CRCP TRANSVERSE CONSTRUCTION JOINTS

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Austin District

2015 Transportation Short Course
BS-PCW: Big Spalling
PCH-RJ: Punchout at Repair Joint
PCH-CJ: Punchout at Construction Joint
PCH: Real Punchout

Courtesy Dr. Moon Won, 0-6687
0-6687 Identification Of CRCP Distress (AMA, CHS, DAL, FTW, HOU, WFS)

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Courtesy Dr. Moon Won, 0-6687
Example of PCH-CJ

Courtesy Dr. Moon Won, 0-6687
Example of PCH-CJ

Courtesy Dr. Moon Won, 0-6687
Example of PCH-CJ

M. Won, NCC Meeting, San Antonio, Texas 2009
Example of PCH-TJ
Example of PCH-TJ
Prevention of PMDs in CRCP

- PMDs at Transverse Construction Joints (TCJs)
- Pavement Behavior Issue

![Image of pavement with transverse construction joints](image)

![Graph showing pavement displacements at transverse construction joint](graph)

Pavement Displacements at Transverse Construction Joint

- Outside
- Center
- Inside
- Reference
- Air Temp

Ambient Temperature [°F]

Pavement Displacements [in]

Time [days]

-2.5 -2.0 -1.5 -1.0 -0.5 0.0

-0.20 -0.15 -0.10 -0.05 -0.00 0.00 0.05 0.10

Courtesy Dr. Moon Won, 0-6687
TCJ With Longitudinal Steel @ ~30” Spacing
Expansion of End of Pavement: Research Project 0-6326

Hua Chen, 2014 TxDOT Construction Conference
Expansion of End of Pavement: Research Project 0-6326

Hua Chen, 2014 TxDOT Construction Conference
## TABLE NO. 1 LONGITUDINAL STEEL

<table>
<thead>
<tr>
<th>SLAB THICKNESS AND BAR SIZE</th>
<th>REGULAR STEEL BARS</th>
<th>FIRST SPACING AT EDGE OR JOINT</th>
<th>ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)</th>
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Prevention of PMDs in CRCP

- PMDs at Transverse Construction Joints (TCJs) – Construction Issues

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Prevention of PMDs in CRCP

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Prevention of PMDs in CRCP

- PMDs at Transverse Construction Joints (TCJs) – Construction Issues

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NO SPLICES ALLOWED WITHIN 10 FT OF THE JOINT.
What Else Can Be Done?

- Reduce shrinkage potential
  - Improve concrete mix design
  - Improve construction and curing techniques to reduce shrinkage potential
- Restrain shrinkage?
  - Steel design change: Looking into it! Stay tuned.
  - 0-4893 Evaluation of Bonded Concrete Overlay on IH 610 in Houston, Texas, February 2008, Dongho Kim, Moon Won
  
  • “...lack of continuous reinforcement near the bottom of the overlay (Item 4 on the list) and the use of concrete with high CTE (Item 1 on the list) are believed to be the primary contributing factors to delaminations.”
  
  • “It appears that welded wire fabric provided more effective restraint on concrete volume change potential, thus helping better bonds between BCO and existing concrete.”
“Good” or Better Distress Scores
(PMIS Distress Score 70 or above)

Pavement Type

- State
- ACP 91.22% of Lane Miles
- CRCP 6.88% of Lane Miles
- JCP 1.89% of Lane Miles

Age vs. Rate of Distress CRCP in Texas

M. Won, 2014 TxDOT Construction Conference
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Usage percentages:
- **BS-PCW**: 47%
- **PCH-CJ**: 21%
- **PCH-RJ**: 18%
- **PCH**: 14%

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18% BS-PCW
14% PCH
21% PCH-CJ
18% PCH-RJ

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