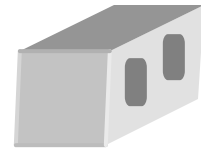




# BLOCK PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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## **ATTACHMENT**

Attachment #1 – Surface Alterations

Attachment #2 – Surface Alterations Continued

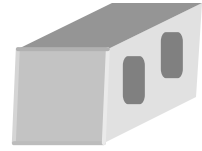
Attachment #3 – Protective Water Repellents

Technical Services TECH Note RILEM Test Method No. II.4

Product Data literature for all products evaluated



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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**FOR:** Steve Long  
cc: Tom Yager  
John Bourne

**SUBJECT:** Beavertown Block  
Middleburg, PA

**DATE:** January 17, 2002

**PROJECT:** 0112-10 BP

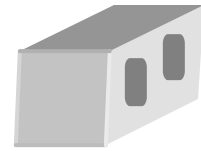
**SAMPLES SUBMITTED:** Three of each block type submitted

<u>SAMPLE</u>	<u>COLOR</u>	<u>SIZE</u>
Ground-face CMU	Charcoal	2 ½ " x 8" x 16"
Smooth-face CMU	Crème	3 ½ " x 8" x 16"
Split-face CMU	Brown	3 ½ " x 8" x 16"

**Submitted by:** Steve Long



# BLOCK PROGRAM LABORATORY REPORT



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## PURPOSE OF TESTING:

One type of each integrally colored split-face, smooth-face and ground-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> Custom Masonry Cleaner and Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner 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 Ash Grove<sup>®</sup> 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 Ash Grove<sup>®</sup> 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 and Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner were 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	

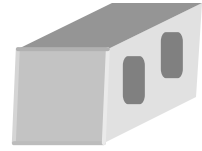
**\* NOTE: When cleaning integrally colored CMU.**

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.



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

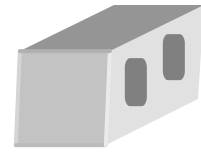
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**C. Protective Water Repellents** – Sure Klean<sup>®</sup> Custom Masonry Sealer, Sure Klean<sup>®</sup> Weather Seal Natural Stone Treatment, Sure Klean<sup>®</sup> Weather Seal Natural Stone Treatment WB and Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate were evaluated for their ability to provide water repellency to the submitted samples. All samples were evaluated for water repellency by using RILEM method II.4.



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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## CLEANING PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
"Brown" split-face and "Crème" smooth-face CMUs	Sure Klean® Custom Masonry Cleaner	1:2, 1:4, 1:6
"Charcoal" ground-face CMUs	Sure Klean® Burnished Custom Masonry Cleaner	1:2, 1:3

## SURFACE ALTERATION PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
"Brown" split-face and "Crème" smooth-face CMUs	Sure Klean® Custom Masonry Cleaner	1:2, 1:4, 1:6
"Charcoal" ground-face CMUs	Sure Klean® Burnished Custom Masonry Cleaner	1:2, 1:3

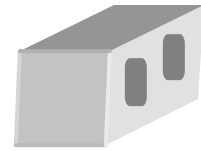
## WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All colors and types of CMUs	Sure Klean® Weather Seal Siloxane WB Concentrate	1:9
	Sure Klean® Custom Masonry Sealer	Concentrate
	Sure Klean® Weather Seal Natural Stone Treatment	Concentrate
	Sure Klean® Weather Seal Natural Stone Treatment WB	Concentrate

**NOTE:** Dilution ratios refer to mixtures of concentrated product : fresh water.



# BLOCK PROGRAM LABORATORY REPORT



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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 to most efficiently remove mortar from the submitted split-face and ground-face CMU samples.

**Sure Klean® 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.

**Sure Klean® Burnished Custom Masonry Cleaner** – A general purpose, non-etching acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture. Liquid concentrate for dilution with 2-3 parts water. Apply by brush or low-pressure spray.

### TEST METHOD – Cleaning

Dilution ratios refer to mixtures of parts concentrated cleaner : parts fresh water. Chemical cleaners were evaluated using the following procedure:

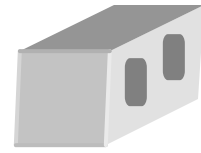
1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilution.
3. Allow appropriate exposure time:
 

Custom Masonry Cleaner.....	3 minutes
Burnished Custom Masonry Cleaner.....	5 minutes
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.



