TEST REPORT

June 22, 1993

LAW ENGINEERING

GEOTECHNICAL, ENVIRONMENTAL
& CONSTRUCTION MATERIALS
CONSULTANTS

Mr. Harold Muench
Koester American Corporation
1206 Laskin Road
Suite 201
Virginia Beach, VA 23451

Subject: Water Permeability Test (Positive Side Testing)
NB 1 Coating on Porous Concrete Substrate
Law Engineering Project Number 5820472101

Dear Mr. Muench,

Law Engineering is pleased to submit this report of the above subject testing. Included in this report are the scope of work, test procedures, and results. Authorization to perform this testing was given by you via Law's Proposal Acceptance Sheet.

SCOPE OF WORK

The purpose of this testing was to measure the water permeability of the prepared sample of **NB 1 Coating** submitted to our laboratory by Koester American Corporation. The sample was of approximately 12 by 12 by 2-inches dimensions and had the **NB 1 Coating** applied on a porous masonry concrete block substrate by Koester American Corporation. The porous concrete block substrate was observed to be fully saturated after ponding with water for approximately 30 minutes.

TEST PROCEDURES

A six inches diameter specimen was cored from the block sample and was fixed in place inside a steel permeability cylinder using an epoxy adhesive. The specimen was installed in a way so that the negative (uncoated) side of the specimen was exposed to the laboratory air to allow free ventilation and to provide viewing of the specimen for water penetration during the test period, whereas the positive (coated) side was in contact with water inside the steel cylinder.

The system was then charged with deaired water. As much air as possible was removed from the system prior to testing. Once the free air was removed from the system, a positve head was applied to the specimen. Initially a pressure less than 25 psi was applied. The water volume entering the test chamber was monitored. When the rate of water entering the test chamber decreased to a negligible amount, the pressure was increased in approximately 25 psi increments up to 200 psi.

TEST RESULTS

Results are presented in the following table.

396 PLASTERS AVENUE, N.E.
ATLANTA, GEORGIA 30324
404-873-4761
TELEFAX 404-881-0508

Water Permeability Test Results (Positive Side Testing)			
Sample Identification: NB 1 Coating applied on Porous Masonry Concrete Substrate			
Average Specimen Thickness[1]: 2.1 inches			Average Coating Thickness[1]: 71 mils
Hydrostatic Pressure applied to Positive Side of Coating		Time Elapsed (hours)	Result of Observation @ End of Test Period
psi	Head of Water (ft.)		
25	57.8	120	No signs of leakage, softening or discoloration
50	115.5	120	No signs of leakage, softening or discoloration
75	173.3	48	No signs of leakage, softening or discoloration
100	231.0	48	No signs of leakage, softening or discoloration
125	288.8	48	No signs of leakage, softening or discoloration
150	346.5	48	No signs of leakage, softening or discoloration
175	404.3	48	No signs of leakage, softening or discoloration
200	462.1	48	No signs of leakage, softening or discoloration

(1) Total specimen thickness was measured by a caliper at 4 locations. Coating thickness was measured at 4 locations on the cross-section by a magnifying device graduated to 0.1 mm.

Law Engineering would like to thank you for allowing us to provide this service. If you should have any questions, or if we may of further service, please call us at 1-800-TESTING or (404) 871-0243.

Sincerely,

LAW ENGINEERING, INC.

Ronnie T. Hardemen
Engineering Assistant

Quincy Kong
Materials Engineer

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TEST REPORT

June 16, 1993

LAW ENGINEERING

GEOTECHNICAL, ENVIRONMENTAL
& CONSTRUCTION MATERIALS
CONSULTANTS

Mr. Harold Muench
Koester American Corporation
1206 Laskin Road
Suite 201
Virginia Beach, VA 23451

Subject: Water Permeability Test (Negative Side Testing)
NB 1 Coating on Porous Concrete Substrate
Law Engineering Project Number 5820472101

Dear Mr. Muench,

Law Engineering is pleased to submit this report of the above subject testing. Included in this report are the scope of work, test procedures, and results. Authorization to perform this testing was given by you via Law's Proposal Acceptance Sheet.

SCOPE OF WORK

The purpose of this testing was to measure the water permeability of the prepared sample of **NB 1 Coating** submitted to our laboratory by Koester American Corporation. The sample was of approximately 12 by 12 by 2-inches dimensions and had the **NB 1 Coating** applied on a porous masonry concrete block substrate by Koester American Corporation.

TEST PROCEDURES

A six inches diameter specimen was cored from the block sample and was fixed in place inside a steel permeability cylinder using an epoxy adhesive. The specimen was installed in a way so that the positive (coated) side of the specimen was exposed to the laboratory air to allow free ventilation and to provide viewing of the specimen for water penetration during the test period, whereas the negative (uncoated) side was in contact with water inside the steel cylinder. The porous masonry concrete block substrate was fully saturated within approximately 30 minutes after it was in contact with water.

The system was then charged with deaired water. As much air as possible was removed from the system prior to testing. Once the free air was removed from the system, a positve head was applied to the specimen. Initially a pressure less than 25 psi was applied. The water volume entering the test chamber was monitored. When the rate of water entering the test chamber decreased to a negligible amount, the pressure was increased in approximately 25 psi increments up to 200 psi.

TEST RESULTS

Results are presented in the following table.

396 PLASTERS AVENUE, N.E.
ATLANTA, GEORGIA 30324
404-873-4761
TELEFAX 404-881-0508

Water Permeability Test Results (Negative Side Testing)			
Sample Identification: NB 1 Coating applied on Porous Masonry Concrete Substrate			
Average Specimen Thickness[1]: 2.1 inches		Average Coating Thickness[1]: 71 mils	
Hydrostatic Pressure applied to Negative Side of Coating		Time Elapsed (hours)	Result of Observation @ End of Test Period
psi	Head of Water (ft.)		
25	57.8	120	No signs of leakage, softening or discoloration
50	115.5	120	No signs of leakage, softening or discoloration
75	173.3	48	No signs of leakage, softening or discoloration
100	231.0	48	No signs of leakage, softening or discoloration
125	288.8	48	Slight leakage was observed from a tiny small pin hole on the coating [2]
150	346.5	48	No futher deterioration of leakage
175	404.3	48	No further deterioration of leakage
200	462.0	48	No signs of leakage

(1) Total specimen thickness was measured at 4 locations by a caliper. Coating thickness was measured at 4 locations on the cross-section by a magnifying device graduated to 0.1 mm.
(2) The pin hole appears to be an air void entrapped during coating application.

Law Engineering would like to thank you for allowing us to provide this service. If you should have any questions, or if we may of further service, please call us at 1-800-TESTING or (404) 871-0243.

Sincerely,

LAW ENGINEERING, INC.

Ronnie T. Hardemen
Engineering Assistant

Quincy Kong
Materials Engineer

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