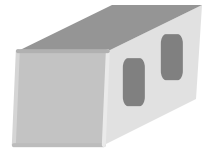




# BLOCK PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

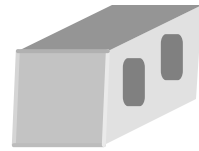
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**FOR:** Kevin Vernazza  
**Cc:** Mike Burdette  
Richard Anderson  
Paul Tessier

**SUBJECT:** Superrock Block Company

**DATE:** March 22, 2002

**PROJECT:** 0201-19 BP

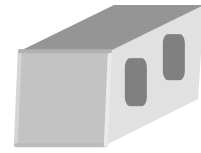
**SAMPLES SUBMITTED:** Six rough-face CMU types (6 faces of each)

<u>Sample</u>	<u>Color</u>	<u>Size</u>
Split-face CMU	706 Overton	16" x 8" x 2"
Split-face CMU	303 Briarwood	16" x 8" x 2"
Split-face CMU	801 Limestone	16" x 8" x 2"
Split-face CMU	505 Redstone	16" x 8" x 2"
Split-face CMU	206 Oak Mountain	16" x 8" x 2"
Split-face CMU	304 Cahaba	16" x 8" x 2"

**Submitted by:** Kevin Vernazza  
Superrock Block Company  
3017 35<sup>th</sup> St. N  
Birmingham, AL 35207



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## PURPOSE OF TESTING:

Six integrally colored split-face CMUs with large, small and fine aggregate were submitted for testing using PROSOCO's new construction cleaning and water repellent products.

**A. Cleaning Concrete Masonry Units:** Sure Klean<sup>®</sup> New Construction Cleaners were evaluated for removal of laboratory applied mortar.

To simulate new construction soiling, all CMUs are placed on a bench with finished surface facing upward. Hollow cylinders measuring 50 mm in diameter and 75 mm tall are positioned on top of each CMU and filled with a wet mixture of Type S cementitious mortar. The wet, mortar-filled cylinder is allowed to remain in contact with the CMU for 10 minutes before removal.

Soiled CMUs are allowed to dry before test cleaning.

Heavy deposits of mortar are removed with dry scraping after 24 hours. Prepared cleaning solutions are then evaluated for their effectiveness in removing residual Type S mortar staining after 3 days, 7 days, and 14 days of curing.

Refer to “\*Note: When cleaning integrally colored CMU” in the following section, “Surface Alteration Testing.”

**B. Surface Alteration Testing** - Sure Klean<sup>®</sup> Custom Masonry Cleaner was tested at various dilutions to determine if a cleaning program implemented to remove excess mortar and related new construction soiling would otherwise alter the appearance of cleaned surfaces. Surface Alteration was evaluated visually based upon perceived discoloration or erosion/etching of the masonry unit.

Aggregate Exposure is the visual examination of the CMU comparing aggregate exposure of the untreated control surface to surfaces cleaned with selected product(s) at given dilutions.

Surface Pigment Alteration/Removal\* is the visual examination of the CMU comparing the surface pigmentation of the untreated control to surfaces cleaned with selected product(s) at given dilutions.

Matrix Erosion is the visual examination comparing the untreated control surface to surfaces cleaned with selected products at given dilutions looking for any potential erosion/digestion of the cementitious matrix of the CMU.

Staining is the visual examination for changes that are the result of a chemical reaction that leaves a staining precipitate.

The following is the scale used for reporting results of all categories:

0 – no change	3 – heavy
1 – slight	4 – excessive
2 – moderate	

**\* NOTE: When cleaning integrally colored CMU.**

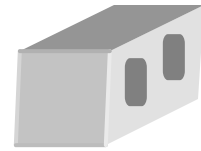
Integrally colored concrete masonry units (CMUs) frequently have high amounts of pigments concentrated on the surface of the cured concrete unit. Variation of surface pigment concentrations from one CMU to the next creates a blotchy appearance in the completed wall. Allowed to remain on the surface of the CMU, the weakly bound pigment will weather and streak, further detracting from the appearance of the completed CMU wall.

