

Request for Research Funding for FY 2023-2024

Project Number (Research Center Use Only): SMO-24-01

Requesting Office	SMO	Priority	1 of 12
Proposed Title	Corrosion risk assessment of unbonded post tensioned tendons filled with flexible fillers that have air voids with and without water including the development of a nondestructive tool to identify these voids.		
Justification	The use of unbonded post tensioned tendons filled with flexible fillers have recently been implemented for bridge structures. Water was found in a post tensioned tendon that failed. This failure was apparently due to corrosion occurring on the strands. The Department needs a means to nondestructively identify voids within installed tendons filled with flexible fillers. In addition, it is imperative to determine what conditions within these voids can lead to corrosion, the severity of the corrosion, and the impact on the service life.		
Impact	The ability to identify and assess the impact of voids in unbonded post tensioned tendons containing flexible fillers is crucial to the Departments' mission to provide a safe transportation system. Without this ability the Department is at risk of a structure collapse and a potential for human casualty.		
Affected Offices	Construction (David Wagner), Maintenance (Scott Arnold), Materials (Dave Cerlanek, Sue Zheng)		
Existing Work	None found		
Keywords Used In Existing Work Search (Cannot leave blank)	Flexible filler; tendon; void		
Related Contracts (Give contract numbers)	BDV25-977-24, BDV25-977-52, BDV27-977-10		
Funding Request	\$280k	Anticipated Duration	30 months
Project Manager	Adrian Steele	Contracting Method	RFP to all registered vendors
Equipment	NA	none	
Urgency	1	A failure has already occurred. The Department needs a means to inspect other structures as soon as possible in order to identify, and remediate, any potential for corrosion related failures of unbonded post tensioned tenons containing flexible fillers.	

Implementability	1	Implementation of the research outcome could be performed quickly by revising existing specifications to require the identification of voids and the potential for water intrusion as well as potential techniques to correct identified deficiencies.
<p>Project Benefits (Succinct, complete explanation)</p> <p>The potential financial benefits of implementing the research results are a reduction of construction and maintenance costs of bridges by expediting repairs during construction and preventing major maintenance repairs to preserve the intended bridge service life.</p>		
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
<input type="radio"/> Materials Enhancement	Post-tensioned tendon durability	Detection of filler deficiencies and their potential implications to durability considering water intrusion.
<input type="radio"/> Materials Savings	NA	
<input type="radio"/> Time Savings	NA	
<input type="radio"/> Lives Saved/Injuries Prevented	NA	
<input type="radio"/> Other (Explain)	NA	

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