



# RESEARCH NEED STATEMENT

Call for Projects 2015

Project Research Title: Internal Concrete Curing

TDOT Sponsor Director: Brian Egan

List TDOT Research Team Lead: Jamie Waller

List TDOT Research Team Members: Jason Mellons, Amanda Neighbors

1. Define the problem or research requested. What is the goal/objective of the research?

TDOT has witnessed concrete cracking throughout all different types of structures throughout the state. Cracking may occur in concrete when all other factors that could possibly contribute to cracking are eliminated as the cause. Cracking will affect the service life of a structure. Internally cured concrete is being heavily promoted and is being implemented in other states to reduce cracking. The department has no prior experience with internally cured concrete and would like to explore the benefits it leans to concrete performance.

2. Is this research a continuation of a past or present project?

No  Yes

If yes, provide current research project title, RES # and reason for the project continuation.

3. Describe anticipated benefits/expected deliverables.

- Summary of use and best practices
- Material and mix design recommendations for lightweight aggregates used for internal curing
- Specification recommendations/requirements if using lightweight aggregates for internal curing

4. What is your timeline for completion of the research?

12 months

5. List the anticipated tasks for this research.

Literature Review on internally cured concrete structures.

Determine fine aggregate gradations and replacement rates to be incorporated into the TDOT Specifications Manual for internally cured structures.

Determine an internal cured mix design that meets TDOT Specifications

Determine total allowed absorption percentages for the aggregates as well as other properties

Demonstrate on a local concrete structure and monitor to report the progress

6. Describe how the project results will be implemented?

Results of this research will be beneficial in developing a new specification for internally cured concrete or to revise our current specification for utilizing this option.

7. Will this study produce software, web page or other technology that will involve the Information Technology Division?

No  Yes, please describe:

8. Will training be provided to employees as a result of this research?

No  Yes, please describe:

9. Will this research involve equipment or materials purchase?

No  Yes, please describe:

Concrete materials to produce the internally cured concrete will need to be purchased as well as other laboratory equipment necessary to provide all the deliverables.

10. Research must support the Long Range Transportation Plan Policy Recommendations **and/or** TDOT Operational Goals and/or Strategic Initiative. *(See attachments for additional information)*

Please indicate which categories the research will support:

Transportation Long Range Plan Policy Recommendations

(A) Accessibility

(B) Safety, Security, and Transportation Resilience

(C) Coordination, Cooperation, and Consultation

(D) Demographic and Employment Changes and Trends

(E) Freight Logistics and Planning

(F) Financial

(G) Mobility

(H) Travel Trends and System Performance

TDOT Operational Goals and/or Strategic Initiative

(A) Deliver transportation projects on schedule and within budget

(B) Maintain the state transportation system to protect the long term investment in our infrastructure assets

(C) Operate and manage Tennessee's transportation system to provide a high level of safety and service to our customers and workers

(D) Expanding mobility choices to maximize access

(E) Dramatically change the paradigm for delivery of transportation products and service to improve the efficiency and effectiveness of Tennessee's transportation network

11. Please explain how the research supports the Long Range Transportation Plan Policy Recommendations **and/or** TDOT Operational Goals and/or Strategic Initiative selected above:

This research would meet the Department's operational goals for protecting the long term investment of our infrastructure and to provide the highest level of safety to the public. The concrete utilized would use less cement thus decreasing shrinkage cracking and lowering chloride permeability. The Department would ultimately have a more durable structure with a longer service life.

For additional information, please contact:

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