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14. Supplementary Notes

15. Abstract

Objective
The main goal of the monitoring activities was to determine if partial replacement of Portland cement with an optimized quantity of locally available fly ash or GGBFS can extend the service life of bridge structures.

Scope
These bridges are being monitored for corrosion of the reinforcing steel, chloride penetration into the concrete, and temperature changes in the top five inches of the concrete deck.
A Gecor 6 instrument was used to measure corrosion rate and concrete resistivity four times each year. Stainless steel inserts connected to the rebar were cast into the bridge deck to facilitate the Gecor 6 measurements. Temperature was measured on a continuous basis using cast-in-place thermocouples. Chloride was measured by collecting concrete samples from the decks at various depths and analyzing for the chloride content.

Summary
Based on some of the results obtained, it appears that the concrete that contained the mineral admixtures did perform better than the plain concrete. The chloride data in particular indicates that after the first year of the project, the plain concrete consistently contained the highest chloride levels at 0.5, 3 and 5 inches of depth into the deck. The Icorr corrosion measurements indicated a similar trend, however the differences in the Icorr values were fairly small and the values clearly showed that all three decks were in a passive condition at all locations where the measurements were collected. The temperature data collected indicated that all the bridges experienced similar numbers of freeze/thaw cycles during the project, so it can be concluded that freeze/thaw effects were not a major variable in terms of the overall performance of the three bridge decks.

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