

SGI TESTING SERVICES

A Georgia Limited Liability Company

18 May 2008

Mr. David Agee Geostone Retaining Wall Systems, Inc. P.O. Box 325 Westover, AL 35185

Subject: Laboratory Test Results Transmittal

Connection Strength Testing

Synteen SF Geogrids/

Geostone Blocks (8" Thick)

Dear Mr. Agee,

SGI Testing Services, LLC (SGI) is pleased to present the attached test results for the above-mentioned testing program. The note section below addresses sample preparation, sample disposal and a disclosure statement.

SGI appreciates the opportunity to provide laboratory testing services to Geostone Retaining Wall Systems, Inc. Should you have any questions regarding the attached document(s), or if you require additional information, please do not hesitate to contact the undersigned.

Sincerely,

Zehong Yuan, Ph.D., P.E. Laboratory Manager

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Attachments

(1) Unless otherwise noted in the test results the sample(s)/specimen(s) were prepared in accordance with the applicable test standards or generally accepted sampling

(2) Contaminated/chemical samples and all related laboratory generated waste (i.e., test liquids, PPE, absorbents, etc.) will be returned to the client or designated representative(s), at the client's cost, within 60 days following the completion of the testing program, unless special arrangements for proper disposal are made with SGI_{sm}. (3) Materials that are not contaminated will be discarded after test specimens and archived specimens are obtained. All of the tested and archived specimens will be discarded 30 days after the completion of testing, unless long-term storage arrangements are specifically made with the laboratory.

(4) The reported results apply only to the materials and test conditions used in the laboratory testing program. The results do not necessarily apply to other materials or test conditions. The test results should not be used in engineering analysis unless the test conditions model the anticipated field conditions. The testing was performed in accordance with general engineering testing standards and requirements. The reported results are submitted for the exclusive use of the client to whom they are addressed.

SGI8014-01

Mail To: SGITesting Services, LLC

P.O. Box 2427 Lil bur n, Geor gia 30048 - 2427 4405 International Boulevard

Facility Location

Suit e B-117 Nor cross, Georgia 30093

Phone: 770.931.8222 Fax: 770.931.8240

ATTACHMENT 1 SCHEMATIC DIAGRAM AND PHTOTO CONNECTION TEST SET-UP

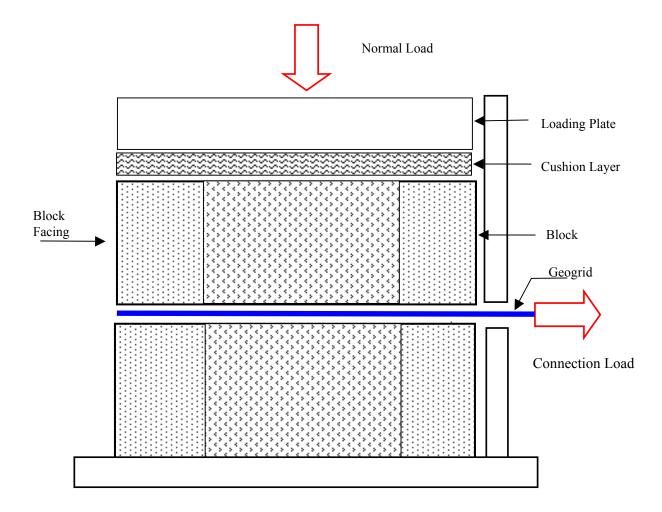


Figure A-1. Schematic Diagram of Test Set-up

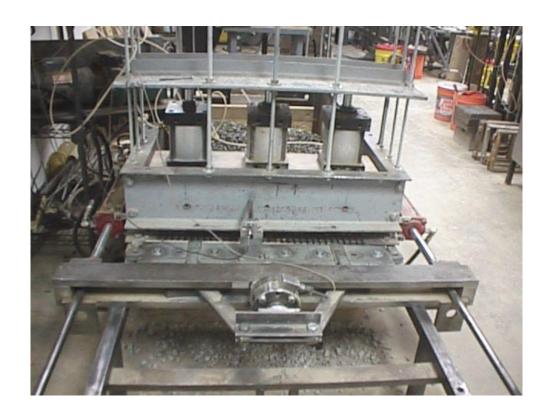
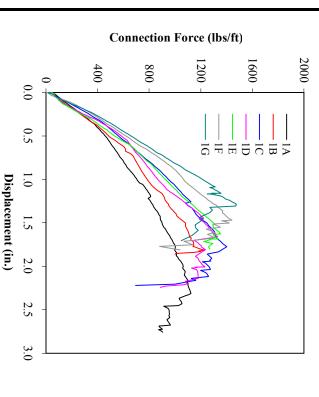


