Request for Research Funding for FY 2021-2022			
Requesting Office	State Materials Office	**Priority - High**	# 2 of # 10
Proposed Title	NEXTGEN Concrete – The Tests of the Future		
Justification	FDOT needs to minimize or eliminate cracking in new structural elements. We need to stop constructing our future maintenance headaches. As part of this goal, FDOT needs to do a better job assessing concrete mixes for specific structural applications. This assessment needs to adapt to the ever changing physical, chemical and market issues associated with concrete's constituent ingredients. We need to apply a series of screening tests to our mixes that robustly asses their cracking potential in specific FDOT applications. Specifically, we need tests that: Measure a mixes shrinkage potential, Sulfate and Chloride durability and potential to generate excessive heat. These are the key materials related factors generating cracking in FDOT's new structures. The tests should be simple enough for a high school graduate to run. The cost of the equipment should be low enough to support a wide deployment. The tests should avoid the use of hazardous materials. The tests should take no longer that 30 days to complete. We ultimately need to know what tests to run and what specification thresholds to use when screening a mix for a particular use on our projects. SMO Strategic Focus Area – G2, G3 and S2		
Impact	Mix designs would be put through a more rigorous evaluation based on their intended use on our projects. We should be able to substantially reduce cracking in new structural elements.		
Affected Offices	Construction – Hurtado, Westphal Structures Design – Robertson Specifications- Strickland State Materials Office – Ruelke, Upshaw, Musselman (MAC)		
Existing Work	The first phase of this overall project is underway and will be reviewing the existing literature to see if there are existing tests that meet our needs. The PI will offer an expert opinion on why tests are or are not suitable.		
Keywords Used In Existing Work Search **(Cannot leave blank)**	Concrete shrinkage Heat of hydration Chloride and Sulfate durability of concrete Concrete Mix Approval		
Related Contracts (Give contract numbers)	BDV31 TWO 977-136		
Funding Request	Project 1 $50K Underway- Draft Final - Feb. 21 Project 2 $300K Project 3 $200K	**Anticipated Duration**	Project 1- 6 Mo. Project 2 - 36 months Project 3 - 18 months
Project Manager	Ruelke	**Contracting Method**	Project 1- Direct UF Ferraro Project 2 - RFP Project 3 – If satisfied, Direct to PI of Project 2

Urgency	1	We anticipate that some of the tests needed to meet our needs do not exist today. We need to identify those gaps (Project 1), Create the tests to fill them (Project 2), and then set the spec limits for approval for all the tests (Project 3).
Implementability		

Project Benefits (Succinct, complete explanation)		
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 - YES		.
o Materials Savings – YES		
o Time Savings - YES		
o Lives Saved/Injuries Prevented		
o Other (Explain)		

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