



Applied Testing, Inc.

Materials Testing and Inspections

Report No: 502-014-033103 AQUAFIN Permeability Testing

Report Date: 03/31/2003

REPORT OF CONCRETE PERMEABILITY TESTING

Client: AQUAFIN

Laboratory Staff : Richard King / Craig Joss

Concrete Materials Supplied by: DePaul Concrete Company

Testing Program: Complete testing of AQUAFIN-2K/M using Corps of Engineers CRD C 48-92, December 1, 1992 "Standard Test Method for Water Permeability of Concrete."

AQUAFIN-2K/M Testing Program Phase I

Untreated Control Sample. Prepare one (1) control sample (Nominal compressive strength to be 3000 psi), twelve (12) inches long by six (6) inch diameter, and set up in test equipment. Complete permeability testing according to CRD-C 48-92.

Treated Sample. Prepare one (1) treated sample with 1/16 inch coating of AQUAFIN-2K/M and test with positive side pressure according to CRD-C 48-9.

Concrete Specifications Untreated Control Sample

Class / Amount Concrete: 3000 psi (1 bar = 14.5 psi)	Admixture: n/a
Type of Forms: Plastic standard cylinder mold 6" x 12". 25 tamps of 1" rod per 4" lift.	Type of Mixer: Batch
Date Placed: 4/8/2002 Weather: Sunny 80°	Concrete Temperature: 75°
Slump: 4.0	

Concrete Mix: Cement 490 lbs.

Natural Sand: 1390 lbs.

Coarse Agg. #1: 1850 lbs

Total Water 260 lbs

Additional water added at Laboratory to achieve slump.

Percent Air Entrainment: 5 %

Concrete Specifications Treated Sample

Class / Amount Concrete: 3000 psi (1 bar = 14.5 psi)	Admixture: n/a
Type of Forms: Plastic standard cylinder mold 6" x 12". 25 tamps of 1" rod per 4" lift.	Type of Mixer: Batch
Date Placed: 4/8/2002 Weather: Sunny 80°	Concrete Temperature: 75°
Slump: 4.0	

Concrete Mix: Cement 490 lbs.

Natural Sand: 1390 lbs.

Coarse Agg. #1: 1850 lbs

Total Water 260 lbs

Additional water added at Laboratory to achieve slump.

Percent Air Entrainment: 5 %

AQUAFIN-2K/M applied at a rate of 1/16 inch thickness (5.5 lbs per square yard).

Concrete Strength Testing:

Testing Date: 5/6/2002 Compressive strength testing was completed in accordance with ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. Average 28-day compressive strength was 3517 psi (1 bar = 14.5 psi).

TEST # 1 Control Test

Coating Material: None

Date Test Started: May 26, 2002

Method of Test: Permeability test performed in accordance with CRDC-48-92

Ambient Temperature: 74°F

Test: **Positive (water) side.**

Water Pressure During Test: 200 psi (1 bar = 14.5 psi) applied with regulated air pressure.

Test Duration: 23 days. Concrete and test cylinder prepared as provided for on CRDC 48-92.

RESULT:

Test Result: Water flow through test specimen monitored over 21-day period. Permeability calculated from change in head data and elapsed time during test for final five days of testing. The calculated permeability was 1.1×10^{-9} cm/sec.

TEST # 2 AQUAFIN-2K/M

Coating Material: AQUAFIN-Integracoat 2K/M at 1/16 inch thickness - 5.5 lbs/sq. yd.

Date Test Started: February 27, 2003

Date test Completed: March 24, 2003

Method of Test: Permeability test performed in accordance with CRDC-48-92

Ambient Temperature: 72°F

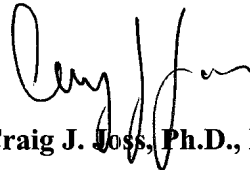
Test: **Positive side pressure with AQUAFIN-2K/M coating**

Water Pressure During Test: 200 psi (1 bar = 14.5 psi) applied with regulated air pressure.
Test Duration: 26 day period. Concrete and test cylinder prepared as provided for on CRDC 48-92.

RESULT:

Test Result: Head measurements were monitored in the permeameter sight glass throughout the 26-day test period. In addition, the outflow valve at the base of the cylinder test cell was inspected on a daily basis to record the presence of moisture, if any. No liquid water at all was observed to exit the test cell during the 26 day test period. Overall calculated permeability from change in head data and elapsed time during the entire test period was 2.6×10^{-11} cm/s. Permeability over the last seven (7) days was 1.36×10^{-11} cm/sec approximately half of the overall value. This inferred permeability results from migration of water vapor from test specimen.

Respectfully submitted,
Applied Testing, Inc.



Craig J. Joss, Ph.D., P.E.
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