

PAPA REGIONAL TECHNICAL MEETINGS

MARCH 15, 16, & 17, 2022

"CRACKAND SEAT PAVEMENT TREATMENT"

Pennsylvania Asphalt Pavement Association





IMPETUS FOR CRACK AND SEAT PAVEMENT TREATMENT

PUB 242
PAVEMENT
POLICY MANUAL

PENNDOT HAS:



- ✓ 1868 Miles of Interstate Highways
- ✓ Most PCC With Asphalt Overlay
- ✓ Average Pavement Age = 50 years
- ✓ Interstate Preservation Reconstruction Plan – IIJA FUNDS
- ✓ Just like bridges, they've reached their 50-year design life!
- ✓ PennDOT already has done 300+ miles of successful and performing Crack & Seat Projects

Pennsylvania Asphalt Pavement Association

3544 North Progress Avenue • Suite 100 • Harrisburg, PA 17110 Phone (717) 657-1881 FAX (717) 657-0687 www.pa-asphalt.org

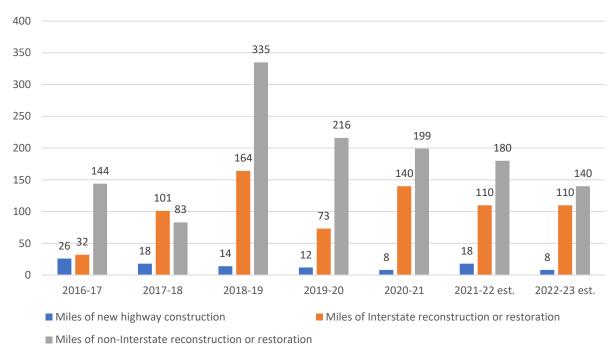


IMPETUS FOR CRACK AND SEAT PAVEMENT TREATMENT

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PENNDOT HIGHWAY IMPROVEMENT PROGRAM



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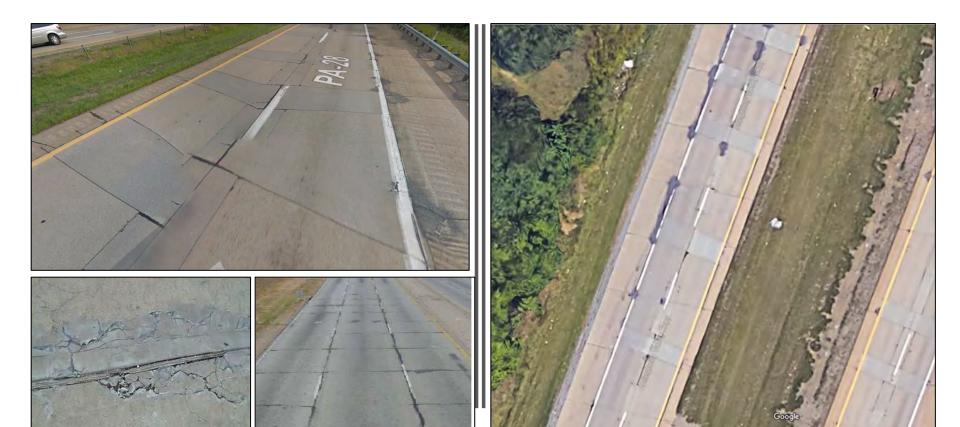
PUB 242 PAVEMENT POLICY MANUAL

PUB 242 PAVEMENT POLICY MANUAL Chapter 3 – 3.3 PAVEMENT TYPE DETERMINATION

- A. Asphalt Rehabilitation Strategies
- 2. Asphalt Overlay on Crack and Seated Concrete
- a. Cracking and seating the existing concrete pavement.
- Base repair with Base Course/Superpave Base Course.
- c. Continuous pavement base drain.
- d. Leveling course (1-inch minimum), includes cross-slope correction.
- e. Asphalt overlay (thickness as required by design).
- f. Full-depth asphalt shoulders.
- g. Resetting and/or replacing guide rail and drainage structures, as necessary.