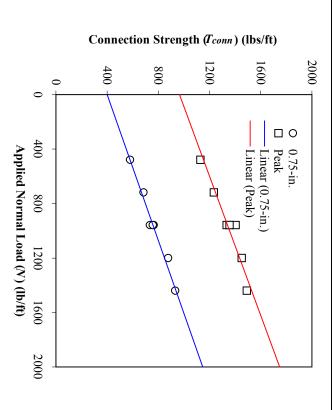
Figure A-2. Photo of Connection Test Set-up

ATTACHMENT 2 CONNECTION TEST RESULTS

CONNECTION STRENGTH TESTING (ASTM D 6638) GEOSTONE RETAINING WALL SYSTEMS, INC.

compacted AASHTO #57 stone within block apertures and space between blocks TEST SERIES NO. 1: Synteen SF20 geogrid in machine direction between two courses of Geostone blocks (8" thick) with





d Test Equivalent Approx. Approx. 0.75-in. en Normal Normal No. of Wall Strength Strength Vidth Stress Load Blocks Height (lb/ft) (lb/ft) 3.3 480 6 4.0 578 5.0 720 9 6.0 682 6.7 960 12 8.0 763 6.7 960 12 8.0 733 6.7 960 12 8.0 736 8.2 1200 15 100 875		1489	930	12.0 igh. in each test.	n. long and 8 in. h	18 12.0 18 12.0 12.0 18 12.0 12.0 18 in. wide by 12 in. long and 8 in. high. 70 lbs 120 pcf Abrasion and rupture of geogrid ribs in each test	10.0 Gravel):	NOTES: 34.0 10. NOTES: Dimensions of Block: Weight of Full-Size Block: Unit Weight of Facing (Block & Gravel): Failure Mode of Geogrid:	NOTES: Dimensions of Block: Weight of Full-Size B Unit Weight of Facing Failure Mode of Geog
Test Equivalent Approx. Approx. 0.75-in. Peak Conn Normal Normal No. of Wall Strength Strength Strength (psi) Load Blocks Height (lb/ft) (lb/ft) (lb/ft) 3.3 480 6 4.0 578 1128 1128 5.0 720 9 6.0 682 1232 7a.75-in. = 6.7 960 12 8.0 763 1403 7a.64 = 6.7 960 12 8.0 733 1332 7a.64 =			756 875	8.0	12	960	6.7	34.0	1E
Test Equivalent Approx. Approx. 0.75-in. Peak Conn Normal Normal No. of Wall Strength Strength Strength stress Load Blocks Height (lb/ft) (lb/ft) <td< td=""><td></td><td></td><td>733</td><td>8.0</td><td>12</td><td>960</td><td>6.7</td><td>34.0</td><td>1D</td></td<>			733	8.0	12	960	6.7	34.0	1D
Test Equivalent Approx. Approx. 0.75-in. Peak Conn Normal Normal No. of Wall Strength Strength Strength 1 Stress Load Blocks Height (lb/ft) (lb/f		1403	763	8.0	12	960	6.7	34.0	1C
Test Equivalent Normal Approx. Approx. 0.75-in. Peak Normal Normal No. of Wall Strength Strength Stress Load Blocks Height (lb/ft) (lb/ft) (psi) (lb/ft) (ft) (lb/ft) (lb/ft) 3.3 480 6 4.0 578 1128	$T_{0.75-in.} =$	1232	682	6.0	9	720	5.0	34.0	1B
Test Equivalent Approx. Approx. 0.75-in. Peak Normal Normal No. of Wall Strength Strength Stress Load Blocks Height (ft) (lb/ft) (lb/ft) (lb/ft)		1128	578	4.0	6	480	3.3	34.0	1A
Test Equivalent Approx. Approx. 0.75-in. Peak Normal Normal No. of Wall Strength Strength Stress Load Blocks Height		(lb/ft)	(lb/ft)	(ft)		(lb/ft)	(psi)	(in.)	
Test Equivalent Approx. Approx. 0.75-in. Peak Normal Normal No. of Wall Strength Strength				Height	Blocks	Load	Stress	Nominal Width	
Test Equivalent Approx. Approx. 0.75-in. Peak		Strength	Strength	Wall	No. of	Normal	Normal	Specimen	No.
	Connect	Peak	0.75-in.	Approx.	Approx.	Equivalent	Test	Geogrid	Test



