



Michigan Technological University • Department of Civil, Environmental, & Geospatial Engineering

PASER TRAINING

DISTRESS IDENTIFICATION

Sponsored by:



Michigan
Transportation Asset
Management Council



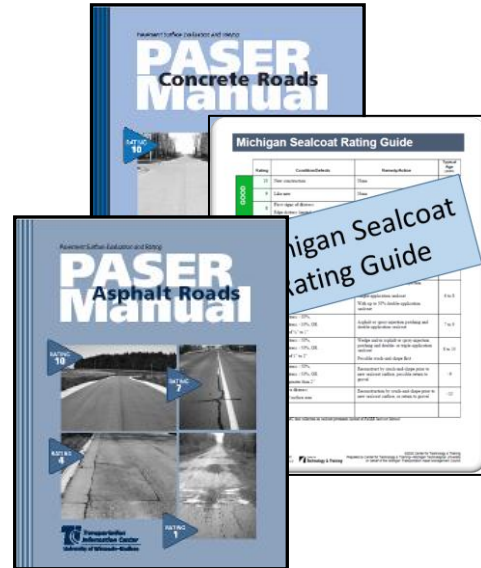
Be sure to fill out the self-certification survey!

Certificates will be E-mailed



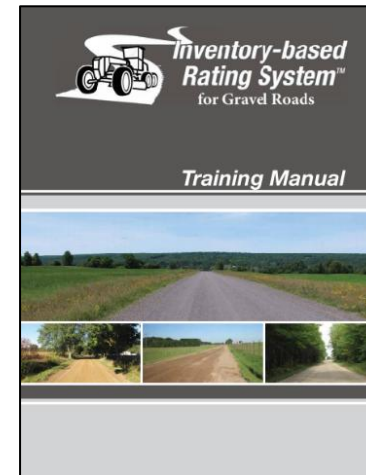
TAMC Data Collection Training Program

PASER for Paved Roads



Class 1: Distress Identification
Class 2: PASER Training

Inventory-Based Rating for Gravel Roads



See ctt.mtu.edu
for upcoming trainings

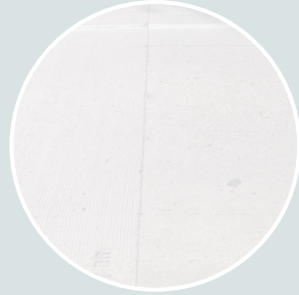
Not as Obvious as it is Today

Asphalt



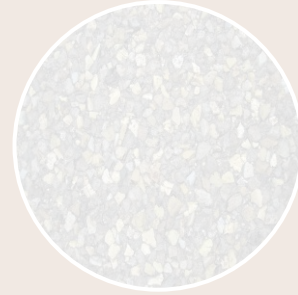
Bituminous Binder
Aggregate

Concrete



Portland cement
Aggregate
Water

Sealcoat



Bituminous Binder
Aggregate Chips

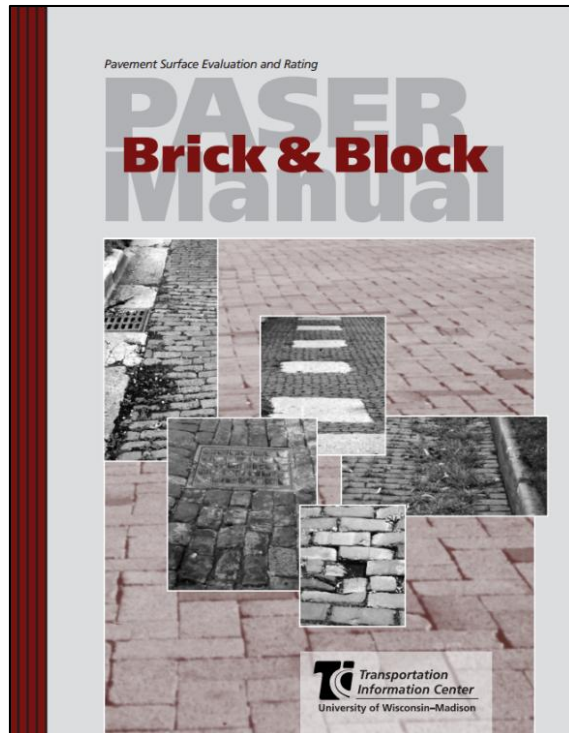
Gravel

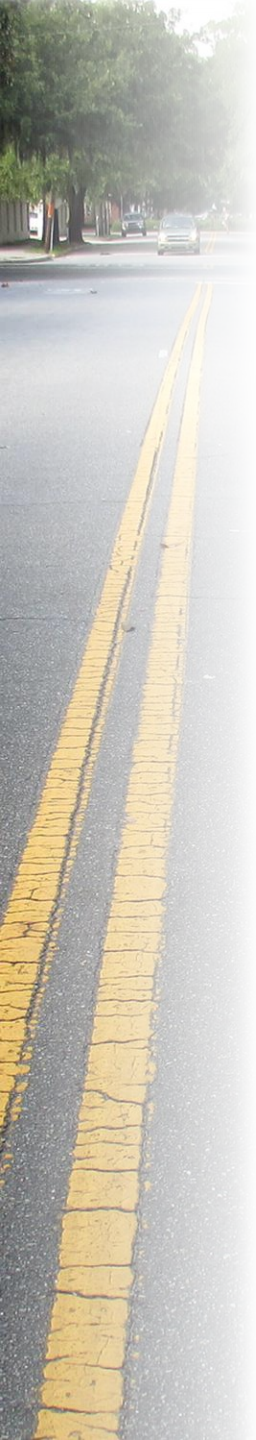


Aggregate

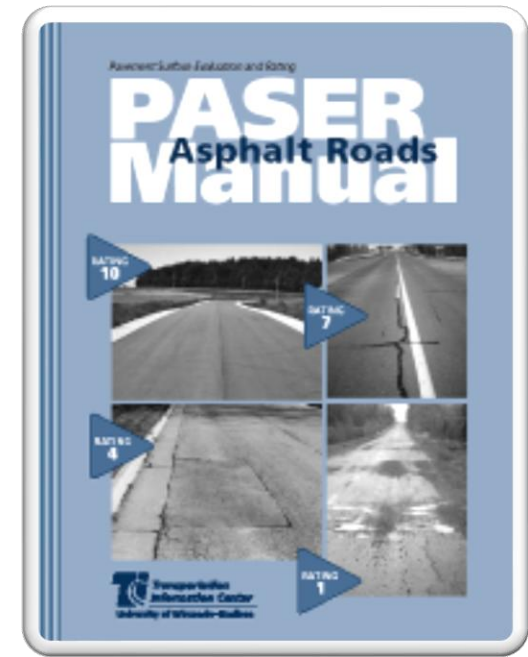


Brick





Asphalt Pavement



Asphalt Distress Types

Age



Structural



Various



Asphalt Distress Types

Age



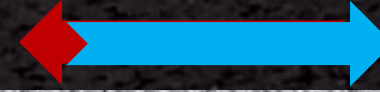
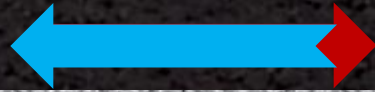
Structural



Various



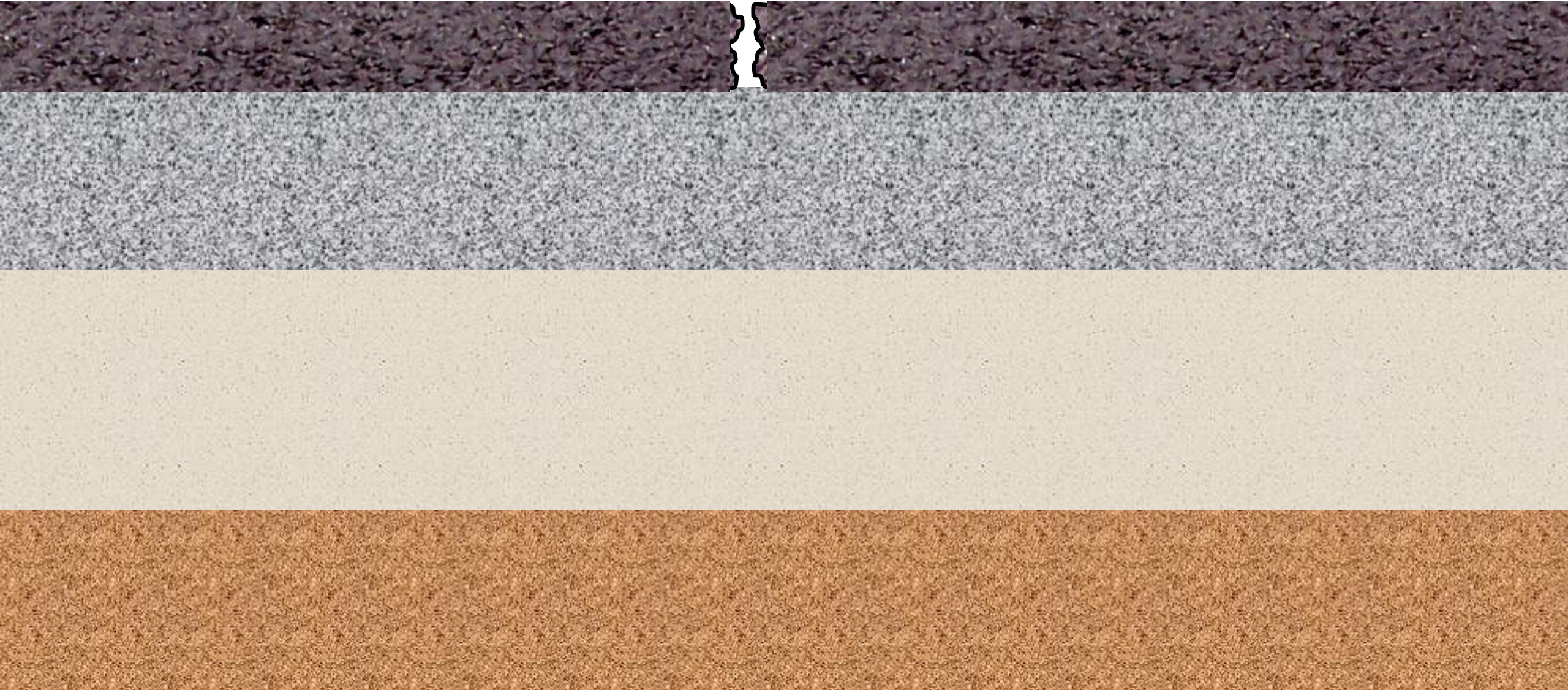
Environment Aging



Environment Aging



First Distress



Cracking

Primary Age-related Distresses



Transverse



Longitudinal Joint



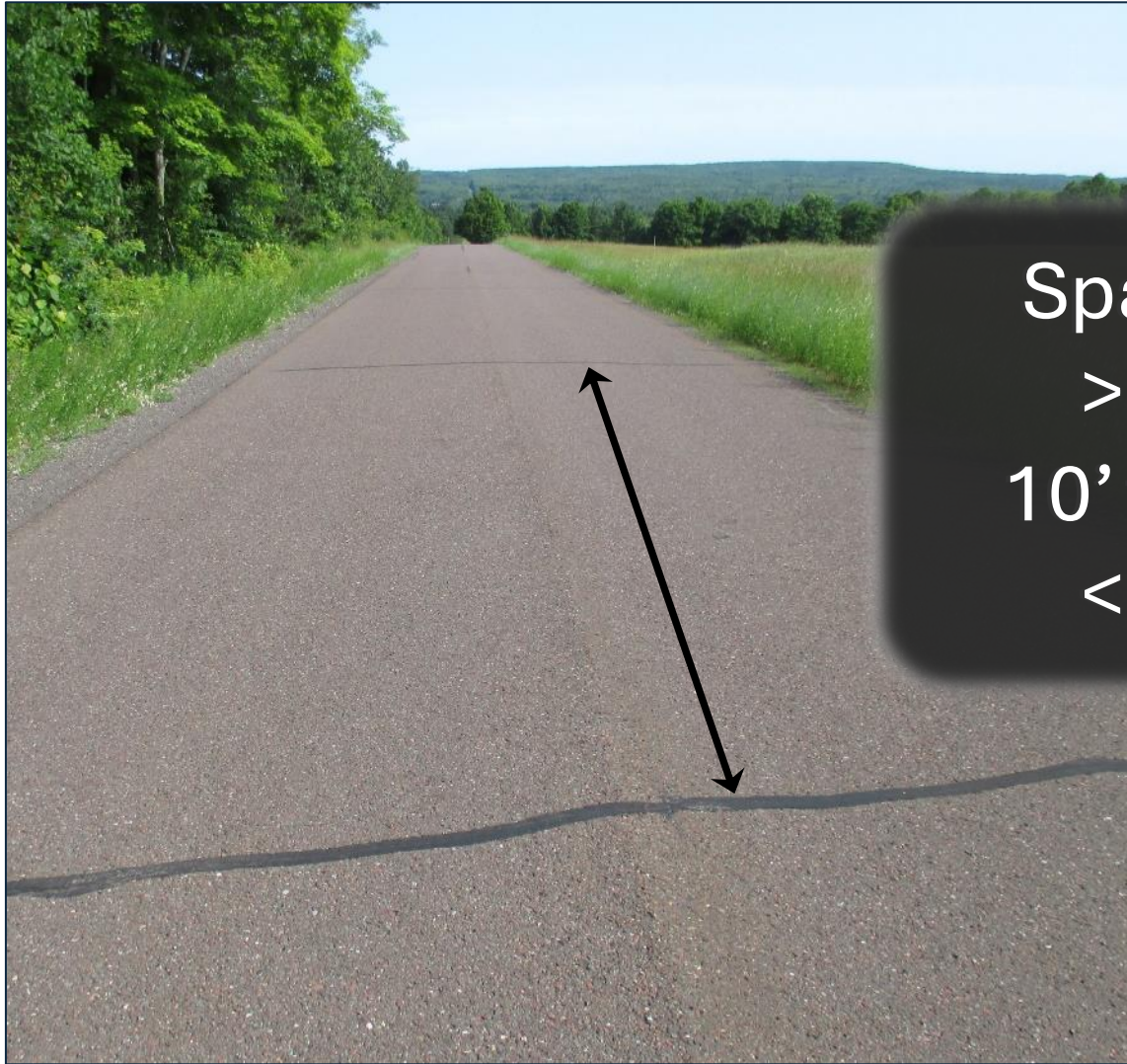
Block

Transverse Cracking

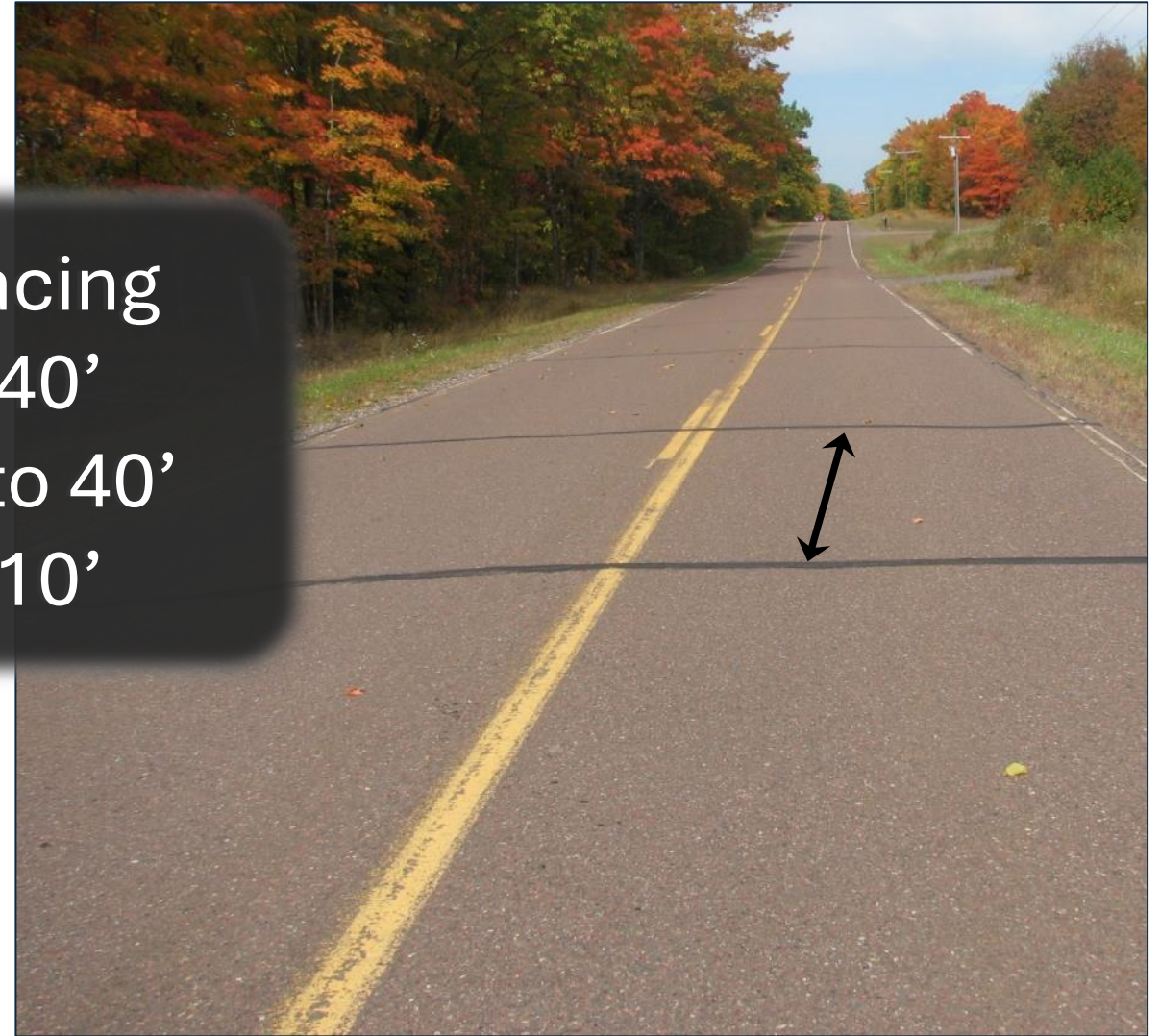
Age-related



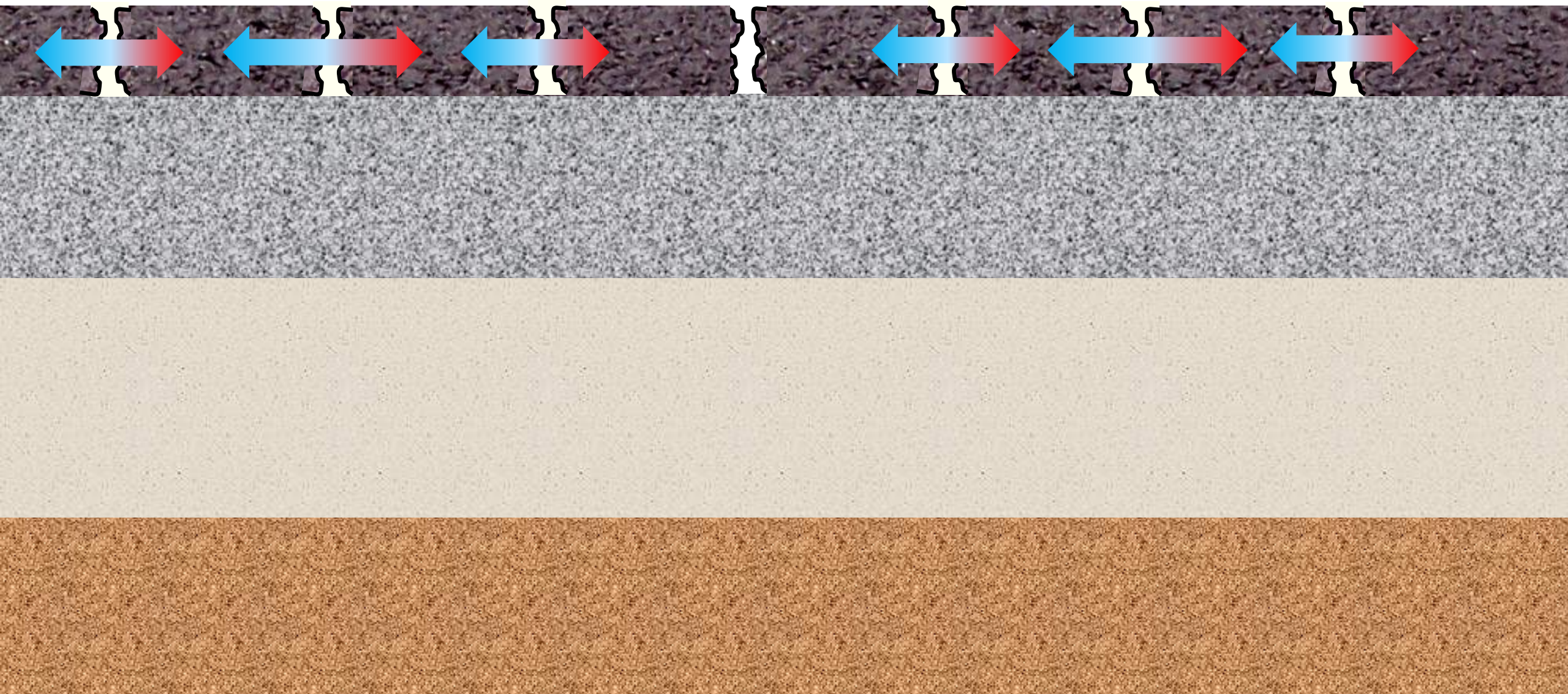
Transverse Cracking



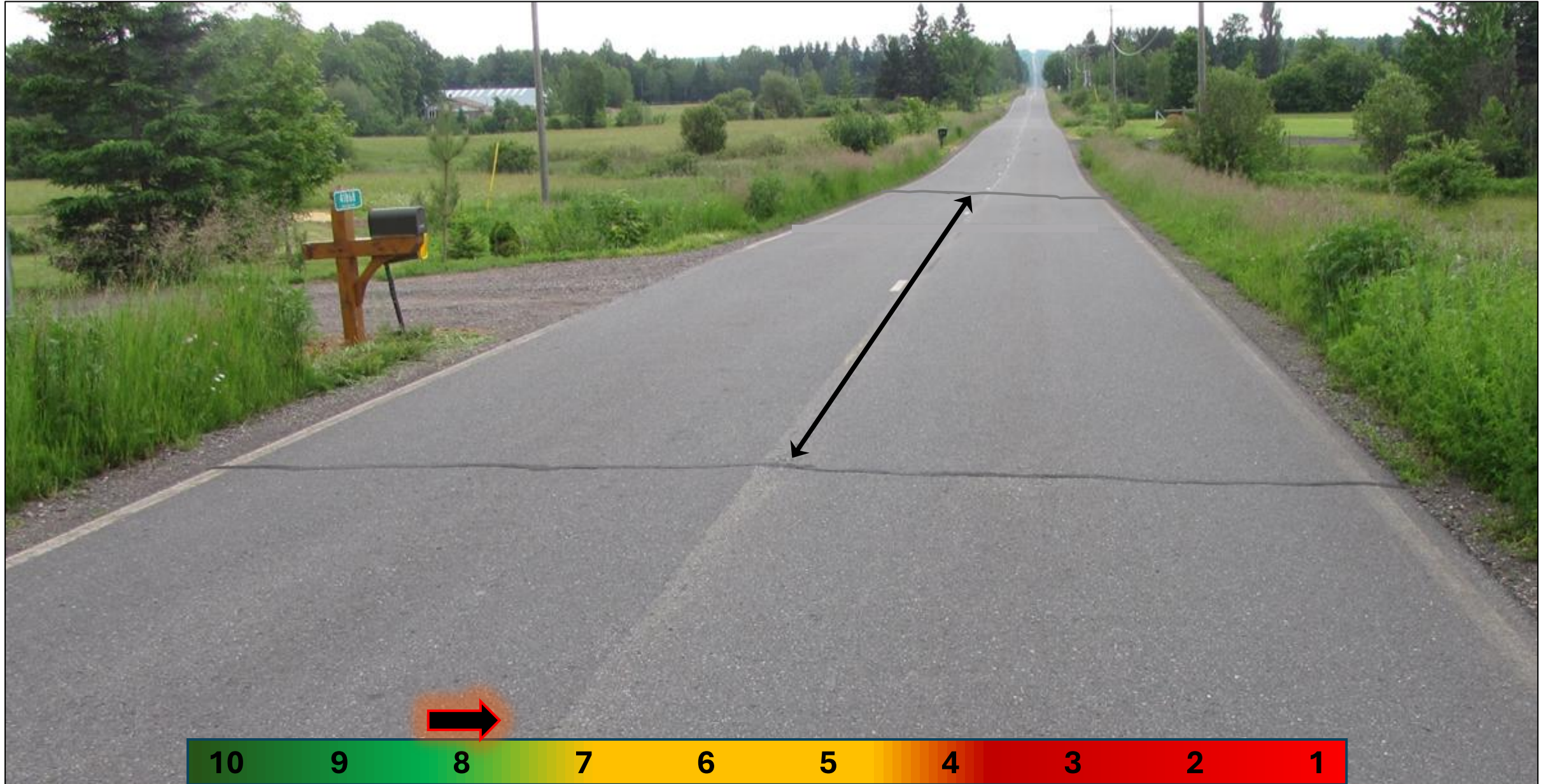
Spacing
> 40'
10' to 40'
< 10'



Transverse crack progression



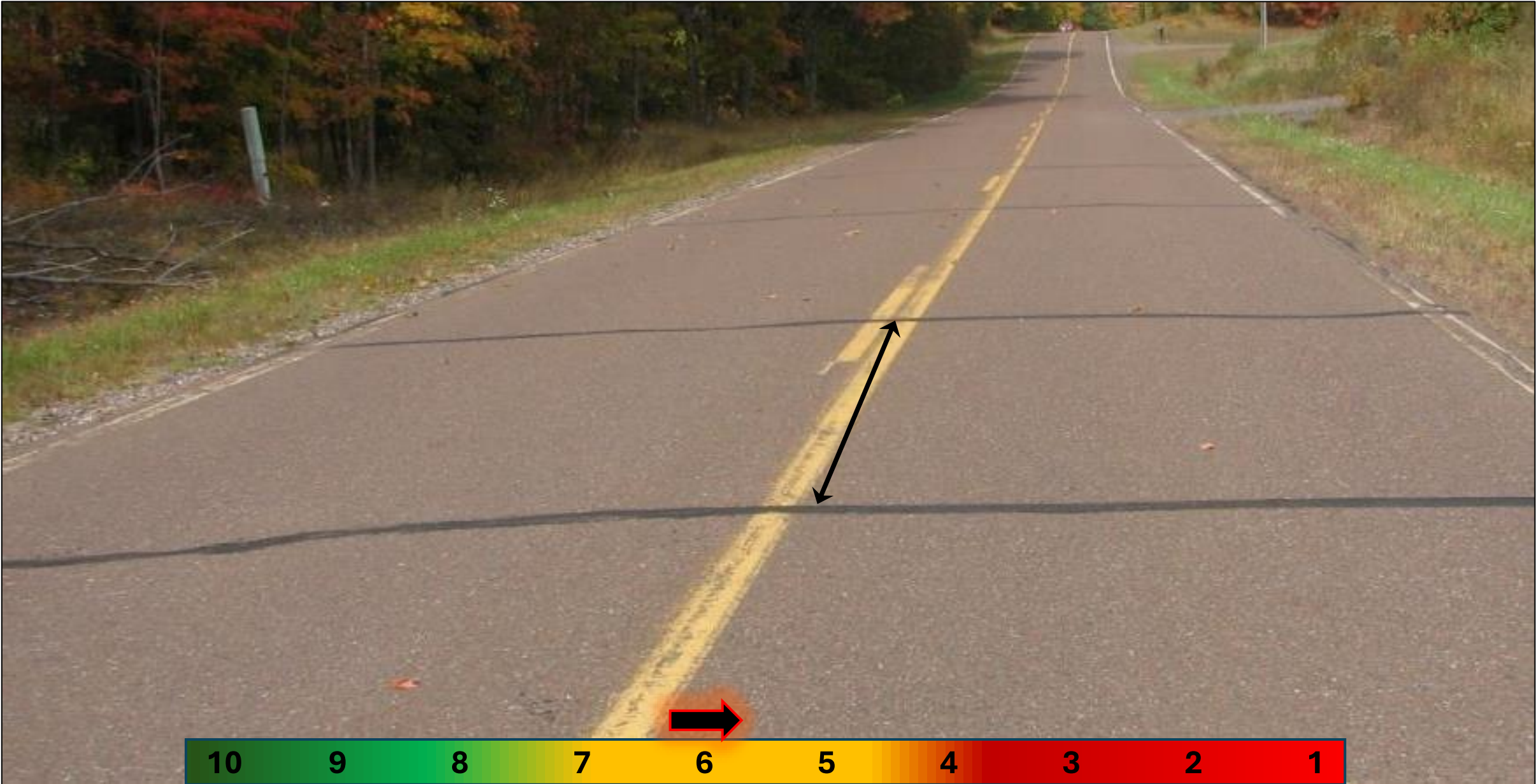
Transverse Cracking - > 40' Spacing



Transverse Cracking - 10' to 40' Spacing



Transverse Cracking < 10'

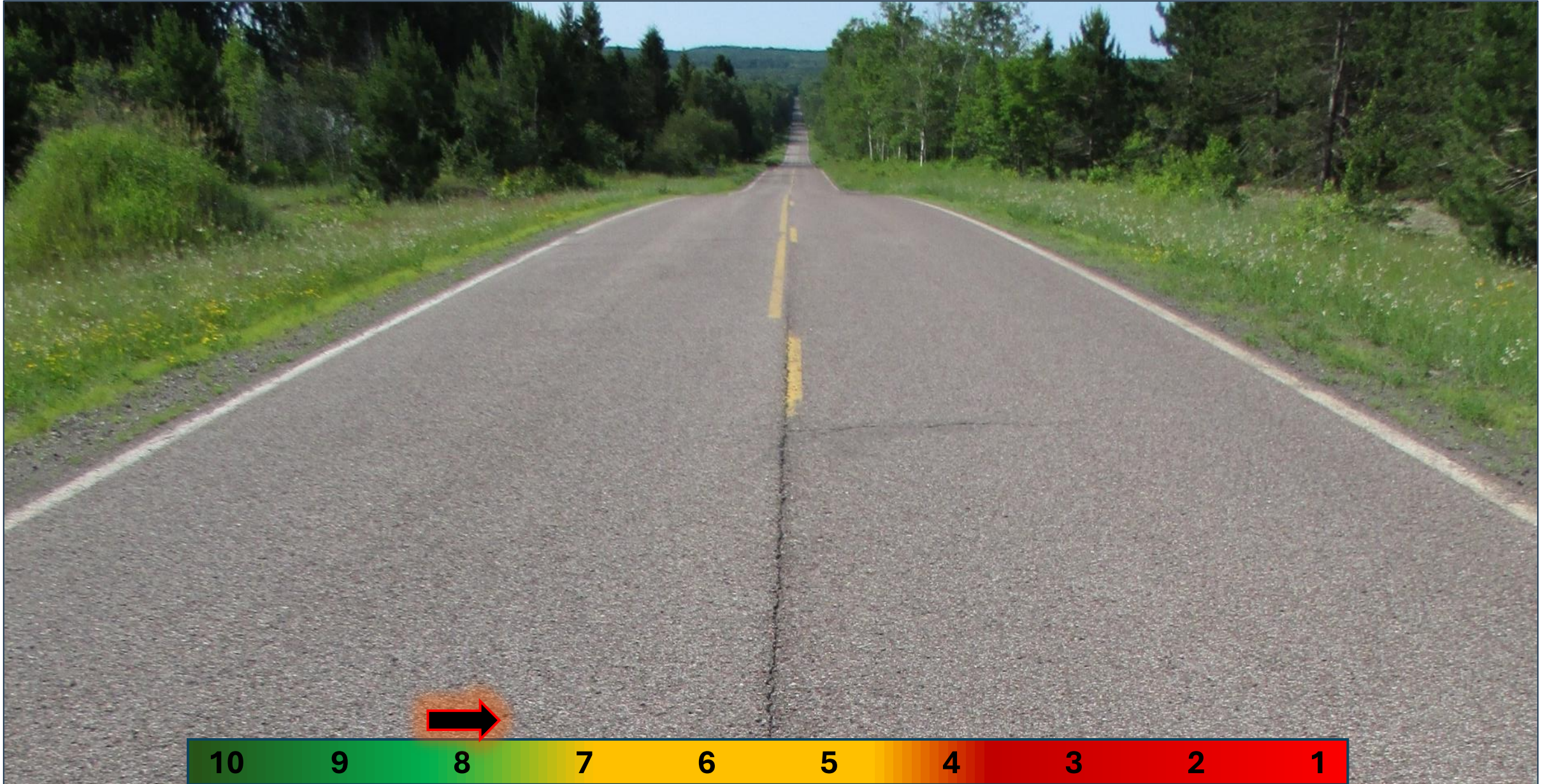


Longitudinal Joints

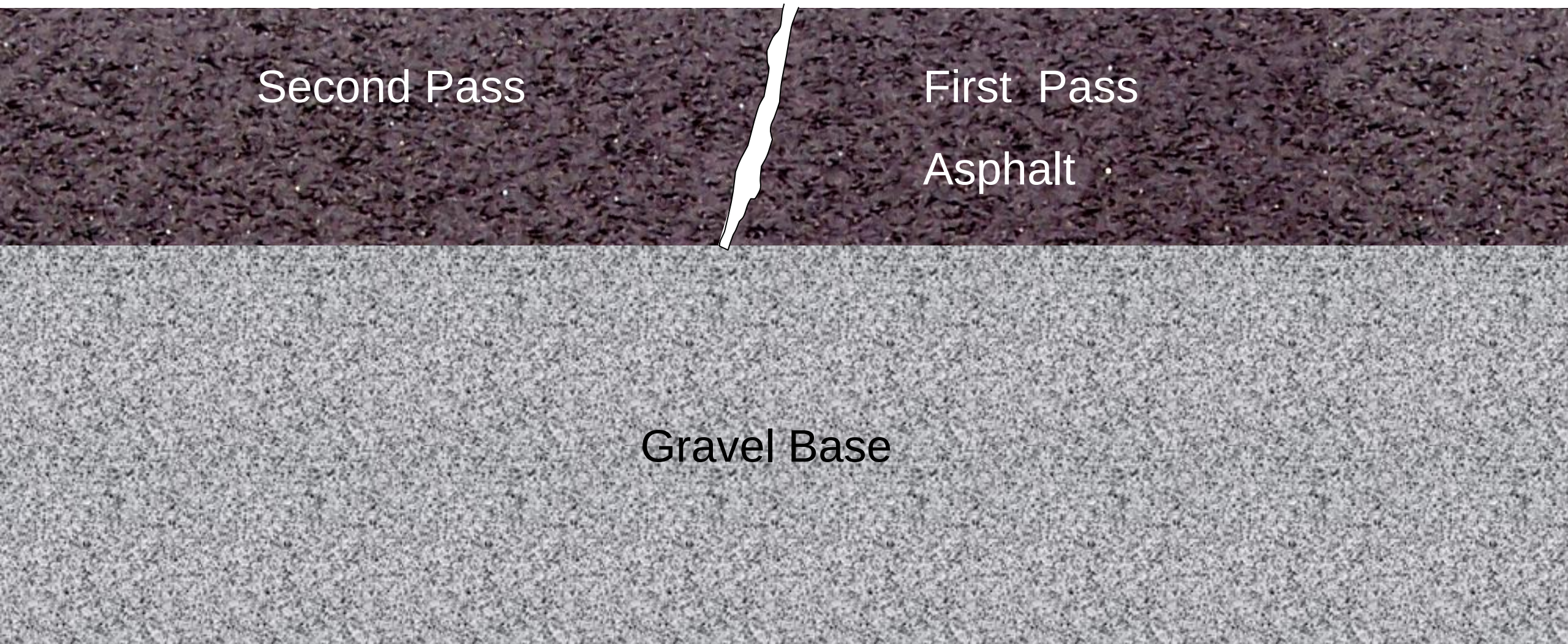
Age-related



Longitudinal Joints Reflecting to Surface



Common Construction Joint



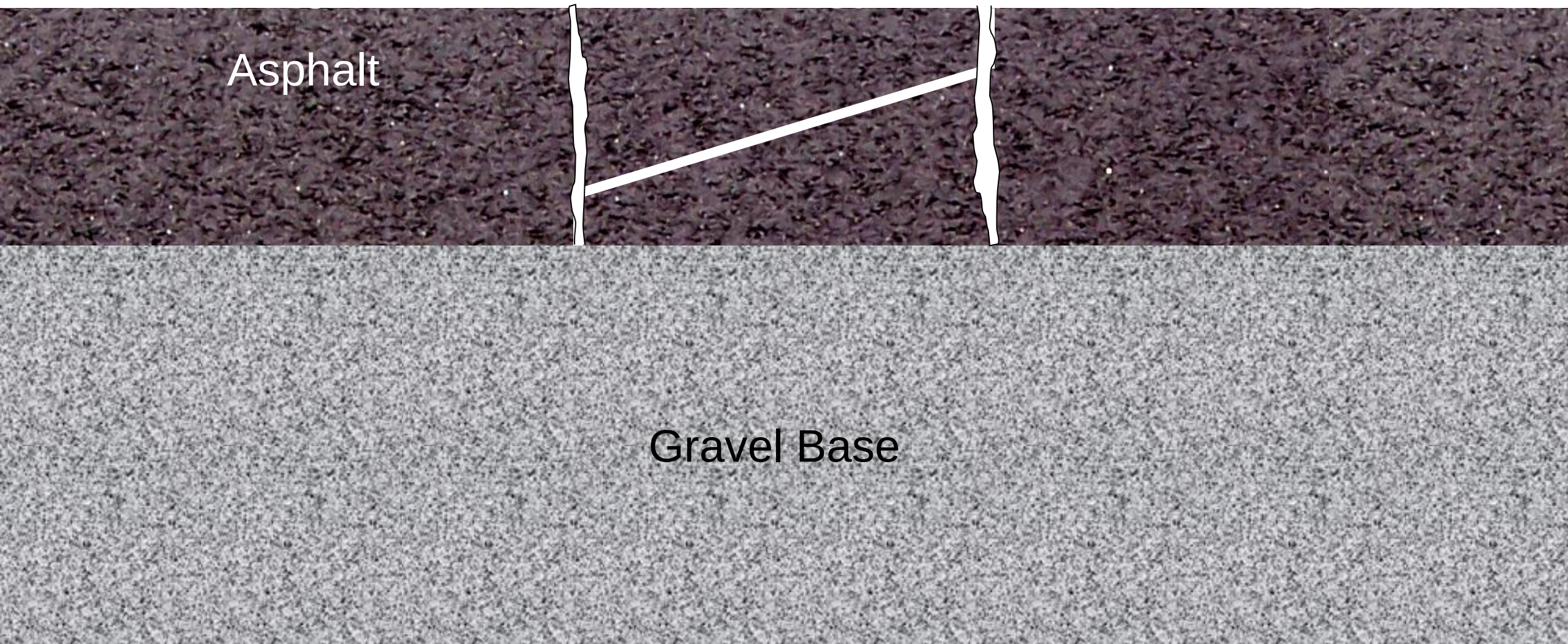
Second Pass

First Pass

Asphalt

Gravel Base

Longitudinal Construction Joint (Tapered)



