Center for Technology & Training
Michigan Technological University • Department of Civil & Environmental Engineering

PASER Training

Part 1: Distress Identification

Michigan Transportation Asset Management Council

Agenda

Why Rate Roads?

Distress Identification for Rating:

- Asphalt
- Concrete
- Sealcoat

Stop distractions!

3

Not Registered?

Call (906) 487-2102 after training

4

Why is TAMC Rating Roads?

Public Act 499 (2002) Summary

All public roads in Michigan will be managed using the principles of asset management.

Michigan Transportation Asset Management Council

6

Public Act 199 (Dec. 2007)

TAMC shall develop a pavement management system.

MDOT and local agency reporting to the council is mandatory.

- Road and bridge condition
- 3 year project plan
- Expenditures

7

Michigan Transportation Asset Management Council

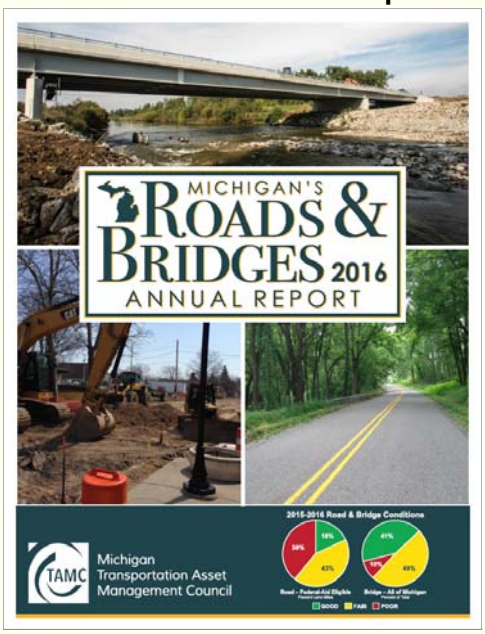
To support excellence in managing Michigan's transportation assets by:

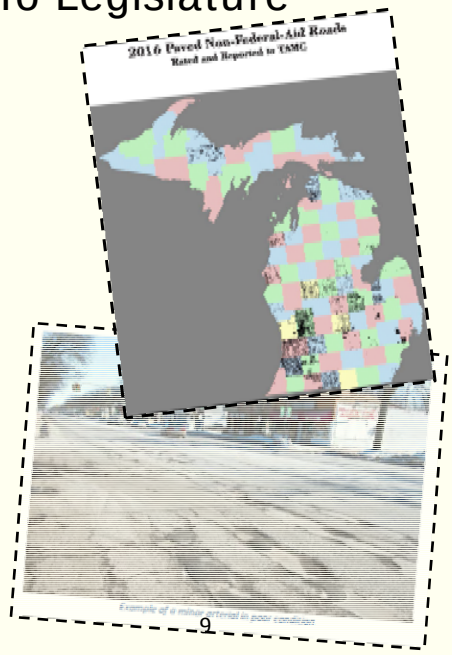
Advising the Legislature and State Transportation Commission

Promoting asset management principles

Providing tools and practices for road agencies

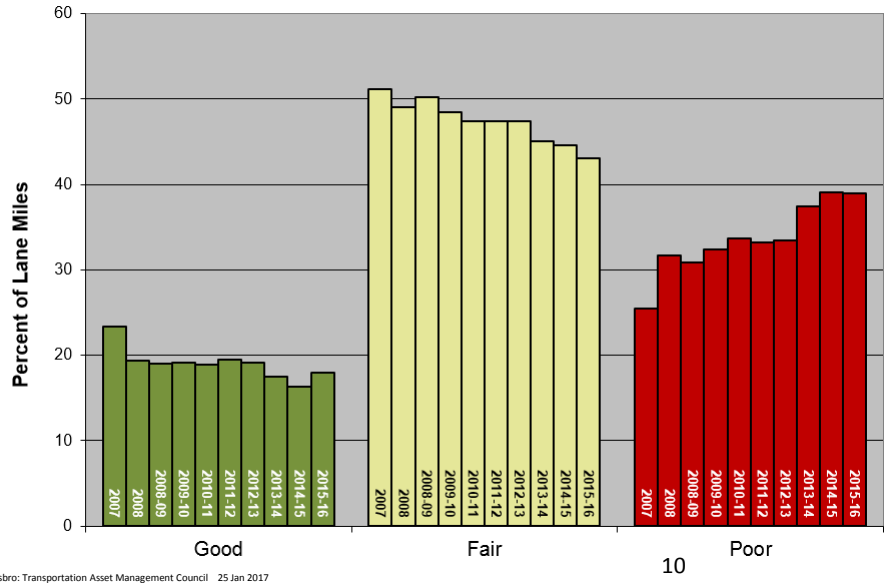
TAMC Annual Report To Legislature





9

2007-2016 Pavement Condition of Federal Aid Eligible Roads



Chesbro: Transportation Asset Management Council 25 Jan 2017

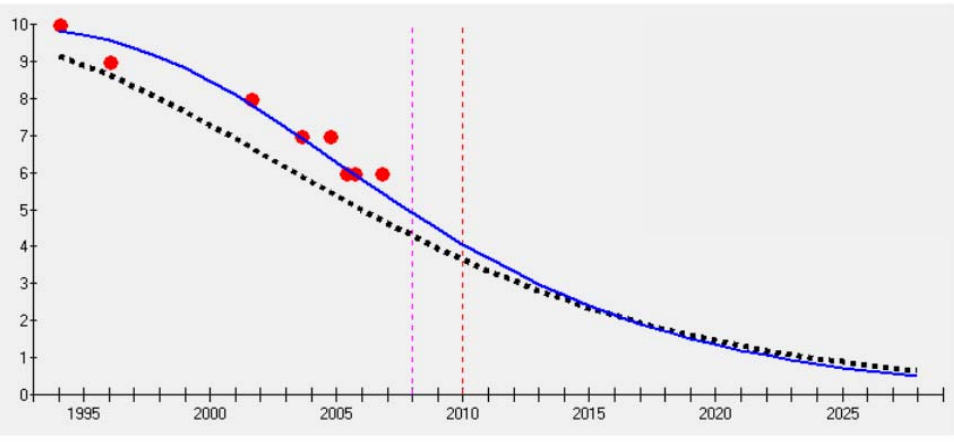
10

Why Should You Rate Roads?

- See how road condition is changing
- Estimate future road condition
- Measure effectiveness of past improvements
- What, Where and When improvements are needed

11

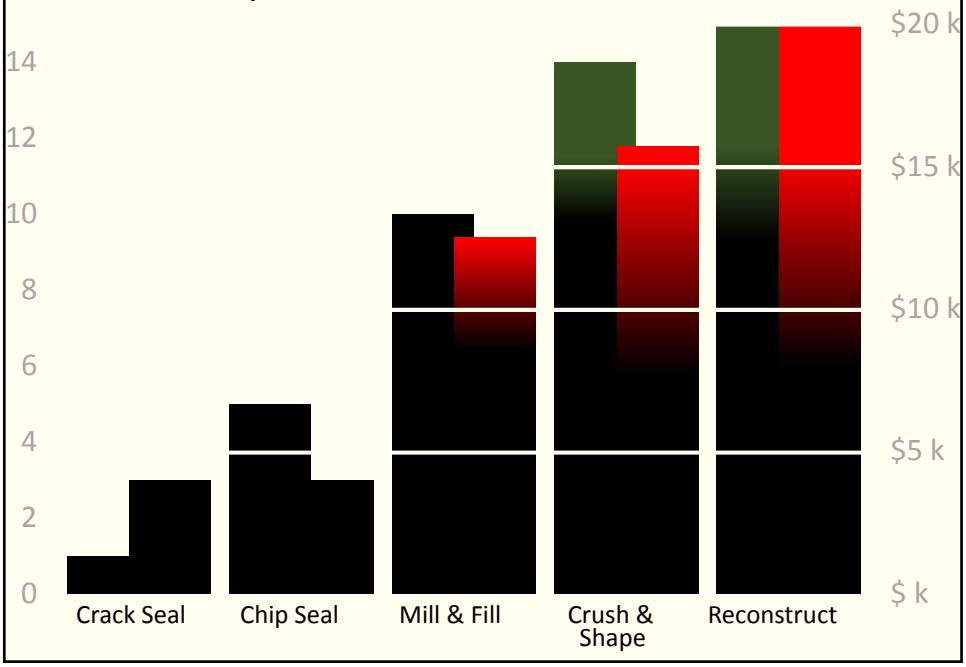
Estimating Deterioration



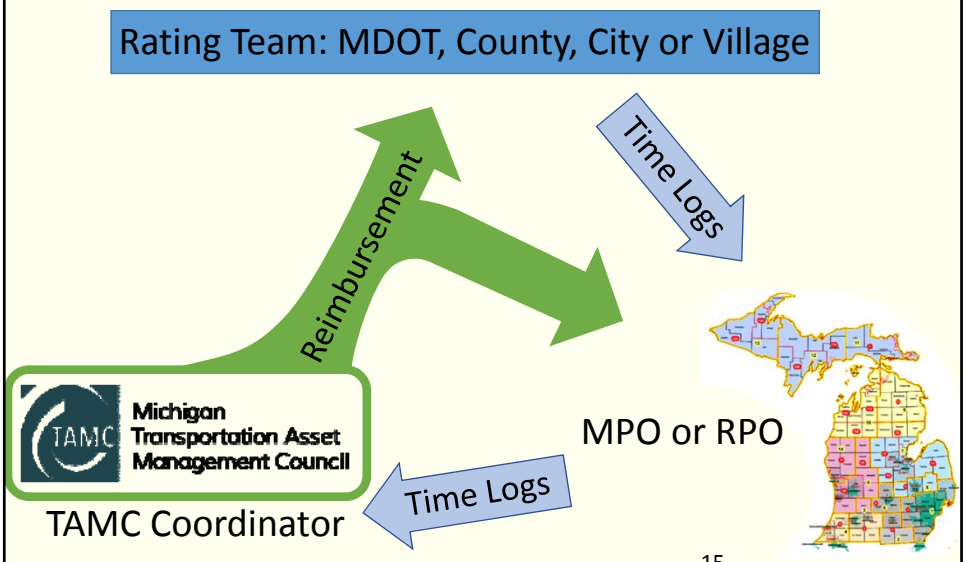
12

Cost Effectiveness of Treatments

Cost per Year of Treatment Life



Training & Data Collection Effort Is Funded



15

Data Collection Policy

All rating team members must attend:

1. PASER webinar - new raters and raters that did not do item 2
2. Onsite PASER training - in the same year of collection
3. IBR training - every 3 years

See the TAMC Policy for more details:

http://www.michigan.gov/documents/tamc/Policy_for_Collection_of_Roadway_Surface_Condition_Data_602939_7.pdf

Michigan Transportation Asset Management Council

16

TAMC Coordinator Assists With:

Reimbursement
Certification
Data collection policy
Reporting requirements

Roger A. Belknap,
TAMC Coordinator
Ph: (517) 373-2249
BelknapR@michigan.gov

Dave Jennett,
TAMC Transportation Planner
Ph: (517) 241-5164
JennettD@michigan.gov

17

Preparing for Rating

18

A Tale of Two Data Collections….

- TAMC federal aid data collection
- Non-federal aid data collection
  - Agency decides what to collect
  - Agency must get approval first to be eligible for reimbursement
  - Agency rater does their own roads

19

Who? What? How?

Raters
- County or City
- MDOT
- RPO or MPO

20

What Tools Are Used?

Roadsoft 2018.1*
Roadsoft GPS Laptop Data Collector 2018.1*
Framework Version 17

*or latest as of April 1 2018

21

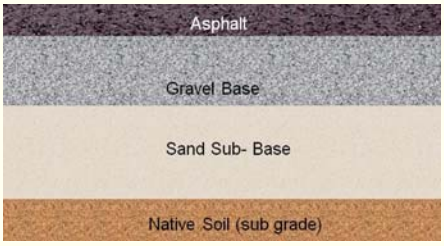
Start Date / End Date

- First Monday of April
  Start collecting (weather permitting)
- Last Friday of November
  Last day to collect
- First Friday of December
  Last day RPO/MPO to submit to CSS

22

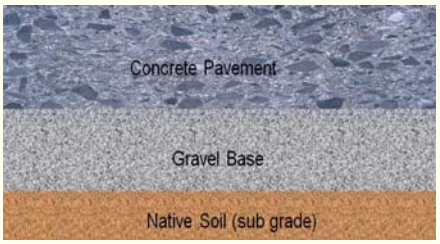
4 Major Pavement Types & 3 Manuals

Hot Mix Asphalt (HMA)



