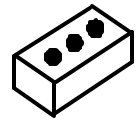




PALLET CARD PROGRAM LABORATORY REPORT



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ATTACHMENTS

Attachment #1 - Graph 1 & 2

Attachment #2 – Photo A & B

Attachment # 3 – Photo C

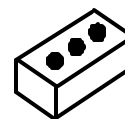
ASTM C 67 Immersion Testing

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

Product Data literature for all products evaluated



PALLET CARD PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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FOR: Mike Longo
cc: Perry Surber
John Bourne

SUBJECT: Whitacre Greer
1400 S. Mahoning Avenue
Alliance, OH

DATE: December 18, 2001

PROJECT: 0109-17 PC

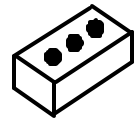
SAMPLES SUBMITTED:

Sample	Color/Finish	Size
(1) Clay/Shale Paver	Orange	2" x 4" x 8"
(1) Clay/Shale Paver	Red	2" x 4" x 8"
(1) Clay/Shale Paver	Buff	2" x 4" x 8"

Submitted by: Perry Surber



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PURPOSE OF TESTING:

Three colors of clay/shale pavers were submitted to PROSOCO, Inc.'s Testing Laboratory with a request to determine if application of the products evaluated will produce any adverse effects during new construction cleaning operations. Additionally, the effectiveness of water repellents and stain repellents, suitable for clay/shale pavers, were evaluated.

A. Surface Alteration Testing - Sure Klean[®] 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.

Surface Finish Removal is the visual examination of the paver comparing the surface finish of the untreated control surface to the surface finish cleaned with selected product(s) at given dilutions.

Substrate Deterioration is the visual examination of the paver comparing the surface of the untreated control to surfaces cleaned with selected product(s) at given dilutions looking for any potential erosion/digestion of the brick.

Color Change is the visual examination comparing the color of the untreated control surface to color of surfaces cleaned with selected products at given dilutions.

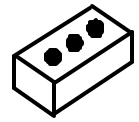
Staining is the visual examination for changes that are the result of a chemical reaction that leaves a staining precipitate.

B. Water Repellent Evaluation – Consolideck[®] Saltguard[®] WB, Stand Off[®] Paver Enhancer and Stand Off[®] SLX100 Water & Oil Repellent were evaluated on the submitted samples for their ability to provide water repellency.

C. Stain Repellent Evaluation - Stand Off[®] Stone, Tile & Masonry Protector, Stand Off[®] SLX100 Water & Oil Repellent, and Stand Off[®] Paver Enhancer were evaluated on the submitted samples for their ability to provide stain repellency.



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SURFACE ALTERATION PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All submitted clay/shale pavers	Sure Klean [®] Custom Masonry Cleaner	1:2, 1:4, 1:6

WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	PRODUCT
All submitted clay/shale pavers	Stand Off [®] Paver Enhancer
	Stand Off [®] SLX100 Water & Oil Repellent
	Consolideck [®] Saltguard [®] WB

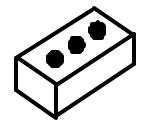
STAIN REPELLENT PRODUCTS EVALUATED

SAMPLE	PRODUCT
All submitted clay/shale pavers	Stand Off [®] Paver Enhancer
	Stand Off [®] SLX100 Water & Oil Repellent
	Stand Off [®] Stone, Tile & Masonry Protector

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



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SECTION A – 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.

TEST METHOD – Surface Alterations

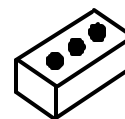
Dilution ratios refer to mixtures of concentrated cleaner : fresh water. Chemical cleaners were evaluated using the following procedure:

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilution.
3. Allow appropriate exposure time.
 Custom Masonry Cleaner..... 3 minutes
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 – Surface Alterations

Substrate: Clay/shale paver		Pigment Color: "Orange"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Custom Masonry Cleaner	1:2	0	0	0	0
Custom Masonry Cleaner	1:4	0	0	0	0
Custom Masonry Cleaner	1:6	0	0	0	0
Substrate: Clay/shale paver		Pigment Color: "Red"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Custom Masonry Cleaner	1:2	0	0	0	0
Custom Masonry Cleaner	1:4	0	0	0	0
Custom Masonry Cleaner	1:6	0	0	0	0
Substrate: Clay/shale paver		Pigment Color: "Buff"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Custom Masonry Cleaner	1:2	0	0	0	0
Custom Masonry Cleaner	1:4	0	0	0	0
Custom Masonry Cleaner	1:6	0	0	0	0

Scale used for reporting results of all categories

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

CONCLUSIONS – Surface Alterations

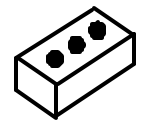
Based upon laboratory evaluations, none of the dilutions of Sure Klean® Custom Masonry Cleaner produced visual surface alterations when applied to the surfaces of the submitted clay/shale pavers.

