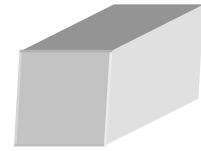




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**PROSOCO, Inc.**

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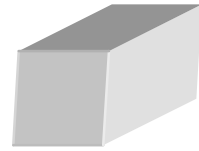
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## ATTACHMENTS

- ASTM C140 – Standard Test Methods of Sampling and Testing Concrete Masonry Units
- Product Data literature for all products evaluated
- Material Safety Data Sheets for all products evaluated



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**FOR:** Pete Peatross, Arriscraft Stone  
Cc: Mike Burdette  
Paul Tessier

**SUBJECT:** Arriscraft Stone  
1202 Timberglen Ct.  
Lilburn, GA 30047

**DATE:** April 18, 2001

**PROJECT:** 0008-19 BP

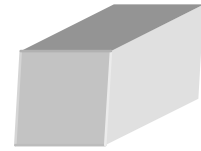
**SAMPLES SUBMITTED:**

<u>Sample</u>	<u>Color</u>	<u>Size</u>
(A1) Rough Face CSU	Taupe	11" x 8" x 3½"
(A2) Rough Face CSU	Taupe	11" x 8" x 3½"
(B1) Smooth Face CSU	White	11" x 8" x 3½"
(B2) Smooth Face CSU	White	11" x 8" x 3½"
(C1) Smooth Face CSU	Wheat	11" x 8" x 3½"
(C2) Smooth Face CSU	Wheat	11" x 8" x 3½"
(D1) Rough Face CSU	Sage	11" x 8" x 3½"
(D2) Rough Face CSU	Sage	11" x 8" x 3½"
(E1) Rough Face CSU	Olive	11" x 8" x 3½"
(E2) Rough Face CSU	Olive	11" x 8" x 3½"

**Submitted By:** Mike Burdette



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## PURPOSE OF TESTING:

Eight integrally colored rough and smooth face Arriscraft CSUs (Calcium silicate units) with fine aggregate were submitted for testing using PROSOCO's new construction cleaning and water repellent products.

**A. Cleaning Calcium Silicate Units:** Sure Klean<sup>®</sup> Vana Trol, Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner and Sure Klean<sup>®</sup> Light Duty Restoration Cleaner were evaluated for removal of laboratory applied mortar. Sure Klean<sup>®</sup> Light Duty Restoration Cleaner is not typically recommended for new construction cleaning but was tested per request of the project submittal.

To simulate new construction soiling, all CSUs 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 CSU and filled with a wet mixture of Type S cementitious mortar. The wet, mortar-filled cylinder is allowed to remain in contact with the CSU for 10 minutes before removal.

Soiled CSUs 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.

**B. Surface Alteration Testing -** Sure Klean<sup>®</sup> Vana Trol, Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner and Sure Klean<sup>®</sup> Light Duty Restoration 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 CSU 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 CSU 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 CSU.

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:

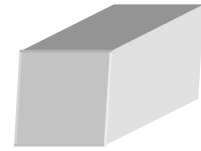
0 – no change	3 – heavy
1 – slight	4 - excessive
2 – moderate	

**C. Protective Treatments -** Conservare<sup>®</sup> HCT, Sure Klean<sup>®</sup> Weather Seal Siloxane PD and Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate were evaluated for their ability to provide water repellency to the submitted samples.

Water repellency was determined by comparing the dry weight of the sample with its weight after immersion in water at 10-minute, 30-minute, 60-minute and 24-hour intervals. See ASTM C 140 for additional information.



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## CLEANING PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All Colors of Rough Face and Smooth Face CSUs	Sure Klean® Burnished Custom Masonry Cleaner	1:3
	Sure Klean® Vana Trol	1:6
	Sure Klean® Light Duty Restoration Cleaner*	Concentrate

## SURFACE ALTERATION PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All Colors of Rough Face and Smooth Face CSUs	Sure Klean® Burnished Custom Masonry Cleaner	1:3
	Sure Klean® Vana Trol	1:6
	Sure Klean® Light Duty Restoration Cleaner*	Concentrate

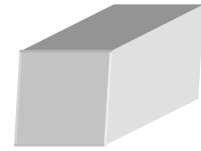
## WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All Colors of Rough and Smooth Face CSUs	Conservare® HCT	Concentrate
	Sure Klean® Weather Seal Siloxane PD	Concentrate
	Sure Klean® Weather Seal Siloxane WB	1:14

\* Sure Klean® Light Duty Restoration Cleaner is not typically recommended for new construction cleaning but was tested per request of the project submittal.