Composite

Concrete

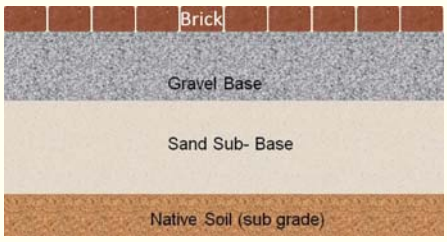


Sealcoat

23

2 Other Pavement Types

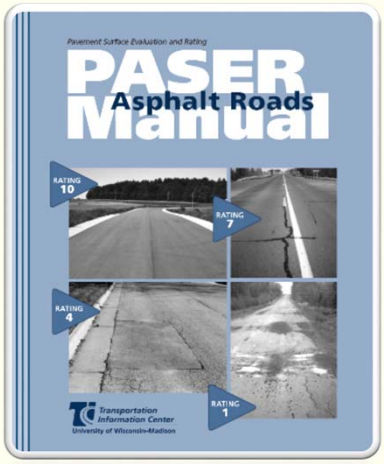
Brick

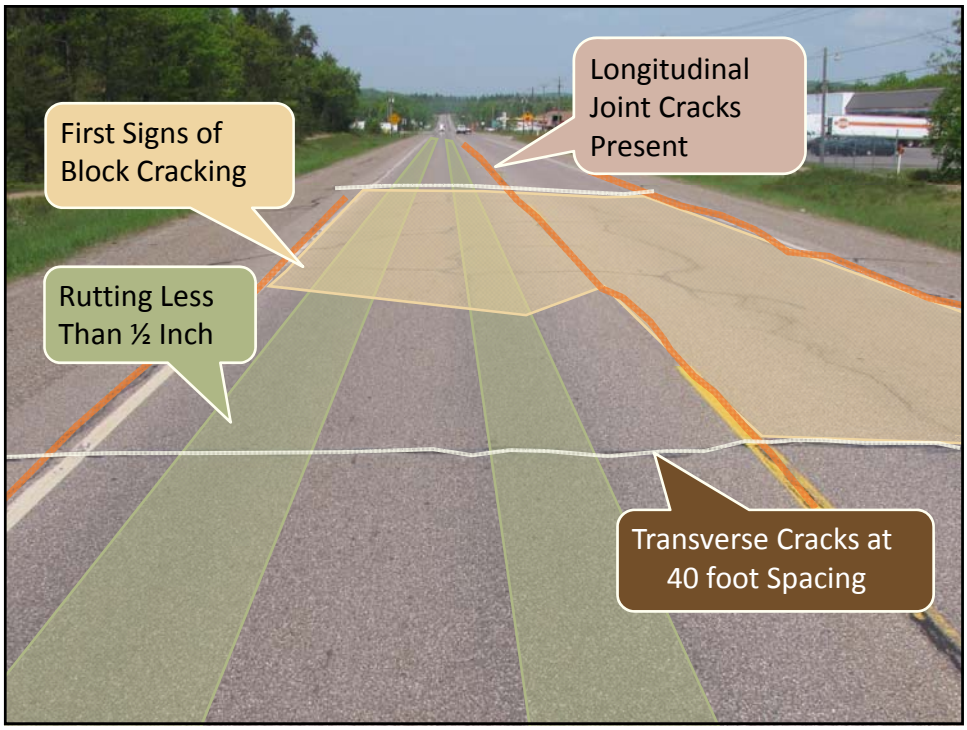


Gravel

24

Asphalt Pavement



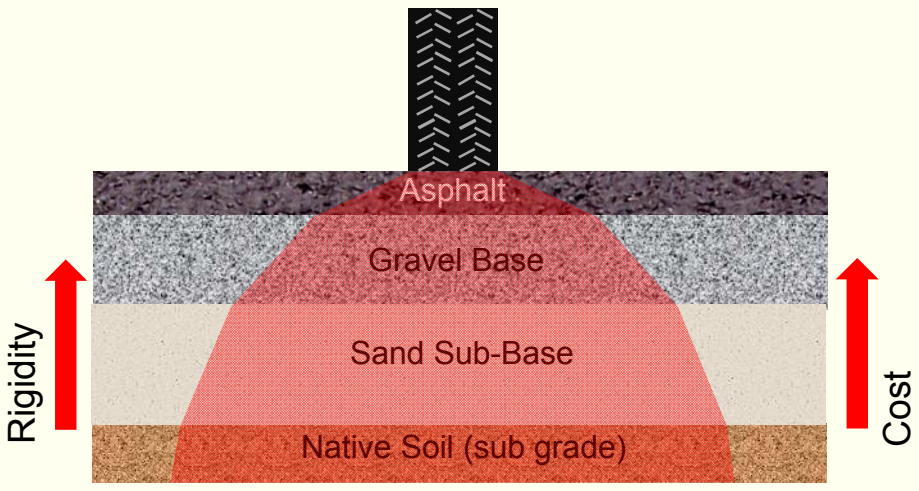


Asphalt Distress Types

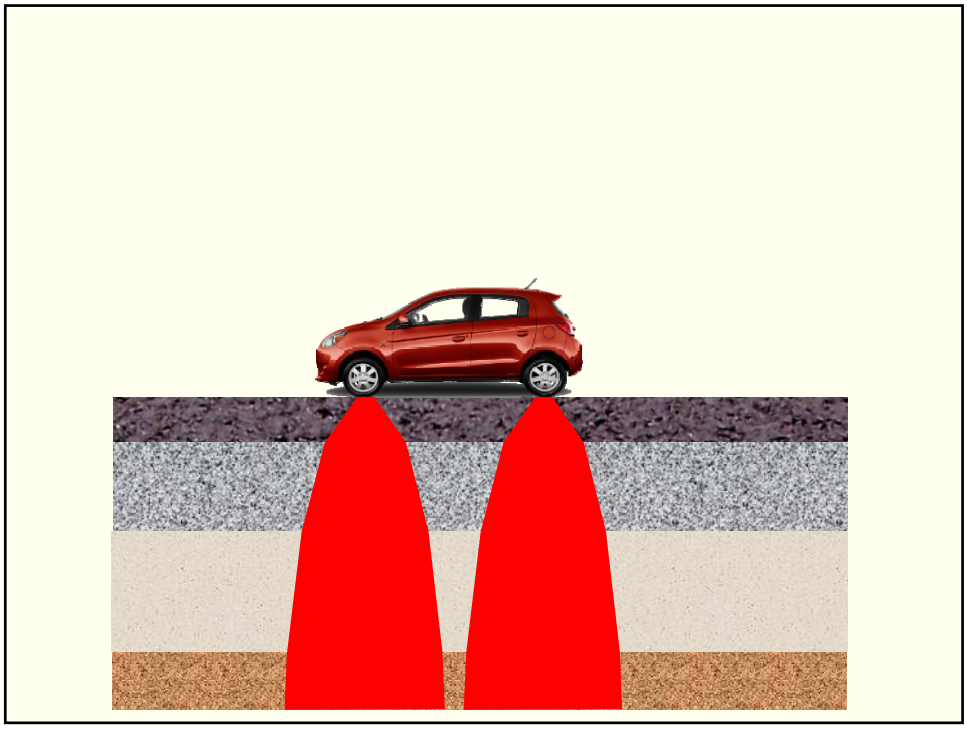
- Structural
- Age-related
- Surface defects
- Limited extent (generally)
- Others (potholes and patches)

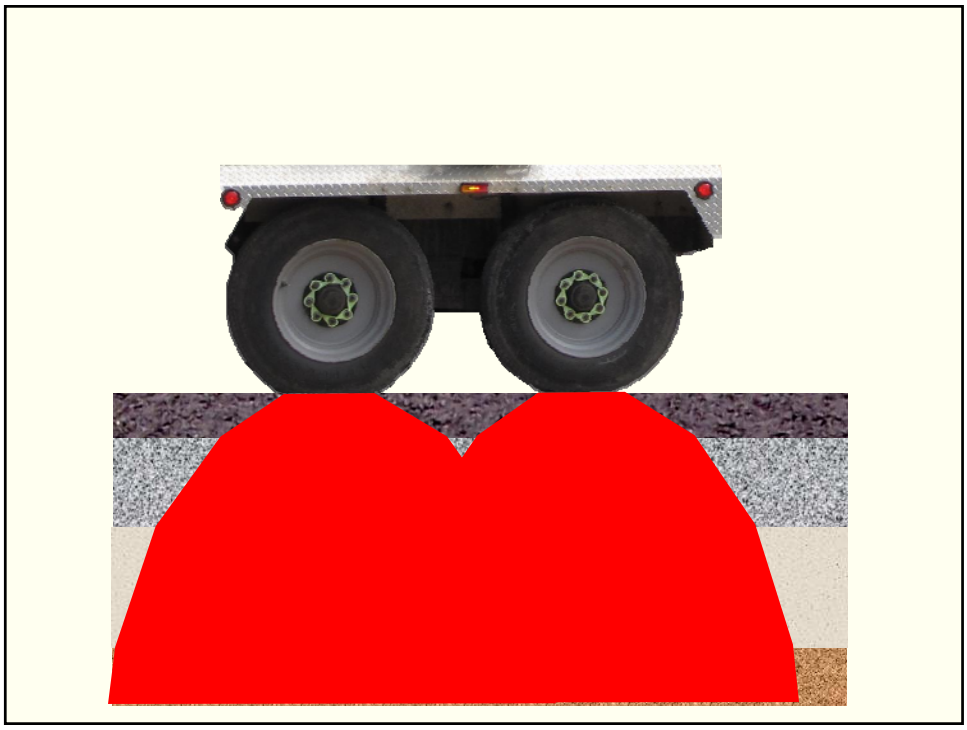
27

Load Distribution



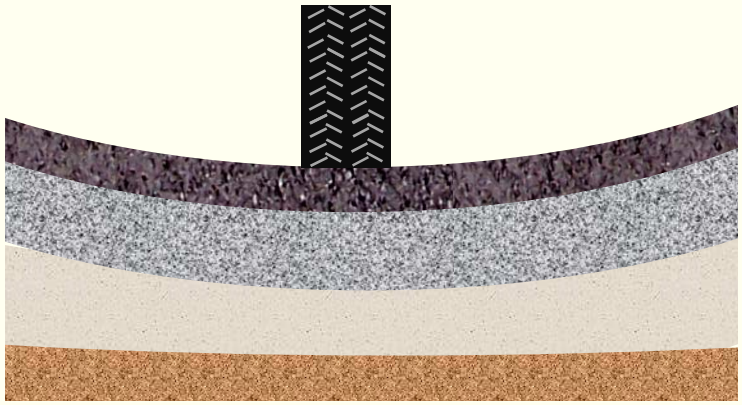
28





Traffic

Traffic



Structural Distresses

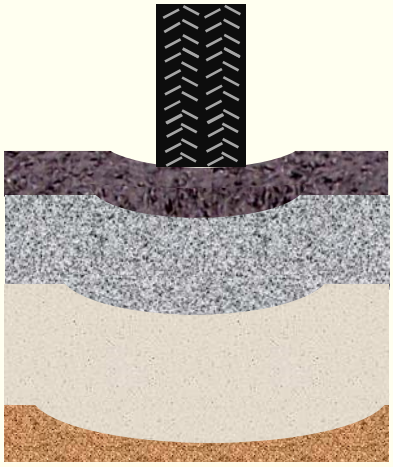
Rutting

Cracking in Wheel Path

Alligator Cracking

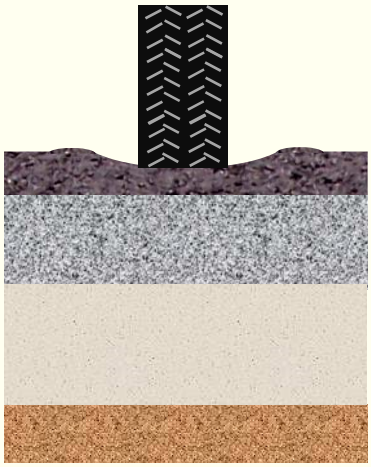
Structural Distress
Rutting

Deep Rutting



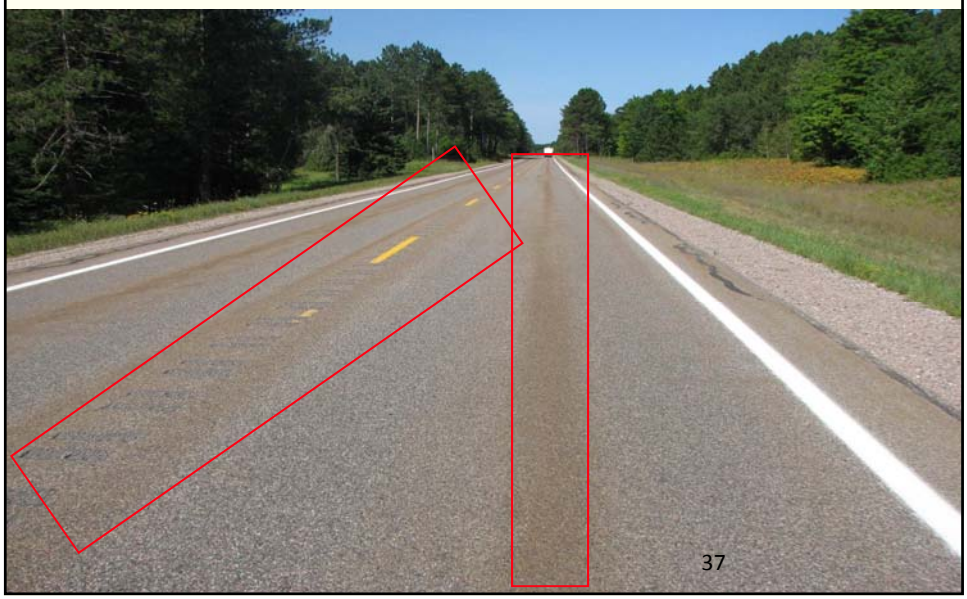
35

Surface (mix) Rutting



36

Signs of Rutting



37

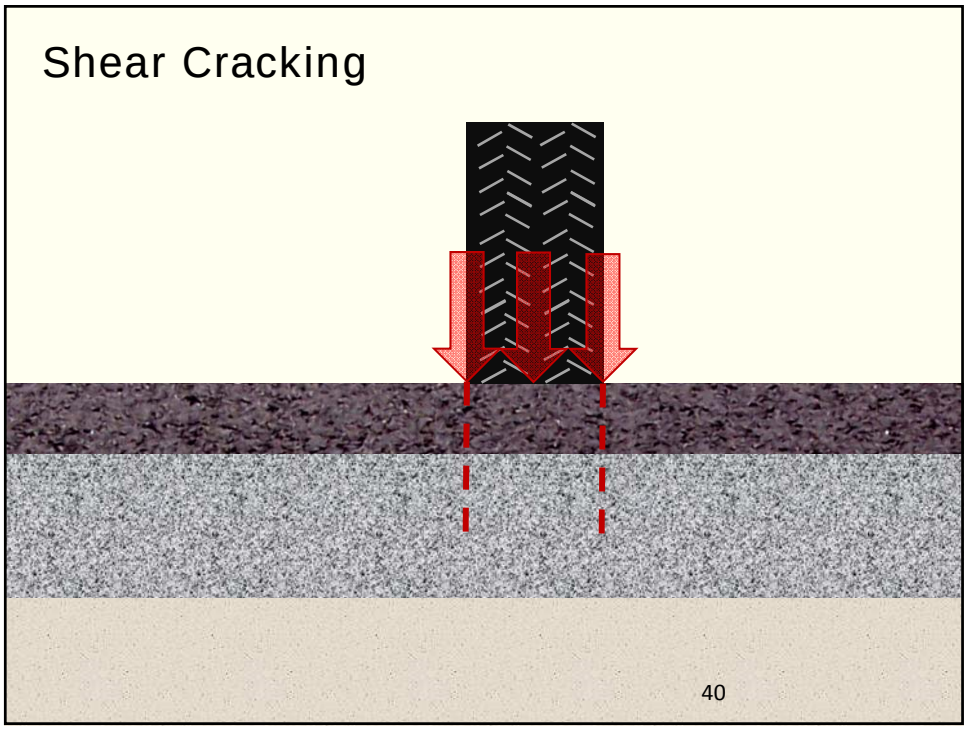
Signs of Rutting

Range of depths
½” to 1”
1” to 2”
> 2”