RECOMMENDATIONS – Surface Alterations

Based upon these evaluations, all dilutions of Sure Klean® Custom Masonry Cleaner tested can be recommended for job-site testing by Whitacre Greer, Alliance, OH. The most appropriate dilution should be determined on the specific job-site, and will be primarily dependent upon the nature and severity of soiling present at that location.



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SECTION B - 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

Stand Off® Paver Enhancer – A solvent-based blend of high-quality siloxanes modified to provide excellent repellency and color enhancement to interlocking concrete, fired clay, porous tile and many types of natural stone surfaces. Paver Enhancer penetrates and reacts with the surface to form a chemical bond, providing long-term durability, alkali resistance and superior breathability.

Consolideck® Saltguard® WB – A ready-to-use water-based, VOC compliant silane/siloxane water repellent and “chloride screen” for the protection of concrete and masonry surfaces. Saltguard® WB penetrates more deeply than conventional water- or solvent- based water repellents. Low odor and alkaline stable, Saltguard® WB is ideal for field or in-plant application to concrete and most masonry surfaces. Saltguard® WB protects horizontal and vertical surfaces from moisture intrusion and chemical attack of chloride salts.

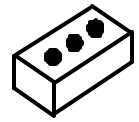
Stand Off® SLX100 Water & Oil Repellent – Combines water and oil repellency to prevent staining by waterborne and oily substances and many types of graffiti. This modified “neat” silane system offers invisible protection and low volatility.

SAMPLE PREPARATION - Protective Water Repellents

The submitted pavers were cleaned, allowed to dry, and allowed to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of two 10-second immersions with a 20-second absorption period between immersions to simulate a wet-on-wet application. All treatments were allowed to cure for 14 days prior to testing.



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TEST METHODS - Protective Water Repellents:

Water Absorption: ASTM C 67, 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, 4-hour and 24-hour intervals. See ASTM C 67 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.

Water Absorption Tube Test: RILEM II.4, 5.0 milliliters, 20 minutes

The water absorption tube test simulating wind driven and wind blown rain conditions was also performed. Tests were run with 5.0-milliliter head pressures. Filled to 5 milliliters, a water absorption tube produces a 98 mph dynamic wind pressure. See ASTM C 67 and RILEM II.4 Tech Note for additional information.

The ranking system used to evaluate the effectiveness of the products applied to each submitted sample is as follows:

AA = “Above Average” correlates to less than or equal to 20% of the maximum untreated absorption.

A = “Average” correlates to less than or equal to 50% of the maximum untreated absorption.

BA = “Below Average” correlates to greater than 50% of the maximum untreated absorption.

EXAMPLE: If RILEM tubes applied to an untreated sample result in loss of 5 ml of water or more, then:

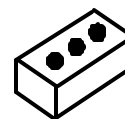
A rating of **AA** *Above Average* water repellent performance would require loss of no more than $5 \text{ ml} \times 20\% = 1 \text{ ml}$.

A rating of **A** *Average* water repellent performance would require loss of no more than $5 \text{ ml} \times 50\% = 2.5 \text{ ml}$.

