date:_____ Tested by:_____ 5/27/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X2**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

6.19.08
SJ

RCTS Testing Record (Page 9 of 10)

Station: RC7 Date: 6.21.08 Tested by: Sonad Jupic
Project #: 0411-08-1696 Project Name: GE1
Boring #: CR RL Specimen #: PAD #1-2
Confining Pressure: 50 Psi **Testing Stage: X4**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	9:41	PAD#1-2-P50-T-0	8	1	167.9	
AM	11:18	PAD#1-2-P50-T-7	8	1	172.6	
	~~END~~ 12:47/19/08					

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	12:48	PAD#1-2-P50-S-0	4	1	172	
	12:48	PAD#1-2-P50-S-1	8	1	171.7	
	12:48	PAD#1-2-P50-S-2	16	1	171.1	
	12:48	PAD#1-2-P50-S-3	32	1	170.1	
	12:48	PAD#1-2-P50-S-4	64	1	168.3	
	12:50	PAD#1-2-P50-SA-0	128	10	166.3	
	12:50	PAD#1-2-P50-SA-1	256	10	162.5	
	12:51	PAD#1-2-P50-SB-0	512	10	156.6	
	12:52	PAD#1-2-P50-SC-0	1024	10	146.5	
	12:52	PAD#1-2-P50-SD-0	2048	10	137.1	
PM	12:53	PAD#1-2-P50-SE-0	4000	10	123.7	
		END				

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
12:54	PAD#1-2-P50-SCE	8	1	155.8	

6.19.08
SL

RCTS Testing Record (Page 10 of 10)

Station: RC7 Date: 5.21.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: SRR Specimen #: PAD #1-2
Confining Pressure: 50 Psi **Testing Stage: X4**

TS Tests (prior to tests, fr= 172.6 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-2-P50-TS01	0.15	2.98	1.6-6	
0.5	PAD#1-2-P50-TS02	0.30	5.96	31-6	
0.5	PAD#1-2-P50-TS03	0.6	11.93	0.6-5	
0.5	PAD#1-2-P50-TS04	1.0	19.88	1.04-5	
0.1	PAD#1-2-P50-TS05	1.0	19.88	1.05-5	
0.5	PAD#1-2-P50-TS06			1.04-5	
1	PAD#1-2-P50-TS07			1.03-5	
5	PAD#1-2-P50-TS08			1.01-5	
10	PAD#1-2-P50-TS09	1.0	19.88	1-5	
0.5	PAD#1-2-P50-TS10	2.	39.77	2.1-5	
0.5	PAD#1-2-P50-TS11	4	79.61	4.37-5	
0.5	PAD#1-2-P50-TS12	4.7	93.59	0.52-4	
0.1	PAD#1-2-P50-TS13	4.7	93.59	0.53-4	
0.5	PAD#1-2-P50-TS14			0.5-4	
1	PAD#1-2-P50-TS15			0.5-4	
5	PAD#1-2-P50-TS16			0.49-4	
10	PAD#1-2-P50-TS17	4.7	93.59	0.48-4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	11:50	PAD#1-2-P50-TSCK	8	1	169.5	
AM	12:46	NA	8	1	171.8	
	END					

Geotechnical
Environmental and
Water Resources
Engineering

GEI Consultants

Transfer of Fugro RCTS Report
Transmittal Letter No. 1

June 23, 2008
Project 07223

Mr. Frank X. Bellini
Field Project Manager
AREVA NP, INC.
Solomon Pond Park
400 Donald Lynch Boulevard
Marlborough, MA 01752

Dear Mr. Bellini:

Re: Transmittal No. 1 – Resonant Column Cyclic Torsional Shear Tests (RCTS) Report
Nine Mile Point Site Characterization
Oswego, New York

The purpose of this letter is to document GEI Consultants, Inc.'s transmittal of a compact disc containing the Fugro RCTS Tests Report dated June 20, 2008. This Transmittal is being prepared according to the AREVA NP, INC. Purchase Order and Scope of Work provided in our proposal dated July 6, 2007, which is the basis of our current contract with AREVA.

Documents

This Letter of Transmittal No. 1 transfers Fugro RCTS Tests Reports dated June 20, 2008 for the Nine Mile Point Site Characterization Project; it includes one document containing two RCTS tests (RCTS#A and RCTS#B) and two reports.

.

1. **Resonant Column Cyclic Torsional Shear Tests (RCTS) Report.**

All test samples were managed and tested in accordance with the following AREVA-approved procedures:

- 38-9058206-004: GEI Procedure 124 R4 - Transportation and Tracking of Soil and Rock Samples.
- 38-9080235-000: GEI Procedure 109 - Resonant Column Cyclic Torsional Shear CCyTS).
- 38-9065537-001: GEI Procedure 101 R1- Water Content Measurement.

Prior to testing, all Fugro personnel involved in the work were trained to the procedures.

Please call me, Tom Kahl or Robert Lambe if you have questions regarding this Transmittal Letter.

Sincerely,

GEI CONSULTANTS, INC.

Herbert Scribner
Electronic signature inserted by D. Bishop per
email approval from Herbert Scribner 6/23/08
HS/db
Attachments M:\PROJECT\2007\07223\Reports-Data - Subconsultants\Fugro Consultants\Transmittal #1 Fugro RCTS test.doc

FUGRO CONSULTANTS, INC.

6100 Hillcroft (77081)
P.O. Box 740010
Houston, Texas 77274
Tel: 713-369-5400
Fax: 713-369-5518

June 20, 2008

Mr. Thomas W. Kahl
Senior Vice President
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

Dear Mr. Kahl:

RE: Letter of Transmittal
Resonant Column Cyclic Torsional Shear Tests
Backfill Samples
Nine Mile Point Unit 3
Oswego, New York

Test Results Summary

Fugro performed two RCTS tests on remolded specimens of sand and gravel backfill samples provided by GEI Consultants, Inc. The **final** reports of the tests along with Dr. Kenneth Stokoe's approval sheet are presented in Attachment A.

Test Procedures

All test samples were managed and tested in accordance with the following AREVA-approved procedures:

- 38-9058206-004: GEI Procedure 124 R4- Transportation and Tracking of Soil and Rock Samples
- 38-9080235-000: GEI Procedure 109- Resonant Column Cyclic Torsional Shear (RCCyTS)
- 38-9065537-001: GEI Procedure 101 R1- Water Content Measurement

Prior to testing, all Fugro personnel involved in the work were trained to the procedures.

Test Documents

Copies of completed test forms related to the testing required by the above-referenced procedures are contained in Attachment B.

Please call me at if you have any questions.

Sincerely,

Jiewu Meng, PhD, P.E.
Project Engineer

Bill DeGroff, P.E.
Laboratory Department Manager

Enclosure(s)

RCTS TEST APROVAL

PROJECT SITE/NAME	Nine-Mile Point

Test ID	Sample ID	Depth B.S. (Ft)	Approved By (Initials)	Date
RCTS#A	Pad 1-1	---	KHS (+)	18 June '08
RCTS#B	Pad 1-2		KHS (+)	18 June '08

Two RCTS tests for the site referenced above were tested, and two reports were prepared, by Fugro Consultants, Inc.

I have reviewed the data and associated results listed above and found them to be reasonable.

Approved By:

K. H. Stokoe

Dr. Kenneth Stokoe

(+) Consider minor comments on a few figures. ~~However, Fig. A.16 is missing~~. I found Fig. A.16 in Appendix B. — no prob.!

ATTACHMENT A

Fugro # 0411-08-1696

APPENDIX A

Remolded Specimen Pad 1-1
Sample Location: Streeter Rathburn Road

Borehole ---NA
Sample ---NA
Depth = --- ft (--- m)
Total Unit Weight = 125.2 lb/ft^3
Water Content = 7.8 %
Estimated In-Situ Mean Effective
Stress = 13 psi

FUGRO JOB #: 0411-08-1696
Testing Station: RC7

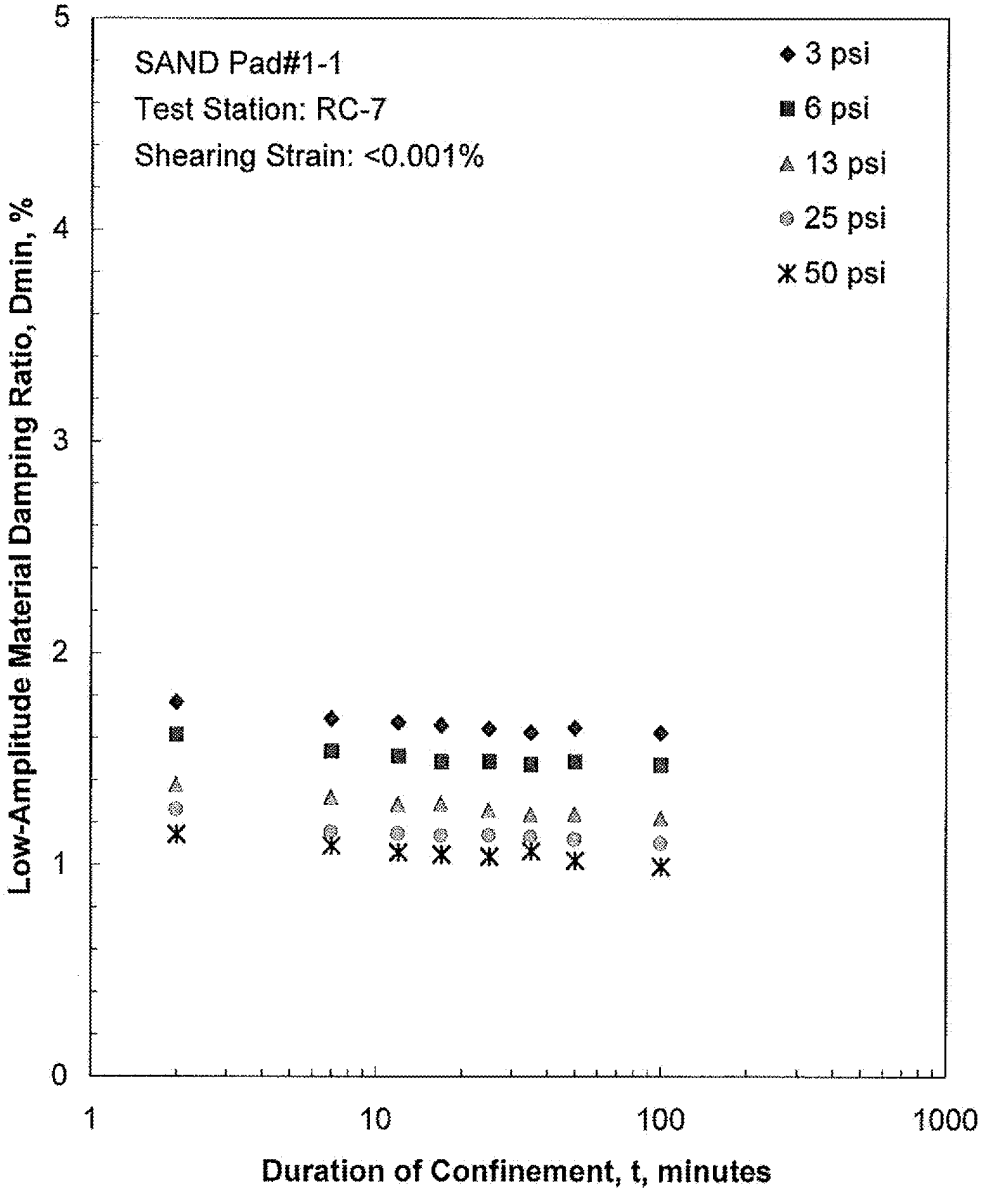


Figure A.2 Variation in Low-Amplitude Material Damping Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

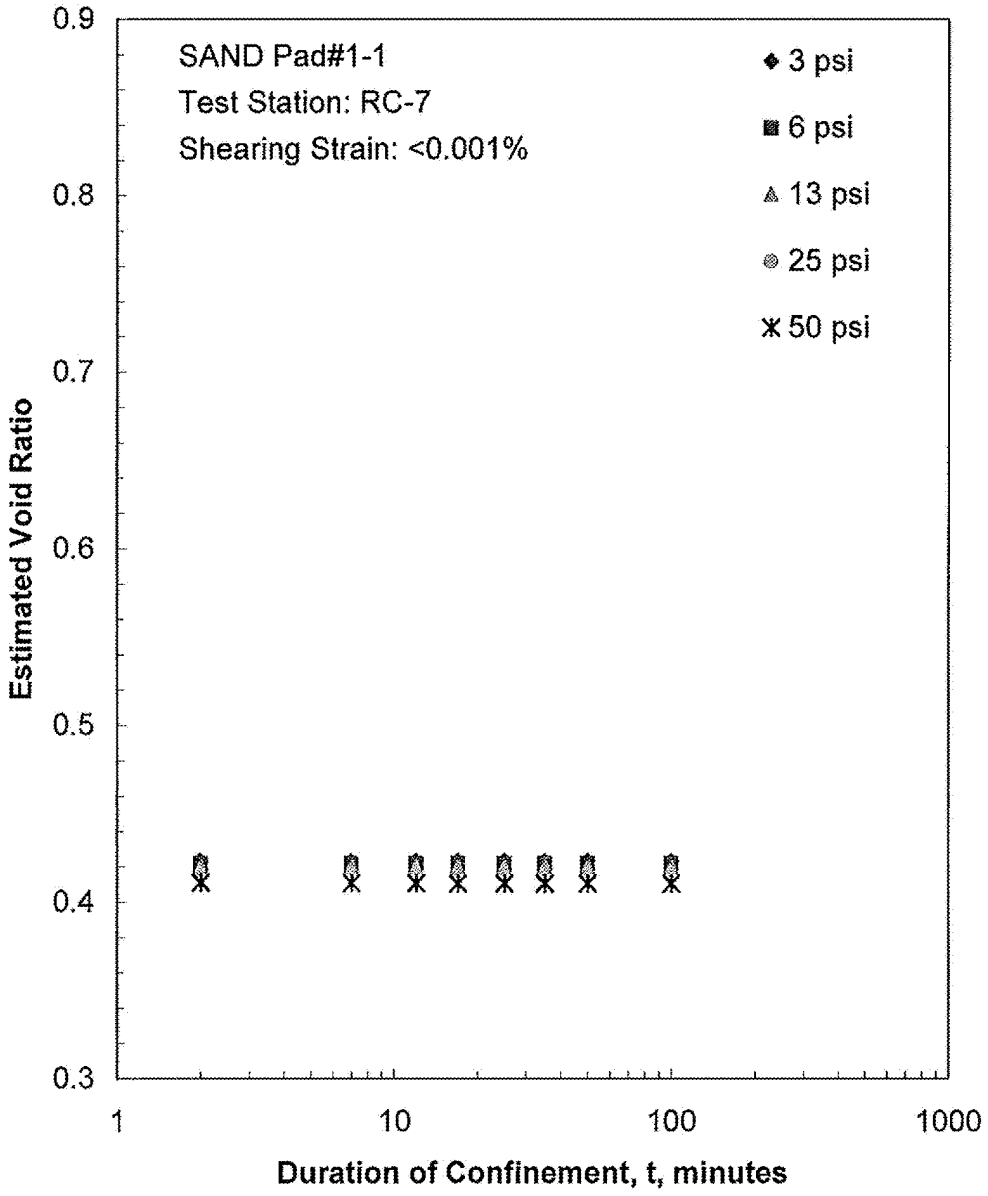


Figure A.3 Variation in Estimated Void Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

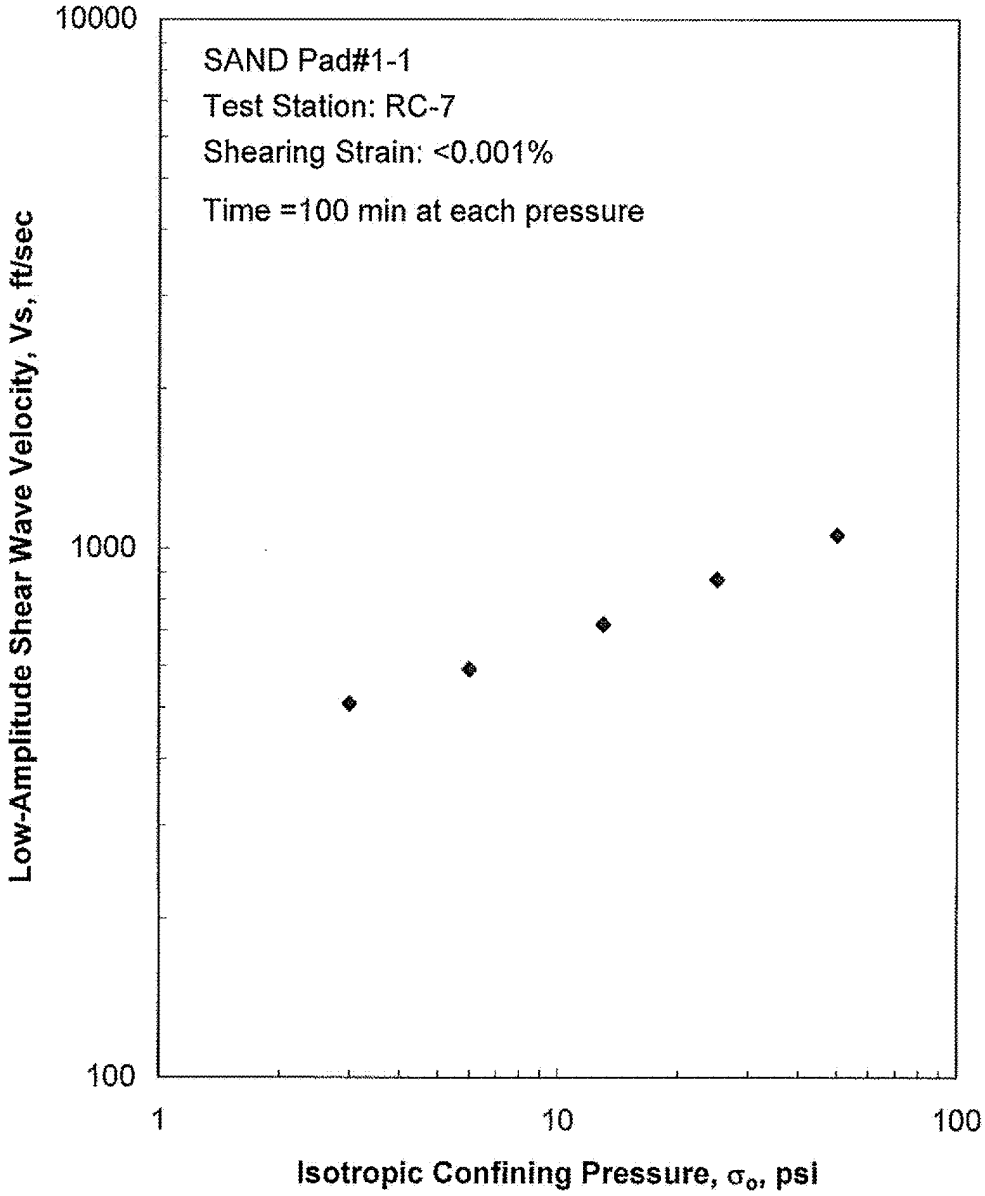


Figure A.4 Variation in Low-Amplitude Shear Wave Velocity with Isotropic Confining Pressure from Resonant Column Tests

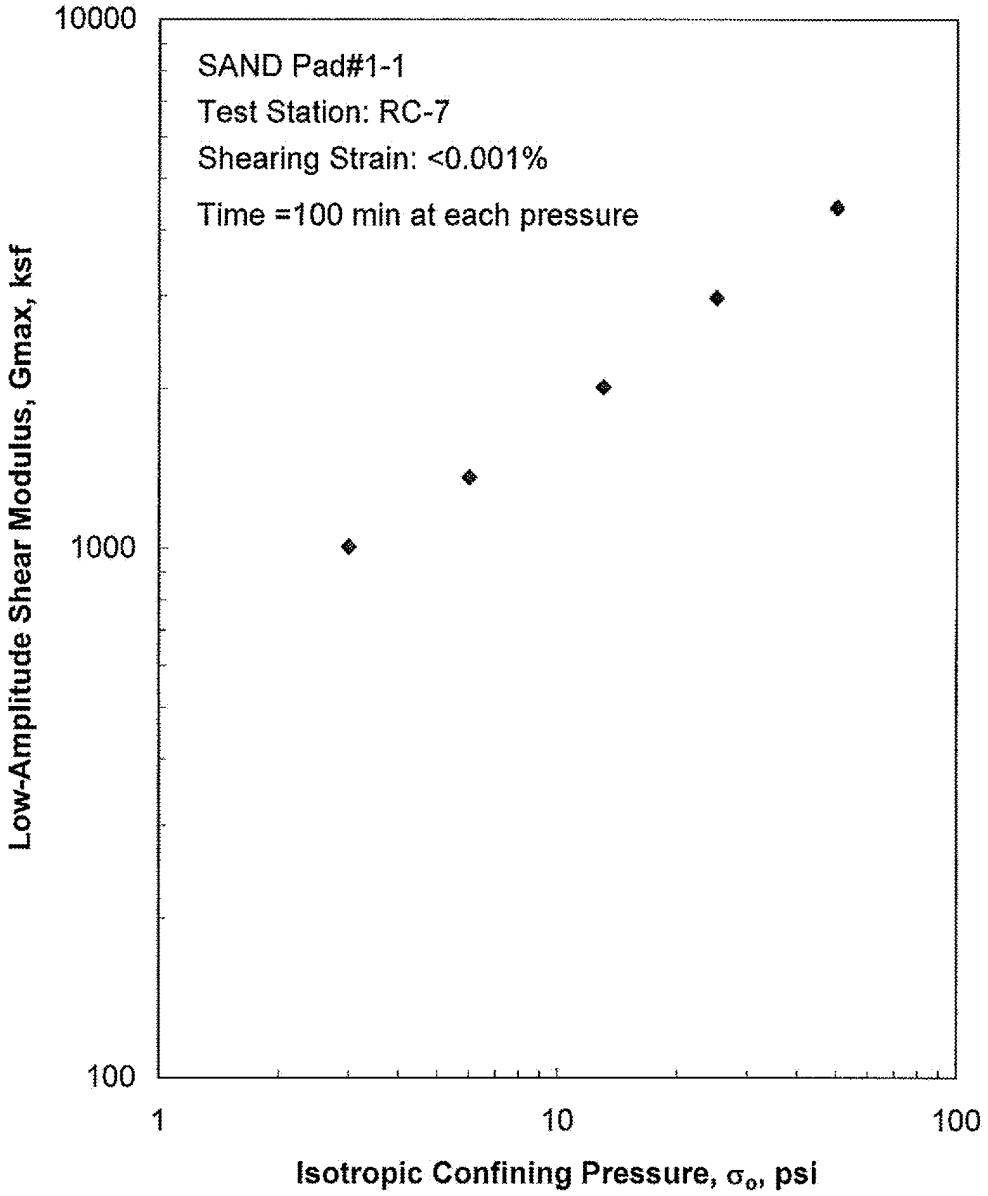


Figure A.5 Variation in Low-Amplitude Shear Modulus with Isotropic Confining Pressure from Resonant Column Tests

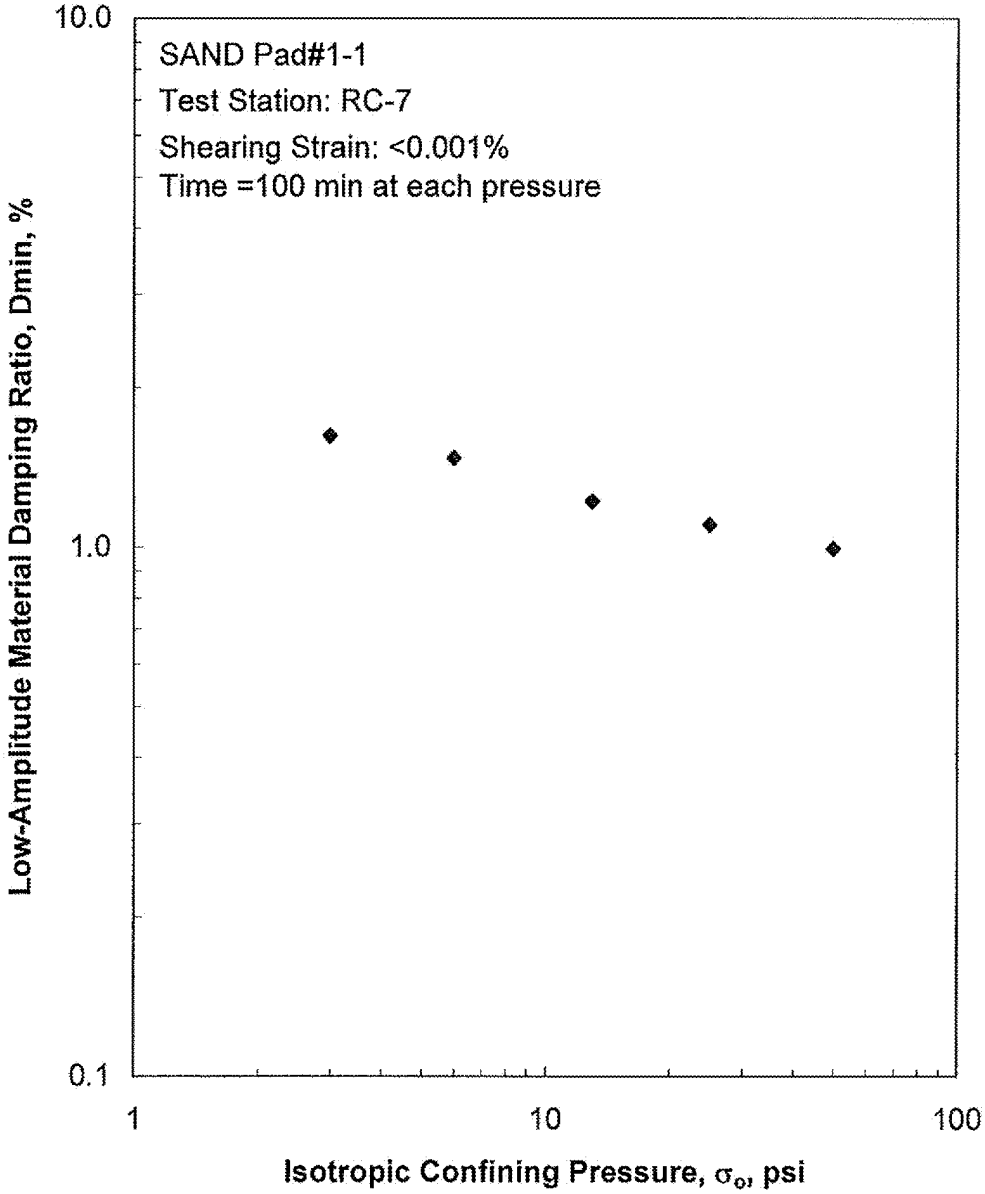


Figure A.6 Variation in Low-Amplitude Material Damping Ratio with Isotropic Confining Pressure from Resonant Column Tests