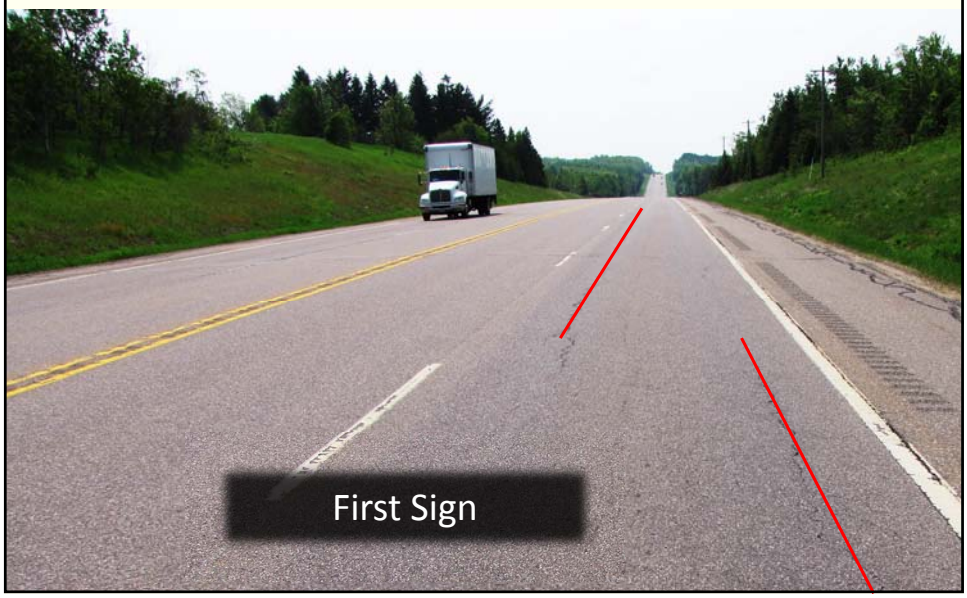
38

Structural Distress
Longitudinal Cracking in Wheel Path

Shear Cracking

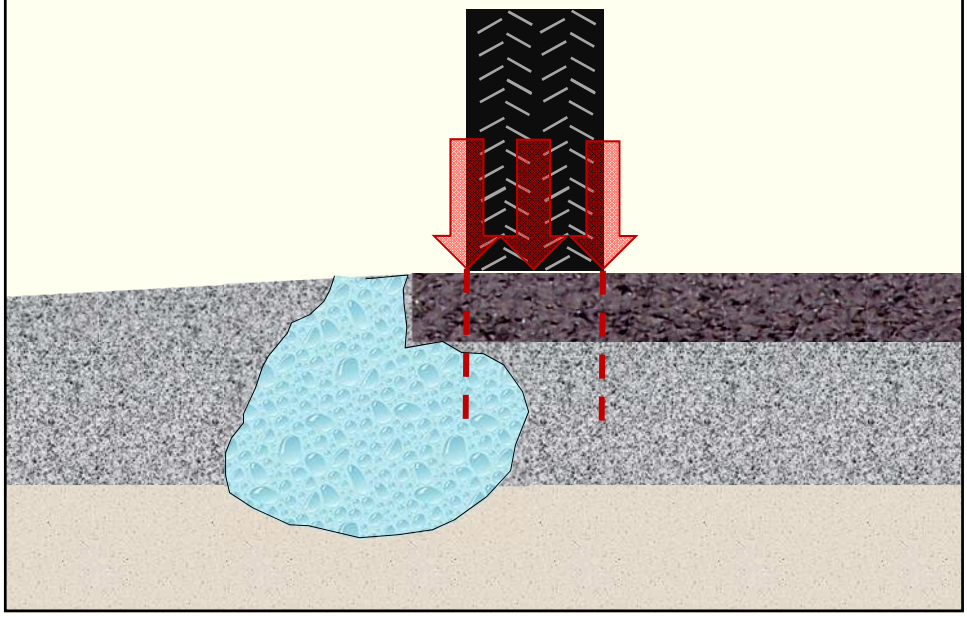


Longitudinal Cracking in Wheel Path



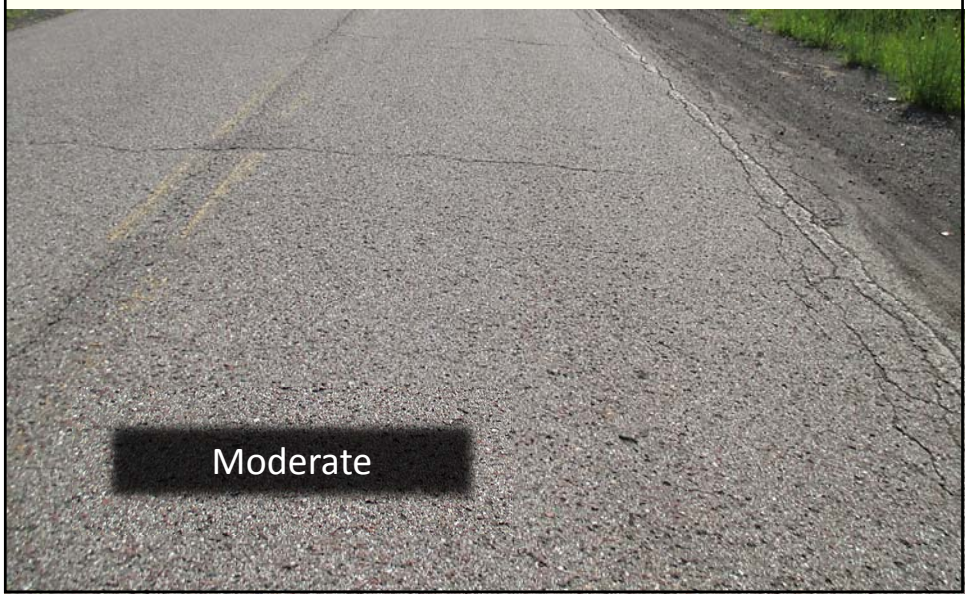
Structural Distress
Edge Cracking

Edge Cracking



Edge Cracking

Edge Cracking



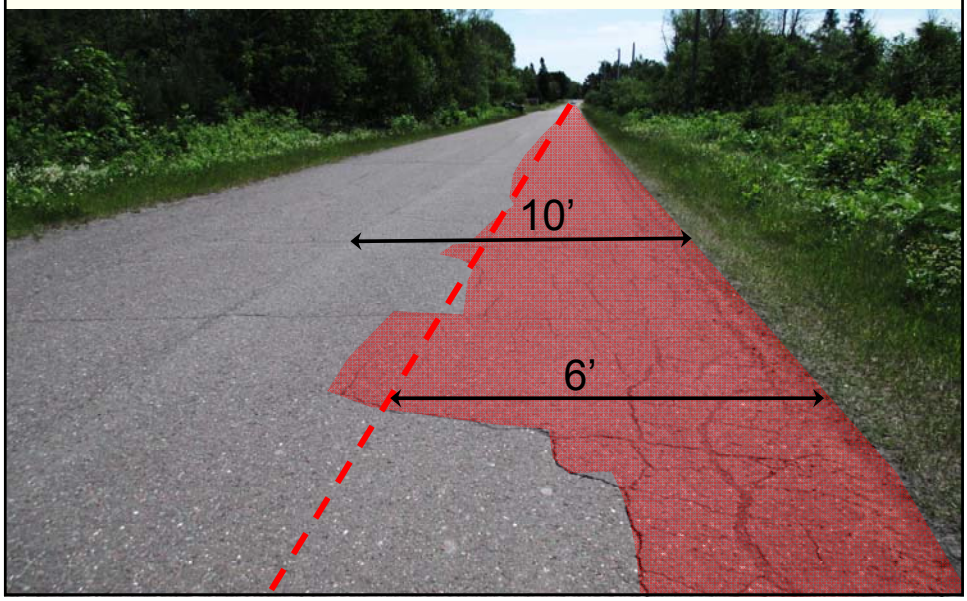
Structural Distress
Edge Cracking

Structural Distress
Alligator (Fatigue) Cracking

Alligator (Fatigue) Cracking

Structural Distress
Alligator (Fatigue) Cracking

Percentage of Worst Lane



Primary Age-related Distresses

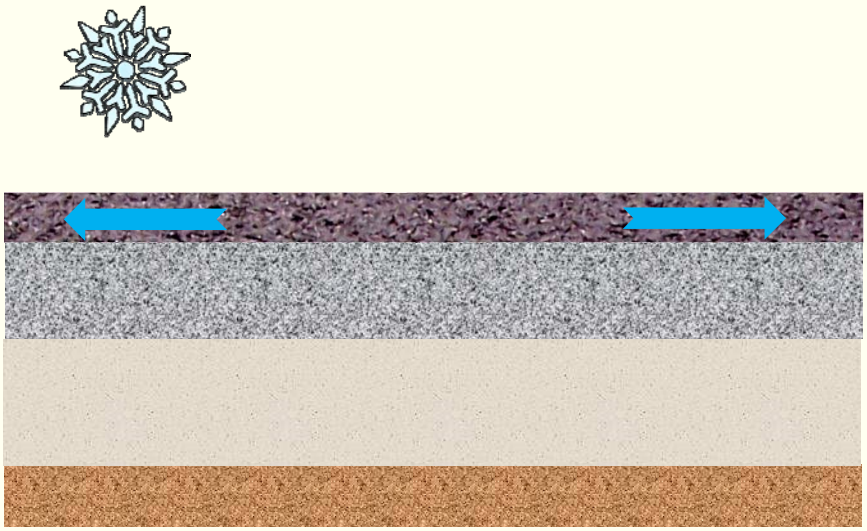
Transverse cracking

Longitudinal joint cracking

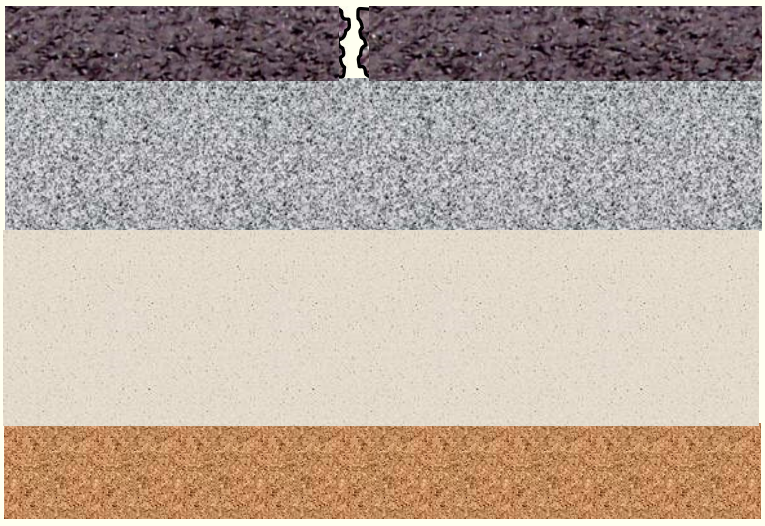
Block cracking

Environment

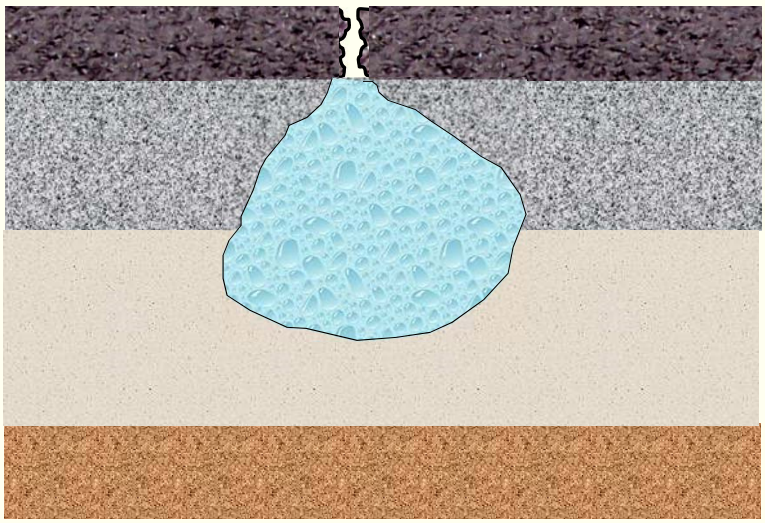