Longitudinal Tapered Joint Reflective Cracking

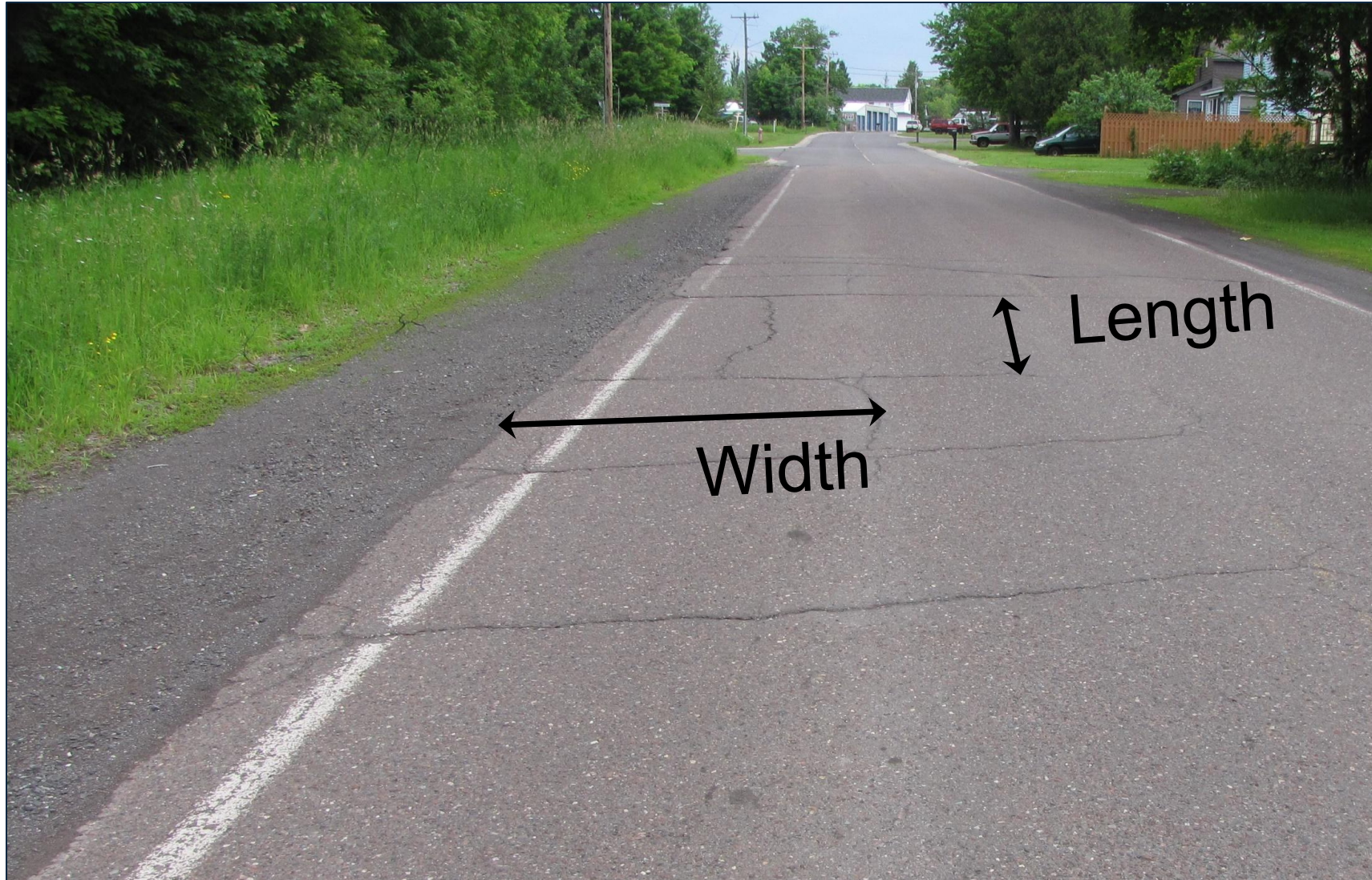


Block Cracking

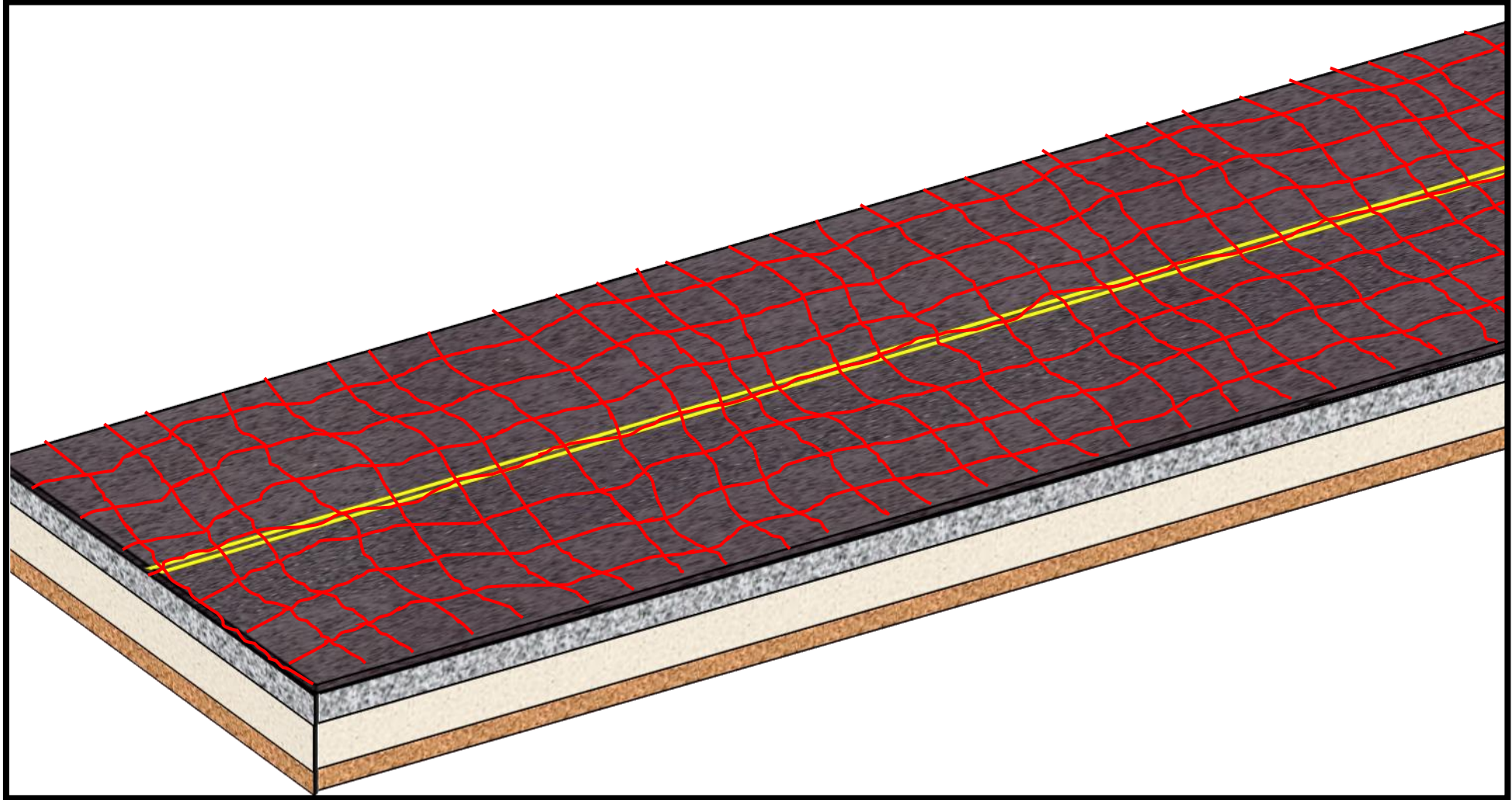
Age-related



Block Cracking

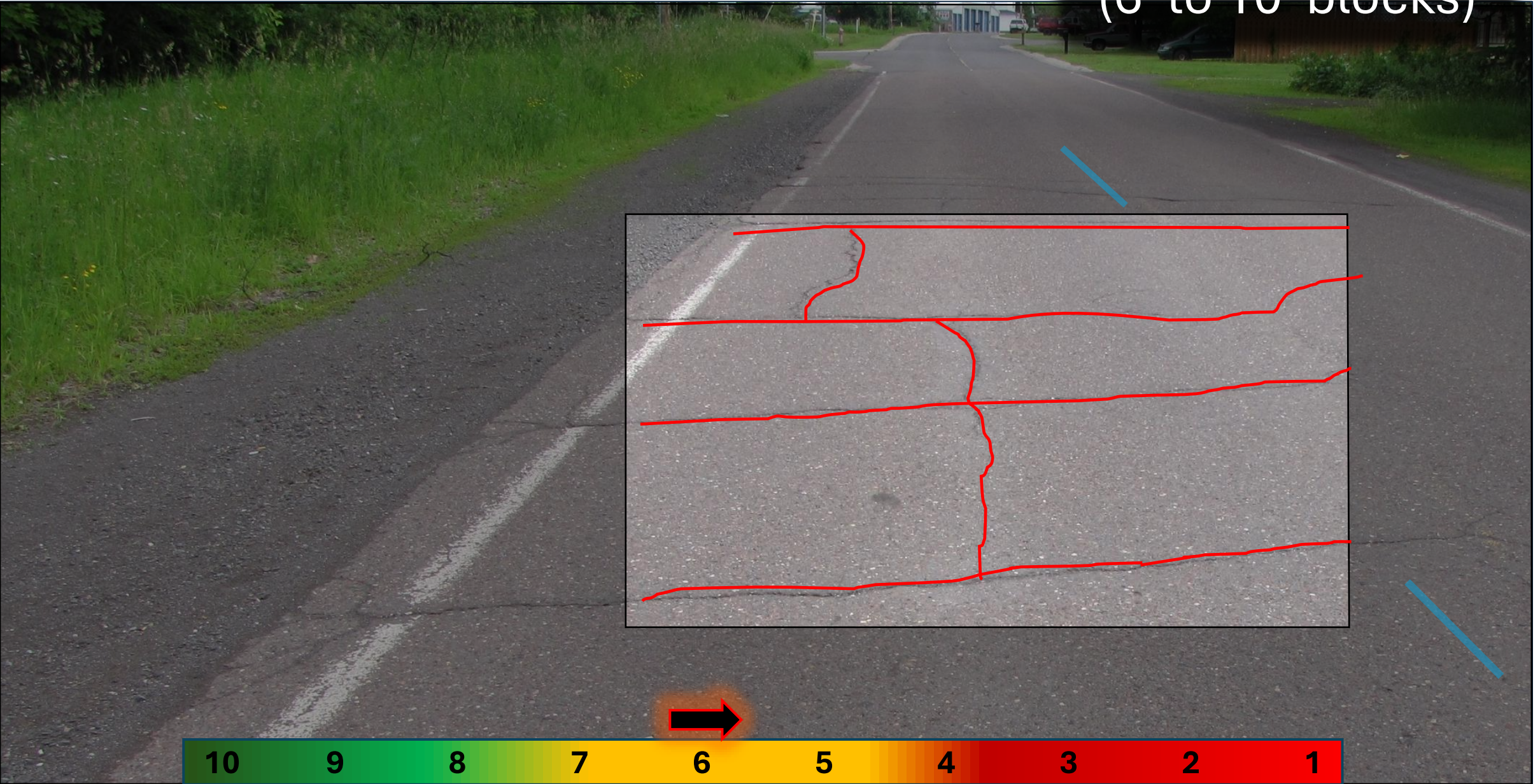


Block Cracking Progression



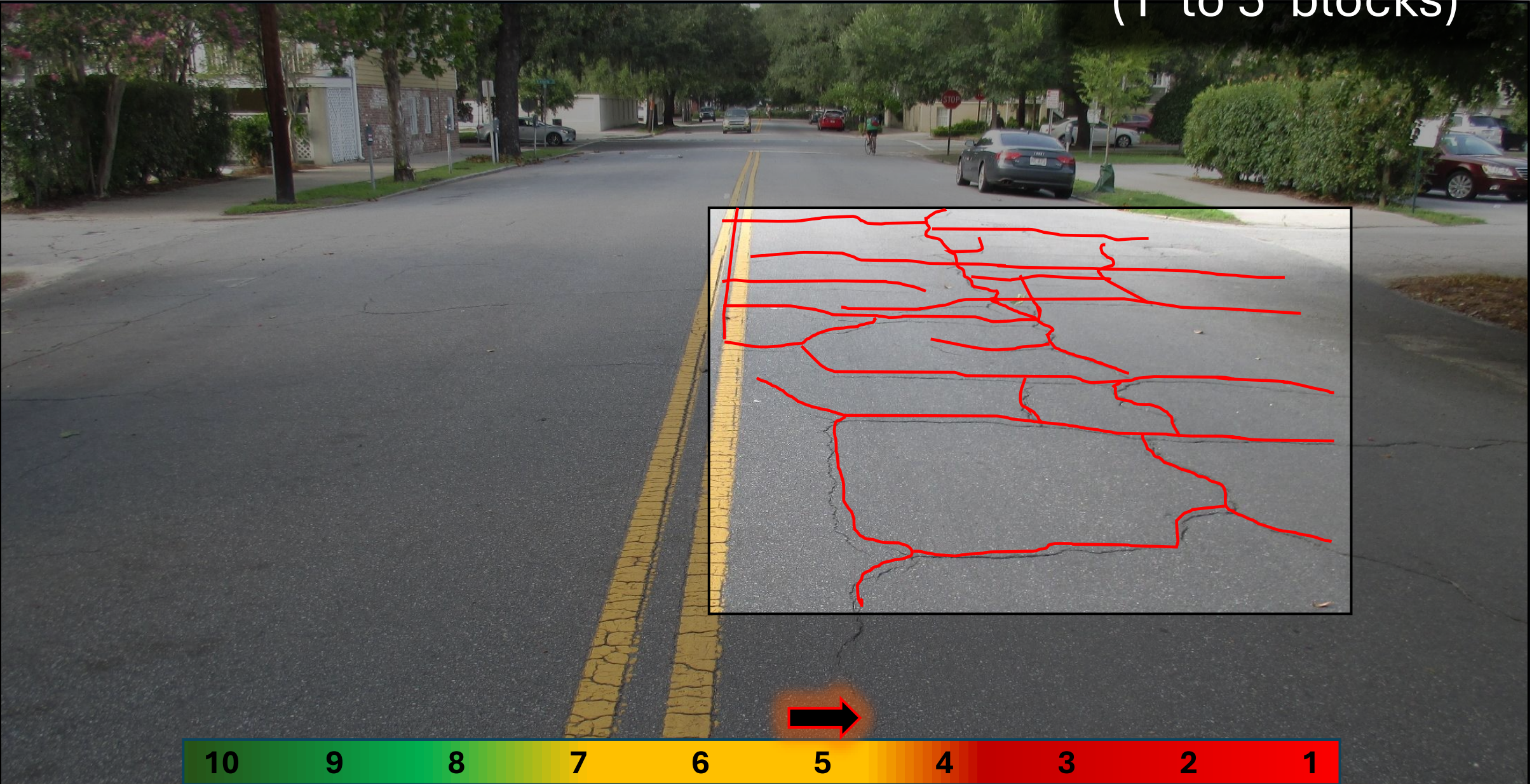
First Signs (6' to 10' blocks)

First Signs (6' to 10' blocks)



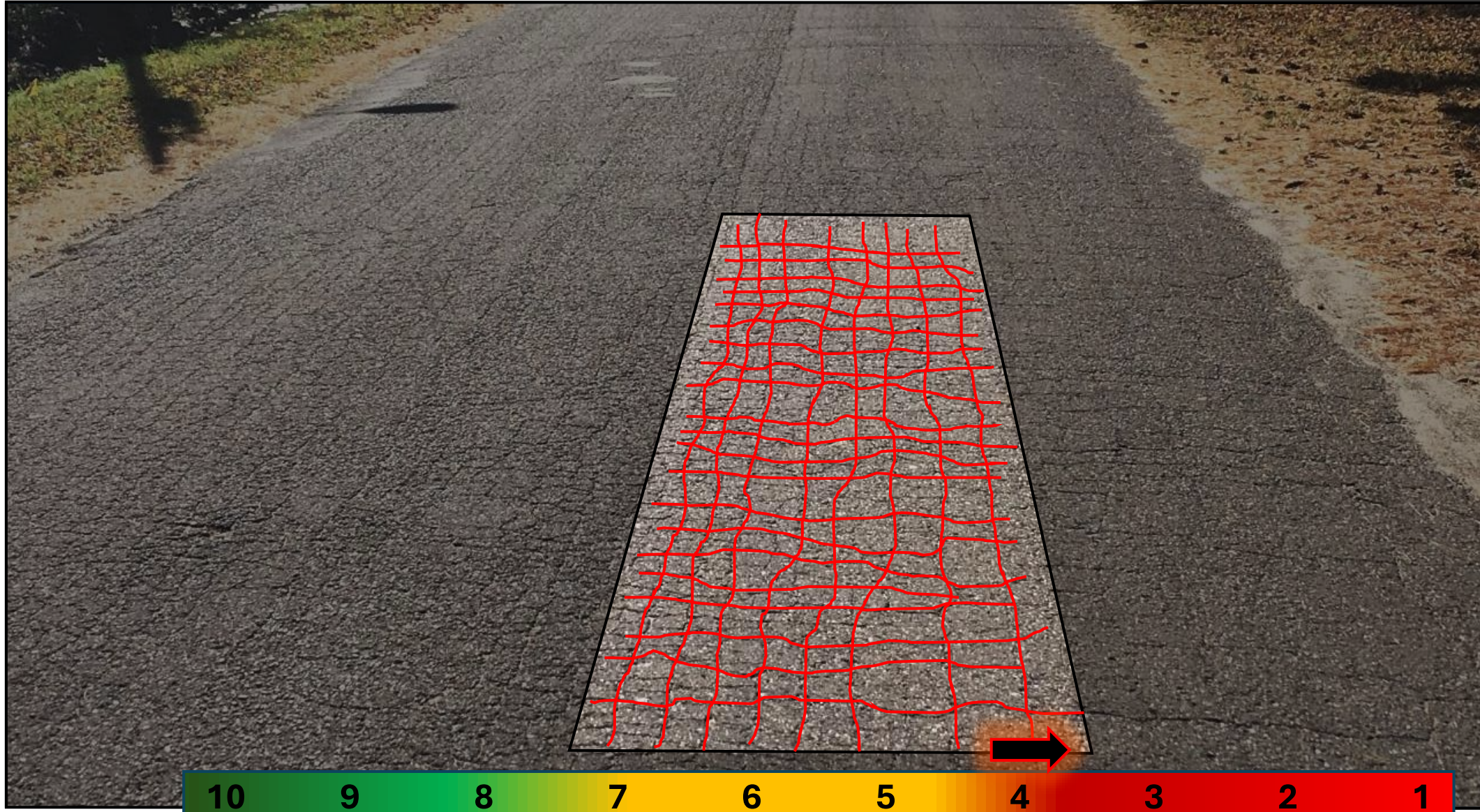
Block Cracking – Moderate

Moderate
(1' to 5' blocks)



Block Cracking – Severe

Severe
($<1'$ blocks)

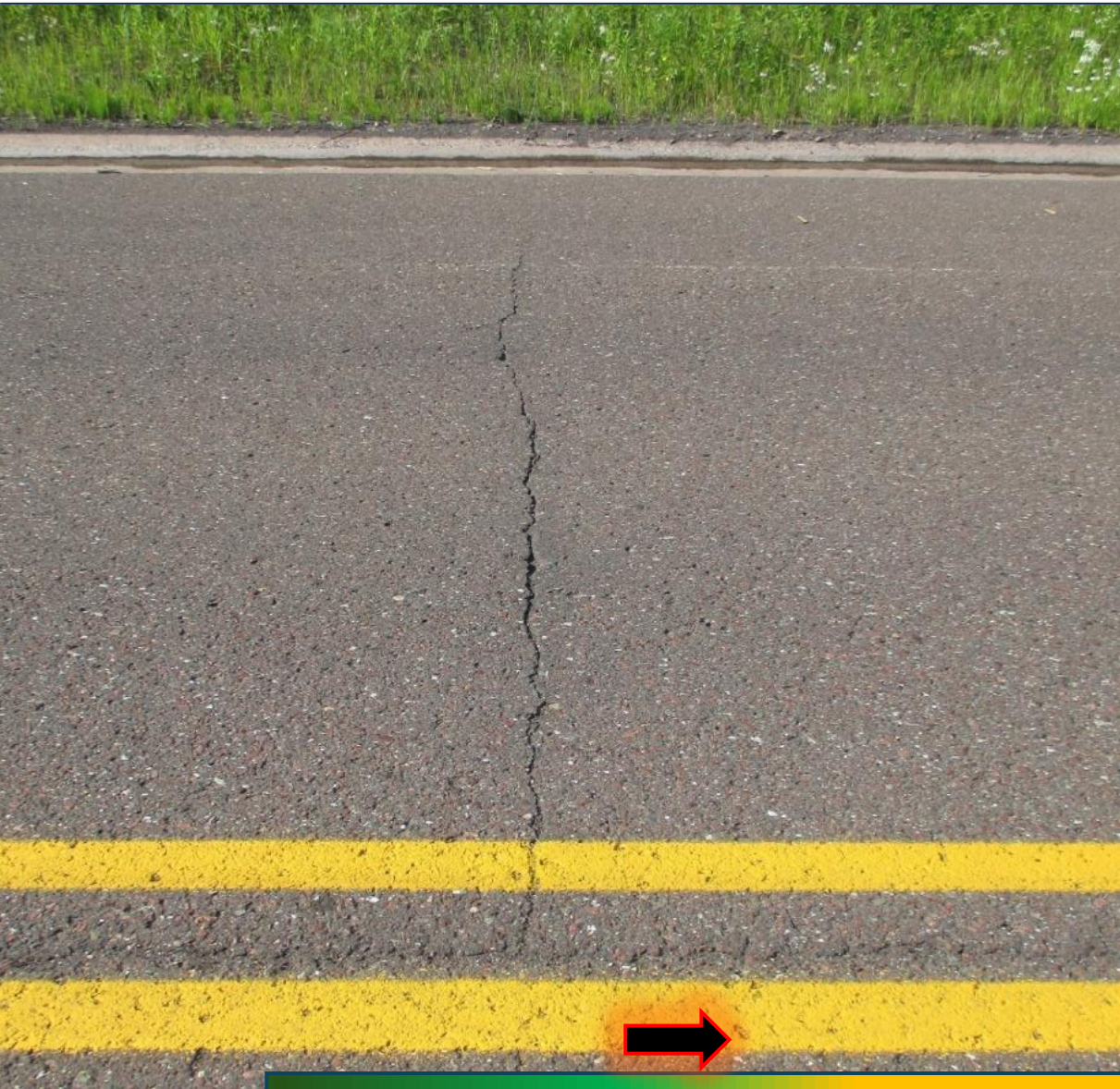


Crack Width

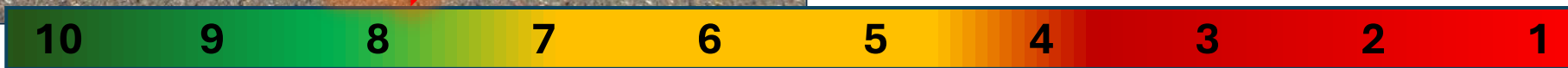
Age-related



Crack Width - Tight



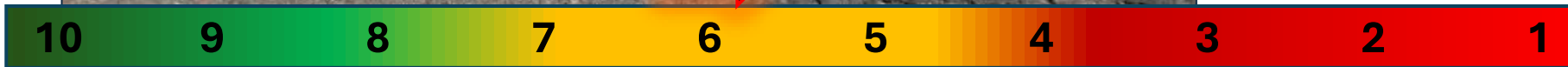
Tight



Crack Width – Open



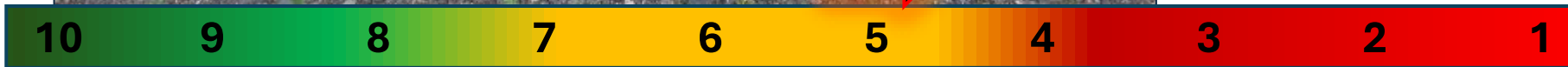
Open



Secondary Cracking



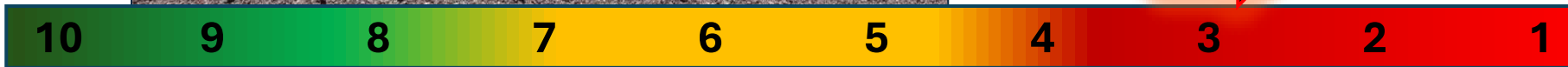
Secondary



More Than Just a Crack.....



Progressed to
Structural





Some notes about cracks...

A sealed crack is still a crack

Crack opening width is unknown

Thermal expansion and contraction

Asphalt Distress Types

Age



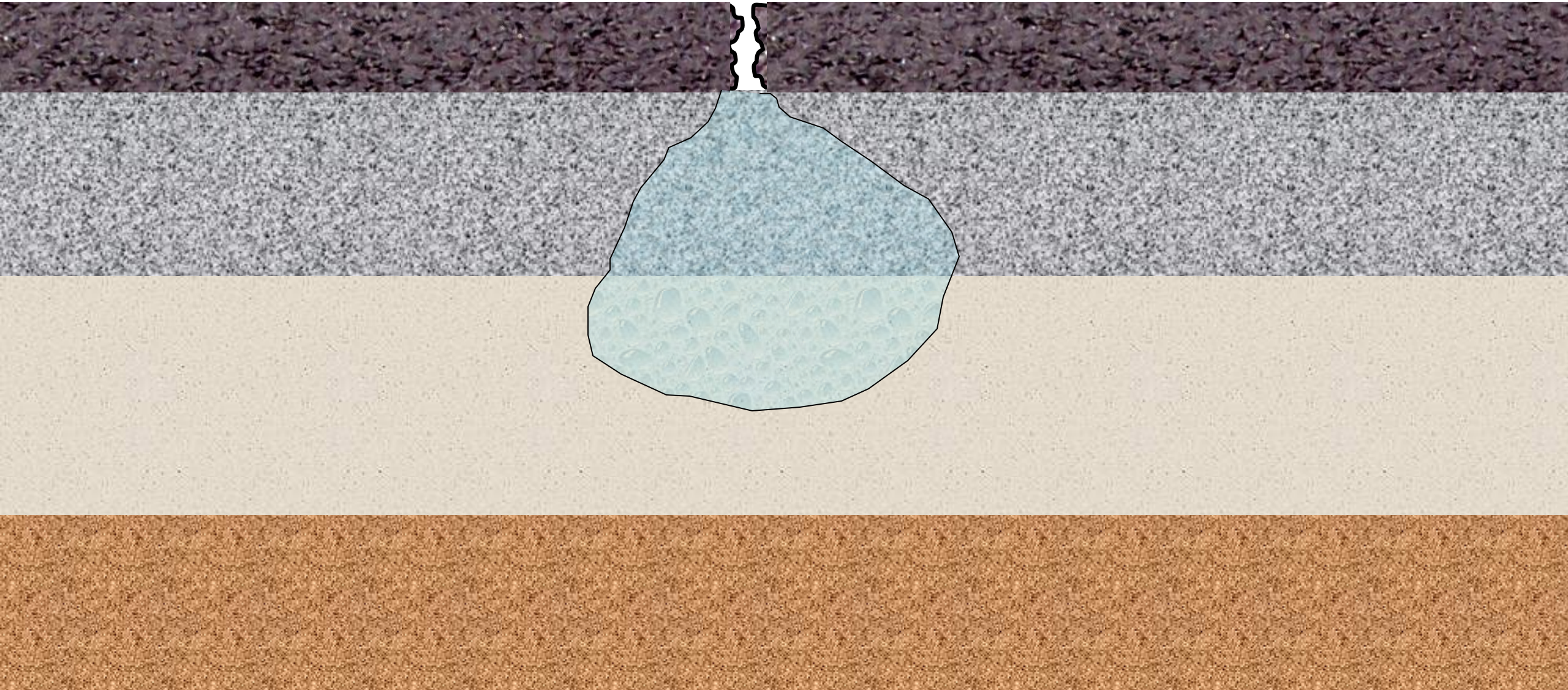
Structural



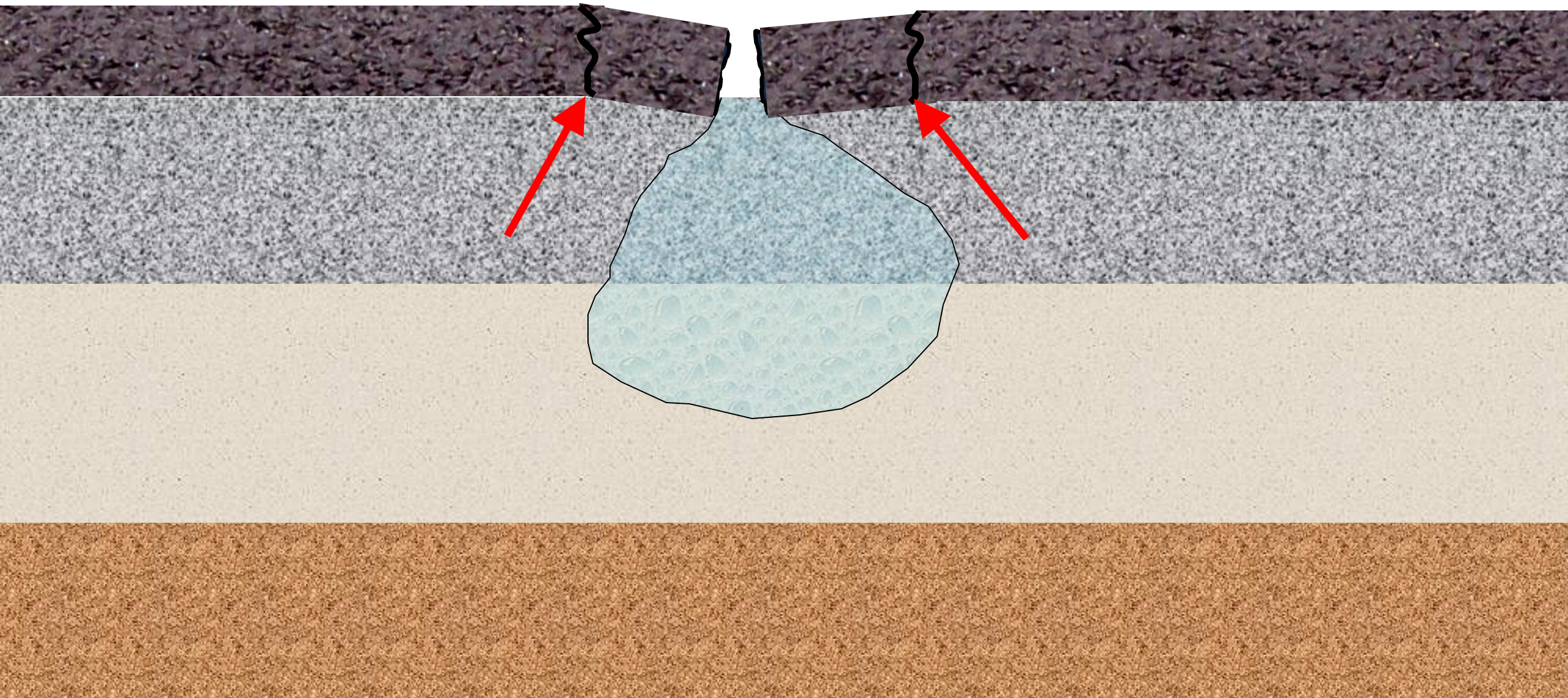
Various



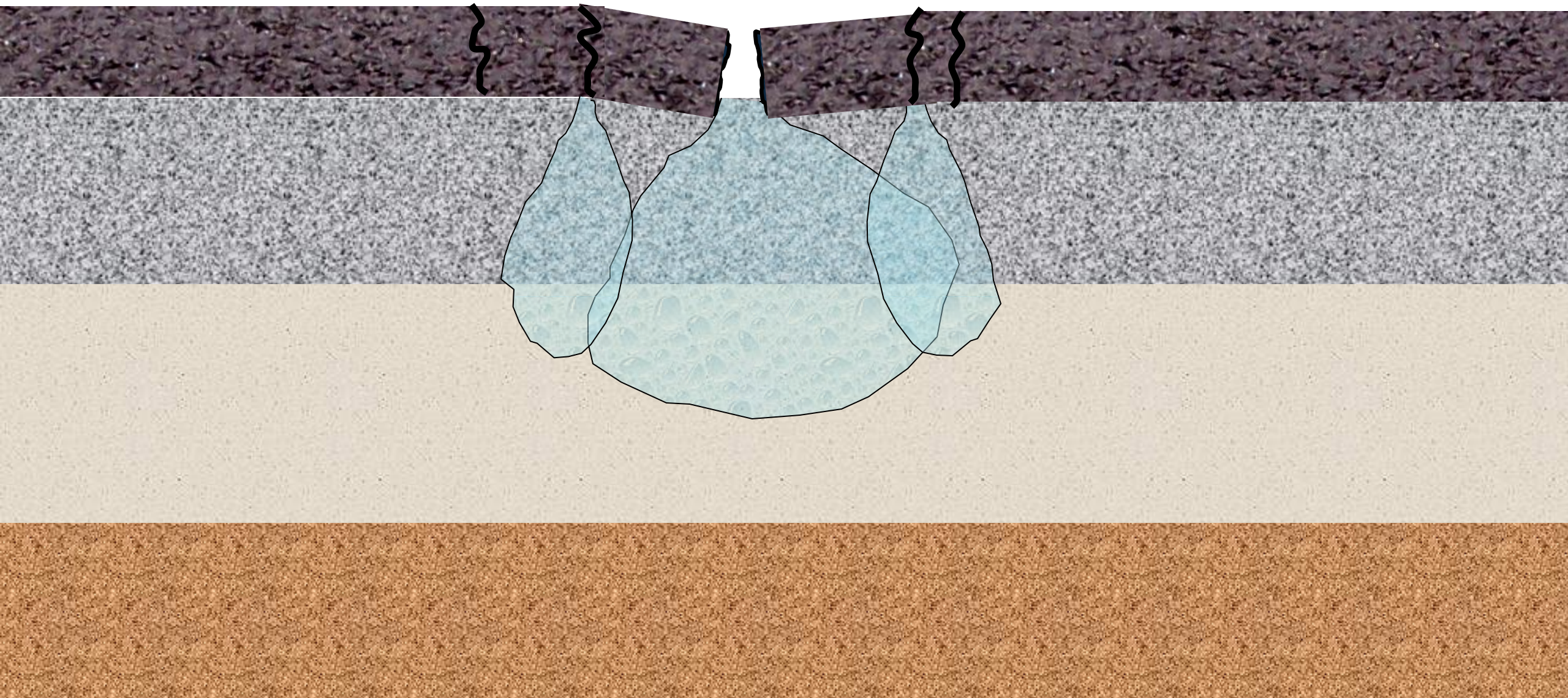
Environmental Structural Weakening: Water Intrusion