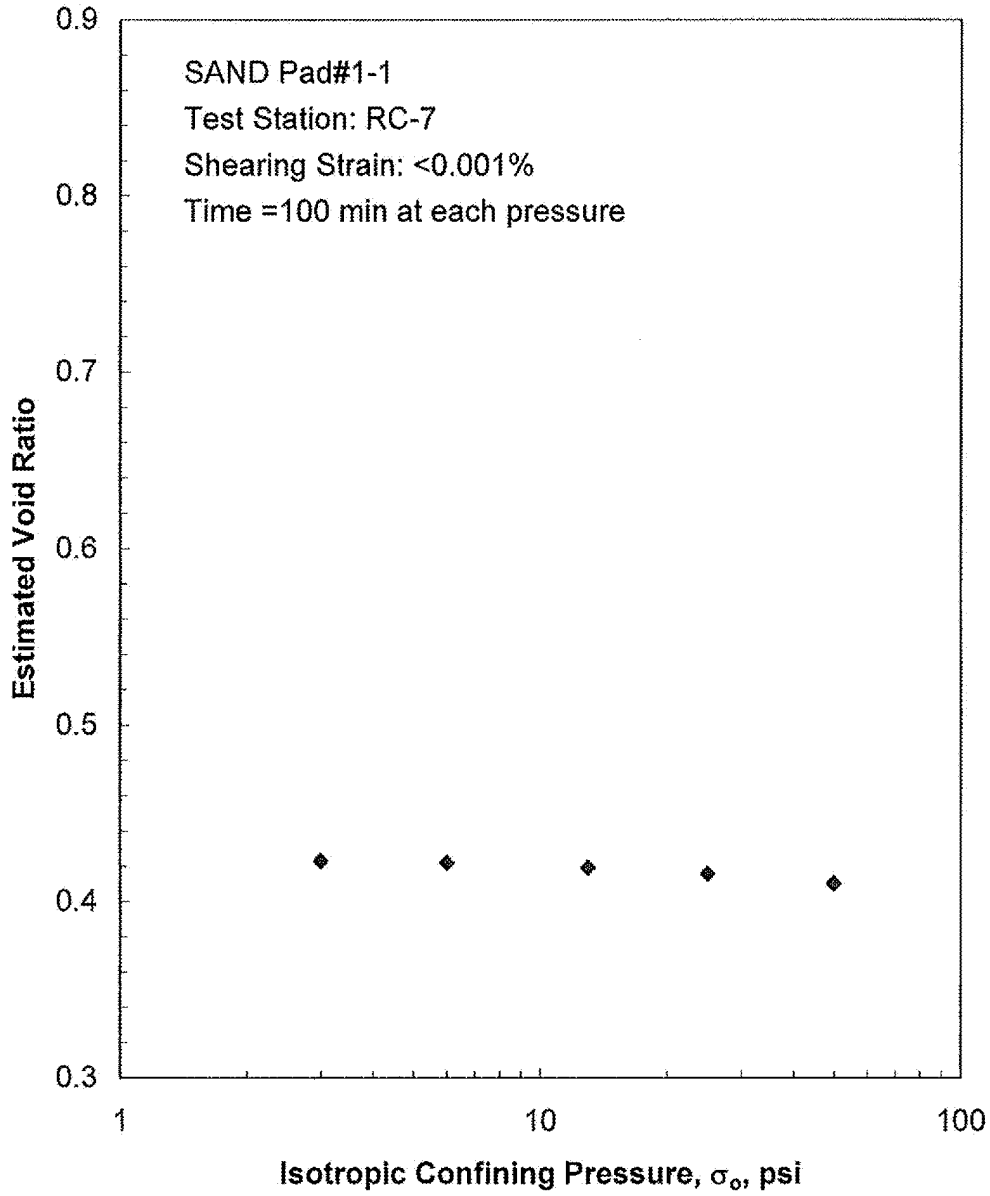


Figure A.7 Variation in Estimated Void Ratio with Isotropic Confining Pressure from Resonant Column Tests

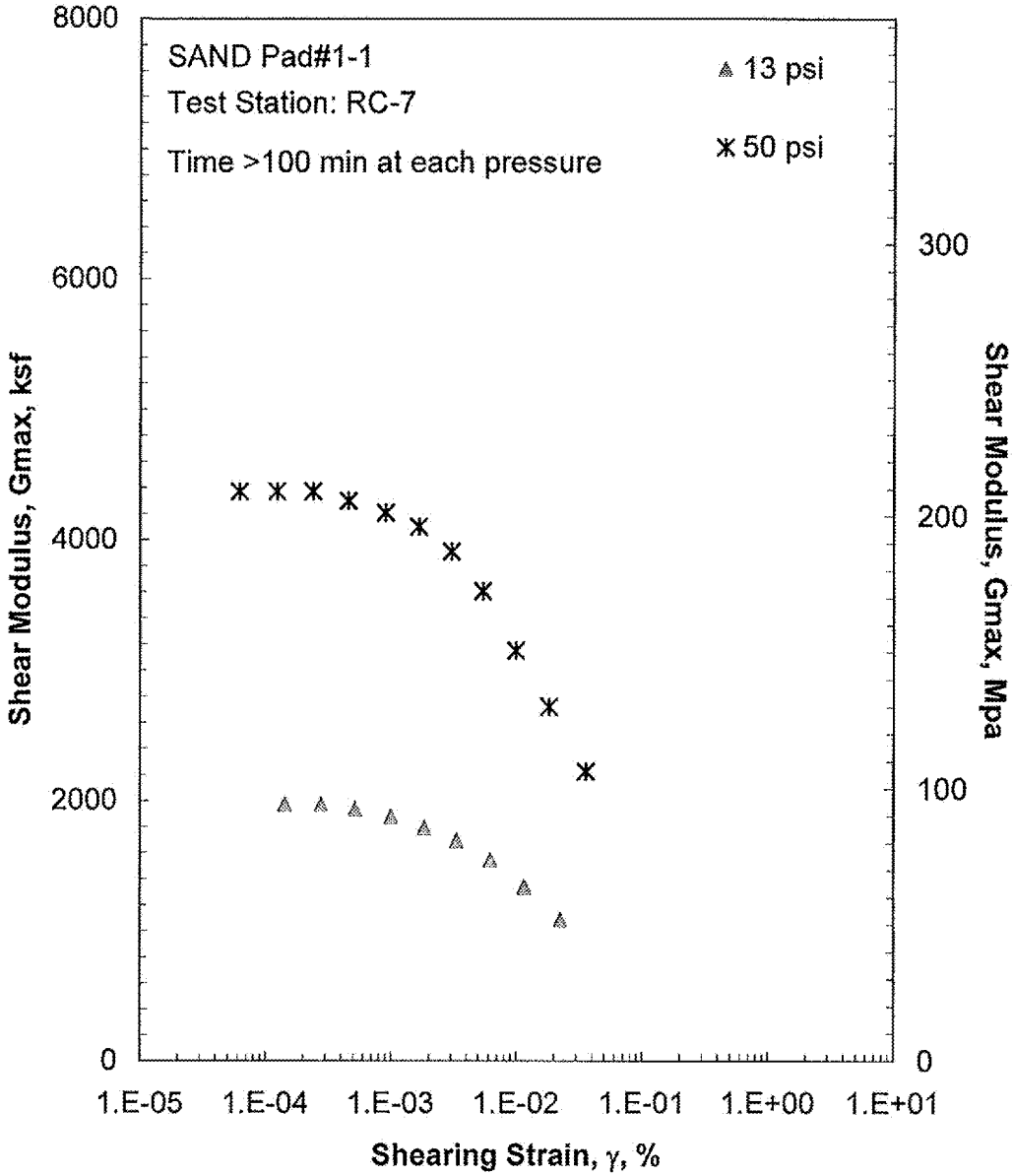


Figure A.8 Comparison of the Variation in Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

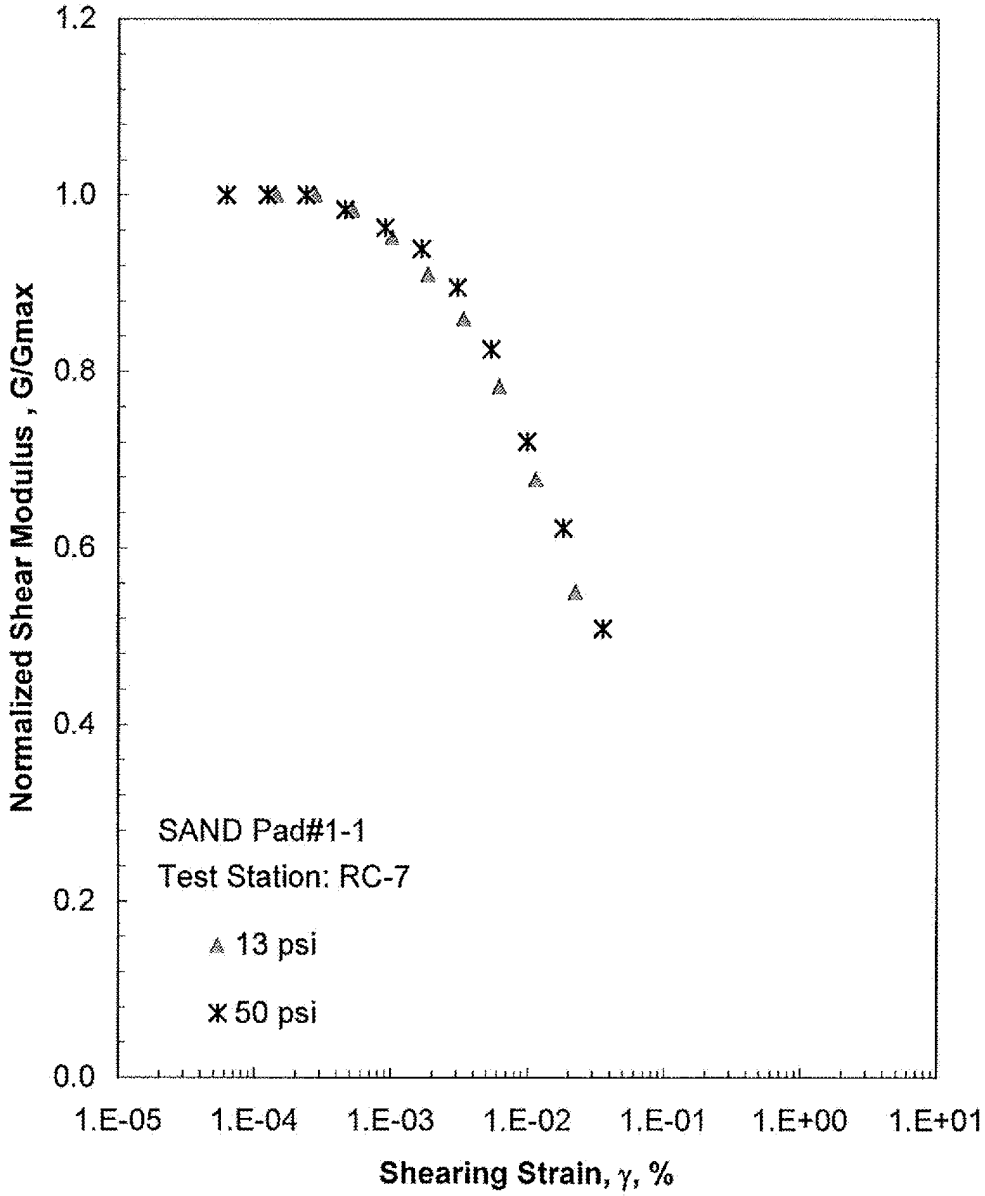


Figure A.9 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

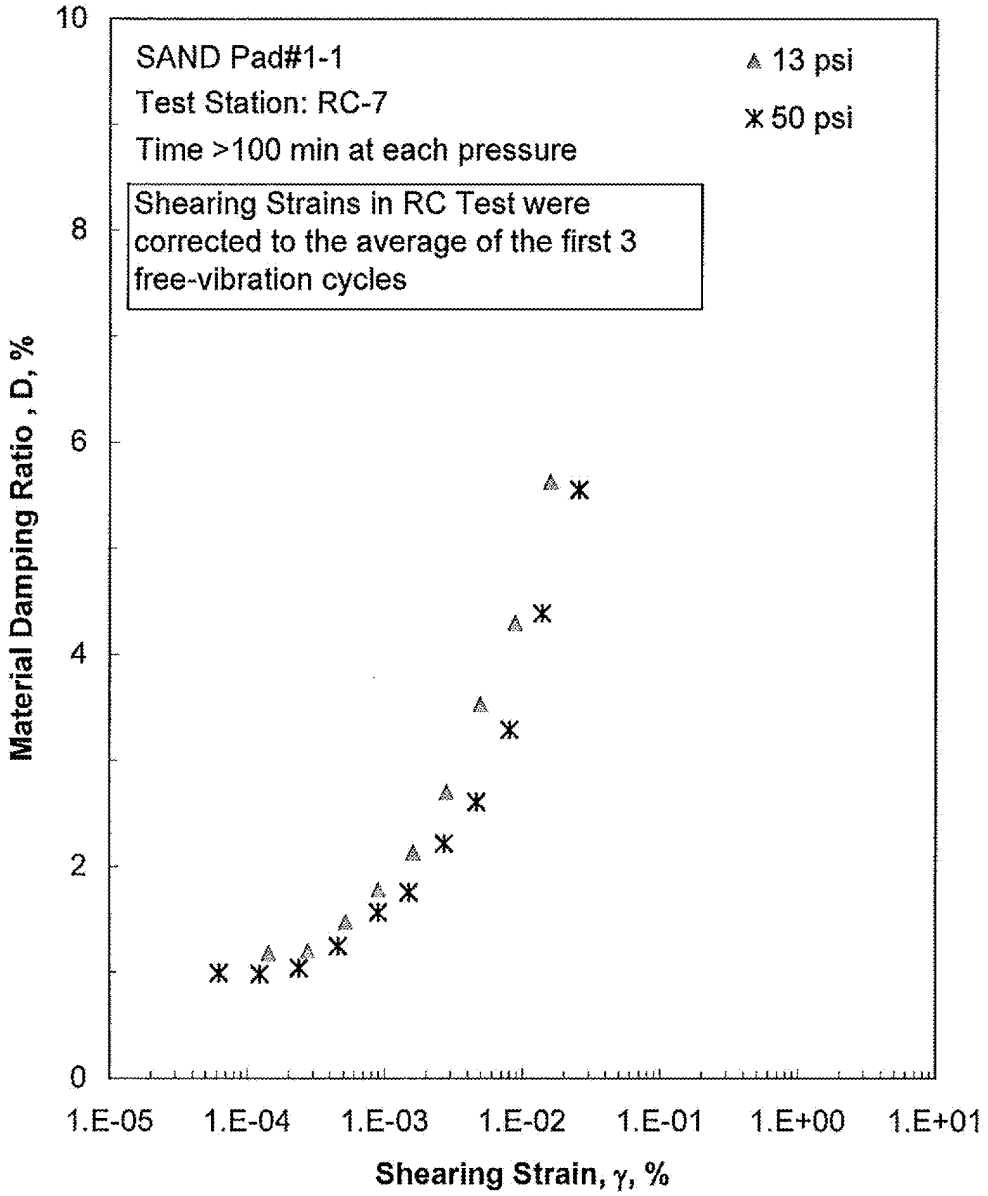


Figure A.10 Comparison of the Variation in Material Damping Ratio with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

