Request for Research Funding for FY 2023-2024			
Project Number (Research Center Use Only): SMO-24-09			
Requesting Office	State Materials	**Priority**	9 of 12
Proposed Title	Determining the Effect of Changing Relative Area on the Galvanic Corrosion Rate of Contacting Dissimilar Metals		
Justification	It is widely known that the behavior of galvanic corrosion between dissimilar metals is greatly impacted by ratio of the metals' surface areas. Engineers are instructed to design components so that the surface area of the cathode is significantly larger than that of the anode. However, few studies have been conducted to determine a precise threshold where the area ratio begins to be unfavorable and promote galvanic corrosion. This question is becoming increasingly prevalent in bridge design as designers move away from specifying carbon steel as reinforcement for substructure elements in submerged marine environments in favor of more corrosion resistant materials such as stainless steel. At the same time, designers may opt to continue specifying carbon steel in superstructure elements to prevent further increases in cost. This design choice may result in dissimilar metals being in direct contact with each other at varying surface area ratios which could lead to accelerated corrosion of the more anodic carbon steel reinforcement.		
Impact	The results of this research could lead to changes to the Structures Design Guidelines to specify a precise quantity ratio of carbon steel to stainless steel based on maximum allowable corrosion rates specified in the Structures Design Guidelines.		
Affected Offices	State Materials – Rodrigo Antunes, Ph.D., P.E.; Alexander Lewis Structures Design – Steven Nolan, P.E. State Construction Office – David Wagner, P.E. State Structures & Facilities Maintenance Office – Bruno Vasconcelos, P.E.		
Existing Work			
Keywords Used In Existing Work Search **(Cannot leave blank)**	Basalt Fiber, Composite, BFRP, FRP, bars, rebar, durability,		
Related Contracts (Give contract numbers)	N/A		
Funding Request	$100,000	**Anticipated Duration**	12 months
Project Manager	Alexander Lewis	**Contracting Method**	RFP
Equipment	N/A	N/A	
Urgency	4		
Implementability	2	If the results are conclusive implementation would only be a change to the Design Guidelines.	

Project Benefits (Succinct, complete explanation)

The results of this research would provide State Materials and Design Offices with guidance to address relative quantities of dissimilar reinforcement materials in bridge design.

Project Benefits (Select all that apply and explain)	Quantifiable Benefits (units, dollars, etc…if applicable)	Methodology or Data Sources Used to Determine Quantifiable Benefits. If not applicable, please give justification of project benefits
o Materials Enhancement	N/A	
o Materials Savings	N/A	Addressing this issue could mitigate future maintenance and service life concerns brought about by corrosion.
o Time Savings	N/A	
o Lives Saved/Injuries Prevented	N/A	Ensuring long term durability of concrete reinforcement should be a safety consideration for its residents, visitors, and businesses. The goal is to provide a fatality free transportation system.
o Other (Explain)	N/A	

*Comments should explain and support urgency, financial benefit, and implementability scores