# BLOCK PROGRAM LABORATORY REPORT



## SECTION A – CLEANING INTEGRALLY COLORED CSUs

### DESCRIPTION OF PRODUCTS EVALUATED

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

**Sure Klean® Vana Trol®** – A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Use on” gray, brown, white and most light-colored brick, natural stone, and cast stone.

**Sure Klean® Burnished Custom Masonry Cleaner** - A general-purpose cleaner used to remove common construction and atmospheric staining from custom masonry and other architectural concrete. Burnished Custom Masonry Cleaner is a non-etching acidic cleaner used to remove rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture.

**Sure Klean® Light Duty Restoration Cleaner** – Safely removes light to moderate atmospheric and oxidation staining from dense masonry surfaces. Removes difficult calcium stains, white scum and other staining from most window glass.

### TEST METHOD – Cleaning

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

1. Pre-wet the surface with water.
2. Apply each cleaner at the appropriate dilutions
 

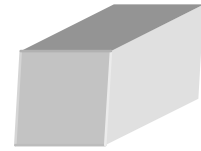
Vana Trol® .....	1:6
Burnished Custom Masonry Cleaner .....	1:3
Light Duty Restoration Cleaner .....	concentrate
3. Allow an appropriate exposure time for each cleaner:
 

Vana Trol® .....	5 minutes
Burnished Custom Masonry Cleaner .....	5 minutes
Light Duty Restoration Cleaner .....	15 minutes
4. Re-apply 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 800 psi with a warm water flow rate of 1.9 gallons per minute.



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## Test Results - Cleaning

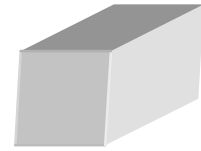
SAMPLE	Cleaner	Dilution	Dwell	Effectiveness
"Taupe" Rough Face CSU	Burnished Custom Masonry Cleaner	1:3	3 day	70%
			7 day	70%
			14 day	70%
	Vana Trol®	1:6	3 day	95%
			7 day	95%
			14 day	95%
	Light Duty Restoration Cleaner	Concentrate	3 day	20%
			7 day	20%
			14 day	20%

SAMPLE	Cleaner	Dilution	Dwell	Effectiveness
"White" Smooth Face CSU	Burnished Custom Masonry Cleaner	1:3	3 day	100%
			7 day	100%
			14 day	100%
	Vana Trol®	1:6	3 day	98%
			7 day	98%
			14 day	95%
	Light Duty Restoration Cleaner	Concentrate	3 day	100%
			7 day	100%
			14 day	100%

SAMPLE	Cleaner	Dilution	Dwell	Effectiveness
"Wheat" Smooth Face CSU	Burnished Custom Masonry Cleaner	1:3	3 day	100%
			7 day	100%
			14 day	100%
	Vana Trol®	1:6	3 day	98%
			7 day	100%
			14 day	100%
	Light Duty Restoration Cleaner	Concentrate	3 day	100%
			7 day	100%
			14 day	100%



# BLOCK PROGRAM LABORATORY REPORT



SAMPLE	Cleaner	Dilution	Dwell	Effectiveness
"Sage" Rough Face CSU	Burnished Custom Masonry Cleaner	1:3	3 day	50%
			7 day	50%
			14 day	40%
	Vana Trol®	1:6	3 day	50%
			7 day	70%
			14 day	50%
	Light Duty Restoration Cleaner	Concentrate	3 day	50%
			7 day	50%
			14 day	50%

SAMPLE	Cleaner	Dilution	Dwell	Effectiveness
"Olive" Rough Face CSU	Burnished Custom Masonry Cleaner	1:3	3 day	100%
			7 day	95%
			14 day	100%
	Vana Trol®	1:6	3 day	100%
			7 day	100%
			14 day	100%
	Light Duty Restoration Cleaner	Concentrate	3 day	90%
			7 day	100%
			14 day	100%

## CONCLUSIONS - CLEANING:

Test results indicate that all cleaners tested work well removing mortar from the "White", "Wheat" and "Olive" smooth faced CSUs. Sure Klean® Vana Trol® (1:6) performed the best on the "Taupe" and "Sage" rough faced CSUs removing 50% to 95% of the mortar.

