



FY 2025 Annual Program Research Project Statement 25-014-01

Title:	Determine Feasibility and Efficacy of Hollow Precast Straddle Bents
The Problem:	Contractors have recently shown keen interest in utilizing hollow precast straddle bent concepts in major TxDOT (Texas Department of Transportation) projects. These contractor-proposed concepts come with multiple benefits, such as reduced weight, improved transportability, efficient erection procedures, cost-effectiveness, and minimized potential for disrupting traffic. However, there is currently a knowledge gap regarding design considerations for the long-term performance and durability of these elements. Consequently, TxDOT has reservations regarding the service and ultimate load behavior of these concepts, primarily due to the lack of well-defined design criteria and proven structural performance. TxDOT aims to establish clear design criteria and ensure proven structural performance for both rectangular and inverted tee bent caps, for both mildly reinforced concrete and prestressed concrete caps.
Technical Objectives:	<p>The objectives of this project are:</p> <ul style="list-style-type: none">• Perform synthesis of research concerning hollow concrete straddle bents, both at national and international levels.• Review details and reports related to completed precast straddle bents constructed on TxDOT projects.• Establish an industry review committee to identify fabrication and constructability limitations.• Perform advanced structural modeling to develop recommended targeted testing and areas of concern.• In consultation with TxDOT, develop and execute a targeted testing program that demonstrates the service, ultimate performance and durability of hollow straddle bent caps.• Proposed work will include full-scale tests.• Create a design guide, detailing recommendations, and design examples that can be utilized by designers. <p>The expected technology readiness level (TRL) for this project is 8.</p>
Anticipated Deliverables:	<ol style="list-style-type: none">1. Technical memorandum for each task completed.2. Monthly progress reports.3. Hollow Precast Straddle Bents Design Guide.4. Sample design standard and specification.5. Industry review committee report.6. Project Summary Report.7. Research report documenting the findings of this research, including:<ul style="list-style-type: none">• Design recommendations of hollow precast straddle bents.• Details and results of the test program.• Value of Research (VoR) that includes both qualitative and economic benefits.
Proposal Requirements:	<ol style="list-style-type: none">1. RFP#1 Q&A Deadline: 12:00 p.m. Central Time, Friday, May 10, 2024.2. Proposal Deadline: 12:00 p.m. Central Time, Tuesday, May 21, 2024.3. Use the current "ProjAgre" and "PA Forms" templates located at the RTI Forms webpage.4. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's University Handbook.5. Proposals should be submitted by the University Liaison in PDF format; (1) PDF file per proposal. File name should include project name and university abbreviation.6. This project will be tracked during the life of the project using the Technology Readiness Level (TRL) scale.7. The 2021 Texas Legislative Session requires that universities be in compliance with Senate Bill 475 by submitting a completed and signed TxDOT Security Questionnaire (TSQ) to RTIMAIN@txdot.gov. Universities that have not submitted a completed and signed TSQ one week after award will be considered non-compliant and unable to participate in the Program.