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TYPICAL CONCRETE PAVEMENT

TYPICAL CONCRETE PAVEMENT









TYPICAL ASPHALT OVERLAID CONCRETE PAVEMENT

SLAB FRACTURING TECHNIQUES FOR PCC PAVEMENTS





CRACK AND SEAT

- PCC PAVEMENT WITHOUT STEEL
- ≥ 18" CRACKED SLAB DIMENSION





BREAK AND SEAT

- PCC PAVEMENT WITH STEEL REINFORCEMENT
- ≥ 18" CRACKED SLAB DIMENSION





RUBBLIZATION

- USE ON ANY PCC PAVEMENT
- PUB 408 SEC 526 TYPE 1 ≥ 12" Type 2 ≥ 8"

ANALYZE EXISTING PAVEMENT – DESIGN PROJECT

UNDER DRAINS Ensure They Are in Working Order Take Cores – Pavement Depth, No or Limited **PAVEMENT** ASR, Subbase Condition, etc. **FWD** Test to Get Before and After Structural Value **ANALYZE**

CRACK & SEAT TREATMENT/ASPHALT OVERLAY SELECTED

Perform Best Value Analysis

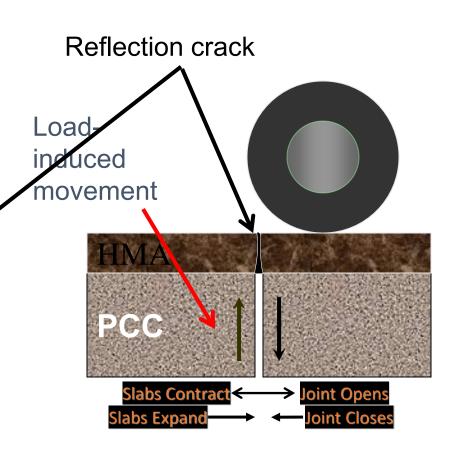
COMPOSITE PAVEMENT REVIEW

Reflection Cracking

 By far, the biggest problem in HMA overlays of PCC pavement

 Caused by movement at PCC joints and cracks

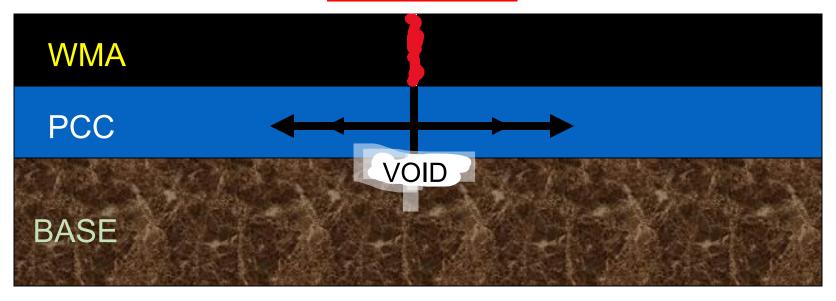




COMPOSITE PAVEMENT REVIEW

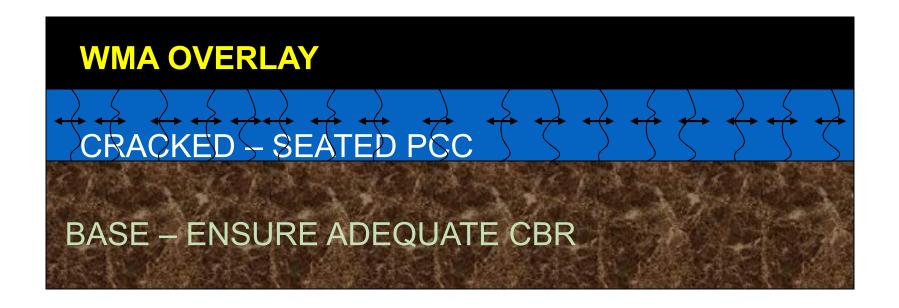
Larger Pieces = Larger Movement = Cracking