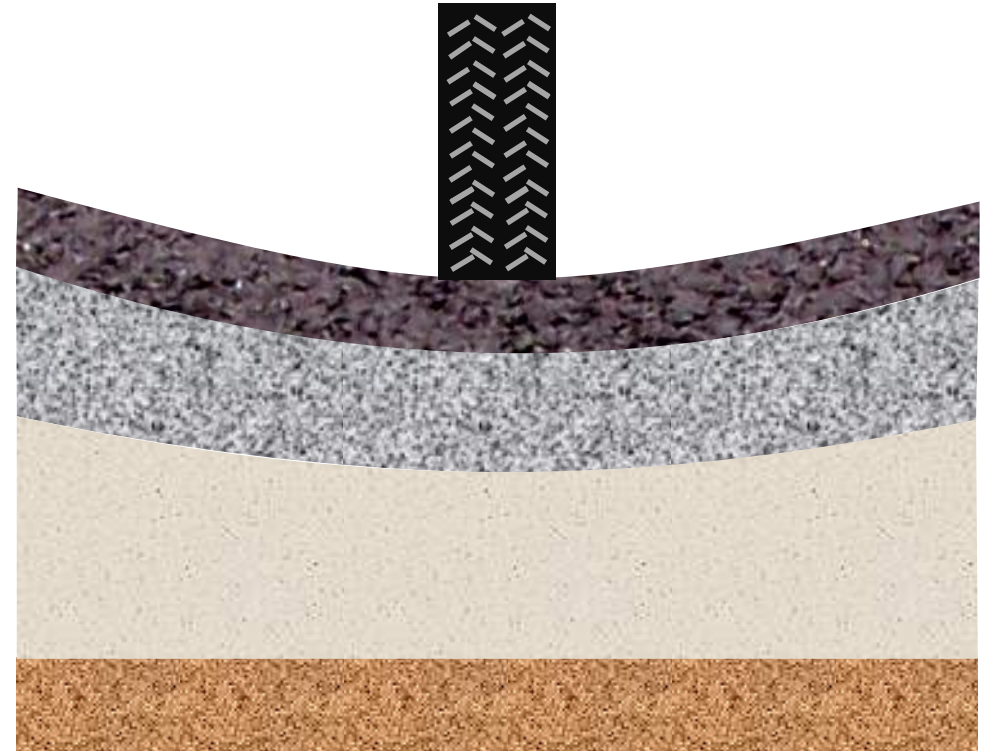
Base Weakening & Loss of Support



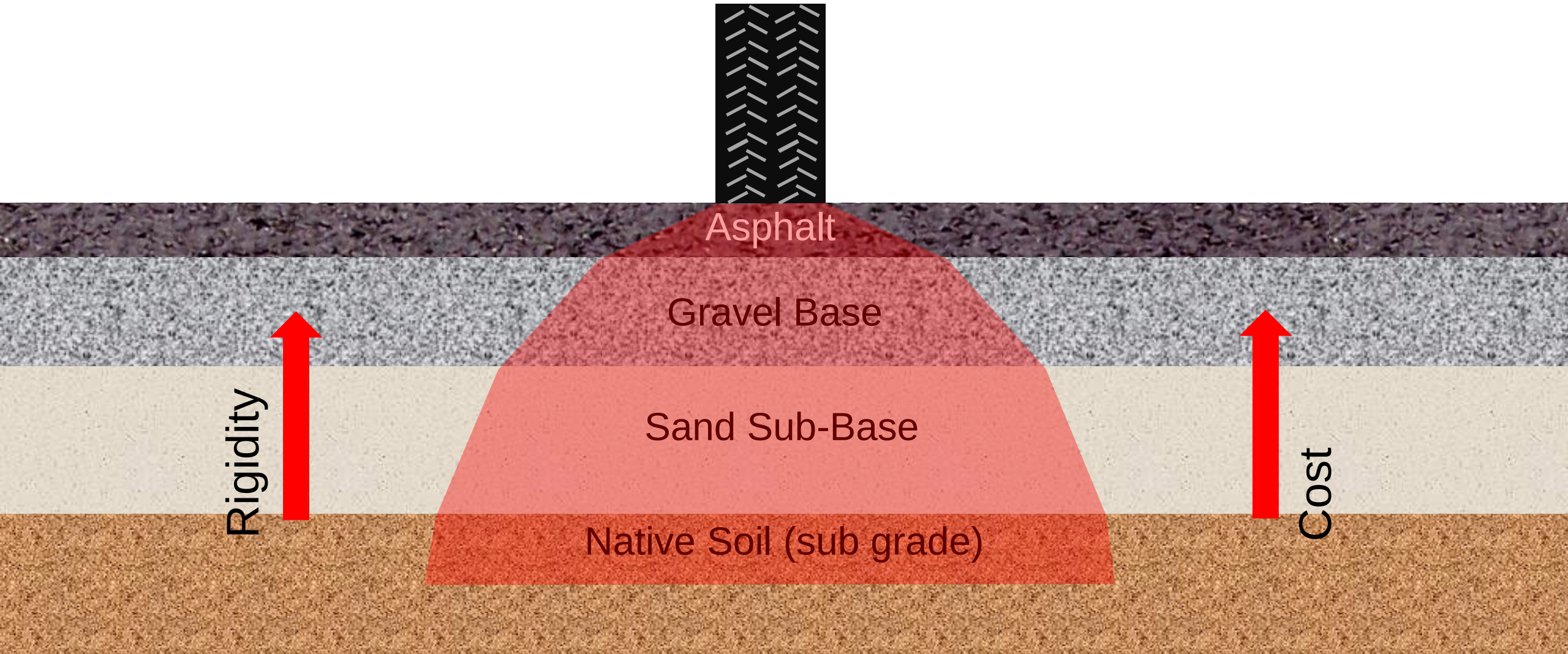
Distress Propagation



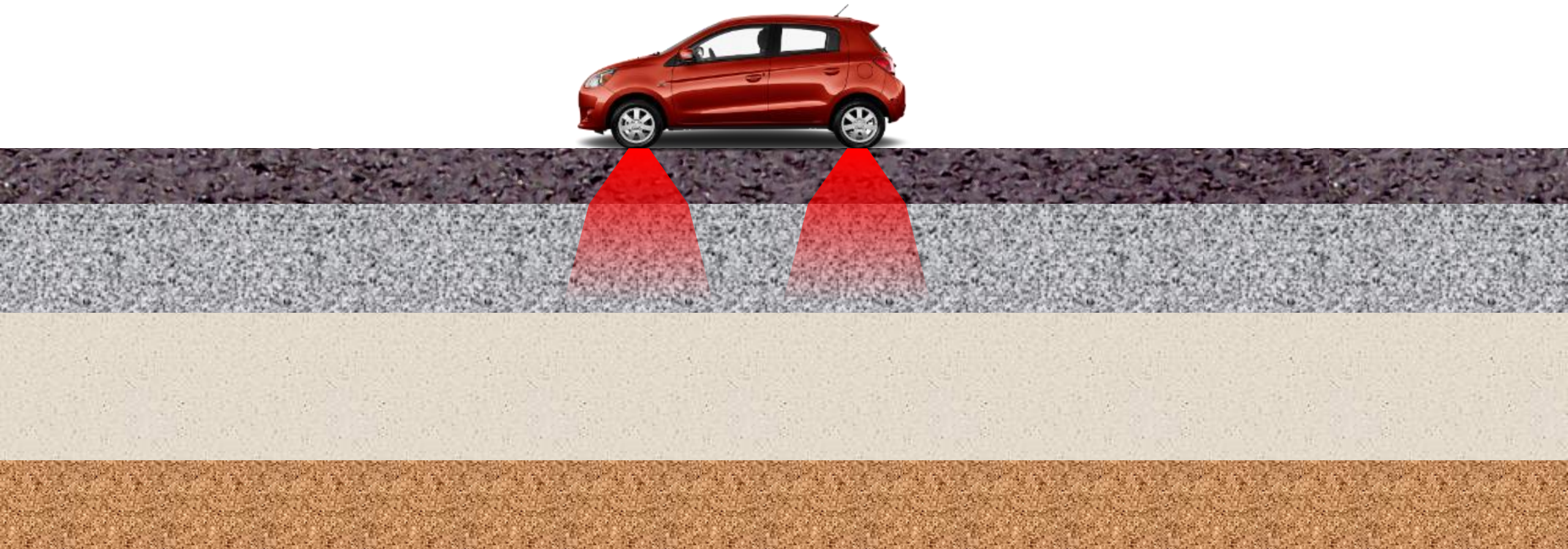
Traffic Structural Weakening: Repeated Loading



Load Distribution



Load Distribution – Small Vehicle



Load Distribution – Large Vehicle



Structural Distresses



Rutting



Shear Cracking



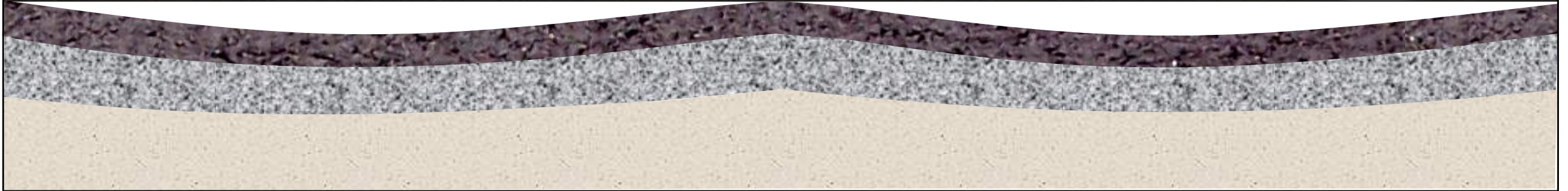
Alligator Cracking

Rutting

Structural Distress

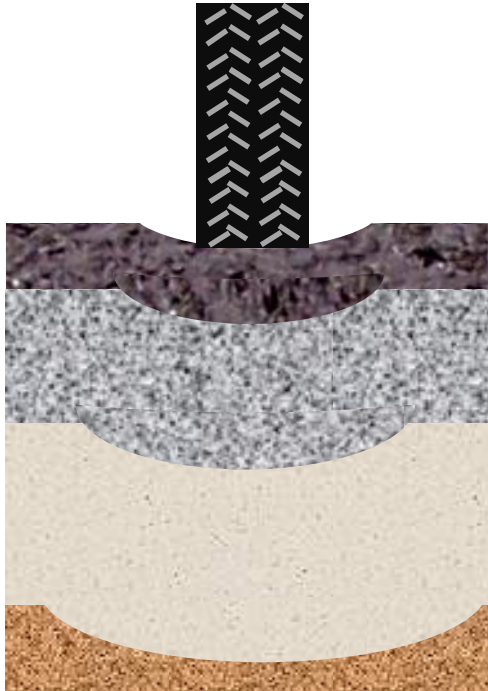


Structural Distress – Rutting

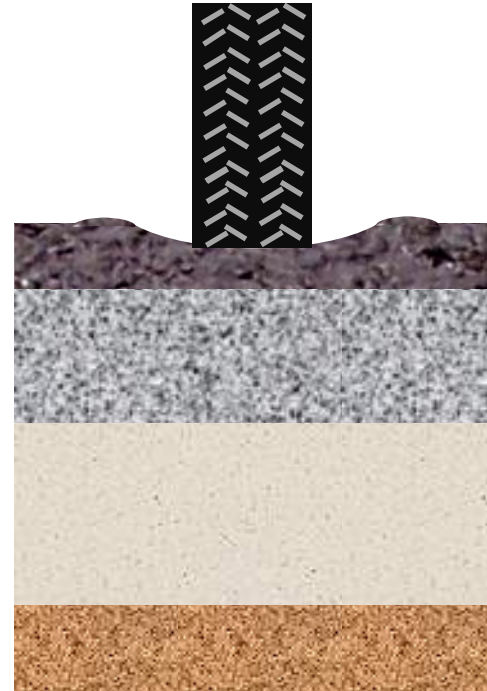


Structural Distress – Rutting

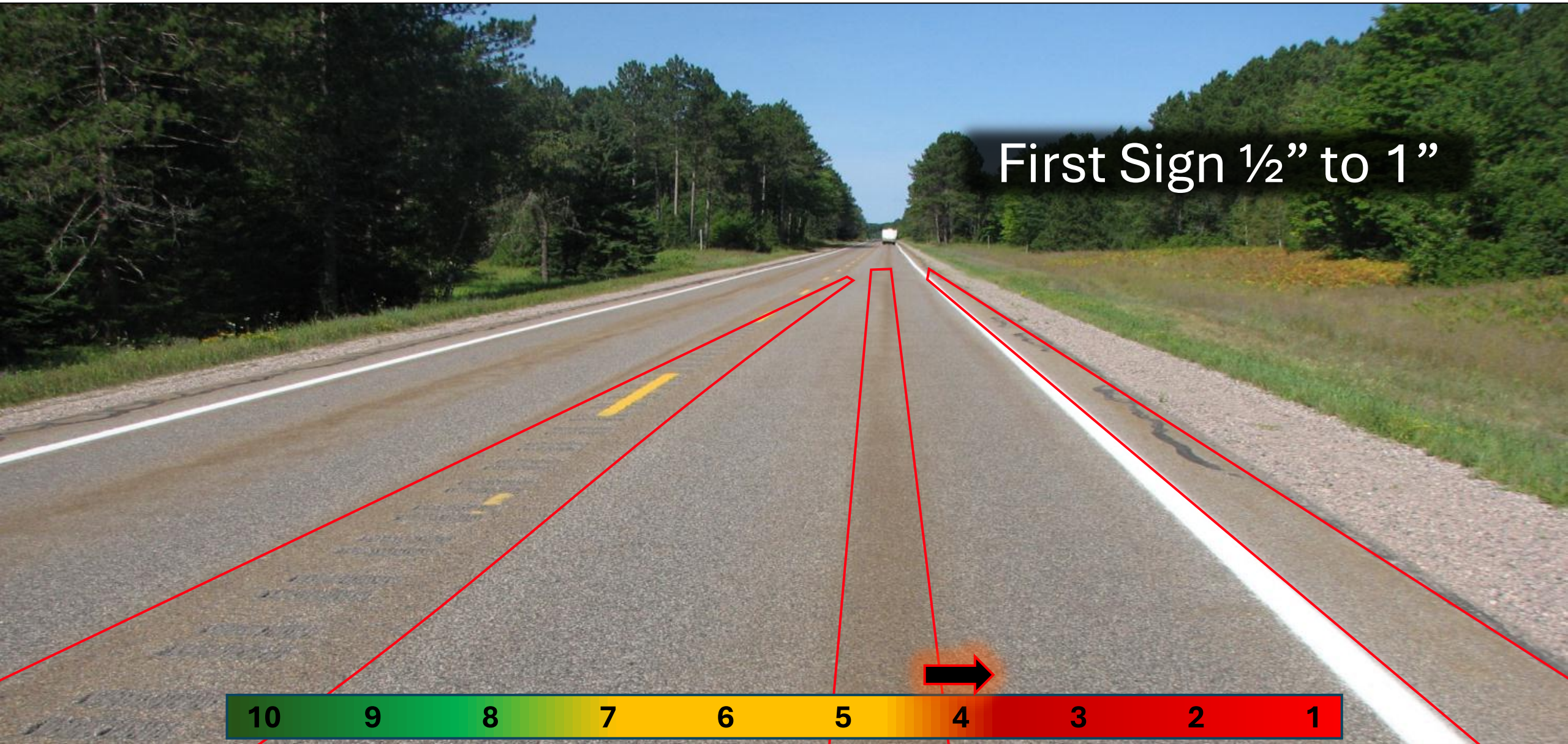
Deep Rutting



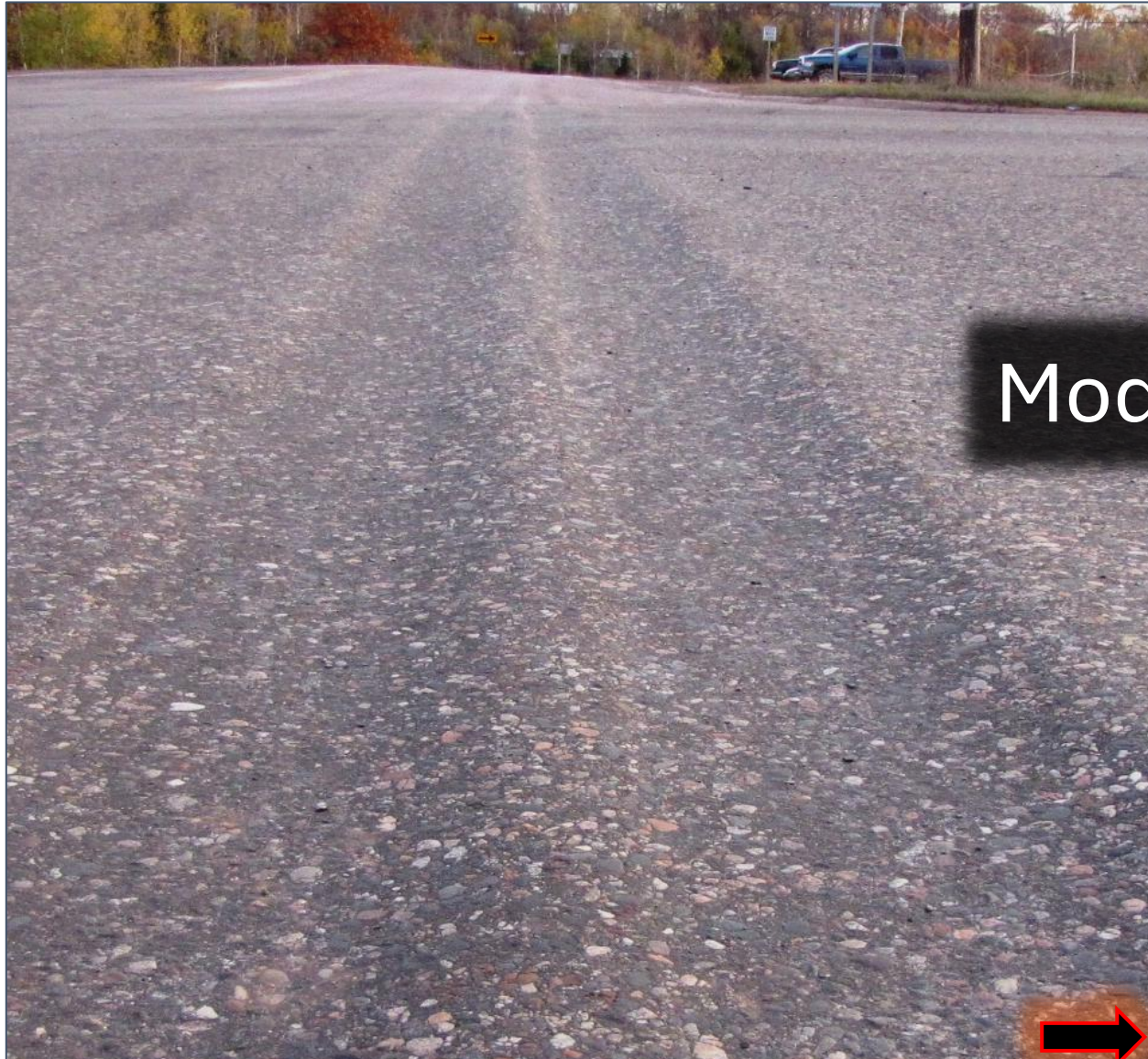
Surface Rutting



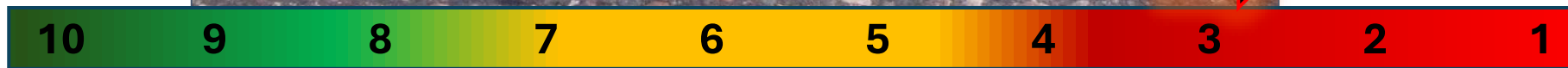
Rutting Progression



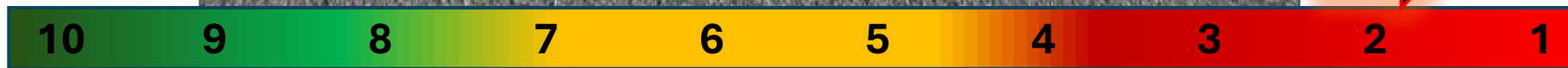
Rutting Progression



Moderate 1" to 2"



Rutting Progression



Measuring Rutting

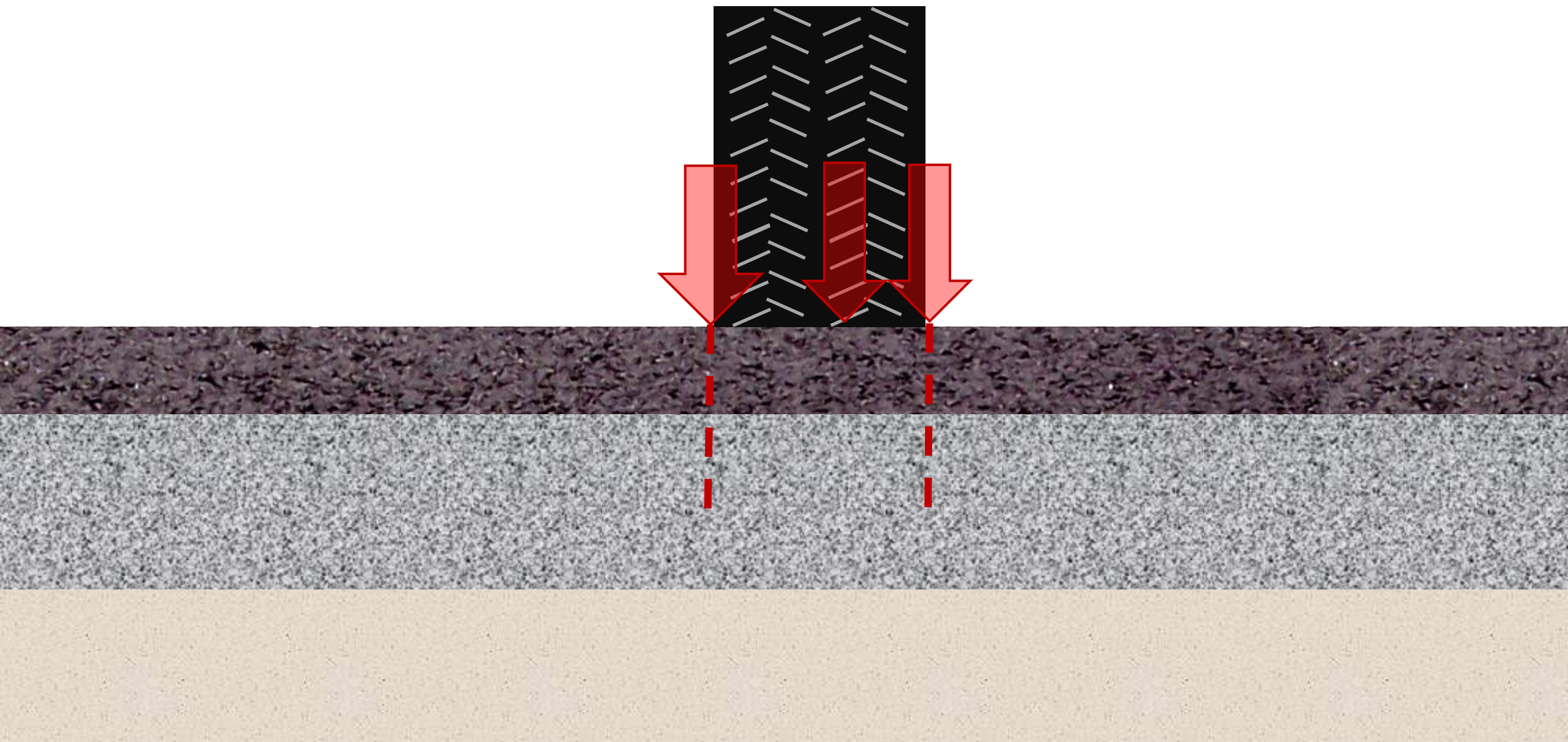


Shear Cracking or Cracking in the Wheel Path

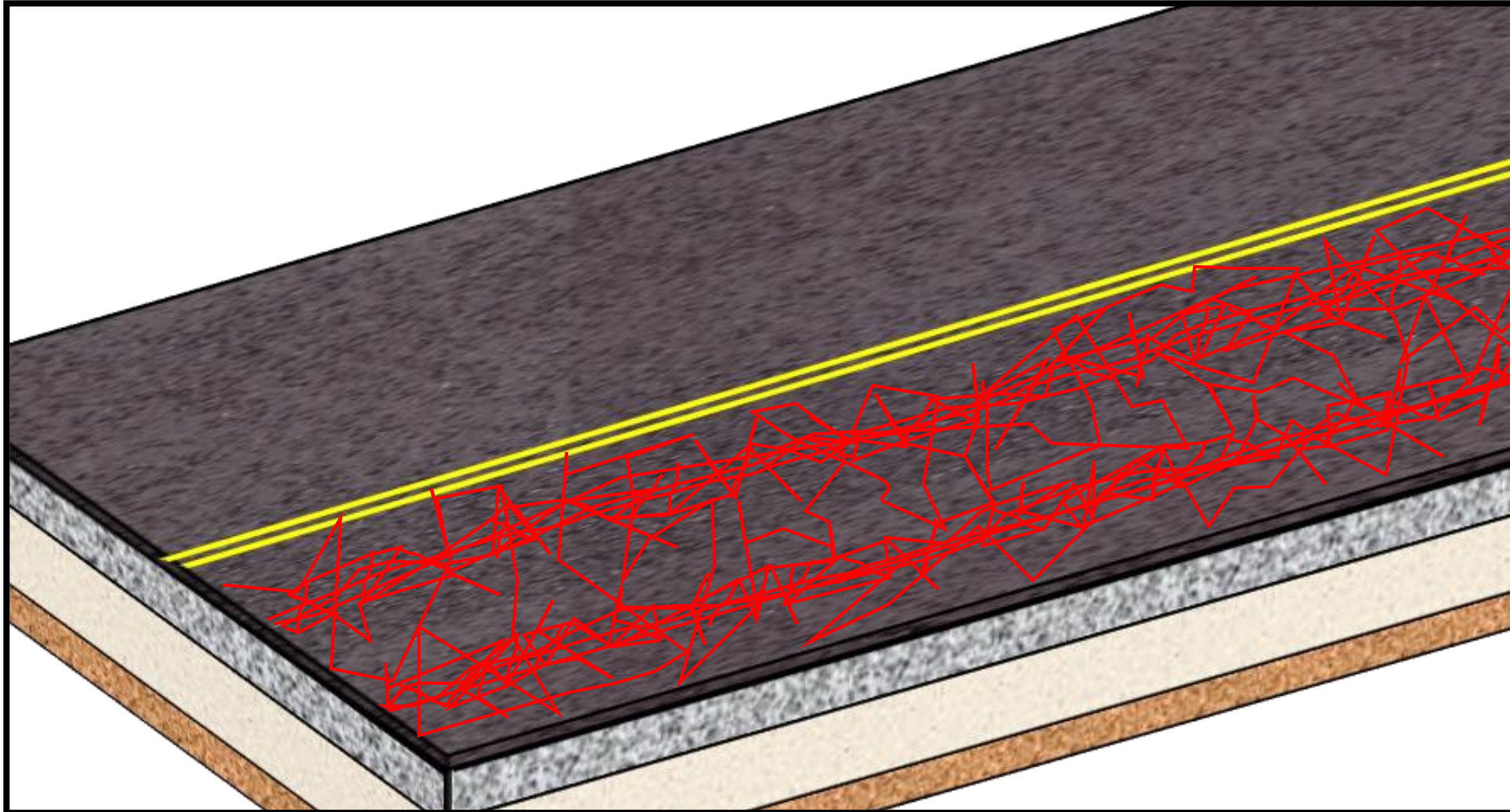
Structural Distress



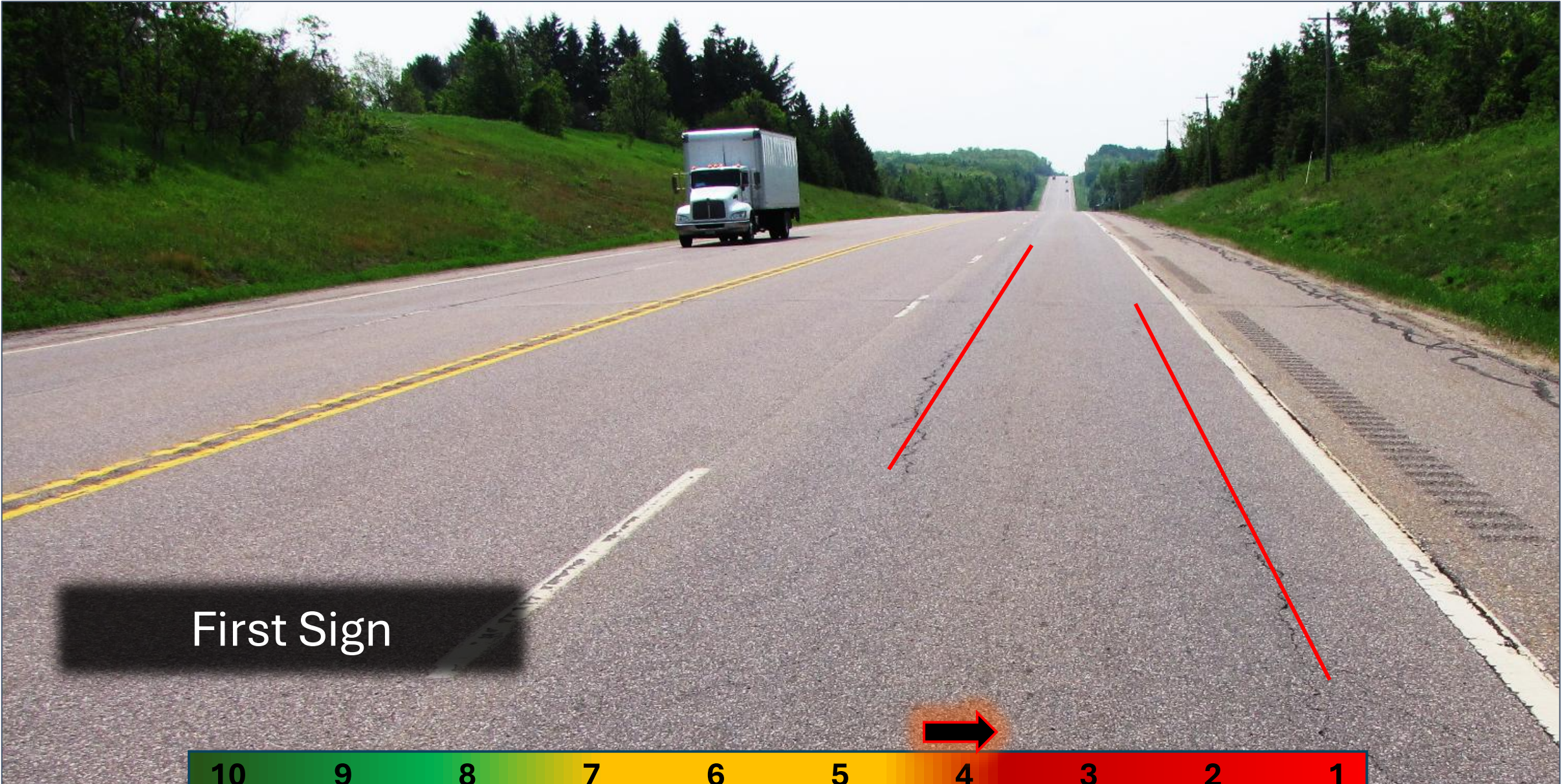
Shear Cracking



Load Related Distress Progression

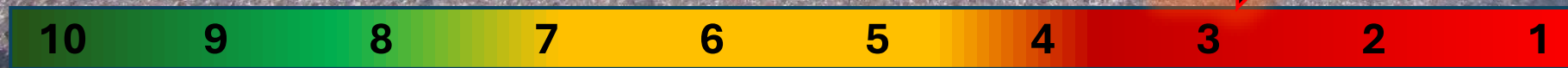


Wheel Path Crack Progression

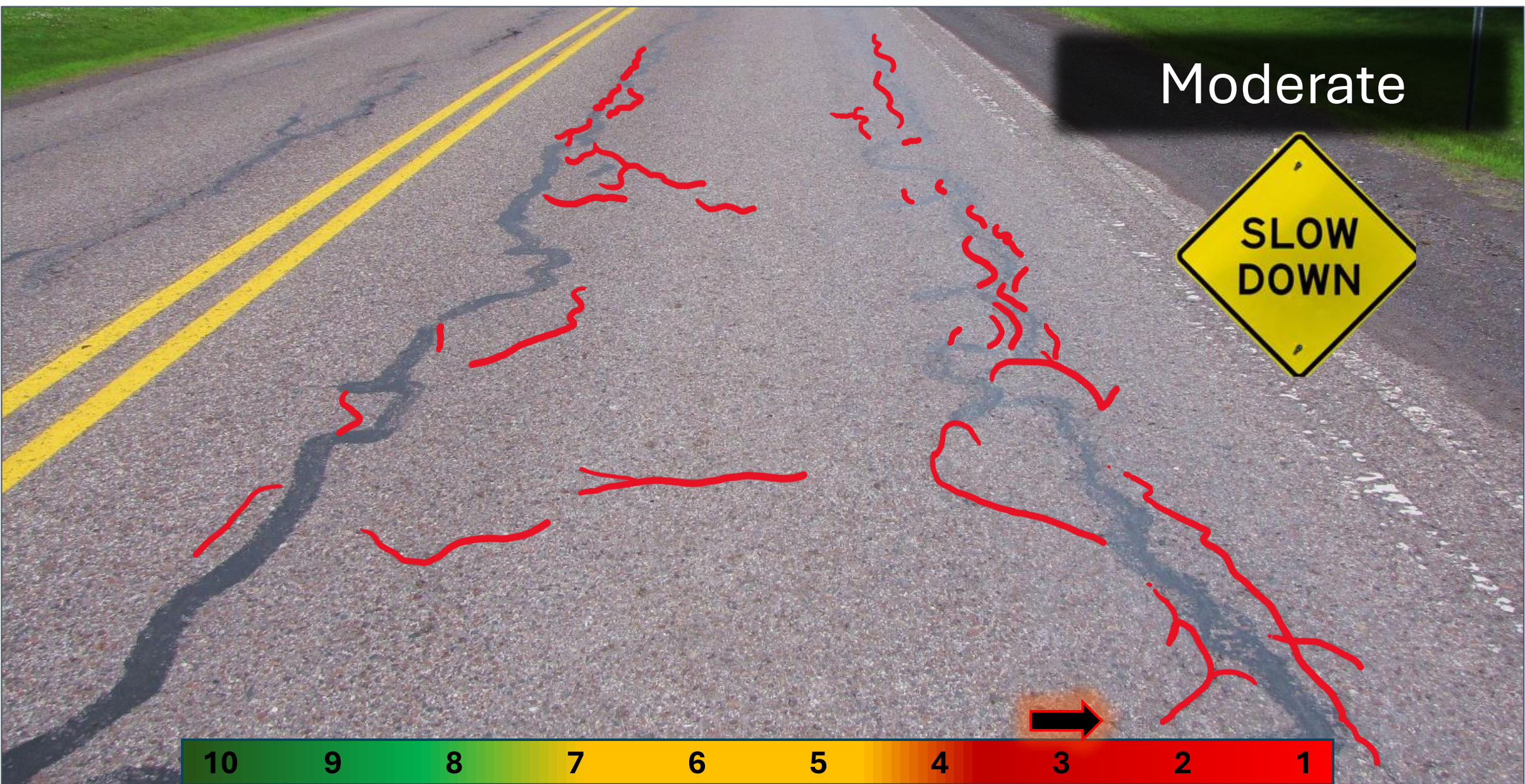


Wheel Path Crack Progression

Moderate

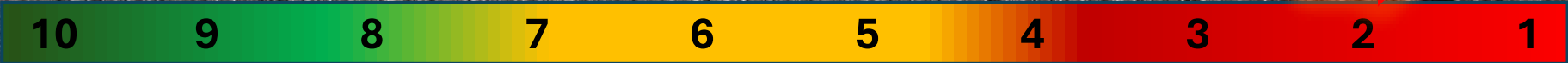
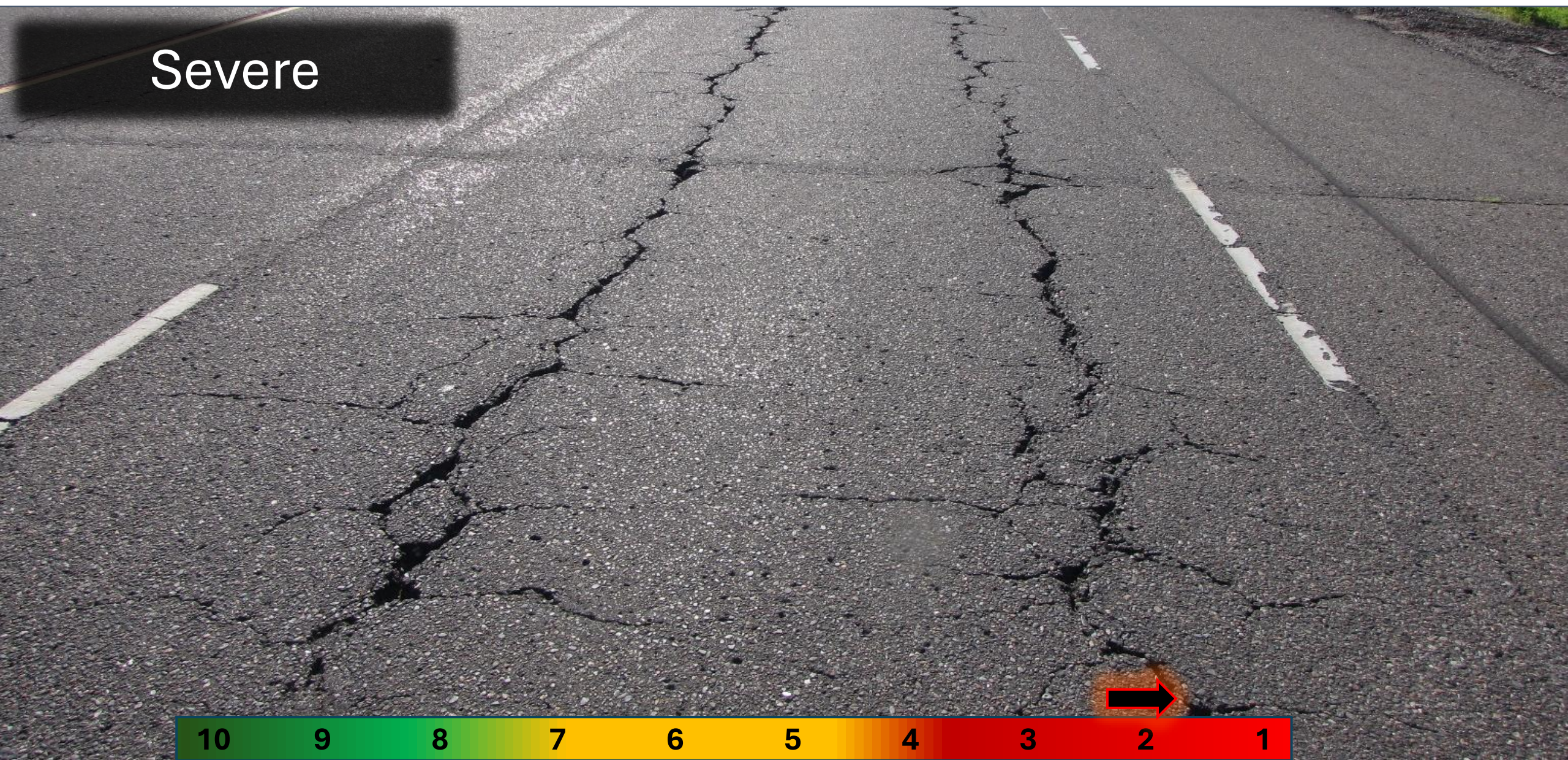