Use higher concentrations of cleaner and more surface agitation to maximize aggregate exposure. Use low concentrations of cleaner and little to no surface agitation to minimize aggregate exposure.

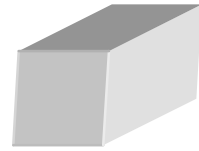
## RECOMMENDED PRODUCTS AND DILUTIONS - CLEANING:

Based on the test results, Sure Klean® Vana Trol® (1:6) is recommended for job site testing on all CSUs submitted by Arriscraft for this study.

It should be noted that the use of PROSOCO cleaners might slightly darken or enhance the natural characteristics of the calcium silicate unit. To ensure a uniform appearance, **always pre-wet** the surface before applying cleaning products, keep lower areas wet to avoid streaks. Apply the cleaner **evenly** on the CSUs face working from the bottom up and thoroughly **rinse** surface with fresh water to ensure all cleaner has been removed from the CSU. Failure to follow application instructions can result in an uneven and blotchy appearance.



# BLOCK PROGRAM LABORATORY REPORT



## SECTION B – Surface Alterations:

### DESCRIPTION OF PRODUCTS EVALUATED – Surface Alterations:

**Sure Klean® Vana Trol®** – A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Use on” gray, brown, white and most light-colored brick, natural stone, and cast stone.

**Sure Klean® Burnished Custom Masonry Cleaner** - A general-purpose cleaner used to remove common construction and atmospheric staining from custom masonry and other architectural concrete. Burnished Custom Masonry Cleaner is a non-etching acidic cleaner used to remove rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture.

**Sure Klean® Light Duty Restoration Cleaner** – Safely removes light to moderate atmospheric and oxidation staining from dense masonry surfaces. Removes difficult calcium stains, white scum and other staining from most window glass.

### TEST METHOD – Surface Alteration Testing:

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

1. Pre-wet the surface with water.
2. Apply each cleaner at the appropriate dilutions
 

Vana Trol® .....	1:6
Burnished Custom Masonry Cleaner .....	1:3
Light Duty Restoration Cleaner .....	concentrate
3. Allow an appropriate exposure time for each cleaner:
 

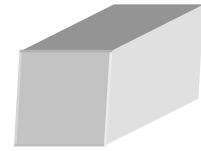
Vana Trol® .....	5 minutes
Burnished Custom Masonry Cleaner .....	5 minutes
Light Duty Restoration Cleaner .....	15 minutes
4. Re-apply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
7. Allow the surface to dry for at least 18 hours and visually examine.

\* Pressure rinsing was conducted at approximately 800 psi with a warm water flow rate of 1.9 gallons per minute.





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**Surface Alteration Results:**

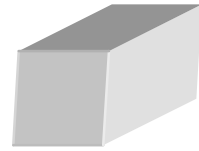
<b>Substrate: "Taupe"</b>					
<b>Product</b>	<b>Dilution</b>	<b>Aggregate Exposure</b>	<b>Surface Pigment Alteration/Removal</b>	<b>Matrix Erosion</b>	<b>Staining</b>
Burnished Custom Masonry	1:3	0	0	0	0
Vana Trol <sup>®</sup>	1:6	0	0	0	0
Light Duty Restoration Cleaner	Conc.	0	0	0	0
<b>Substrate: "White"</b>					
<b>Product</b>	<b>Dilution</b>	<b>Aggregate Exposure</b>	<b>Surface Pigment Alteration/Removal</b>	<b>Matrix Erosion</b>	<b>Staining</b>
Burnished Custom Masonry	1:3	0	0	0	0
Vana Trol <sup>®</sup>	1:6	0	0	0	0
Light Duty Restoration Cleaner	Conc.	0	0	0	0
<b>Substrate: "Wheat"</b>					
<b>Product</b>	<b>Dilution</b>	<b>Aggregate Exposure</b>	<b>Surface Pigment Alteration/Removal</b>	<b>Matrix Erosion</b>	<b>Staining</b>
Burnished Custom Masonry	1:3	0	0	0	0
Vana Trol <sup>®</sup>	1:6	0	0	0	0
Light Duty Restoration Cleaner	Conc.	0	0	0	0
<b>Substrate: "Sage"</b>					
<b>Product</b>	<b>Dilution</b>	<b>Aggregate Exposure</b>	<b>Surface Pigment Alteration/Removal</b>	<b>Matrix Erosion</b>	<b>Staining</b>
Burnished Custom Masonry	1:3	0	0	0	0
Vana Trol <sup>®</sup>	1:6	0	0	0	0
Light Duty Restoration Cleaner	Conc.	0	0	0	0
<b>Substrate: "Olive"</b>					
<b>Product</b>	<b>Dilution</b>	<b>Aggregate Exposure</b>	<b>Surface Pigment Alteration/Removal</b>	<b>Matrix Erosion</b>	<b>Staining</b>
Burnished Custom Masonry	1:3	0	0	0	0
Vana Trol <sup>®</sup>	1:6	0	0	0	0
Light Duty Restoration Cleaner	Conc.	0	0	0	0

