

August 6, 2013

Billy Bice
Eagle Bay Hardscape Products®
1231 Willis Road
Richmond, Virginia 23237

Mr. Bice

Enclosed please find a report of testing performed by the National Concrete Masonry Association Research and Development Laboratory on the following products:

Report Number	Unit Description
13-341	Concrete Paving Unit Mark: Aqua Brick Type 4 'L' 80mm

Please note that the contents of this report are not to be reproduced, except in full, without the written approval of the NCMA Research and Development Laboratory.

We are constantly improving our services and would greatly appreciate any feedback regarding your experience with NCMA's Research and Development Laboratory. We have set up an online survey which can be found at www.ncma.org/lab/Pages/LaboratorySurvey.aspx. After taking the online survey, make use of the many resources available at our website, www.ncma.org, including the latest industry news and events, a searchable directory of products and services, a vast collection of literature on the design, implementation, and marketing of manufactured concrete products and hardscape systems, as well as a list of available laboratory services for future testing.

The National Concrete Masonry Association Laboratory is dedicated to the scientific testing and research of concrete masonry products and systems. We take pride in meeting your product certification and evaluation requirements and look forward to continuing to service your testing needs for years to come.

Thank you for choosing NCMA's Research and Development Laboratory. Please feel free to contact me directly with any comments or questions at 703-713-1900 or nlang@ncma.org.

Sincerely,



Nicholas R. Lang
Manager, Research & Development Laboratory

ASTM C140-12a Test Report
Sampling and Testing Concrete Masonry Units and Related Units

Job No: 13-341A
Report Date: 6/5/2013

Client: Eagle Bay Hardscape Products®
Address: 1231 Willis Road
Richmond, VA 23237

Testing Agency: National Concrete Masonry Association
Research and Development Laboratory
Address: 13750 Sunrise Valley Drive
Herndon, VA 20171-4662

Unit Specification: ASTM C936/C936M-12

Sampling Party: Eagle Bay Hardscape Products®

Unit Description: Concrete Paving Unit
Mark "Aqua-Bric Type 4 'L' 80 mm"

Date Samples Received: 5/10/2013

Specified Height (mm): 80

Summary of Test Results

	ASTM C936			ASTM C140 Required Compression	
	Required	Actual		Specimen	Actual
Net Area Compressive Strength:	8000 min	9850	psi	Length/Width Ratio:	2.1 max 1.33
Absorption:	5 max	4.3	%	Aspect Ratio (R_a):	0.60 - 1.20 0.67
Density (Oven Dry Condition):	---	134.5	lb/ft ³	Average Cap Thickness:	0.0625 max 0.03 in.

Individual Unit Test Results

Full Size Unit Measurements

	Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Sample Weight (lb)
Unit #1	9.413	3.194	9.648	17.24
Unit #2	9.387	3.144	9.685	16.91
Unit #3	9.409	3.132	9.661	16.71
Average	9.403	3.157	9.665	16.95

Compression Specimens

The compression specimens were reduced in size to meet test specimen dimensional requirements.

Date Tested: 6/5/2013

	Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Sample Weight (lb)
Unit #1	4.734	3.194	6.307	7.46
Unit #2	4.747	3.144	6.298	7.39
Unit #3	4.728	3.132	6.308	7.32
Average	4.736	3.157	6.304	7.39

	Average After Capping Height (in.)	Average Cap Thickness (in.)	Aspect Ratio R_a	Aspect Ratio Factor F_a	Total Load (lb)	Net * Area (in. ²)	Net Area Compressive Strength (psi)
Unit #1	3.243	0.024	0.67	1.06	275690	29.86	9760
Unit #2	3.223	0.040	0.66	1.05	278770	29.89	9760
Unit #3	3.208	0.038	0.66	1.05	285540	29.82	10020
Average	3.224	0.034	0.67	1.05	280000	29.86	9850

* Net area determined as the product of the length and width of the unit.