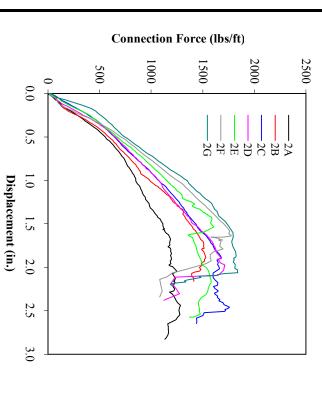
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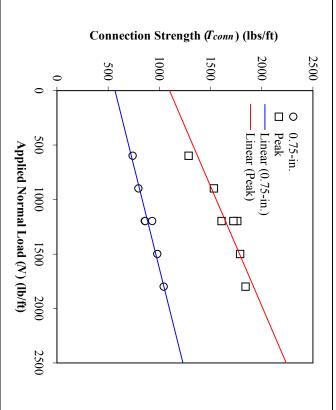
DATE REPORTED: 3/20/2008

DOCUMENT NO PROJECT NO. FIGURE NO. SGI8014 C-1

CONNECTION STRENGTH TESTING (ASTM D 6638) GEOSTONE RETAINING WALL SYSTEMS, INC.

compacted AASHTO #57 stone within block apertures and space between blocks TEST SERIES NO. 2: Synteen SF35 geogrid in machine direction between two courses of Geostone blocks (8" thick) with





								NOTES
	1840	1042	15.0	23	1800	12.5	34.0	2G
	1786	980	12.5	19	1500	10.4	34.0	2F
		929	10.0	15	1200	8.3	34.0	2E
$T_{peak} = 1100 + (N) tan (24)$		861	10.0	15	1200	8.3	34.0	2D
	1760	857	10.0	15	1200	8.3	34.0	2C
$T_{0.75-in.} = 565 + (N) tan (15^{\circ})$	1530	793	7.5	11	900	6.3	34.0	2B
	1284	737	5.0	8	600	4.2	34.0	2A
(T_{conn})	(lb/ft)	(lb/ft)	(ft)		(lb/ft)	(psi)	(in.)	
			Height	Blocks	Load	Stress	Nominal Width	
	Strength	Strength	Wall	No. of	Normal	Normal	Specimen	No.
Connection Strength Equations	Peak	0.75-in.	Approx.	Approx.	Equivalent	Test	Geogrid	Test



Dimensions of Block:
Weight of Full-Size Block:
Unit Weight of Facing (Block & Gravel):

Failure Mode of Geogrid:

18 in. wide by 12 in. long and 8 in. high. 70 lbs 120 pcf

Abrasion and rupture of geogrid ribs in each test

DATE REPORTED: 3/20/2008

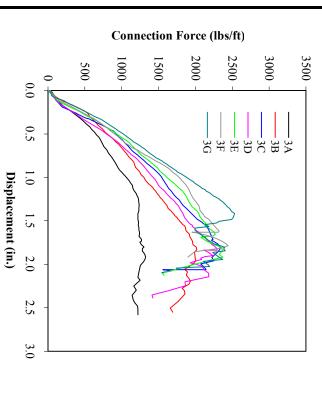
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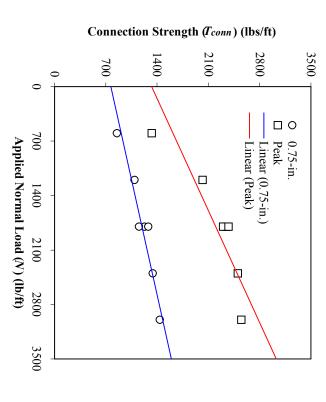


