



CONSULTANTS  
 ENVIRONMENTAL  
 GEOTECHNICAL  
 MATERIALS  
 FORENSICS

## **REPORT OF PENETRATING CURING AGENT TESTING**

**PROJECT:**  
AMERIPOLISH PCA  
PENETRATING CURING AGENT

**REPORTED TO:**  
AMERIPOLISH  
120 COMMERCIAL AVENUE  
LOWELL, AR 72745

**ATTN:** CARL CABOT

**AET PROJECT NO:** 29-01645

**DATE:** NOVEMBER 18, 2014

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### **INTRODUCTION**

This report presents the test results for the testing of Ameripolish's PCA penetrating curing agent. This product was tested as a finishing aid and curing agent. The purpose of the testing was to determine what effect the following parameters would have on the performance of the product.

- Type of finishing tool used
- Presence of fly ash
- Application timing

Our work was performed in accordance with our September 8, 2014 proposal to you.

### **SUMMARY OF TEST RESULTS**

The testing results revealed that the PCA is effective both as a finishing aid and curing agent. The improvement of "ease of finishing" occurred with all three finishing tools in both the straight-cement and fly ash mixes.

The use of PCA eliminated the crazing experienced by the control slab when subjected to high temperature and rapid air movement.

The abrasion testing will be performed on October 31, 2014. This report will be updated.

### **TEST PROCEDURES**

The performance was measured by the following three methods:

- Ease of finishing was determined by three experienced concrete finishers on a scale of 1 to 5.
- Two slabs were subjected to high temperature and rapid air movement in order to observe crazing.

- Abrasion resistance determined in accordance with ASTM C1353/C1353 M-09, "Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform Double-Head Abrasion."

Concrete was batched in our laboratory on October 3, 2014. Two different concrete mixes The concrete was prepared using the mix design included in the section of this report entitled "Mix Proportions."

Six, 2x2 foot x 3-1/2 inch slabs were made. Ameripolish PCA was applied to five of the six slabs. The slabs contain the following:

<u>Slab No.</u>	<u>Description</u>
1	Control-Straight cement, no product, steel trowel finish
2	Straight cement, product used as a finishing aid, magnesium float finish
3	Straight cement, product sprayed on after finishing with magnesium float finish
4	25% fly ash replacement, product sprayed on after finishing with magnesium float finish
5	Straight cement, product used as a finishing aid with steel trowel finish
6	Straight cement, product used as a finishing aid with plastic trowel finish

### **Mix Proportions – SSD Weight per Cubic Yards**

	<u>Straight Cement</u>	<u>25% Fly Ash</u>
Type I Cement, lbs.	517	387
Class C, Fly Ash, lbs.	-	130
Sand, lbs.	1,299	1,286
¾" River Gravel, lbs.	1,788	1,771
Water, lbs.	282	280
Water Cementitious Ratio	0.55	0.54

### **Finishing**

Once the concrete was placed in the slab forms, it was screeded using a wood straight edge. The top slab was smoothed with a magnesium bull float. Once the surface water was dissipating, the final finish was performed with one of the following tools:

- Magnesium float
- Steel trowel
- Plastic trowel

The PCA product was either sprayed on per manufacturer's recommendations during the final finishing as a finishing aid or after final finish as a curing agent.

### **Crazing**

Slabs one and five were subjected to 200° F temperature with rapid air movement above the slab for 24 hours after placement.

### **Abrasion**

The concrete slabs will cure in our moist curing room at 73° F for 28 days. Three four inch diameter cores will be taken from each slab. Abrasion resistance was determined on the top surface of these cores in accordance with ASTM C1353/C1353 M-09. “Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform for Double-Head Abrasion.”

## **TEST RESULTS**

### **Ease of Finishing**

Three experience concrete finisher rated the ease of finishing on a scale of 1 to 5. The slabs were only identified with a slab number to the finishers.

- 1 Very easy to finish
- 2 Easy to finish
- 3 Average effort to finish
- 4 Tough to finish
- 5 Very tough to finish

	<b>Finisher #1</b>	<b>Finisher #2</b>	<b>Finisher #3</b>	<b>Average</b>
Slab #1 Control – Straight cement, no product; steel trowel finish	3	3	3	3.0
Slab #2 Straight cement, product used as a finishing aid; magnesium float	1	2	2	1.7
Slab #3 Straight cement, no product during finishing; magnesium float	3	4	3	3.3
Slab #4 25% fly ash, no product during finishing; magnesium float	2	3	2	2.3

	Finisher #1	Finisher #2	Finisher #3	Average
Slab #5 Straight cement, product used as a finishing aid; steel trowel finish	1	2	2	1.7
Slab #6 Straight cement, product used as a finishing aid; plastic trowel finish	1	2	2	1.7

**Crazing**

As the attached photographs reveal, crazing occurred on the control slab but not on the slab that was finished with PCA.

**Abrasion**

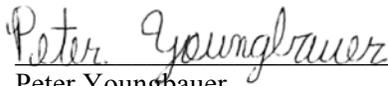
When the product is used as a curing agent (Slabs 3 and 4), the abrasion resistance improved over the control slab.

Abrasion Results	Slab 1	Slab 2	Slab 3	Slab 4	Slab 5	Slab 6
Wt. loss, mg.	2,000	2,000	1,700	1,800	2,000	1,950
Thickness loss, in.	0.024	0.023	0.018	0.020	0.022	0.024

**REMARKS**

We appreciate the opportunity to assist you on this project. If you have any questions regarding this report or our services, feel free to contact me.

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**PHOTOGRAPHS**  
**AET PROJECT NO. 29-01645**



Photo 1: Showing crazing on control slab #1 subjected to 200° F with rapid air movement above slab.

Photo 2: Showing Slab #5 subjected to 200° F with rapid air movement slab.