Absorption Specimens

	Received Weight W_R (lb)	Immersed Weight W_I (lb)	SSD Weight W_S (lb)	Oven-Dry Weight W_D (lb)	Absorption (%)	Density (pcf)	Net Volume (ft ³)	
Date Tested: 5/30/2013 to 6/1/2013	Unit #4	17.03	9.63	17.31	16.58	4.4	134.8	0.1230
	Unit #5	16.88	9.50	17.10	16.42	4.2	134.7	0.1219
	Unit #6	16.80	9.44	17.05	16.35	4.3	134.0	0.1220
	Average	16.90	9.52	17.15	16.45	4.3	134.5	0.1223

Comments: These units meet or exceed the compressive strength and absorption requirements of ASTM C936/C936M-12.



Nicholas R. Lang
Manager, Research & Development Laboratory

**ASTM C1645/C1645M-11 Test Report
Freeze-Thaw and De-icing Salt Durability of
Solid Concrete Interlocking Paving Units**

Job No: 13-341B
Report Date: 8/8/2013

Client: Eagle Bay Hardscape Products®
1231 Willis Road
Richmond, Virginia 23237

Testing Agency: National Concrete Masonry Assoc.
Research and Development Laboratory
Address: 13750 Sunrise Valley Drive
Herndon VA, 20171-4662

Unit Specification: ASTM C936/C936M-12

Sampling Party: Eagle Bay Hardscape Products®

Name/Description of Unit:
Concrete Paving Unit
Mark: Aqua Brick Type 4 'L' 80mm

Date Samples Received: 5/10/2013

Specified Height (mm): 80

Summary of Test Results

	Required	Actual	
Surface Area	****	0.12	m ²
7 Cycle Mass Loss	****	7.22	g/m ²
28 Cycle Mass Loss	225 max	46.61	g/m ²

Test Solution: Water

Individual Unit Test Results

	Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Surface Area (in ²)	Surface Area (m ²)
Unit #1	4.75	3.13	9.41	178.06	0.11
Unit #2	4.79	3.13	9.39	178.61	0.12
Unit #3	4.76	3.15	9.42	178.99	0.12
Average	4.76	3.14	9.41	178.55	0.12

Date Tested:
6/25/2013

	7 Cycle Mass Loss (g)	7 Cycle Mass Loss (g/m ²)	28 Cycle Mass Loss (g)	28 Cycle Mass Loss (g/m ²)
Unit #1	0.68	5.92	3.63	31.60
Unit #2	1.13	9.84	9.53	82.69
Unit #3	0.68	5.89	2.95	25.54
Average	0.83	7.22	5.37	46.61

Date Tested:
6/26/2013
to
8/4/2013



Comments: These units comply with the resistance to freezing and thawing requirements of ASTM C936/C936M-12.

Nicholas R. Lang
Manager, Research & Development Laboratory

**ASTM C418-12 Test Report for Abrasion Resistance of
of Concrete by Sandblasting**

Job No.: 13-341C
Report Date: 8/8/2013

Client: Eagle Bay Hardscape Products®
Address: 1231 Willis Road
Richmond, VA 23237

Testing Agency: National Concrete Masonry Association
Address: Research and Development Laboratory
13750 Sunrise Valley Drive
Herndon, VA 20171-4662

Unit Designation/Description: Concrete Paving Unit
Mark "Aqua-Bric Type 4 'L' 80 mm"

Date Samples Received: 5/10/2013
Sampling Party: Eagle Bay Hardscape Products®

The client delivered full size solid concrete paving units for abrasion resistance testing.
This testing was subcontracted by the NCMA Research and Development Laboratory.
Two units were sampled for testing.

Summary of Test Results

	Required	Actual
Volume Loss.....	15 max	1.99 cm ³ /50 cm ²
Average Thickness Loss.....	3 max	0.40 mm

Based on the criteria in C936/C936M-12, these units comply with the requirements for abrasion resistance.

NOTE: Testing performed at:
TEC Services, Inc.
235 Buford Drive
Lawrenceville, GA 30046
Ref: TEC Project No. TEC 12-0982



Nicholas R. Lang
Manager, Research and Development
Laboratory