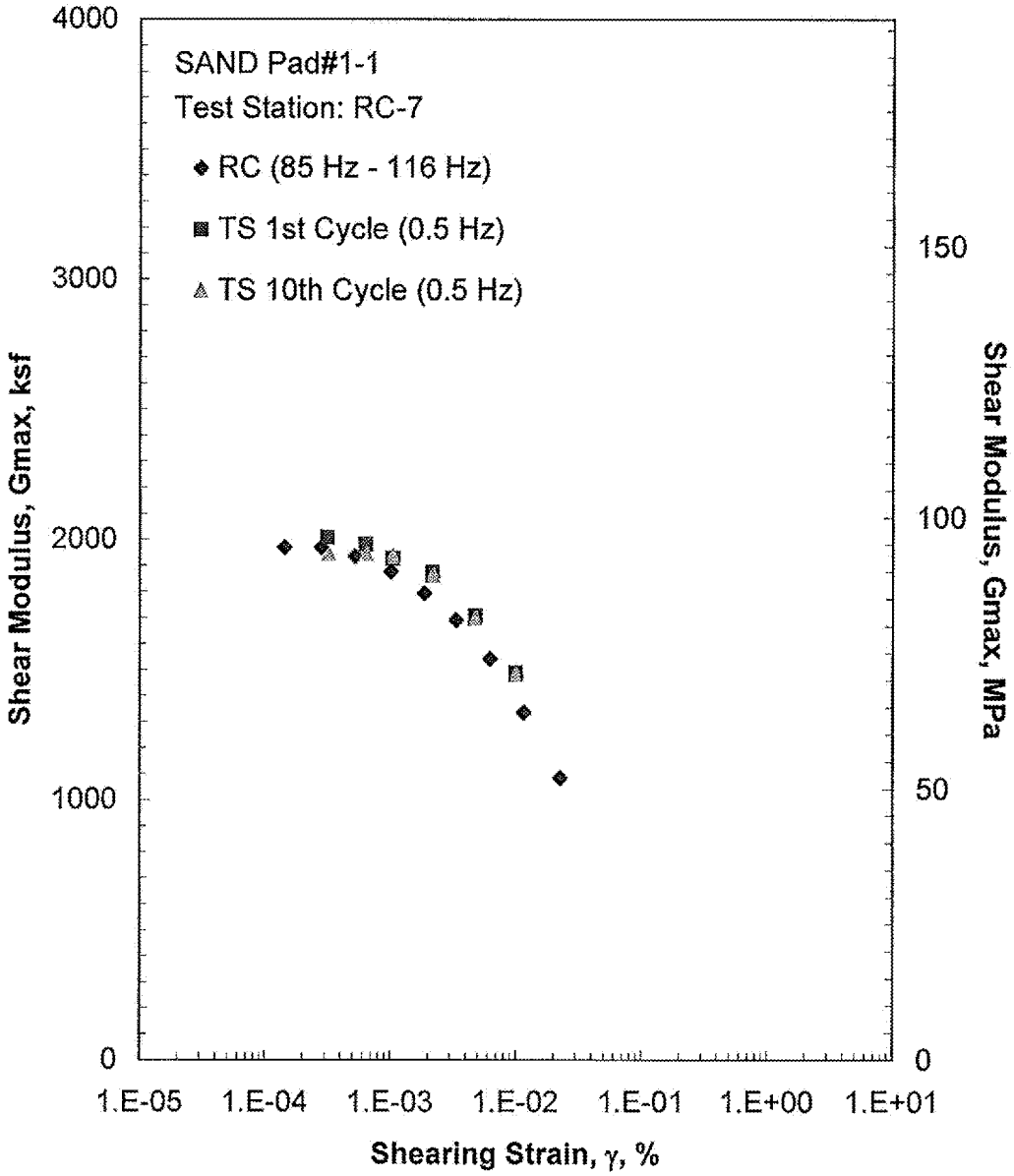


Figure A.11 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

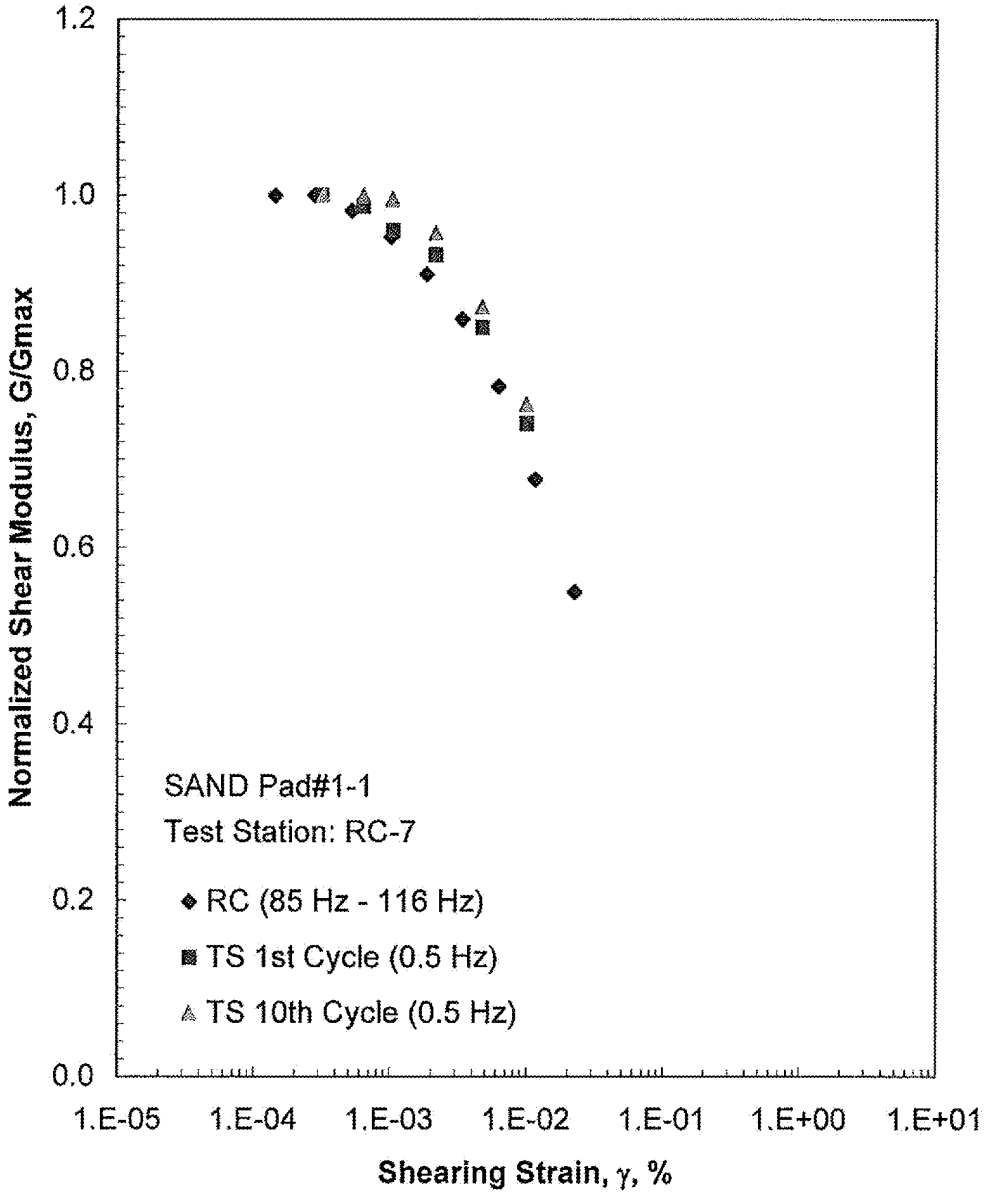


Figure A.12 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

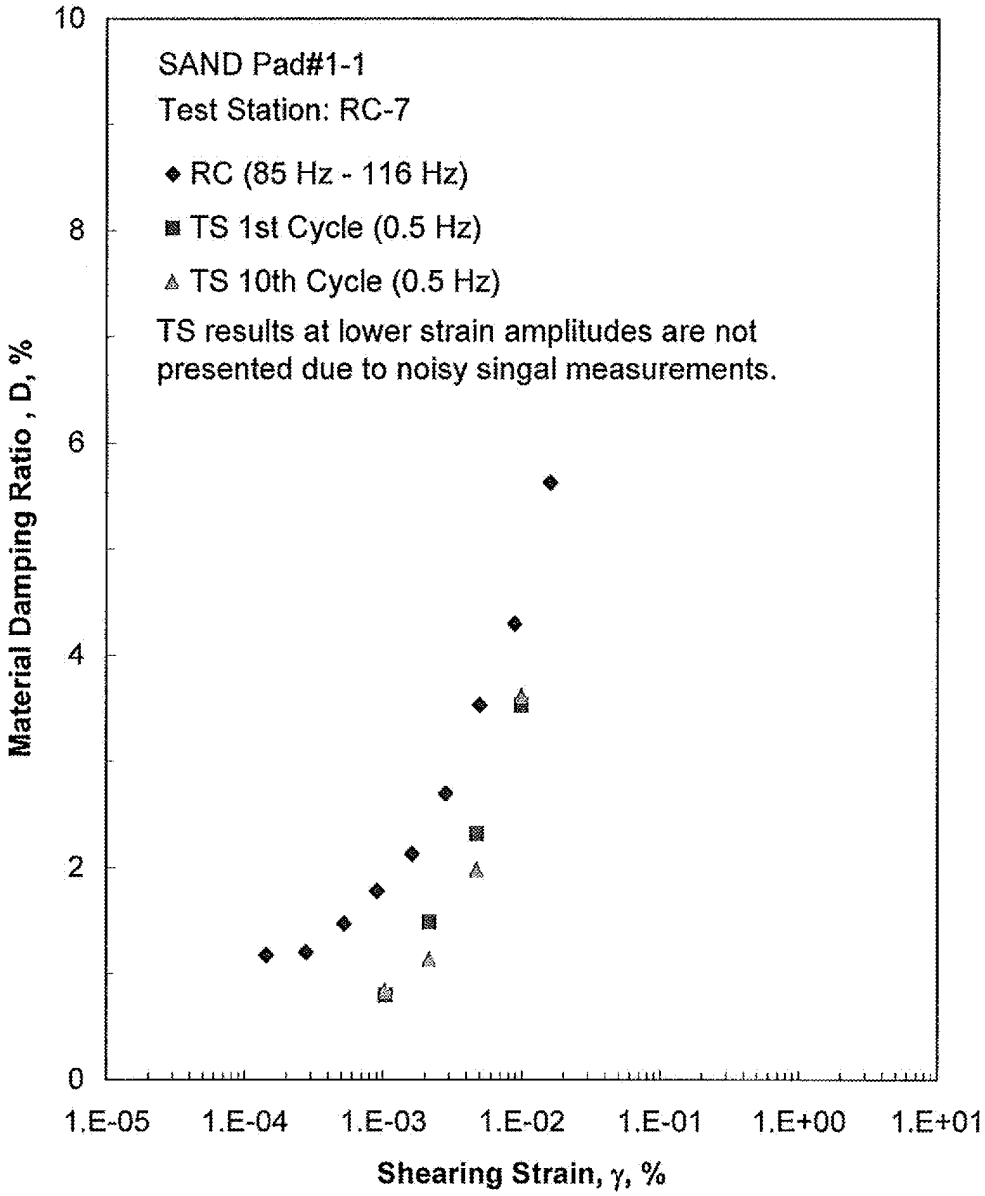


Figure A.13 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

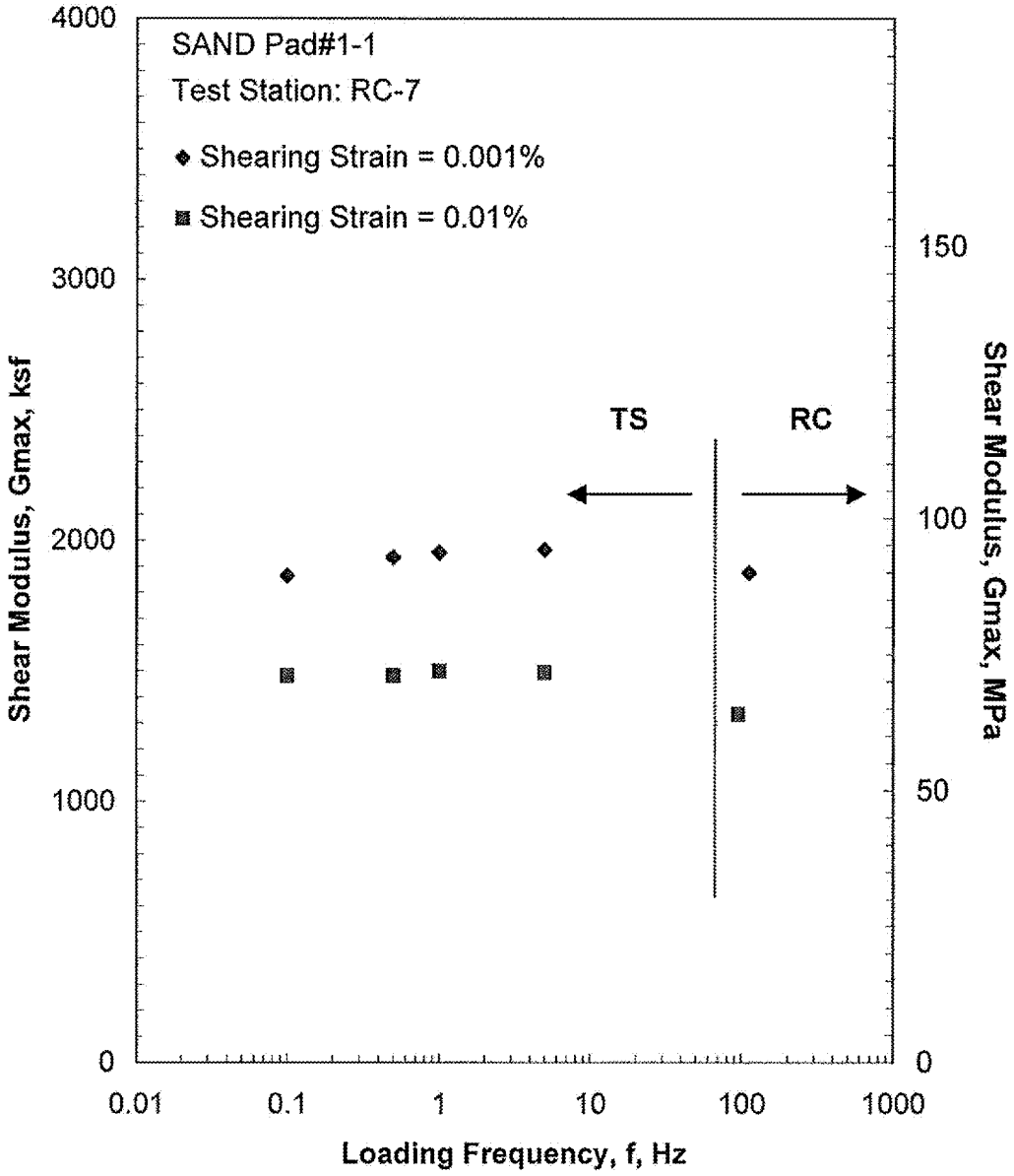


Figure A.14 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

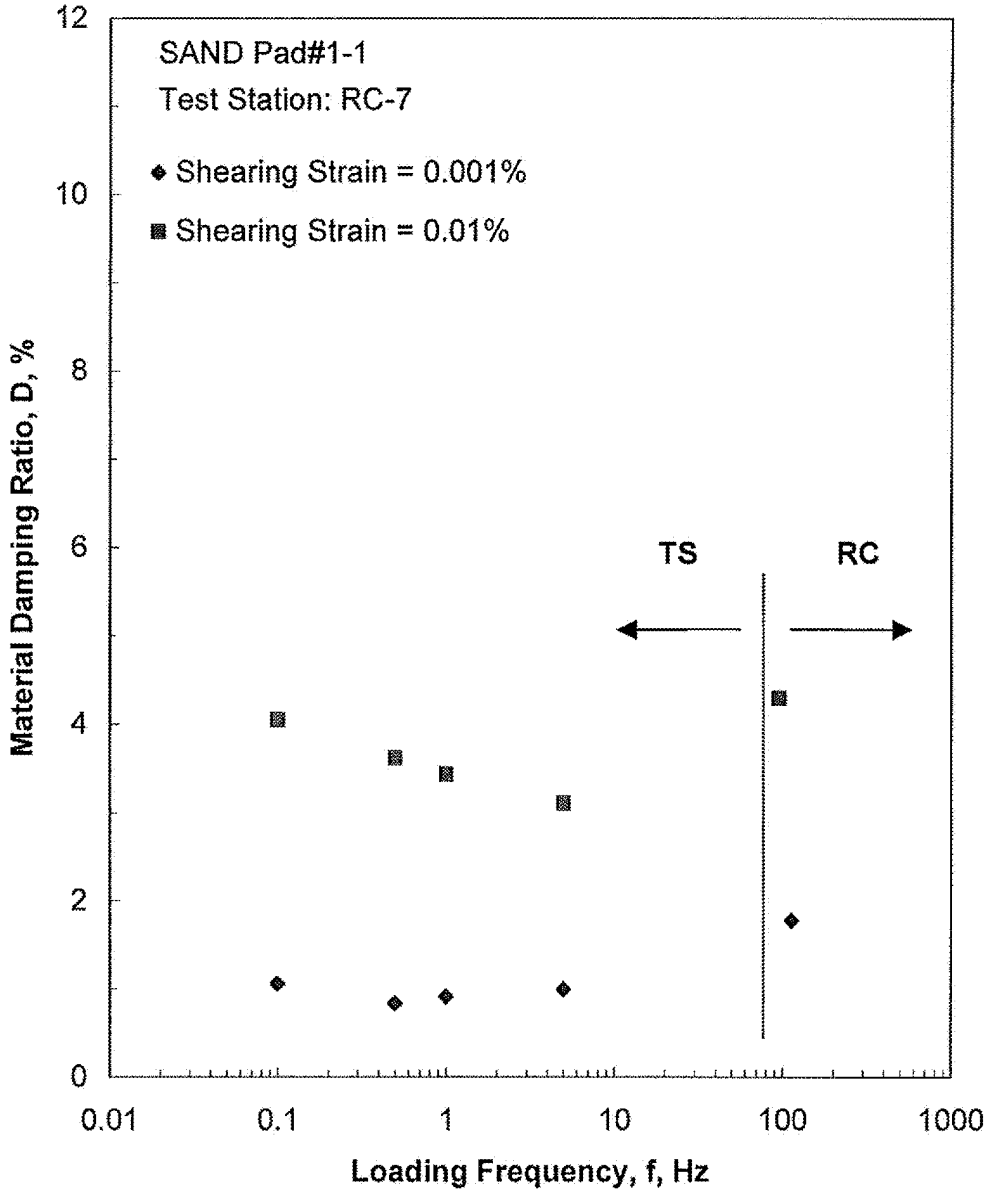


Figure A.15 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

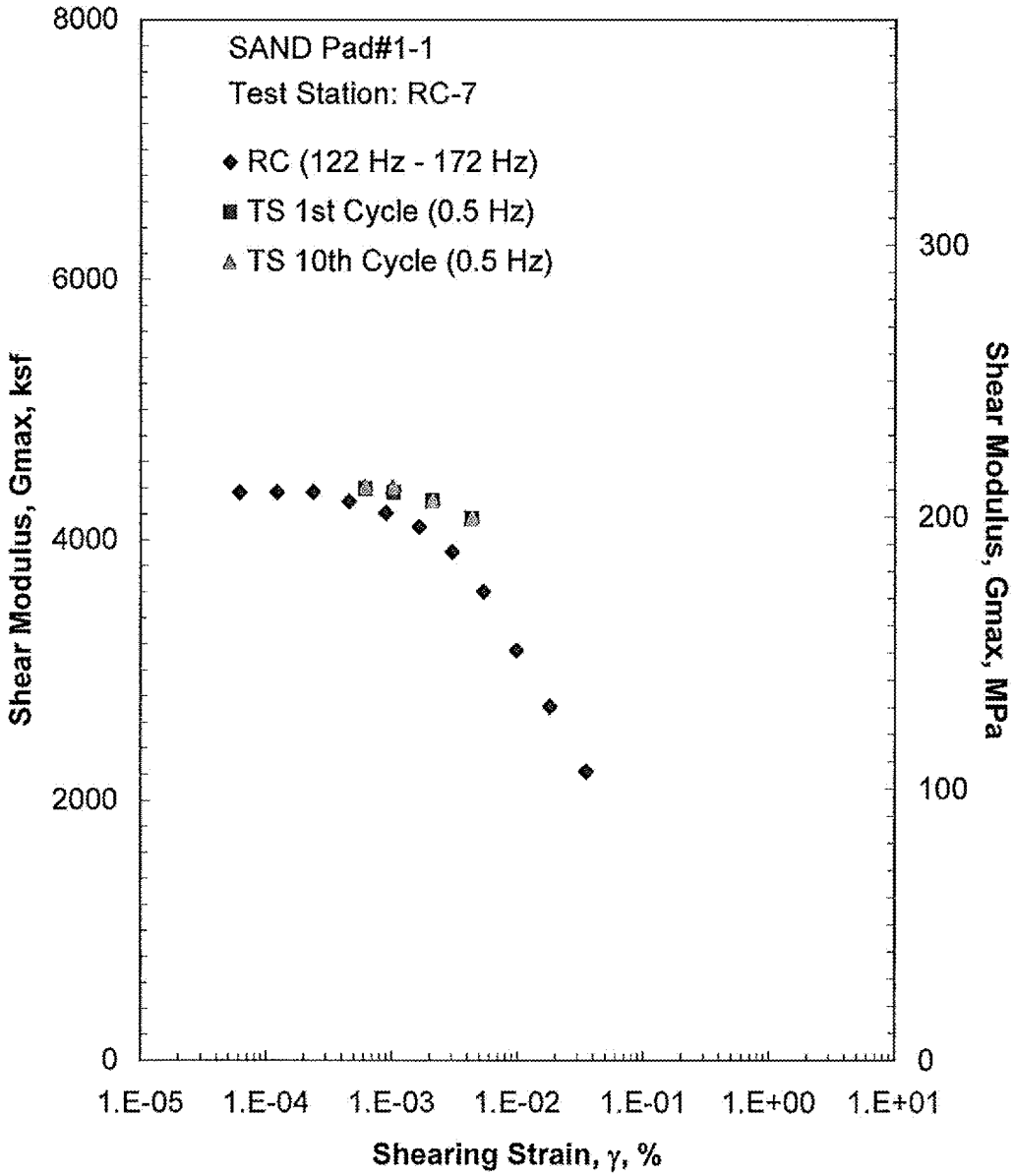


Figure A.16 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

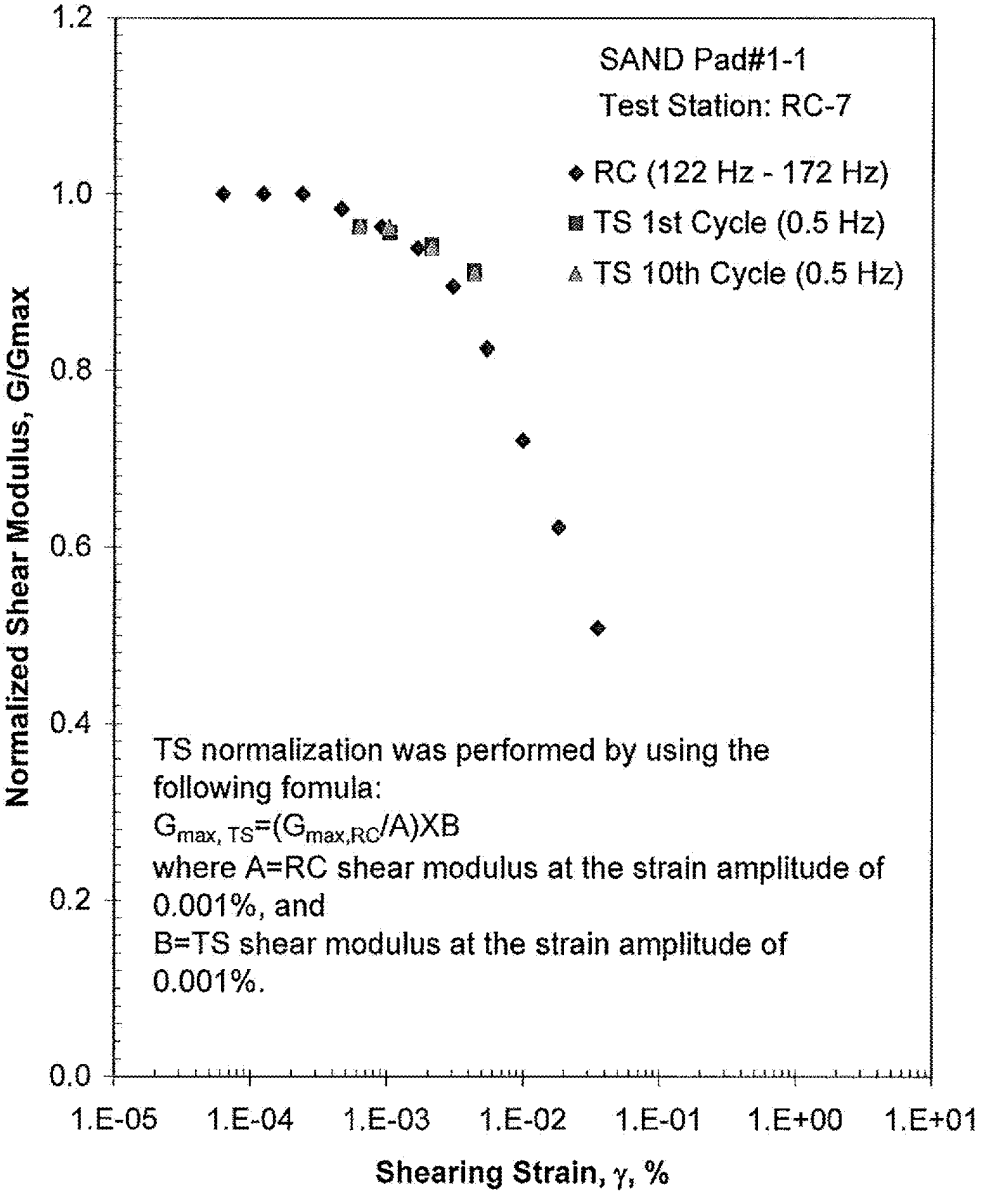


Figure A.17 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

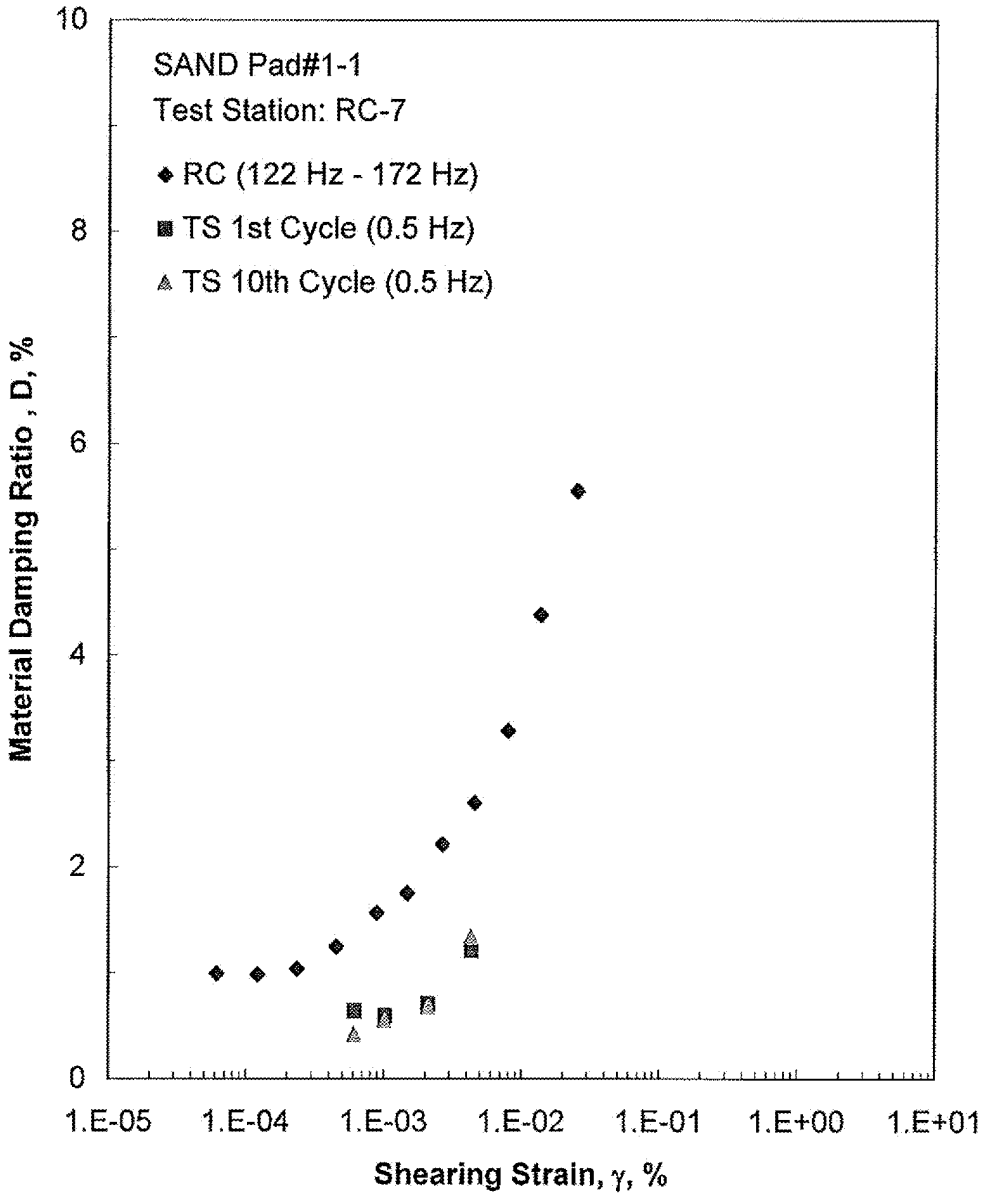


Figure A.18 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

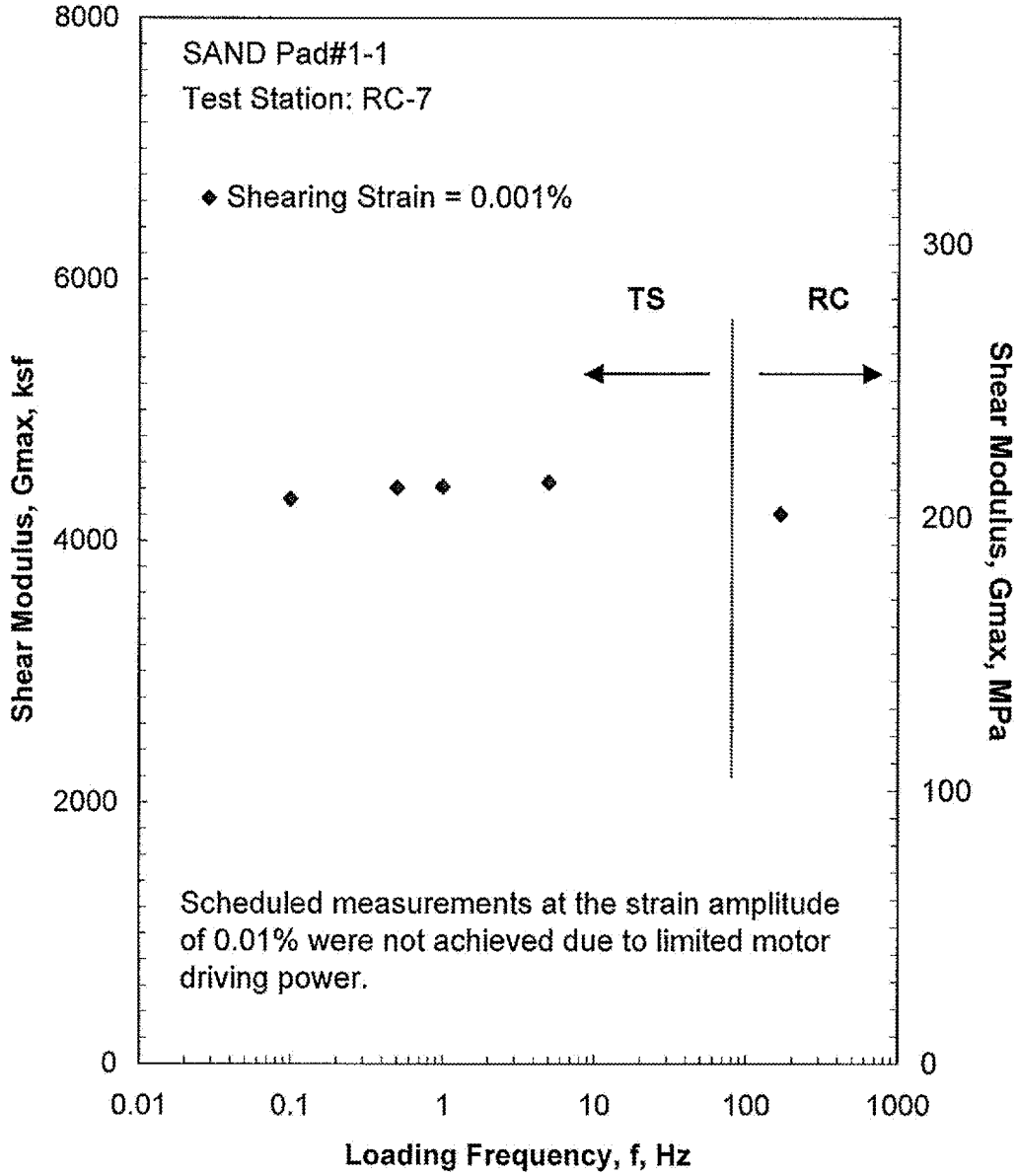


Figure A.19 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

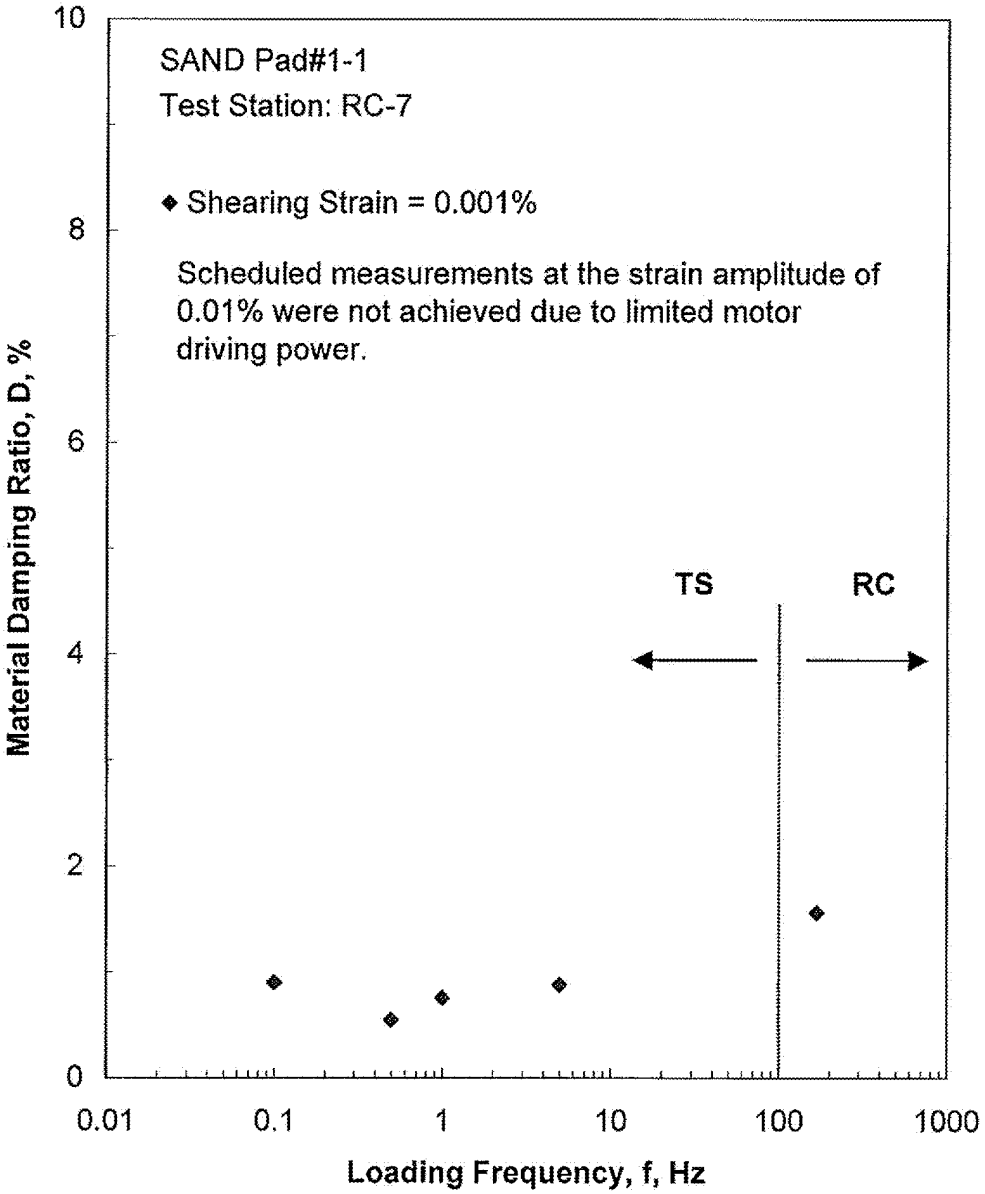


Figure A.20 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

Table A.1 Variation in Low-Amplitude Shear Wave Velocity, Low-Amplitude Shear Modulus, Low-Amplitude Material Damping Ratio and Estimated Void Ratio with Isotropic Confining Pressure from RC Tests of Specimen Pad 1-1

