

# Concrete Pavement Repair & Restoration



Purdue Road School  
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Indiana Chapter

American Concrete Pavement Association

# Rehabilitation Strategies

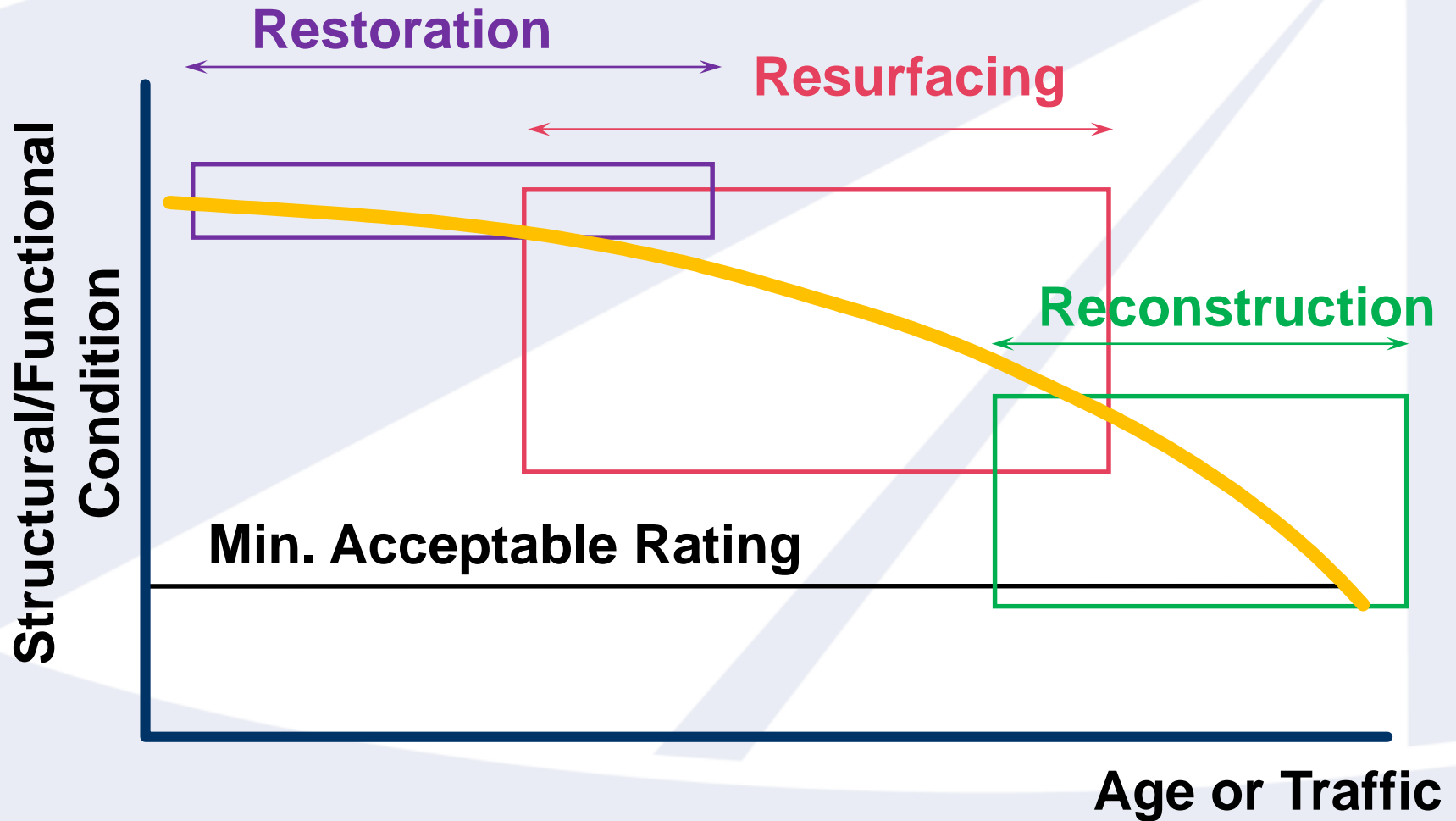
- Three categories:
  - Restoration
  - Resurfacing
  - Reconstruction

Together, known as CPR<sup>3</sup>

- Which is used depends on existing condition.



# Rehabilitation Timing



# Restoration Techniques

## Concrete Pavements

- Full-depth repair
- Partial-depth repair
- Diamond grinding
- Joint & crack resealing
- Slab stabilization
- Retrofitting dowels
- Retrofitting concrete shoulders
- Cross-stitching long. cracks/joints



# Partial Depth Repair (PDR)

- Repairs deterioration in the top 1/3 of the slab.
- Generally located at **joints**, but can be placed anywhere surface defects occur