Scale used for reporting results of all categories

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



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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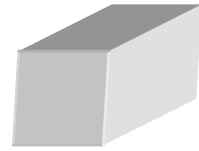
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## CONCLUSIONS – Surface Alterations:

The data above concludes that no surface alterations occurred as a result of applying the Sure Klean<sup>®</sup> products in the recommended fashion.

Use higher concentrations of cleaner and more surface agitation to maximize aggregate exposure. Use lower concentrations of cleaner and little to no surface agitation to minimize aggregate exposure.

It should be noted that the use of PROSOCO cleaners might slightly darken or enhance the natural characteristics of the calcium silicate unit. To ensure a uniform appearance, **always pre-wet** the surface before applying cleaning products, keep lower areas wet to avoid streaks. Apply the cleaner **evenly** on the CSUs face working from the bottom up and thoroughly **rinse** surface with fresh water to ensure all cleaner has been removed from the CSU. Failure to follow application instructions can result in an uneven and blotchy appearance.



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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® Weather Seal Siloxane PD** - A low odor, alkaline stable, water-based blend of silanes and oligomeric alkoxy siloxanes. Weather Seal Siloxane PD is supplied pre-diluted and is designed for use on concrete and clay masonry surfaces. Weather Seal Siloxane PD penetrates more deeply than conventional water or solvent-based water repellents.

**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 which is ideal for application to either dense or porous masonry surfaces.

**Conservare® HCT** - Conversion treatment for carbonate surfaces. HCT increases the ability for silicon-based products to adhere to the carbonate surface by imparting hydroxy functional bonding sites. HCT also provides protection from acid rain and other detrimental weathering forces.

In this study HCT is being evaluated to determine if formation of the conversion layer on carbonate surfaces will improve the abrasion resistance of the cast stone.

Results from abrasion testing will be issued as an amendment to this report.

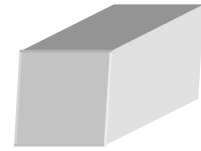
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## **SAMPLE PREPARATION - Protective Water Repellents:**

The submitted CSUs were cut into two-inch cubes, oven dried and allowed to reabsorb atmospheric humidity for 24 hours prior to treatment. Weather Seal Siloxane PD and Weather Seal Siloxane WB Concentrate consisted of two 10-second immersions with a 20-second absorption period between immersions to simulate a wet-on-wet application. Refer to product data sheet for application instructions for Conservare® HCT. All treatments were allowed to cure for at least 14 days prior to testing.



# BLOCK PROGRAM LABORATORY REPORT



## TEST METHODS - Protective Water Repellents:

### Water Absorption: ASTM C 140, Immersion

Water absorption was determined by comparing the dry weight of the sample with its weight after immersion in water at 10-minute, 30-minute, 60-minute and 24-hour intervals. See ASTM C 140 for additional information.

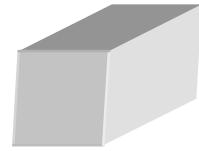
Reduced water absorption values – reported as effectiveness – measure the effectiveness of selected treatments in protecting samples from water penetration and water related decay mechanisms. Generally a reduction of approximately 80% is required to provide resistance to water intrusion under normal exposure conditions.

Due to limited samples the protective treatment experiments were carried out on either “White” smooth face CSUs or “Wheat” smooth face CSUs, which were cut into 2” cubes.