Isotropic Confining Pressure, σ_o			Low-Amplitude Shear Modulus, G_{max}		Low-Amplitude Shear Wave Velocity, Vs	Low-Amplitude Material Damping Ratio, Dmin	Estimated Void Ratio, e
(psi)	(psf)	(kPa)	(ksf)	(MPa)	(fps)	(%)	
3	432	21	1007	48	508.6	1.62	0.42
6	864	41	1363	65	591.3	1.47	0.42
13	1872	90	2016	97	718.7	1.22	0.42
25	3600	172	2976	143	872.0	1.10	0.42
50	7200	345	4405	211	1058.9	0.99	0.41

Table A.2 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad 1-1; Isoptropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
1.44E-04	1969	1.00	1.44E-04	1.18
2.80E-04	1969	1.00	2.80E-04	1.21
5.24E-04	1935	0.98	5.24E-04	1.47
1.01E-03	1876	0.95	9.11E-04	1.78
1.87E-03	1793	0.91	1.62E-03	2.13
3.38E-03	1692	0.86	2.84E-03	2.70
6.24E-03	1542	0.78	5.00E-03	3.53
1.16E-02	1335	0.68	8.92E-03	4.30
2.26E-02	1083	0.55	1.61E-02	5.63

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table A.3 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad 1-1; Isotropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
3.13E-04	2007	1.00	0.76	3.24E-04	1945	1.00	0.20
6.35E-04	1982	0.99	1.05	6.46E-04	1945	1.00	0.59
1.05E-03	1927	0.96	0.80	1.04E-03	1936	1.00	0.84
2.16E-03	1873	0.93	1.49	2.17E-03	1861	0.96	1.14
4.74E-03	1707	0.85	2.32	4.77E-03	1698	0.87	1.98
9.98E-03	1488	0.74	3.53	1.00E-02	1483	0.76	3.62

Table A.4 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad 1-1; Isoptropic Confining Pressure, σ_o= 50 psi (7.2 ksf = 345 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
6.20E-05	4367	1.00	6.20E-05	0.99
1.23E-04	4367	1.00	1.23E-04	0.98
2.38E-04	4367	1.00	2.38E-04	1.04
4.57E-04	4294	0.98	4.57E-04	1.25
8.98E-04	4205	0.96	8.98E-04	1.57
1.66E-03	4100	0.94	1.49E-03	1.75
3.04E-03	3909	0.90	2.68E-03	2.22
5.40E-03	3602	0.83	4.59E-03	2.61
9.90E-03	3148	0.72	8.01E-03	3.29
1.82E-02	2719	0.62	1.38E-02	4.38
3.54E-02	2222	0.51	2.55E-02	5.55

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table A.5 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad 1-1; Isotropic Confining Pressure, σ_o= 50 psi (7.2 ksf = 345 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
6.18E-04	4392	0.96	0.64	6.16E-04	4408	0.96	0.42
1.04E-03	4364	0.96	0.60	1.03E-03	4406	0.96	0.55
2.10E-03	4299	0.94	0.71	2.11E-03	4297	0.94	0.68
4.35E-03	4167	0.91	1.21	4.35E-03	4161	0.91	1.34

APPENDIX B

Remolded Specimen Pad 1-2
Sample Location: Streeter Rathburn Road

Borehole ---NA
Sample ---NA
Depth = --- ft (--- m)
Total Unit Weight = 125.2 lb/ft^3
Water Content = 8.2%
Estimated In-Situ Mean Effective
Stress = 13 psi

FUGRO JOB #: 0411-08-1696
Testing Station: RC7

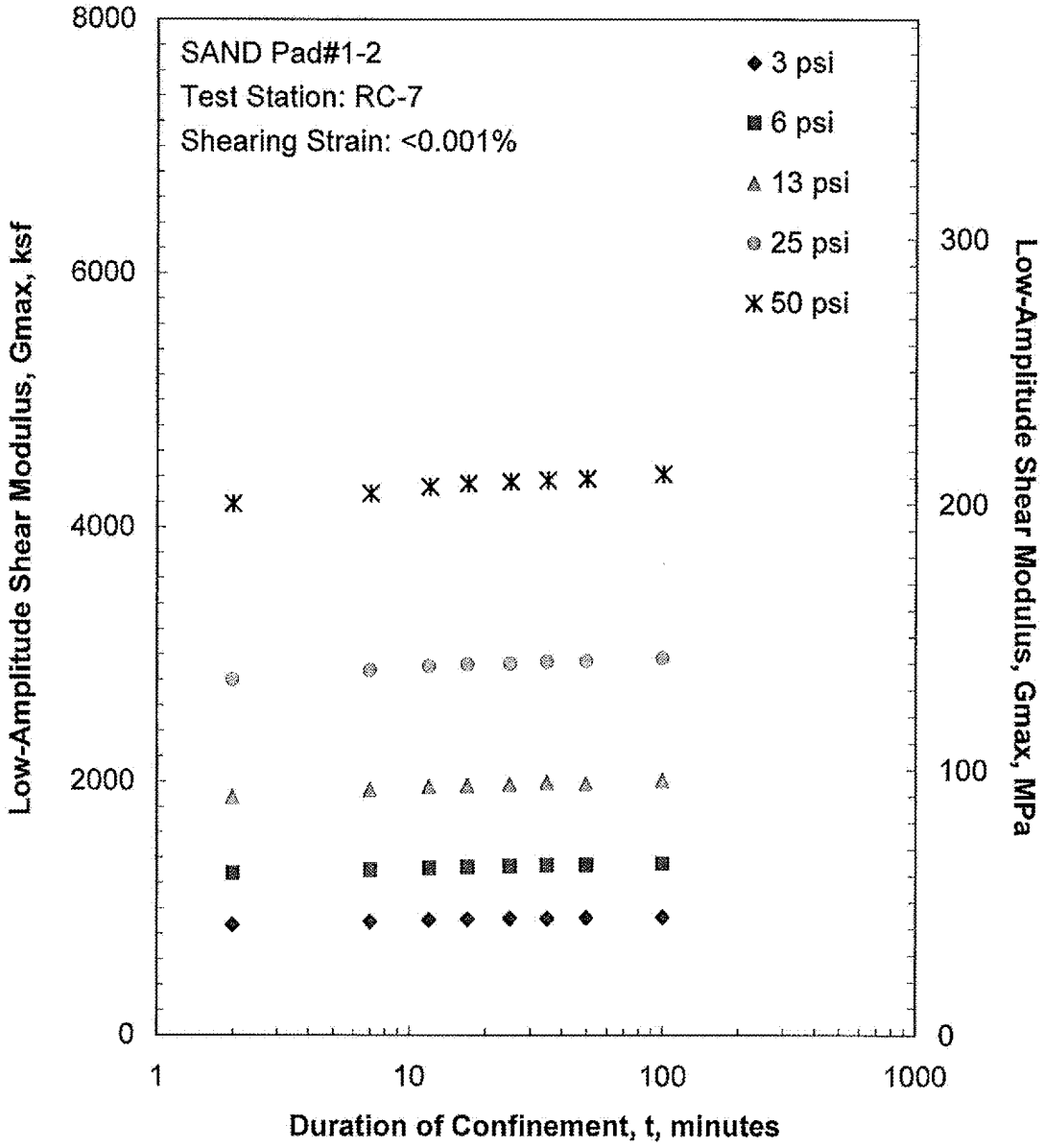


Figure B.1 Variation in Low-Amplitude Shear Modulus with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

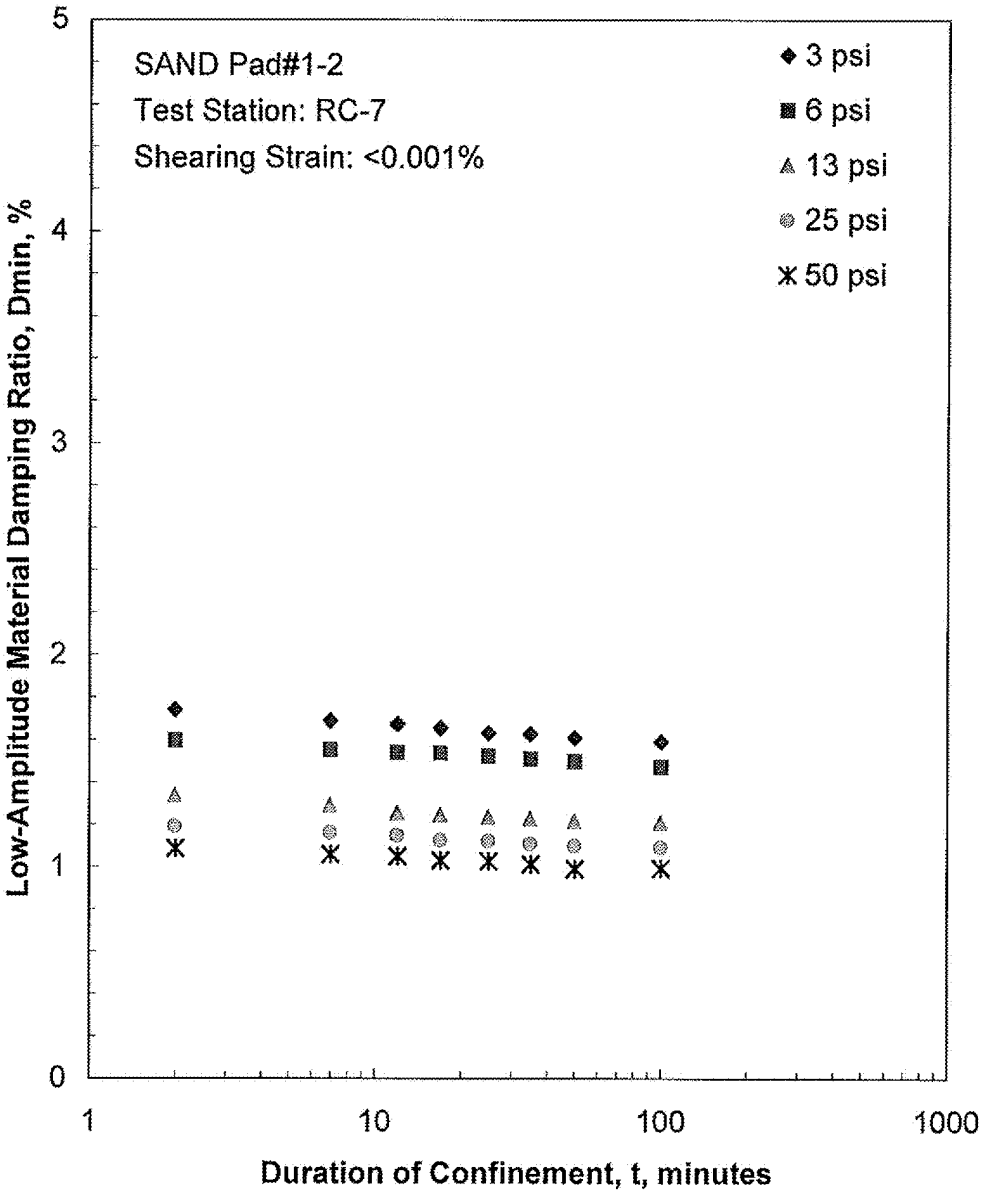


Figure B.2 Variation in Low-Amplitude Material Damping Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

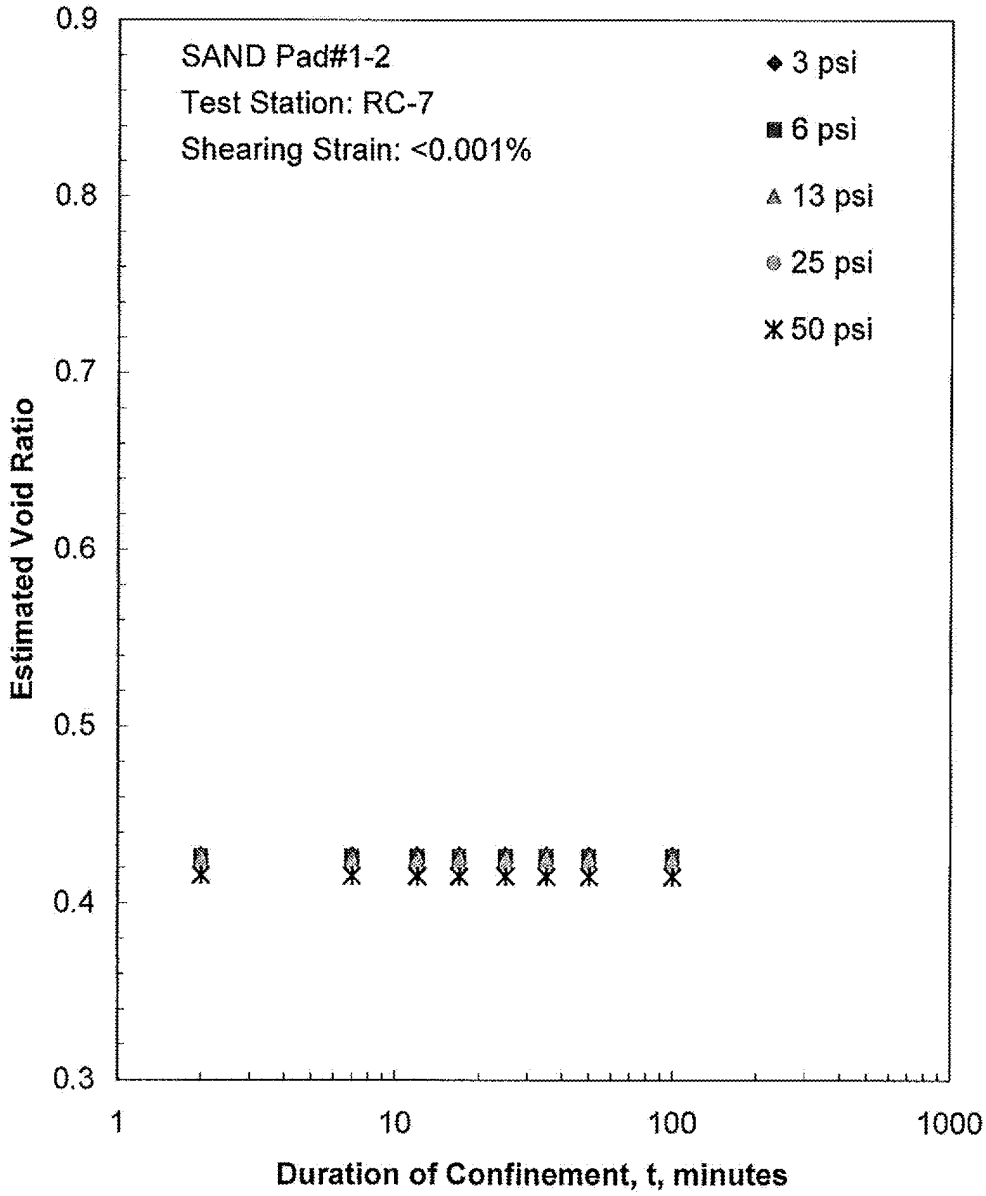


Figure B.3 Variation in Estimated Void Ratio with Magnitude and Duration of Isotropic Confining Pressure from Resonant Column Tests

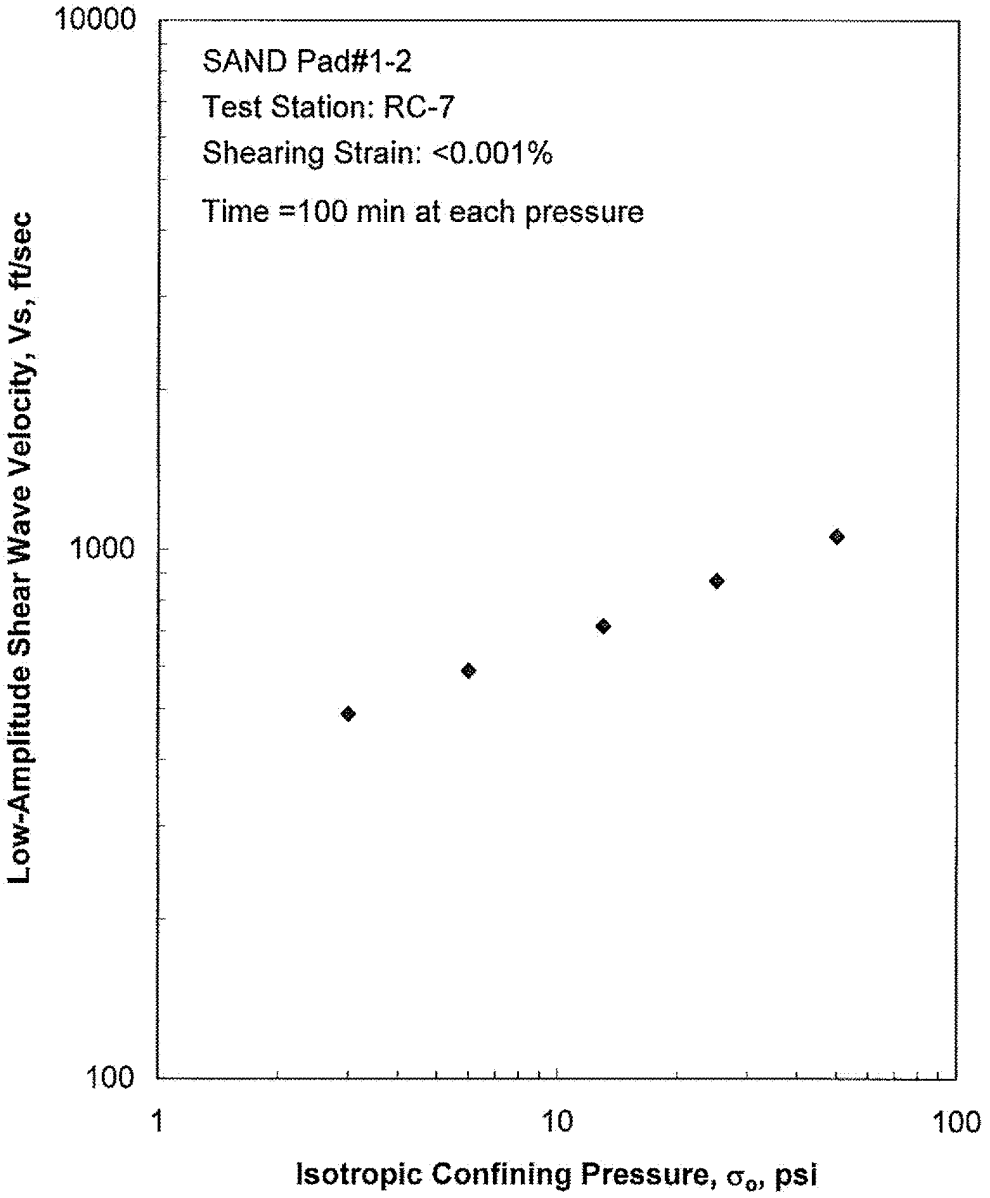


Figure B.4 Variation in Low-Amplitude Shear Wave Velocity with Isotropic Confining Pressure from Resonant Column Tests

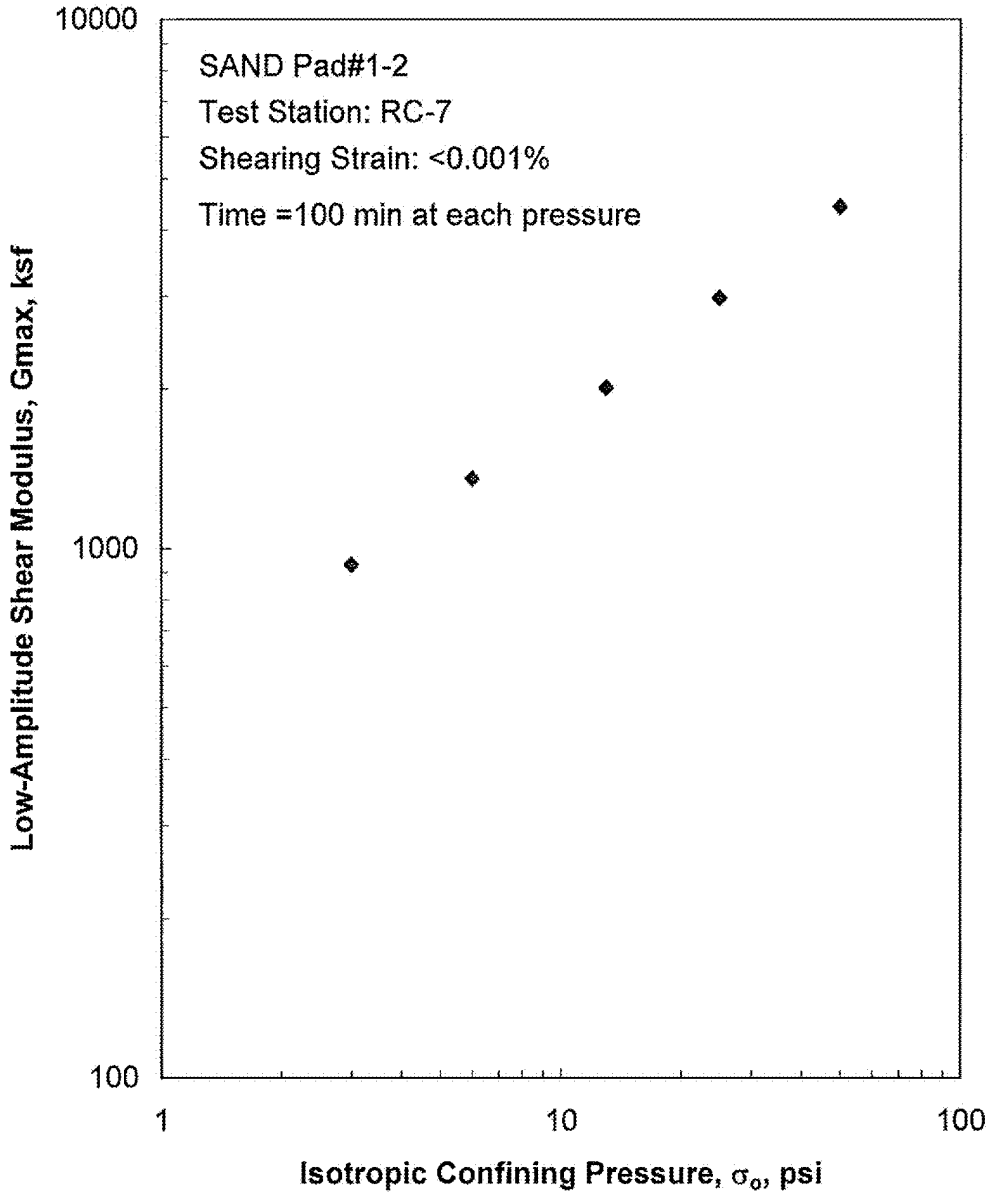


Figure B.5 Variation in Low-Amplitude Shear Modulus with Isotropic Confining Pressure from Resonant Column Tests