In addition to removing excess mortar and construction related soiling, the goal of any cleaning operation undertaken on integrally colored CMU should include removal of unnaturally high concentrations of surface pigment. By revealing the natural through-body color on the integrally colored unit, the overall color uniformity and weathering resistance of the completed CMU wall is improved.

**C. Protective Water Repellents** - Sure Klean<sup>®</sup> Custom Masonry Sealer and Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate were evaluated for their ability to provide water repellency to the submitted samples.



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## CLEANING PRODUCTS EVALUATED

SAMPLE	Sure Klean <sup>®</sup> Custom Masonry Cleaner
All Colors of Split-face CMUs	1:2
	1:4
	1:6

## SURFACE ALTERATION PRODUCTS EVALUATED

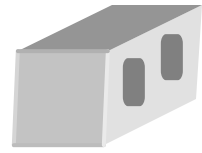
SAMPLE	Sure Klean <sup>®</sup> Custom Masonry Cleaner
All Colors of Split-face CMUs	1:2
	1:4
	1:6

## WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	Product	Dilution
All Colors of Split-face CMUs	Sure Klean <sup>®</sup> Custom Masonry Sealer	Concentrate
	Sure Klean <sup>®</sup> Weather Seal Siloxane WB Concentrate	1:9; 1:14



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## SECTION A – CLEANING INTEGRALLY COLORED CMUs

### DESCRIPTION OF PRODUCTS EVALUATED

These cleaning trials were conducted to determine the optimal cleaning/cure time combination.

**Sure Klean<sup>®</sup> Custom Masonry Cleaner** – A general purpose, concentrated acidic cleaner for most custom masonry and colored concrete. Removes concrete splashes, excess mortar, mud, heavy efflorescence and surface soiling, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 2-6 parts water. Apply by brush or low-pressure spray.

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### TEST METHOD – Cleaning

Dilution ratios refer to mixtures of parts concentrated cleaner : parts fresh water.

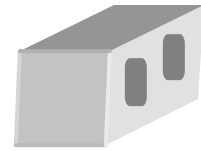
Sure Klean<sup>®</sup> Custom Masonry Cleaner evaluated at dilution 1:2, 1:4, and 1:6. The following procedure was used:

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow 3-5 minute exposure time.
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
6. Allow the surface to dry for at least 18 hours and visually examine.

\* Pressure rinsing was conducted at approximately 1300 psi with a warm water flow rate of 1.9 gallons per minute.



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## Test Results - Cleaning

Sample	Cleaner	Dilution	Cure	Effectiveness
All Colors of Split-face CMUs	Custom Masonry Cleaner	1:2	3 day	100%
		1:4		100%
		1:6		100%
		1:2	7 day	100%
		1:4		100%
		1:6		100%
		1:2	14 day	100%
		1:4		100%
		1:6		100%

## CONCLUSIONS - Cleaning:

Based on the test data, all of the submitted block samples were efficiently cleaned with each dilution of the selected PROSOCO Inc.'s cleaning products. Use higher concentrations and surface agitation to maximize aggregate exposure. Use low concentration and surface agitation to minimize aggregate exposure.

Based on the test data, all dilutions of Sure Klean<sup>®</sup> Custom Masonry Cleaner tested affected the substrate in a similar manner, removing slight to moderate concentrations of pigmented matrix from the split-face CMUs, exposing small and large aggregate, and enhancing the natural appearance of the integrally colored concrete masonry unit.