Reflection crack



PAVEMENT DESIGN

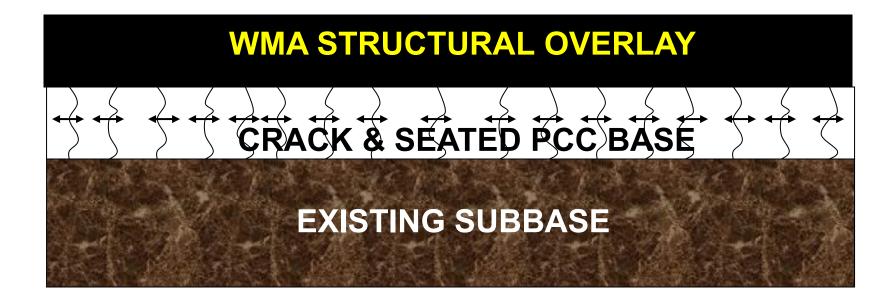
Smaller Pieces = Smaller Movement = No Cracking



CRACK & SEAT PAVEMENT DESIGN

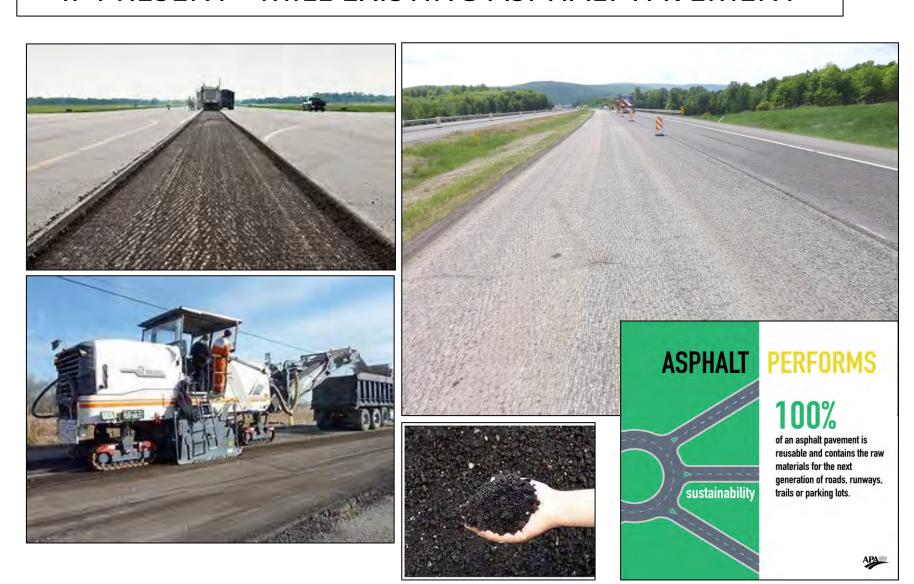
PAVEMENT CROSS SECTION

Typical WMA – 9.5 mm 1"-2" Bond Breaker, 5"-8" 19.0 mm Binder Layer & 9.5 mm 1.5" Wearing Layer (SMA)



TYPICAL DESIGNED SECTION = 8"- 12" MAX of WMA

IF PRESENT - MILL EXISTING ASPHALT PAVEMENT



RAP is 100% RECYCLABLE! Most Recycled Material in the US!

