Durability Study of Type II Cements

INTRODUCTION

A study of type II cements at the Iowa State Highway Commission concluded that the amount of tricalcium aluminate in the cement appears to have an inverse effect on concrete durability.[1] This conclusion agrees with the results of the Kansas Highway Department's study to determine the combination of cement and aggregate which would produce the best possible durability factor.[2]

This study is a result of the questions raised following the completion of the project at the Iowa State Highway Commission. This project is being conducted on a larger scale so that more definite conclusions can be drawn.

PURPOSE

The purpose of this project is to determine if the amount of tricalcium aluminate in type II cements has an inverse effect on the durability of concrete.

87. Thus, it is concluded that before a project to determine the effects of a small difference of tricalcium aluminate can be conducted, there must be an improvement in the dependability and repeatability of the freeze and thaw test procedure.

SUMMARY

This study has shown that:

1. There is no justification for concluding that the amount of tricalcium aluminate has an inverse effect on the durability of type II cements when measured by ASTM C291. This conclusion is a direct result of chemical analysis discrepancies and inconsistant test data.
2. There must be a complete investigation as to the dependability and repeatability of the freeze and thaw test procedure before projects of this magnitude can be conducted in the future.

Possible areas of more stringent control might be:

A. Mixing Atmosphere
B. Vibration Time
C. Frequency Determination