A rating of **BA** *Below Average* water repellent performance would be reported for treatments which result in a loss of more than $50\% \times 5 \text{ ml} = 2.5 \text{ ml}+$



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TEST RESULTS - Protective Water Repellents

Water Absorption: ASTM C 67, Immersion

"Buff"	% Absorption	% Effectiveness
Untreated Control	3.61	--
Paver Enhancer	0.09	98%
Saltguard® WB	1.28	66%
SLX100 Water & Oil Repellent	0.12	97%
"Red"	% Absorption	% Effectiveness
Untreated Control	0.62	--
Paver Enhancer	0.10	87%
Saltguard® WB	0.60	19%
SLX100 Water & Oil Repellent	0.14	81%
"Orange"	% Absorption	% Effectiveness
Untreated Control	6.10	--
Paver Enhancer	0.15	98%
Saltguard® WB	3.62	41%
SLX100 Water & Oil Repellent	0.21	97%

Water Absorption Tube Test: RILEM II.4, 5.0 milliliters, 20 Minutes

AA = Above Average

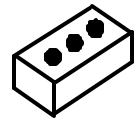
AA = Average

BA = Below Average

"Buff "	Results	Ranking
Untreated Control	0.0 mL loss	--
Paver Enhancer	0.0 mL loss	<u>AA</u>
Saltguard® WB	0.0 mL loss	<u>AA</u>
SLX100 Water & Oil Repellent	0.0 mL loss	<u>AA</u>
"Red"	Results	Ranking
Untreated Control	0.0 mL loss	--
Paver Enhancer	0.0 mL loss	<u>AA</u>
Saltguard® WB	0.0 mL loss	<u>AA</u>
SLX100 Water & Oil Repellent	0.0 mL loss	<u>AA</u>
"Orange"	Results	Ranking
Untreated Control	0.8 mL loss	--
Paver Enhancer	0.0 mL loss	<u>AA</u>
Saltguard® WB	0.0 mL loss	<u>AA</u>
SLX100 Water & Oil Repellent	0.2 mL loss	<u>AA</u>



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CONCLUSIONS - Protective Water Repellents

Based upon laboratory evaluations, Stand Off[®] Paver Enhancer and Stand Off[®] SLX100 Water & Oil Repellent exhibited above average water repellency to all submitted samples. Generally, a reduction of approximately 80% is required to provide resistance to water intrusion under normal exposure conditions. Consolideck[®] Saltguard[®] WB was unable to achieve this type of results.

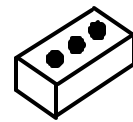
RECOMMENDATIONS - Protective Water Repellents

Based upon laboratory evaluations, Stand Off[®] Paver Enhancer and Stand Off[®] SLX100 Water & Oil Repellent are recommended to provide excellent water repellency protection to all samples submitted by Whitacre Greer, Alliance, OH.

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.



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SECTION C – PROTECTIVE STAIN REPELLENTS

The testing below evaluates the suitability of stain protection treatments.

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

1. Ease of application
2. Color change
3. Removal of staining substances

DESCRIPTIONS OF PRODUCTS EVALUATED – Protective Stain Repellents

Protective Stain Repellents:

Stand Off® Stone, Tile & Masonry Protector – A penetrating oil and stain repellent. This easy-to-use, low-VOC, low-odor protective treatment improves the stain resistance and simplifies maintenance cleaning on interior and exterior stone, quarry tile, concrete and masonry surfaces. Surfaces treated with STMP resist staining from oil, food and waterborne matter while retaining their natural color, texture, and breathability.

Stand Off® SLX 100 Water & Oil Repellent - Combines water and oil repellency to prevent staining by waterborne and oily substances and many types of graffiti. This modified “neat” silane system offers invisible protection and low volatility.

Stand Off® Paver Enhancer- A solvent-based blend of high-quality siloxanes modified to provide excellent repellency and color enhancement to interlocking concrete, fired clay, porous tile and many types of natural stone surfaces. Paver Enhancer penetrates and reacts with the surface to form a chemical bond, providing long-term durability, alkali resistance and superior breathability.

Products Evaluated for Stain Removal:

Enviro Klean® 2010 All Surface Cleaner – Dilution: 1 part concentrate : 10 parts fresh water.

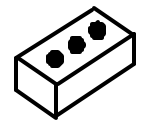
Food & Oil Products Evaluated:

Temperature

Coca Cola®	~75°F
Ketchup	~75°F
Red Wine	~75°F
Olive Oil	~75°F
Wesson Oil	~75°F
Motor Oil	~75°F



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SAMPLE PREPARATION – Protective Stain Repellents

The submitted samples were cut and allowed to dry, and reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of a single saturating application that was allowed to cure for at least 72 hours prior to testing.