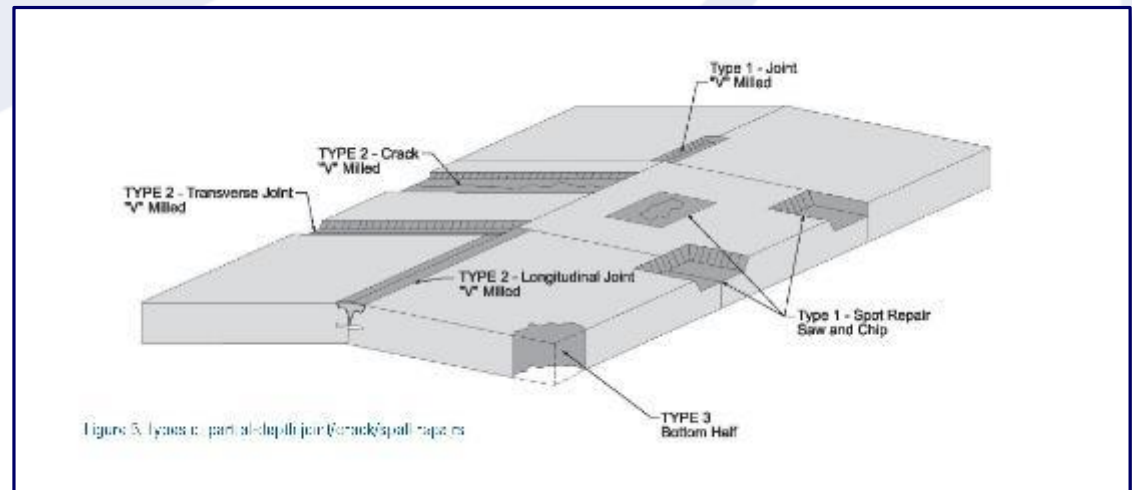


Figure 5. Types of partial depth joint/crack/spall repairs

# Field Training in Indiana to-date

IN LTAP in Danville, IN October 12, 2012





# Field Training in Indiana to-date

INDOT Greenfield and LaPorte Districts

June 2013



APWA Training, Fishers, IN

March 2016



# Candidates for PDR





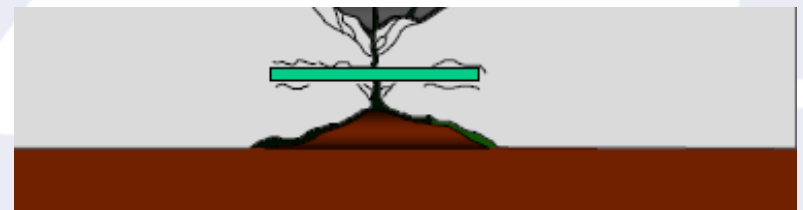
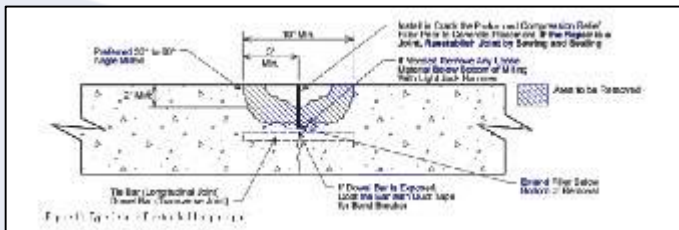
# Partial Depth or Full Depth?



**Partial Depth Repair**



**Full Depth Repair**



# Finding Unsound Concrete

## Sounding the pavement:

- Hammer
- Steel rod
- Steel chain



# Removal

- Sawing and chipping
- Carbide milling
  - Transverse
  - Longitudinal





# Carbide-Milling

- Efficient
- Leaves rough surface
- Avoid hand work



# Note V-shape Edge





# Milling Distresses Joint



# Cleaning

- Check removal by sounding before cleaning
- Air or Sandblast bottom and vertical faces
- Acceptable waterblast:
  - 100-200 MPa pressure
  - Waiting period to dry



# Final Cleaning... Pre-placement

- Airblow to remove dust & debris
- Direct away from patches
  - Use 0.63 MPa minimum air pressure
  - Oil & moisture free air
  - Check with clean cloth
- Backpack blowers acceptable



# Re-establish Joint

- Separates patch from adjacent lane
- Reforms joint reservoir
- Provides uniform sealing reservoir
- Acceptable materials:
  - Styrofoam
  - Asphalt-impregnated fiberboard
  - Fiberboard



# Applying Bonding Agent

- Check patch area cleanliness first
- Clean again if necessary
- Apply agent uniformly
  - Scrub cementitious grout with wire brush
  - Apply epoxy with soft brush
  - Coat all surfaces (horizontal & vertical)





# Placing Patch Material

- Mix in small quantities
- Place from wheelbarrows, buggies
- Slightly overfill the patch area
- Use small spud vibrators (<25 mm)
  - Hold at 15-30 degrees
  - Do not drag!!



# Finishing

- Match surrounding elevation
- Work tool from center toward edges
- Seal saw runouts with grout or liquid epoxy





**Completed Partial Depth Patch**



# Technical Publications

<http://www.cptechcenter.org/>



# **Additional Resources**

**2017 Indiana Concrete Pavement Workshop  
Presentations:**

<http://indianaconcretepavement.com/>



**THANK YOU**

**Questions?**

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