

**Request for Research Funding for FY 2021-2022**

<b>Requesting Office</b>	SMO	<b>Priority</b>	# 9 of # 10
<b>Proposed Title</b>	Modeling the Stainless Steel Corrosion Propagation Stage		
<b>Justification</b>	The findings of BDV25 977 TWO 56 indicated that corrosion of stainless steel (SS) rebar in concrete is typically limited to 1/4 - 1/2 of the rebar circumference and the corrosion length is much less than that of carbon steel (CS). The research also found that the damage morphology of SS results in higher values of critical corrosion penetration (Xcrit) which may result in an alternative limit state especially in locally deficient concrete. In order to further verify and refine the length of the propagation stage determined, an Xcrit model applicable to SS that considers localized corrosion needs to be developed. The mechanical failure limit state for SS in locally-deficient concrete also needs to be verified and relationships between corrosion damage and mechanical properties of SS alloys taking extreme localization into account.		
<b>Impact</b>	More in-depth understanding and accurate models of SS corrosion in concrete will allow the Department to maximize the utilization of SS as a corrosion-resistant concrete reinforcing option.		
<b>Affected Offices</b>	Materials, Design, Maintenance		
<b>Existing Work</b>	BDV25 977 TWO 56		
<b>Keywords Used In Existing Work Search</b> (Cannot leave blank)	Stainless Steel Corrosion Propagation		
<b>Related Contracts (Give contract numbers)</b>	BDV25 977 TWO 56		
<b>Funding Request</b>	\$200,000	<b>Anticipated Duration</b>	24 months
<b>Project Manager</b>	Chase Knight/Ron Simmons	<b>Contracting Method</b>	Direct-USF
<b>Urgency</b>	2	A shortage of cementitious materials has prompted the need for other corrosion mitigation solutions. Further introduction of stainless steel reinforcement will allow reduced concrete cover and alleviate the demand for supplementary cementitious materials without compromise to design service life.	
<b>Implementability</b>	1	The sole restraints to implementability would include modifying our current Standard Specifications. Additionally, industry may have to adjust to new form requirements.	
<b>Project Benefits (Succinct, complete explanation)</b>			
Provide FDOT Design office with modeling data for further implementation of stainless steel reinforcement to facilitate reduction of concrete cover and as a result, supplementary cementitious materials.			
<b>Project Benefits</b>	<b>Quantifiable Benefits (units, dollars, etc...if applicable)</b>	<b>Methodology or Data Sources Used to Determine Quantifiable Benefits. If not applicable, please give justification of project benefits</b>	

<b>(Select all that apply and explain)</b>		
<input type="radio"/> Materials Enhancement	None	
<input type="radio"/> Materials Savings	Supplementary Cementitious Materials	Costs savings due to reduced concrete cover needed for stainless steel reinforcement.
<input type="radio"/> Time Savings	None	
<input type="radio"/> Lives Saved/Injuries Prevented	None	
<input type="radio"/> Other (Explain)	None	

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