Environment



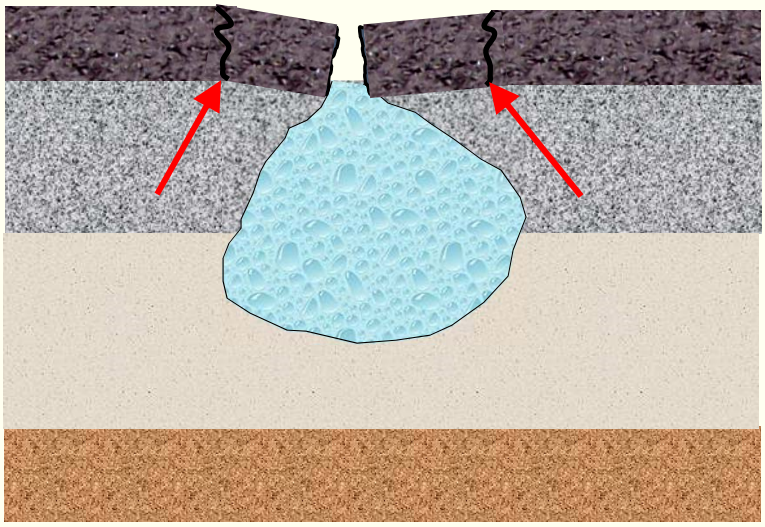
First Distress



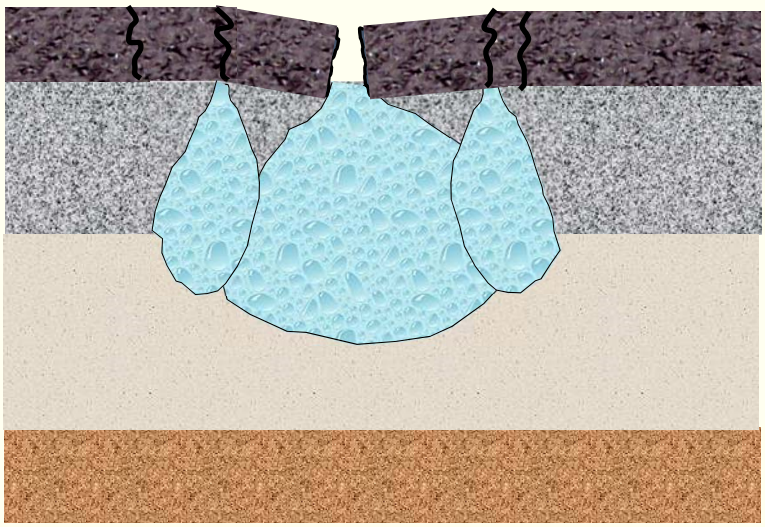
Water Intrusion



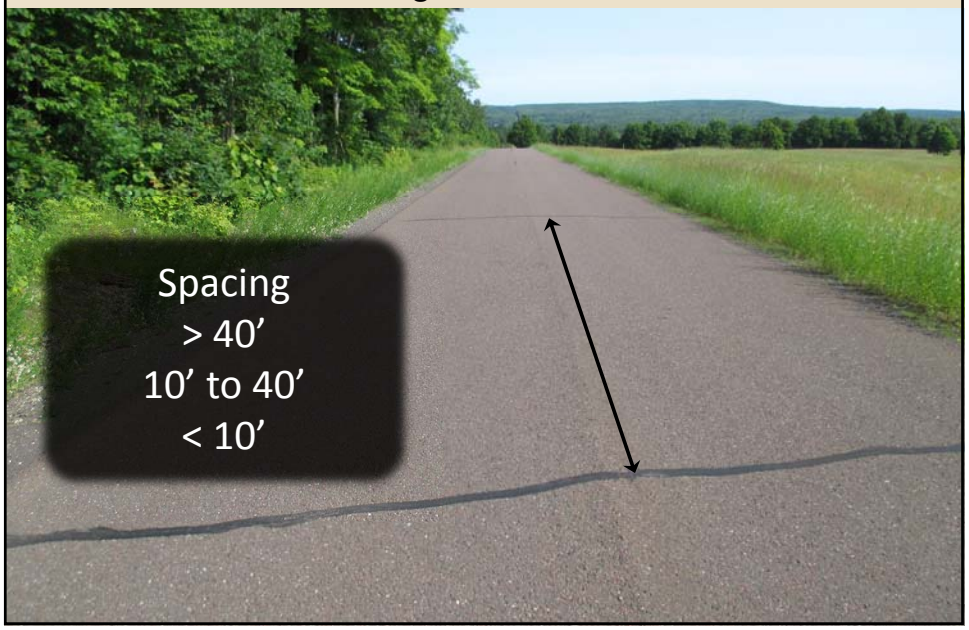
Base Weakening & Loss of Support



Distress Propagation



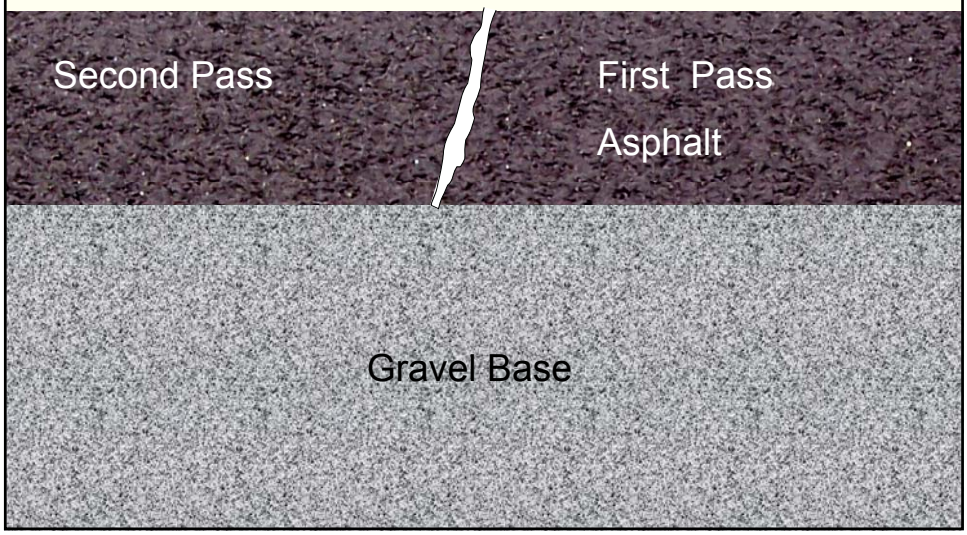
Primary Aging Distress
Transverse Cracking



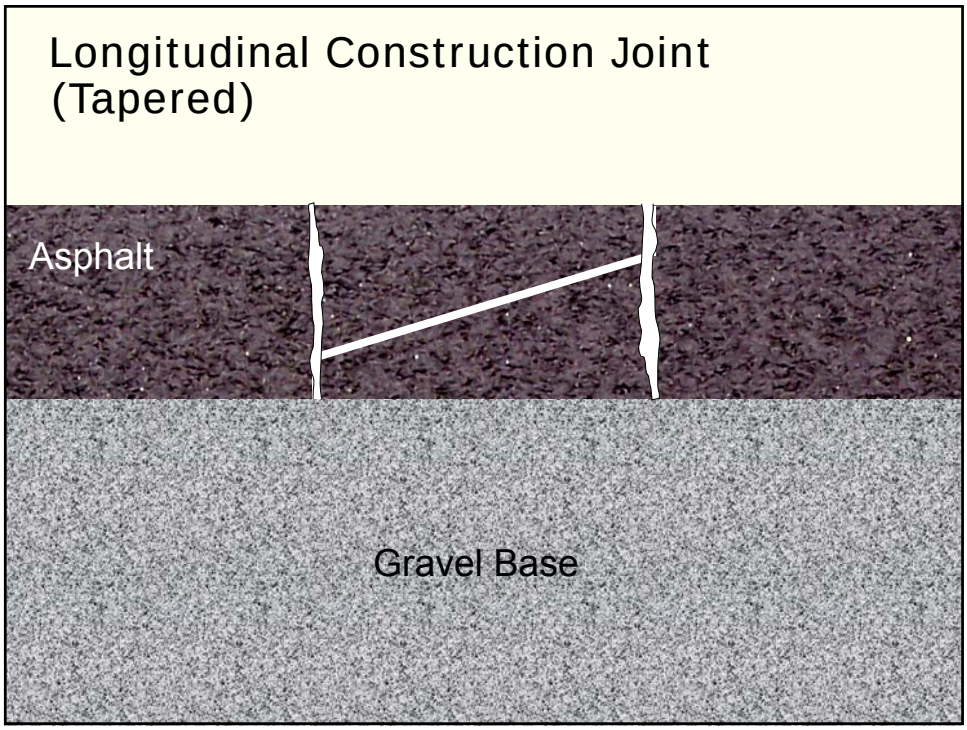
Poll Question

Primary Aging Distress
Longitudinal Joint Cracking

Common Construction Joint

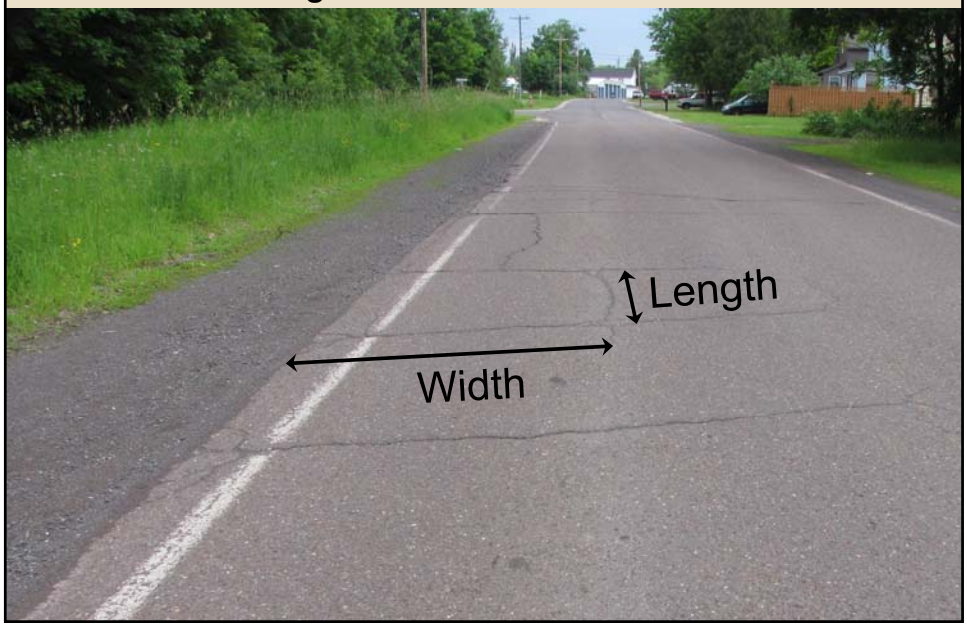


Longitudinal Construction Joint (Tapered)

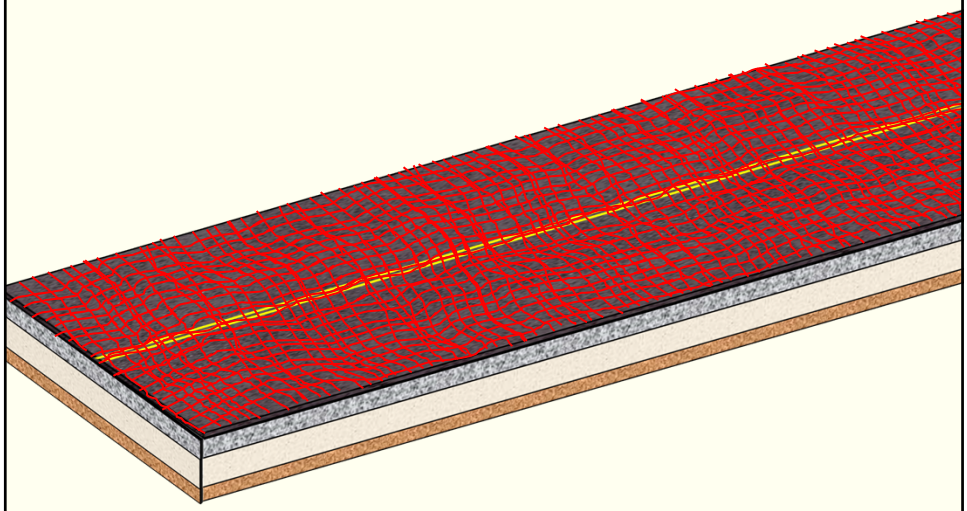


Longitudinal Tapered Joint Cracking

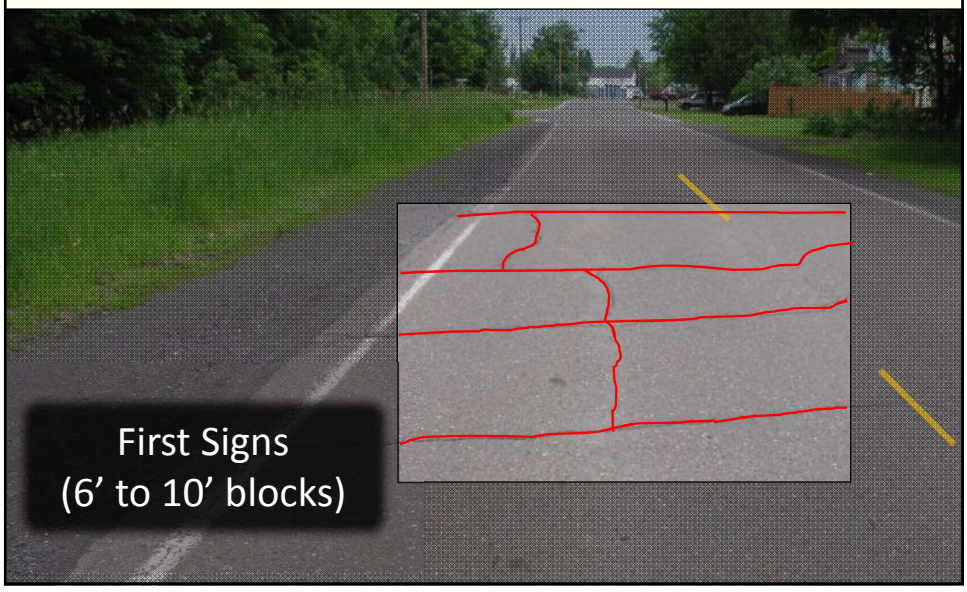
Primary Aging Distress
Block Cracking



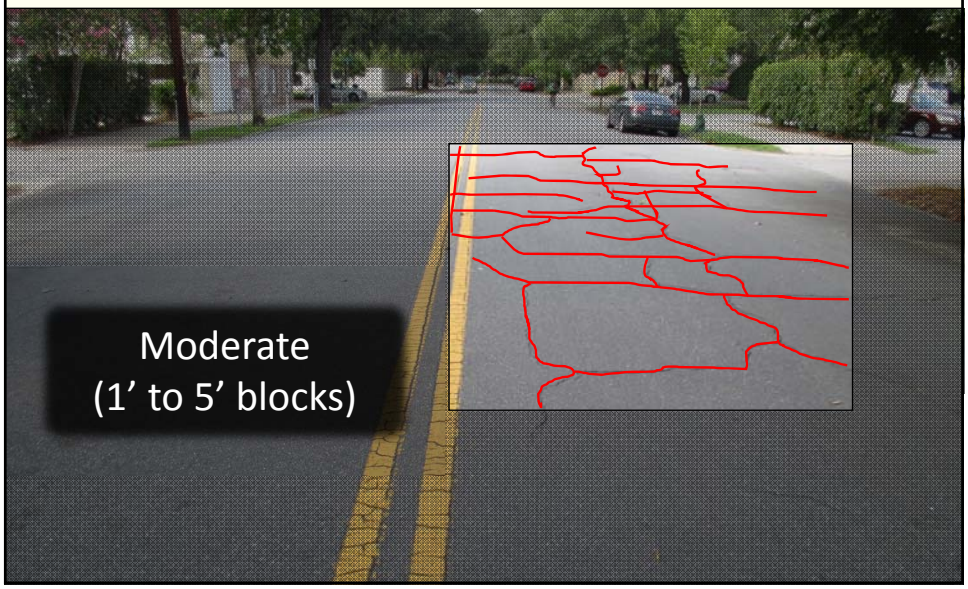
Primary Aging Distress
Block Cracking Progression