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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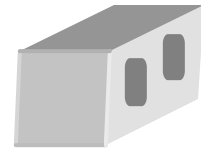
## Test Results - Cleaning

SAMPLE	CLEANER	DILUTION	CURE	% EFFECTIVENESS
"Charcoal" ground-face CMUs	Sure Klean <sup>®</sup> Burnished Custom Masonry Cleaner	1:2	3 day	100%
		1:3		100%
		1:2	7 day	100%
		1:3		100%
		1:2	14 day	100%
		1:3		100%

SAMPLE	CLEANER	DILUTION	CURE	% EFFECTIVENESS
"Crème" smooth-face CMUs	Sure Klean <sup>®</sup> 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%



# BLOCK PROGRAM LABORATORY REPORT



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SAMPLE	CLEANER	DILUTION	CURE	% EFFECTIVENESS
"Brown" split-face CMUs	Sure Klean <sup>®</sup> 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		95%
		1:6		97%

## CONCLUSIONS – Cleaning

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

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

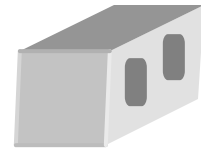
## RECOMMENDED – CLEANING

Based on these evaluations, all dilutions tested of Sure Klean<sup>®</sup> Custom Masonry Cleaner can be recommended on "Brown" split-face CMUs and "Crème" smooth-face CMUs and Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner can be recommended on "Charcoal" ground-face CMUs for job-site testing on the CMUs submitted by Beavertown Block, Middleburg, PA. 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.





# BLOCK PROGRAM LABORATORY REPORT



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## **SECTION B – Surface Alterations**

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

**Sure Klean® 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.

**Sure Klean® Burnished Custom Masonry Cleaner** – A general purpose, non-etching acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture. Liquid concentrate for dilution with 2-3 parts water. Apply by brush or low-pressure spray.

### **TEST METHOD – Surface Alterations**

Dilution ratios refer to mixtures of parts concentrated cleaner : parts fresh water. Chemical cleaners were evaluated using the following procedure:

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilution.
3. Allow appropriate exposure time:
 

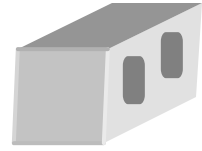
Custom Masonry Cleaner .....	3 minutes
Burnished Custom Masonry Cleaner .....	5 minutes
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
6. Allow the surface to dry for at least 18 hours and visually examine.

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





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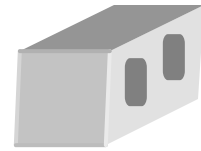
## RECOMMENDATIONS – Surface Alterations

Based upon laboratory evaluations, Sure Klean<sup>®</sup> Custom Masonry Cleaner in all dilutions is recommended for job-site testing on the split-face and smooth-face CMUs. Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner in all dilutions is recommended on all submitted ground-face CMUs submitted by Beavertown Block, Middleburg, PA.

They are effective in removing excess mortar and assist in improving the color and uniformity of these CMUs. 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.



# BLOCK PROGRAM LABORATORY REPORT



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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

---

### **DESCRIPTIONS OF PRODUCTS EVALUATED – Protective Water Repellents**

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

**Sure Klean® Weather Seal Natural Stone Treatment** – A modified siloxane water repellent developed for limestone, marble and most other traditional masonry surfaces. It penetrates deeply to provide long-lasting protection without altering the natural appearance of the substrate.

**Sure Klean® Weather Seal Natural Stone Treatment WB** – An odorless, water-based solution of potassium methyl silicate developed to effectively treat a wide range of natural stone and masonry surfaces. Natural Stone Treatment WB provides long-lasting repellency without altering the natural appearance of the substrate.

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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 72 hours prior to testing.