TEST METHODS – Protective Stain Repellents

Surface Beading

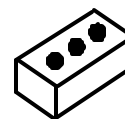
The food and oil products were applied to the test areas. The beading properties of the oils and liquids were visually evaluated within two minutes after application. The results are reported as a rating based on the angle of contact between the base of the droplet and the substrate. A rating of “1 or 2” indicates the smallest angle of contact ($<90^\circ$) which correlates to “above average” repellency. A rating of “3 or 4” indicates “average” repellency. A rating of “5 or greater” indicates that the oil quickly absorbed into the substrate and correlates to “below average” repellency.

Stain Resistance

The soiling agents were allowed to dwell on the treated and untreated substrate for times of 24 hours, 7 hours, 4 hours, and 1 hour. The test areas were then cleaned with Enviro Klean[®] 2010 All Surface Cleaner diluted 1 part to 10 parts fresh water and scrubbed under a stream of running water from a faucet. Samples were allowed to dry for 24 hours. Evaluation consisted of a visual examination of the tested areas to determine the percentage of staining removal.



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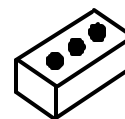
TEST RESULTS – Surface Beading

“Buff”					
Coca Cola®	Ketchup	Red Wine	Olive Oil	Wesson Oil	Motor Oil
Untreated Control					
3	N/A	3	4	5	4
Paver Enhancer					
2	N/A	3	4	4	4
SLX 100					
1	N/A	1	2	3	2
STMP					
3	N/A	3	2	3	3
“Red”					
Coca Cola®	Ketchup	Red Wine	Olive Oil	Wesson Oil	Motor Oil
Untreated Control					
2	N/A	3	6	6	6
Paver Enhancer					
2	N/A	3	6	5	6
SLX 100					
1	N/A	2	2	3	2
STMP					
2	N/A	3	2	2	3
“Orange”					
Coca Cola®	Ketchup	Red Wine	Olive Oil	Wesson Oil	Motor Oil
Untreated Control					
3	N/A	3	6	6	6
Paver Enhancer					
2	N/A	3	6	5	6
SLX 100					
1	N/A	2	2	2	3
STMP					
2	N/A	2	2	3	3

Rating system: 1 & 2 Above Average
 3 & 4 Average
 5 & 6 Below Average
 N/A Not a free flowing liquid



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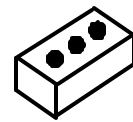
TEST RESULTS – Protective Stain Repellents

“Buff”						
	Coca Cola®	Ketchup	Red Wine	Olive Oil	Wesson Oil	Motor Oil
Untreated Control						
24 hr	100%	100%	100%	100%	20%	20%
8 hr	100%	100%	100%	100%	20%	20%
10 min	100%	100%	100%	100%	20%	20%
Paver Enhancer						
24 hr	100%	100%	100%	100%	100%	100%
8 hr	100%	100%	100%	100%	100%	100%
10 min	100%	100%	100%	100%	100%	100%
SLX 100						
24 hr	100%	100%	100%	100%	80%	50%
8 hr	100%	100%	100%	100%	80%	50%
10 min	100%	100%	100%	100%	80%	50%
STMP						
24 hr	100%	100%	100%	100%	90%	90%
8 hr	100%	100%	100%	100%	90%	90%
10 min	100%	100%	100%	100%	90%	90%
“Red”						
	Coca Cola®	Ketchup	Red Wine	Olive Oil	Wessen Oil	Motor Oil
Untreated Control						
24 hr	100%	100%	100%	100%	80%	50%
8 hr	100%	100%	100%	100%	80%	50%
10 min	100%	100%	100%	100%	80%	50%
Paver Enhancer						
24 hr	100%	100%	100%	50%	50%	50%
8 hr	100%	100%	100%	50%	50%	50%
10 min	100%	100%	100%	50%	50%	50%
SLX 100						
24 hr	100%	100%	100%	100%	90%	50%
8 hr	100%	100%	100%	100%	90%	20%
10 min	100%	100%	100%	100%	90%	20%
STMP						
24 hr	100%	100%	100%	100%	100%	80%
8 hr	100%	100%	100%	100%	100%	80%
10 min	100%	100%	100%	100%	100%	80%

% - percent removal of stain following maintenance cleaning



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TEST RESULTS – Protective Stain Repellents Continued

