WHAT IS THE NEED?

Caltrans has made great strides in researching seismic Accelerated Bridge Construction (ABC) connection details and implementing the results into practice. One connection detail that has been approved by Caltrans for ABC is the precast column with no couplers (PNC) for column-to-footing and column-to-cap connections. Past research has proven the seismic performance of this connection. However, it used proprietary ultra-high performance concrete (UHPC) that is roughly 9 times as expensive as standard grout, poses challenges for specification writers, and presents an obstacle for the adoption of ABC by California bridge engineers.

WHAT ARE WE DOING?

The researchers will conduct a series of mix designs and mechanical testing to develop non-proprietary UHPC’s. In collaboration with Caltrans bridge engineers, UNR and University of California, Berkeley (UCB) will construct and test two large-scale columns using non-proprietary UHPC at the connection ducts.
WHAT IS OUR GOAL?

The objective of this research is to evaluate different cement-based materials and develop and test non-proprietary UHPC that could be used to provide anchorage in the approved PNC detail. Reducing the cost and using non-proprietary materials will be the focus of this study to establish a less expensive alternative for ABC column connections in California, and alleviate sole-source specification.

WHAT IS THE BENEFIT?

The “product” from this project will be a non-proprietary UHPC that can be used to design and construct ABC bridges. A final report will be provided on recommendations in a format that is consistent with Caltrans Standards to facilitate its adoption by Caltrans Engineers.

WHAT IS THE PROGRESS TO DATE?

Begin work as described in the scope.