Composite Pavement Test Sections at MnROAD: DOT Perspective

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SHRP2 STRATEGIC HIGHWAY RESEARCH PROGRAM

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R21. Composite Pavement Systems

- **Prime Contractor**: Applied Research Associates, Inc. (Darter, Rao)
- **Sub Contractors**: U Minnesota (Khazanovich), U California (Signore), U Pittsburgh (Vandenbossche)
- Mn/DOT (MnROAD)
  - WSB & Associates, Inc. (Construction Admin.)
    - EVS (Surveys)
  - C.S. McCrossan, Inc. (Construction Contractor)
    - Aggregate Industries (Mix Design and Delivery)
      - AET (Trial Batching)

Outline

- MnROAD Test Facility and Test Section Design
- Challenges & How they were Overcome
- What Worked Well & Lessons Learned

MnROAD Test Facility

- Low Volume
- I-94
  - 28,000 AADT
  - ~1M CESALS
- Sensors
- Monitoring
- Forensics

Design:
3 Distinct Test Cells

70	71	72
3" 64-34 Saw/Seal	3" PCC EAC	3" PCC EAC
6" PCC Recycle	6" PCC Recycle	6" PCC Low Cost
8" Class 7	8" Class 7	8" Class 7
Clay 15' Panel 1.25" dowels driving none passing	Clay Innovative DG (driving) Convent. DG (passing) 15' Panel 1.25" dowels	Clay EAC Surface 15' Panel 1.25" dowels

Design: 3 PCC Mixes

- 2 Lower PCC Mixes
  - Low Cost/Quality
  - Recycled Concrete as Coarse Aggregate
  - Low Slump
  - High Fly Ash Substitution (40 – 60%)
- 1 Upper PCC Mix
  - Granite Aggregate
  - Higher Slump
  - Lower Fly Ash Substitution (15%)

Design: 4 Textures

- Exposed Aggregate
- Innovative Diamond Grinding
- Conventional Diamond Grinding
- Conventional (12.5mm) HMA with Saw/Seal