CRACK CONCRETE PAVEMENT



C & S PRODUCTION/ONE BREAKER = 2-3 LANE MILES/DAY

SEAT CRACKED CONCRETE PAVEMENT

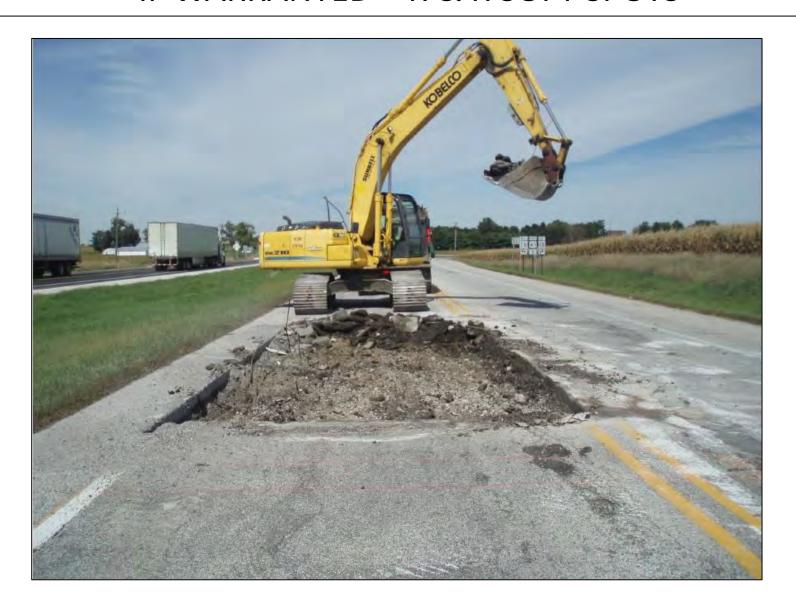


TYPICAL CRACK & SEAT PATTERN – MAKES A GOOD BASE

SEAT CRACKED CONCRETE PAVEMENT



IF WARRANTED – R & R SOFT SPOTS



ADVANTAGE - ONLY CLOSE ONE TRAFFIC LANE



TEST CRACKED/SEATED CONCRETE PAVEMENT

FALLING WEIGHT DEFLECTOMETER (FWD)



PennDOT's Falling Weight Deflectometer



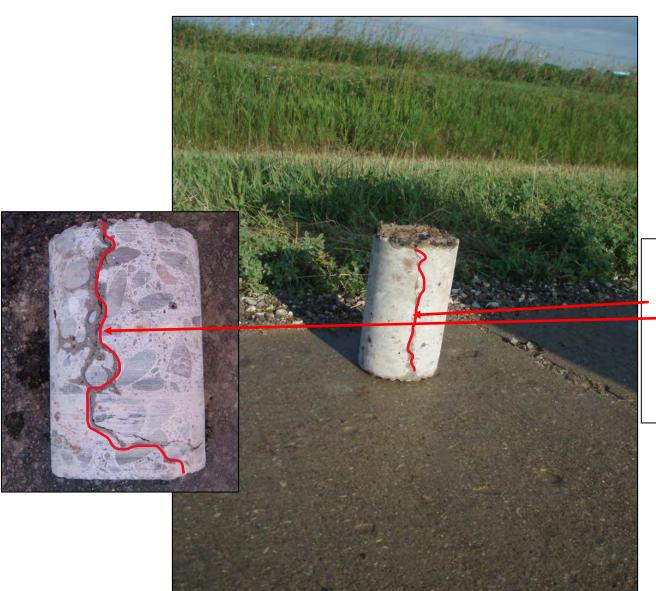
WATER TEST CRACKED/SEATED CONCRETE PAVEMENT