## RECOMMENDED PRODUCTS AND DILUTIONS - CLEANING:

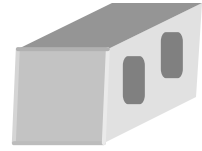
Based on these evaluations, all of the dilutions of Sure Klean<sup>®</sup> Custom Masonry Cleaner tested can be recommended for job-site testing. They all are effective in removing excess mortar, and they all assist in improving the color and uniformity of these concrete blocks. The most appropriate cleaner and dilution should be determined on the specific job-site, and will be dependent primarily on the nature and severity of soiling present at that location.

Note: To remove excess mortar while minimizing aggregate exposure and color enhancement, clean within 7 days of completion using Sure Klean<sup>®</sup> Custom Masonry Cleaner diluted with 6 parts fresh water.

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. On-site testing should be conducted to determine the most appropriate cleaning product and procedures for a particular project. See product literature for additional application and product information.



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## SECTION B – SURFACE ALTERATIONS

### **DESCRIPTION OF PRODUCTS EVALUATED – Surface Alterations:**

**Sure Klean<sup>®</sup> Custom Masonry Cleaner** – A general purpose, concentrated acidic cleaner for most custom masonry and colored concrete. Removes concrete splashes, excess mortar, mud, heavy efflorescence and surface soiling, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 2-6 parts water. Apply by brush or low-pressure spray.

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### **TEST METHOD – Surface Alteration Testing:**

Dilution ratios refer to mixtures of concentrated cleaner : fresh water.

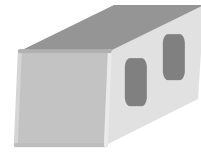
Sure Klean<sup>®</sup> Custom Masonry Cleaner evaluated at dilution 1:2, 1:4, and 1:6. The following procedure was used:

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow 3-5 minute exposure time.
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
7. Allow the surface to dry for at least 18 hours and visually examine.

\* Pressure rinsing was conducted at approximately 1300 psi with a warm water flow rate of 1.9 gallons per minute.



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**Surface Alteration Results:**

<b>Substrate: Split-face CMU</b>		<b>Pigment Color: 706 Overton</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:2	2	2	2	0
Custom Masonry Cleaner	1:4	2	1	2	0
Custom Masonry Cleaner	1:6	1	1	1	0
<b>Substrate: Split-face CMU</b>		<b>Pigment Color: 303 Briarwood</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:2	2	1	2	0
Custom Masonry Cleaner	1:4	1	1	1	0
Custom Masonry Cleaner	1:6	1	0	1	0
<b>Substrate: Split-face CMU</b>		<b>Pigment Color: 801 Limestone</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:2	1	1	1	0
Custom Masonry Cleaner	1:4	1	1	1	0
Custom Masonry Cleaner	1:6	0	1	0	0
<b>Substrate: Split-face CMU</b>		<b>Pigment Color: 505 Redstone</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:2	2	1	2	0
Custom Masonry Cleaner	1:4	1	1	1	0
Custom Masonry Cleaner	1:6	0	1	0	0

Scale used for reporting results of all categories

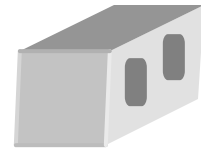
0 – no change  
1 – slight  
2 – moderate

3 – heavy  
4 – excessive





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### Surface Alteration Results Continued:

<b>Substrate: Split-face CMU</b>		<b>Pigment Color: 206 Oak Mountain</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:2	1	1	1	0
Custom Masonry Cleaner	1:4	0	1	0	0
Custom Masonry Cleaner	1:6	0	1	0	0
<b>Substrate: Split-face CMU</b>		<b>Pigment Color: 304 Cahaba</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:2	2	1	2	0
Custom Masonry Cleaner	1:4	1	1	1	0
Custom Masonry Cleaner	1:6	1	1	1	0

Scale used for reporting results of all categories

0 – no change  
 1 – slight  
 2 – moderate

3 – heavy  
 4 – excessive

### **CONCLUSIONS – Surface Alterations:**

Based on the test data, all dilutions of Sure Klean<sup>®</sup> Custom Masonry Cleaner tested affected the substrate in a similar manner, removing slight to moderate concentrations of pigmented matrix from the split-face CMUs, exposing small and large aggregate, and enhancing the natural appearance of the integrally colored concrete masonry unit.