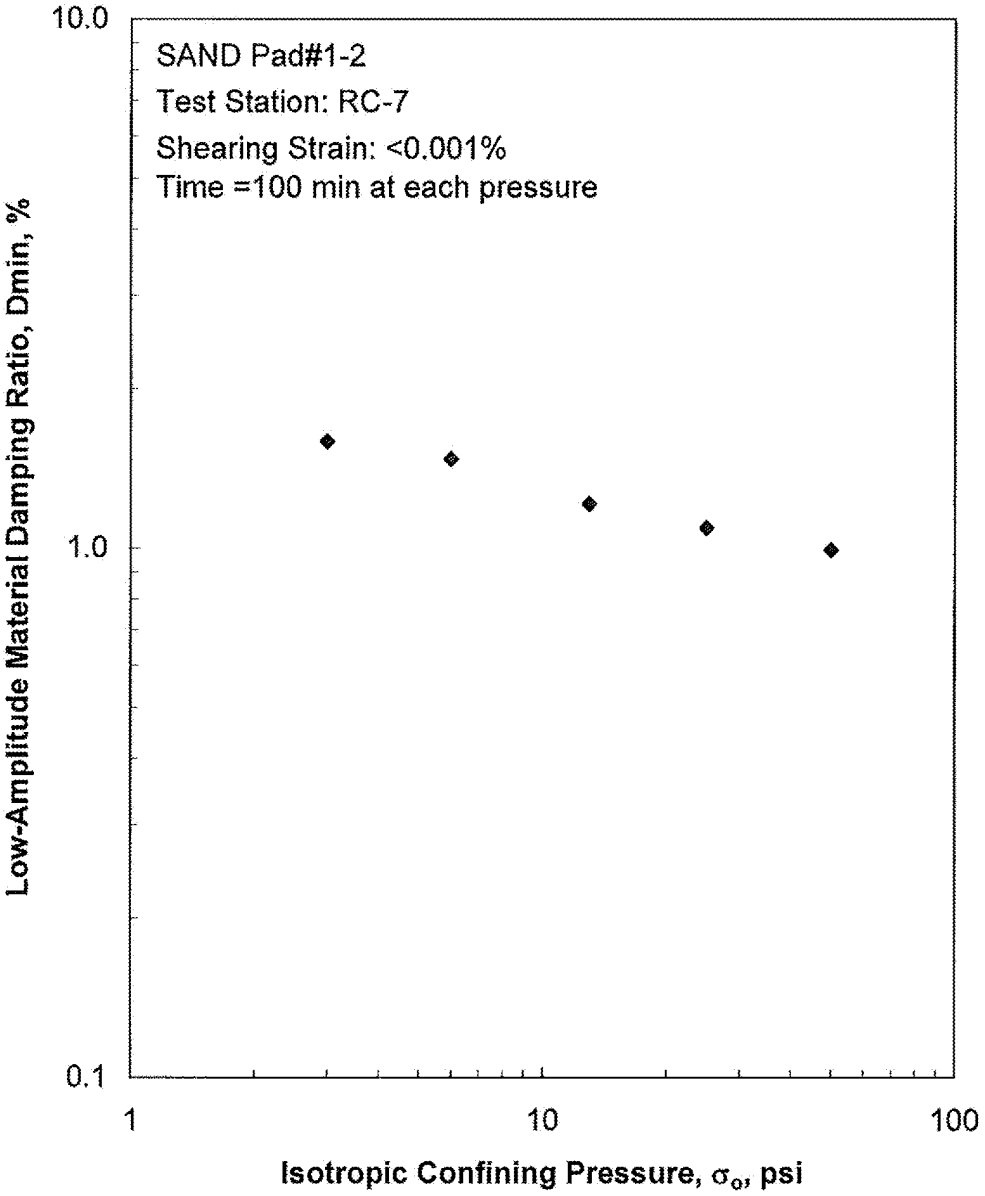


Figure B.6 Variation in Low-Amplitude Material Damping Ratio with Isotropic Confining Pressure from Resonant Column Tests

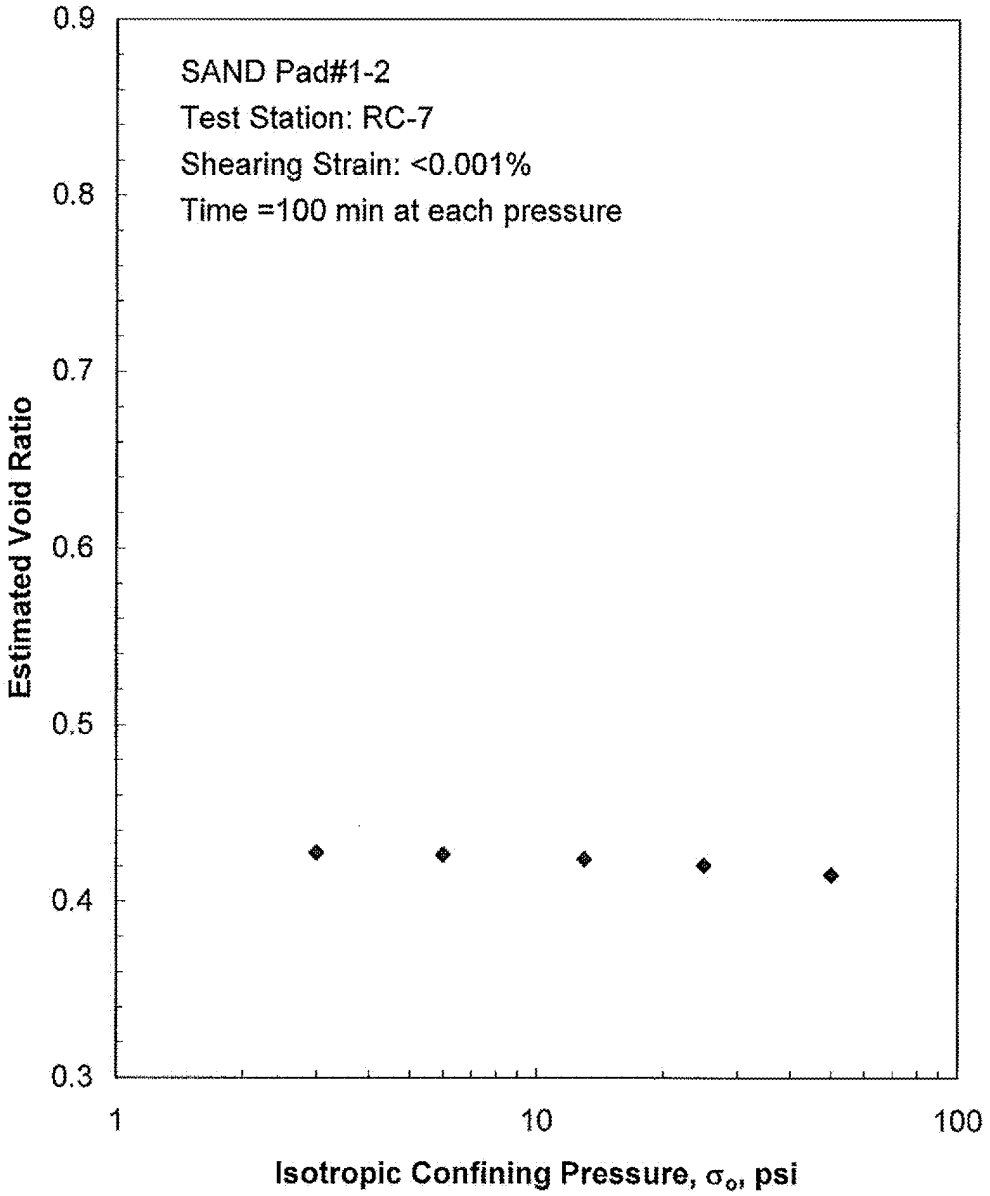


Figure B.7 Variation in Estimated Void Ratio with Isotropic Confining Pressure from Resonant Column Tests

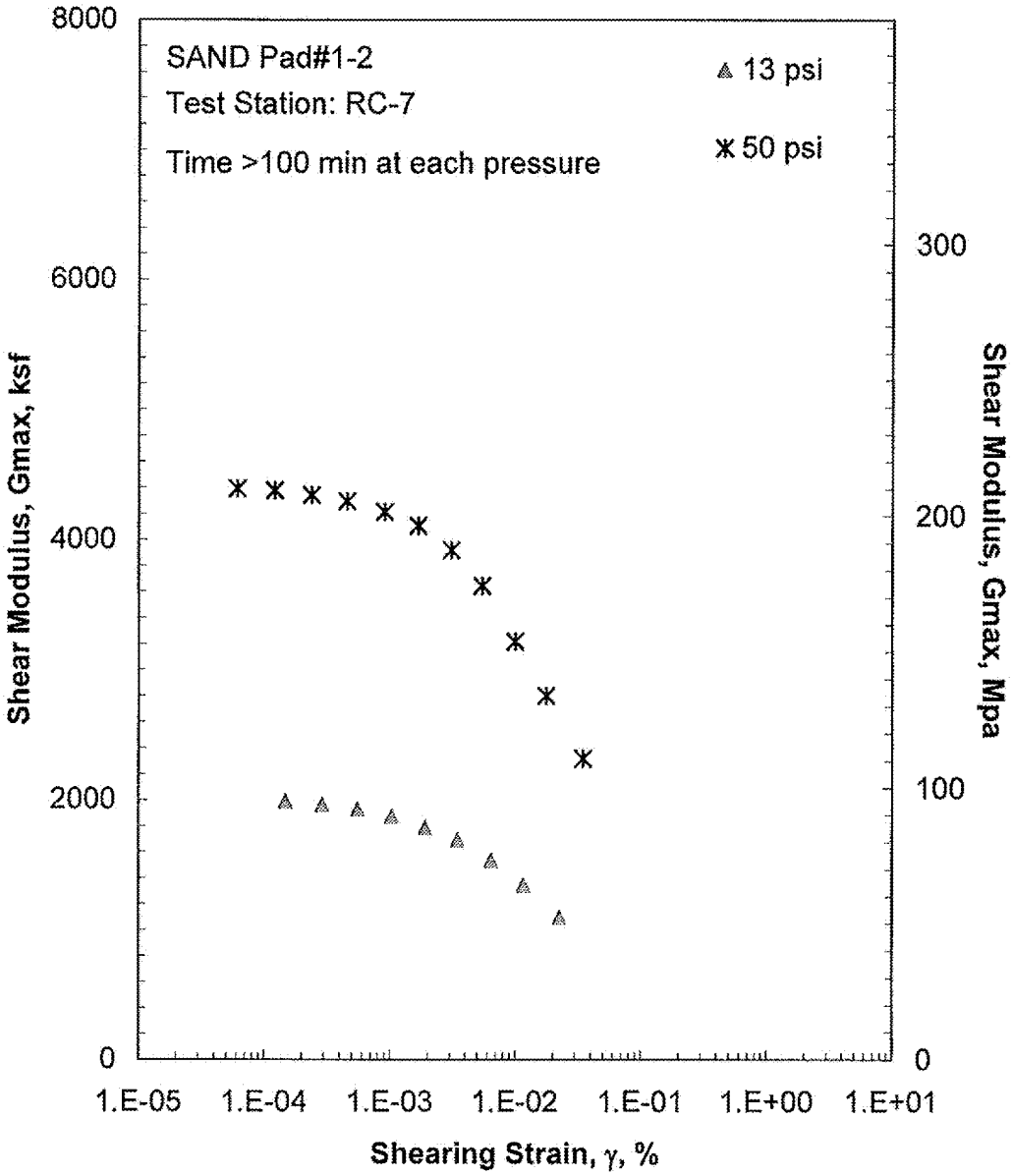


Figure B.8 Comparison of the Variation in Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

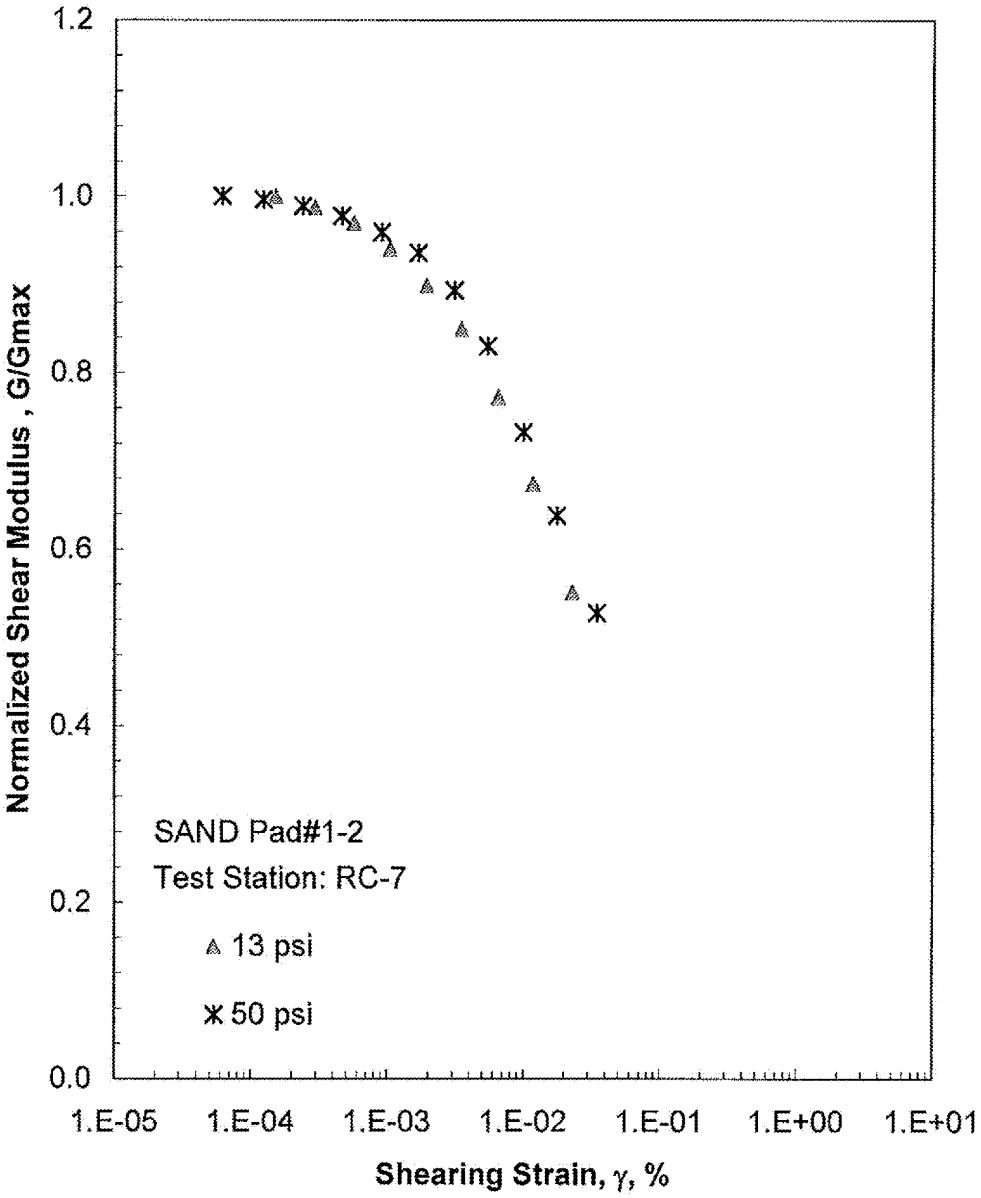


Figure B.9 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

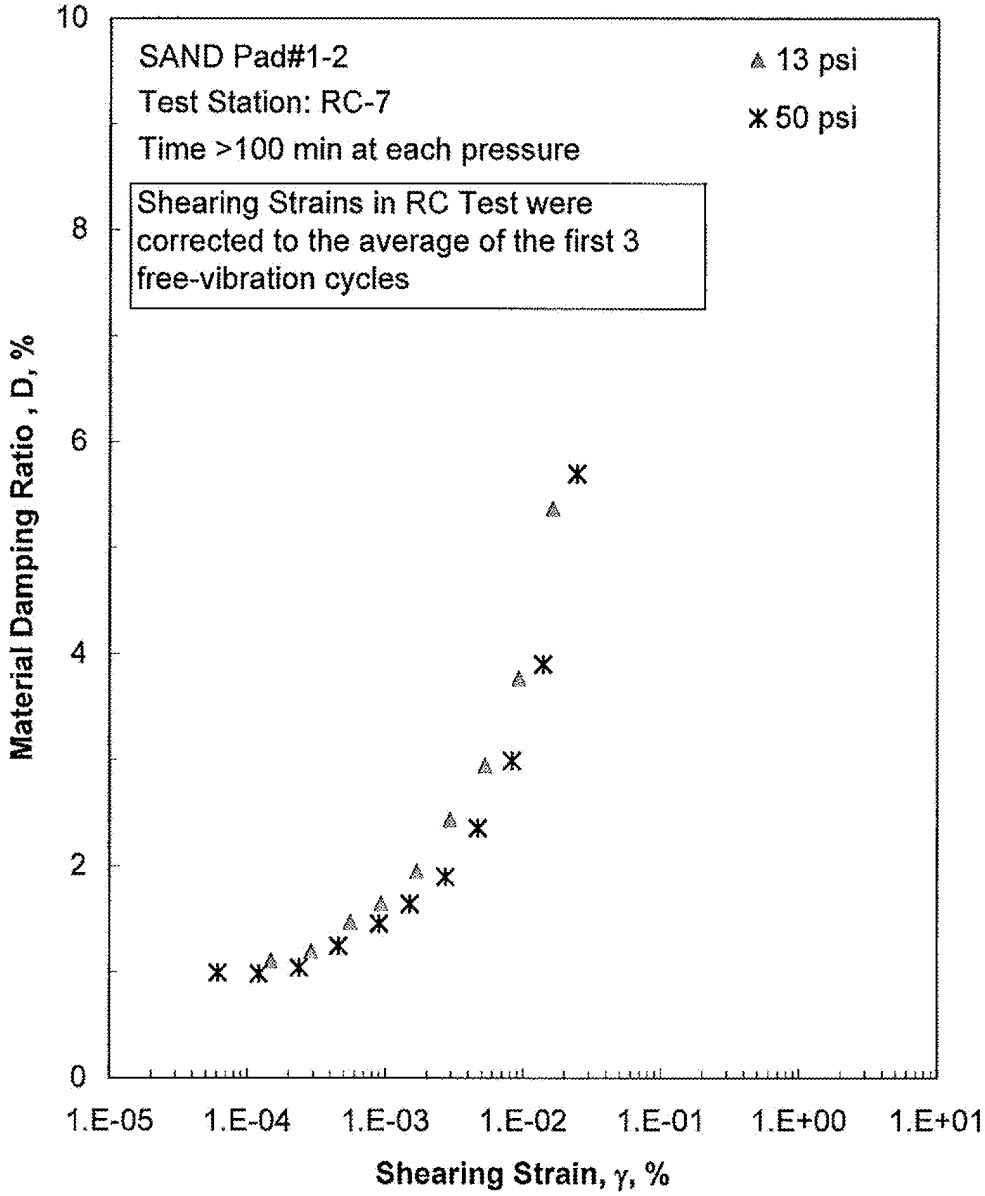


Figure B.10 Comparison of the Variation in Material Damping Ratio with Shearing Strain and Isotropic Confining Pressure from the Resonant Column Tests