“Orange”						
	Coca Cola®	Ketchup	Red Wine	Olive Oil	Wessen Oil	Motor Oil
Untreated Control						
24 hr	100%	100%	100%	80%	80%	80%
8 hr	100%	100%	100%	80%	80%	80%
10 min	100%	100%	100%	80%	80%	80%
Paver Enhancer						
24 hr	100%	100%	100%	80%	80%	80%
8 hr	100%	100%	100%	80%	80%	80%
10 min	100%	100%	100%	80%	80%	80%
SLX 100						
24 hr	100%	100%	100%	100%	80%	50%
8 hr	100%	100%	100%	100%	80%	50%
10 min	100%	100%	100%	100%	100%	50%
STMP						
24 hr	100%	100%	100%	100%	100%	100%
8 hr	100%	100%	100%	100%	100%	100%
10 min	100%	100%	100%	100%	100%	100%

% - percent removal of stain following maintenance cleaning

CONCLUSIONS:

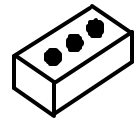
Based upon laboratory results, Stand Off® Stone, Tile & Masonry Protector provided the overall best stain protection to all submitted samples. Stand Off® SLX 100 Water & Oil Repellent provided average stain protection to all submitted samples with the exception of motor oil staining. Stand Off® Paver Enhancer provided average stain protection to sample types “orange” and “buff”, and was less effective at protecting type “red” from oil staining.

RECOMMENDATIONS:

Based upon laboratory evaluations, Stand Off® Stone, Tile & Masonry Protector is recommended to provide the best stain protection on all samples submitted by Whitacre Greer, Alliance, OH.

Refer to product data sheets for further information regarding application instructions.

