

**TPF-5(368) PERFORMANCE ENGINEERED CONCRETE PAVING MIXTURES (PEM)  
SOUTH-EAST REGION STATE-INDUSTRY PEM CALL**

November 9, 2020  
Meeting Minutes

**Attendees:**

<b>Name</b>	<b>Organization</b>	<b>Name</b>	<b>Organization</b>
Gordon Smith	CP Tech Center	Brian Hunter	North Carolina DOT
Jerod Gross	Snyder & Associates, Inc.	Jason Mellons	Tennessee DOT
Mike Praul	FHWA	Derek Gaw	Tennessee DOT
Bob Conway	FHWA	Greg Dean	ACPA SE Chapter
Jeff Covay	Arkansas DOT	Tara Cavalline	University North Carolina
Tyler Ley	Oklahoma State University	Melissa Campbell	Georgia Concrete Pvmt
Cecil Jones	Diversified Engr Services		
Jason Waters	Georgia DOT		
Peter Wu	Georgia DOT		
Monica Flournoy	Georgia DOT		

**Discussion items:**

- 1. Has your state agency recently implemented any new tests to your concrete program or are you planning to implement any in the near future?**

**Georgia:**

They have not implemented anything recently. Still researching some of the tests.

**North Carolina:**

Looked at surface resistivity, Box test and super air meter. Have not implemented anything yet. UNC is looking at research to lower paste content, lower total cementitious content and get the information to North Carolina DOT. The shadow test project did well and the contractor learned a lot about the tests. The contractor is planning to use the tests again on the next shadow project for research purposes.

**Tennessee:**

They have not implemented any testing. Working with industry to educate them on the PEM testing. Still in the research stage for the tests. They do not have a lot of concrete pavement that they work with. They do not have a contact to work with right now. Gordon stated to let him know if they need assistance with contacting industry.

**Arkansas:**

They have not implemented any testing. There is some interest from the construction staff and the state might be open to the PEM training. They are open to the new tests but need some training.

**2. Do you currently leverage QC in your specification? In other words, do you require QC and does the state do any monitoring of QC? This question is NOT asking if you use contractor data for acceptance.**

**Georgia:**

Their current spec does not have QC. They verify they are running the basic tests at the plant. The contractor runs their own QC but the DOT does not monitor it.

**North Carolina:**

They require the contractor to submit a QC plan to them for review. They do not review the contractor's QC data. They do their own testing for acceptance. UNC and the team are almost complete with preparing a guide for QC. Industry asked if the design-build jobs submitted anything over and above the NCDOT QC limits. NCDOT is not providing any incentives.

**Tennessee:**

They require a QC plan and certifications from the contractor and producers. The contractor's QC data is only reviewed if they encounter a low break. If they cannot provide their QC data they go to liquidated damages on the low breaks.

**Arkansas:**

They look at the QC side of the contractor and review their materials and sources. Arkansas DOT field crews will do an independent QA and testing.

**3. Have you engaged your agency construction staff in a PEM discussion/planning? If so, what are the details?**

**Georgia:**

Georgia DOT has had general conversation on moving towards PEM specifications. Have not had discussions with construction staff on PEM.

**North Carolina:**

One of the research projects from UNC included regional training for DOT. Need to show the upper level of DOT what PEM is all about. They have not discussed it with the construction staff. The training does help with understanding PEM. Need to make sure they have the right candidates and right information to move forward and feel comfortable with PEM. Need to understand PEM does offer incentives to the contractor and the agencies.

**Tennessee:**

They include the construction staff in writing the spec and construction staff has been in conversation about PEM. They are moving forward with training in implementing PEM. Tennessee DOT also feels they need to get a good understanding and comfort level with PEM to move forward with implementation.

**Arkansas:**

Have kept the leadership staff and construction staff in conversation about including PEM. When they move into training and implementation, they will have some background information on PEM. There is interest in PEM in Arkansas.

- 4. Have you made, or will you be making, spec changes to transition from prescriptive requirements to a performance approach? Some examples of this are:**
- a. Eliminating slump testing for acceptance**
  - b. Eliminating minimum cementitious content requirements**
  - c. Eliminating single aggregate gradation requirements**

**Georgia:**

They have not made any specification changes. Waiting to see where they go with PEM after they see the research results (18 to 24 months). Looking at what tests are needed to add to the specs and looking at some literature research on performance from other DOTs and will look at making some changes after the research results.

**North Carolina:**

They have not changed any specifications. Looking at cement content and optimized gradation in the research tests. Sent a memo to Ready Mix allowing them to go up to 6" slump from a 3 ½". Stipulating they have to use chemicals and not water for the increase in slump. UNC research hopes to get results about the right process to optimize gradation.

**Tennessee:**

They have not made any changes to date. Looking at bigger design-build projects to give industry incentive to include PEM. Would like to do all the above moving forward.

**Arkansas:**

They have the standard prescriptive requirement for concrete specifications and they have not changed anything yet. They would not introduce any new changes by job specific special provisions until they get a comfort level. Arkansas has not seen a problem with slump when everything else looks good.

- 5. Which statements describe your agency's approach to PEM:**
- a. We are satisfied with the status quo and do not envision making significant changes.**
  - b. We will be keeping our program as is but planning to add a new test or two.**
  - c. We are enhancing our spec approach and adding QC requirements.**
  - d. We plan to develop robust QC requirements and include some level of agency monitoring of QC.**
  - e. We will be reducing/eliminating prescriptive requirements and moving to a performance approach.**

**Georgia:**

Georgia will be reducing/eliminating prescriptive requirements and moving to a performance approach.

**North Carolina:**

They have really good concrete. Moving forward they would like to add a. b. c.

**Tennessee:**

They would like to be at d. and e.

**Arkansas:**

They would like to be at a. b. e.

6. **The current PEM initiative focuses heavily on the mix and mix design (“design the mix properly for its service environment”). Moving forward, do you see the next step towards performance specifications as an effort to develop ways to assess the impact of construction activities? (the ultimate goal is being able to test the concrete to be sure we “build the concrete to perform in its service environment.”) Some examples include effect or pumping/transport, vibration, and real-time curing assessment.**

**Georgia:**

Any kind of research on durability for projects into the future would be great. Getting longer life and better performance would help to promote PEM.

**North Carolina:**

Anything that the department and producers can feel comfortable with and save money.

**Tennessee:**

Any kind of research on durability that projects into the future would be great. Getting longer life and better performance would help to promote PEM.

**Arkansas:**

Need improvement on placement and curing. There is a lot of room to improve curing in their area.

**Homework questions:**

What can the PEM Team do to assist you today in accomplishing your PEM vision?

What do you think of this format?

**Other Comments:**

**Jerod**

We need to get the word out and more training on PEM. Need to demonstrate value. We can do this with shadow testing so we need to do more shadow testing. We are getting samples on concrete that has failed. We need to get samples on concrete that has performed.

**Cecil**

Let the team know if you need anything. Will get information or training to you.

**Tyler**

The way to get comfortable is to get started. Do a shadow project and collect data. Need to get it out of the lab and into the field. You will get a lot of feedback. Tyler also stated to let the team know if they need anything.

**Tara**

On one of their shadow pilot projects the contractor wanted to get out in front of something good after hearing about PEM. Wanted to give it a try to get out in front of it and know how to do PEM.