

RESEARCH PROBLEM STATEMENT

DATE: 9/6/2018	PROJECT AREA: Design	
TITLE: Development of Metals Corrosion Maps of Arkansas and Maintenance of Cross-drains		
PROBLEM STATEMENT:		
<p>Metal culverts or pipes used along or across the Arkansas highway system can corrode over time. The rate of metal corrosion varies around the ArDOT districts and it depends on various material properties and environmental conditions, which include soil type, ground water table, rainfall, acidity level of soils, etc. Catastrophic incidents such as a complete wash out of metal culverts along with roadway can be prevented if proper metals can be selected during the construction project. A user-friendly corrosion map will help to reduce such catastrophic damage and save human life and properties. Also, selecting less expensive metals in less corrosive areas can be cost effective to the ArDOT. Further, the ArDOT districts that have more ice and snow would be more susceptible to metal pipe corrosion because of the amount of salt used in the winter. Since different metals corrode at different rates even under the same environmental conditions, this could lead to us picking more appropriate materials for a longer life expectancy. Louisiana has done similar work and completely banned metal pipes in District 2 (New Orleans).</p>		
OBJECTIVES:		
<p>The main objective of the proposed study is to develop a corrosion map of Arkansas so that appropriate metal pipes can be selected for cross-drains. Specific objectives are: (1) Analyze soils, materials and environmental data from historical and new construction projects; (2) Develop a user friendly corrosion map for Arkansas; (3) Conduct life cycle cost analysis of different metal pipes; and (4) Suggest cost-effective maintenance options of cross-drains to lengthen their service lives.</p>		
FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:		
<p>Recommendations for possible changes of ArDOT Specifications Division 600 (SECTION 606 PIPE CULVERTS> 606.02 Materials). Implementing the outcome of this project will be significant cost savings for ArDOT by selecting proper metals and taking necessary measures to enhance existing structures' service life. It will also help ArDOT to avoid catastrophic damage due to corrosive failure of metal pipes used in cross-drains.</p>		
Estimated Project Duration: 24 Months		
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Standing Subcommittee
Ranking

3/3

Advisory Council
Ranking

32/37

Statement Combined with
Statement Number(s)
