

# Performance Engineered Mixtures - The Path to Implementation

NCC  
Columbus, Ohio

April 26, 2016



# PEM - The Path to Implementation

## The Vision:

- Concrete Mixtures that are **engineered** to meet or exceed the design requirement, are predictable durable, with increased sustainability.
- Keys:
  - ✓ Design and field control of mixtures around engineering properties related to performance
  - ✓ Development of practical specifications
  - ✓ Incorporating this knowledge into a implementation system (Design, Mat'ls, Construction, Maintenance)
  - ✓ Is validated and refined by performance monitoring



# PEM - The Path to Implementation

- Background on PEM Activities
  - CP Tech Center & FHWA working with Champion NCC Members
    - Illinois Tollway
    - Indiana
    - Iowa
    - Michigan
    - Minnesota
    - Nebraska
    - South Dakota
    - Wisconsin
    - Manitoba



# PEM - The Path to Implementation

- Background on PEM activities
  - Research Team
    - Peter Taylor
    - Tyler Ley
    - Jason Weiss
    - Cecil Jones
    - Tom Van Dam



# PEM - The Path to Implementation

- PEM Activities In 2015
  - Begin Evaluating Promising new tests
  - Equipment provided to Champion States
  - Survey taken to get user feedback to improve new tests
  - Data provided back to research team



# PEM - The Path to Implementation

- PEM Activities in 2015 con't
  - Sample round robin run on resistivity
  - Survey responses of tests run by each agency
    - SAM 10-110
    - Box 5-27
    - Resistivity 50-600

# Survey Responses

- Strengths and weaknesses?
  - SAM
    - Rim must be clean
    - Tech must follow procedure
    - Takes time
  - Box
    - Power supply is a challenge
    - Working surface must be level
    - Subjective
  - Resistivity
    - Correlation with field performance?
    - Correlation with age?

# Survey Responses

- Improvements?
  - SAM                      Looking forward to trying the compressor
  - Box                        Plexiglass wall
  - Resistivity              More definition on curing process



# Survey Responses

- Results?
  - SAM                      Some samples passed C457 and failed SAM
  - Box                        -
  - Resistivity              Coarse grained limestone skewed findings

# PEM - The Path to Implementation

- 2016 Plans
  - Field Testing
    - SAM
    - BOX
    - F Factor
    - V-Kelly
  - AASHTO Standard of Practice
    - Introduce at NCC
    - SOM Meeting in August
  - Guidance Document



# PEM - The Path to Implementation

- Challenge to all of us
  - How do we as an industry develop an approach to sustain and accelerate this exciting opportunity to the benefit of the end customer?



# PEM - The Path to Implementation

- Our Team's Proposal
  - Develop a technical and financial partnership
    - FHWA
    - DOT's
    - Industry
  - Supported by a TPF



# PEM - The Path to Implementation

- Proposed TPF Scope
  1. Implementation of Key Performance Tests
  2. Specification Refinement
  3. Implementation Technical Assistance
  4. Education & Training
  5. Performance Monitoring



# PEM - The Path to Implementation

**Thanks for your partnership!**