Wheel Path Crack Progression



Wheel Path Crack Progression

Severe

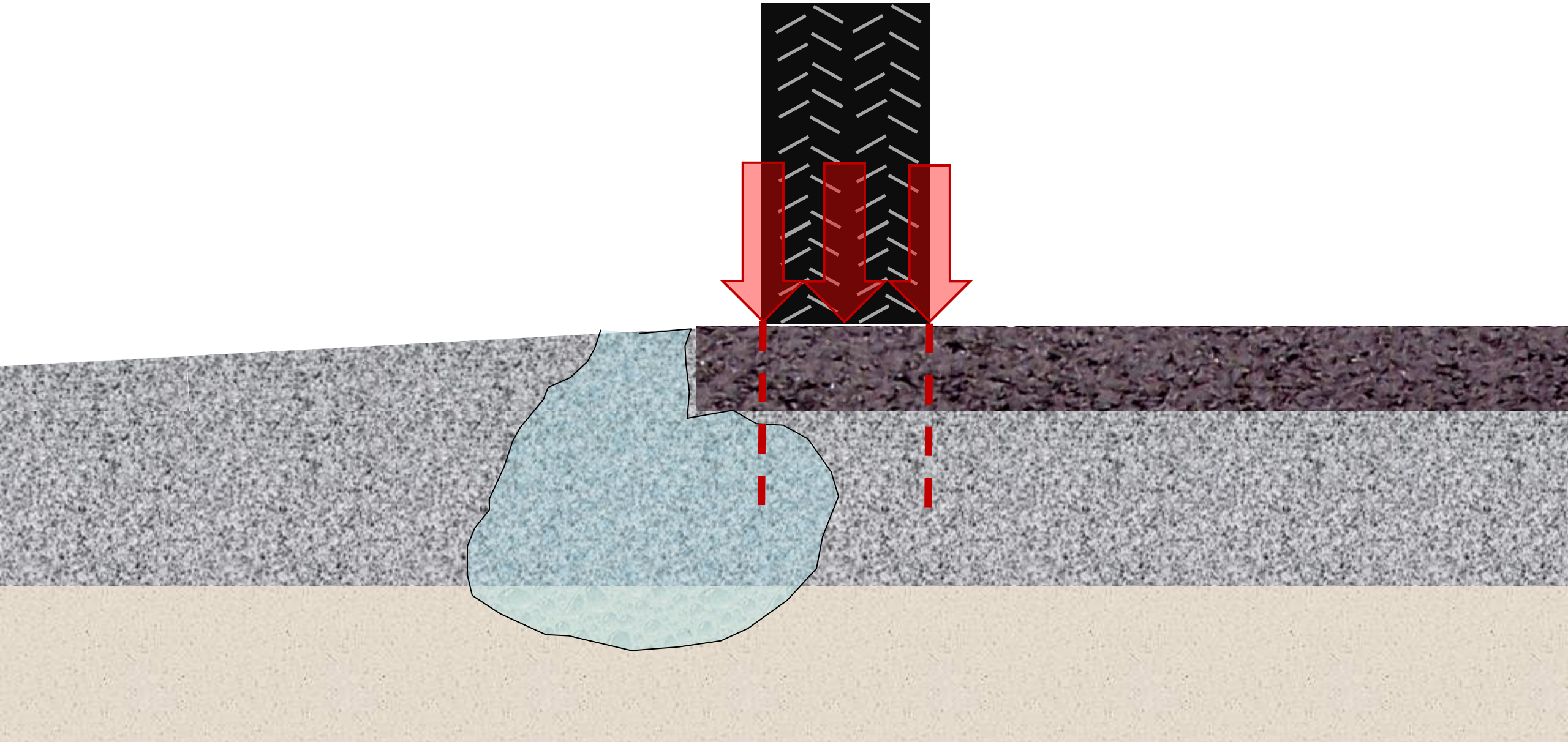


Edge Cracking

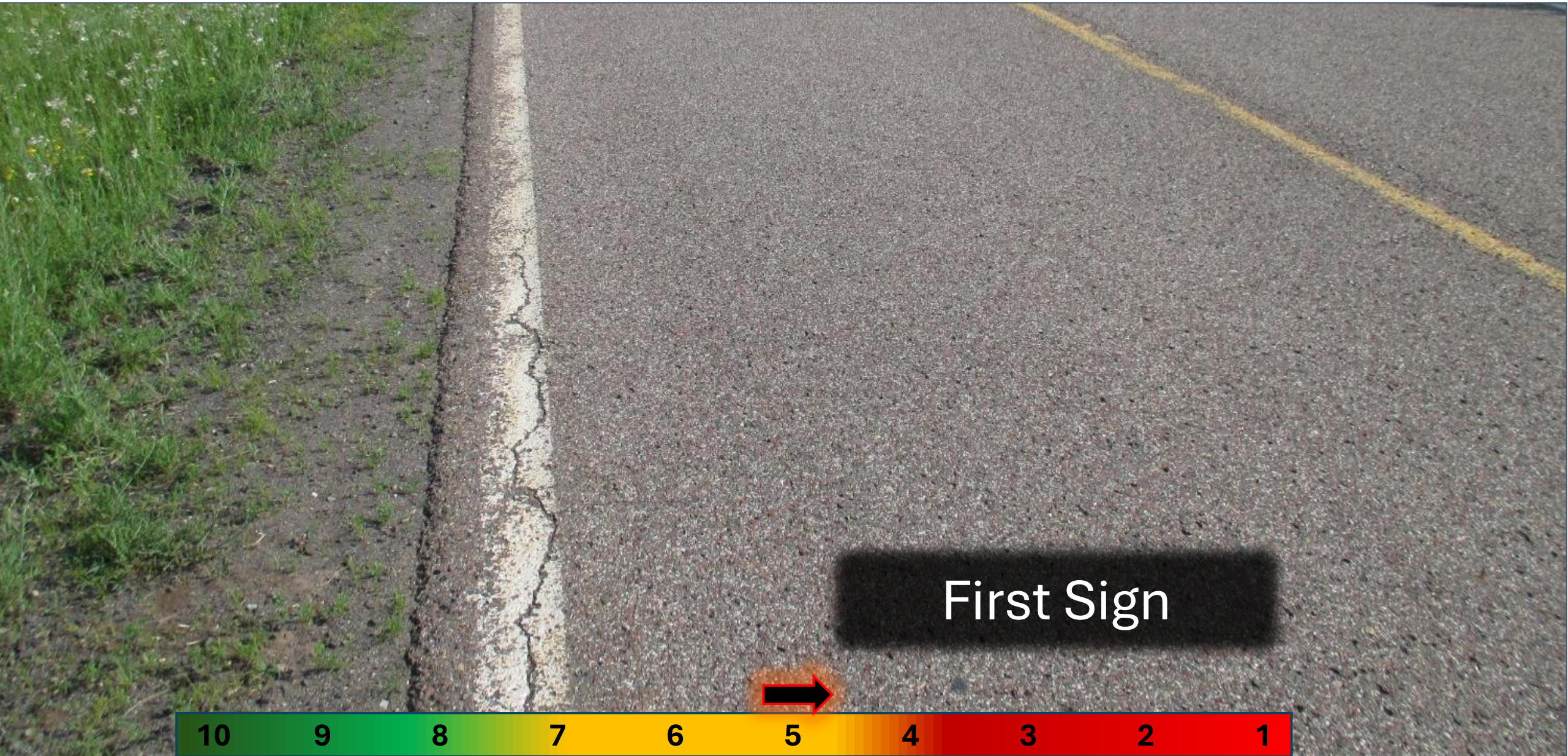
Structural Distress



Edge Cracking

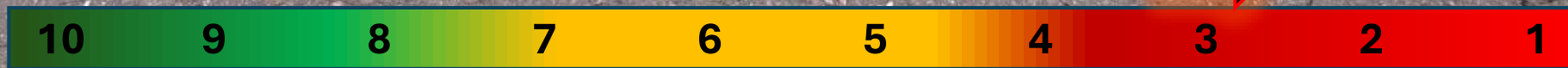


Edge Cracking



Edge Cracking

Progressed



Fatigue Cracking

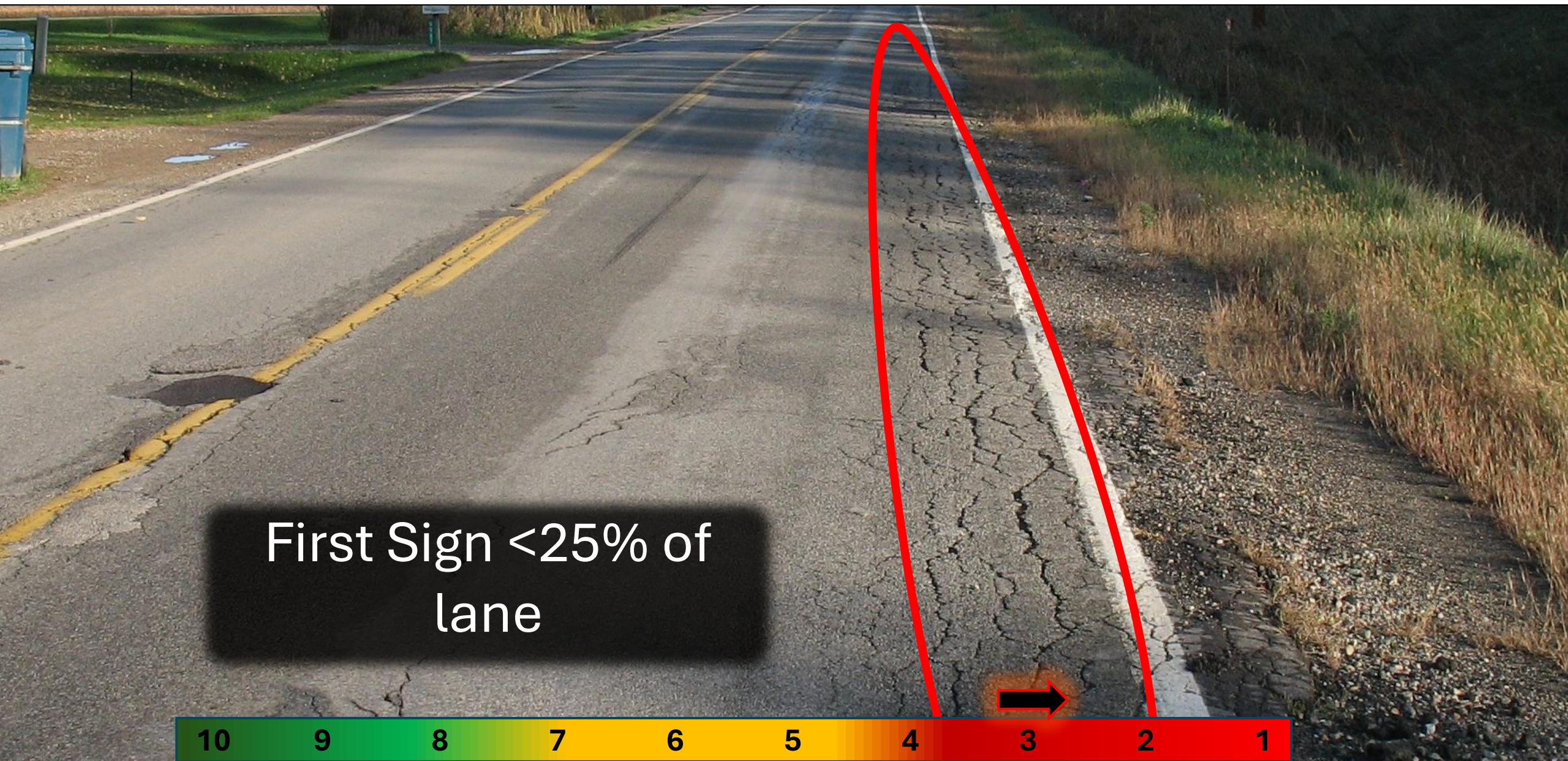
Structural Distress



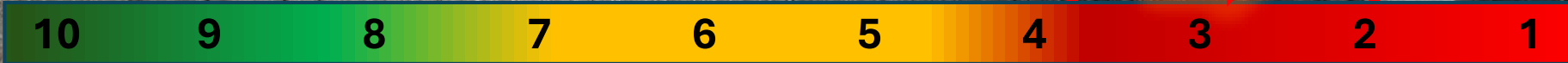
Structural Distress – Alligator (Fatigue) Cracking



Alligator (Fatigue) Cracking

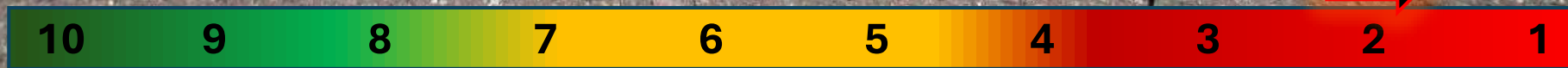


First Sign <25% of lane

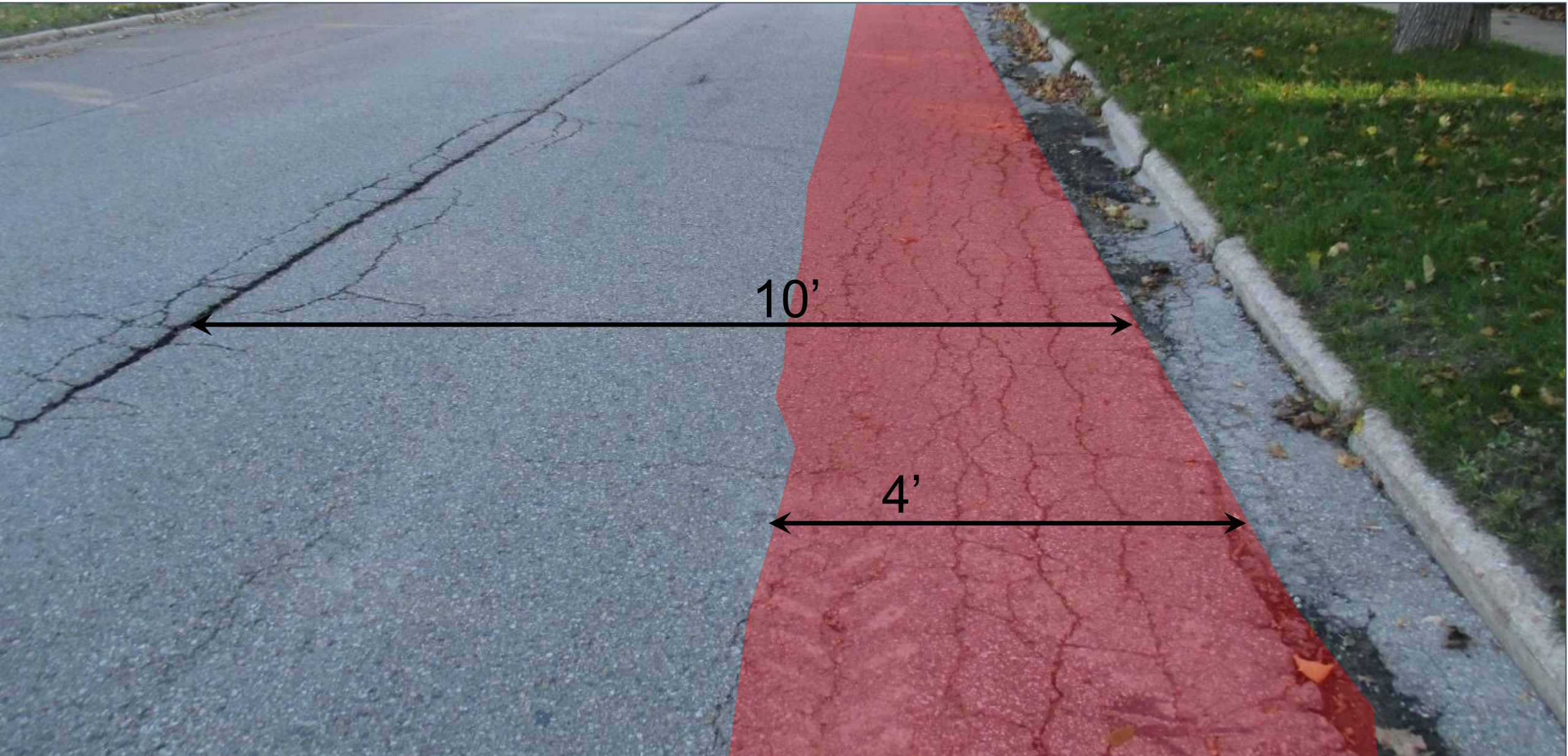


Alligator (Fatigue) Cracking

Severe >25% of lane



Percent of Worst Lane



Asphalt Distress Types

Age



Structural



Various



Surface Defects that Form for Various Reasons



Raveling



Flushing or Bleeding



Polishing

Raveling

Surface Defect



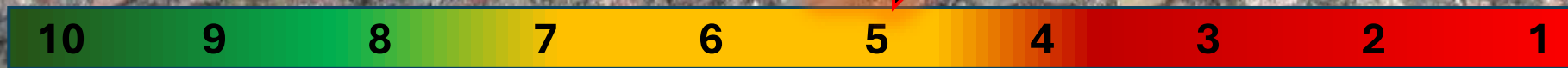
Surface Defect - Raveling

Slight
(loss of fines)



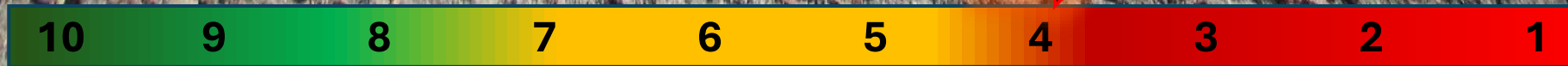
Surface Defect - Raveling

Moderate
(loss of aggregate)



Surface Defect - Raveling

Severe



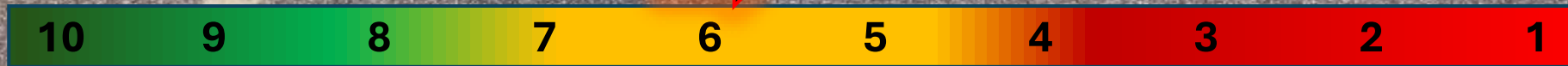
Flushing or Bleeding

Surface Defect



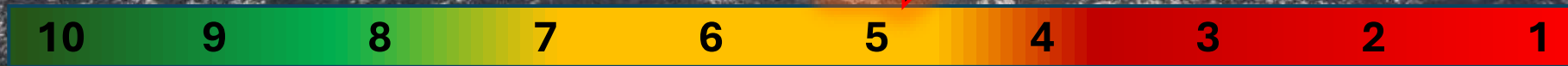
Surface Distress – Flushing / Bleeding

Slight to Moderate



Surface Defect – Flushing / Bleeding

Extensive to Severe



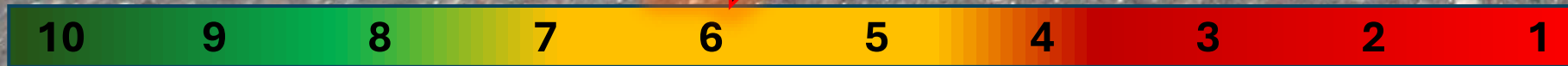
Polishing

Surface Defect

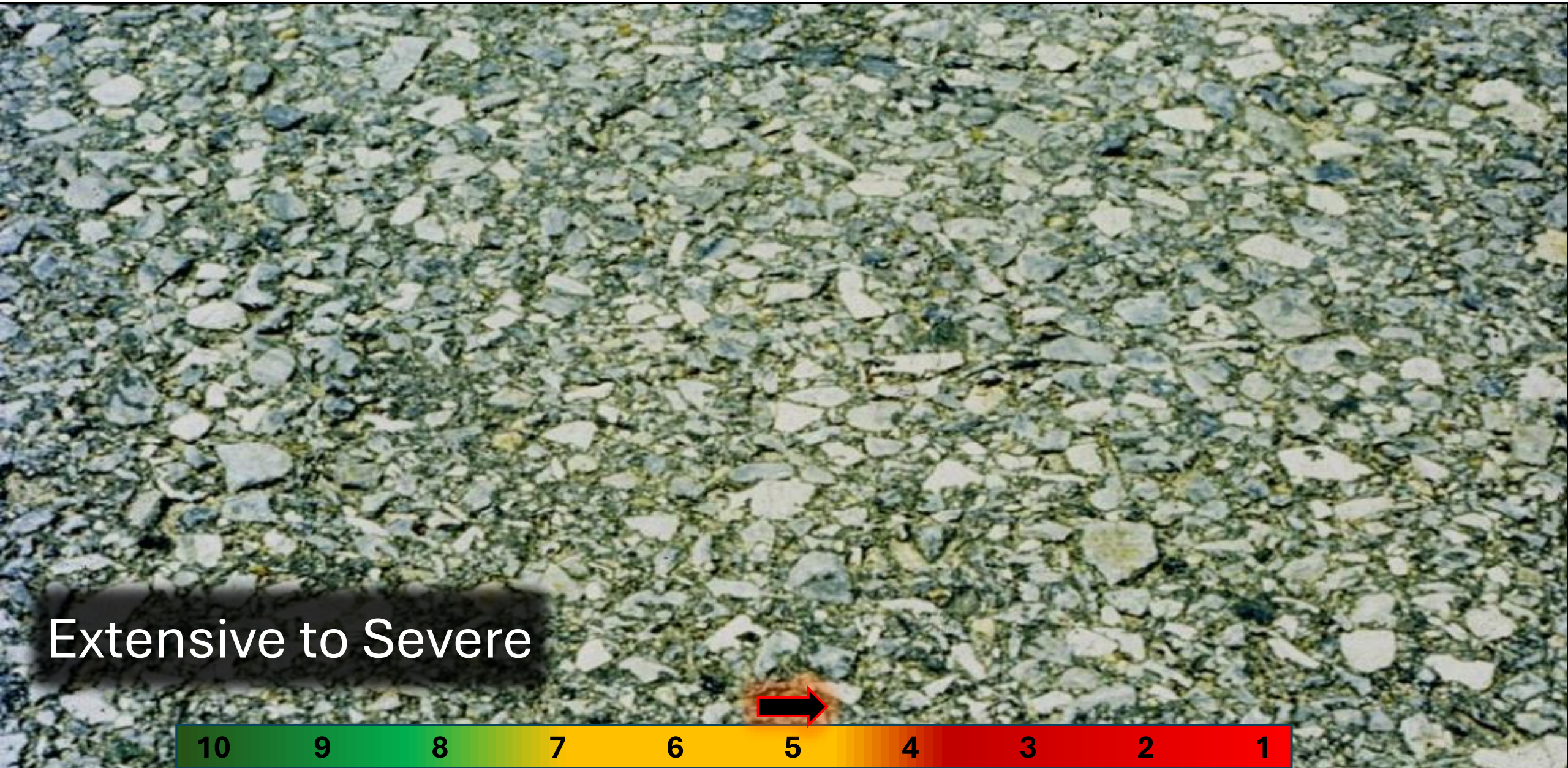


Surface Defect – Polishing

Slight to Moderate



Surface Defect – Polishing



Extensive to Severe



Surface Deformations that Form for Various Reasons



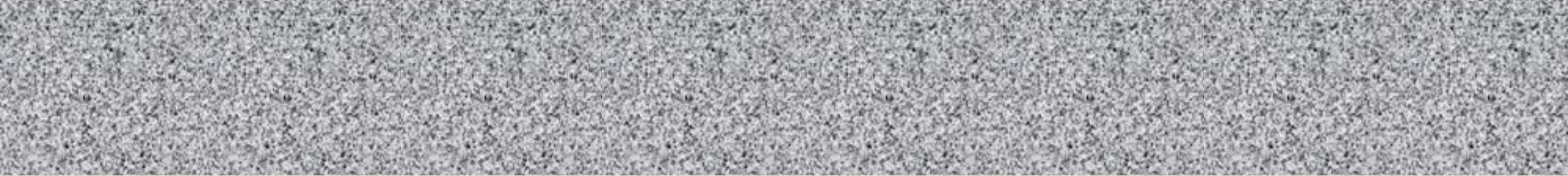
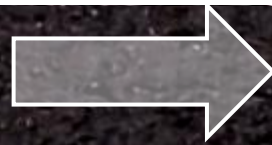
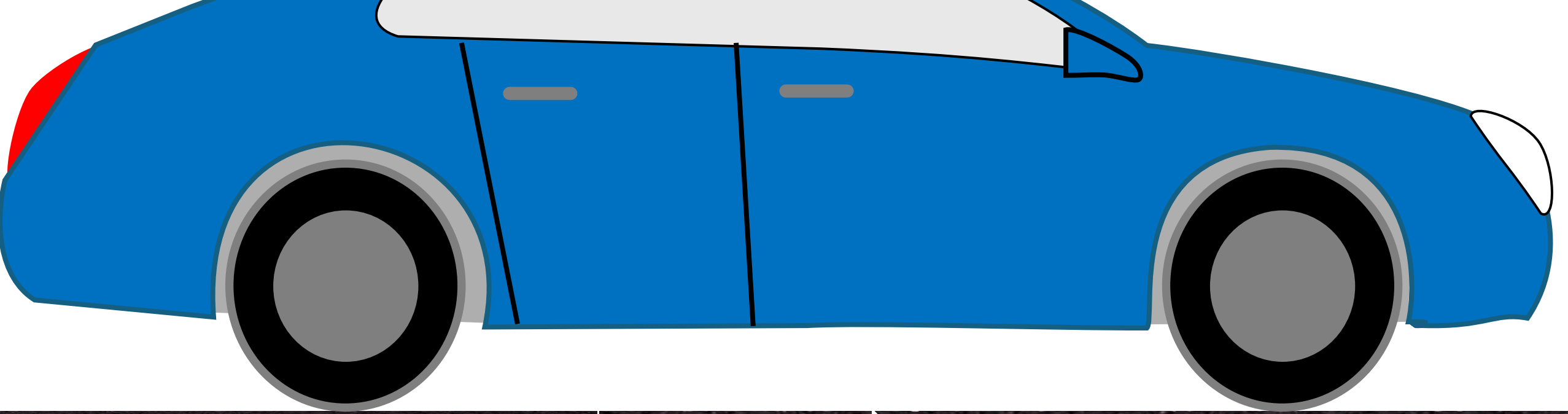
Slippage



Frost Heave



Distortion



Surface Deformation – Layer Slippage

First Signs



Surface Deformation – Layer Slippage



Advanced

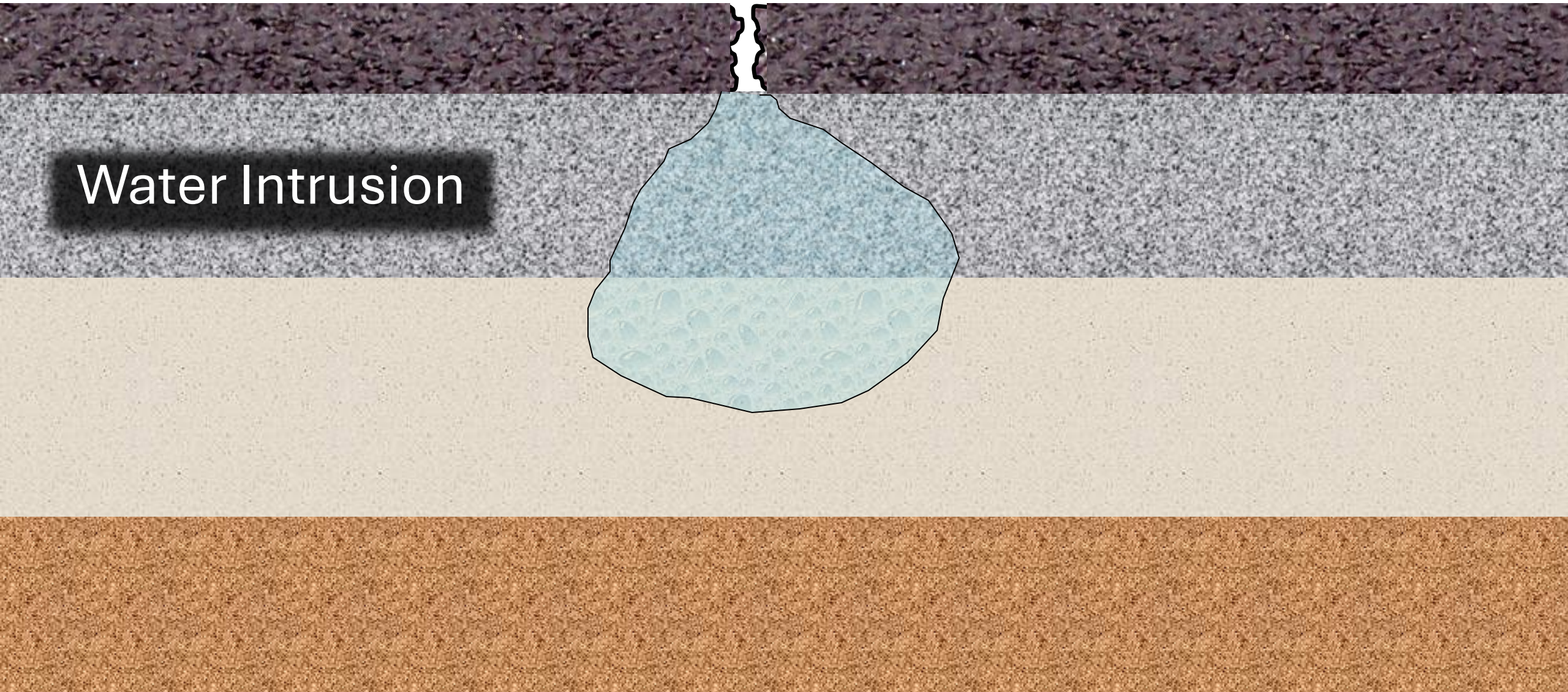
Surface Deformation – Frost Heave



The diagram illustrates the layers of a pavement structure. From top to bottom, the layers are: a dark, textured surface layer; a grey, granular base layer; a light grey, smooth subgrade layer; and a brown, granular subbase layer. A vertical crack is shown in the surface layer, with a jagged, irregular shape indicating a break or fracture. The text 'First Distress' is overlaid on the grey base layer.