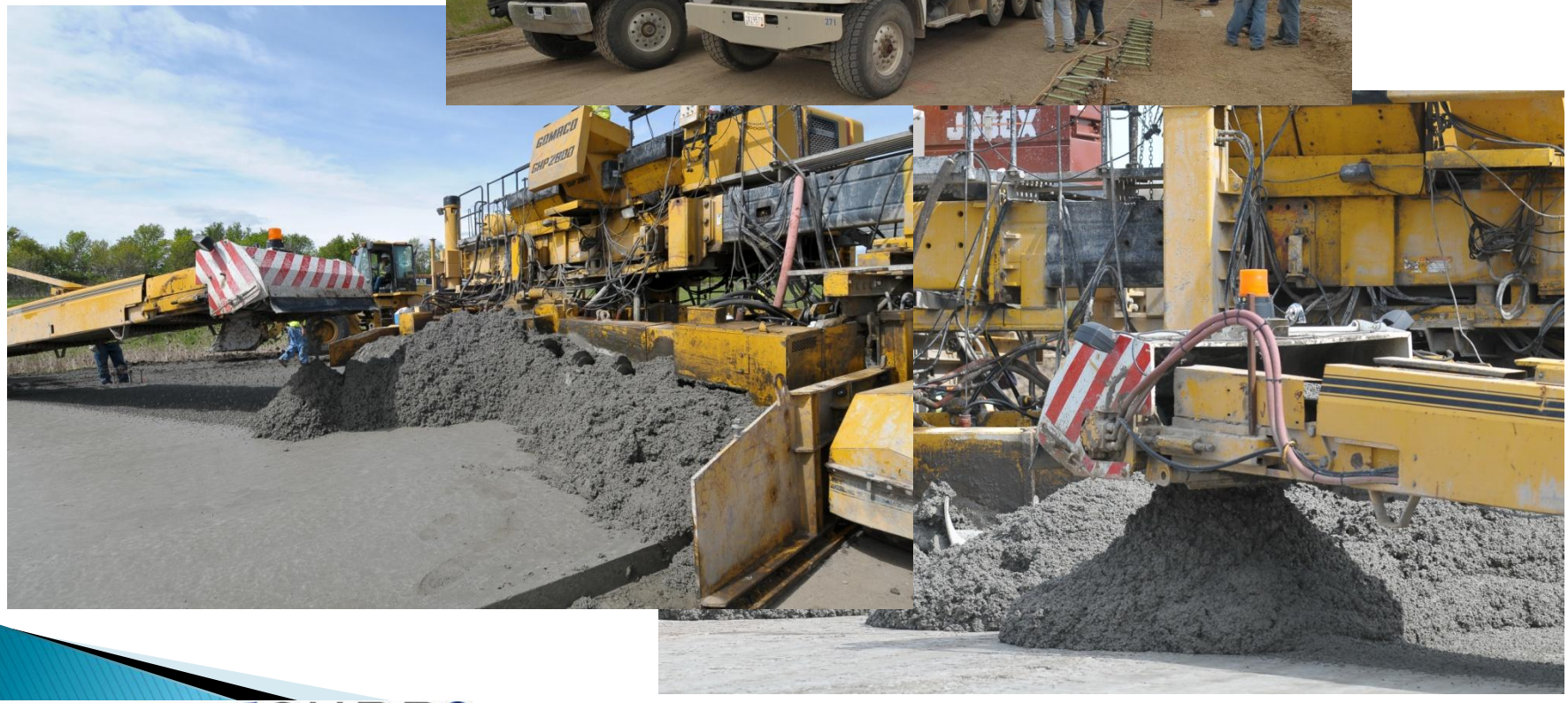
Challenges: Material Properties

- Lab vs. Field Work
- Happened on Demo Slab

Challenges: Mix Consistency

- Short Test Cells
- Stiff Mix
- Sensitive to Adjustments

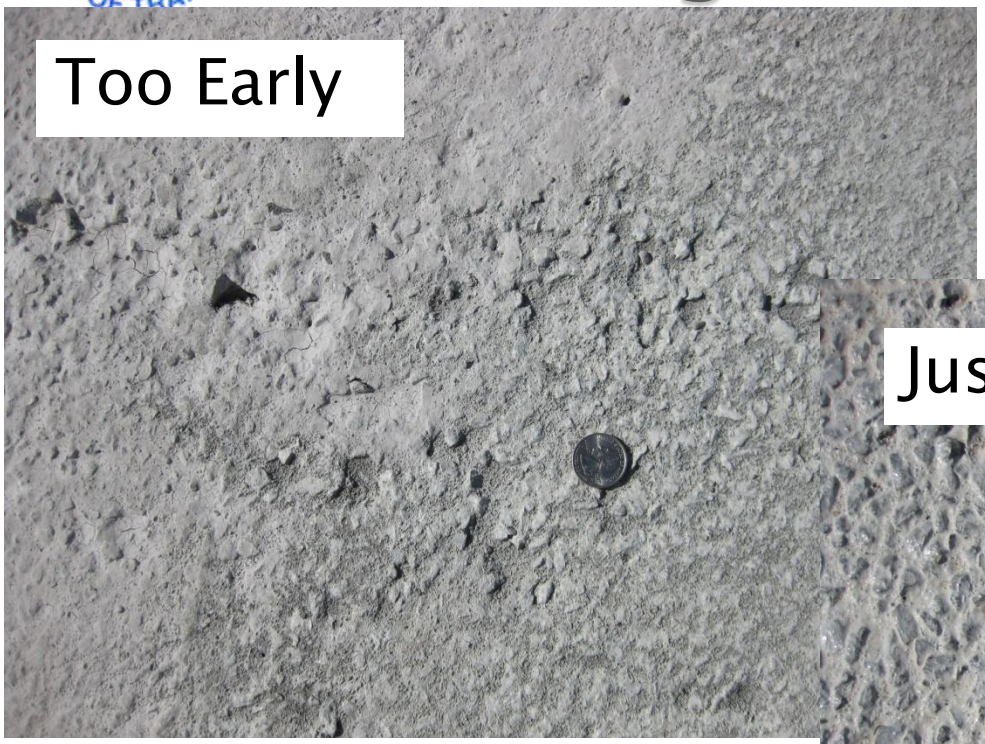
Challenges: Mix Delivery

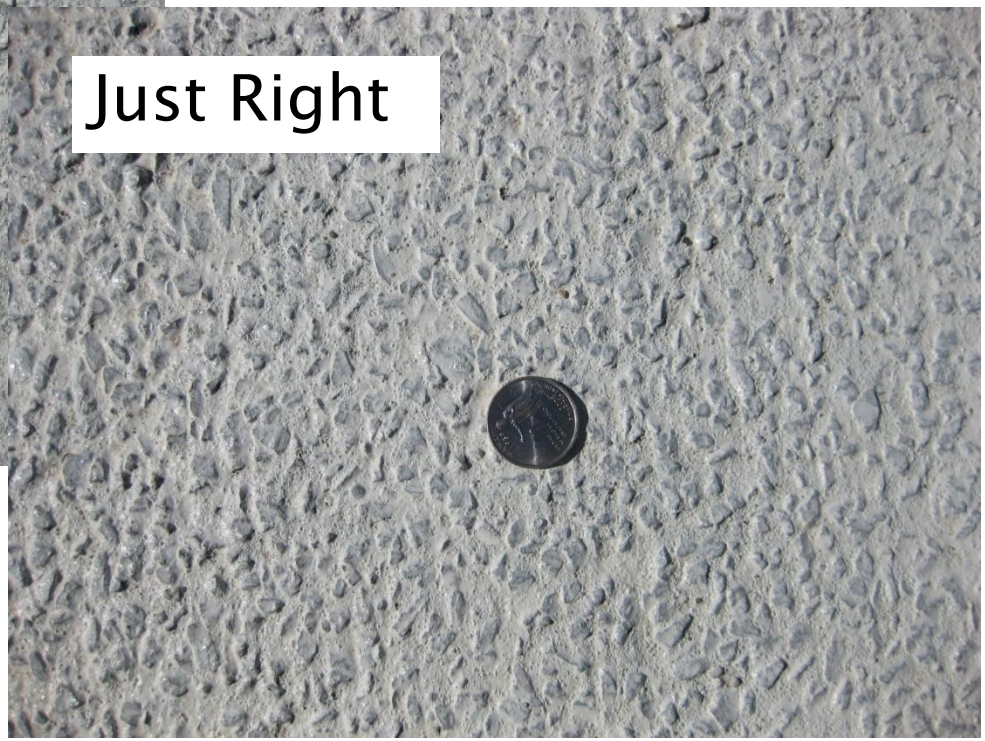


Challenges:
New Surface Texture

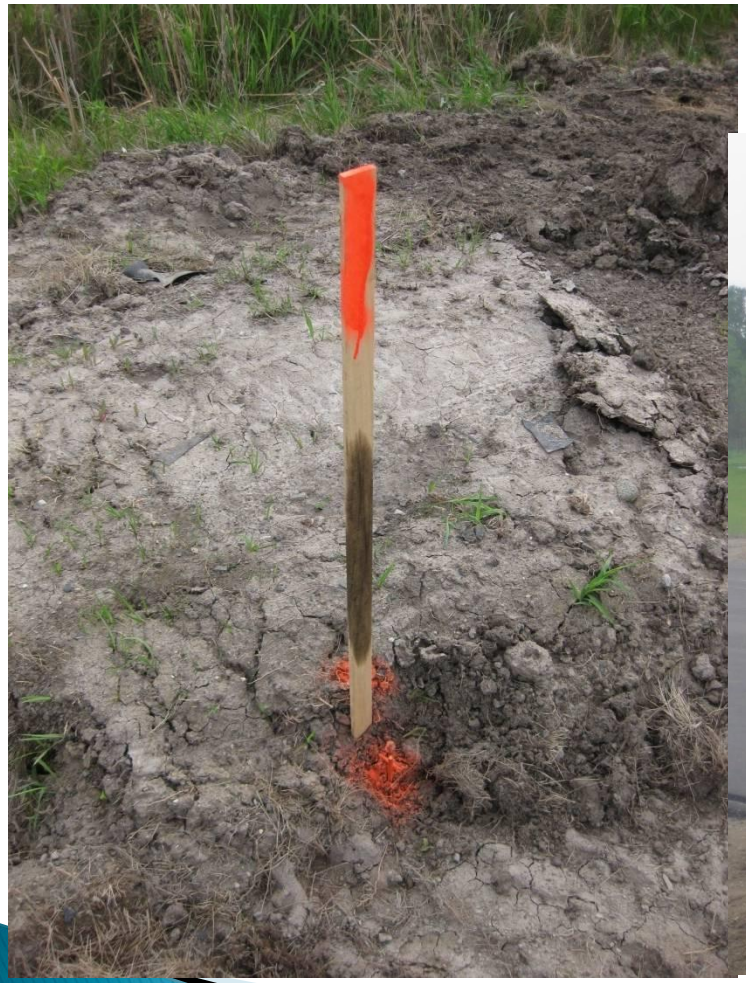
- Application
- Experience

Lessons Learned: Brushing Time





Challenges: Locating PCC Joints



What Worked Well: Demonstration Slab