Use higher concentrations and surface agitation to maximize aggregate exposure. Use low concentration and surface agitation to minimize aggregate exposure.

### **RECOMMENDED PRODUCTS AND DILUTIONS – SURFACE ALTERATIONS:**

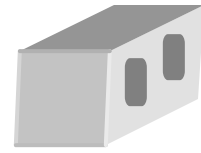
Based on these evaluations, all of the dilutions of Sure Klean<sup>®</sup> Custom Masonry Cleaner tested can be recommended for job site testing. They all are effective in removing excess mortar, and they all assist in improving the color and uniformity of these concrete blocks. The most appropriate cleaner and dilution should be determined on the specific job-site, and will be dependent primarily on the nature and severity of soiling present at that location.

Note: To remove excess mortar while minimizing aggregate exposure and color enhancement, clean within 7 days of completion using Sure Klean<sup>®</sup> Custom Masonry Cleaner diluted with 6 parts fresh water.

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. On-site testing should be conducted to determine the most appropriate cleaning product and procedures for a particular project. See product literature for additional application and product information.



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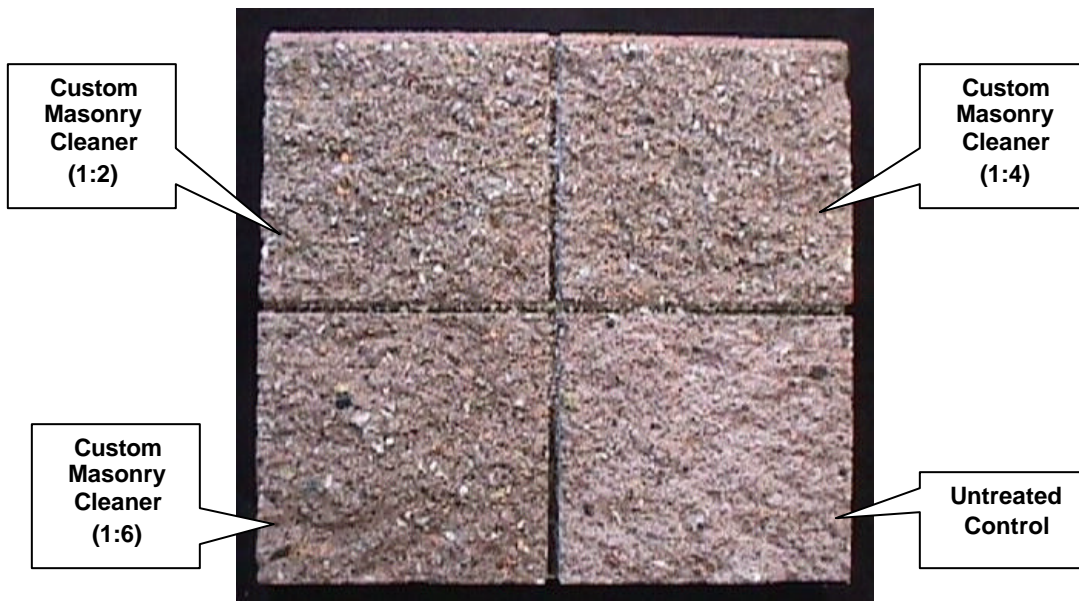
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## “206 Oak Mountain” Split-face CMU

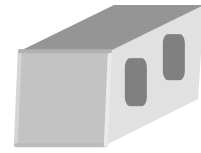


## “304 Cahaba” Split-face CMU





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## **SECTION C - PROTECTIVE WATER REPELLENTS**

The testing described below evaluates the suitability of water repellent treatments.

