VERMONT
AGENCY OF TRANSPORTATION
RESEARCH PROGRAM

# Stainless Steel Coated Rebar for Chloride Resistant Concrete Highway and Bridges

**STUDY TIMELINE**
April 2022 - June 2023


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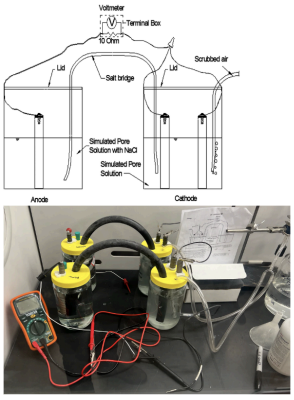
**KEYWORDS**
Corrosion, Materials Science, Durability

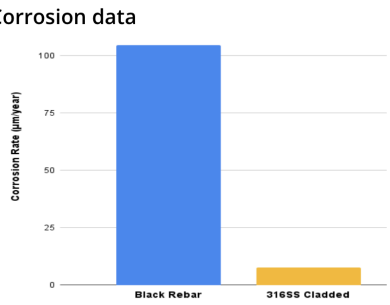
**FUNDING**
NCHRP IDEA 240


## Introduction (or Problem Statement)

Corrosion of steel reinforcement (rebar) is one of the primary challenges limiting the durability of reinforced concrete structures. In this project, Allium Engineering, Inc. developed a new type of stainless-clad steel reinforcement with a novel laser deposition manufacturing process. The mechanical and corrosion properties of the material were tested.




**Allium stainless-clad rebar shows 93% reduction in corrosion rate**




## Project Methodology

The project initially focused on cold spray deposition. Quickly this was determined to not provide the corrosion and mechanical performance needed. After several iterations the laser deposition process was determined to give the ductility and corrosion resistance required for bridge applications.

## Conclusions/Next Steps

Allium Engineering, Inc. has continued to develop the technology including experimentation with different stainless steel grades for the cladding layer. Currently the focus is on establishing and scaling up manufacturing with a new facility opened recently in North Billerica, MA to enable production.

## Impacts and Benefits

Allium Engineering, Inc. is working closely with the AOT towards two pilot bridge applications in Lowell and Springfield Vermont.