NATIONAL CONCRETE MASONRY ASSOCIATION
RESEARCH & DEVELOPMENT LABORATORY

13750 Sunrise Valley Drive
Herndon, VA 20171- 4662
703. 713. 1900 Main
703. 713. 1910 Fax
www.ncma.org

September 7, 2017

Fred Dunand
Saturn Materials
350 Yorkville Park Square
Columbus, MS 39702

Mr. Dunand,

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
17-437	Concrete Paving Unit Mark: 'Holland Paver'

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: http://www.surveymonkey.com/s/DDFPZT9. After taking the online survey, make use of the many resources available at our website, www.ncma.org. There you will find 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 the available laboratory services for future testing.

The National Concrete Masonry Association Research and Development 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
Director of Business Development

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ASTM C140/C140M-17 Test Report
Sampling and Testing Concrete Masonry Units and Related Units
Compressive Strength Testing Only

Job No: 17-437
Report Date: 9/7/2017

Client: Saturn Materials
Address: 350 Yorkville Park Square
Columbus, MS 39702

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

Unit Specification: ASTM C936/C936M-16

Sampling Party: Saturn Materials

Unit Description: Concrete Paving Unit
Mark: 'Holland Paver'

Date Samples Received: 9/6/2017

Specified Height (mm): 60

Summary of Test Results

	ASTM C936 Required	Actual	
Net Area Compressive Strength:	8000 min	8070	psi

	ASTM C140 Required Compression Specimen	Actual	
Length/Width Ratio:	2.1 max	2.02	
Aspect Ratio (R_a):	0.60 - 1.20	0.62	
Average Cap Thickness:	0.0625 max	0.03	in.

Individual Unit Test Results

Full Size Unit Measurements

Date Tested: 9/6/2017

Specimen No.	Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Sample Weight (lb)
Unit #1	3.885	2.394	7.832	5.62
Unit #2	3.883	2.394	7.831	5.67
Unit #3	3.883	2.390	7.827	5.49
Average	3.883	2.393	7.830	5.59

Compression Specimens

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

Date Tested: 9/6/2017

Specimen No.	Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Sample Weight (lb)
Unit #1	3.885	2.394	7.832	5.62
Unit #2	3.883	2.394	7.831	5.67
Unit #3	3.883	2.390	7.827	5.49
Average	3.883	2.393	7.830	5.59

Specimen No.	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	2.445	0.026	0.62	1.00	245100	30.43	8090
Unit #2	2.445	0.026	0.62	1.00	262660	30.40	8680
Unit #3	2.453	0.031	0.62	1.00	225020	30.39	7430
Average	2.447	0.027	0.62	1.00	244260	30.41	8070

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

Comments: 1) These units meet or exceed the compressive strength and dimensional requirements of ASTM C936/C936M-16.

Nicholas R. Lang
Director of Business Development