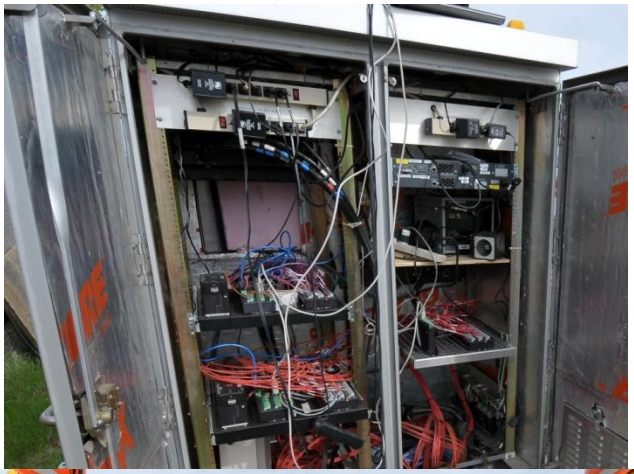
- Dress Rehearsal
- Value as Research and preparation

What Worked Well: Demonstration Slab

- Sensor Installation Techniques
- Construction Techniques
- Materials Sampling and Testing (MCL, Contractor, DOT, Research)
- Videos, Photographer

What Worked Well: Sensors

- Live as Concrete was Placed
- More than 500 Sensors!



What Worked Well
Diamond Grinding

Cell 71 = 96.8dBA (Quieter than HMA!)

What Worked Well Composite Pavements!

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Thank You!

Questions?