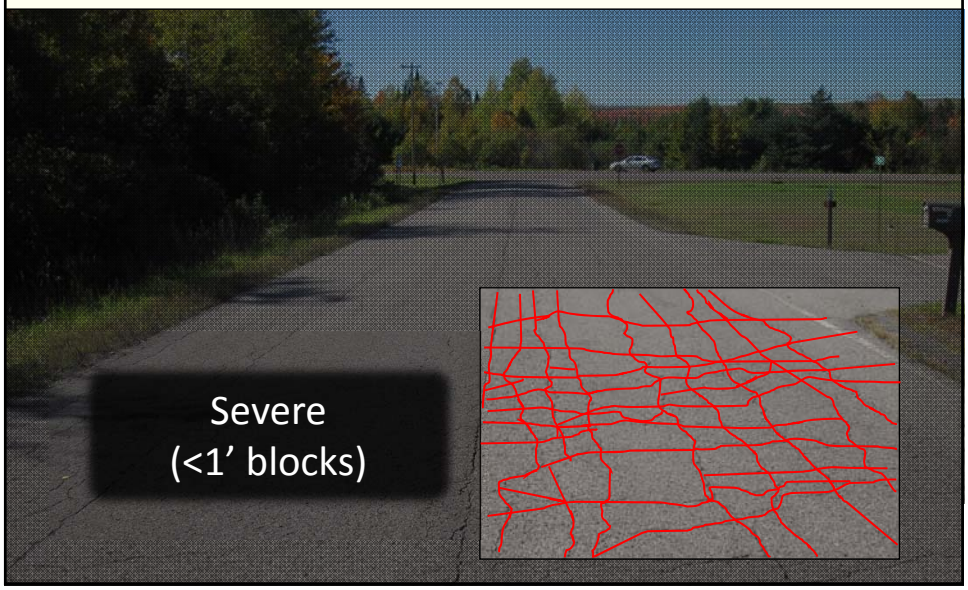
Primary Aging Distress
Block Cracking



Primary Aging Distress
Block Cracking



Primary Aging Distress
Block Cracking



Widths of Cracks

Tight

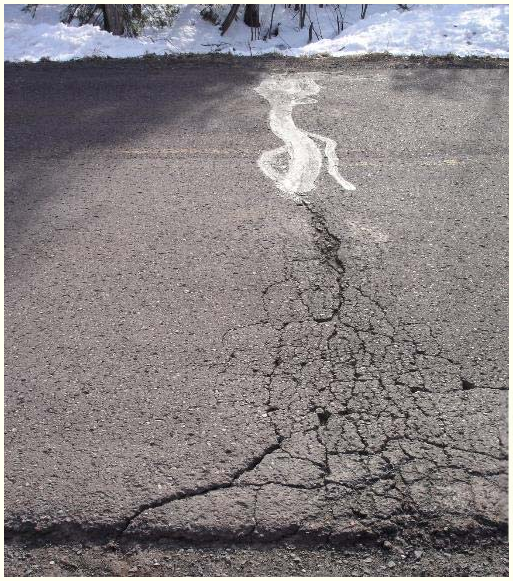
Width of Cracks

Open

Width of Cracks

Secondary

More Than Just a Crack…..