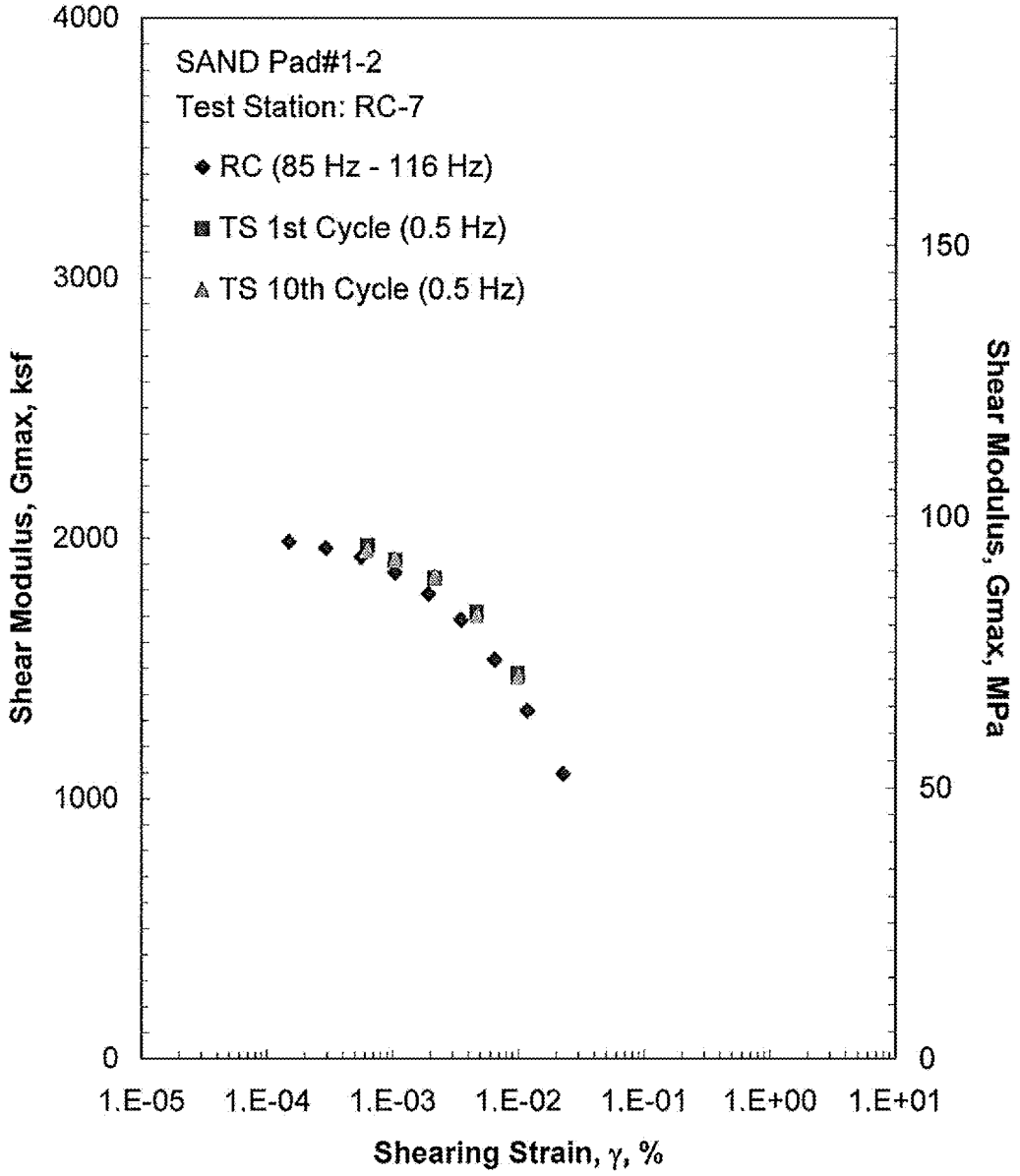


Figure B.11 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

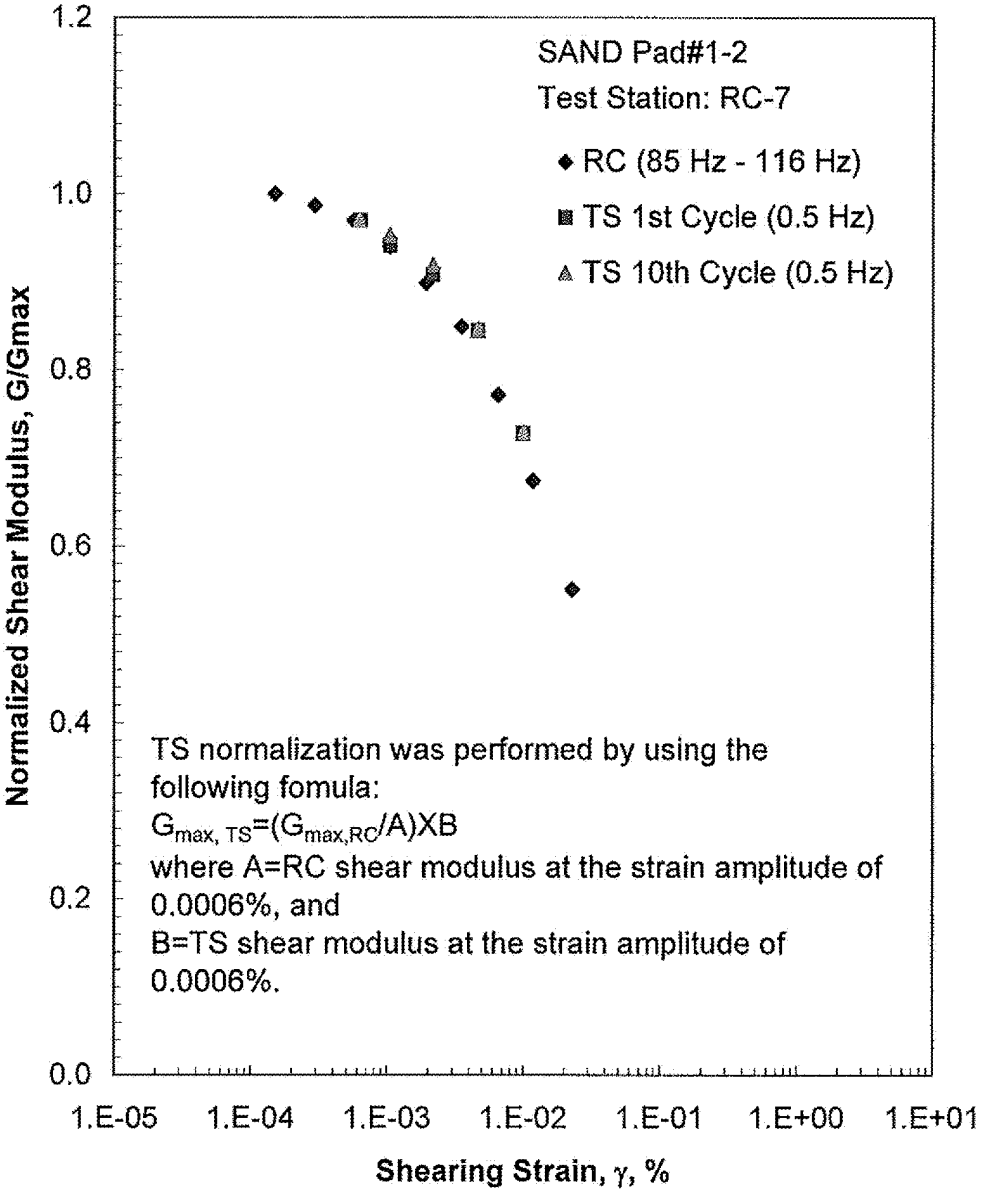


Figure B.12 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

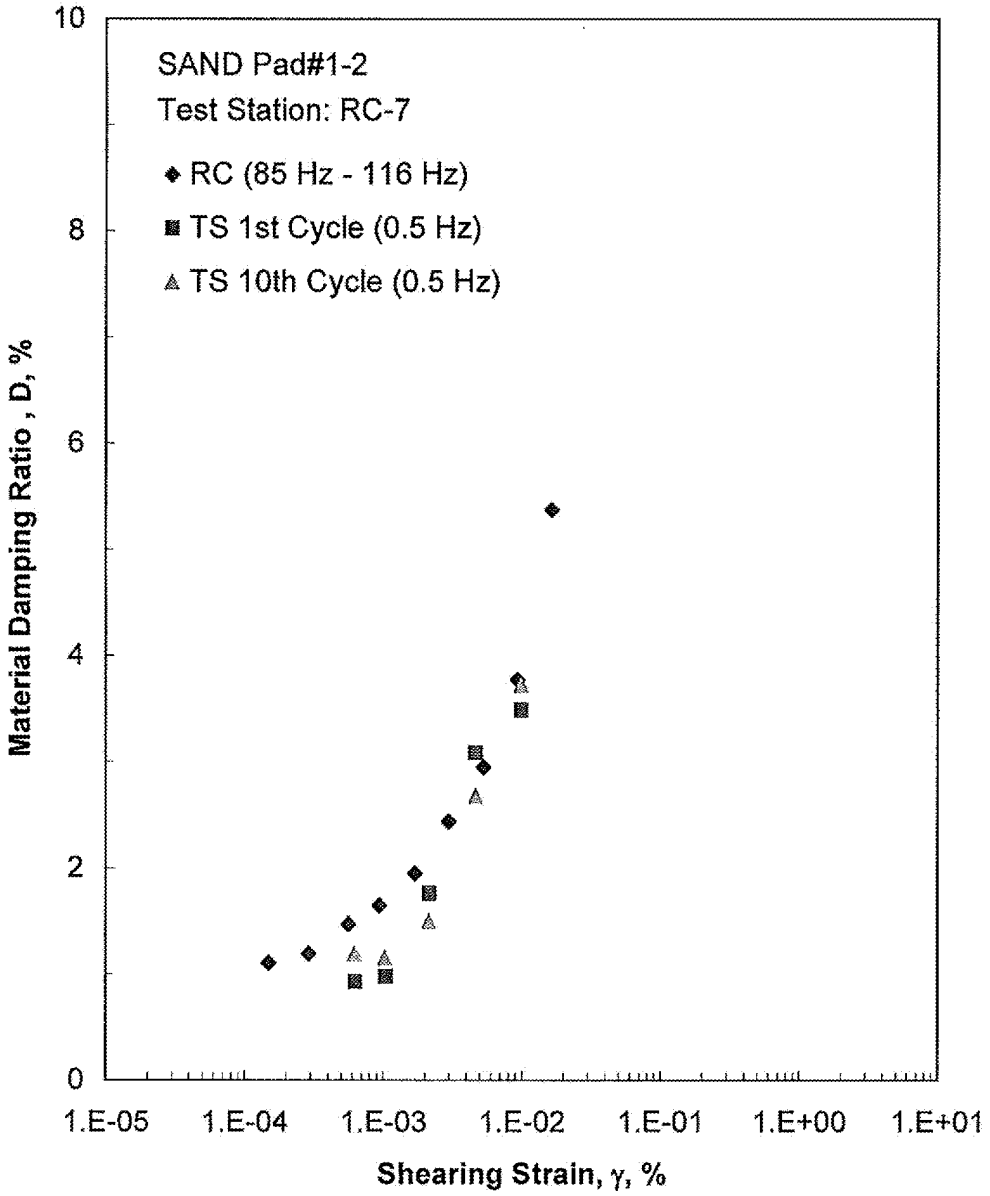


Figure B.13 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

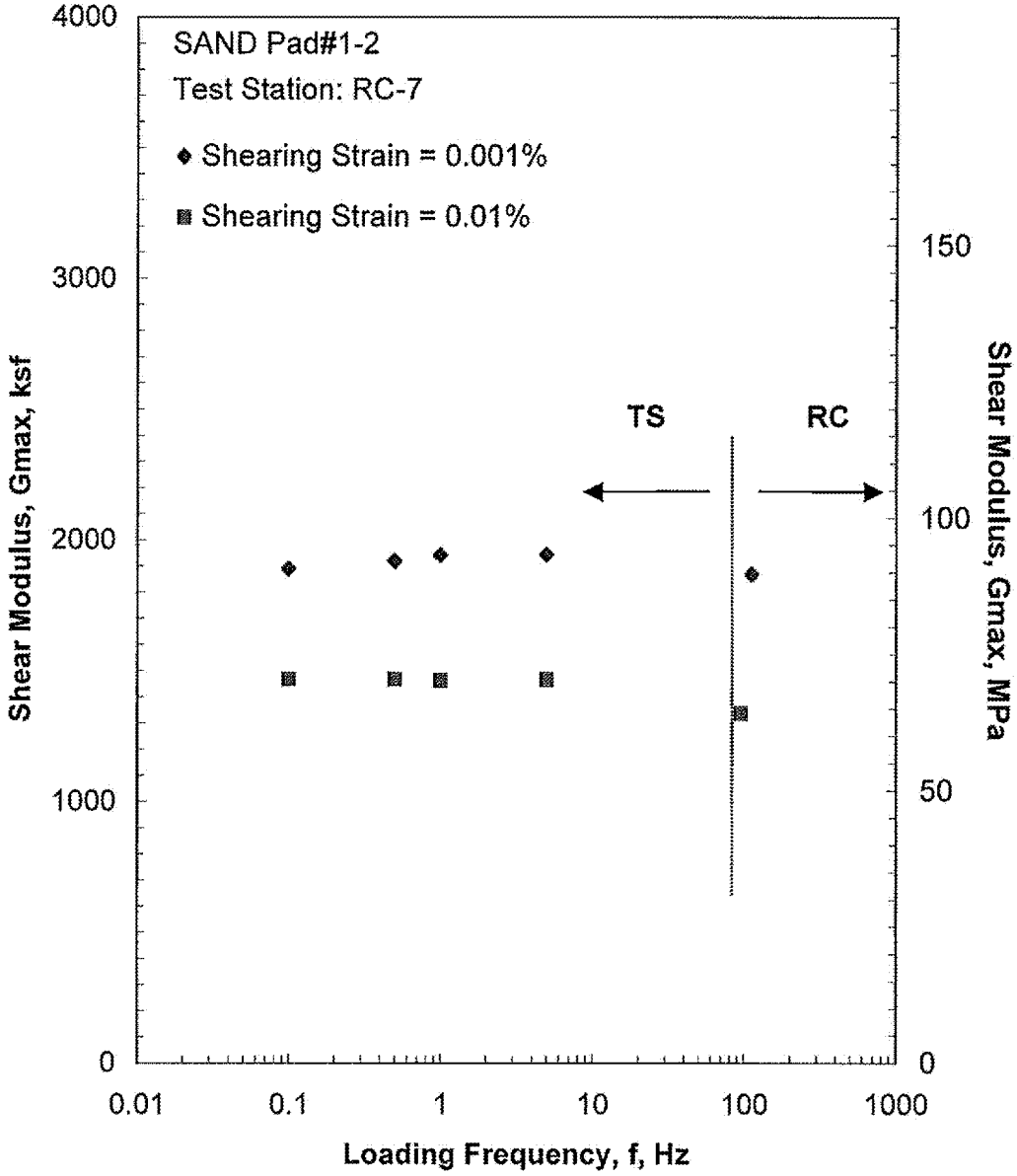


Figure B.14 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

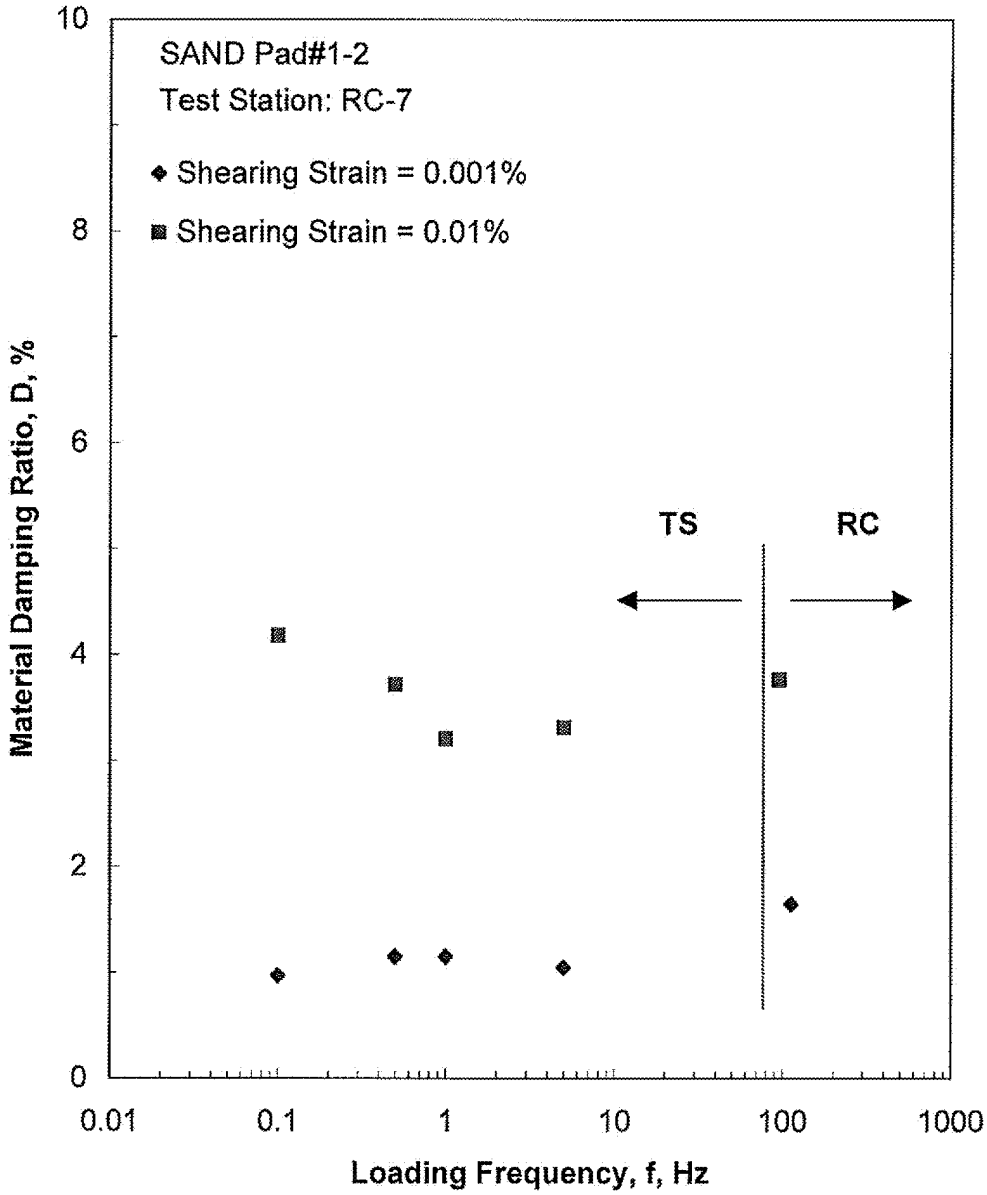


Figure B.15 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 13 psi from the Combined RCTS Tests

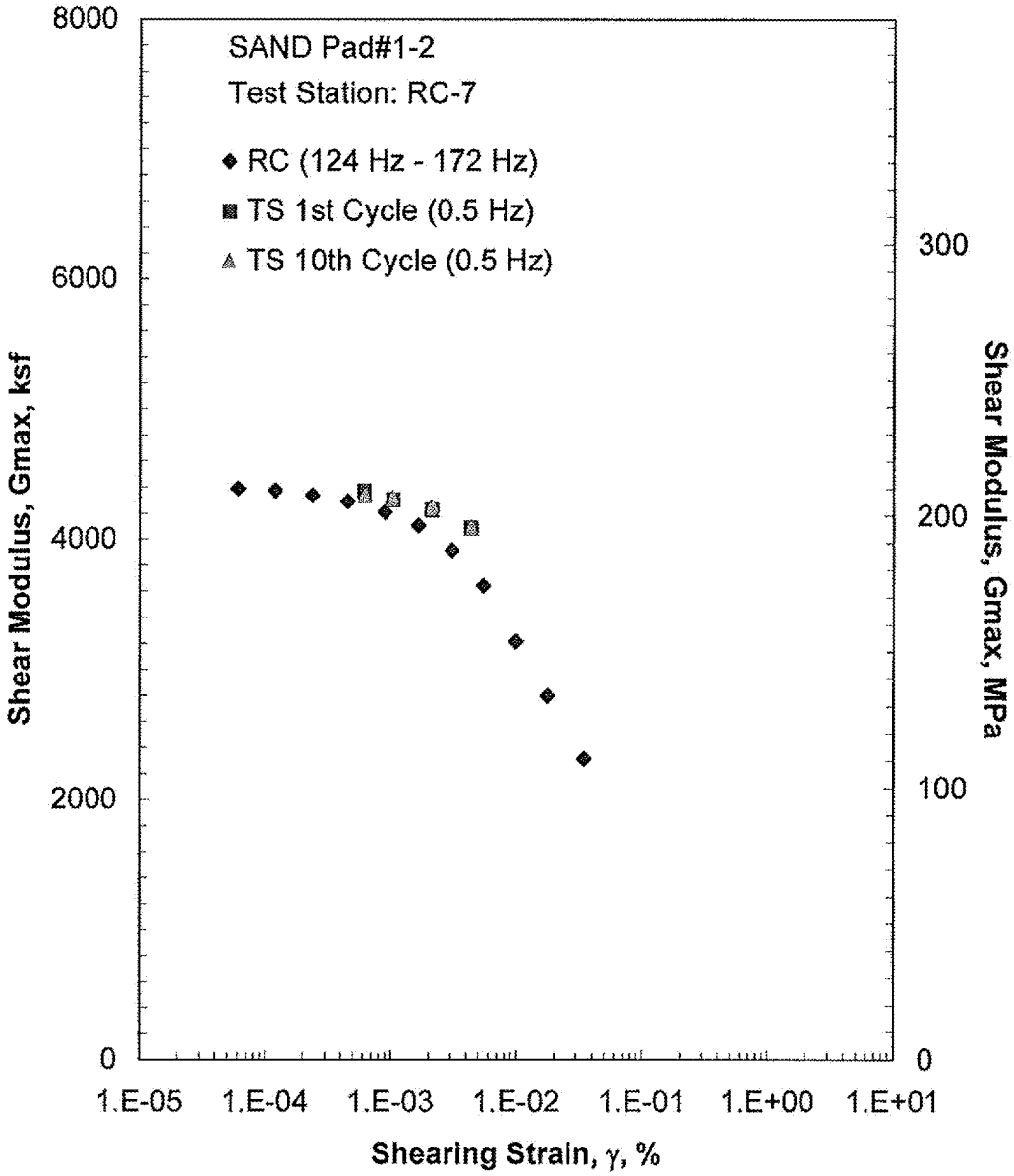


Figure B.16 Comparison of the Variation in Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

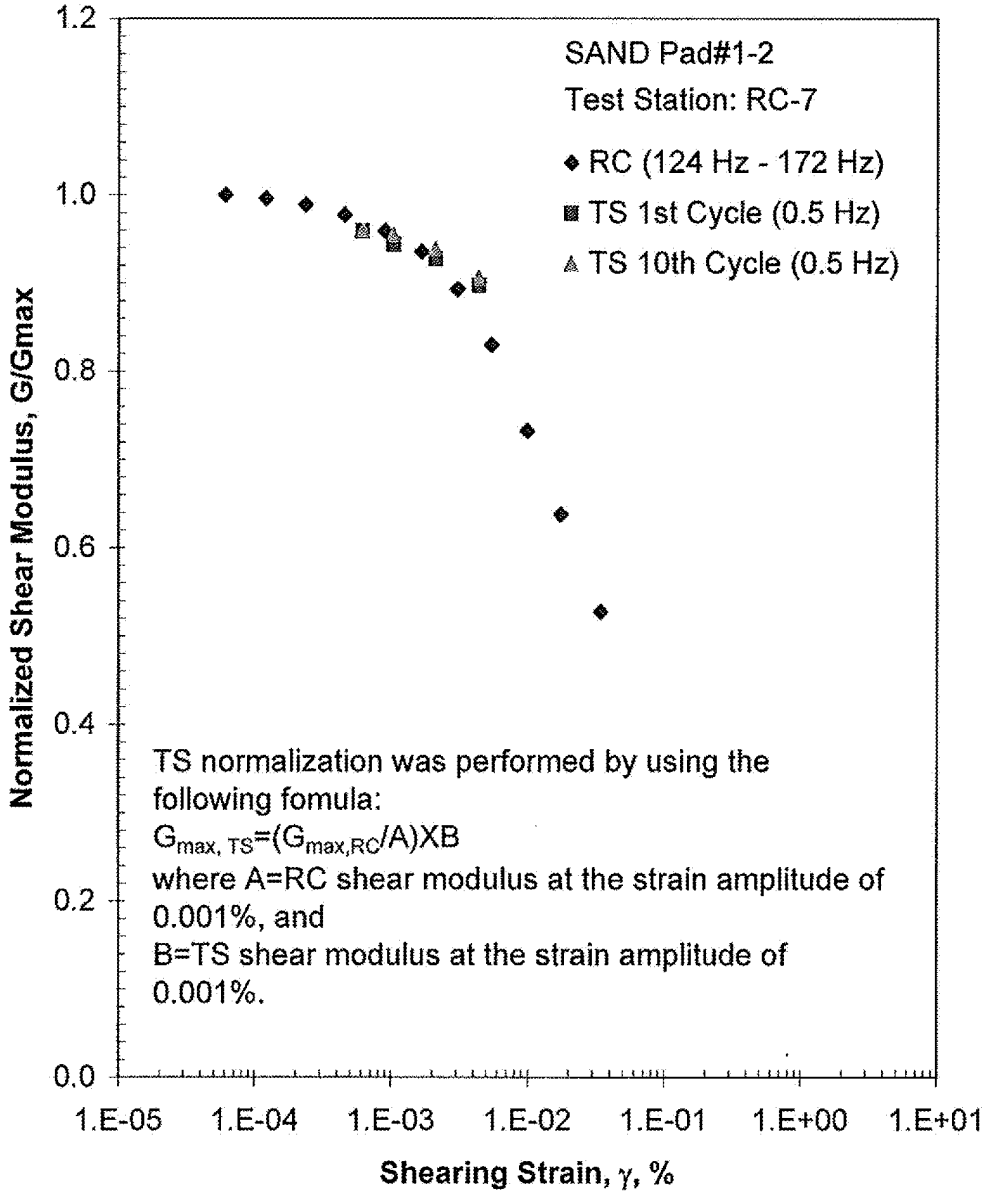


Figure B.17 Comparison of the Variation in Normalized Shear Modulus with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

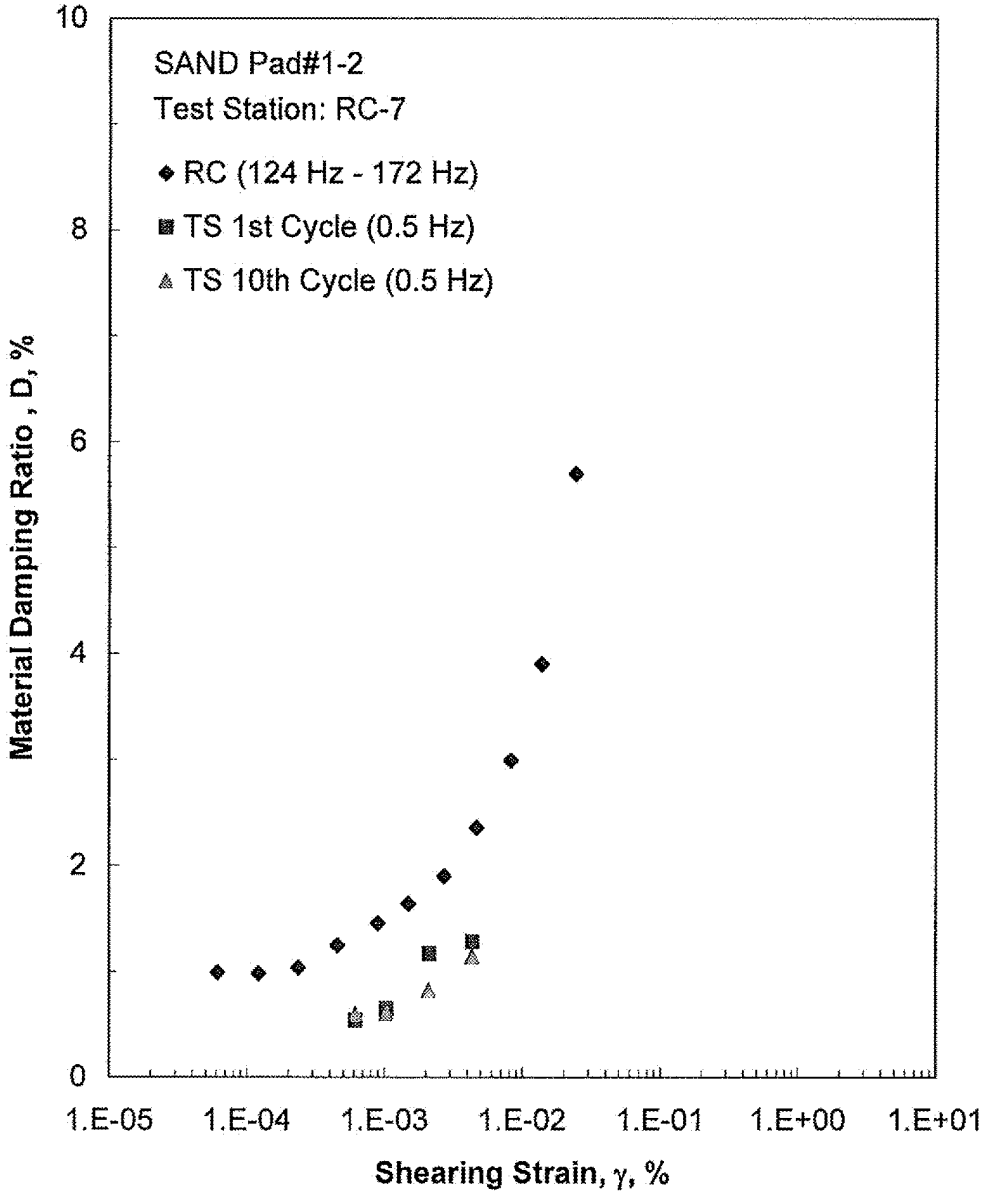


Figure B.18 Comparison of the Variation in Material Damping Ratio with Shearing Strain at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

