

# SUMMARY REPORT 81-3(S)

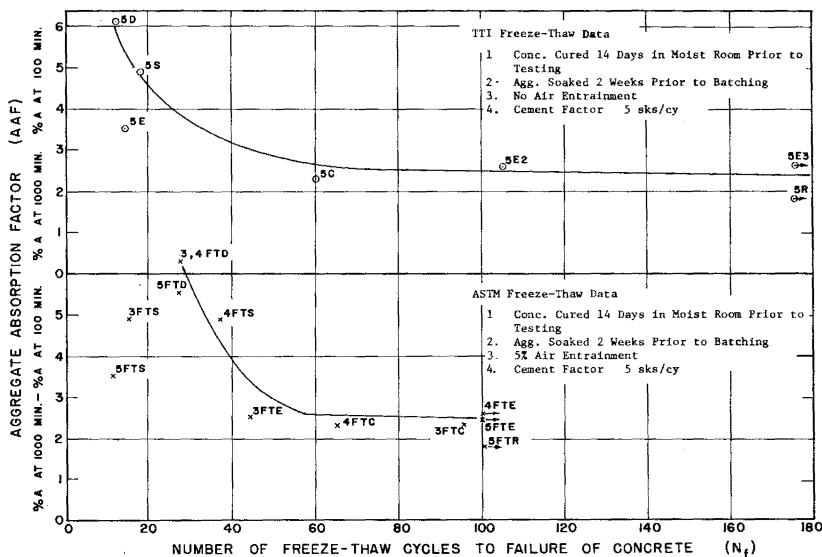
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## AGGREGATE ABSORPTION FACTOR AS AN INDICATOR OF THE FREEZE-THAW DURABILITY OF STRUCTURAL LIGHTWEIGHT CONCRETE

SUMMARY REPORT  
of  
Research Report Number 81-3  
Study 2-8-65-81



Freeze-Thaw Durability as a Function of AAF for Selected  
Synthetic Lightweight Concretes, by Code Number.

Cooperative Research Program of the  
Texas Transportation Institute and the Texas Highway Department  
In Cooperation with the  
U. S. Department of Commerce, Bureau of Public Roads

February, 1967

TEXAS TRANSPORTATION INSTITUTE  
Texas A&M University  
College Station, Texas

# **Aggregate Absorption Factor as an Indicator of the Freeze-Thaw Durability of Structural Lightweight Concrete**

by

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The purpose of this phase of investigation was twofold:

1. Correlation of freeze-thaw research results at the Texas Transportation Institute with ASTM Standard freeze-thaw results.
2. Development of preliminary durability acceptance criteria for concrete using synthetic aggregates based on freeze-thaw test.

The research reported herein represents a portion of a study undertaken in cooperation with the Texas Highway Department and U. S. Bureau of Public Roads. Two formal reports have been prepared to date. Complete information concerning the over-all purpose, scope, limitations, and background of this research study is given in these two reports.<sup>1,2</sup>

From the results obtained in this phase of investigation, the following conclusions are suggested:

1. The Aggregate Absorption Factor (AAF) of the synthetic lightweight coarse aggregates studied is a readily obtainable property which can be used to predict the coarse aggregate's resistance to freezing and thawing and the resulting concrete's durability against freezing and thawing (see cover illustration).

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<sup>1</sup>Ledbetter, W. B., "Correlation Studies of Fundamental Aggregate Properties with Freeze-Thaw Durability of Structural Lightweight Concrete," Research Report 81-1, Texas Transportation Institute, Texas A&M University, August, 1965.

<sup>2</sup>Kanabar, C. N. and Ledbetter, W. B., "Effects of Degree of Synthetic Lightweight Aggregate Pre-Wetting on the Freeze-Thaw Durability of Lightweight Concrete," Research Report 81-2, Texas Transportation Institute, Texas A&M University, November, 1966.

2. A relationship was established between the Texas Transportation Institute and ASTM Standard (C290) concrete freeze-thaw tests.

From the findings of this study, the following recommendations are suggested:

1. Continued attempts should be made to relate fundamental aggregate properties with the durability of the resulting concrete.

2. The relationship developed between the two concrete freeze-thaw tests should not be universally applied without further substantiating data.