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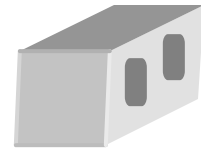
### **TEST METHODS – Protective Water Repellents**

#### **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.



# BLOCK PROGRAM LABORATORY REPORT



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## TEST RESULTS – Protective Water Repellents

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

	RESULTS
<b>“Charcoal” Ground-face</b>	
Untreated Control	45 mph
Custom Masonry Sealer	60 mph
Natural Stone Treatment	60 mph
Natural Stone Treatment WB	60 mph
Siloxane WB Concentrate (1:9)	60 mph
<b>“Crème” Smooth-face</b>	
Untreated Control	50 mph
Custom Masonry Sealer	60 mph
Natural Stone Treatment	60 mph
Natural Stone Treatment WB	60 mph
Siloxane WB Concentrate (1:9)	60 mph
<b>“Brown” Split-face</b>	
Untreated Control	<40 mph
Custom Masonry Sealer	<40 mph
Natural Stone Treatment	<40 mph
Natural Stone Treatment WB	<40 mph
Siloxane WB Concentrate (1:9)	60 mph

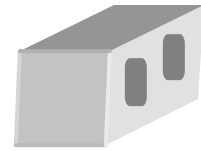
## CONCLUSIONS – Protective Water Repellents

Based upon laboratory evaluations, all water repellents tested on the “Charcoal” ground-face and “Crème” smooth-face CMU provided above average water repellency. Sure Klean® Weather Seal Siloxane WB Concentrate diluted with nine parts water was the only product tested that was able to provide above average water repellency to “Brown” split-face CMU. Sure Klean® Custom Masonry Sealer enhanced the natural appearance of “Brown” split-face CMU only.

**NOTE:** Refer to Attachment #3 for Protective Water Repellent photographs



# BLOCK PROGRAM LABORATORY REPORT



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## RECOMMENDATIONS – Protective Water Repellents

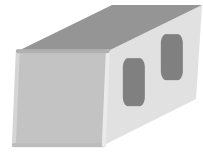
Based on evaluations the following recommendations are made for job-site testing on the CMUs submitted by Beavertown Block, Middleburg PA.

	Sure Klean <sup>®</sup> Custom Masonry Sealer	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment WB	Sure Klean <sup>®</sup> Weather Seal Siloxane WB Concentrate (diluted 1:9)
<b>“Charcoal” ground-face</b>	Yes	Yes	Yes	Yes
<b>“Crème” smooth-face</b>	Yes	Yes	Yes	Yes
<b>“Brown” split-face</b>	No	No	No	Yes

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.