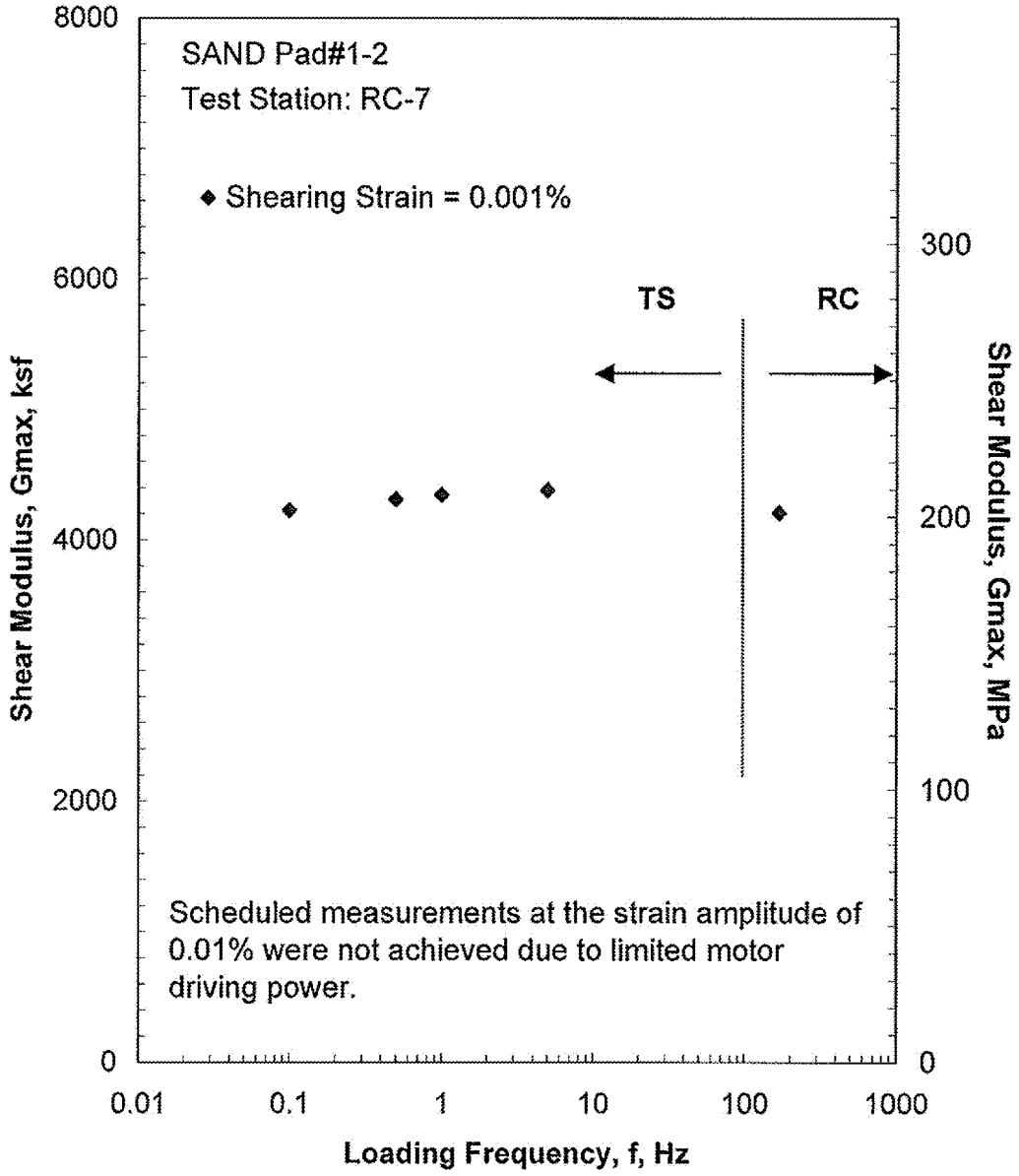


Figure B.19 Comparison of the Variation in Shear Modulus with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

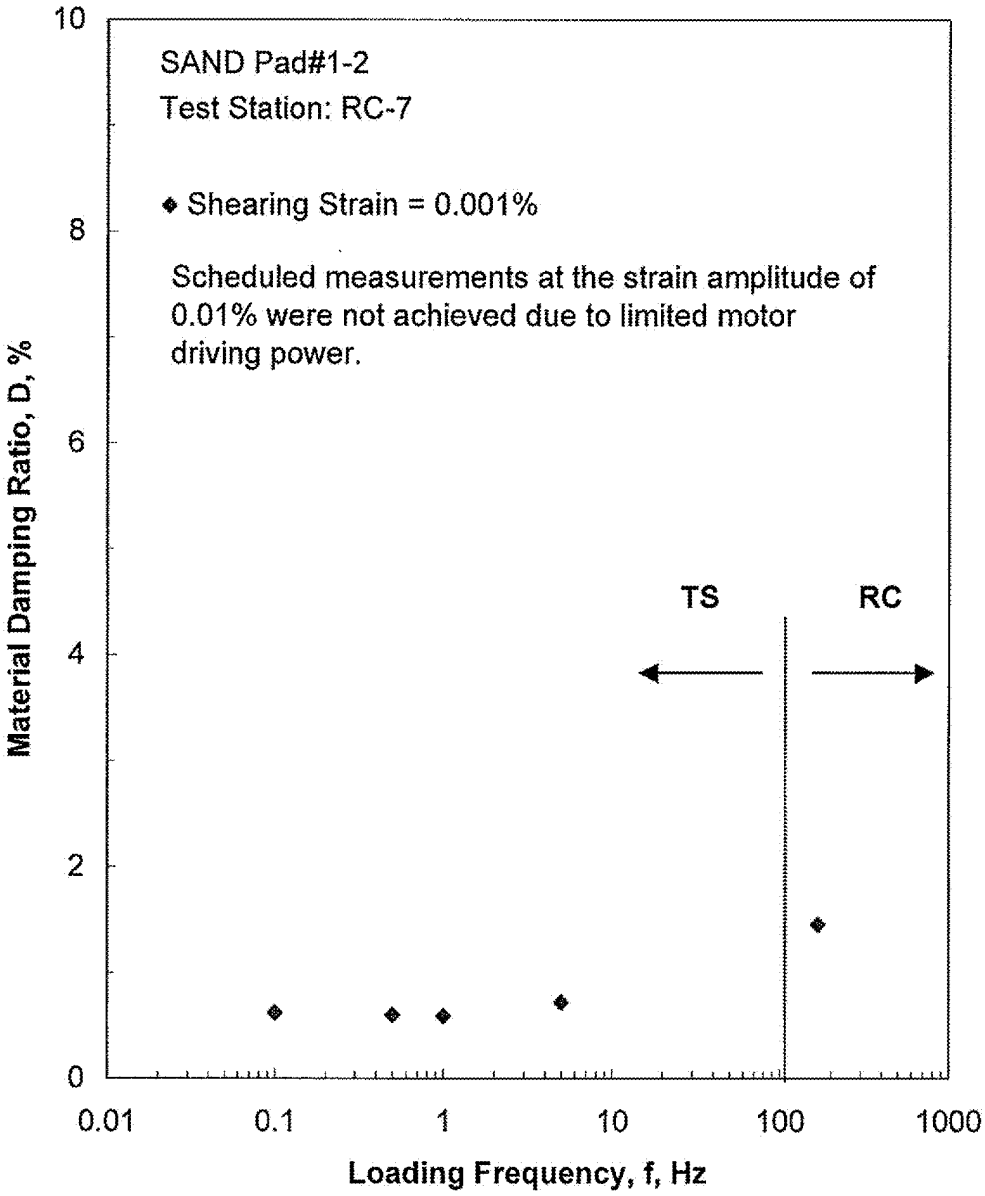


Figure B.20 Comparison of the Variation in Material Damping Ratio with Loading Frequency at an Isotropic Confining Pressure of 50 psi from the Combined RCTS Tests

Table B.1 Variation in Low-Amplitude Shear Wave Velocity, Low-Amplitude Shear Modulus, Low-Amplitude Material Damping Ratio and Estimated Void Ratio with Isotropic Confining Pressure from RC Tests of Specimen Pad 1-2

Isotropic Confining Pressure, σ_o			Low-Amplitude Shear Modulus, G_{max}		Low-Amplitude Shear Wave Velocity, Vs	Low-Amplitude Material Damping Ratio, Dmin	Estimated Void Ratio, e
(psi)	(psf)	(kPa)	(ksf)	(MPa)	(fps)	(%)	
3	432	21	932	45	489.0	1.59	0.43
6	864	41	1355	65	589.6	1.47	0.43
13	1872	90	2010	96	717.4	1.21	0.42
25	3600	172	2971	143	871.1	1.09	0.42
50	7200	345	4415	212	1059.9	0.99	0.42

Table B.2 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad1-2; Isoptropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
1.50E-04	1988	1.00	1.50E-04	1.11
2.93E-04	1962	0.99	2.93E-04	1.20
5.63E-04	1928	0.97	5.63E-04	1.47
1.05E-03	1869	0.94	9.43E-04	1.65
1.93E-03	1786	0.90	1.70E-03	1.95
3.51E-03	1688	0.85	2.98E-03	2.44
6.51E-03	1534	0.77	5.33E-03	2.95
1.18E-02	1339	0.67	9.33E-03	3.77
2.29E-02	1095	0.55	1.65E-02	5.37

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table B.3 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad1-2; Isotropic Confining Pressure, σ_o= 13 psi (1.9 ksf = 90 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
6.31E-04	1972	0.97	0.93	6.26E-04	1953	0.97	1.19
1.04E-03	1915	0.94	0.98	1.04E-03	1919	0.95	1.15
2.17E-03	1847	0.91	1.76	2.16E-03	1851	0.92	1.50
4.66E-03	1717	0.84	3.09	4.70E-03	1703	0.85	2.68
9.91E-03	1480	0.73	3.49	1.00E-02	1467	0.73	3.72

Table B.4 Variation in Shear Modulus and Material Damping Ratio with Shearing Strain from RC Tests of Specimen Pad 1-2; Isoptropic Confining Pressure, σ_o= 50 psi (7.2 ksf = 345 kPa)

Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Average[+] Shearing Strain, %	Material Damping Ratio[x], D, %
6.10E-05	4389	1.00	6.10E-05	0.99
1.21E-04	4373	1.00	1.21E-04	0.98
2.37E-04	4340	0.99	2.37E-04	1.04
4.56E-04	4291	0.98	4.56E-04	1.25
8.98E-04	4211	0.96	8.98E-04	1.46
1.67E-03	4107	0.94	1.50E-03	1.64
3.06E-03	3918	0.89	2.72E-03	1.90
5.44E-03	3643	0.83	4.68E-03	2.36
9.94E-03	3215	0.73	8.25E-03	2.99
1.76E-02	2799	0.64	1.39E-02	3.90
3.46E-02	2316	0.53	2.45E-02	5.70

[+] Average Shearing Strain from the First Three Cycles of the Free Vibration Decay Curve

[x] Average Damping Ratio from the First Three Cycles of the Free Vibration Decay Curve

Table B.5 Variation in Shear Modulus, Normalized Shear Modulus and Material Damping Ratio with Shearing Strain from TS Tests of Specimen Pad 1-2; Isotropic Confining Pressure, σ_c= 50 psi (7.2 ksf = 345 kPa)

First Cycle				Tenth Cycle			
Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %	Peak Shearing Strain, %	Shear Modulus, G, ksf	Normalized Shear Modulus, G/G_{max}	Material Damping Ratio, D, %
6.14E-04	4370	0.96	0.54	6.19E-04	4335	0.96	0.60
1.04E-03	4301	0.94	0.65	1.04E-03	4314	0.95	0.60
2.12E-03	4225	0.93	1.17	2.11E-03	4242	0.94	0.82
4.38E-03	4088	0.90	1.28	4.38E-03	4091	0.91	1.14

ATTACHMENT B

Fugro # 0411-08-1696

Geotechnical
Environmental &
Water Resources
Engineering

GEI Consultants

LETTER OF TRANSMITTAL

400 Unicorn Park Drive
Woburn, MA 01801
Phone: (781) 721-4000
Fax: (781) 721-4073
www.geiconsultants.com

To:	Bill DeGroff	Date:	April 17, 2008
	Fugro Consultants, Inc. 6100 Hillcroft (77081)	GEI Project No.	07223, Task 1003
		Re:	Nine Mile Point
	Houston, TX 77081		

We are sending you the following enclosures:

No.	Type	Description
1		Bag sample of borrow soil: Streeter Rathburn Road, Sample Pad #1 (<3/4-inch material) for RCTS testing
2		Modified Compaction and Grain Size Distribution Curves
3		Chain-of-Custody Form

These are transmitted as checked below:

☐ For Approval ☐ For Your Use ☐ For Review/Comment ☐ As Requested ☐ Other

Message:

Bill,

Enclosed is the soil sample for the RCTS testing, along with the proctor and grain size results. When not in use, please keep the soil locked up. Also, please return a signed copy by PDF or fax of the Chain-of-Custody Form.

Thanks for your help.

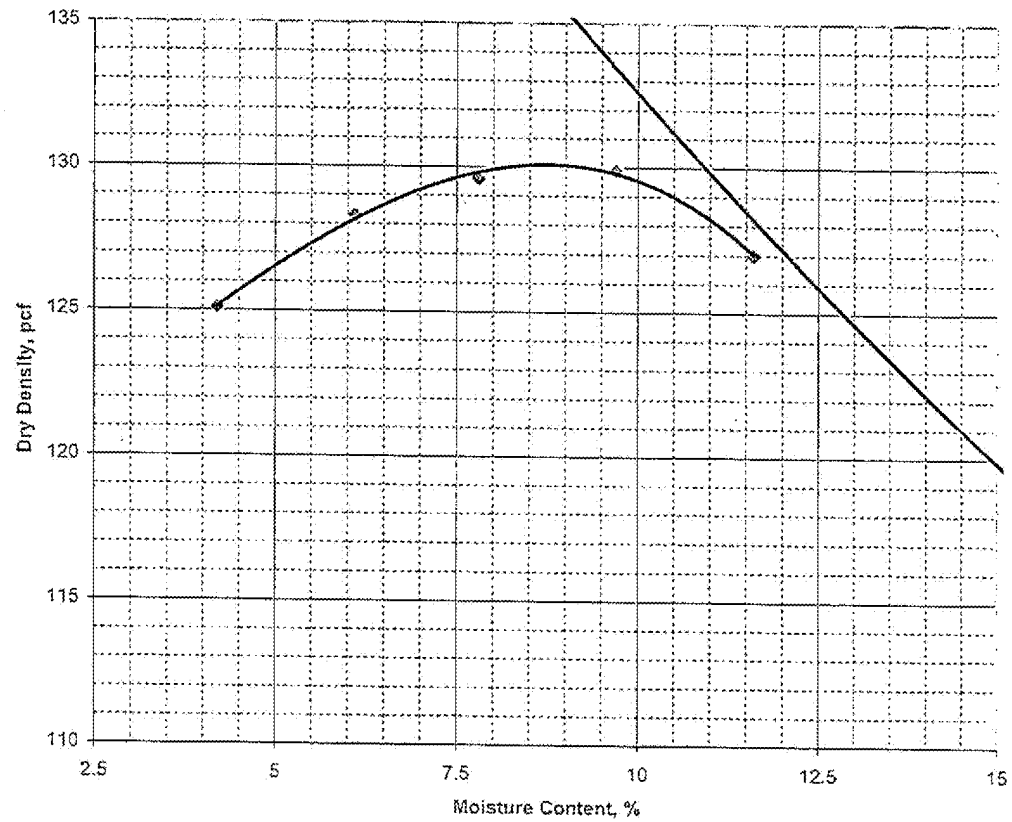
Copy to:
Project Files

Signed: Doug Aghjayan

Doug Aghjayan
Ext. 4031

If enclosures are not as noted, kindly notify us at once.

Point	Moisture Content, percent	Dry Unit Wt. lb/ft^3
1	4.2	125.1
2	6.1	128.3
3	7.8	129.6
4	9.7	129.9
5	11.6	127
6	NM	NM

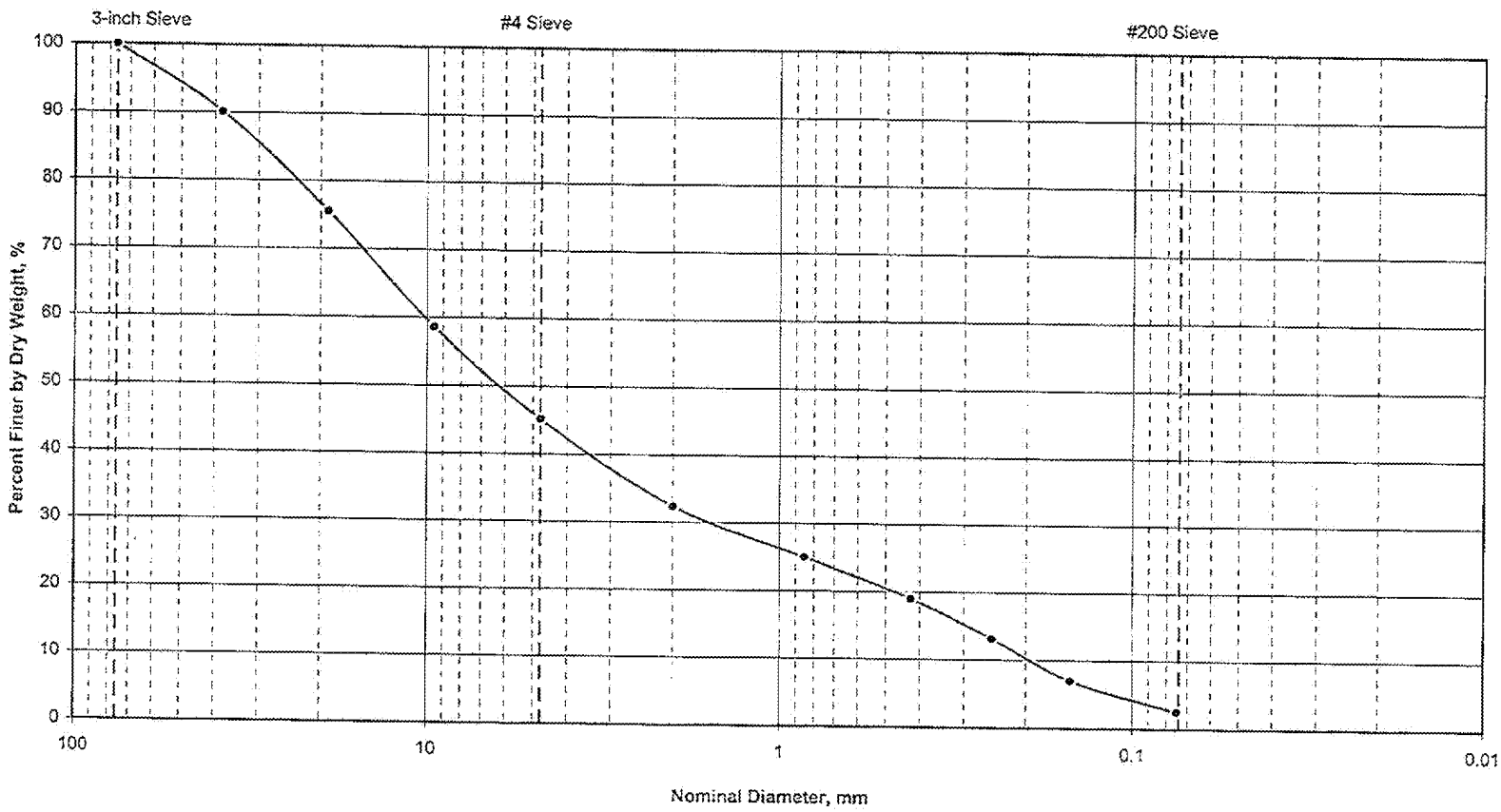


Specific Gravity for Zero Air Voids Curve	2.698
Maximum Dry Density, pcf	130.3
Optimum Moisture Content, %	9.0

Note: Maximum dry density and optimum moisture content are NOT corrected for oversize gravel.

Compaction Test Method (A, B, or C):	C
Max Particle Size in Test:	3/4 in.
Percent Oversize Particles >3/4 in.	24.5

Nine Mile Point Unit 3 Site Characterization Oswego, NY	GEI Consultants Project 07223	Moisture - Density Curve Modified Compaction Source: Streeter Rathburn Rd. Sample: Sample Pad #1 Form 111.0 rev. 0 (page 3 of 3)



%+3"	% Gravel	% Sand	% Fines
0.0	54.9	42.6	2.5

Nine Mile Point Site Characterization Oswego, NY	GEI Consultants Project 07223	Grain Size Curve Boring/Test Pit No. : Streeter Rathburn Rd Sample No. : Sample Pad #1 Form 105.2 rev. 1 (page 2 of 2)

file OSWEGO 5.13.

RCCyTS Functional Check w/Aluminum Specimen(s)

5.1

Performed by: S. Jupic — Date: 5.13.08

Checked by: J Meng — Date: 5/13/08

Station # RC-7

Aluminum # MS02

RC Check

Items	Expected Range	Before, B	After, A	Variation, % (B-A)/A*100%	Notes
Input voltage (mV)	NA	40	40	NA	
Power amplification	NA	10	10	NA	
Strain amplitude	NA	5.1×10^{-5}	5.2×10^{-5}	NA	
Charge amplification	NA	1	1	NA	
Resonant freq (Hz)	NA	56.9	57	-0.2%	
Sweeping width (Hz)	NA	18	18	NA	
# of excitation cycles	NA	160	160	NA	JS 6/20/08
File name	NA	MS-2-0513B ~~MS-2-0513A~~		NA	MS-2-0513A
Damping ratio	NA	0.94%	0.87%	~~0.1%~~ 1.2% JM.	

TS Check

Items	Expected Range	Before, B	After, A	Variation, % (B-A)/A*100%	Notes
Input voltage (mV)	NA	4000	4000	NA	
Power amplification	NA	10	10	NA	
Excitation frequency	NA	0.5	0.5	NA	
# of excitation cycles	NA	11	11	NA	
Strain amplitude	NA	0.6-4	0.5b-4	NA	JS 6/20/08
File name	NA	MS-2-0513TSB ~~MS-2-0513TSA~~		NA	MS-2-0513TSA
Shear modulus	27,600 MPa ± 10%	27,989	26,610	5.2%	
Damping ratio	NA	0.053	0.048	<0.01%	Use difference

NA = not applicable

Functional check is acceptable if measured values are within the expected range, and if the variation in the values measured before and after the project testing is less than 10%.

* ~~MS-2-0513TSB~~ -B1 -B2 JM 06/20/08

Form No. Rev. 0

RESONANT COLUMN CYCLIC TORSIONAL SHEAR (RCCyTS) TEST
Specimen Setup / Take Down

Project No: 0411-08-1696 Test Type: RCTS Cell No.: RC7 File Name: N/A
Project Name: GEI Test Stress(es), σ' = 3.1, 6.2, 12.5, 25 & 50 psi (1)
Task No.: N/A Stokoe Resonant Column Device Gs = N/A [ ] Meas.; [ ] Assumed
Test No.: N/A Test Series No.: N/A Top Cap ID: 002

Assig. Remarks: (SR.RO) AS 6/20/08

[ ] Tube [ ] Field Extruded [ ] Liner [ ] N/A
Boring No.: STEGTEC PATH RH [ ] Reconstituted
Sample No.: PAD #1 - 1 Compostite No.: N/A
Depth (ft): N/A Specimen No.: A
[ ] Spec. Selection by X-ray; [ ] Geomarine Sample

Specimen Preparation (for reconstituted samples)
Target Dry Density 115.7 Lift Thickness 29.92 mm No. Lifts 5
Final Ht. 148.77 Final Area 40.489 cm² Final Vol. 602.36 cm³
Final Total Mass 1207.87 Water Cont. 7.76

Type Consolidation: [X] Isotropic [ ] Anisotropic [ ] Ko stress path [ ] 45o stress path

Water Content (WC);	Initial - Trimming Location: Top (Wo,1)	Bottom (Wo,2)	Sides (Wo,3)	Final (Wat) (see below)
Container No	823			7A
Mass Moist Soil + Cont. (g)	200.35			388.97
Mass Dry Soil + Cont. (g)	188.25			372.19
Mass Container (g)	32.23			139.34
Water Content, Wo,n (%)	7.76	N/A	N/A	7.21
Avg. Initial WC, Wo,avg (%)	7.76	Final (Wat);	Slice;	Whole Spec.

AS 6/14/08

SOIL MASSES:	Initial	Final
Moist + Tare (etc.)(g):	1804.47	1338.77
Tare (etc.) (g):	596.60	139.34
Spec. Moist Mass (g):	1207.87	1199.43

EXCESS DRY SOIL (stuck to membrane, filters stones, etc.)

Container No:	N/A
Mass Dry Soil + Container (g):	N/A
Mass Container (g):	N/A
Mass Excess Dry Soil (g):	N/A

Specimen Dimensions

Height (mm) Initial (Ho)	Final (Hat)		Diameter (mm) Initial (Do)	Final (Dat)
GB 127		T	72.0	
1 21.770		M	71.9	
2 21.774		B	71.6	NA*
3 21.757	NA*	T'		AS 6/14/08
4 21.768		M'	AS 6/14	
5 21.763		B'		
Avg 148.77		Avg	71.8	

Measuring Devices: Pi Tape: [X] Dia. 5.85 2.82
Calipers: [ ] Ht. [ ] Dia.
Dial Comparator: [X] Ht. [ ] Dia.

Ao (cm2) = N/A
Vo (cm3) = N/A
Aat (cm2) = N/A
Vat (cm3) = N/A

Estimated Initial Unit Weight:
Total, gt,o (lb/ft3) = N/A Dry, gd,o (lb/ft3) = N/A

Membrane / Filter Paper / Apparatus

Membrane (mm):	Top	Bottom
Number: 1 Thickness: [ ] Single; [X] Double	N/A	N/A
	0.61	0.78
Circumference (Crm,o)	214	216
(1) Total thickness, if 2+ membranes Average:	Thickness (1) N/A	Dia.(Crm,o/p) N/A

Filter Paper: Top + Bottom: [ ] Yes ; [✓] No
Filter Strips: [ ] Yes ; [✓] No Number =
If yes number = — Vertical: ¼" & Whatman #54 or N/A
" or = N/A or Sprial: ¼" & Whatman #1 or
Mass Drive Plate & Cap, Mdpc = N/A g, N/A lbf

NA - Not Applicable; UK - Unknown; GB - Gage Block
* SAMPLE CRASHED DURING TAKING DOWN. (INITIAL LVDT READING - 3.45694)
Note: (1) Each Test Stress is identified as a Test Stage or Sequence on other data sheets.
Final Specimen Description (USCS group name & symbol, color, layering, max. part. size, slickensided, fissured, blocky, honeycombed, etc.):
M & to Coarse Sa, Br ~~Gray~~ w/ gr

[ ] Photo taken (internal sliced surface & outside surface) AS 5/14/08
Other Remarks

Resonant Column Cyclic Torsional Shear (RCCyTS) Signature & Equipment Page	Boring: N/A
	Sample: PAD #1 (1)
	Depth (ft): N/A
	Test No. N/A

Project: Nine Mile Point Site Characterization Location: Oswego, New York	Fugro Project No.: 0411-08-1696

SIGNATURES

Specimen Trimmed/Recompacted by: [signature]	Date: 5/14/08
Specimen Setup by: Jupic [signature]	Date: 5.14.08
Test Performed by: (per GEI Procedure 109 rev. ___) Jupic [signature]	Date: 5.14.08
Specimen Takedown by: [signature]	Date: 05/19/08
Preliminary Calculations by: [signature]	Date: 5/21/08
Calculated by: [signature]	Date: 5/21/08
Reviewed by: [signature]	Date: 6/13/08

EQUIPMENT USED

RCCyTS Workstation No.: RC7	Balance ID: BA-006
Caliper ID: VH-10838	PI Tape ID: VH-10822
Oven ID: H14	Scalping Sieve Size & ID: 3/8" B-31
Other (specify) ID: —	Other (specify) ID: —

Comments/Notes: —

Water Content Measurement

Project Name: Nine Mile Point Site Characterization, Oswego, NY

Project No.: 07223 0411-08-1696

Performed by, per Proc 101, rev ( ): DANIEL NYARKO

Checked By: N/A 5/11/08 Date: 5/14/08

AS 6/18/06

Determination No.	07223					
Boring	STREETER RATHBUN RD					
Sample	PAD #1					
Oven ID	# 14					
Balance ID	BA 006					
Date/Time In Oven	5/13/08					
Date/Time Out of Oven	5/14/08					
Tare No.	PAN 1					
(a) Wet Wt. + Tare	912.74 g	g	g	g	g	g
(b) Dry Wt. + Tare	856.60 g	g	g	g	g	g
(c) Wt. Tare	138.99 g	g	g	g	g	g
(d) Wt. Water (a – b)	56.14 g	g	g	g	g	g
Wt. Wet Solids (a – c)	773.75 g	g	g	g	g	g
(e) Wt. Dry Solids (b – c)	717.61 g	g	g	g	g	g
Water Content (d/e) x 100, %	7.8					
Is Wet Wt. Enough for Method B? (yes/no)	YES					

AS 6/18/08

Remarks:

Test Notes:
1. Oven dry at 110°C (±5°C) for 12 hours minimum.
2. Cool in desiccator for a minimum of 30 minutes before weighing.