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CONNECTION STRENGTH TESTING (ASTM D 6638) GEOSTONE RETAINING WALL SYSTEMS, INC.

compacted AASHTO #57 stone within block apertures and space between blocks TEST SERIES NO. 3: Synteen SF55 geogrid in machine direction between two courses of Geostone blocks (8" thick) with





NOTES:	3G	3F	3E	3D	3C	3B	3A			No.	Test
	34.0	34.0	34.0	34.0	34.0	34.0	34.0	(in.)	Nominal Width	Specimen	Geogrid
	20.8	16.7	12.5	12.5	12.5	8.3	4.2	(psi)	Stress	Normal	Test
	3000	2400	1800	1800	1800	1200	600	(lb/ft)	Load	Normal	Equivalent
	38	30	23	23	23	15	8		Blocks	No. of	Approx.
	25.0	20.0	15.0	15.0	15.0	10.0	5.0	(ft)	Height	Wall	Approx.
	1431	1335	1278	1150	1224	1086	846	(lb/ft)		Strength	0.75-in.
	2546	2498	2373	2297	2336	2020	1326	(lb/ft)		Strength	Peak
				$T_{peak} = 1325 + (N) tan (26)$		$T_{e.75-in.} = 765 + (N) tan (13°)$		(T_{conn})			Connection Strength Equations



Dimensions of Block: Weight of Full-Size Block:

Unit Weight of Facing (Block & Gravel):

Failure Mode of Geogrid:

18 in. wide by 12 in. long and 8 in. high. 70 lbs 120 pcf

Abrasion and rupture of geogrid ribs in each test

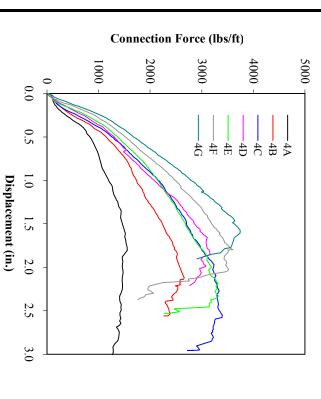


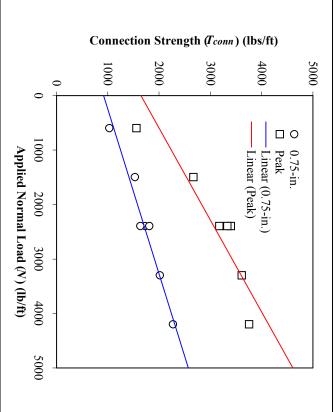
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GEOSTONE RETAINING WALL SYSTEMS, INC. CONNECTION STRENGTH TESTING (ASTM D 6638)

compacted AASHTO #57 stone within block apertures and space between blocks TEST SERIES NO. 4: Synteen SF80 geogrid in machine direction between two courses of Geostone blocks (8" thick) with





NOTES:	4G	4F	4E	4D		4B					Test
	34.0	34.0	34.0	34.0	34.0	34.0	34.0	(in.)	Nominal Width	Specimen	Geogrid
	29.2	22.9	16.7	16.7	16.7	10.4	4.2	(psi)	Stress	Normal	Test
	4200	3300	2400	2400	2400	1500	600	(lb/ft)	Load	Normal	Equivalent
	53	41	30	30	30	19	8		Blocks	No. of	Approx.
	35.0	27.5	20.0	20.0	20.0	12.5	5.0	(ft)	Height	Wall	Approx.
	2265	2012	1803	1632	1724	1521	1022	(lb/ft)		Strength	0.75-in.
	3749	3607	3328	3172	3397	2663	1557	(lb/ft)		Strength	Peak
				$T_{peak} = 1645 + (N) tan (31)^{\circ}$		$T_{0.75-in.} = 920 + (N) tan (18^{\circ})$		(T_{com})			Connection Strength Equations



Dimensions of Block:
Weight of Full-Size Block:
Unit Weight of Facing (Block & Gravel):
Failure Mode of Geogrid:

18 in. wide by 12 in. long and 8 in. high. 70 lbs 120 pcf

Abrasion and rupture of geogrid ribs in each test

SGI TESTING SERVICES, LLC

DATE REPORTED: 3/20/2008
FIGURE NO. C-4

FIGURE NO. C-4
PROJECT NO. SGI8014
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