

TEST RESULTS:

Freeze-Thaw

abc
FIBERS

...makes ordinary concrete
EXTRAordinary

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Summary. The addition of ABC Fibers to the concrete mix does not adversely affect the freeze-thaw durability of the concrete.

Background: Freeze-Thaw tests were performed on six panels, three control panels without fiber and three panels with ABC Fibers. The tests were performed using ASTM 666 Method A. Acceptance criteria were in accordance with ICBO AC32, Section 5.3. Shown below are the average of the three tests.

Data:	Control	Fiber
Fundamental Frequency		
Before 302 Cycles:	.707	1.00
After 302 Cycles:	.683	0.97
Durability Factor	87.3	90.0

Over ->

Freeze-Thaw Durability testing was done by :

Twin City Testing Corporation
662 Cromwell Avenue
St. Paul, MN 55114-1776

Test Supervisor:
Mr. John D. Lee, PE
Senior Staff Engineer
Construction Materials Department.

Testing began on September 15, 1999. The results were published as Project 99-09552 on October 28, 1999. Mr. Lee can be reached at 651.659.7340.

The goal of the test was to determine if the addition of ABC Fibers to a concrete mix adversely affected the freeze-thaw durability. The tests were performed in accordance with ASTM 666 Method A. ICBO Acceptance Criteria for Synthetic Fiber-Reinforced Concrete, Section 5.3 was used. The condition of acceptance of the test is that the addition of fibers does not adversely affect the freeze-thaw durability of the concrete.

Three identical concrete panels were prepared without the addition of fibers. ABC Fibers were added to the original mix at the rate of 1.5 pounds per cubic yard, and three more identical panels were poured. The six panels were tested through 302 freeze-thaw cycles. The tests concluded when the modulus of elasticity of the control sample reached 60% of the initial modulus value

In summary, the test results indicate the addition of ABC fibers does not adversely affect the freeze-thaw durability of the concrete mix.

Materials:

Cement: Type I Portland Cement (ASTM:C150)
Fine Aggregate: Shiely Aggregates Inc. Meeting the grading requirements of ASTM: C494 and C33.

Coarse Aggregate: Shiely Aggregates Inc. Meeting the grading requirements of ASTM:C494 and C33.

Admixtures: DARAVAIR by W.R. Grace (ASTM: C260) ABC Fibers. (Fibers not in control.)

Mix Design:

Mix Number:	1 and 2
Mixture Type	Control and Fiber
Portland Cement, Lb.:	517
Fine Aggregate, Lb.:	1,365
Coarse Aggregate, Lb.:	1,750
Net Water, Lb.:	257
Admixtures:	
DARAVAIR, Oz.	4.1
ABC Fibers, Lb./cu.yd.	1.5 (not in control)

Concrete Test Data:

	Control 1	Control 2	Control 3
FTF initial	1.51	0.28	0.33
FTF @302 cycles	1.50	0.26	0.29
Durability Factor	99	86	77
Weight, initial	10,108	9,999	10,146
Weight, final	10,047	10,017	10,171
% Change	-0.6%	+0.2%	+0.3%

	Fiber 1	Fiber 2	Fiber 3
FTF initial	0.34	1.20	1.46
FTF @302 cycles	0.30	1.15	1.46
Durability Factor	78	92	100
Weight, initial	10,164	9,935	10,186
Weight, final	10,162	10,075	10,148
% Change	0.0%	+1.4%	+0.4%

FTF – Fundamental Traverse Frequency.