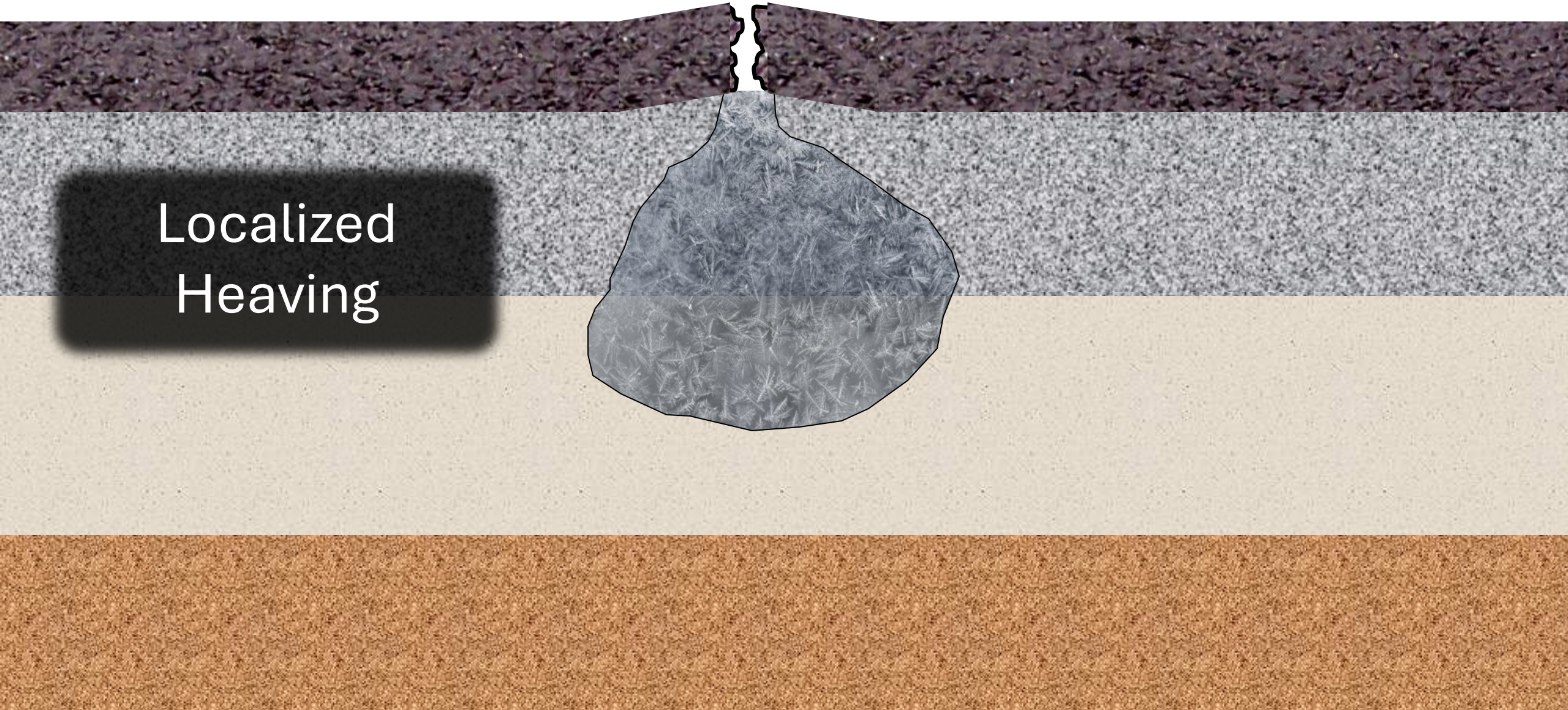
First Distress

Surface Deformation – Frost Heave

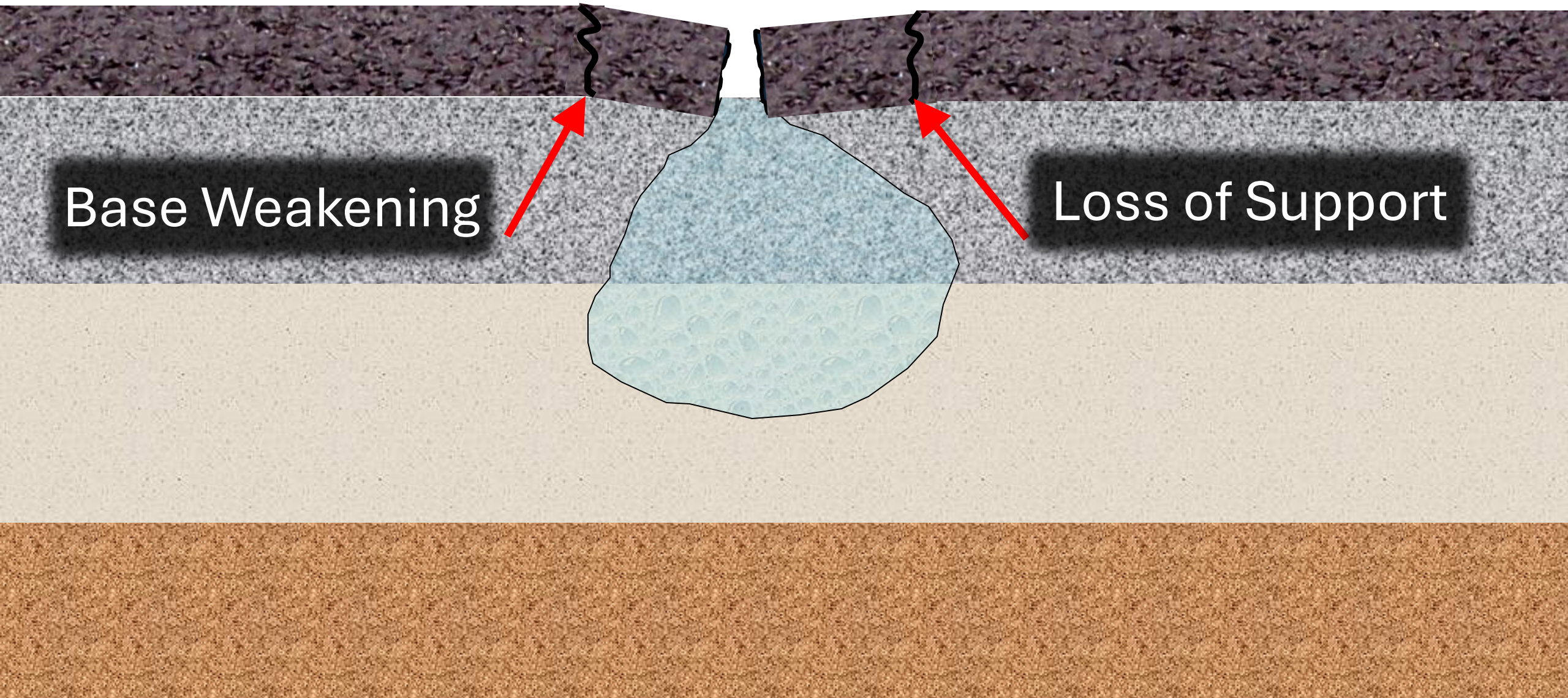


Surface Deformation – Frost Heave

Localized
Heaving



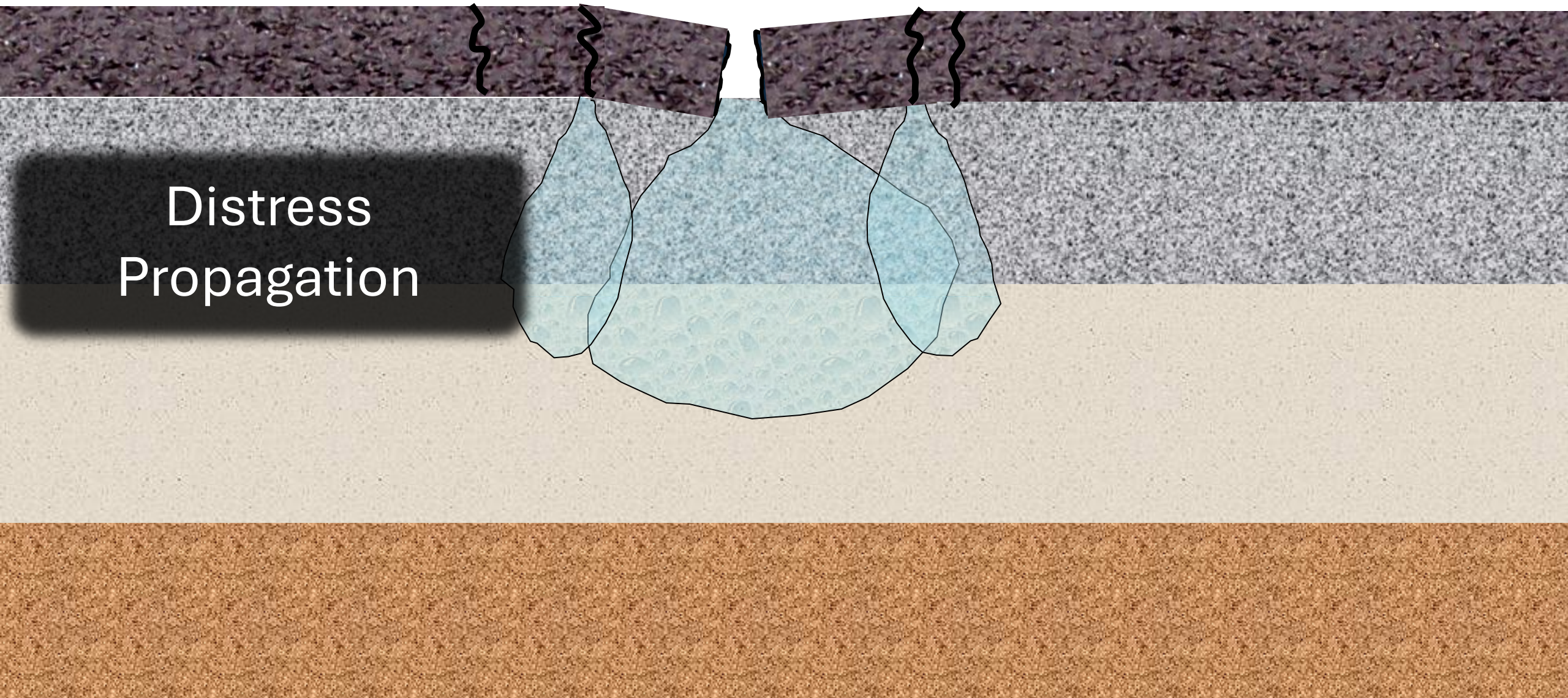
Surface Deformation – Frost Heave



Base Weakening

Loss of Support

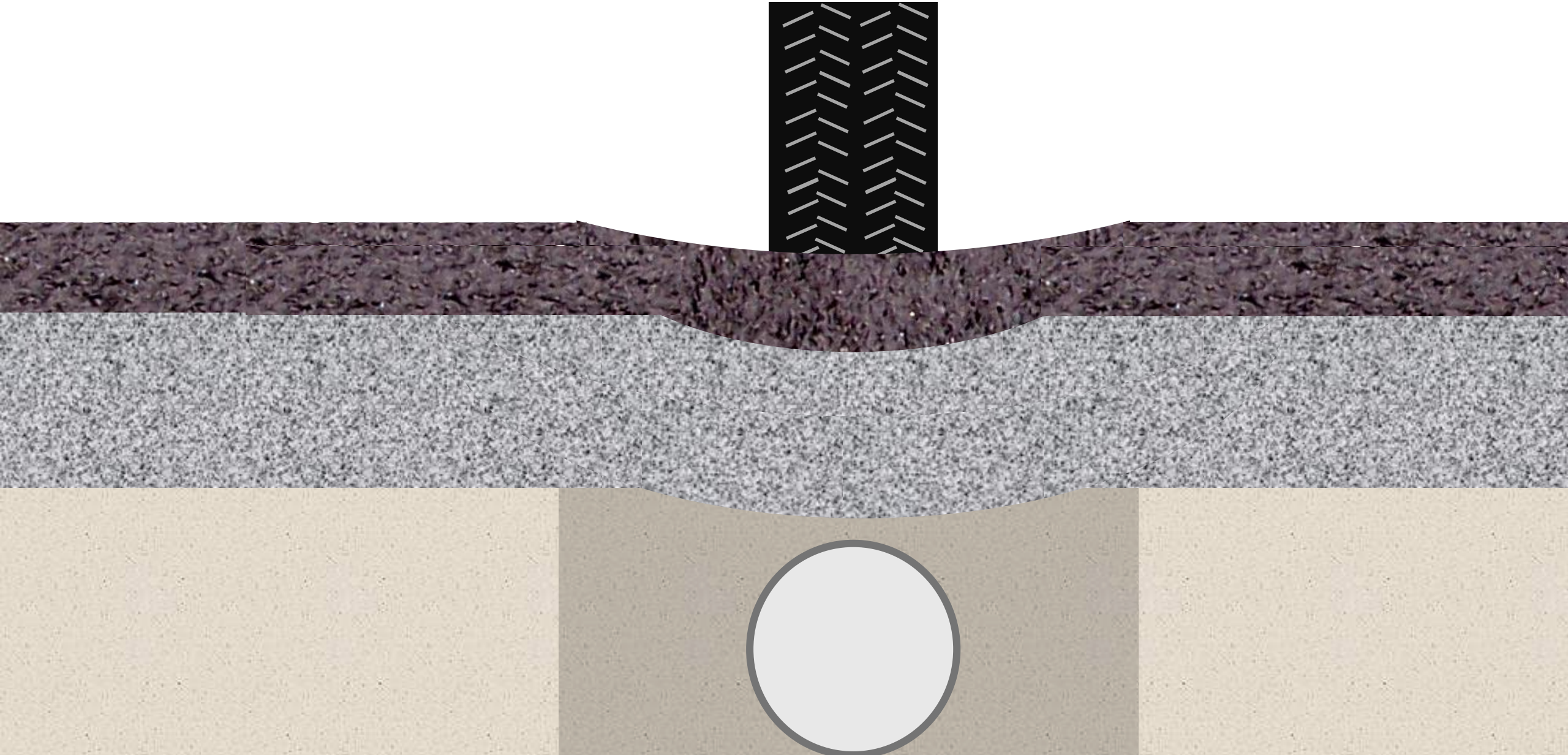
Surface Deformation – Frost Heave



Surface Deformation – Frost Heave

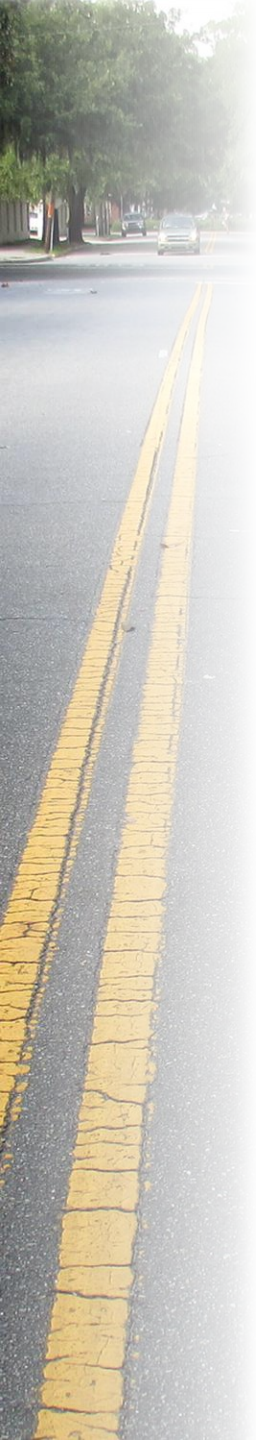


Surface Deformation – Distortion or Settling

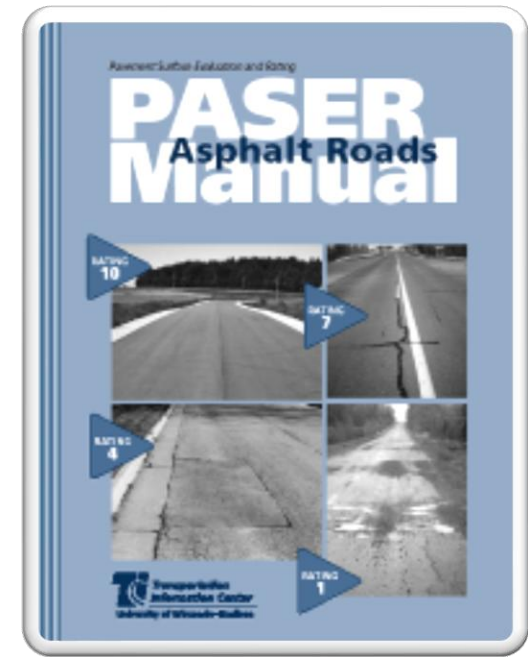


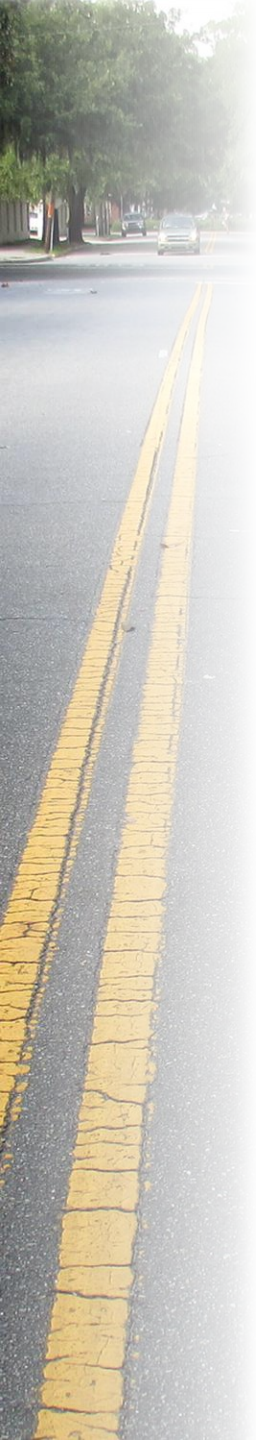
Surface Deformation – Distortion



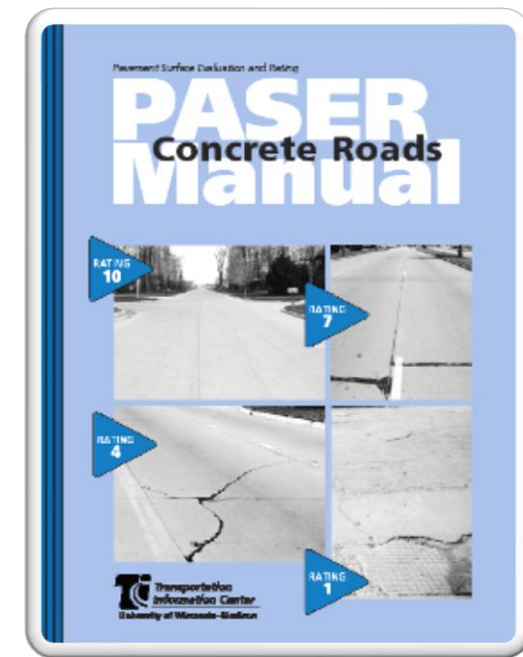


Asphalt Review





Concrete Pavement



Concrete Distress Types

Concrete Surface Distress

Concrete Cracking

Concrete Joint Distress

Concrete Deformations

Concrete Surface Distress



Concrete Surface Distresses



Shallow Steel



Scaling



Pop-out

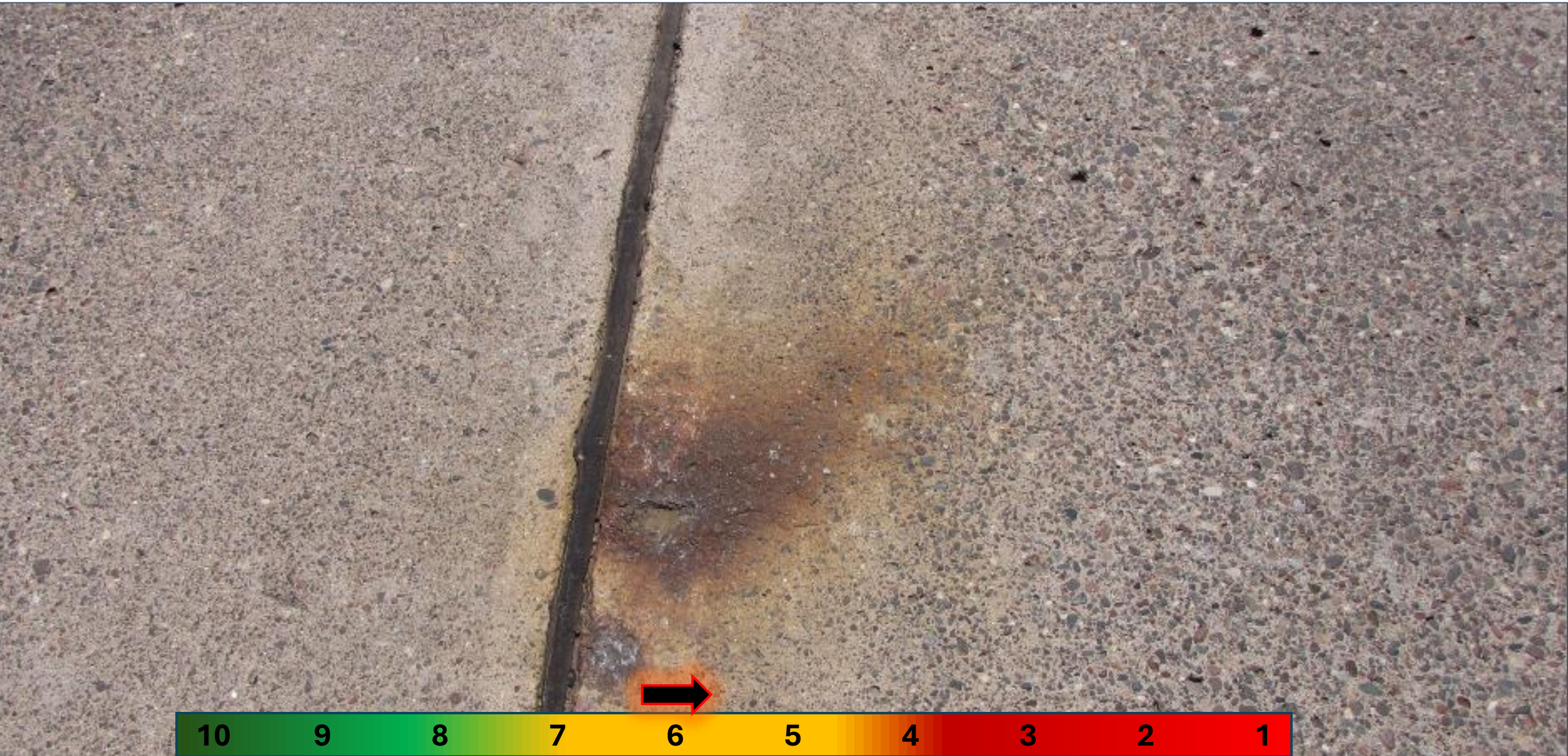


Map Cracking



Polishing

Surface Distress – Shallow Reinforcement



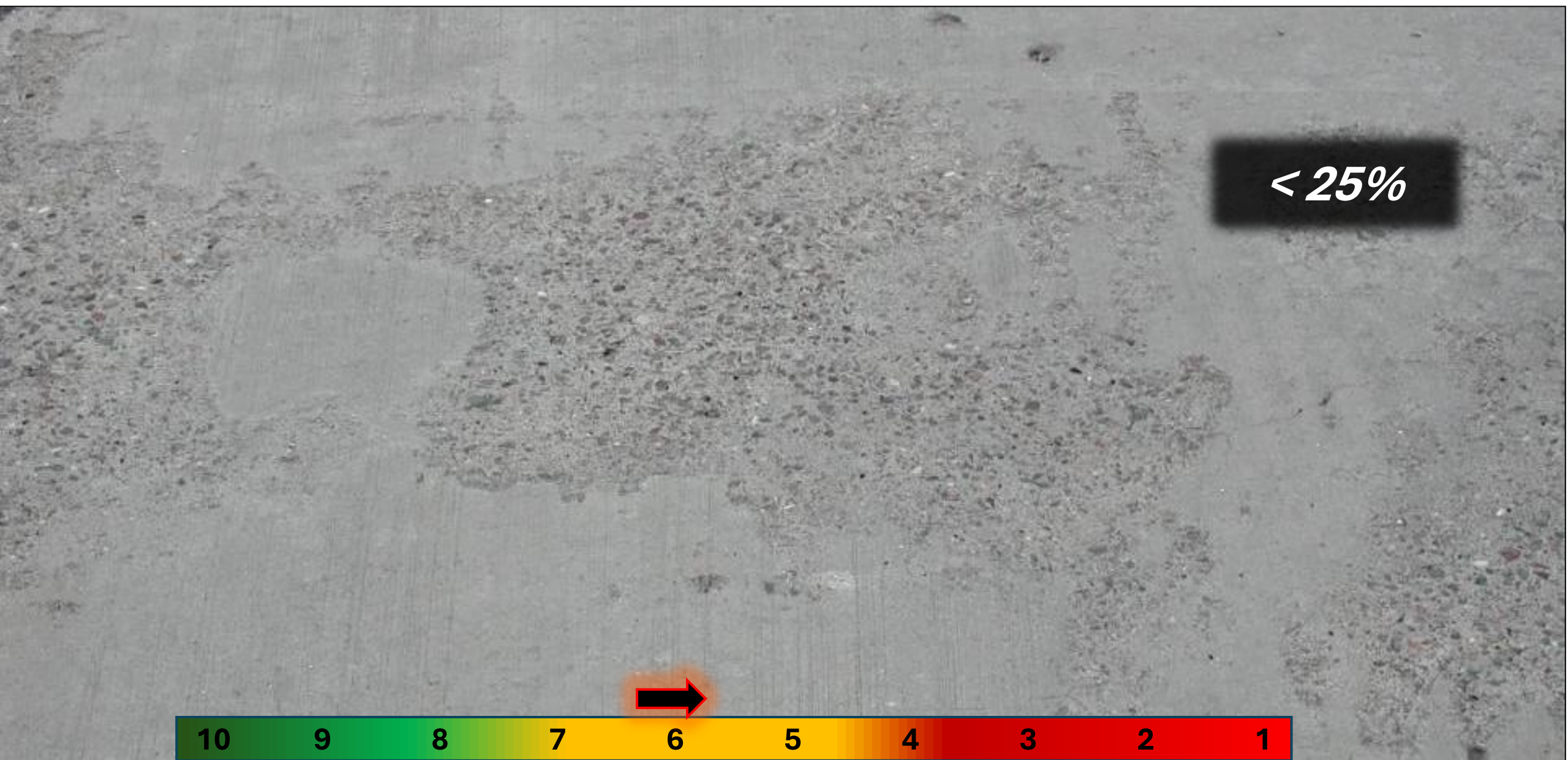
Surface Distress – Shallow Reinforcement



Surface Distress – Scaling



Surface Distress – Scaling



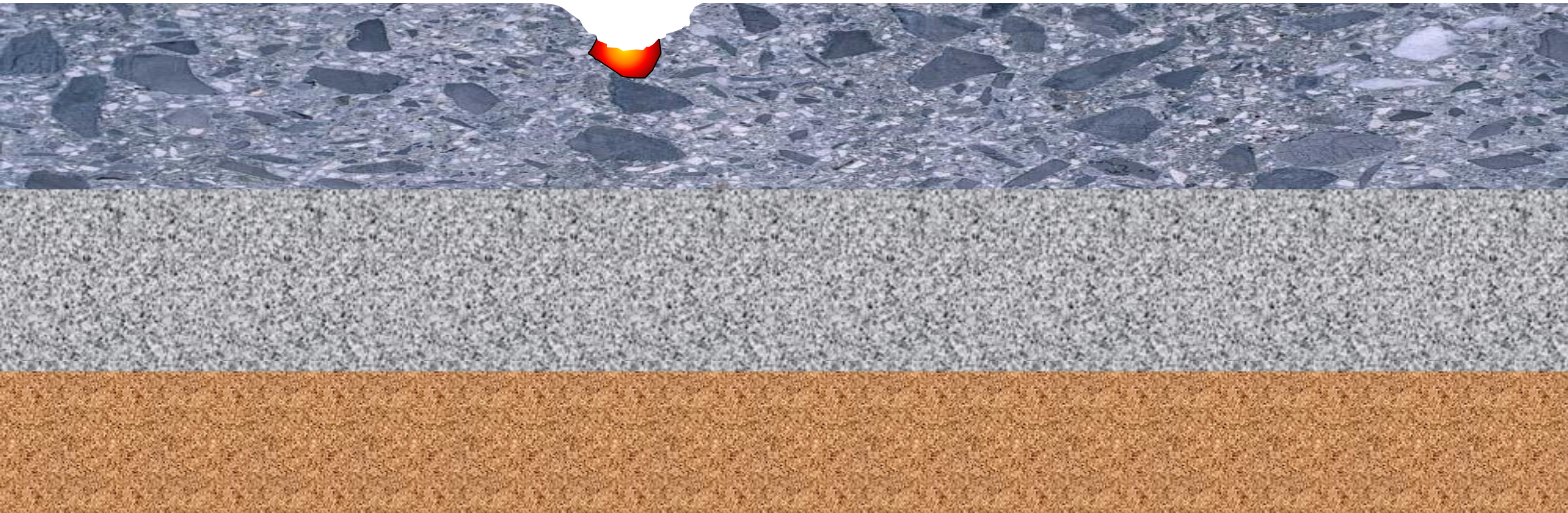
Surface Distress - Scaling



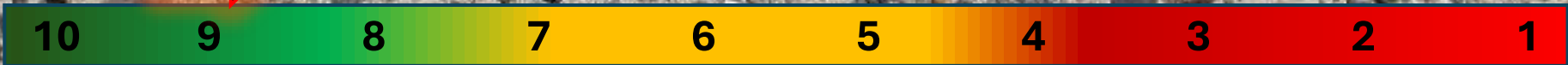
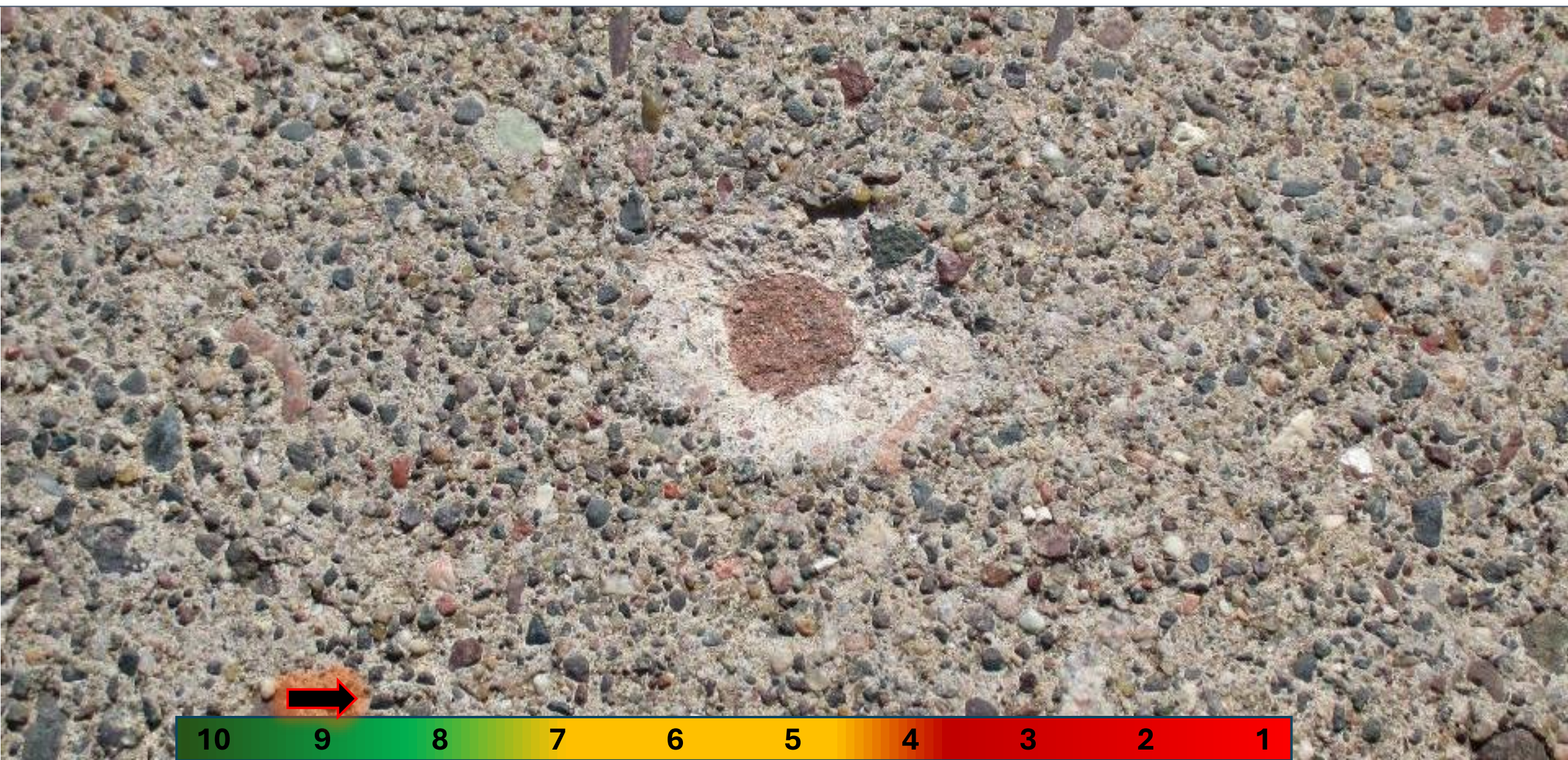
> 50%