Structural

Surface Defects

Raveling

Flushing/ bleeding

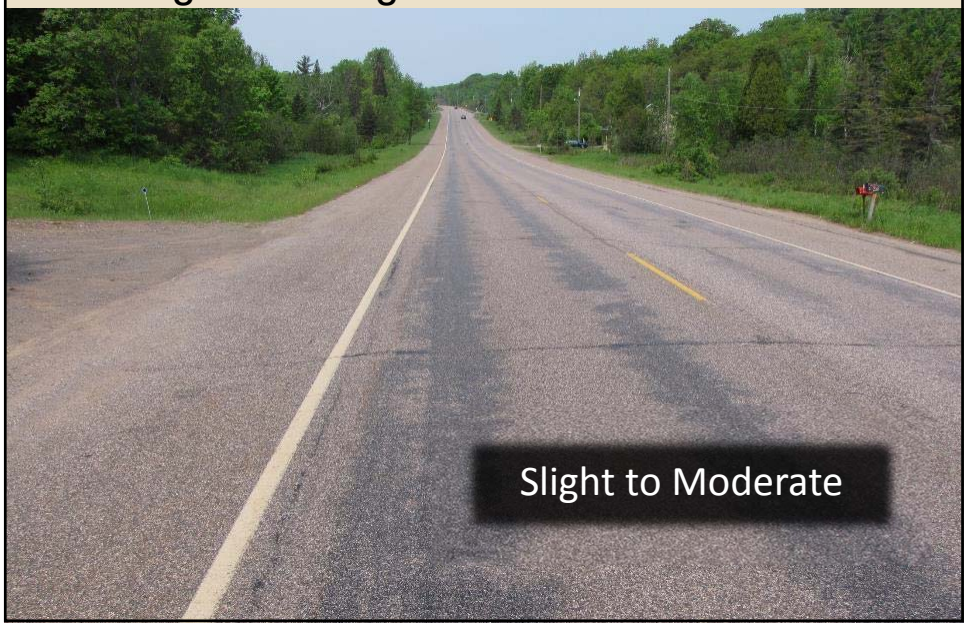
Polishing

Surface Defect Raveling

Raveling

Raveling

Surface Defect
Flushing/Bleeding



Flushing / Bleeding

Surface Defect
Polishing

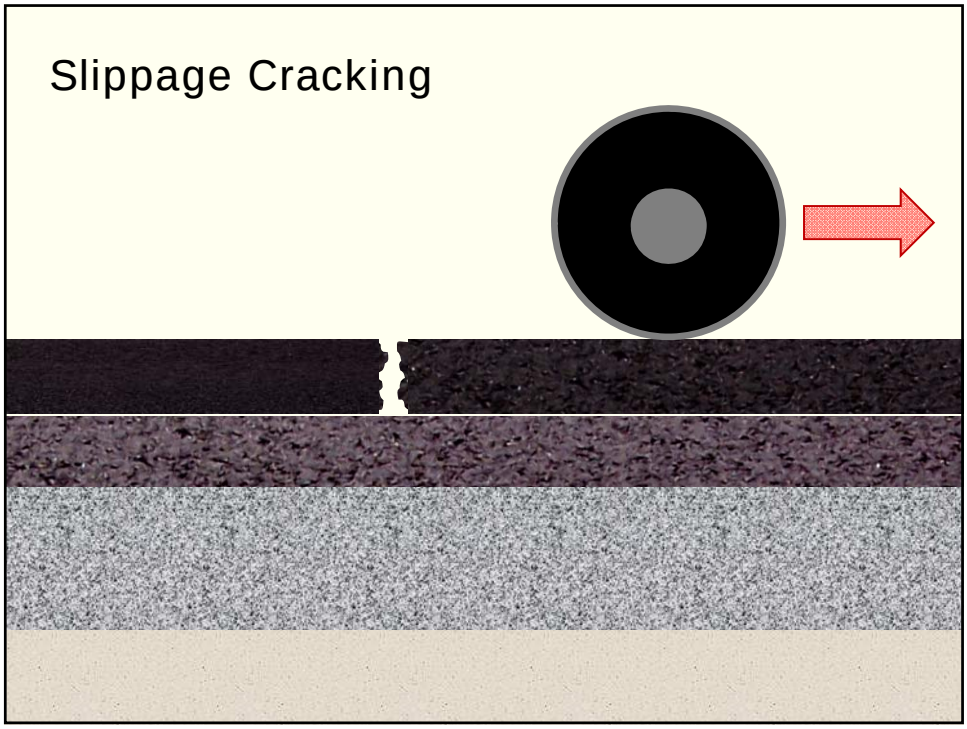
Polishing

Asphalt Limited Extent Distresses

- Slippage cracks
- Shoving & rippling
- Heave & settling

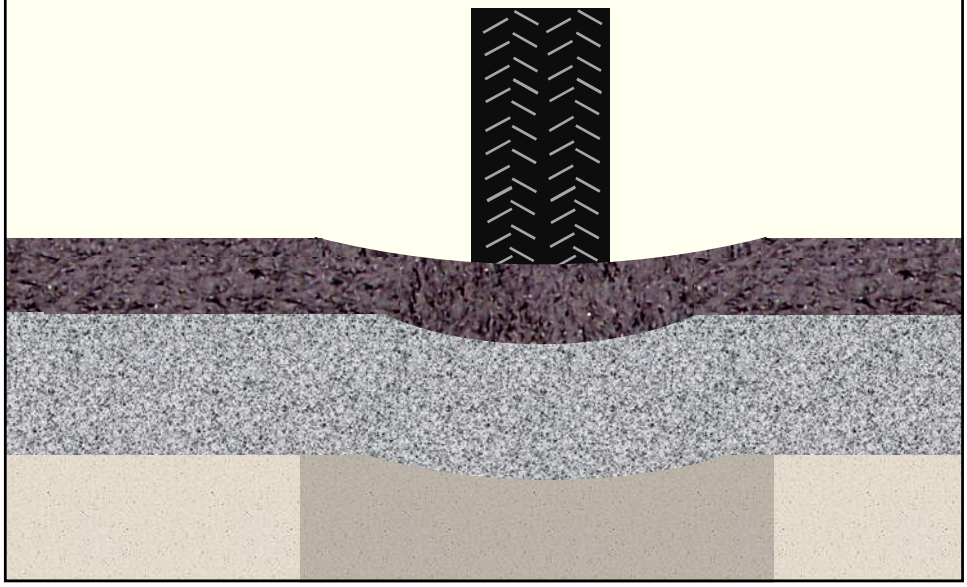
Limited Extent Distress
Slippage Crack

Slippage Cracking

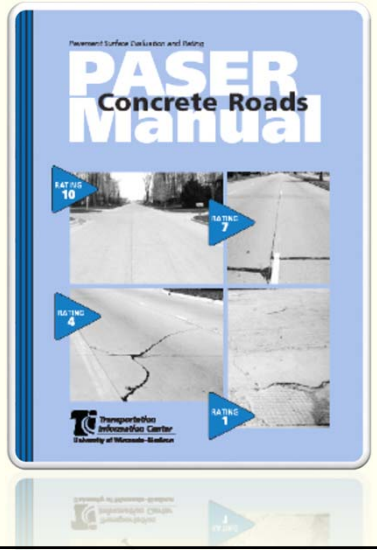


Limited Extent Distress
Heave & Settling

Differential Settlement



Concrete Pavement



Ask the Audience

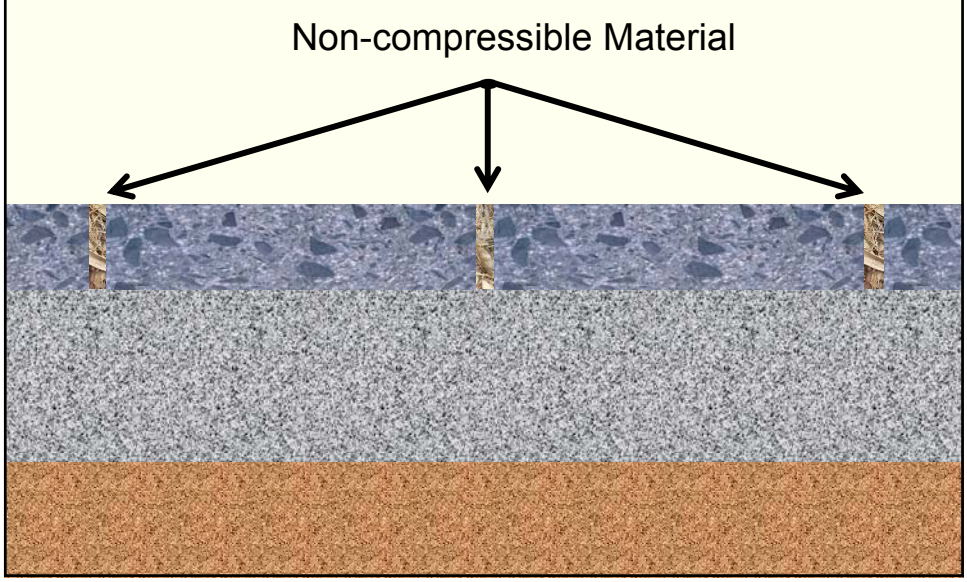
Concrete Distress Types

- Deformations
- Joint Distress
- Cracking
- Surface Distress

Concrete Deformations

- Blowups
- D-cracking
- Faulting

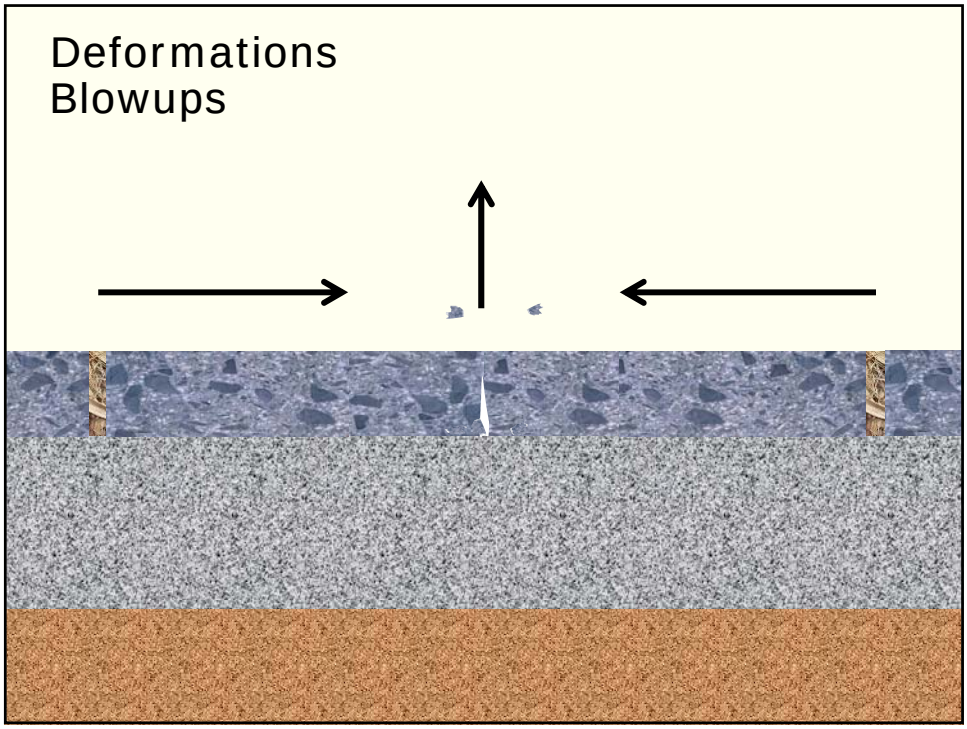
Deformations
Blowups



Deformations
Blowups

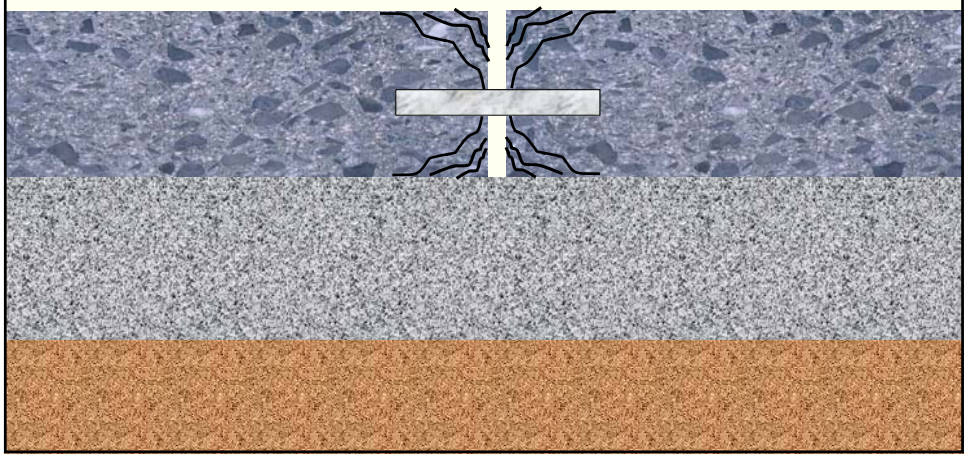
Deformations
Blowups or Tenting

Deformations
Blowups



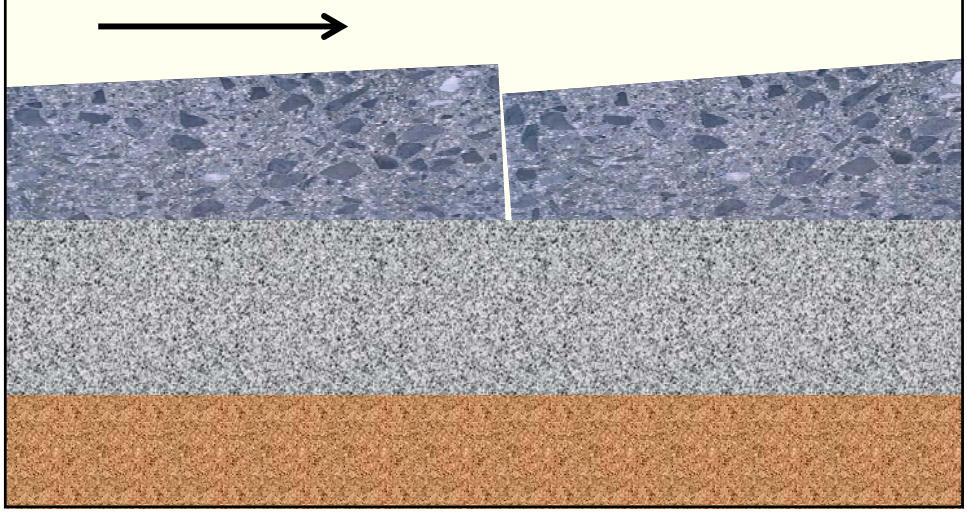
Cracking – Durability Crack

Cracking
Durability Crack



Deformations – Faulting

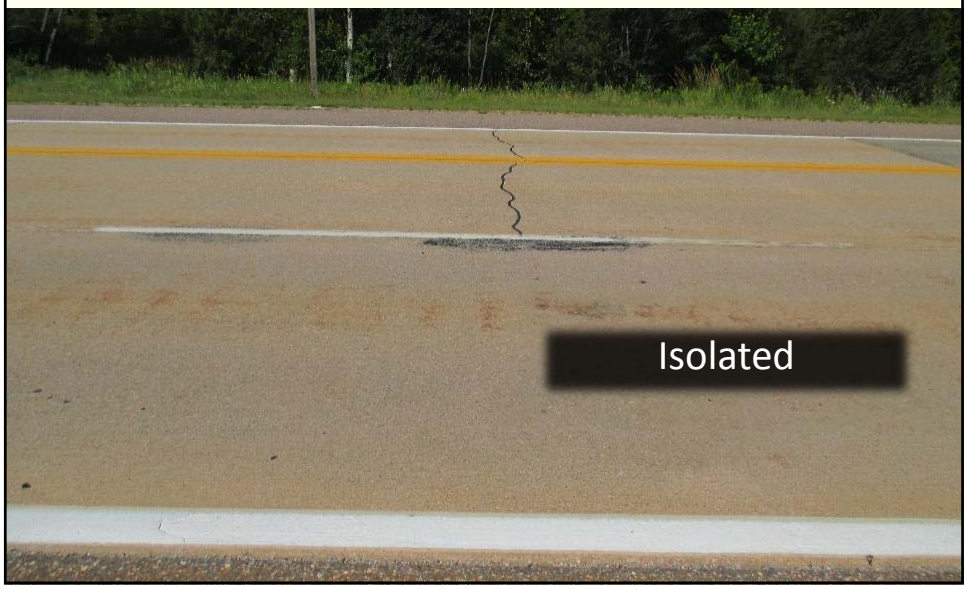
Faulting



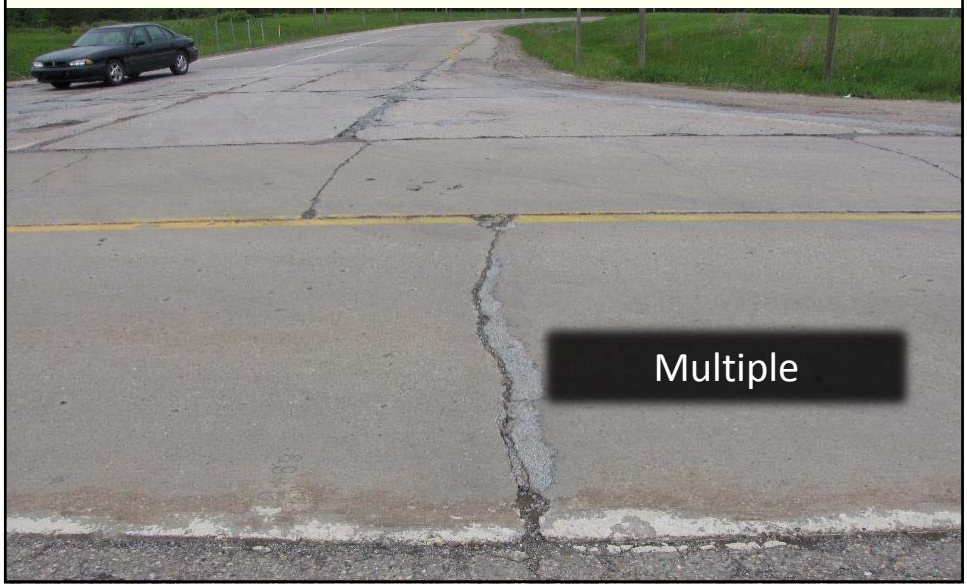
Concrete Cracking

- Transverse cracking
- Meander cracking
- Corner cracking

Cracking
Transverse Crack

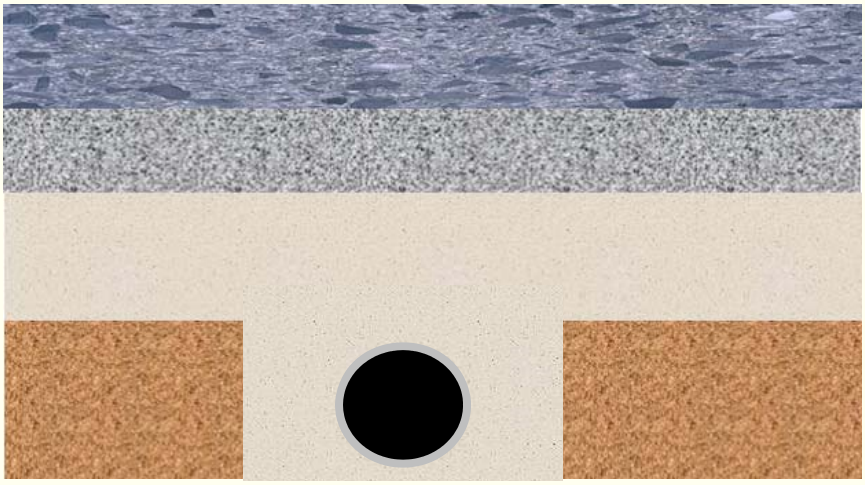


Cracking
Transverse Crack

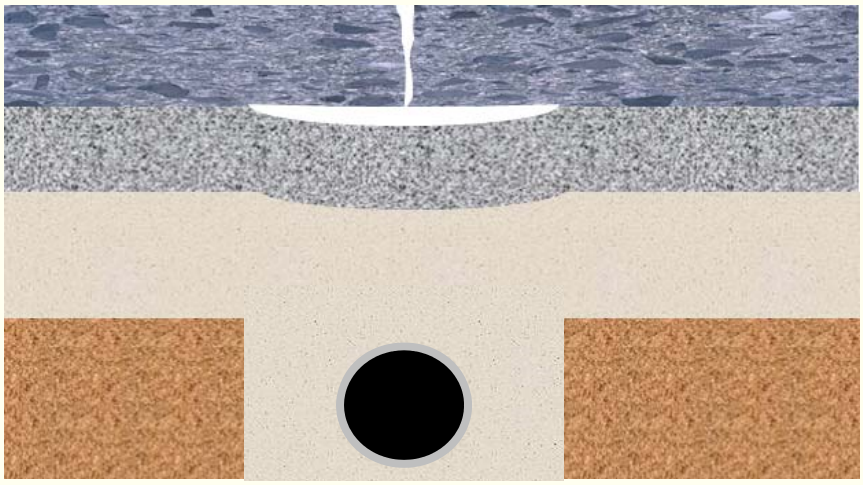


Cracking
Meander Crack

Settlement – Utility Trench



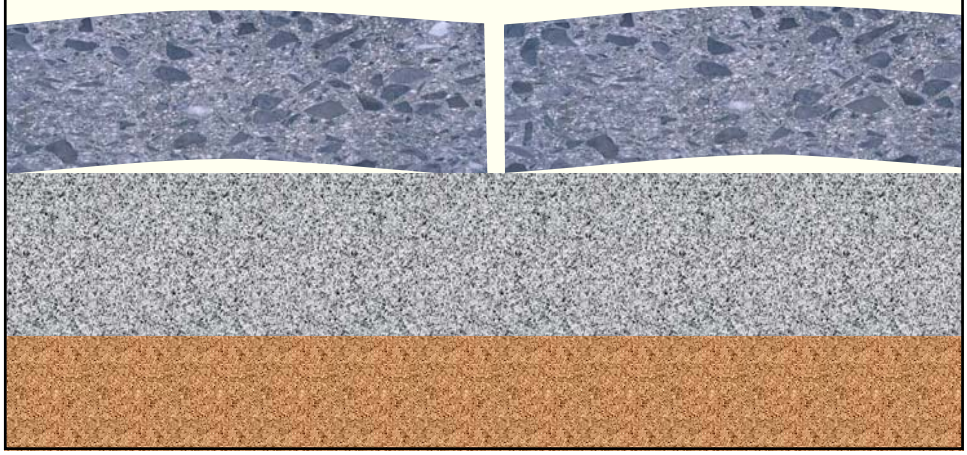
Settlement – Utility Trench



New Construction
Meander Crack

Cracking
Corner Break and Crack

Slab Curling



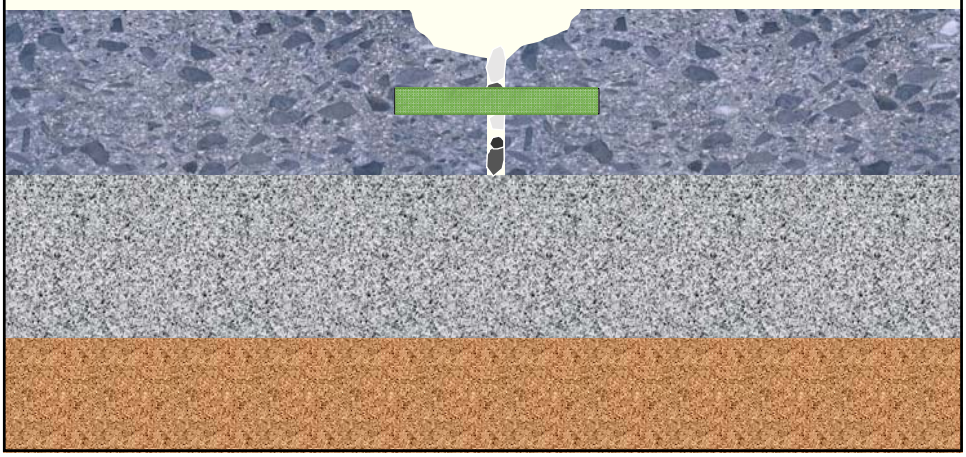
Spalling Happens On:

- Transverse joints
- Longitudinal joints
- Transverse cracks
- Meander cracks
- Corner cracks
- Shallow reinforcing steel

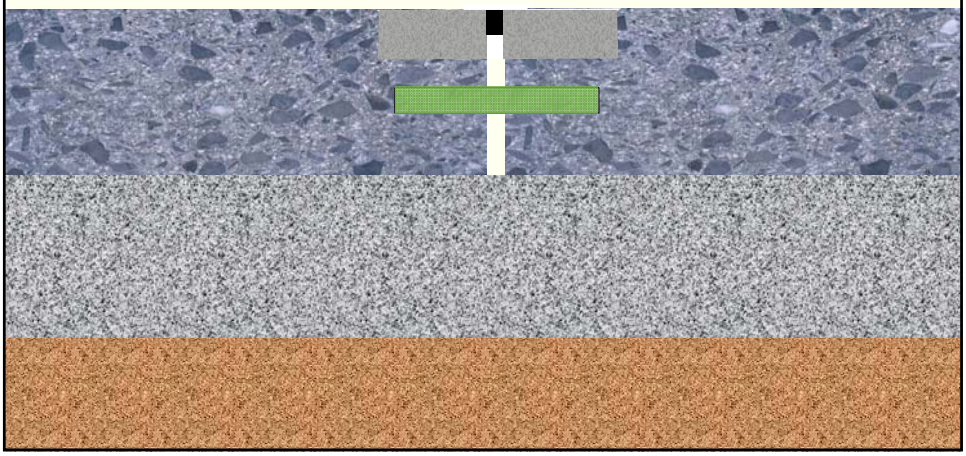
Joint Distress - Spalling

Dowel Bars (load transfer)

Incompressible Material Causes Joint Spalling

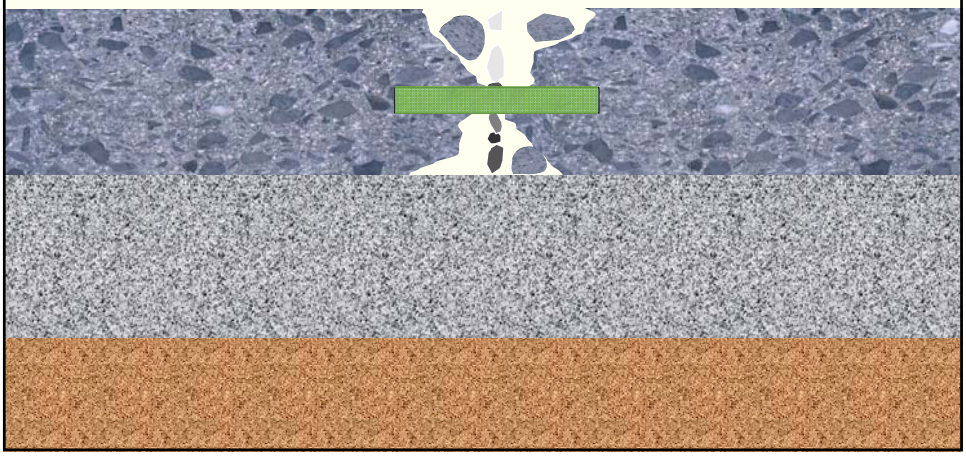


Partial Depth Joint Repair

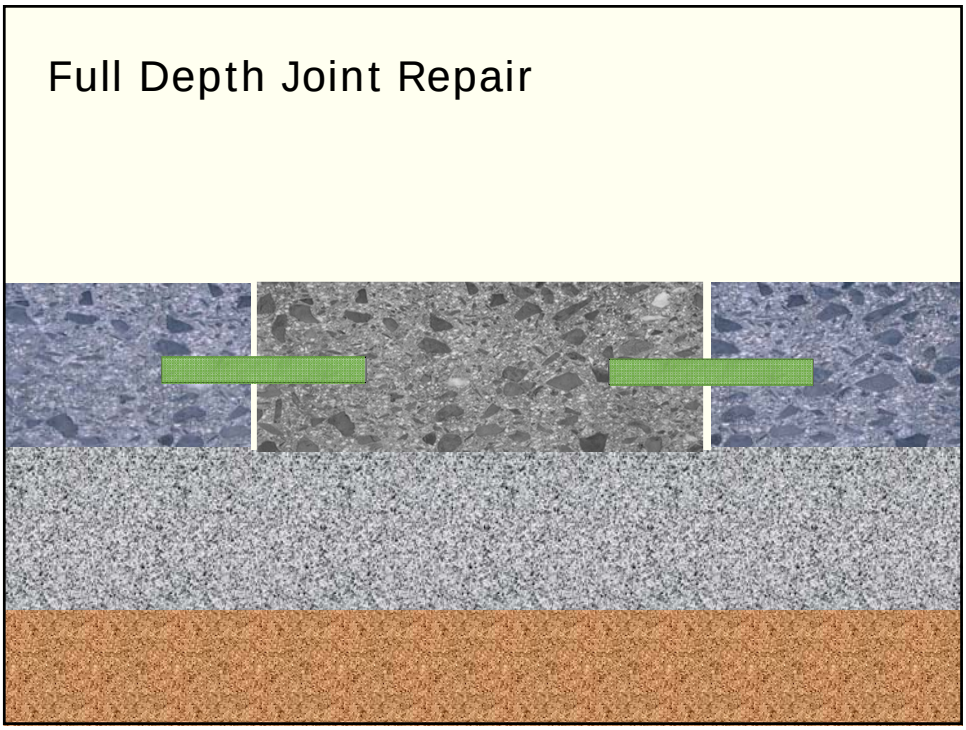


Partial Depth Joint Repair

Full Depth Needed



Full Depth Joint Repair



Full Depth Joint Repairs

Joint and Crack - Spalling

Joint and Crack - Spalling

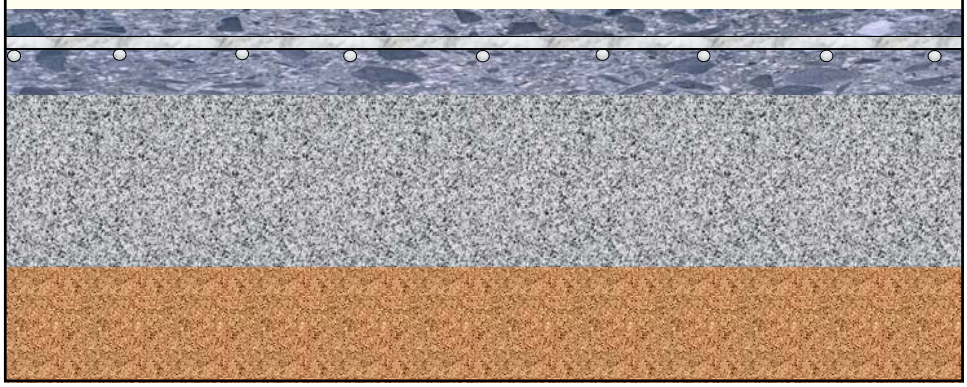
Joint and Crack - Spalling

Concrete Surface Distresses

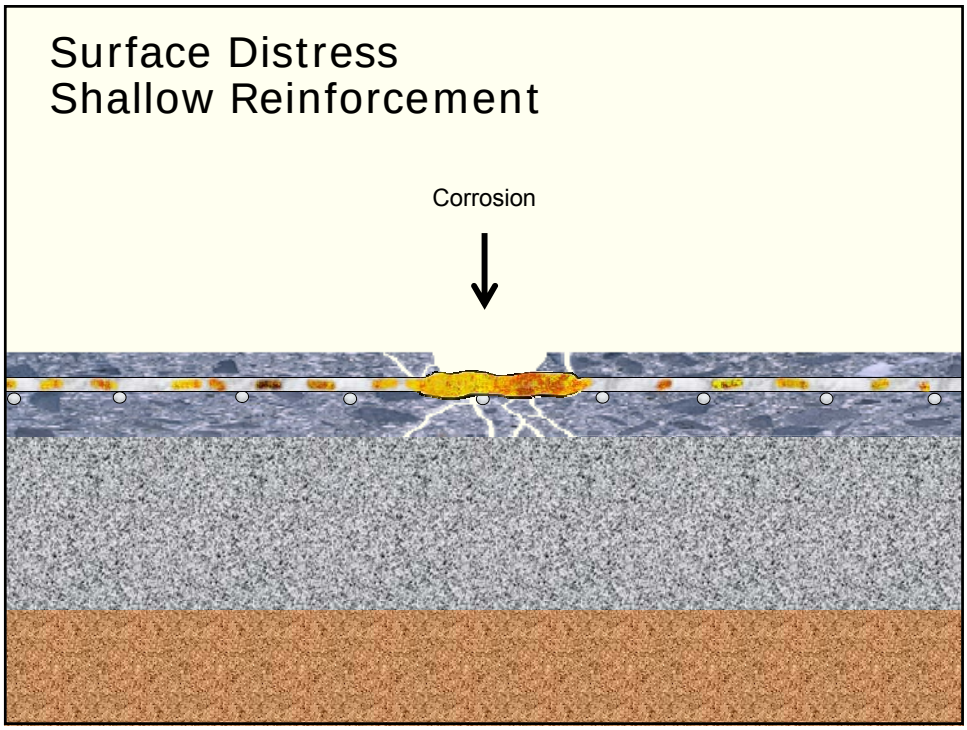
- Due to shallow reinforcement
- Scaling
- Pop outs
- Map cracking
- Polishing