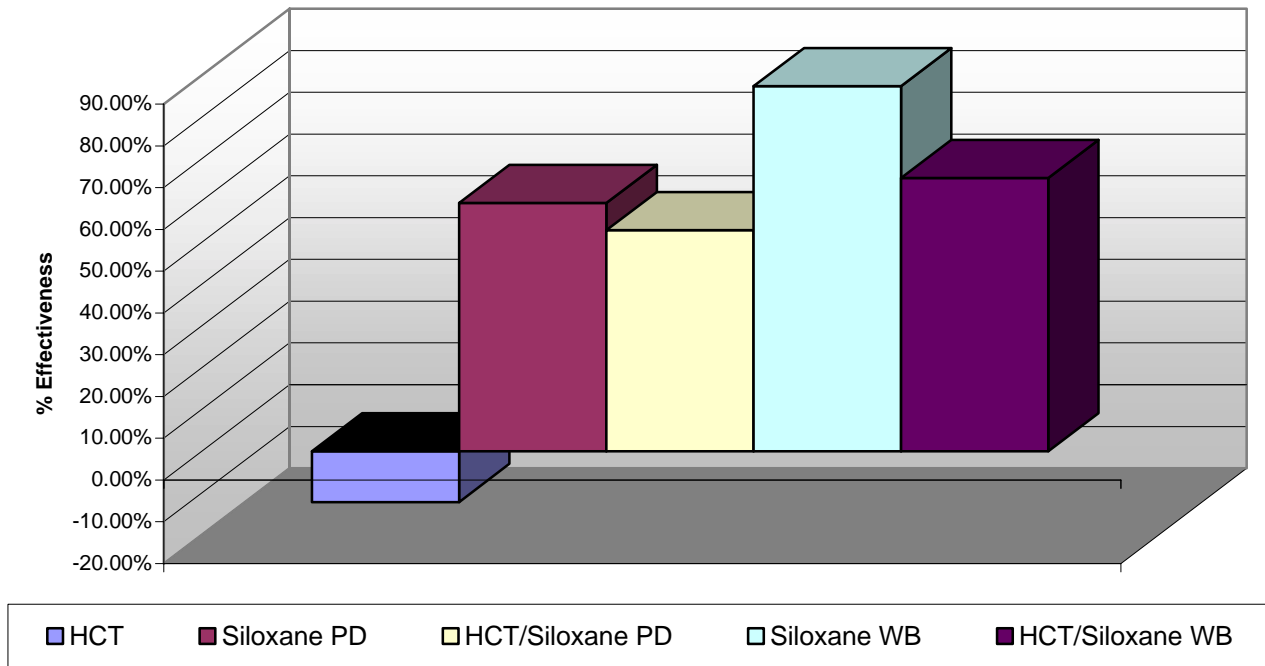
## TEST RESULTS - Protective Treatments:

Samples	Primary Treatment	Secondary Treatment	Average % Absorption				
			10 minute	30 minute	1 hour	4 hour	24 hour
All submitted samples	HCT	None	1.61%	2.55%	3.18%	5.24%	8.18%
	None		1.30%	1.99%	2.53%	4.13%	7.29%
	HCT	Weather Seal Siloxane PD	0.28%	0.47%	0.58%	1.17%	3.43%
	None		0.27%	0.39%	0.52%	1.18%	2.96%
	HCT	Weather Seal Siloxane WB	0.21%	0.28%	0.26	0.58%	2.52%
	None		0.22%	0.23%	0.24%	0.56%	0.92%

Samples	Primary Treatment	Secondary Treatment	Average % Effectiveness
All submitted samples	HCT	None	-12.11%
	None		--
	HCT	Weather Seal Siloxane PD	52.97%
	None		59.47%
	HCT	Weather Seal Siloxane WB	65.44%
	None		<b>87.44%</b>



### Protective Water Repellents



GRAPH 1

### CONCLUSIONS - Protective Water Repellents:

Test results indicate Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate (1:14) performed the best with an average of 87.44% effectiveness at repelling the intrusion of water. All other treatments and combinations of treatments did not meet the required 80% effectiveness to be a recommended treatment for the CSU samples tested.

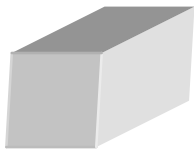
### RECOMMENDATIONS - Protective Water Repellents:

Based on test results, Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate, diluted with 14 parts fresh water, can be recommended for jobsite testing on the submitted Arriscraft Stone as protective treatments.

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.

Christopher L. Ramsey  
Technical Services Analyst

CLR/csm



---

***Laboratory Report***

**Block Program Evaluation**

**Arriscraft Stone  
Lilburn, GA**

***Project No. 0008-19 BP***

***Prepared For:***

**Pete Peatross**

**Arriscraft Stone  
1202 Timberglen CT.  
Lilburn, GA 30047**

***Prepared By:***



***PROSOCO, Inc.  
April 2001***