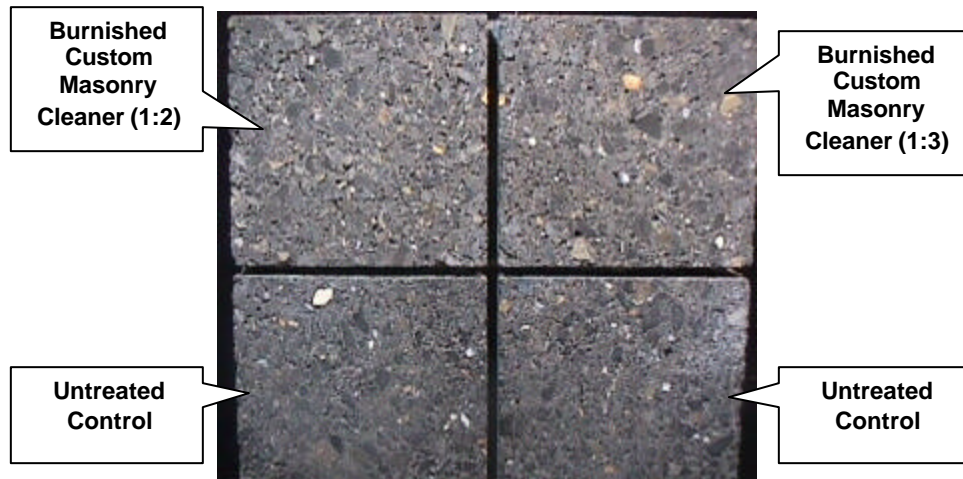
Heidi Turner  
R & D Technician

CMN/HMT/csm



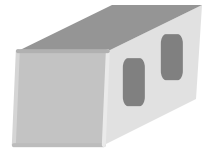
Attachment # 1 – Surface Alterations

“Charcoal” Ground-face CMU



“Crème” Smooth-face CMU

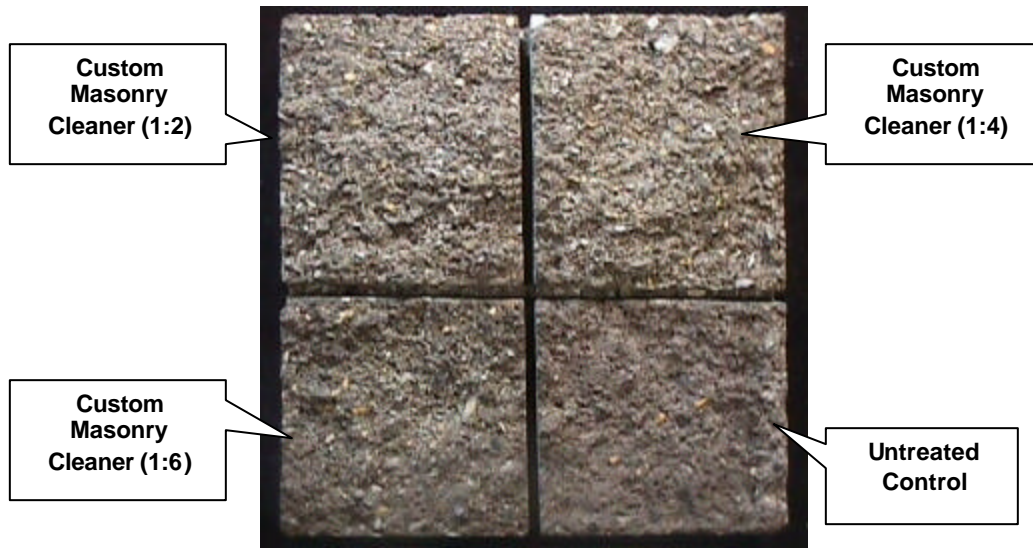




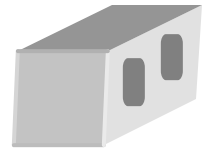
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**Attachment # 2 – Surface Alterations**

“Brown” Split-face CMU



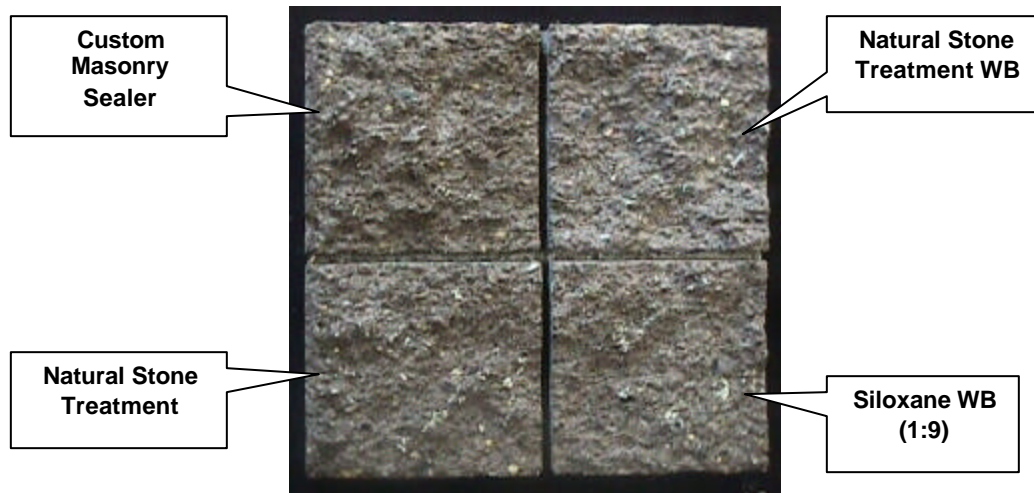


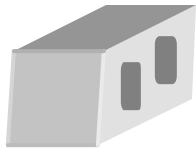


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**Attachment # 3 – Protective Water Repellents**

“Brown” Split-face CMU





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***Laboratory Report***

**Block Program Evaluation**

**Beavertown Block  
Middleburg, PA**

***Project No. 0112-10 BP***

***Prepared For:***

**Joe Cardarelli & Vince Greenway  
Beavertown Block  
R.R. 1 Paxtonville Rd.  
Middleburg, PA 17842**

***Prepared By:***



***PROSOCO, Inc.  
January 2002***