The surface treatments evaluated were selected for their suitability for application based on the following selection criteria:

1. Weatherproofing properties
2. Color change
3. Ease of application

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### **DESCRIPTIONS OF PRODUCTS EVALUATED - Protective Water Repellents:**

**Sure Klean<sup>®</sup> Custom Masonry Sealer** - A clear, solvent-based silicone elastomer formulated to weatherproof custom masonry units, cast stone, and concrete block without altering the natural appearance. Custom Masonry Sealer penetrates and fills pores to prevent water penetration through exterior walls exposed to normal weathering as well as long-lasting protection against many types of graffiti.

**Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate** – A self-emulsifying water repellent concentrate designed for dilution with fresh water at the jobsite. This solvent-free blend of silanes and oligomeric alkoxysiloxanes mixes easily with water to produce a penetrating water repellent ideal for application to dense or porous masonry surfaces.

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### **SAMPLE PREPARATION - Protective Water Repellents:**

The submitted blocks were scored, allowed to dry, and to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of a wet-on-wet brush application. All treatments were allowed to cure at least 3 days prior to testing.

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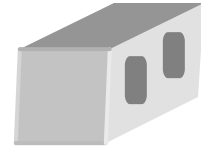
### **TEST METHODS - Protective Water Repellents:**

#### **Water Absorption Tube Test: RILEM II.4, 60 mph, 20 Minutes**

The water absorption tube test simulating wind driven rain conditions was performed. This test simulates 60 mile per hour wind driven rain conditions for a period of 20 minutes.



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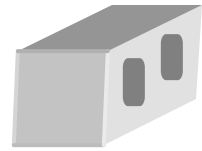
**TEST RESULTS - Protective Water Repellents:**

**Water Absorption Tube Test: RILEM II.4, 60 mph, 20 Minutes**

	RESULTS
<b>“706 Overton” Split-face CMU</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	57 mph
Siloxane WB (1:9)	57 mph
Siloxane WB (1:14)	57 mph
<b>“303 Briarwood” Split-face CMU</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	58 mph
Siloxane WB (1:9)	59 mph
Siloxane WB (1:14)	58 mph
<b>“801 Limestone” Split-face CMU</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	59 mph
Siloxane WB (1:9)	59 mph
Siloxane WB (1:14)	59 mph
<b>“505 Redstone” Split-face CMU</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	59 mph
Siloxane WB (1:9)	57 mph
Siloxane WB (1:14)	56 mph
<b>“206 Oak Mountain” Split-face MCU</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	55 mph
Siloxane WB (1:9)	52 mph
Siloxane WB (1:14)	52 mph
<b>“304 Cahaba” Split-face CMU</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	56 mph
Siloxane WB (1:9)	54 mph
Siloxane WB (1:14)	54 mph



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## CONCLUSIONS - Protective Water Repellents:

Based upon laboratory evaluations, all three treatments tested were able to provide above average water repellency on all six different split-face CMU submitted by Superock Block Company, Birmingham, AL. None of the water repellents altered the natural appearance of the substrate in any way.

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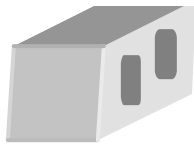
## RECOMMENDATIONS - Protective Water Repellents:

Based on evaluations, Sure Klean<sup>®</sup> Custom Masonry Sealer, Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate diluted with either nine or fourteen parts fresh water can be recommended for job-site testing on all submitted split-face CMUs.

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. On-site testing should be conducted to determine the most appropriate water repellent product and procedures for a particular project. See product literature for additional application and product information.

Carmen M. Niven  
Project Testing Coordinator

CMN/csm



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**Laboratory Report**

**Block Program Evaluation**

**Superrock Block Company  
Birmingham, AL**

***Project No. 0201-19 BP***

***Prepared For:***

**Kevin Vernazza  
Superrock Block Company  
3017 35<sup>th</sup> St. N  
Birmingham, AL 35207**

***Prepared By:***



***PROSOCO, Inc.  
March 2002***