Surface Distress – Pop Outs



Surface Distress – Pop Outs



Surface Distress – Map Cracking



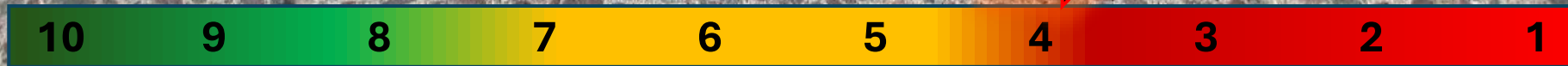
Surface Distress – Polishing

Moderate 25% - 50%



Surface Distress – Polishing

Severe >50%



Concrete Cracking



Concrete Cracking



Transverse

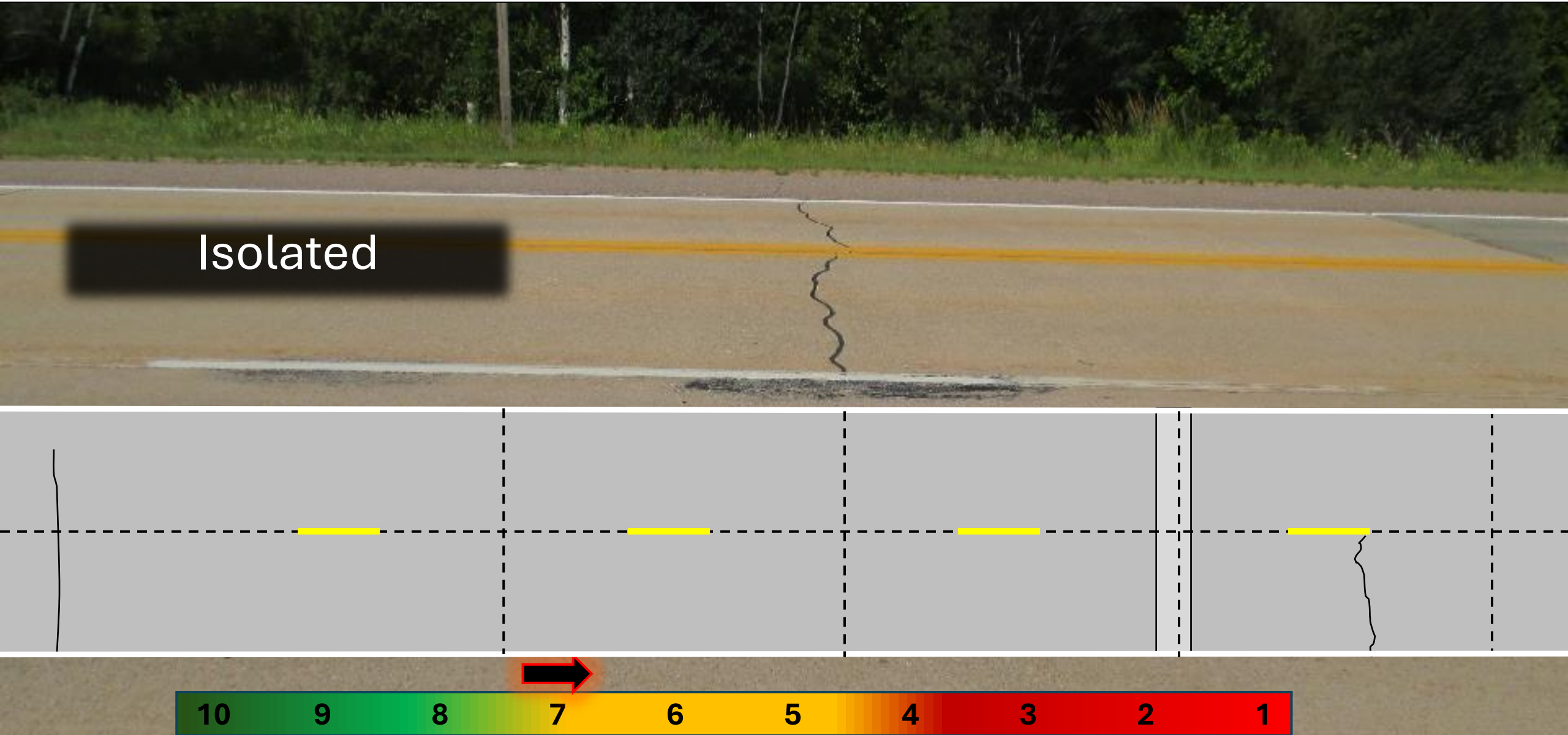


Meander



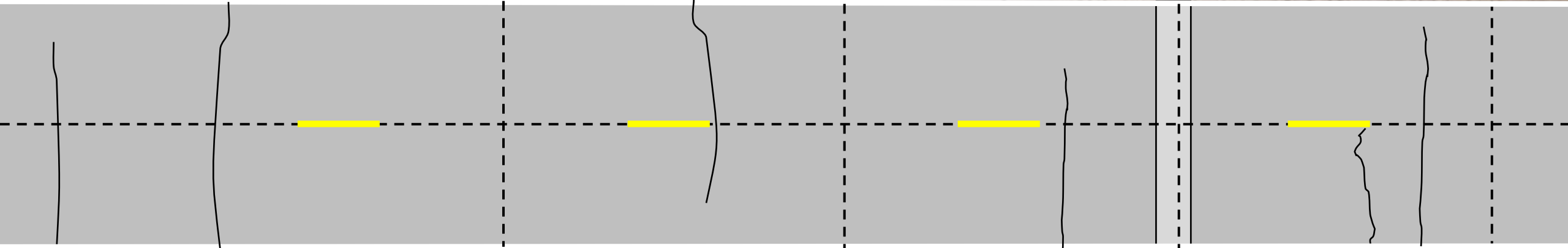
Corner

Concrete Cracking – Transverse



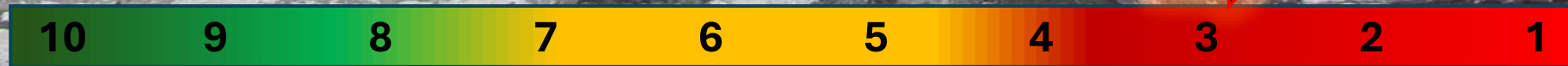
Concrete Cracking – Transverse

Multiple

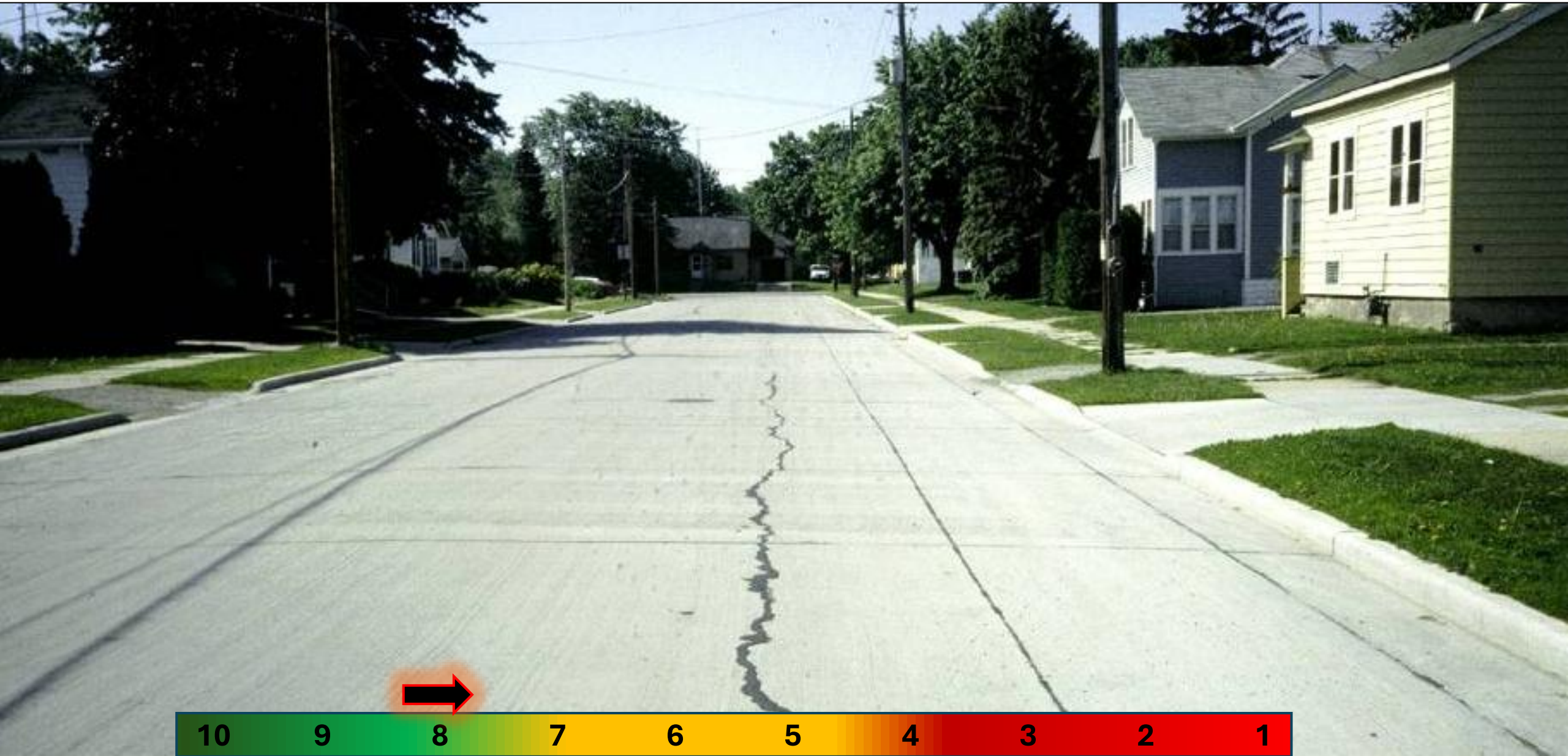


Concrete Cracking - Transverse

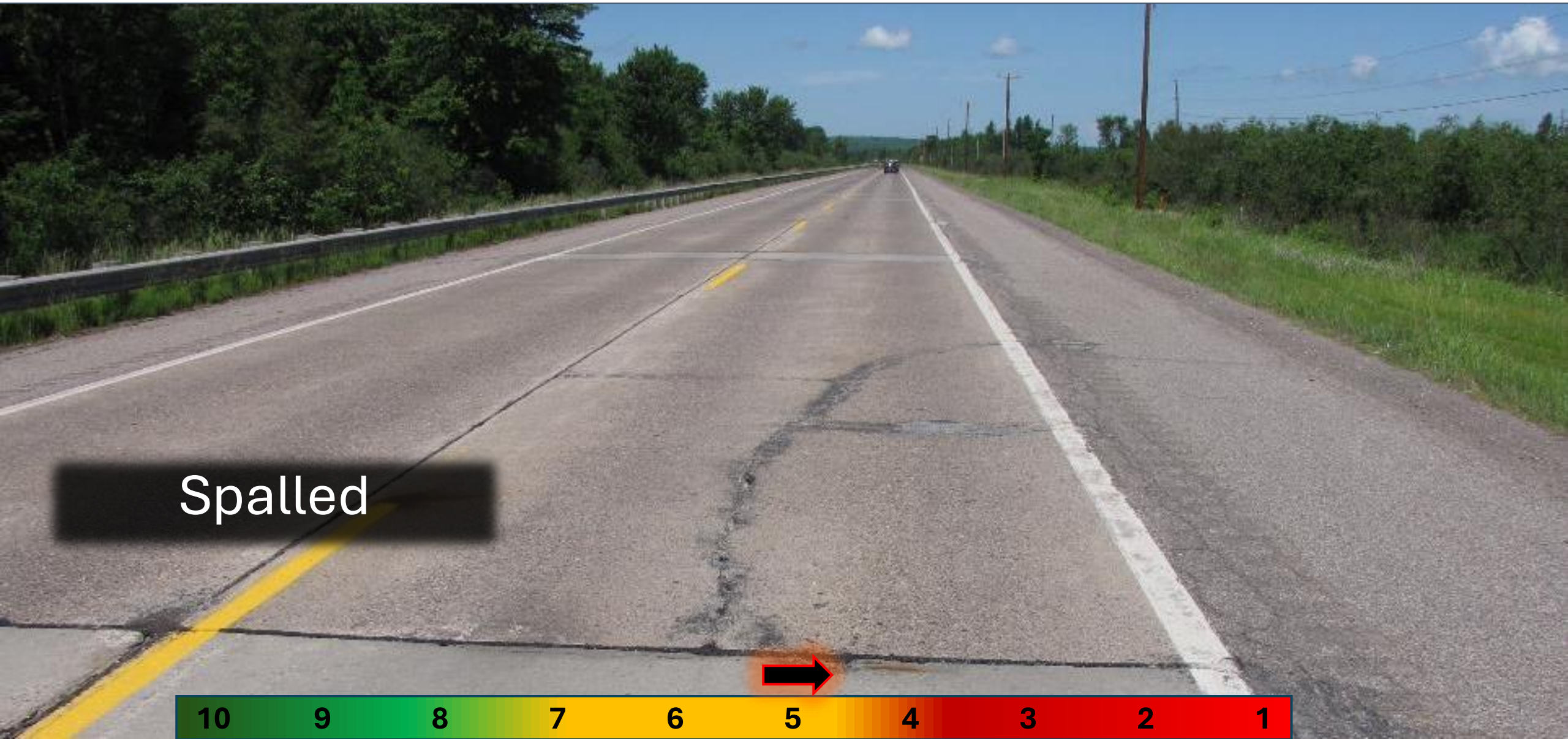
Progressed



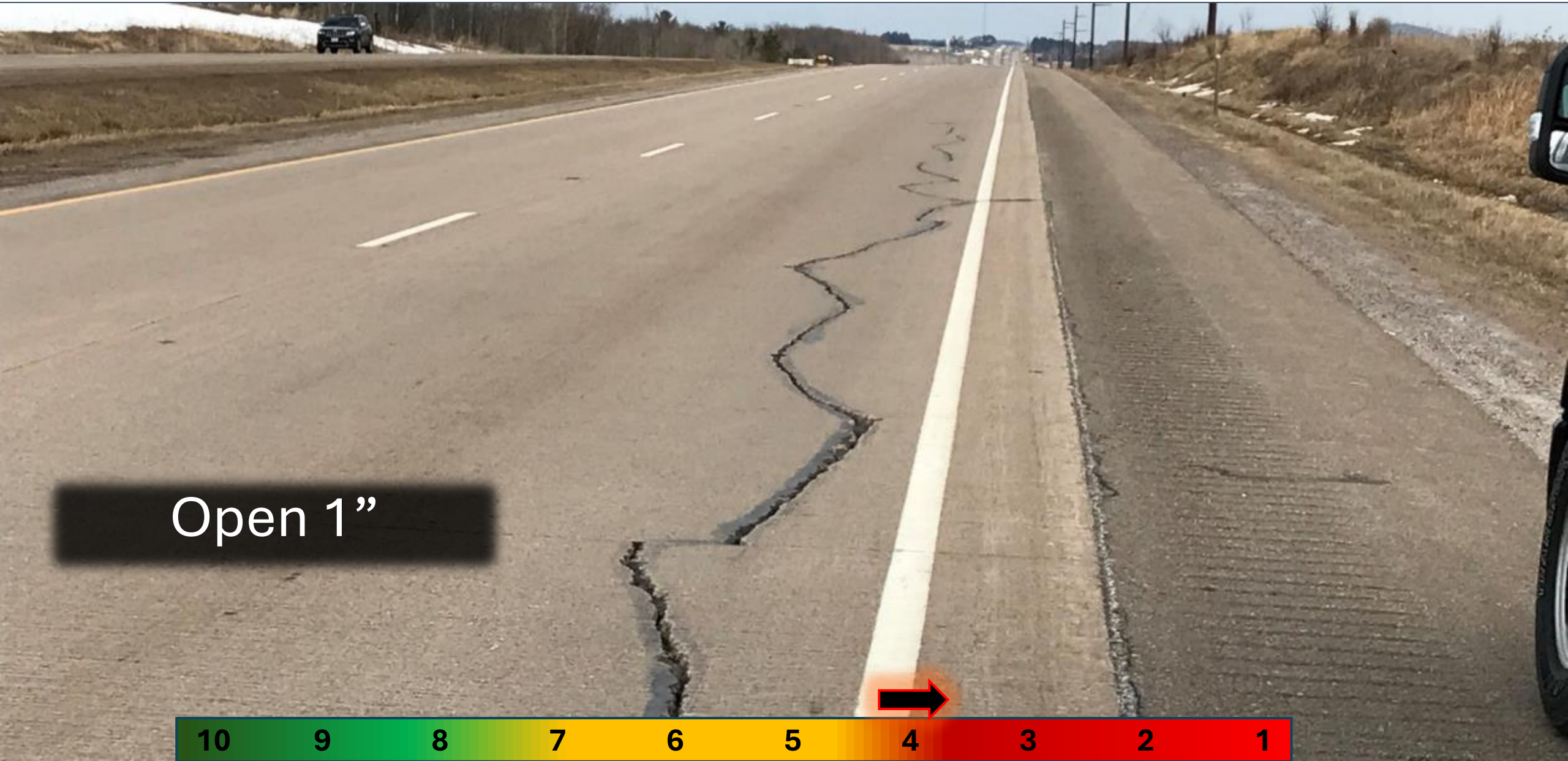
Meander Crack – New Construction



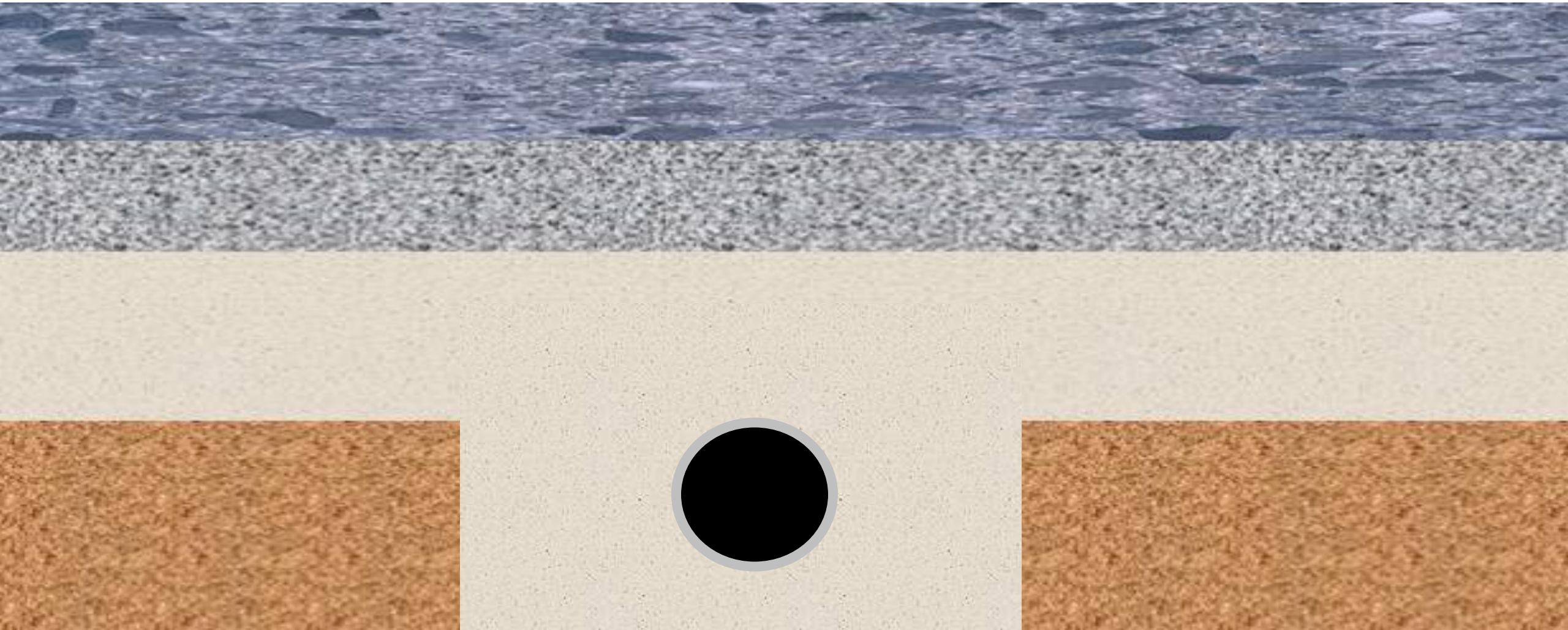
Concrete Cracking - Meander



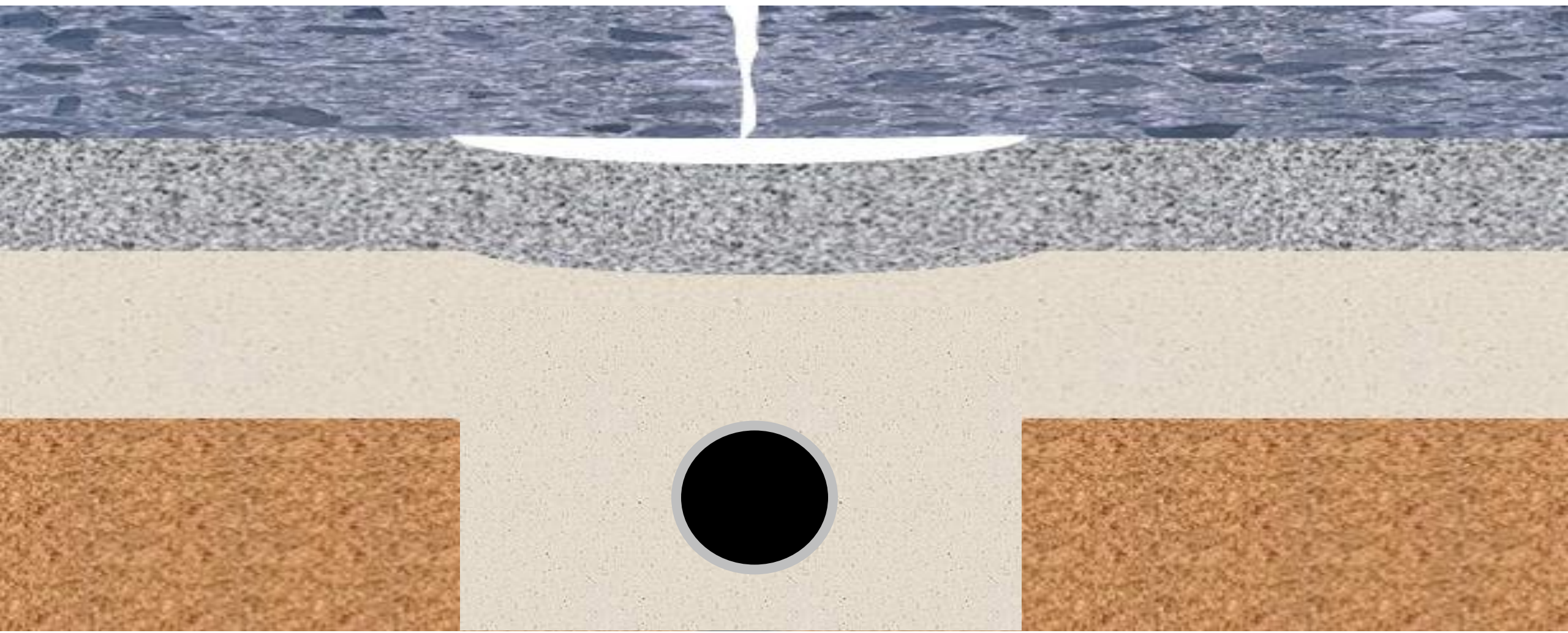
Concrete Cracking - Meander



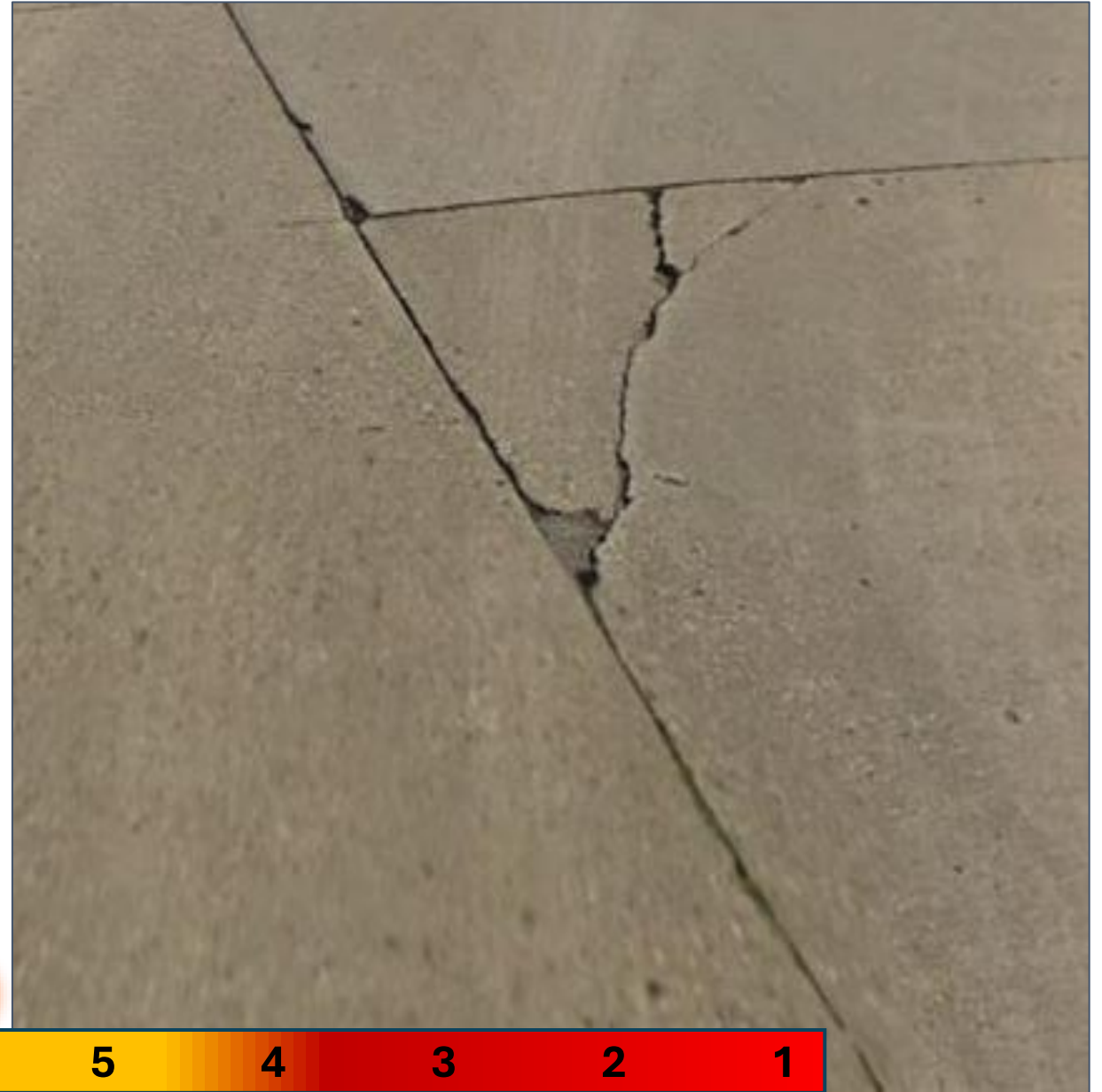
Settlement – Utility Trench



Settlement – Utility Trench

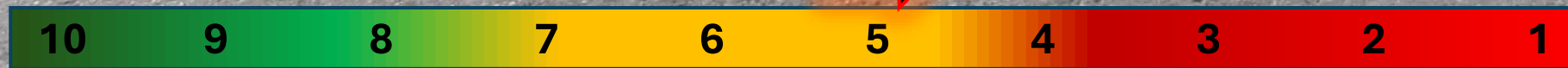


Concrete Cracking – Corner Break

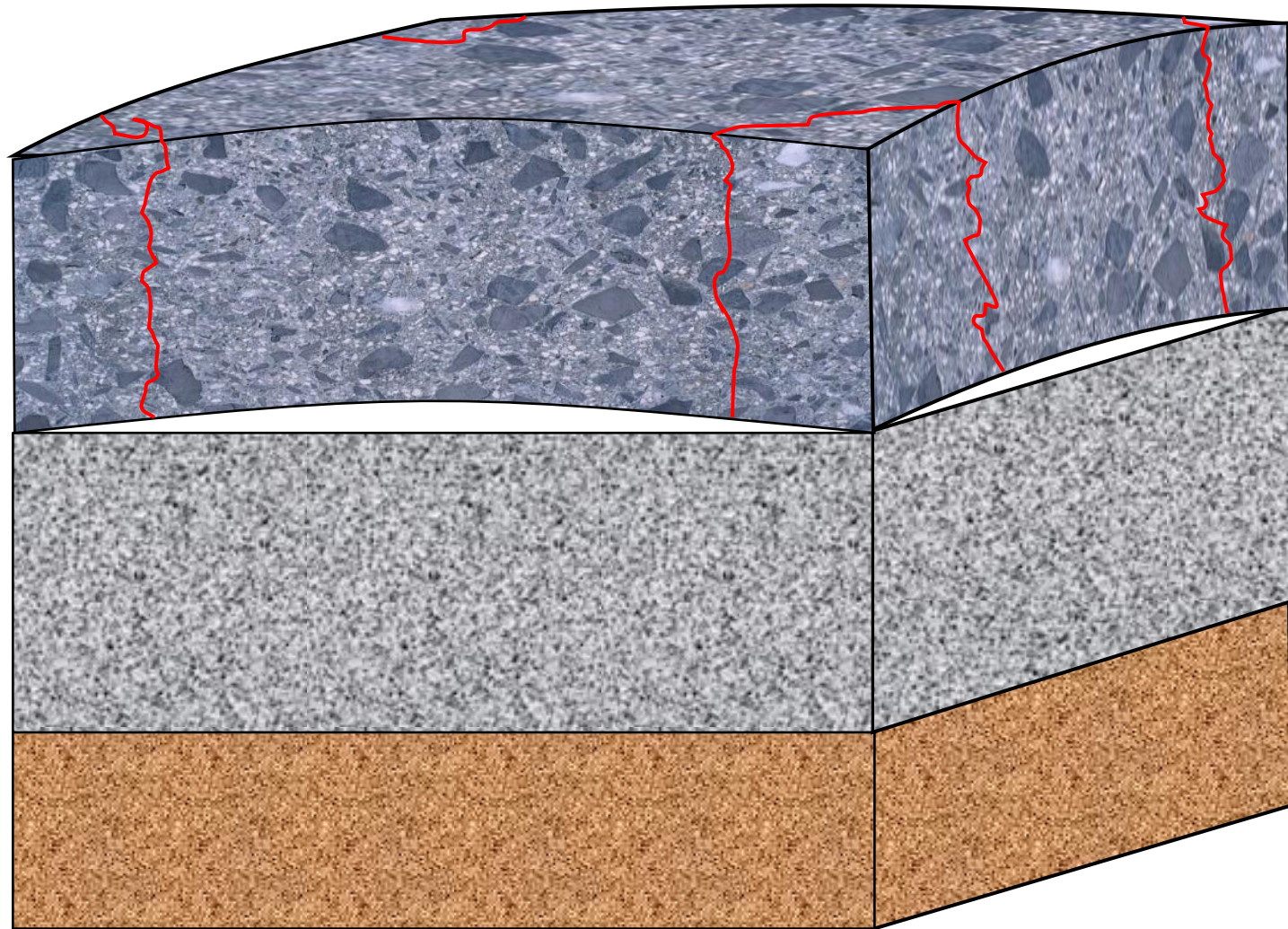


Concrete Cracking – Corner Break

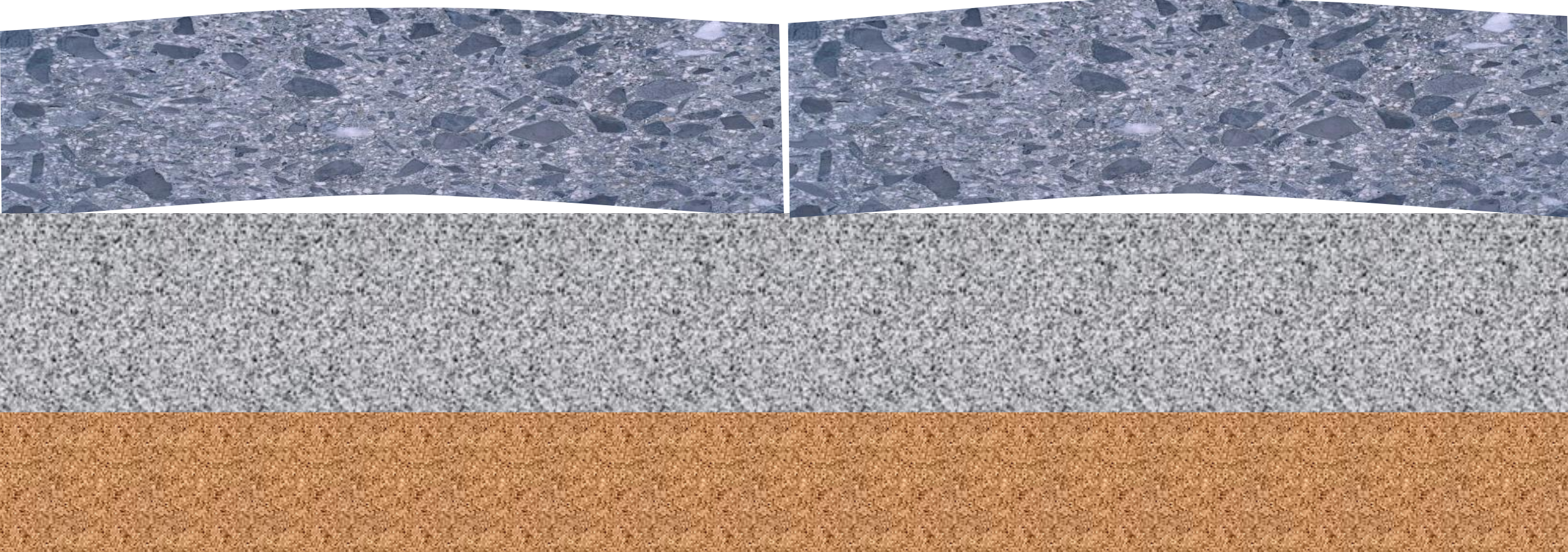
Multiple cracks
with broken pieces



Concrete Cracking – Slab Curling / Corner Break



Concrete Cracking – Slab Curling / Corner Break



Concrete Joint Distress



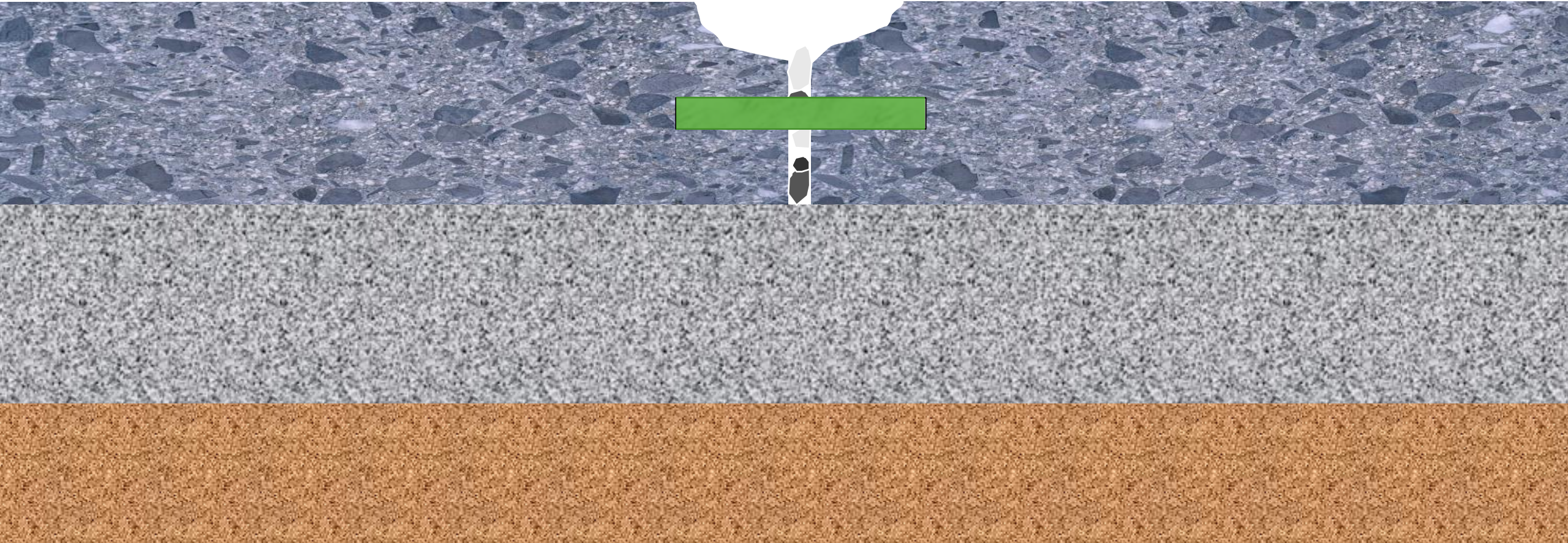
Concrete Joint Distress



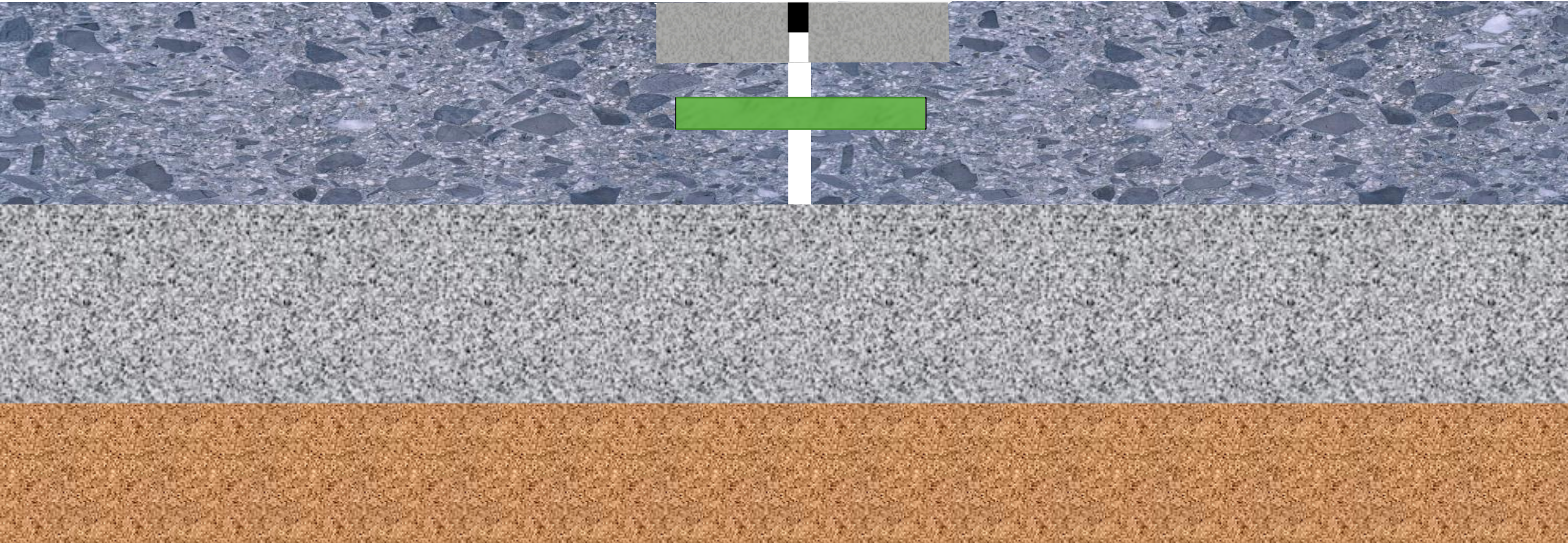
Typical Concrete Joint



Cause of Joint Spall – Incompressible Materials



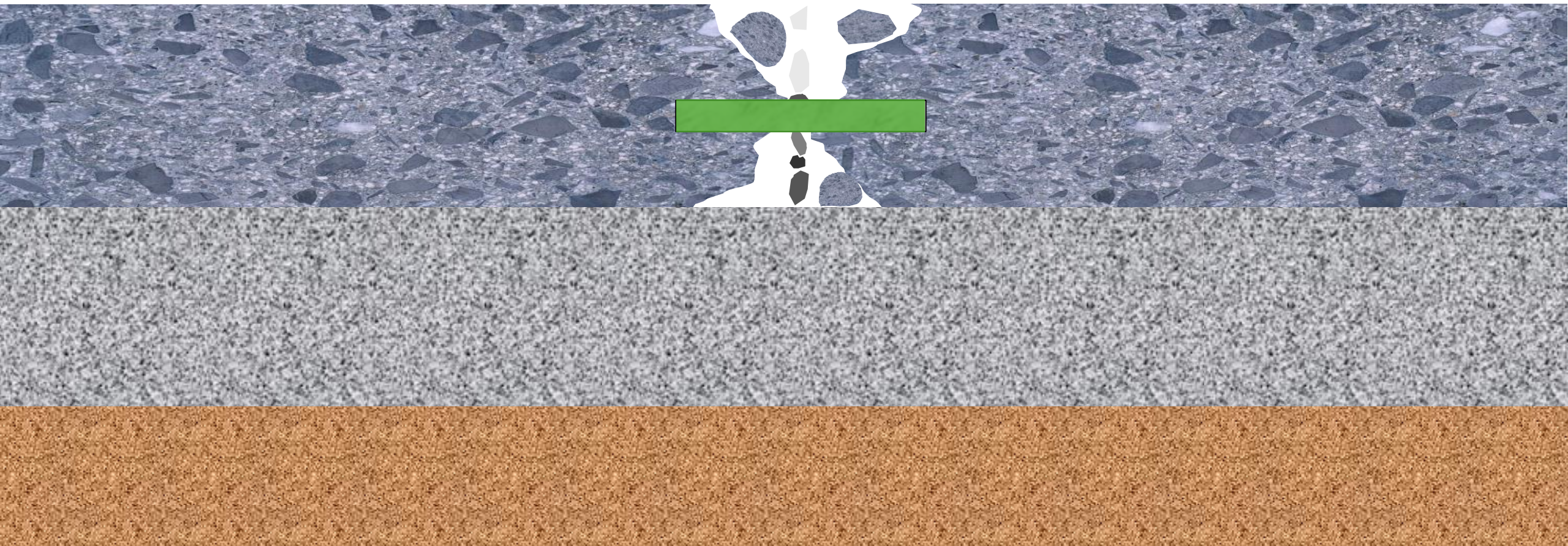
Partial Depth Joint Repair



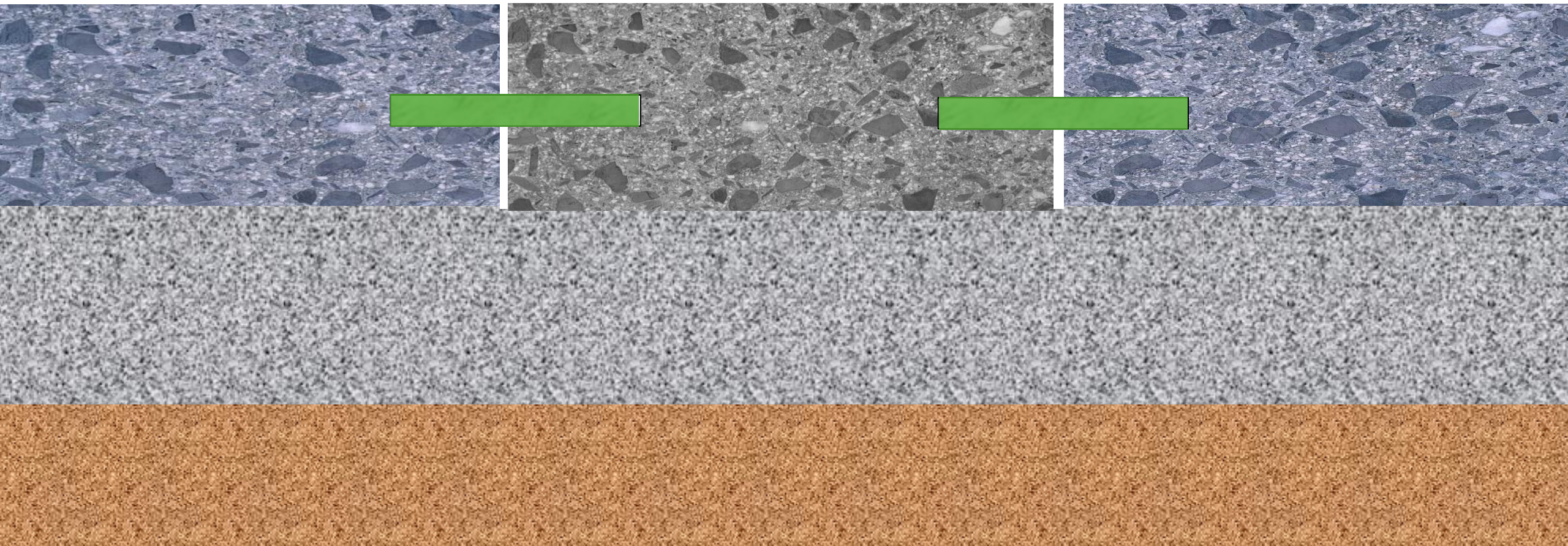
Partial Depth Joint Repair



Full Depth Needed



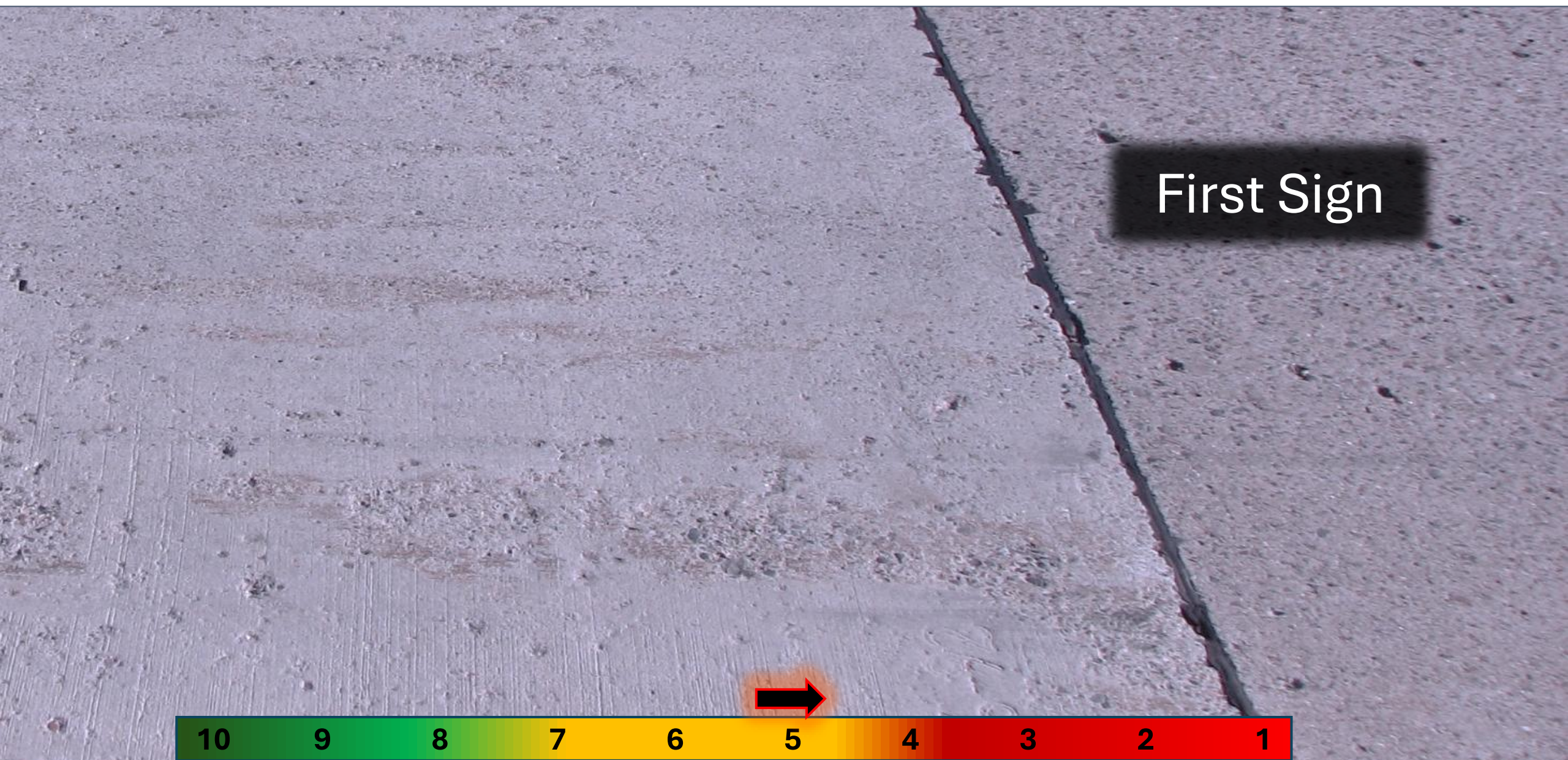
Full Depth Joint Repair



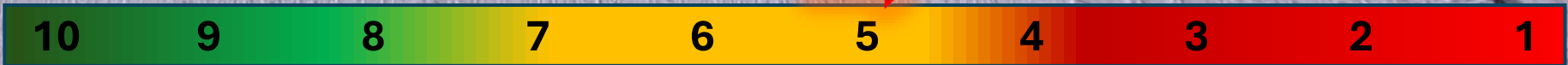
Full Depth Joint Repairs



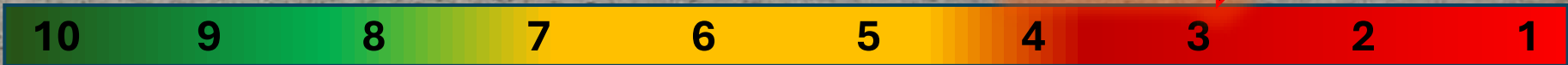
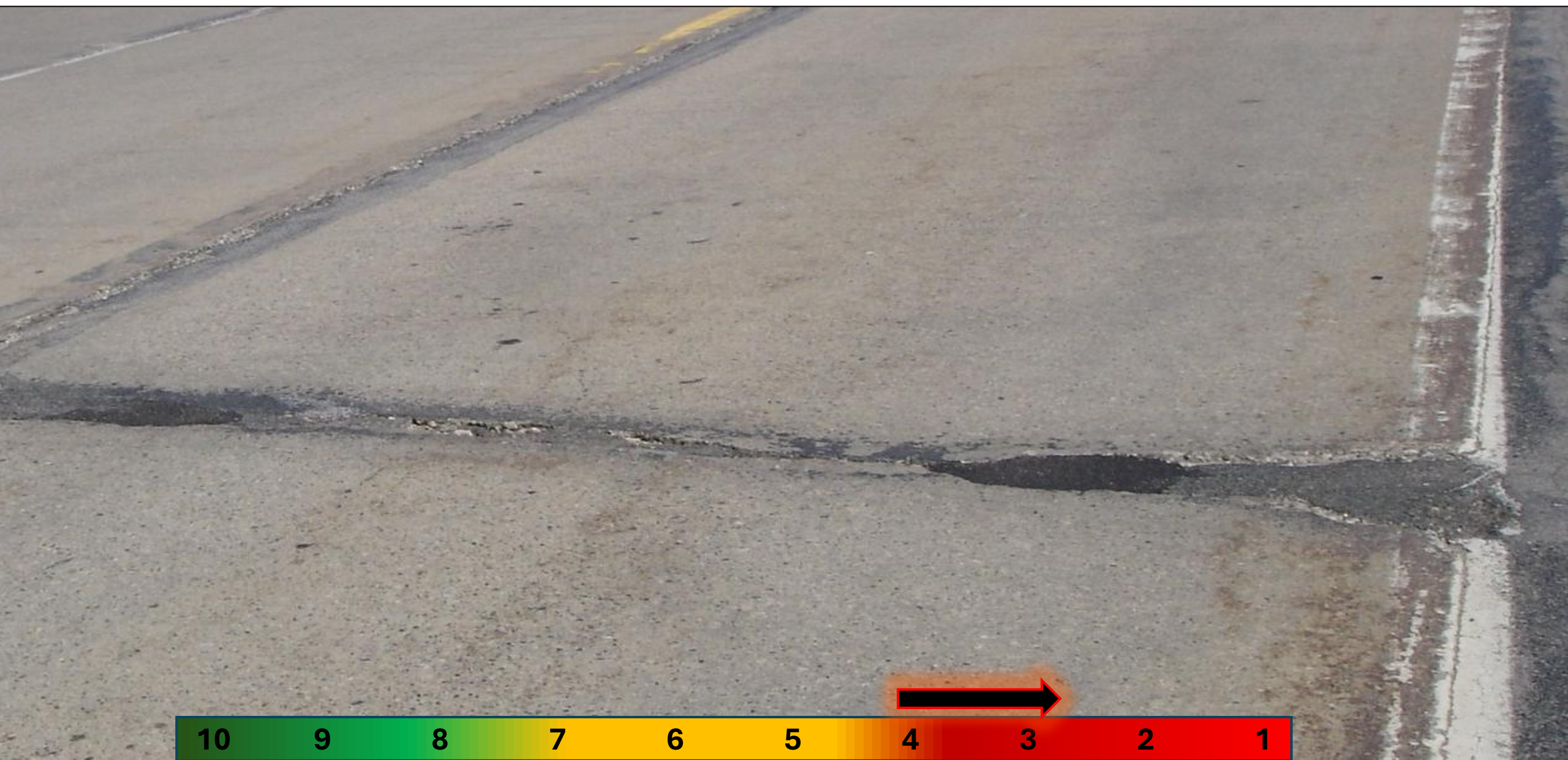
Joint Distress – Spalling