Surface Distress
Shallow Reinforcement

Surface Distress
Shallow Reinforcement



Surface Distress
Shallow Reinforcement

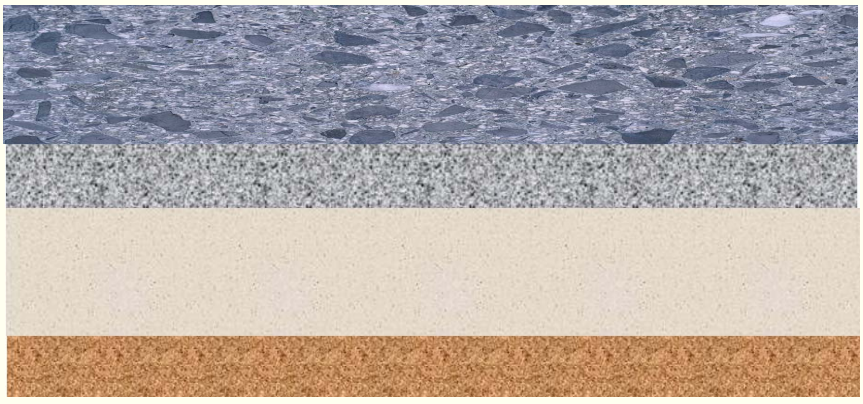


Surface Distress
Shallow Reinforcement

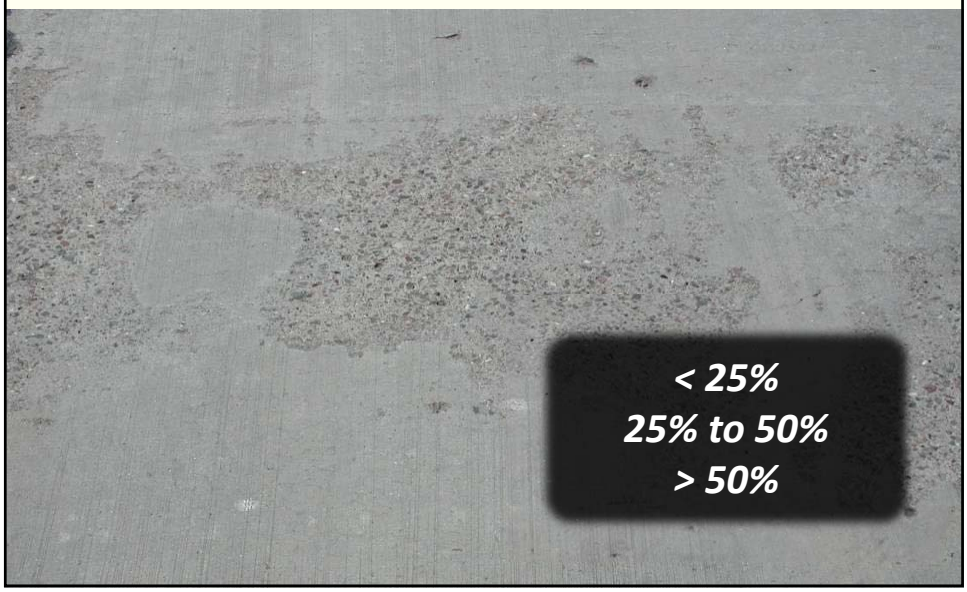
Surface Distress
Shallow Reinforcement

Surface Distress - Scaling

Surface Scaling

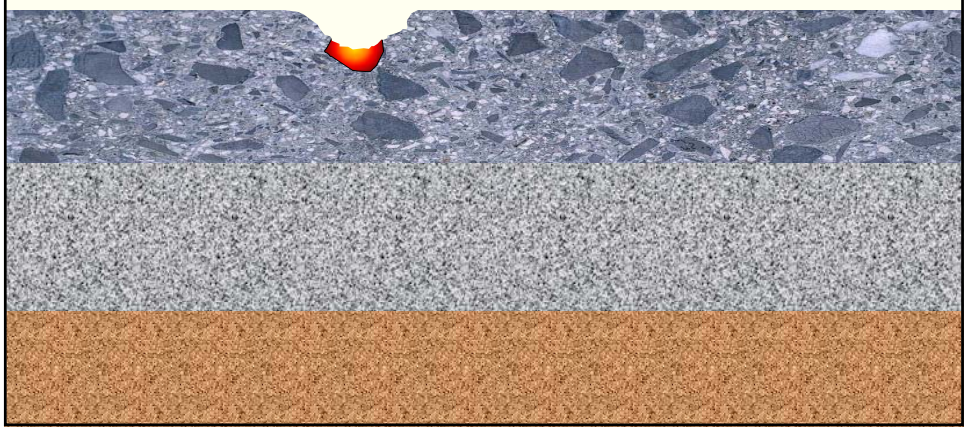


Surface Distress
Scaling



Surface Distress
Pop Outs

Surface Distress
Pop Outs

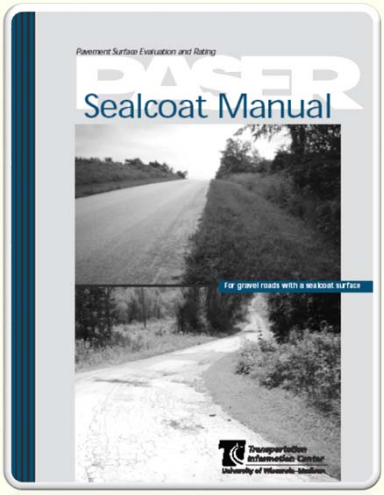


Surface Distress
Map Cracking

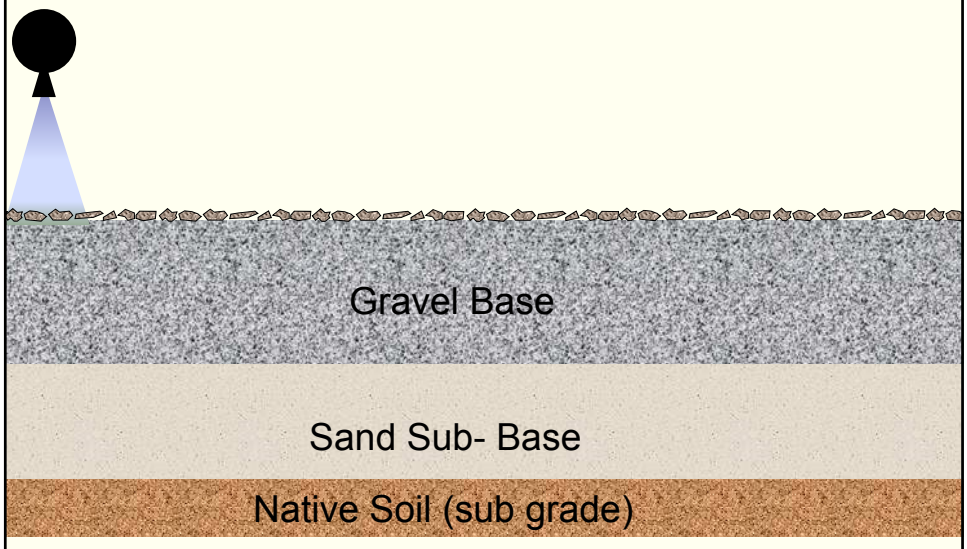
Surface Distress
Polishing

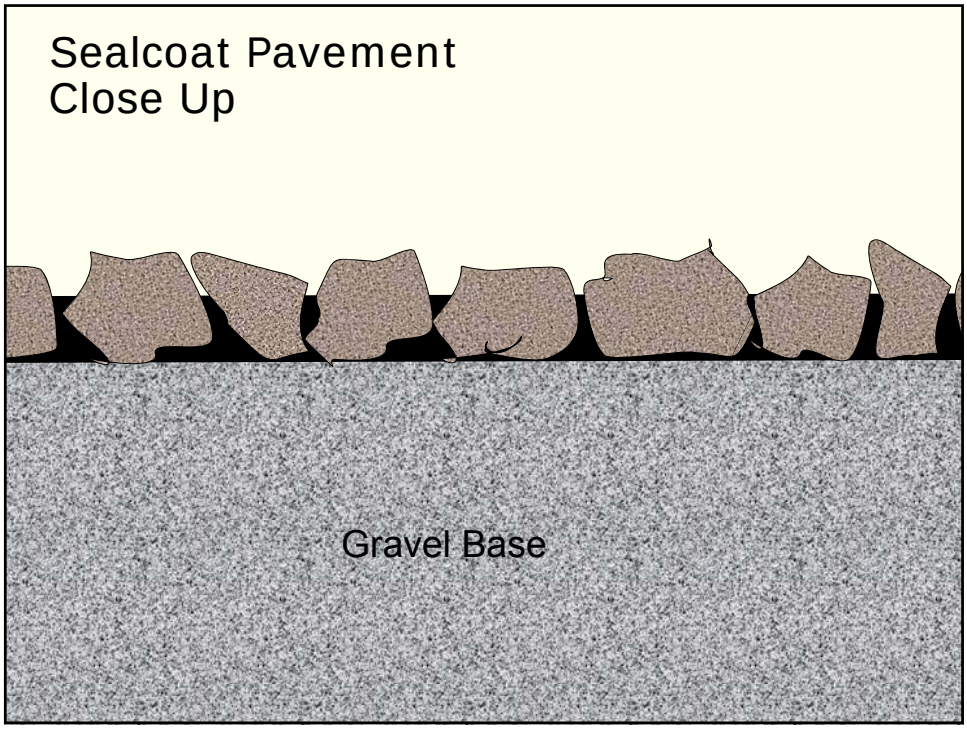
Surface Distress
Polishing

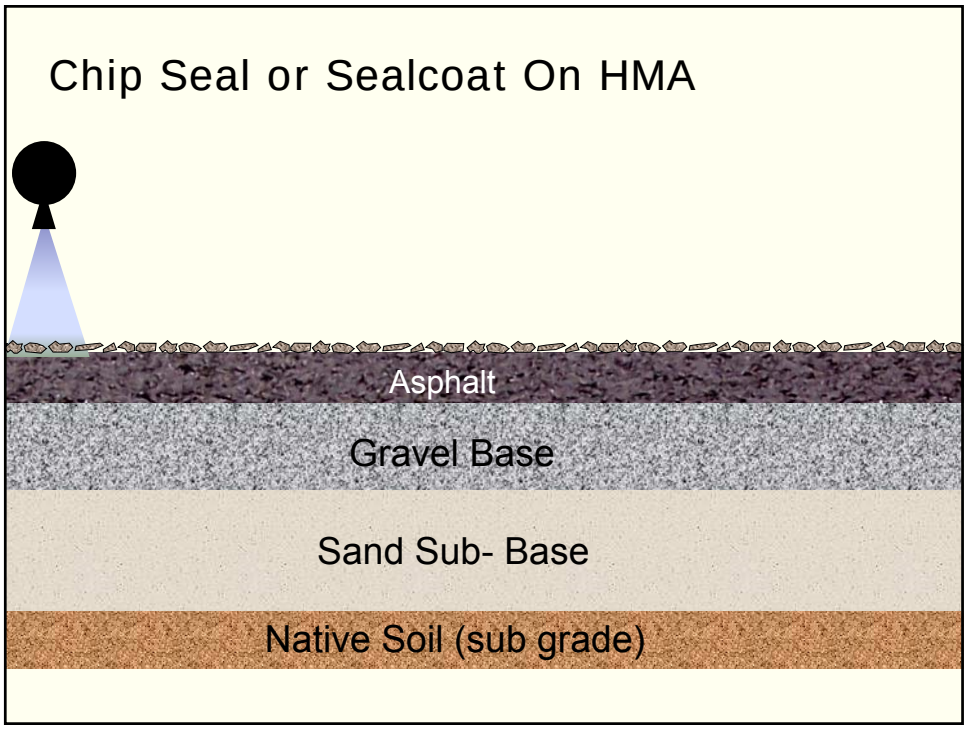
Sealcoat Pavements



Sealcoat Pavement



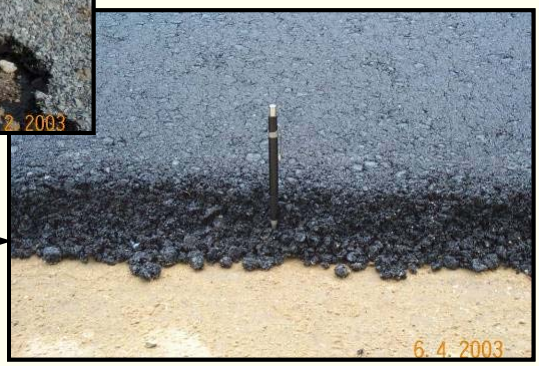

Sealcoat Pavement
Close Up
Gravel Base


Chip Seal or Sealcoat On HMA
Asphalt
Gravel Base
Sand Sub- Base
Native Soil (sub grade)

Asphalt vs. Sealcoat

Sealcoat

Hot Mix
Asphalt

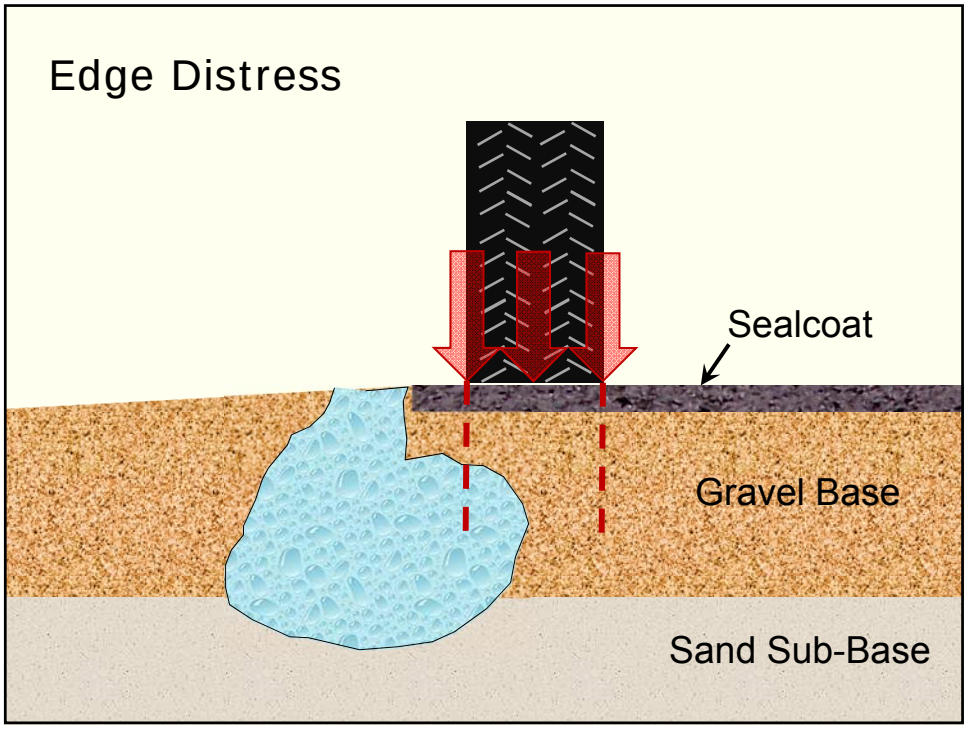


Sealcoat Distress Types

Raveling

Edge Cracks

Lane Cracks/Ruts


Edge Distress
Sealcoat
Gravel Base
Sand Sub-Base


Edge Distress Progression

Edge Distress

Percent of Worst Lane

Lane Cracking

Percent of Worst Lane

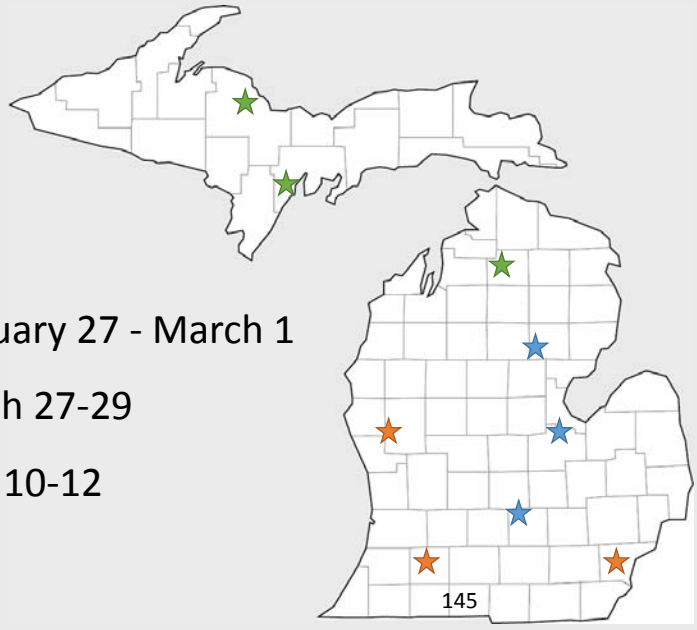
Raveling

Percent of Worst Lane

Rutting

Depth in Inches

Part Two of PASER Training: On-site



- February 27 - March 1
- March 27-29
- April 10-12
- TBD

145

Rater Certification Test

- Not required
- Relief from webinar & on-site training next year
- 3 or 6 years (prior to 2018) rating experience and training required
- Pre-registration required

TAMC Michigan Transportation Asset Management Council

146

Final Thoughts

- Register for:
  - On-Site training
  - IBR training
  - Certification Testing (if invited)
- Safety when Rating
- Review PASER Manuals prior to On-Site training

We will see you in the classroom!