GEI

Form 101.1, rev. 1

RCTS Testing Record (Page 1 of 10)

Project #: 0411-08-1696 Project: Nine Mile Point Unit 3, Oswego, New York
Specimen #: PAD #1 Specimen Description: M to Coarse Sand & Gravel
Tested By, per GEI Procedure 109 rev ( ): [illegible] Date: 5.14.08
Checked By: [illegible] Date: 6/21/08
DS 6/13/08

Test Station: RC7

Confining Pressure: 3.1 psi **Testing Stage: X0.25**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	1:03	PAD#1-P3-T-0	4	1	77.9	
PM	2:43	PAD#1-P3-T-9	4	1	82.6	
END	~~END~~		~~4~~	~~1~~	~~82.6~~	

DS 6/13/08 SI 6.19.08 SI 6.19.08

RC Strain Amplitude Effect Tests

DS 6/13/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 2 of 10)

Station:_____ Date:_____ Tested by:_____ AS 6/19/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.25**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 3 of 10)

SJ 6.19.08

Station: RC 7 Date: 5.14.08 Tested by: ~~SS~~ Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: STRGETER PATH.R8 Specimen #: PAD #1
Confining Pressure: 6.2 psi **Testing Stage: X0.5**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	2:47	PAD #1 - P6 - 7.0	6	1	92.6	
PM	4:25	PAD #1 - P6 - 7.1	6	1	96.1	
END	~~6:05~~		~~6~~	~~1~~	~~96.1~~	

DS 6/18/08 SJ 6.19.08 SJ SJ. 6.19.08

RC Strain Amplitude Effect Tests

DS 6/18/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 4 of 10)

Station:_____ Date:_____ Tested by:_____ AS 6/18/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.5**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

SI
19
6.19.08

RCTS Testing Record (Page 5 of 10)

Station: RC7 Date: 5.14.08 Tested by: ~~AA~~ Suvad Jupic
Project #: 0411-08-1696 Project Name: GE
Boring #: CPRETER2ATHR1. Specimen #: PAD#1
Confining Pressure: 12.5 psi **Testing Stage: X1**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	4:34	PAD#1-P12-T-0	6	1	113.5	
PM	6:12	PAD#1-P12-T-7	6	1	116.8	
END	~~END~~		~~6~~	~~1~~	~~116.8~~	

AS 6/18/08 SI 6.19.08 SI 6.19.08 SI 6.19.08

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	8:35	PAD#1-P12-S-0	3	1	115.6	
	8:36	PAD#1-P12-S-1	6	1	115.1	
	8:36	PAD#1-P12-S-2	12	1	114.4	
	8:36	PAD#1-P12-S-3	24	1	112.6	
	8:37	PAD#1-P12-S-4	48	1	110.1	
	8:38	PAD#1-P12-SA-0	96	10	106.8	
	8:38	PAD#1-P12-SA-1	192	10	101.9	
	8:39	PAD#1-P12-SB-0	384	10	95	
PM	8:40	PAD#1-P12-SC-0	768	10	84.9	
		END				

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min) SI 6.19.08	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
~~AA~~	PAD#1-P12-SCK	6	1	104.8	

PM 8:41

RCTS Testing Record (Page 6 of 10)

SJ
6.19.08

Station: RC7 Date: 5.14.08 Tested by: Surad Jupic

Project #: 0411-08-1696 Project Name: GE1

Boring #: STRETHER PATH Specimen #: PAD # 1

Confining Pressure: 12.5 PSI **Testing Stage: X1**

TS Tests (prior to tests, fr= 116.8 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-P12-TS 01	0.07	1.39	1.6-6	
0.5	PAD#1-P12-TS 02	0.14	2.78	3.2-6	
0.5	PAD#1-P12-TS 03	0.28	5.56	0.62-5	
0.5	PAD#1-P12-TS 04	0.45	8.94	1.03-5	
0.1	PAD#1-P12-TS 05	0.45	8.94	1.06-5	
0.5	PAD#1-P12-TS 06			1.06-5	
1	PAD#1-P12-TS 07			1.03-5	
5	PAD#1-P12-TS 08			1.02-5	
10	PAD#1-P12-TS 09	0.45	8.94	1.02-5	
0.5	PAD#1-P12-TS 10	0.90	17.89	2.16-5	
0.5	PAD#1-P12-TS 11	1.8	35.79	4.6-5	
0.5	PAD#1-P12-TS 12	3.3	65.65	1-4	
0.1	PAD#1-P12-TS 13	3.3	65.65	1.01-4	
0.5	PAD#1-P12-TS 14			1-4	
1	PAD#1-P12-TS 15			0.99-4	
5	PAD#1-P12-TS 16			0.99-4	
10	PAD#1-P12-TS 17	3.3	65.65	0.99.4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	8:05	PAD#1-P12-TSCK	6	1	108.5	
		N/A				
5.16.08	8:32 PM	N/A	6	1	115.4	
END						

RCTS Testing Record (Page 7 of 10)

6.19.08

Station: RC7 Date: 6.18.08 Tested by: Suvad Jupic

Project #: 0411-08-1666 Project Name: GEI

Boring #: TOGETHER PATH RL Specimen #: PAD #1

Confining Pressure: 20 psi **Testing Stage: X2**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	8:49	PAD#1-P25-T.0	8	1	137.9	
PM	10:27	PAD#1-P25-T.7	8	1	141.8	
END	4:00					

AS 6/18/08

RC Strain Amplitude Effect Tests

AS 6/18/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 8 of 10)

Station:_____ Date:_____ Tested by:_____ DS 6/18/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X2**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

SJ
6.19.08

RCTS Testing Record (Page 9 of 10)

Station: RC7 Date: 6.17.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GET
Boring #: [illegible] Specimen #: PAD#1
Confining Pressure: 50 psi **Testing Stage: X4**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	10:30	PAD#1-P50-T-0	8	1	167.3	
AM	12:08	PAD#1-P50-T-7	8	1	172.37	
END	End					

SJS 6/18/08

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	1:37	PAD#1-P50-S-0	4	1	171.9	
	1:37	PAD#1-P50-S-1	8	1	171.6	
	1:37	PAD#1-P50-S-2	16	1	171.1	
	1:37	PAD#1-P50-S-3	32	1	170.1	
	1:38	PAD#1-P50-S-4	64	1	168.3	
	1:39	PAD#1-P50-SA-0	128	10	166	
	1:39	PAD#1-P50-SA-1	256	10	162.1	
	1:40	PAD#1-P50-SB-0	512	10	157.7	
	1:41	PAD#1-P50-SC-0	1024	10	145.6	
	1:42	PAD#1-P50-SD-0	2048	10	134.4	
AM	1:43	PAD#1-P50-SE-0	4000	10	121.5	

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	1:44	PAD#1-P50-SCK	8	1	154.3	

SJ
6.19.08

RCTS Testing Record (Page 10 of 10)

Station: RC 7 Date: 5.15.08 Tested by: Surad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: [illegible] Specimen #: PAD #1
Confining Pressure: 50 psi **Testing Stage: X4**

TS Tests (prior to tests, fr=172.3 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-P50-TS01	0.15	2.98	1.6-6	
0.5	PAD#1-P50-TS02	0.30	5.96	3.1-6	
0.5	PAD#1-P50-TS03	0.60	11.93	0.6-5	
0.5	PAD#1-P50-TS04	1.0	19.88	1.03-5	
0.1	PAD#1-P50-TS05	1.0	19.88	1.05-5	
0.5	PAD#1-P50-TS06			1.04-5	
1	PAD#1-P50-TS07	↓	↓	1.025-5	
5	PAD#1-P50-TS08	↓	↓	1.01-5	
10	PAD#1-P50-TS09	1.0	19.88	1-5	
0.5	PAD#1-P50-TS10	2.0	39.76	2.1-5	
0.5	PAD#1-P50-TS11	4.0	79.59	4.25-5	
0.5	PAD#1-P50-TS12	4.7	93.57	0.51-4	
0.1	PAD#1-P50-TS13	4.7	93.57	0.51-4	
0.5	PAD#1-P50-TS14	↓	↓	0.49-4	
1	PAD#1-P50-TS15	↓	↓	0.49-4	
5	PAD#1-P50-TS16	↓	↓	0.49-4	
10	PAD#1-P50-TS17	4.7	93.57	0.485-4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	12:35	PAD#1-P50-RCK	8	1	168.8	
AM	1:35	NA	8	1	171.4	
	END					

RESONANT COLUMN CYCLIC TORSIONAL SHEAR (RCCyTS) TEST
Specimen Setup / Take Down

Project No: 0411-08-1696 Test Type: RCTS Cell No.: RC7 File Name: N/A
Project Name: (,E) Test Stress(es), σ' = 3.1 , 6.2 , 12.5 , 25 & 50 psi (1)
Task No.: N/A Stokoe Resonant Column Device Gs = N/A [ ] Meas.; [ ] Assumed
Test No.: N/A Test Series No. N/A Top Cap ID: 002

Assig. Remarks: (SR,RD) 5/19/08

[ ] Tube [ ] Field Extruded [ ] Liner [ ] N/A
Boring No.: [illegible] [X] Reconstituted
Sample No.: PAD #1-2 Composite No.: N/A
Depth (ft): N/A Specimen No.: b
[ ] Spec. Selection by X-ray; [ ] Geomarine Sample

Specimen Preparation (for reconstituted samples)
Target Dry Density 115.7 Lift Thickness 29.92 mm 5/19/08 No. Lifts 5
Final Ht. 148.77 Final Area 40.523 cm² Final Vol. 602.86 cm³
Final Total Mass 1208.92 Water Cont. 8.17 %

Type	[X] Isotropic	[ ] Ko stress path
Consolidation:	[ ] Anisotropic	[ ] 45o stress path

Water Content (WC):	Initial - Trimming Location: Top (Wo,1)	Bottom (Wo,2)	Sides (Wo,3)	Final (Wat) (see below)
Container No	163		N/A	PA
Mass Moist Soil + Cont. (g)	154.59			181.74
Mass Dry Soil + Cont. (g)	145.22			169.69
Mass Container (g)	30.49			15.91
Water Content, Wo,n (%)	8.17	N/A	N/A	7.84
Avg. Initial WC, Wo,avg (%)	8.17	Final (Wat);	[ ] Slice;	[ ] Whole Spec.

SOIL MASSES:	Initial	Final
Moist + Tare (etc.)(g):	1805.52	1204.7
Tare (etc.) (g):	596.60	0
Spec. Moist Mass (g):	1208.92	1204.7
EXCESS DRY SOIL (stuck to membrane, filters stones, etc.)		
Container No:		N/A
Mass Dry Soil + Container (g):		N/A
Mass Container (g):		N/A
Mass Excess Dry Soil (g):		N/A

Specimen Dimensions

Height (mm)	Initial (Ho)	Final (Haf)	Diameter (mm)	Initial (Do)	Final (Daf)
GB	127		T	71.9	72.2
1	+ 21.759	147.57	M	71.8	72.2
2	+ 21.768	148.65	B	71.8	72.4
3	+ 21.777	148.27	T'		
4	21.767	148.01	M'		
5	21.771	148.03	B'		
Avg	148.16	147.97	Avg	71.83	72.26

DS 5/19/08

Measuring Devices:
5.80" Pi Tape: [X] Dia. 2.82
Calipers: [ ] Ht. [ ] Dia.
Dial Comparator: [X] Ht. [ ] Dia.

Ao (cm2) = N/A
Vo (cm3) = N/A
Aat (cm2)= N/A
Vat (cm3) = N/A

Estimated Initial Unit Weight:
Total, gt,o (lb/ft3) = N/A Dry, gd,o (lb/ft3)= N/A

Membrane / Filter Paper / Apparatus

Membrane (mm):	Top	Bottom
Number: = 1 [ ] Single; [X] Double	N/A / 0.70	N/A / 0.60
Circumference (Crm,o)	216	216
(1) Total thickness, if 2+ membranes	Thickness (1)	Dia.(Crm,o/p)
Average:		

Filter Paper: Top + Bottom: [ ] Yes ; [✓] No
Filter Strips: [ ] Yes ; [ ] No Number =
If yes number = ✓ Vertical: ¼" & Whatman #54 or N/A
" or = or Sprial: ¼" & Whatman #1 or
Mass Drive Plate & Cap, Mdpc = N/A g, N/A lbf

NA - Not Applicable; UK - Unknown; GB - Gage Block

(INITIAL LVDT READING) 3.70579

Note: (1) Each Test Stress is identified as a Test Stage or Sequence on other data sheets.
Final Specimen Description (USCS group name & symbol, color, layering, max. part. size, slickensided, fissured, blocky, honeycombed, etc.):
Med. to Coarse Sand Brown w/ many gravel

[ ] Photo taken (internal sliced surface & outside surface)
Other Remarks

Resonant Column Cyclic Torsional Shear (RCCyTS) Signature & Equipment Page	Boring: N/A
	Sample: PAD #1 (2)
	Depth (ft): N/A
	Test No. N/A

Project: Nine Mile Point Site Characterization Location: Oswego, New York	Fugro Project No.: 0411-08-1696

SIGNATURES

Specimen Trimmed/Recompacted by:	Date: 5/19/08
Specimen Setup by:	Date: 5.19.08
Test Performed by: (per GEI Procedure 109 rev. ___)	Date: 5/19/08
Specimen Takedown by:	Date: 5/21/08
Preliminary Calculations by:	Date: 5/23/08
Calculated by:	Date: 5/23/08
Reviewed by:	Date: 6/13/08

EQUIPMENT USED

RCCyTS Workstation No.: RC-7	Balance ID: BA-006
Caliper ID: VH-10838	PI Tape ID: VH-10822
Oven ID: #14	Scalping Sieve Size & ID: 3/8" B-31
Other (specify) ID: ———	Other (specify) ID: ———

Comments/Notes: ———

Water Content Measurement

Project Name: Nine Mile Point Site Characterization, Oswego, NY

Project No.: 07223 0411-08-1696

Performed by, per Proc 101, rev ( ): DANIEL NYARKO

Checked By: N/A Date: ~~5/14/08~~ 6/18/08

6/18/08

Determination No.	07223					
Boring	STREETER RATHBUN RD.					
Sample	PAD #1-2					
Oven ID	# 14					
Balance ID	BA 006					
Date/Time in Oven	6/13/08					
Date/Time Out of Oven	5/14/08					
Tare No.	PAN 1					
(a) Wet Wt. + Tare	912.74 g	g	g	g	g	g
(b) Dry Wt. + Tare	856.60 g	g	g	g	g	g
(c) Wt. Tare	138.99 g	g	g	g	g	g
(d) Wt. Water (a – b)	56.14 g	g	g	g	g	g
Wt. Wet Solids (a – c)	773.75 g	g	g	g	g	g
(e) Wt. Dry Solids (b – c)	717.61 g	g	g	g	g	g
Water Content (d/e) x 100, %	7.8					
Is Wet Wt. Enough for Method B? (yes/no)	YES					

DS 6/18/08

Remarks:

Test Notes:
1. Oven dry at 110°C (±5°C) for 12 hours minimum.
2. Cool in desiccator for a minimum of 30 minutes before weighing.

GEI Consultants

Form 101.1, rev. 1

RCTS Testing Record (Page 1 of 10)

Project #: 0411-08-1696 Project: Nine Mile Point Unit 3, Oswego, New York
Specimen #: PAD 1-2 Specimen Description: Fine to coarse sand & w/ many gravel
Tested By, per GEI Procedure 109 rev ( ): [illegible] Date: 5.19.08
Checked By: [illegible] Date: 5/23/08

Test Station: RC 7

Confining Pressure: 3.1 psi **Testing Stage: X0.25**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	4:14	PAD 1-2 - P3 - T0	4	1	76.9	
PM	5:52	PAD 1-2 - P3 - T7	4	1	79.6	
2ND	~~[illegible]~~		~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	

AS 6/17/08 6.19.08 6.19.08

RC Strain Amplitude Effect Tests

AS 5/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

AS 5/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 2 of 10)

Station:_____ Date:_____ Tested by:_____ MS 5/27/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.25**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 3 of 10)

RC7 C.I. 6/20/08

6.19.08

Station: 0411-08-1696 Date: 6.20.08 Tested by: ft Suvad Jupic

Project #: 0411-08-1696 Project Name: GE 1

Boring #: 12 R3 Specimen #: PAD # 1-2

Confining Pressure: 6.2 PSI **Testing Stage: X0.5**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	7:29	PAD# 1-2-P6-T-0	6	1	93.1	
AM	9:06	PAD# 1-2-P6-T-7	"	1	95.9	
EJO	[illegible]					

AS 6/16/08

RC Strain Amplitude Effect Tests

AS 5/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 4 of 10)

Station:_____ Date:_____ Tested by:_____ 5/27/06

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X0.5**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 5 of 10)

6.19.08
SJ

Station: RC7 Date: 6.20.08 Tested by: ~~SJ~~ Suvad Jupic
Project #: 0411-08-169 Project Name: GEI
Boring #: SE B1 Specimen #: PAD#1-2
Confining Pressure: 12.5 Psi **Testing Stage: X1**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	9:20	PAD#1-2-P12-T-0	6	1	112.9	
PM	11:01	PAD#1-2-P12-T-1	6	1	116.6	
END	~~END~~ SJ 6/19/08					

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	5:47	PAD#1-2-P12-S-0	3	1	116.1	
	5:48	PAD#1-2-P12-S-1	6	1	115.4	
	5:48	PAD#1-2-P12-S-2	12	1	114.4	
	5:48	PAD#1-2-P12-S-3	24	1	112.6	
	5:49	PAD#1-2-P12-S-4	48	1	110.1	
	5:50	PAD#1-2-P12-SA-0	96	10	106.9	
	5:50	PAD#1-2-P12-SA-1	192	10	101.9	
	5:52	PAD#1-2-P12-SB-0	384	10	95.2	
PM	5:53	PAD#1-2-P12-SC-0	768	10	85.3	
		~~PAD#1-2-P12~~ END SJ 6.20.08				

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	5:54	PAD#1-2-P12-SCR	6	1	105.1	

RCTS Testing Record (Page 6 of 10)

6.19.08 SJ

Station: RC 7 Date: 8.20.08 Tested by: Surad Jupic

Project #: 0411-08-169 6.20.08 Project Name: GE 1

Boring #: SB P8 Specimen #: PAD #1-2

Confining Pressure: 12.5 PSI **Testing Stage: X1**

TS Tests (prior to tests, fr=116.6 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-2-P12-TS01	0.07	1.39	1.6-6	
0.5	PAD#1-2-P12-TS02	0.14	2.78	3.2-6	
0.5	PAD#1-2-P12-TS03	0.28	5.56	0.63-5	
0.5	PAD#1-2-P12-TS04	0.45	8.94	1.03-5	
0.1	PAD#1-2-P12-TS05	0.45	8.94	1.06-5	
0.5	PAD#1-2-P12-TS06	↓	↓	1.04-5	
1	PAD#1-2-P12-TS07			1.04-5	
5	PAD#1-2-P12-TS08			1.02-5	
10	PAD#1-2-P12-TS09	0.45	8.94	1.01-5	
0.5	PAD#1-2-P12-TS10	0.9	17.90	2.16-5	
0.5	PAD#1-2-P12-TS11	1.8	35.8	4.67-5	
0.5	PAD#1-2-P12-TS12	3.3	65.66	1-4	
0.1	PAD#1-2-P12-TS13	3.3	65.66	1.01-4	
0.5	PAD#1-2-P12-TS14	↓	↓	0.99-4	
1	PAD#1-2-P12-TS15			0.99-4	
5	PAD#1-2-P12-TS16			0.99-4	
10	PAD#1-2-P12-TS17	3.3	65.66	1-4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	11:24	PAD#1-2-P12-TSCK	6	1	109	
PM	5:43	N/A	6	1	115.6	
	END	N/A	N/A	N/A	N/A	

6.19.08
CI

RCTS Testing Record (Page 7 of 10)

Station: CC7 Date: 5.21.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GE1
Boring #: SRM Specimen #: PAD#1-2
Confining Pressure: 25 PSI **Testing Stage: X2**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	7:49	PAD#1-2-P25-T_0	8	1	137.6	
AM	9:29	PAD#1-2-P25-T_7	8	1	141.9	
END	TOA		"			

DS 8/18/08

RC Strain Amplitude Effect Tests

DS 5/27/08

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

RCTS Testing Record (Page 8 of 10)

Station:_____ Date:_____ Tested by:_____ 5/27/08

Project #:_____ Project Name:_____

Boring #:_____ Specimen #:_____

Confining Pressure:_____ **Testing Stage: X2**

TS Tests (prior to tests, fr= Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					
0.5					
0.1					
0.5					
1					
5					
10					
0.5					
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes

6.19.08
SI

RCTS Testing Record (Page 9 of 10)

Station: RC7 Date: 5.21.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GE1
Boring #: SR RL Specimen #: PAD #1-2
Confining Pressure: 50 Psi **Testing Stage: X4**

RC Time Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
AM	9:41	PAD#1-2-P50-T0	8	1	167.9	
AM	[illegible]	PAD#1-2-P50-T-7	8	1	172.6	
	END					

5/19/08

RC Strain Amplitude Effect Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	12:48	PAD#1-2-P50-S-0	4	1	172	
	12:48	PAD#1-2-P50-S-1	8	1	171.7	
	12:48	PAD#1-2-P50-S-2	16	1	171.1	
	12:48	PAD#1-2-P50-S-3	32	1	170.1	
	12:48	PAD#1-2-P50-S-4	64	1	168.3	
	12:50	PAD#1-2-P50-SA-0	128	10	166.3	
	12:50	PAD#1-2-P50-SA-1	256	10	162.5	
	12:51	PAD#1-2-P50-SB-0	512	10	156.6	
	12:52	PAD#1-2-P50-SC-0	1024	10	146.5	
	12:52	PAD#1-2-P50-SD-0	2048	10	137.1	
PM	12:53	PAD#1-2-P50-SE-0	4000	10	123.7	
		END				

Resonant Frequency Check after Higher Strain Amplitude Tests

Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
12:54	PAD#1-2-P50-SCL	8	1	155.8	

6/19/08
SI

RCTS Testing Record (Page 10 of 10)

Station: RC7 Date: 5.21.08 Tested by: Suvad Jupic
Project #: 0411-08-1696 Project Name: GEI
Boring #: CRM Specimen #: PAD #1-2
Confining Pressure: 50 PSI **Testing Stage: X4**

TS Tests (prior to tests, fr=172.6 Hz)

Frequency (Hz)	File Name	Pre-Amp Input (mV)	Post-Amp Input (mV)	Strain Amplitude	Notes
0.5	PAD#1-2-P50-TS01	0.15	2.98	1.6-6	
0.5	PAD#1-2-P50-TS02	0.30	5.96	31-6	
0.5	PAD#1-2-P50-TS03	0.6	11.93	06-5	
0.5	PAD#1-2-P50-TS04	1	19.88	1.04-5	
0.1	PAD#1-2-P50-TS05	1	19.88	1.05-5	
0.5	PAD#1-2-P50-TS06			1.04-5	
1	PAD#1-2-P50-TS07			1.03-5	
5	PAD#1-2-P50-TS08			1.01-5	
10	PAD#1-2-P50-TS09	1	19.88	1-5	
0.5	PAD#1-2-P50-TS10	2	39.77	2.1-5	
0.5	PAD#1-2-P50-TS11	4	79.61	4.77-5	
0.5	PAD#1-2-P50-TS12	4.7	93.57	0.52-4	
0.1	PAD#1-2-P50-TS13	4.7	93.57	0.53-4	
0.5	PAD#1-2-P50-TS14			0.5-4	
1	PAD#1-2-P50-TS15			0.5-4	
5	PAD#1-2-P50-TS16			0.49-4	
10	PAD#1-2-P50-TS17	4.7	93.59	0.48-4	
0.5	END				
0.5					

Resonant Frequency Check after Higher Strain Amplitude Tests

	Time (min)	File Name	Input (mV)	Gain @ Charge Amplifier	fr (Hz)	Notes
PM	11:50	PAD#1-2-P50-TSCK	8	1	169.5	
AM	12:40	NA	8	1	171.8	
END						