I-65/70 South Split
CRC Pavement Replacement Project,
Why CRC?

David Holtz, P.E.
Pavement Director, INDOT

Lisa Egler-Kellems, P.E.
Senior Pavement Design Engineer, INDOT

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- **Reason for project**
  - Numerous bridge hits to several structures within South Split area.
  - Pavement is not distressed.
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Reason for project

Early questions and issues:

What can we do to buy time and increase the clearances?

- Mill off existing HMA overlay and rehabilitate the underlying Jointed Concrete; interim or permanent solution?
- Ordered pavement coring.
- Ordered Falling Weight Deflectometer to determine pavement and subgrade condition.
- Ordered Ground Penetrating Radar to determine if this concrete had wire mesh and how deep.
- Analyzed the pavement and determined the remaining life.
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- **Change of mission:**
  - Look at options to raise bridges and/or lower pavement.
  - **Bridge-centric options eliminated!**

- **Initial pavement option alternatives**
  - 3 options for replacement, rehab not viable
    - HMA Pavement – 20 year design life
    - Jointed Plain Concrete Pavement – 30 year design life
    - Continuously Reinforced Concrete Pavement – 50+ design year life

- **Fix it now!**
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- **HMA Pavement option**
  - 19” HMA with sandwiched OG drainage layer, SMA surface and new underdrains.
  - **Advantages:**
    - Local contractor experience.
    - Perpetual pavement, only smoothness issue in year 20.
  - **Disadvantages:**
    - Too thick! Did not fit within limited space available due to waste water siphon.
    - Drainage layer too deep to drain into storm sewers.
  - Failed feasibility screening criteria.
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- **Jointed Plain Concrete option**
  - 12.5” PCCP with 15’ joints and 1.5” dowels on subbase for PCCP with new underdrains.
  
  - **Advantages**
    - Local contractor experience.
    - Fit within limited space available due to siphon.
  
  - **Disadvantages**
    - Maintenance of joints required during the 30 year design life.
    - Overlay necessary at 30 years, would recreate same problem we have now.
      - Only a 30 year life? Can we do better?
      - Cost of MOT in this area, i.e., 14 trucks per MOT event.
CRC Pavement option

What is CRC?

- INDOT hasn’t built it in many years.
- Very bad experiences (multiple) on I-65.
- Very old CRC still being used on SR 37.
- Poor diagnosis of failure(s) at that time and misconstrued lesson(s) resulted in “BAN”?

Challenge!

- How do we quickly lose our poor past practice and reasoning, and develop competence?
CRC Pavement option

What is CRC?

- Worked with INDOT Office of Material Management to start development of specification.
  - Utilized experience that Illinois DOT had with CRC.
  - Modified Illinois standard drawings and specifications.
- Crash course in design principals for CRC.
- Use AASHTOWARE PavementME™ software for pavement analysis; same as other two options.
- Concerns about building long lasting subbase and subgrade to match long lasting CRC were raised.
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- **Subgrade issues:**
  - Dense graded HMA subbase was utilized to provide very stable platform for CRC.
  - Utilized drainable #53 stone under dense graded HMA to provide subgrade drainage layer.
  - Worked with INDOT Office of Geotechnical Services to develop subgrade treatment that extends pavement life.
    - Developed specification for cement-treated subgrade that requires strength of 120 psi at 48 hours.
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- **Performance curves:**
  - **HMA:**

![Graphs showing performance curves for HMA](image-url)
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- **Performance curves:**
  - Jointed Plain Concrete:

![Graphs showing predicted IRI, faulting, and cracking over pavement age](image-url)
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- Performance curves:
  - Continuously Reinforced Concrete:
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- **CRC pavement selected:**
  - Long lasting, costs of MOT in this location are high.
  - No joints to seal, MOT operations are very dangerous.
  - Life cycle analysis based upon the 50 year design life of the CRC versus 30 years for the Jointed Plain Concrete showed that this was the most cost effective option.
  - Good location to try this because of the option of full closure.
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- **Team effort:**
  - Tony Zander, Concrete Materials Engineer
  - Nayyarzia Siddiki & Athar Khan, Office of Geotechnical Services
  - LaDonna Rowden, ILL DOT Pavement
  - David Holtz, Pavement Director
  - Chris Moore, Greenfield Pavement Engineer
  - Mike Prather, Pavement Area Engineer
  - Kumar Dave, Pavement Design Manager
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- Here’s to 50 more years of CRC pavement at this location.
- More to come?