First Sign



Joint Distress – Spalling



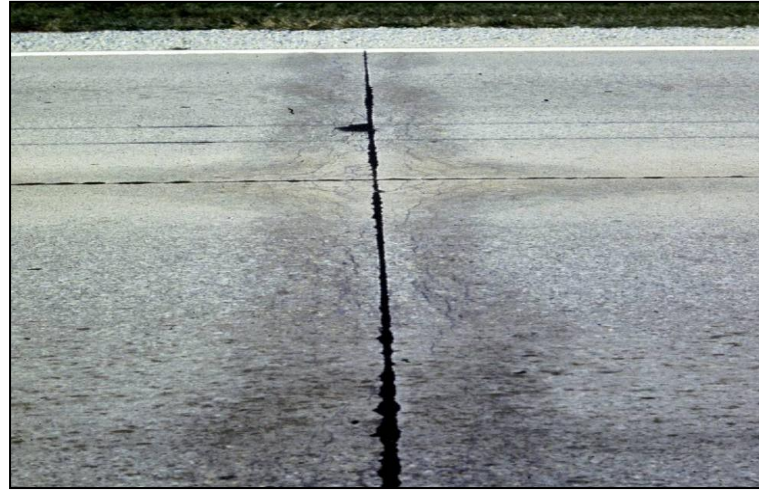
Concrete Deformations



Concrete Deformations



Buckles



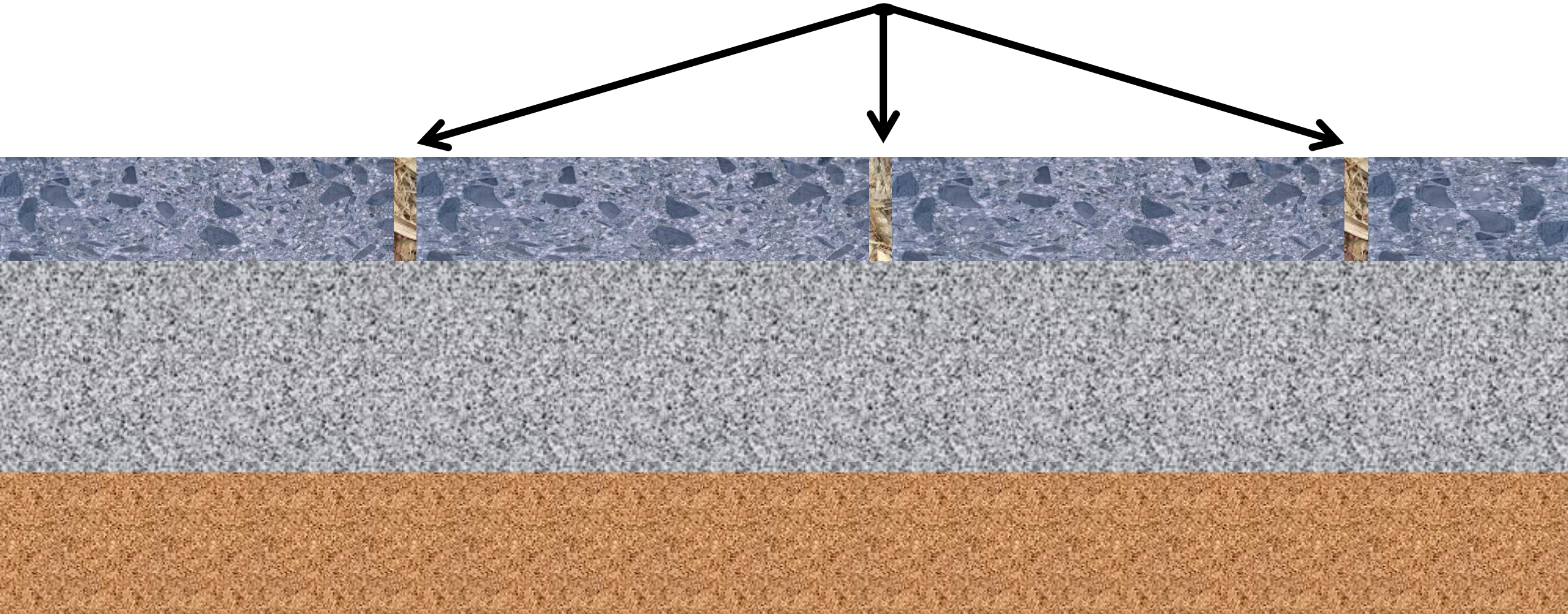
Durability Cracking



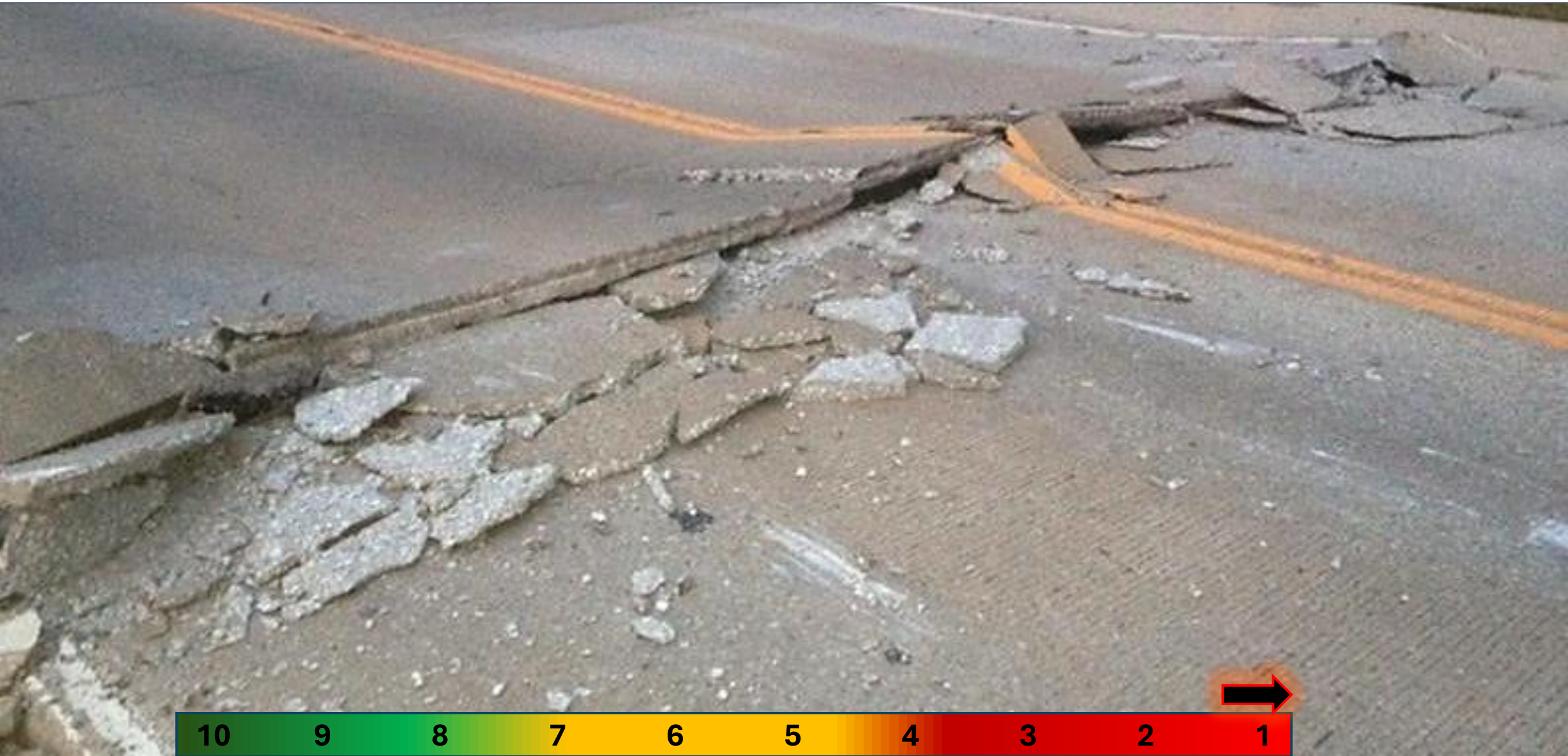
Faulting

Deformations – Buckles

Non-compressible Material



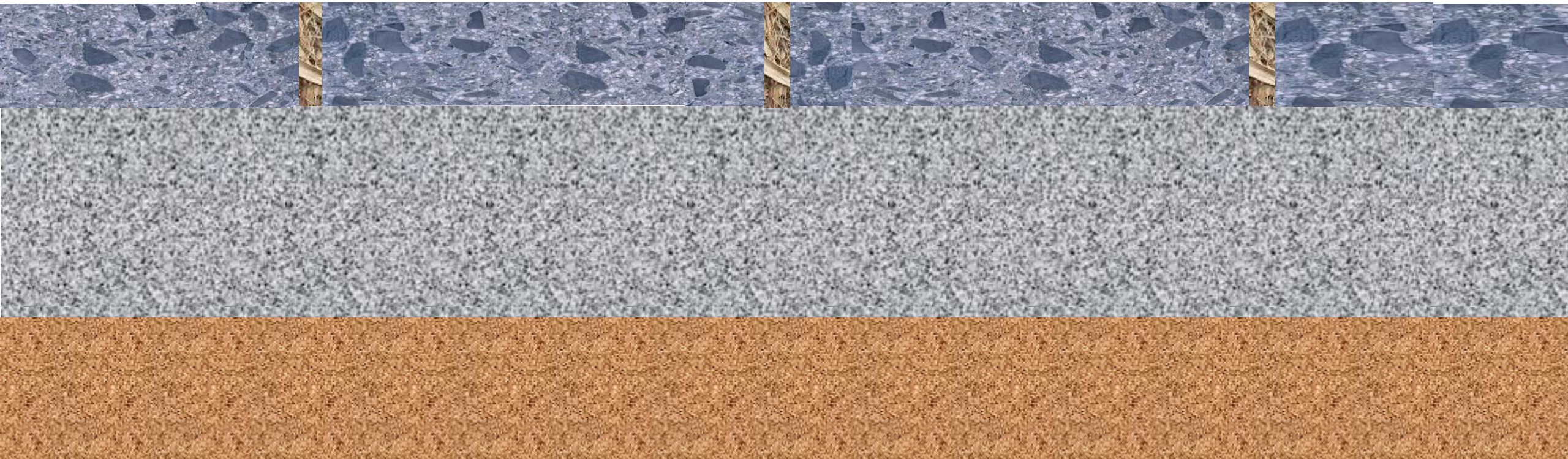
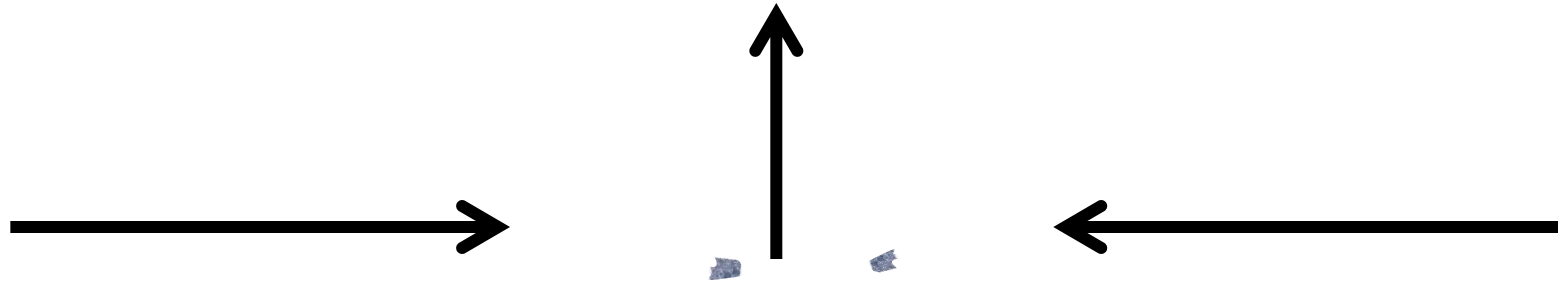
Deformations – Buckles



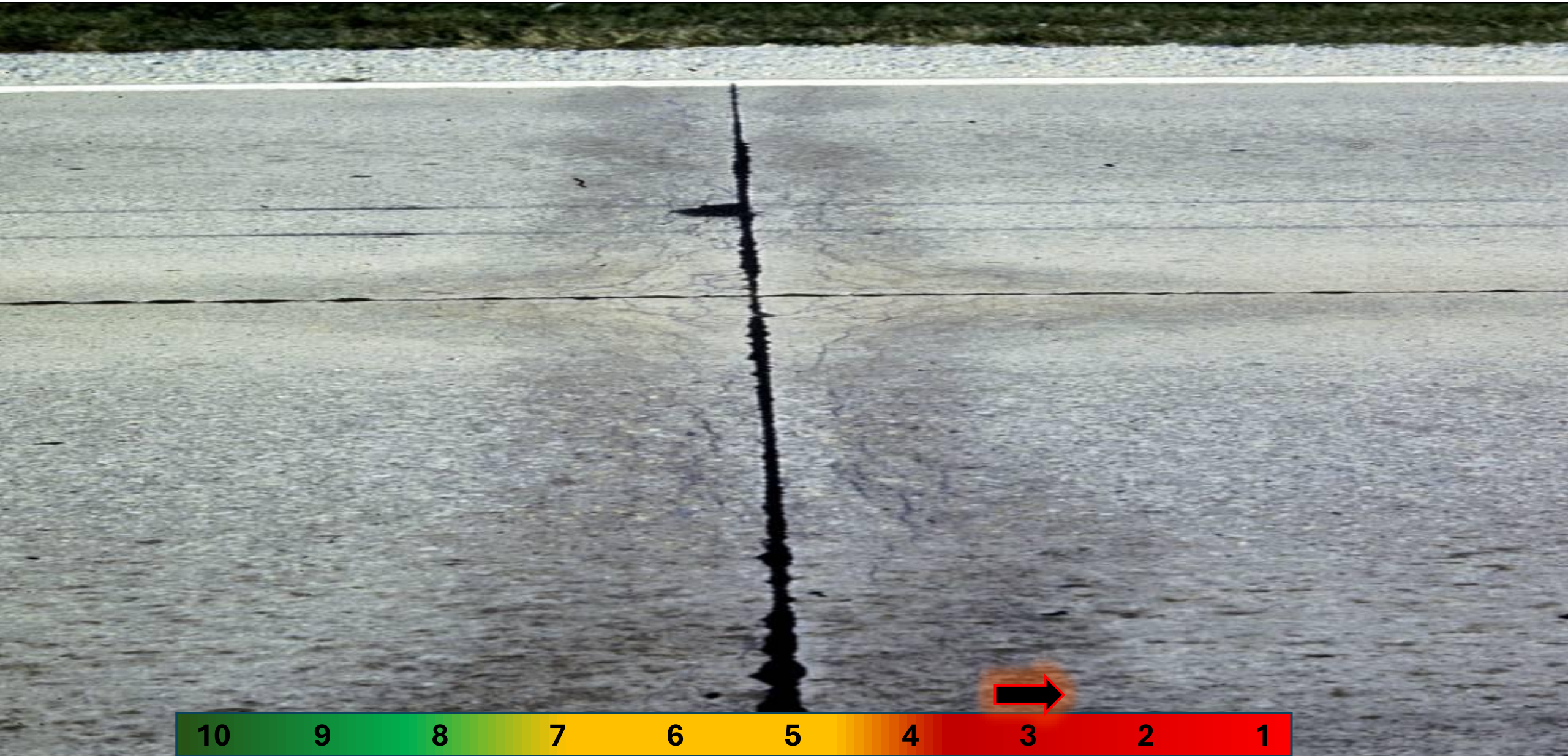
Deformations – Buckling (Tenting)



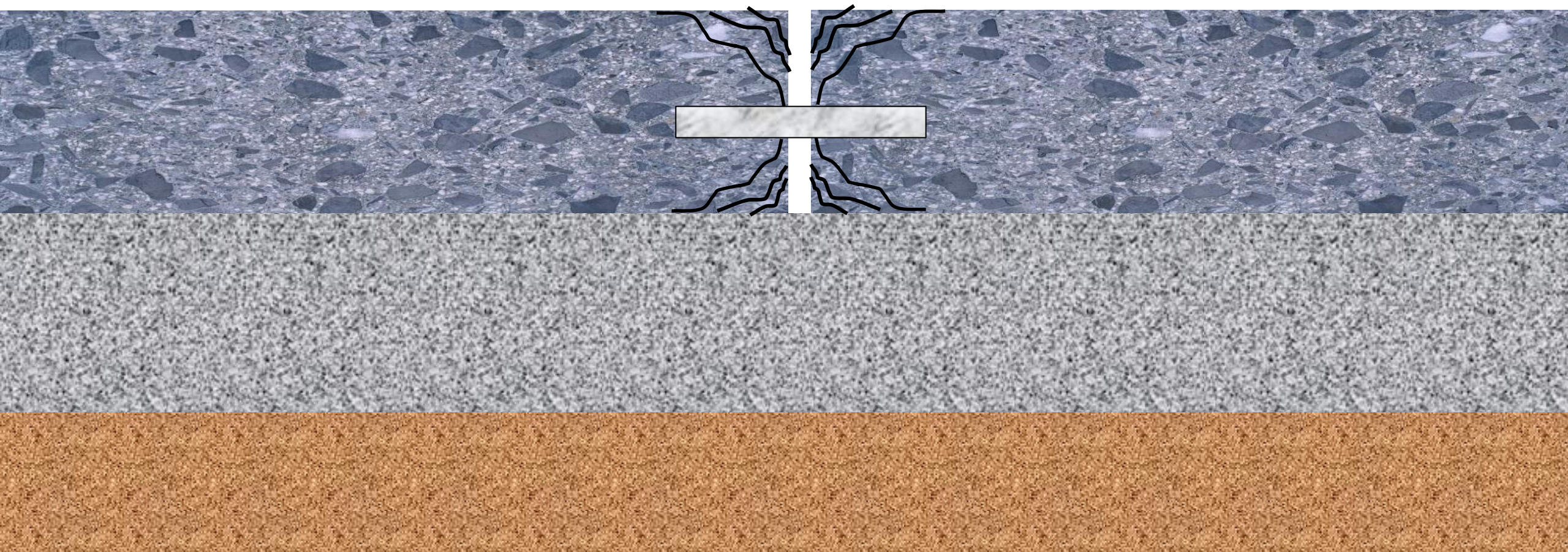
Deformations – Buckles



Deformations – Durability Crack



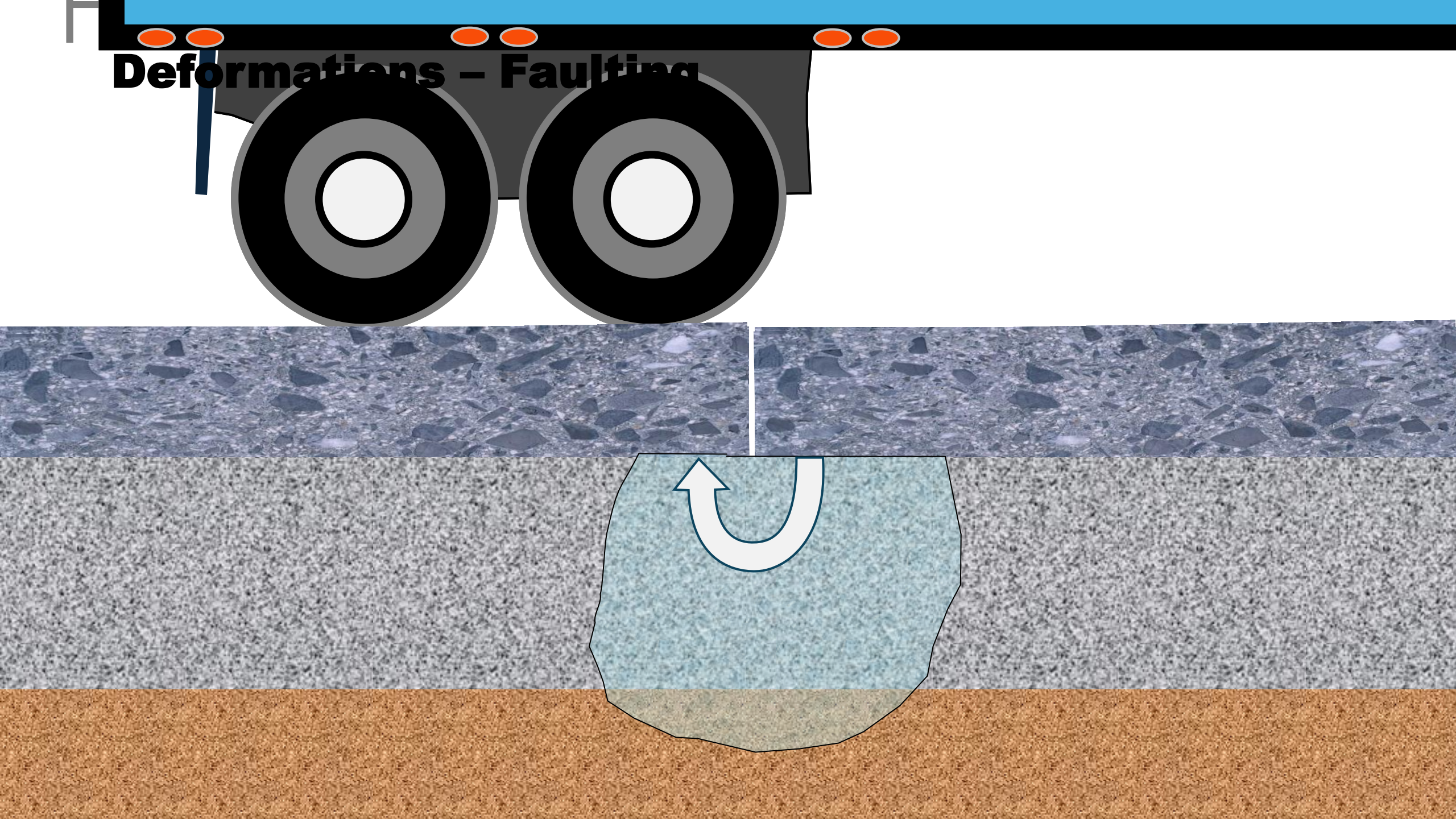
Deformations – Durability Crack



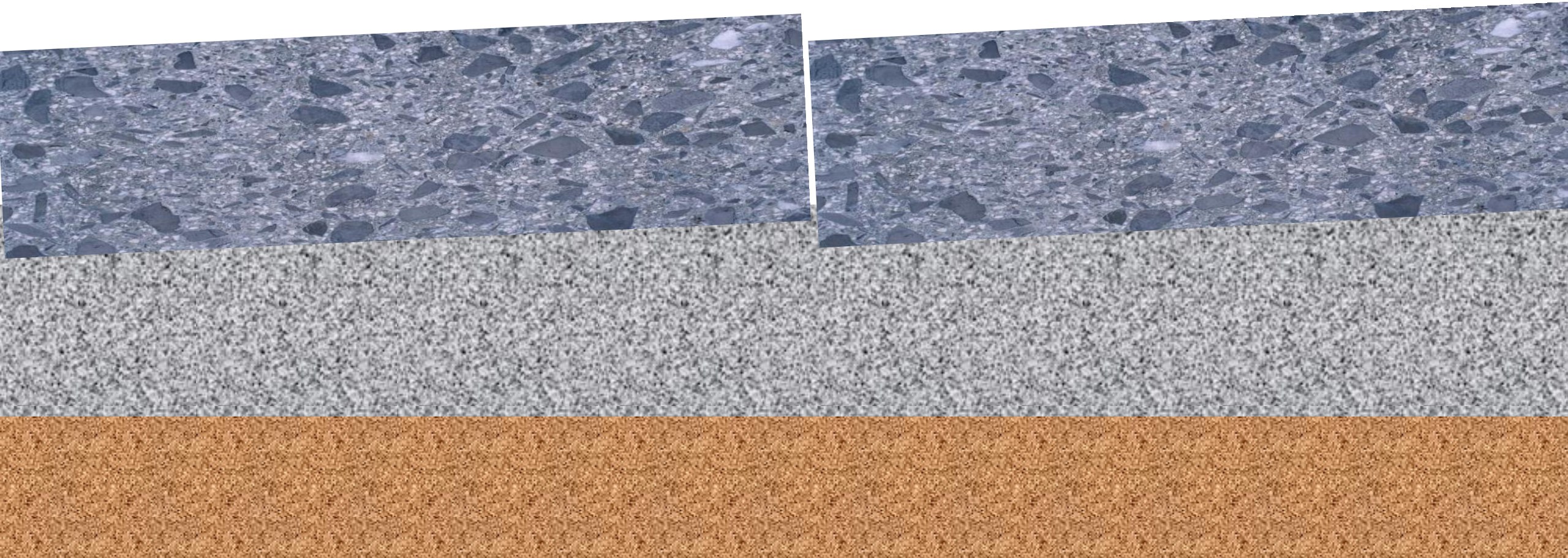
Deformations – Faulting



Deformations – Faulting

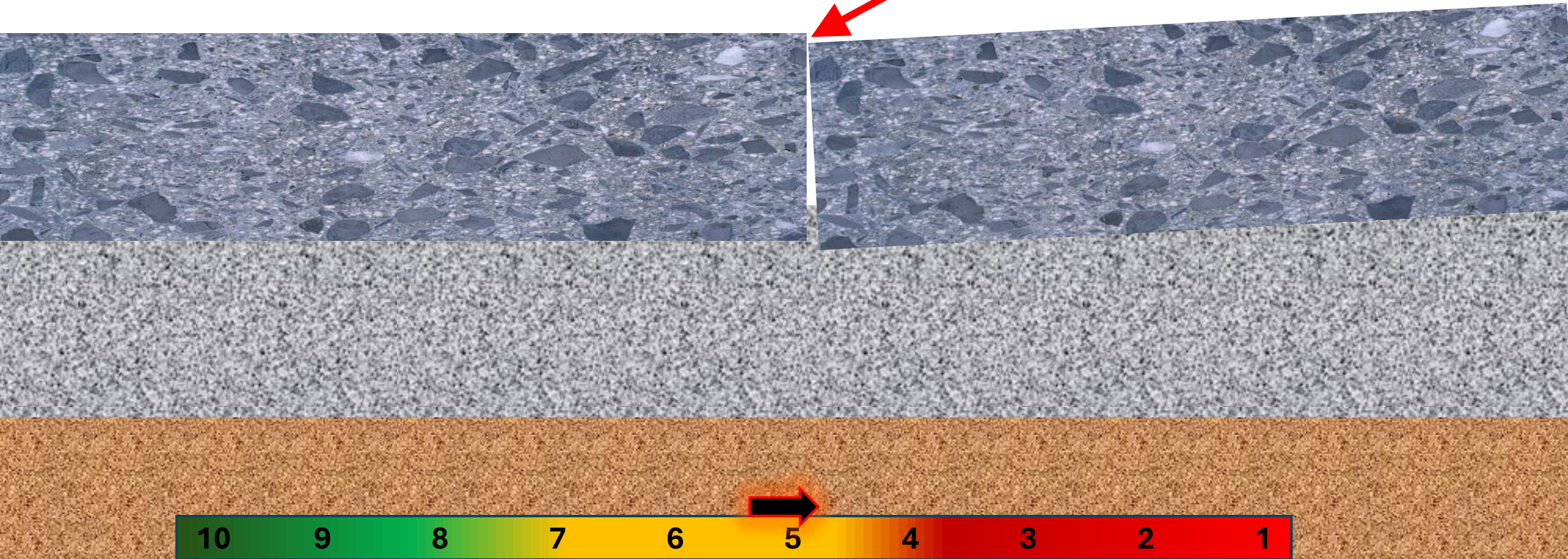


Deformations – Faulting



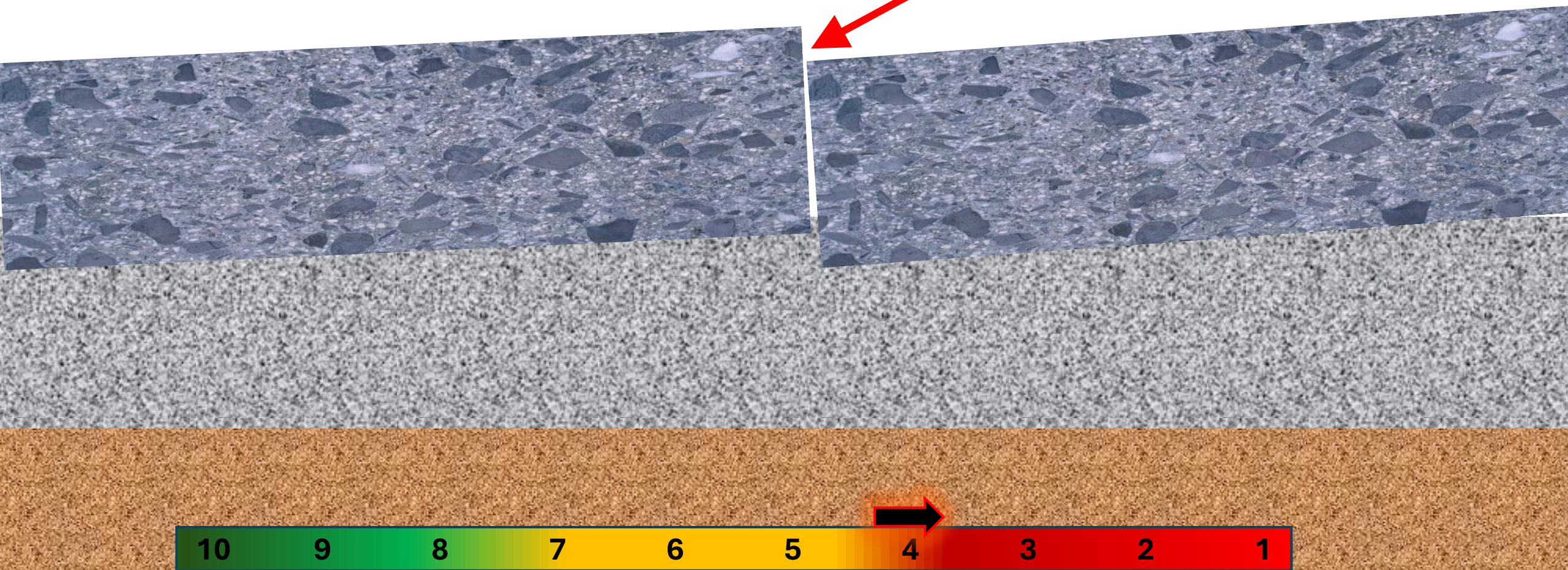
Deformations – Faulting

1/4" or Less Faulting



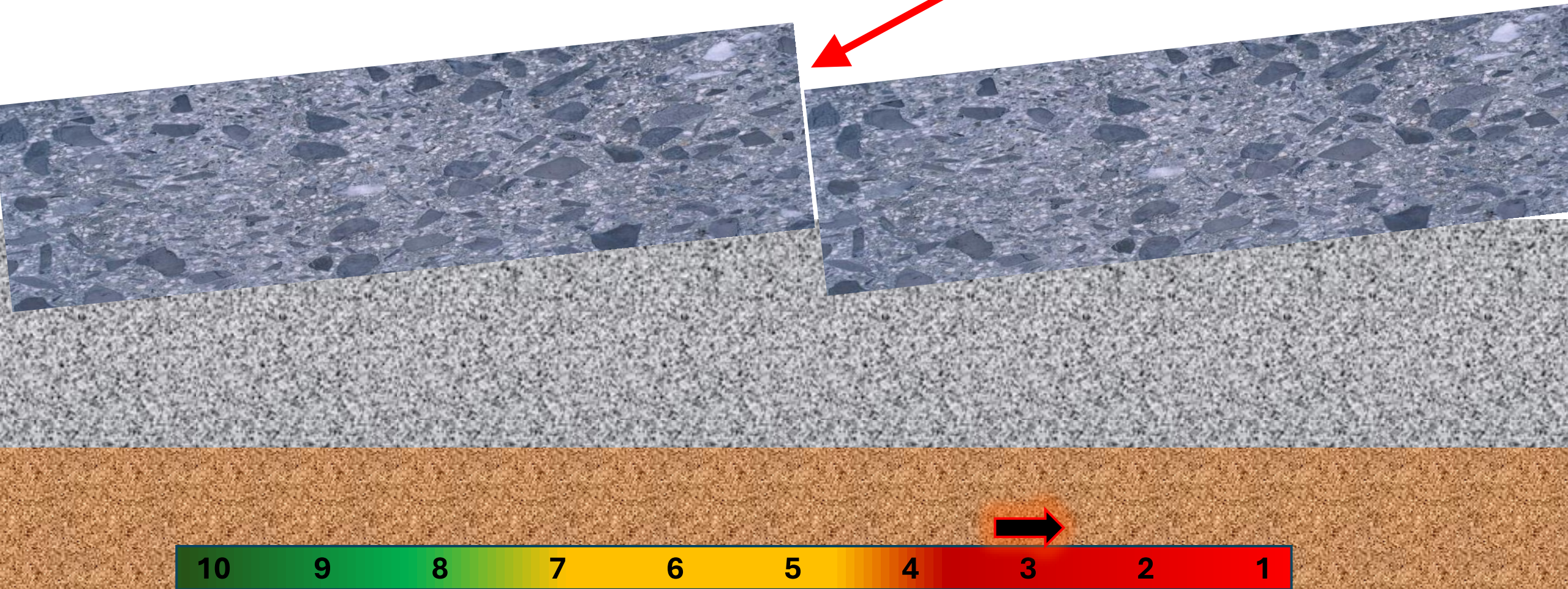
Deformations – Faulting

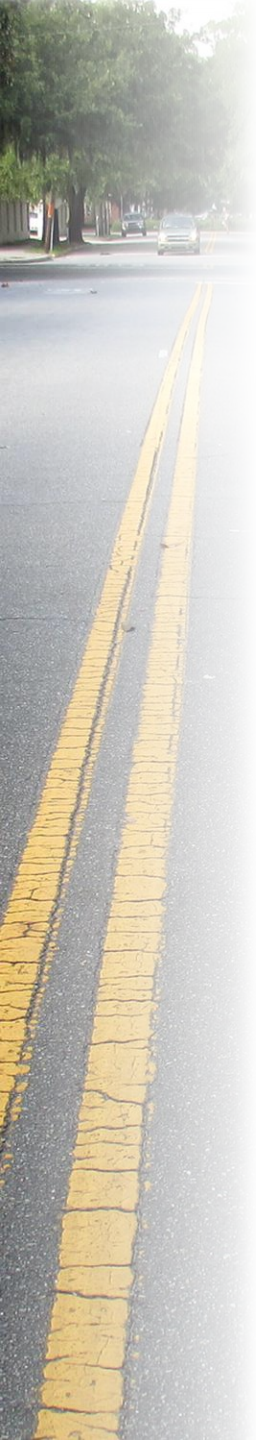
$\frac{1}{4}$ - $\frac{1}{2}$ Faulting



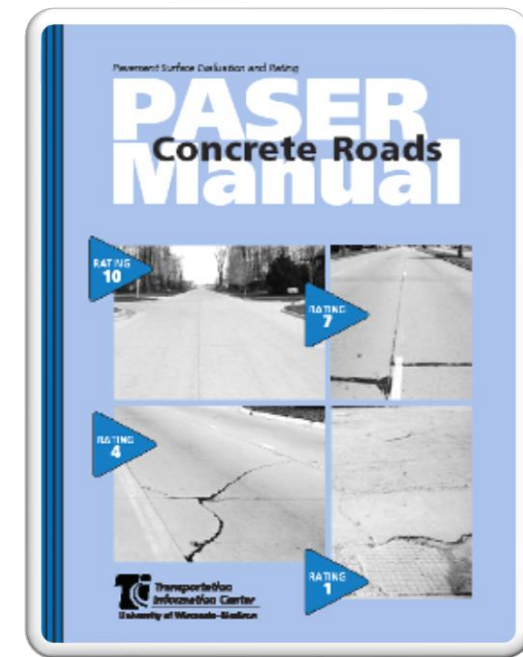
Deformations – Faulting

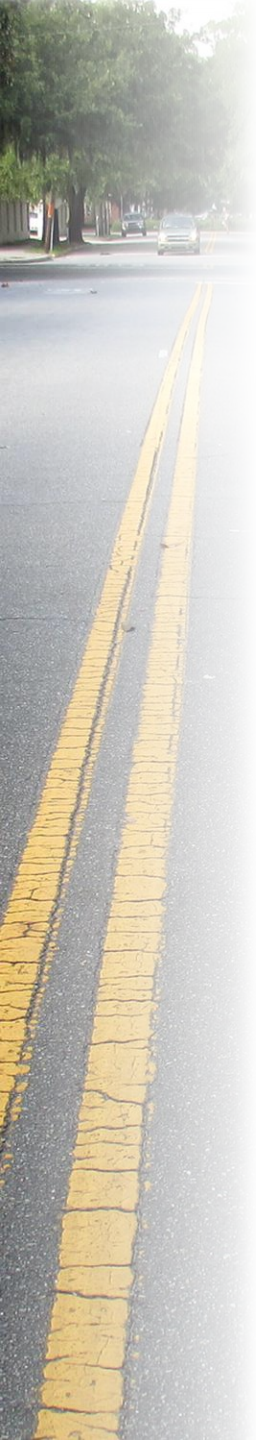
1/2 - 1" Faulting





Concrete Review





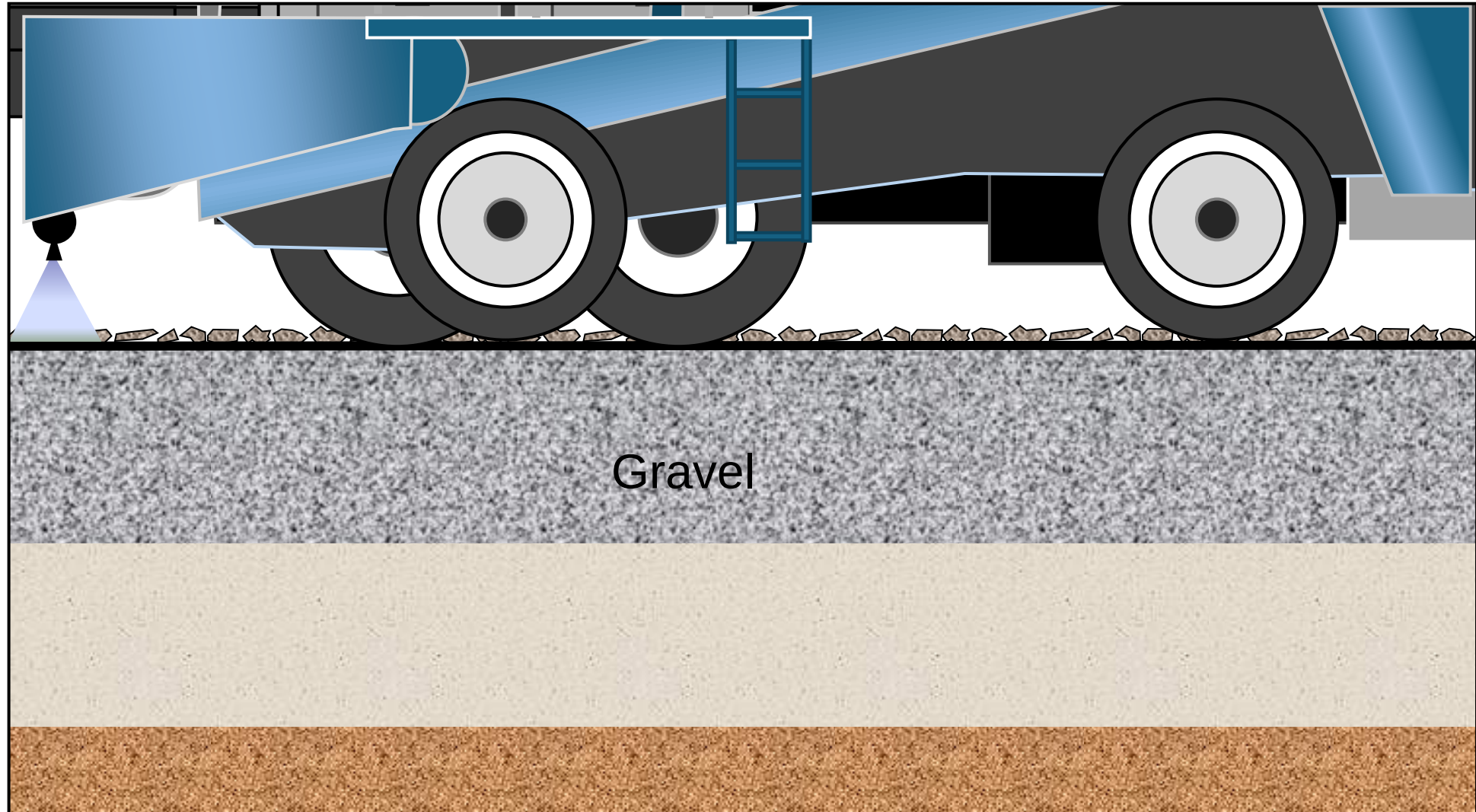
Sealcoat Pavements

Michigan Sealcoat Rating Guide				
	Rating	Condition/Defects	Remedy/Action	Typical Age (years)
GOOD	10	New construction	None	< 1 year
	9	Like new	None	1 to 3
	8	First signs of distress	Resurface construction	3 to 5
	7	Edge distress limited Minor distress	Minor edge seal	5 to 7
FAIR	6	Edge distress < 5% Line distress < 5% OR Raveling < 5% Minor potholes	Minor patching	7 to 10
	5	Edge distress < 10% Line distress < 10% OR Raveling < 10% Moderate potholes	Minor patching or triple application	8 to 10
	4	Possible crush-and-chape first Edge distress < 50% OR Raveling greater than 2"	Reconstruct by crush-and-chape prior to new sealcoat surface, possible return to gravel	> 9
	3	Extensive distress > 50% of surface area	Reconstruction by crush-and-chape prior to new sealcoat surface, or return to gravel	> 10
Not rated	0			

