

RESEARCH PROBLEM STATEMENT

DATE: 09/07/2018	PROJECT AREA: Pavements
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TITLE: Investigating Susceptibility of Arkansas Concrete to Deicing Salt Deterioration

PROBLEM STATEMENT:

Arkansas pavements and bridge decks are a vital part of the infrastructure ARDOT maintains. De-icing salts are regularly used to reduce ice accumulation on highways and bridges before and during winter weather events. In 2014, ARDOT overhauled its winter weather maintenance program resulting in changes to deicing salt usage throughout the state. This new maintenance program relies heavily on increased use of deicing salts to keep ARDOT roads clear during winter weather. However, these salts can cause deterioration of concrete through surface spalling, reinforcement corrosion, and cementitious interactions such as calcium oxychloride formation. Research is needed to determine if Arkansas concrete is susceptible to deicing salt deterioration based on updated ARDOT guidelines, and if so, how to mitigate this deterioration in new concrete.

OBJECTIVES:

Survey Arkansas pavements to look for areas where deicing salts have caused premature deterioration. Test samples from these locations to chemically determine the cause and investigate susceptibility to continued deterioration. Cast concrete and cement paste/mortar mixtures with local materials conforming to ARDOT Class PCCP and Class S(AE) standards to determine susceptibility to future deicing salt degradation. Finally, determine effective mitigation strategies to reduce the deleterious effects of deicing salt usage on Arkansas highways.

FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:

Known damage due to deicing salt deterioration has been documented in many states. This work will determine if deicing salts are a cause of pavement and bridge deck deterioration in Arkansas. If so, this research will lead to mitigation strategies to reduce these negative effects. Hopefully, the addition of supplementary cementitious materials can help reduce deicing salt damage.

Estimated Project Duration: 24 Months
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Standing Subcommittee
Ranking

Advisory Council
Ranking

Statement Combined with
Statement Number(s)

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