TEST CRACKED/SEATED CONCRETE PAVEMENT



TEST CRACKED/SEATED CONCRETE PAVEMENT



ENSURE CRACK
PROPAGATED

THROGH
ENTIRE
PAVEMENT
SESTION

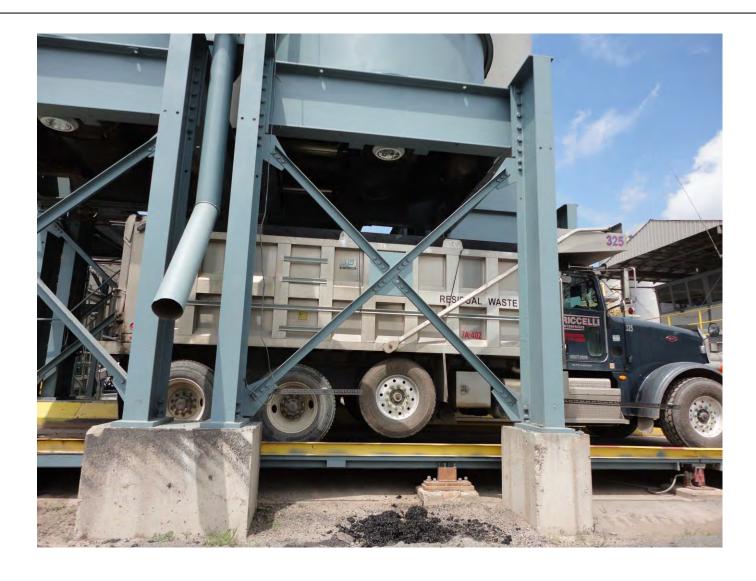
IF WARRANTED - REPLACE UNDER DRAIN



PRODUCE ASPHALT MIX



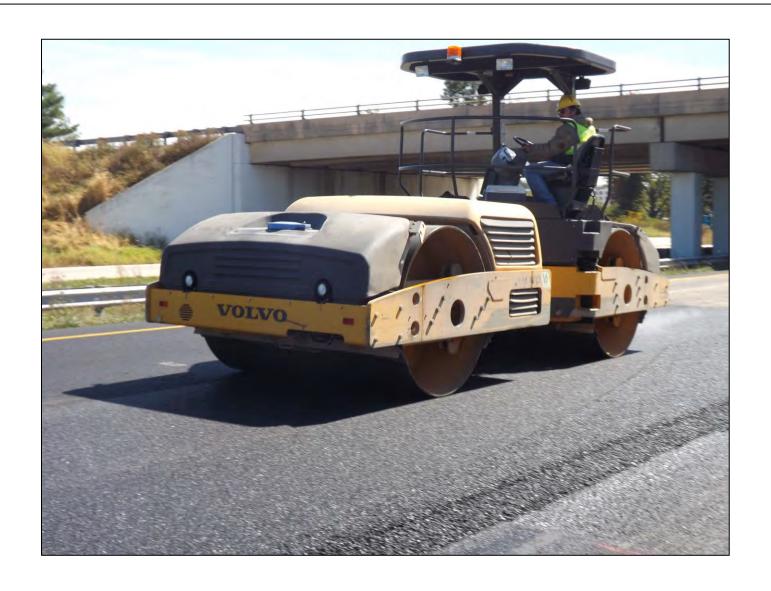
PRODUCE & TRANSPORT ASPHALT MIX



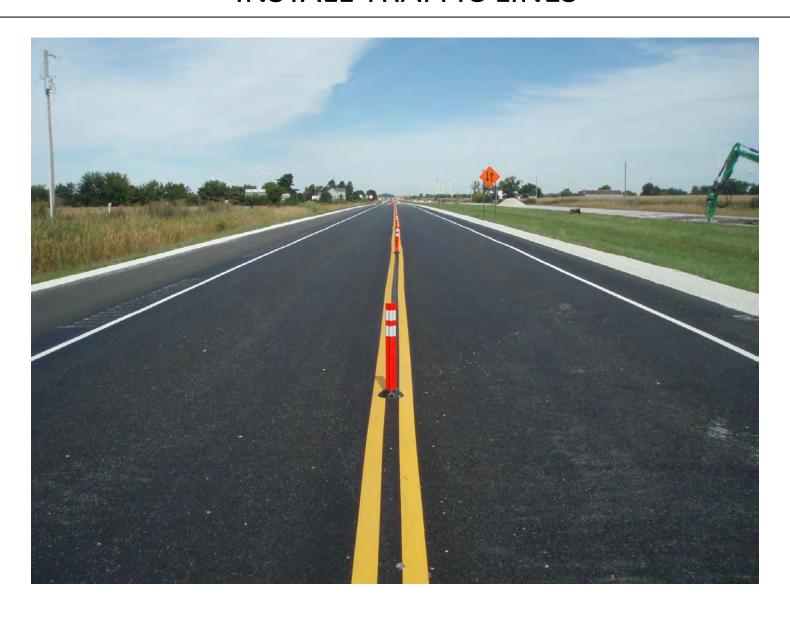
INSTALL ASPHALT MIX



COMPACT ASPHALT MIX



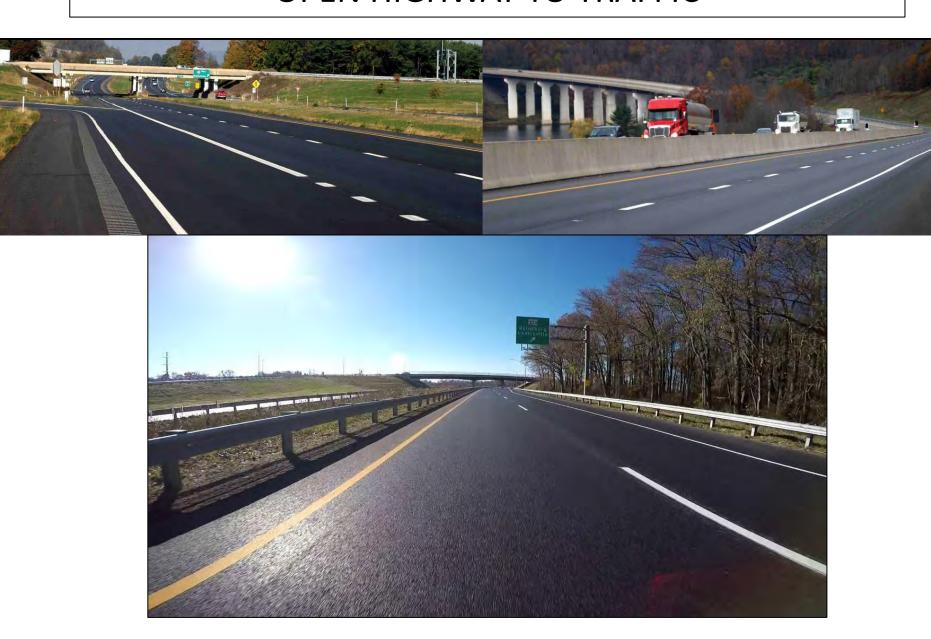
INSTALL TRAFFIC LINES



INSTALL EDGE LINE RUMBLE STRIPS



OPEN HIGHWAY TO TRAFFIC



PennDOT District 11



Tom Adams

District Pavement Engineer

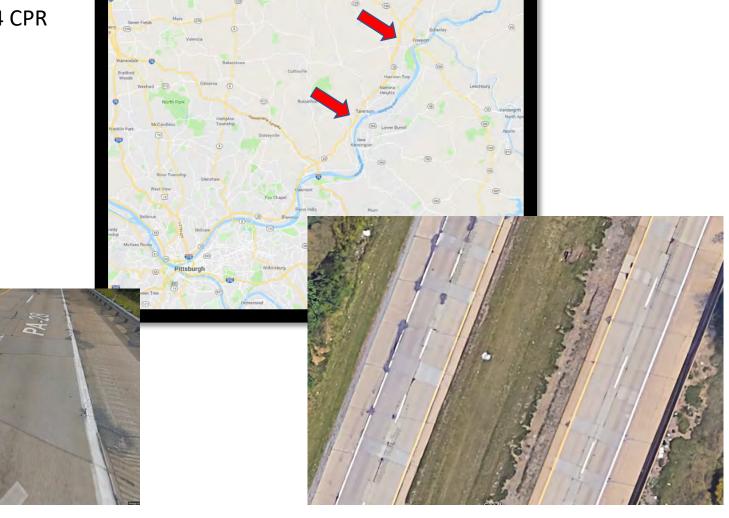
Originally Presented at 2018 PENNDOT PAPA Bus Tour in Pittsburgh on August 1, 2018

PROJECT – SR 28 A55 Pavement Design Solution

• 13.7 Miles of 1984 Reinforced Concrete Pavement



• 2004 CPR



SR28 A55 Pavement Design Solution

Scope?

Patch & Overlay	\$30,000,000
Break & Seat/Rubbilization	8.5 Inch Asphalt \$35,000,000 Overlay
- Unbonded Concrete Overlay	\$50,000,000
Reconstruction	\$53,000,000

PROJECT COMPLETED IN ONE SEASON INSTEAD OF TWO D11 ALLOWED CONTRACTOR TO INNOVATE

THERE ARE MANY UPCOMING PROJECTS THAT ARE SUITABLE FOR THIS REHABILITATION TRATMENT!



WHY NOT Crack & Seat?
AND OVERLAY WITH ASPHALT?

Conclusions

C & S uses the old concrete pavement as a base which is then overlain with asphalt mix

C & S is 50%+ cheaper than reconstruction

C & S 100% recycles the existing pavement

No landfilling of existing concrete pavement

C & S reduces construction time by up to 50%

PennDOT has over 300 + miles of C & S Pavements that continue to perform

Lower Carbon Footprint – Less Pollution

C & S With SMA Surface = 20 Years Until First Preservative Treatment

PA ASPHALT PAVEMENT ASSOCIATION

Thank you for your attention!





Please contact us for any assistance!

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