Lisa Toburen
Assistant Laboratory Technician

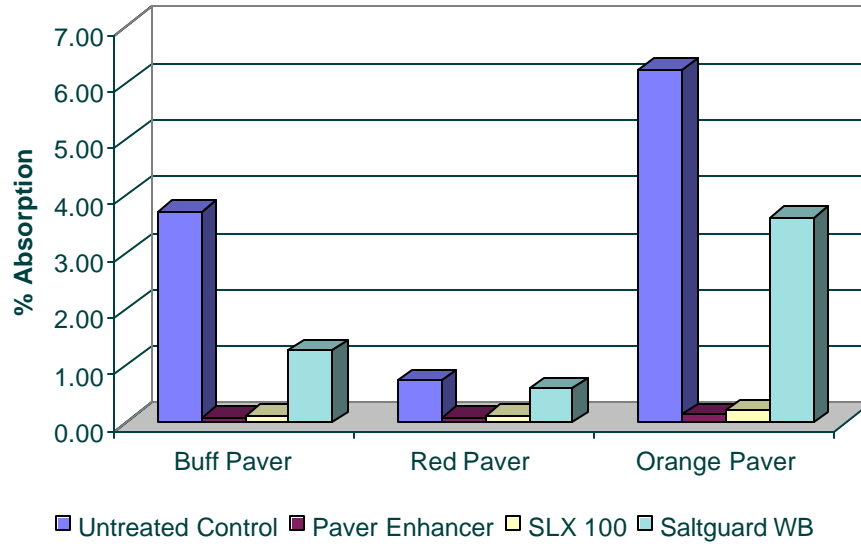


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Attachment # 1

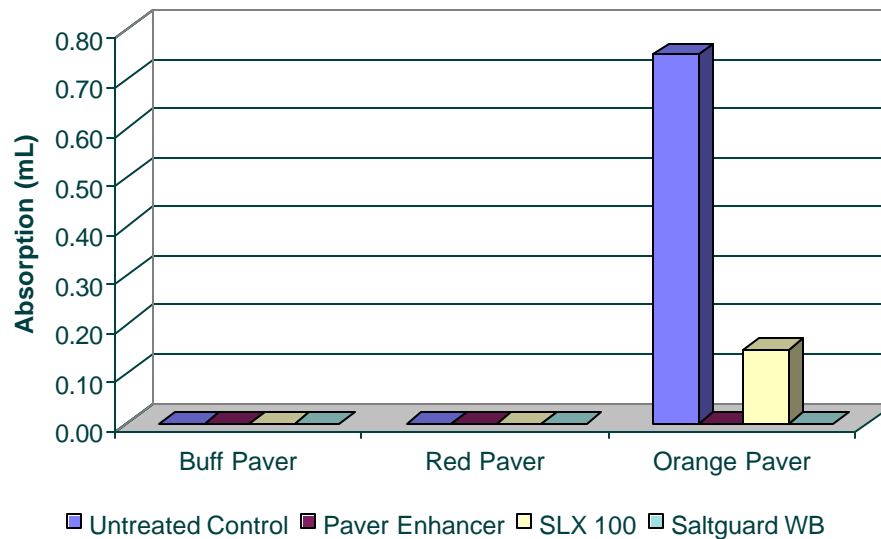
Graph 1

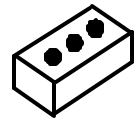
Water Absorption: ASTM C 67, Immersion



Graph 2

Water Absorption Tube Test: RILEM II.4, 5.0 milliliters, 20 minutes





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Attachment # 2

PHOTO A – “Buff” after staining

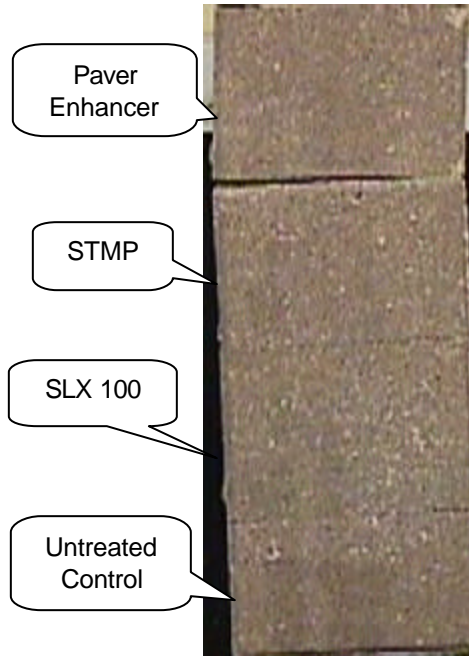
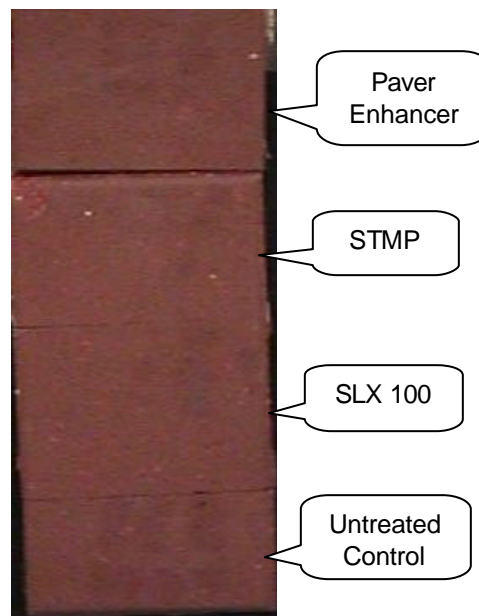
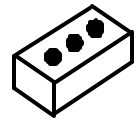


PHOTO B – “Red” after staining

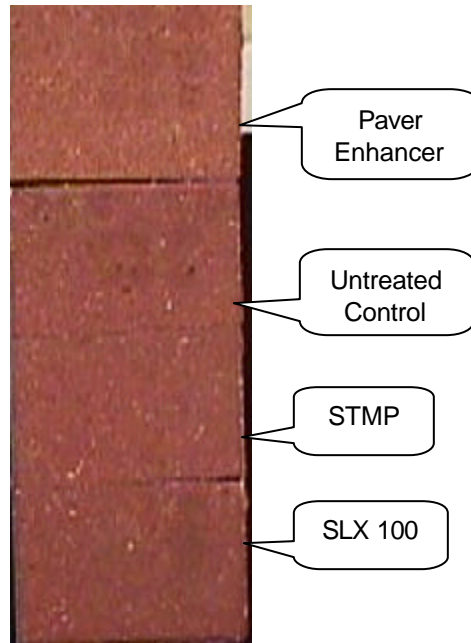


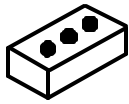


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Attachment # 3

PHOTO C – “Orange” after staining





Laboratory Report

Pallet Card Evaluation

**Whitacre Greer
Alliance, OH**

Project No. 0109-17 PC

Prepared For:

Mike Longo

**Whitacre Greer
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Prepared By:



***PROSOCO, Inc.
December 2001***