

**RESEARCH PROBLEM STATEMENT**

<b>DATE:</b> 09/03/2019	<b>PROJECT AREA:</b> Maintenance
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**TITLE:** Developing Guidelines for Evaluating Weathering Steel Bridges

**PROBLEM STATEMENT:**

Weathering steel is used to protect a structural member from corrosion. Highway departments often use weathering steel for bridges with the expectation that the weathering steel structure will not corrode. Weathering steel has improved corrosion resistant behavior over conventional steel, however weathering steel is not maintenance free and will corrode if not used in proper ambient conditions. Weathering steel retards corrosion, but may require future restoring through cleaning and painting. ARDOT oversees 1174 weathering steel bridges. Eighty-three of these bridges (7.1%) are experiencing oxide film degradation of the steel protective coating, patina (AASHTO bridge inspection code 3430). Other states have also experienced this condition resulting in highway departments facing the dilemma of how to restore weathering steel sections that have experienced corrosion due to chlorides and other contaminants. Consequently, guidelines need to be developed for bridge inspectors to evaluate the patina at weathering steel bridges and how to restore steel sections that are experiencing corrosion.

**OBJECTIVES:**

- Review ARDOT bridge inspection reports for bridges constructed using weathering steel that are identified with oxide film degradation.
- Identify weathering steel bridges for their future potential for oxide film degradation.
- Prioritize weathering steel bridges for remediation.
- Evaluate patina performance during the proposed study period.
- Survey state DOT's for performance of their weathering steel bridges and their remediation procedures.
- Develop guidelines for ARDOT bridge inspectors to evaluate patina condition.
- Develop ARDOT protocol for using weathering steel for future bridge designs (bridge site conditions, ambient conditions).
- Modify ARDOT bridge design standards to minimize conditions that may lead to patina deterioration.

**FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:**

DOT's typically use weathering steel as a cost-effective option for bridges. This cost-effectiveness results from minimizing painting treatment. Corrective measures developed in this proposed research work will ensure that maintenance costs at weathering steel bridges will be minimized by optimizing the design of future weathering steel bridges, minimizing the girder area at existing bridges that should be painted to protect against patina deterioration, and minimizing costs for remediation at girder sections that are already experiencing patina deterioration.

**Estimated Project Duration:** 24 Months

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Standing Subcommittee  
Ranking

Advisory Council  
Ranking

Statement Combined with  
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