UTC Project Information	
Project Title	MPC-586 – Mitigation of Differential Settlement at Highway Bridge Approaches
University	University of Utah
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT, Research and Innovative Technology Administration $40,000 Utah Department of Transportation $104,368
Total Project Cost	$144,368
Agency ID or Contract Number	69A3551747108
Start and End Dates	January 12, 2019 to July 31, 2024
Brief Description of Research Project	Differential settlement in the transition zone between the bridge structure and the approach embankment often creates a "bump" which is a potential safety hazard and comfort issue for drivers. Studies conducted by DOTs around the country suggest that about 25 percent of the 600,000 bridges in the US are affected by bridge approach settlement or the "bump at the end of the bridge." The settlements can result in unsafe driving conditions, rider discomfort, structural deterioration of bridges and long-term maintenance costs. Identifying additional geotechnical or structural means to mitigate this issue, which might be employed in conjunction with preloading, is of benefit to many State DOTs. These benefits might be achieved by providing the project team with the advantages and detriments of supplemental options in terms of their efficacy, cost, schedule, and ease-of-construction. This research focuses on identifying innovative means to mitigate this issue during design and construction, whether through initial cost savings or by providing superior long-term performance, will provide value. This might be gained either through savings from initial capital investment or through life-cycle cost reductions, hence assisting in the preservation of key infrastructure.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	We recommended that full-scale demonstration projects be undertaken to understand better the long-term performance of approach slabs and pavement underlain by LCC. We believe that laboratory-scale testing results herein point to the potential implementation of LCC technology; nonetheless, more information and confirmation could be gained by conducting field-scale testing.

Impacts/Benefits of Implementation (actual, not anticipated)	Regarding pavement systems, future work should include an instrumented field demonstration project for roadways or bridge approaches. Possible application(s) include LCC underneath a roadway pavement or a concrete bridge approach slab. Instrumentation of the project should consist of measurements of stress and strain and monitoring of permanent distress within the LCC and manifestations at the pavement surface. Since LCC is susceptible to freeze/thaw damage yet has good insulation properties, instrumentation should also include monitoring the temperature within the LCC to estimate long-term freeze/thaw performance.
Web Links • Reports • Project Website	• MPC Research Report – Mitigation of Differential Settlement at Highway Bridge Approaches: Lightweight Cellular Concrete Technology