

Request for Research Funding for FY 2019-2020

Requesting Office	CO Structures Design	Priority	3 of 5
Proposed Title	Evaluate Effects from Shored Construction on Steel Composite Bridges		
Justification	Shored construction is permitted by the AASHTO LRFD BDS, but not frequently used due to economics. However shored construction may be used for ABC projects, like pre-topped steel girder sections. There has been limited research on the effects of concrete creep on composite steel girders under large dead loads. There have been only a very limited number of demonstration bridges built with shored construction in the U.S. Of concern is that shored composite bridges that are known to have been constructed in Germany did not retain composite action. Furthermore, there is an increased likelihood of significant tensile stresses occurring in the concrete deck at permanent support points (modular units could use more discrete points) when shored construction is used. Also, the AASHTO provisions may not be sufficient for shored construction where close tolerances on the girder cambers are important. This research would be a synthesis study and economic analysis of the topic.		
Impact	If this research is not pursued, bridge designers who elect to use shored construction for their accelerated bridge construction projects may not have sufficient guidance for design, detailing or construction, which could result in a poorly performing or under-designed bridge.		
Affected Offices			
Existing Work	<p>Continuous Prestressed Concrete Girder Bridges. Volume 2: Analysis, Testing, and Recommendations, 2016</p> <p>Control of Creep and Shrinkage Effects in Steel Concrete Composite Bridges with Precast Decks, Journal of Bridge Engineering, Volume 14, Issue 5, 2009, pp 336-345</p> <p>Influence of the Construction Method on the Long-term behavior of Timber-Concrete Composite Beams, Journal of Construction Engineering, 2015</p>		
Keywords Used In Existing Work Search (Cannot leave blank)	Shored bridge, shored construction		
Related Contracts (Give contract numbers)			
Funding Request	\$150,000	Anticipated Duration	1.5 year
Project Manager	Ben Goldsberry/Sam Fallaha	Contracting Method	RFRP
Urgency	2	Without this project, the use of shored construction could be limited due to lack of understanding in how it performs long-term. With the accelerated construction processes being implemented this type of construction process needs to be evaluated such that the Department can make informed decisions.	
Implementability	3	This project is a synthesis study. The conclusions of this study could show that further research is required before shored construction can be implemented.	
Project Benefits (Succinct, complete explanation)			
This project will provide a better understanding of shored bridge construction.			
Project Benefits	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	

(Select all that apply and explain)		
<input type="radio"/> Materials Enhancement		
<input type="radio"/> Materials Savings		Efficiencies in using the shored construction methodology could be realized.
<input type="radio"/> Time Savings		In some cases the construction methodology could be simplified through the use of shored construction.
<input type="radio"/> Lives Saved/Injuries Prevented		This project may prevent under-designed and therefore unsafe bridges from being constructed using shored construction.
<input type="radio"/> Other (Explain)		

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