

Request for Research Funding for FY 2023-2024

Project Number (Research Center Use Only): SMO-24-12

Requesting Office	State Materials Office	Priority	12 of 12
Proposed Title	Determining Interaction of Organic Material in Silica Sand with Cement		
Justification	The University of Florida (UF) contract BEB28 “Development of a Test to Quantify Organic Content in Silica Sand” identified a suitable chemistry test and reported on results and concrete strength tests. The relation between chemistry results and strength was not sufficiently established. UF suggested a follow-up, in-depth exploration, to identify the type of organic materials present, increase the size of the database, and explore the interaction of the organics with cement		
Impact	How shall the results impact practice? Consequences of not doing the research?		
Affected Offices	Need to be involved in scoping: Central Office Structures. Affected: Materials, Design, Construction, and Maintenance Implementation: Revision to Construction Aggregates Manual for Testing requirements. Testing for Materials Acceptance and Certification System Statewide meeting required: No Implementing office: SMO		
Existing Work	A TRID search for key words “organics, chemistry, sand” found no results, none associated with this topic. A TRID search for key words “chemistry, sand, cement” found, 115 results, mostly related to alkali-aggregate reactions and soils-cement modification for stabilizing roadways. A RIP search for combinations of key words, organics, chemistry, cement and sand found no results associated with this topic.		
Keywords Used In Existing Work Search (Cannot leave blank)	organics, chemistry, cement sand		
Related Contracts (Give contract numbers)			
Funding Request	\$180,000	Anticipated Duration	24 months
Project Manager	John Shoucair, P.E.	Contracting Method	Direct contract with University of Florida who proposed concepts
Equipment	None	N/A	
Urgency	3	The project will continue to explore and supplement the findings/insufficiencies from the previous study. The Department will use immediate results, from the State Materials Office, of proposed AASHTO T 71 “Effect of Organic Impurities in Fine Aggregate on Strength of Mortar” to control acceptance of silica sand at five sand mines while the research is conducted. The urgency is medium because the risk to the Department is minimized by the ready availability of the T 71 test results that can be enforced by existing specifications.	
Implementability	1	The Department will finalize requirements for combination of chemistry test and T 71 in the Construction Aggregates Manual.	

Project Benefits (Succinct, complete explanation)

The Modified Walkley Black test was identified as the most likely chemistry test to rapidly and cost effectively replace the more expensive AASHTO T 71 test for acceptance purposes. Quantification of organics was successful to the parts per million precision. Inconsistencies in test

results that led to insufficient conclusions will be overcome and more confidence will assure the Department in the acceptability of concrete performance when organics are present. Findings from the previous study and existing relationships with the Aggregate Industry have resulted in commitments to cooperation and implementation. The importance has increased because of focus on availability of aggregate resources. Estimates of current sand production at mines with color problems are 100,000 tons per month. Quantities of failing color exceed 50%.

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	N/A	
<input type="radio"/> Materials Savings	Minimum \$millions	Cost of incorrectly rejecting existing silica sand quantities at mines with organics
<input type="radio"/> Time Savings	20 days per test	Length of time to run specified mortar test less time to run chemistry test
<input type="radio"/> Lives Saved/Injuries Prevented	N/A	
<input type="radio"/> Other (Explain)	N/A	

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