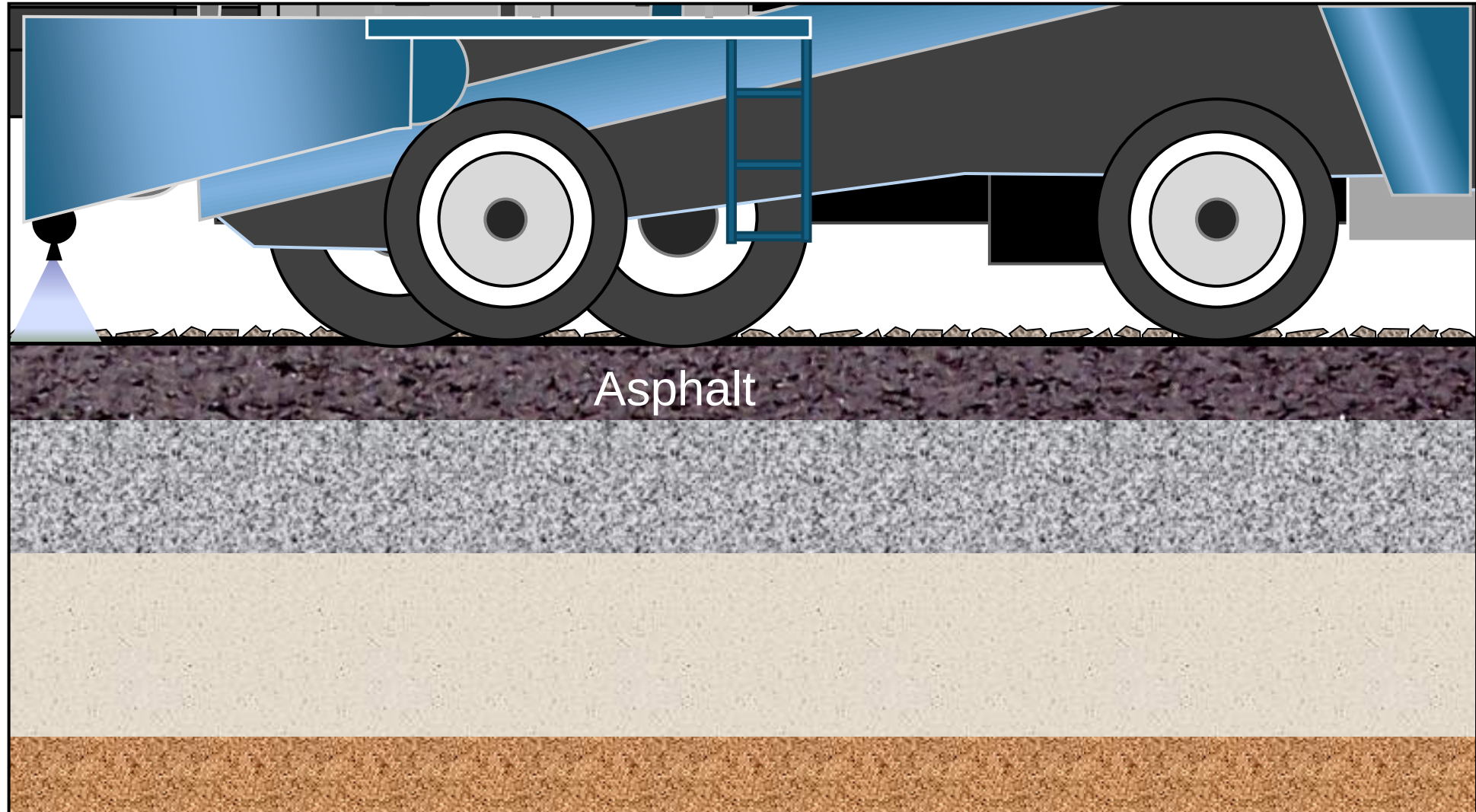
NOTE: To be used for Michigan TAMP, this checklist is subject to various provisions found in P&ID Sealcoat Manual

Michigan Transportation Asset Management Council Presented by Center for Technology & Training 2020 Center for Technology & Training Presented by Center for Technology & Training

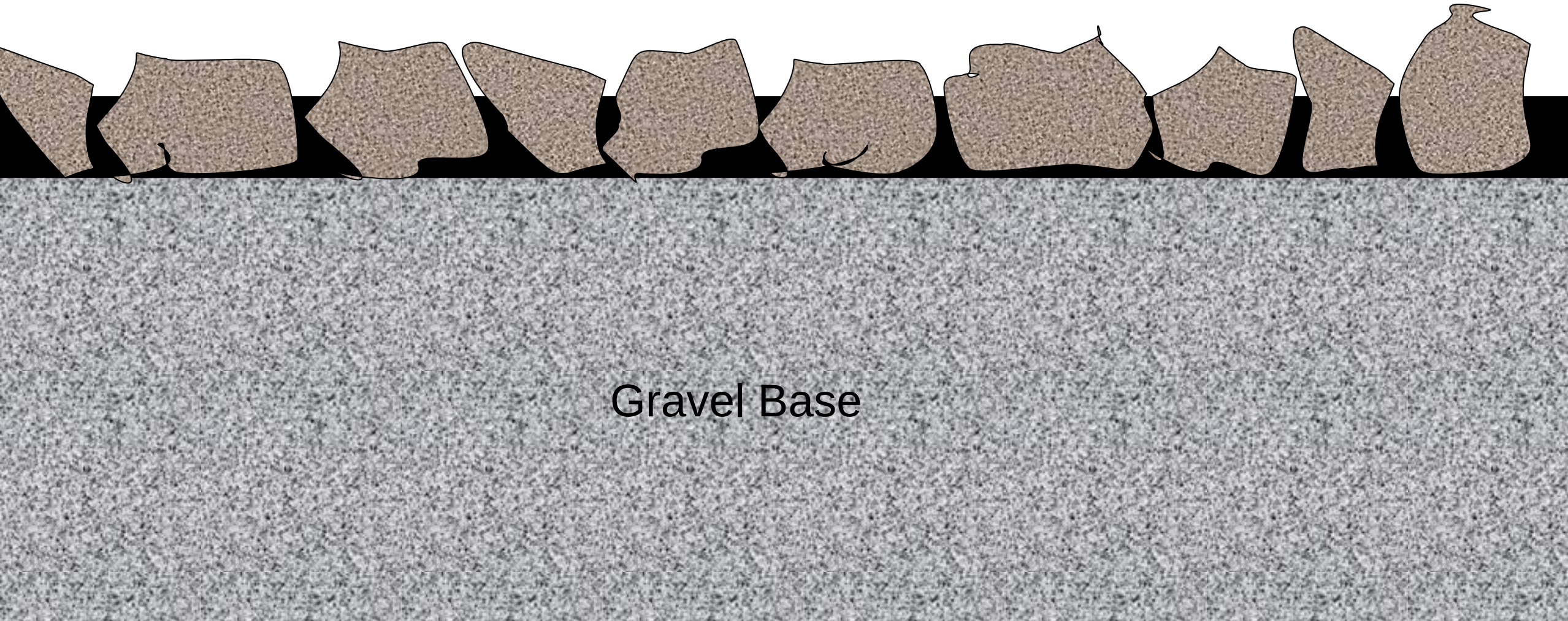
Chip Seal Pavement



Chip Seal on HMA



Sealcoat Pavement Close Up



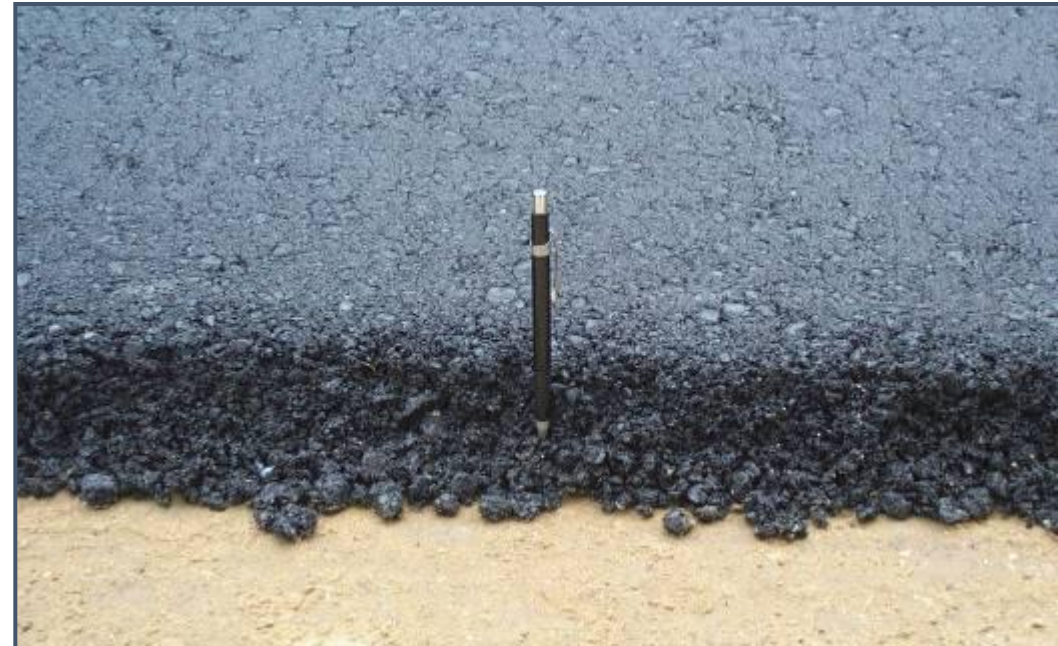
Gravel Base

Asphalt vs. Sealcoat



← Sealcoat

Hot Mix Asphalt →



Sealcoat Distress Types



Edge Distress

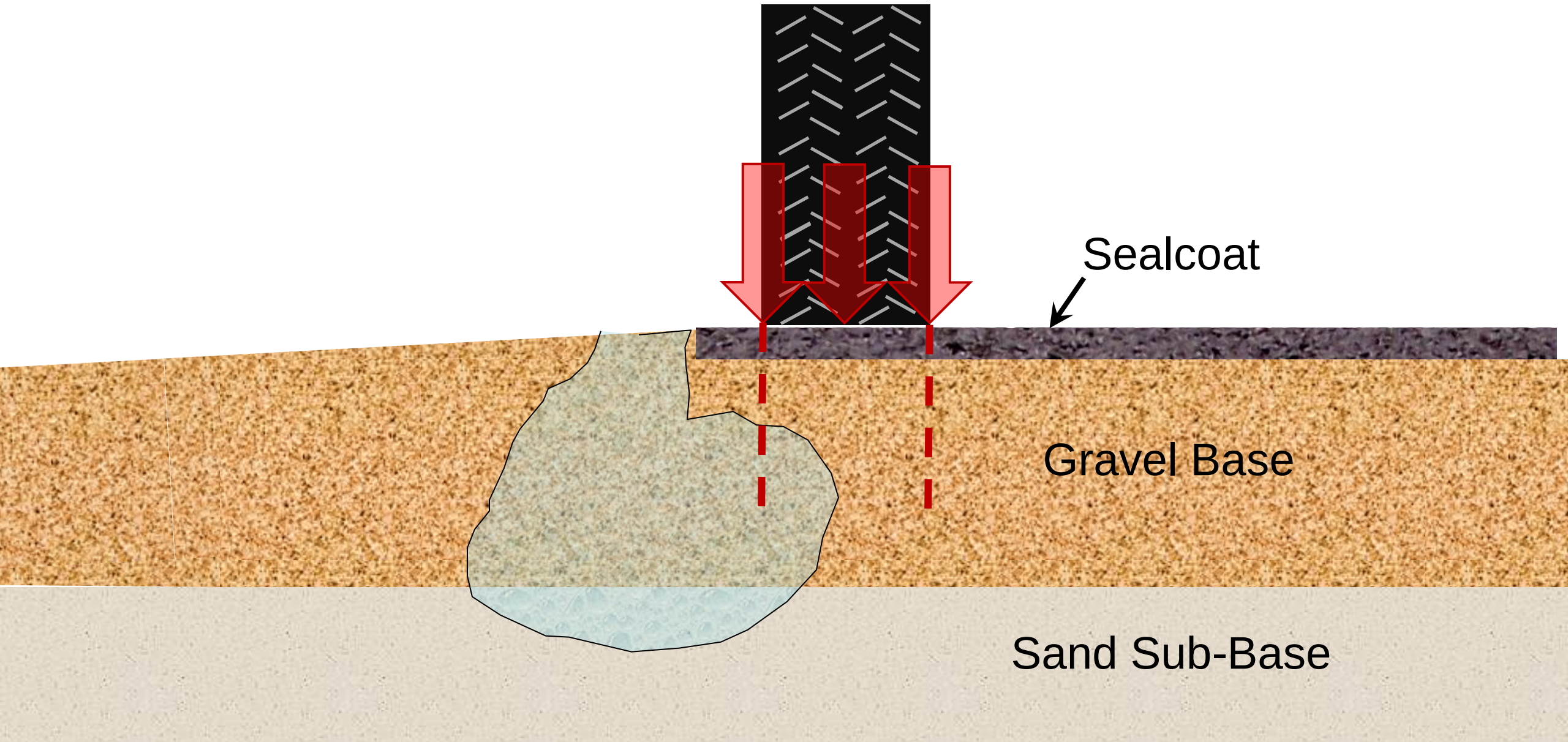


Lane Distress



Raveling

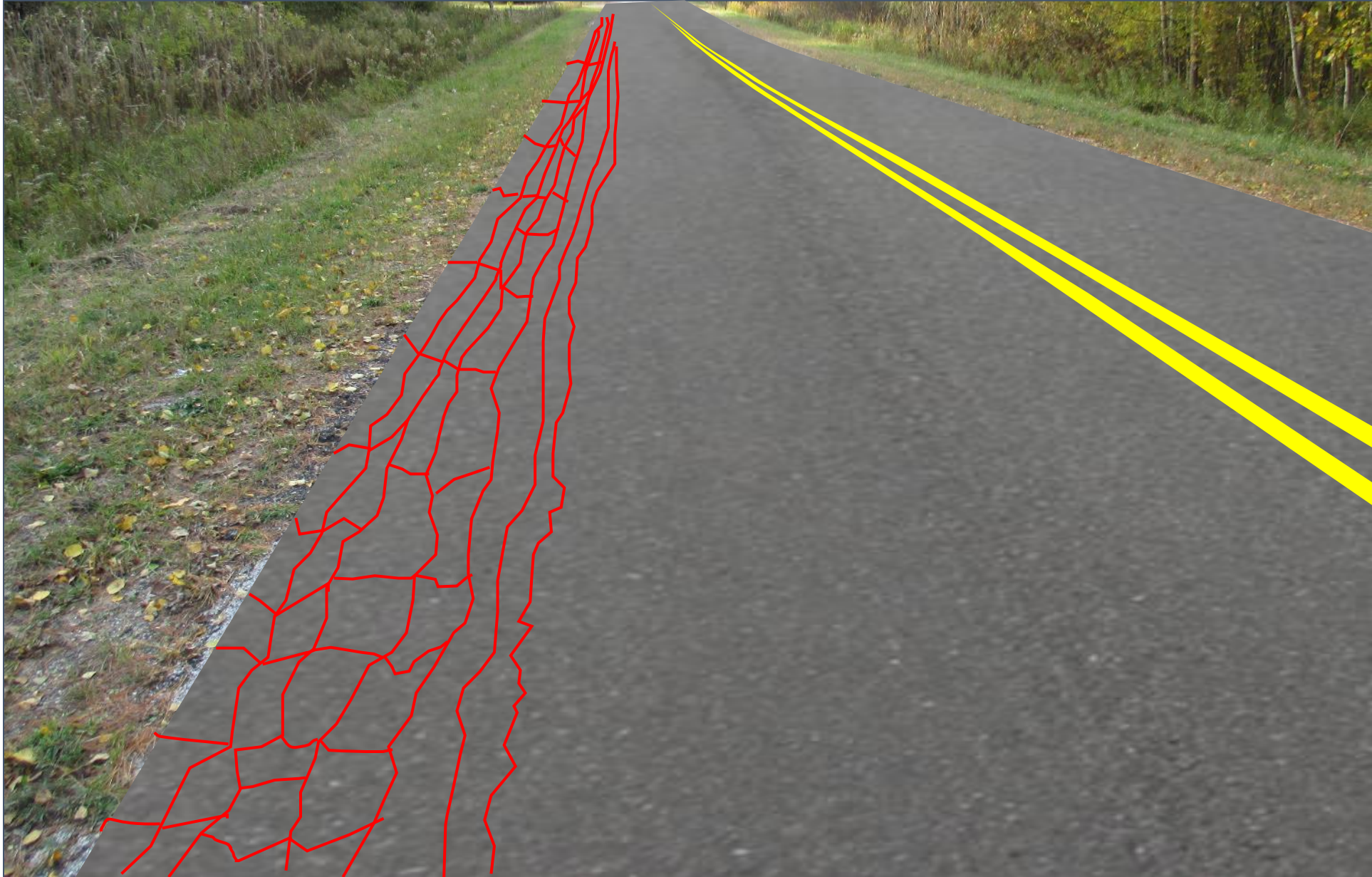
Edge Distress



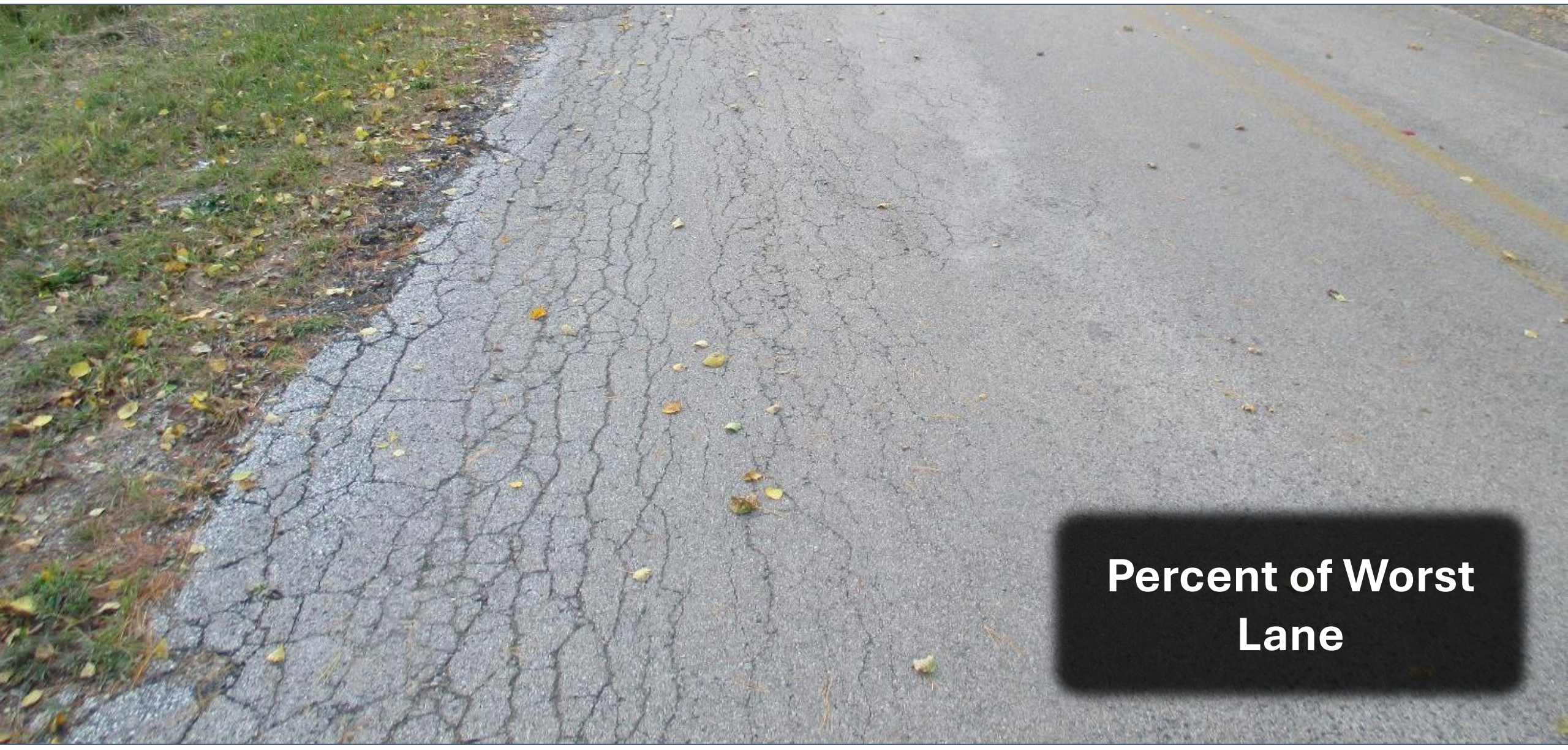
Edge Distress Progression



Edge Distress Progression



Edge Distress



**Percent of Worst
Lane**

Lane Cracking



Percent of Worst Lane



Raveling



Percent of Worst Lane

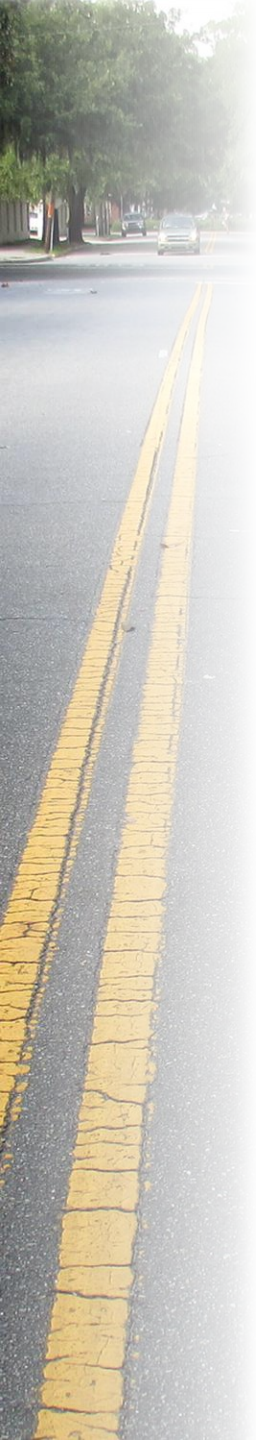


Rutting



Depth in Inches





Sealcoat Review

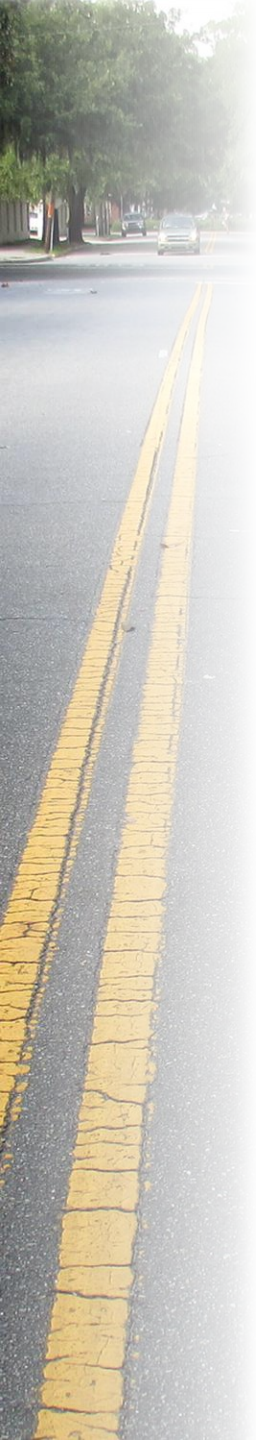
Michigan Sealcoat Rating Guide

Rating	Condition/Defects	Remedy/Action	Typical Age (years)
GOOD	10 New construction	None	< 1 year
	9 Like new	None	1 to 3
	8 First signs of distress	Resurface construction	3 to 5
	Edge distress limited Minor distress	Minor edge seal	
FAIR	7 Edge distress < 5% Lane distress < 5% OR Raveling < 5% Minor potholes	Minor patching	5 to 7
	6 Edge distress < 10% Lane distress < 10% OR Raveling < 10% Moderate potholes	Minor patching	7 to 10
	5 Edge distress < 20% Lane distress < 20% OR Raveling < 20% Moderate potholes	Minor patching	10 to 15
	4 Edge distress < 30% Lane distress < 30% OR Raveling < 30% Moderate potholes	Minor patching	15 to 20
POOR	3 Edge distress < 50% Lane distress < 50% OR Raveling < 50% Extensive potholes	Resurface by crush-and-charge prior to new sealcoat surface, possible return to gravel	> 9
	2 Edge distress < 75% Lane distress < 75% OR Raveling < 75% Extensive potholes	Resurface by crush-and-charge prior to new sealcoat surface, or return to gravel	> 10
Not rated	0		

NOTE: To be used for Michigan TAMP, this checklist is subject to various provisions outlined in P&ID Sealcoat Manual.

Michigan Transportation Asset Management CouncilTechnology & TrainingPresented to Center for Technology & Training, Michigan State University, on behalf of the Michigan Transportation Asset Management Council

Michigan Sealcoat Rating Guide



Final Thoughts

Upcoming Trainings & Final Thoughts

Review PASER Manuals and print Cheat Sheets prior to next training

IBR

Learn the basics of using the Inventory-Based Rating (IBR) System™ for rating unpaved roads.

- January 21, 2025 9am - 11am ET (Webinar)
- February 25, 2025 9am - 11am ET (Webinar)
- June 24, 2025 9am - 11am ET (Webinar)

IBR sessions are virtual only.

PASER Class 1

Class 1 covers distress identification for asphalt, concrete & sealcoat roads and sets the foundation for the PASER visual rating system.

- February 18, 2025 9am - 12pm ET (Webinar)
- March 4, 2025 9am - 12pm ET (Webinar)
- May 13, 2025 9am - 12pm ET (Webinar)
- August 26, 2025 9am - 12pm ET (Webinar)

PASER Class 1 sessions are virtual only.

PASER Class 2

Class 2 is an intro to the PASER system. It includes TAMC updates on data collection & council updates, rating rules and tips, interactive rating exercises on asphalt, concrete, and sealcoat roads.

- February 19 & 20, 2025 9am - 12pm ET (Webinar)
- March 5 & 6, 2025 9am - 12pm ET (Webinar)
- May 14 & 15, 2025 9am - 12pm ET (Webinar)
- May 20, 2025 8am - 12pm ET (Houghton)
- May 22, 2025 8am - 12pm ET (Gaylord)
- June 4, 2025 8am - 12pm ET (Livonia)
- June 5, 2025 8am - 12pm ET (Grand Rapids)
- August 27 & 28, 2025 9am - 12pm ET (Webinar)

PASER Class 2 is available virtual or in-person.

The virtual training is separated into two days; both days must be attended. In-person training is one day, but contains the same amount of information as the virtual training.

Modified for Michigan TAMC Data Collection
• Denotes Priority Distress

Asphalt PASER

Good	Asphalt 10 New construction (< 1 year old) No defects Recent base improvement Possible Action: Proactive Preventative Maintenance (PPM)	Asphalt 9 Like new condition (> 1 year old) No defects Recent overlay with or without a seal and shape Possible Action: PPM	Asphalt 8 Transverse cracks: > 40' apart Cracks: tight (hairline) or sealed Longitudinal cracks: few, no joints Recent seal coat or slurry seal (see below) Possible Action: Crack seal or PPM
Fair	Asphalt 7 Transverse cracks: 10-40' apart Cracks: open < 1/2" Crack erosion: none or little Surface raveling: none or little Patches: none or few in excellent condition First signs of wear Possible Action: Maintain with crack seal, fog seal	Asphalt 6 Transverse cracks: < 10' apart Block cracking: 6-10' blocks (large, stable) Cracks open 1/2" - 1" Surface raveling: slight Patches: few in good condition Polishing or flushing: slight, moderate Sound structural condition Possible Action: Maintain with sealcoat	Asphalt 5 Block cracking: 1' - 5' blocks Longitudinal cracks: first signs, at edge Secondary cracks: first signs Cracks open > 1/2" Surface raveling: moderate Patching or wedging: good condition Polishing & flushing: extensive, severe Sound structural condition Possible Action: Reconstruct with base repair Crack and shape
Poor	Asphalt 4 Block cracking: < 1' blocks Wheel-path cracking (longitudinal) Rating: 1/2" - 1" deep Transverse cracks: slight erosion Longitudinal cracks: slight erosion Surface raveling: severe Patches: fair condition First signs of structural weakening Possible Action: Structural overlay > 2" Underseal	Asphalt 3 Block cracking: severe (like alligator) Alligator cracking: initial, < 25% Rating: 1" - 2" deep Transverse cracks: extensive erosion Longitudinal cracks: extensive erosion Patches: fair/poor condition Potholes: occasional Possible Action: Structural overlay > 2" Patching & repair prior to an overlay Milling to extend overlay life	Asphalt 2 Alligator cracks: > 25% Rating or distortion: > 2" Cracks: closely spaced, with erosion Patches: extensive, in poor condition Potholes: frequent Possible Action: Reconstruction with base repair Crack and shape
	Asphalt 1 Like PASER 2 but with visible base and surface distress: severe with loss of integrity Possible Action: Reconstruction with base repair		

Base surface erosion, not ride quality. The extent of cracks in the wheel path, they can be sealed or not and not affect the ride.

Distressed the shoulder. Rate only the developable pavement, edge line or edge line.

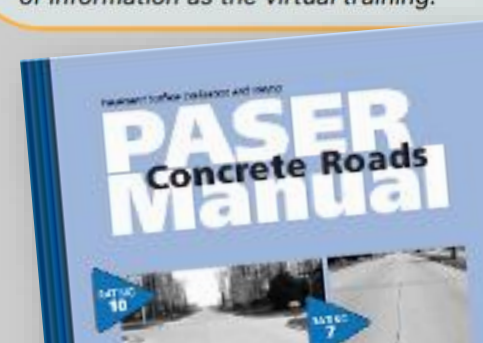
Sealcoat reflective cracks. By inspecting the type of crack (e.g. transverse, longitudinal, block, alligator).

Sealcoat. If maintenance is in progress (i.e., work in progress), rate the surface, not the new surface. Same handle by

Surface condition. rate the surface. Same handle by

Sealcoat. If maintenance is in progress (i.e., work in progress), rate the surface, not the new surface. Same handle by

Sealcoat. If maintenance is in progress (i.e., work in progress), rate the surface, not the new surface. Same handle by





Michigan Technological University • Department of Civil, Environmental, & Geospatial Engineering

PASER TRAINING

CLASS TWO

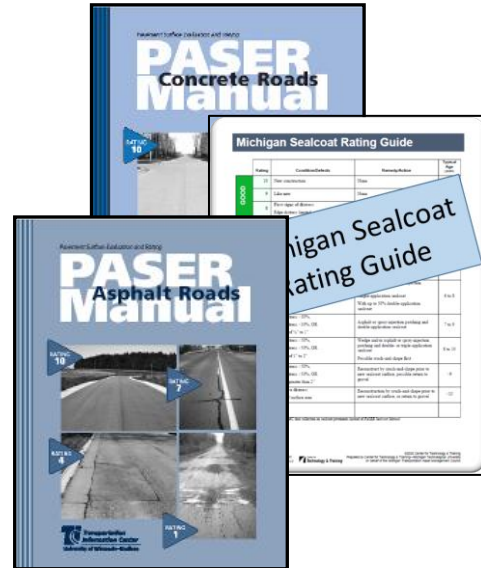
Sponsored by:



Michigan
Transportation Asset
Management Council

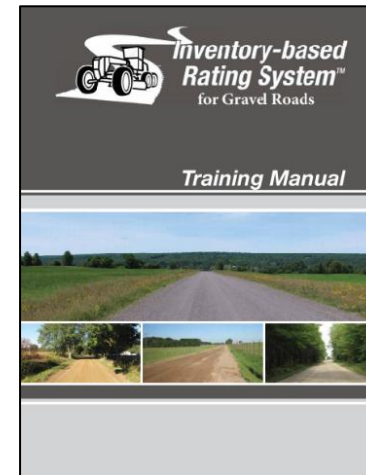
TAMC Data Collection Training Program

PASER for Paved Roads



Class 1: Distress Identification
Class 2: PASER Training

Inventory-Based Rating for Gravel Roads



See ctt.mtu.edu
for upcoming trainings

Today's Agenda

9:00 am



TAMC Update

9:30 am



TAMC
Collection
Processes and
Rating Tips

10:30 am



PASER Rating
Scales

11:30 am



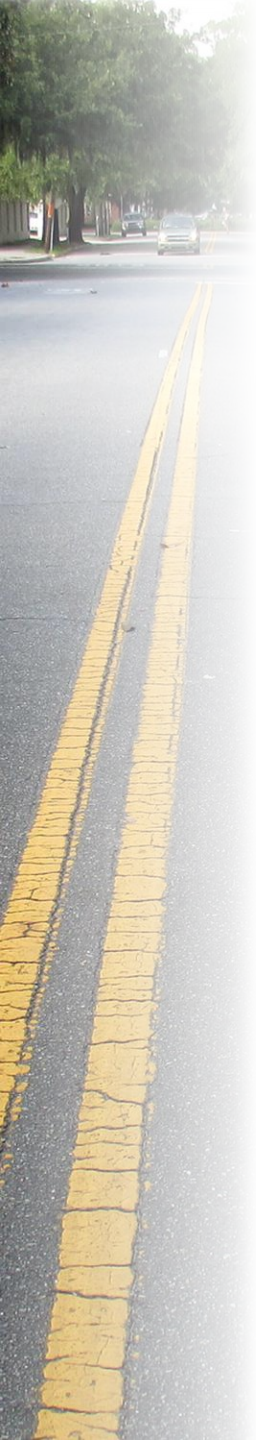
Rating
Demonstration

12:00 pm



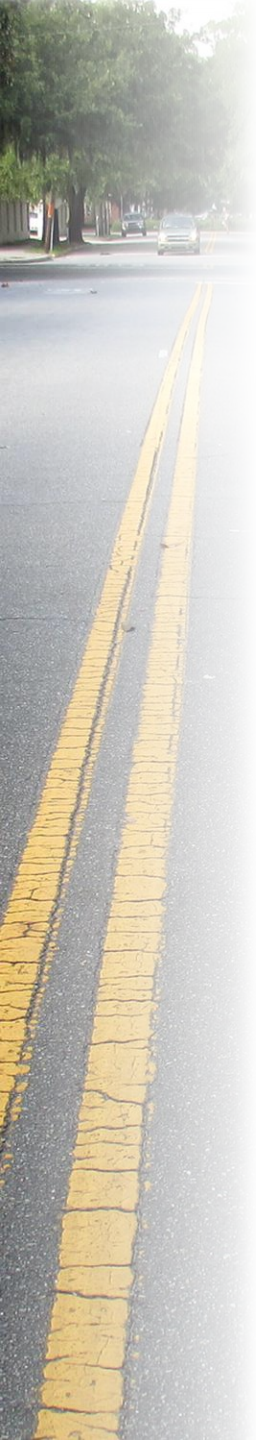
Adjourn





Transportation Asset Management Council Update

TAMC Update



Rating and Data Collection Rules

that are used for TAMC data collection



Who's requiring road condition ratings?

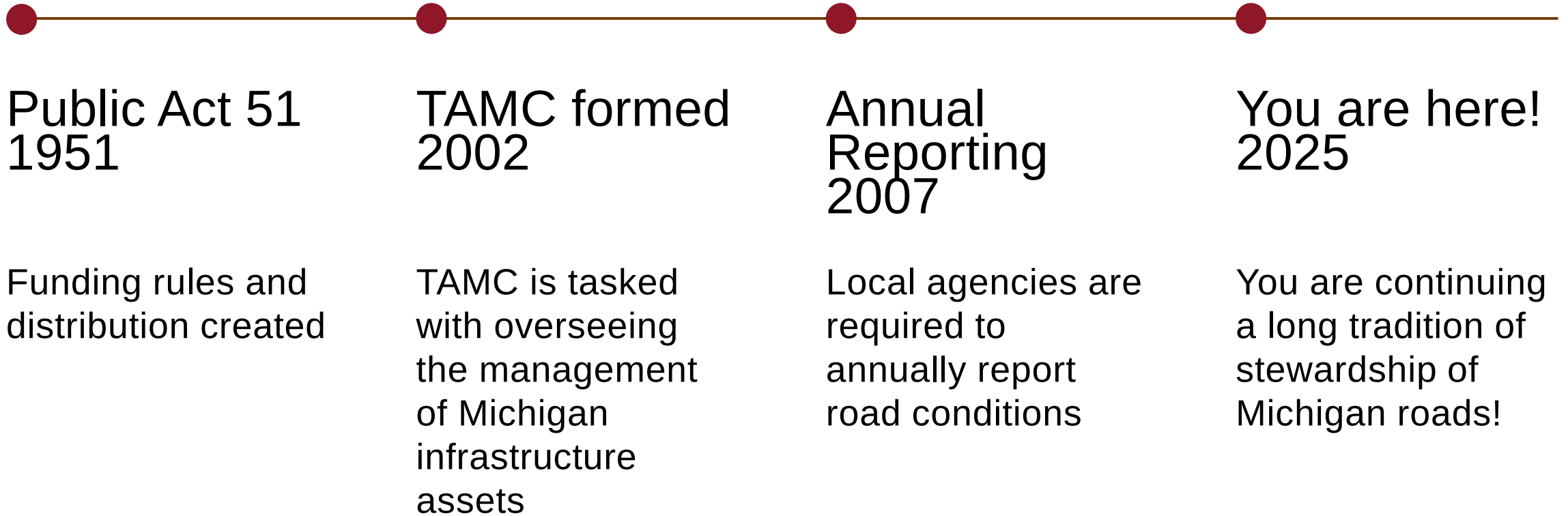


The Michigan Legislature

Public Act 51

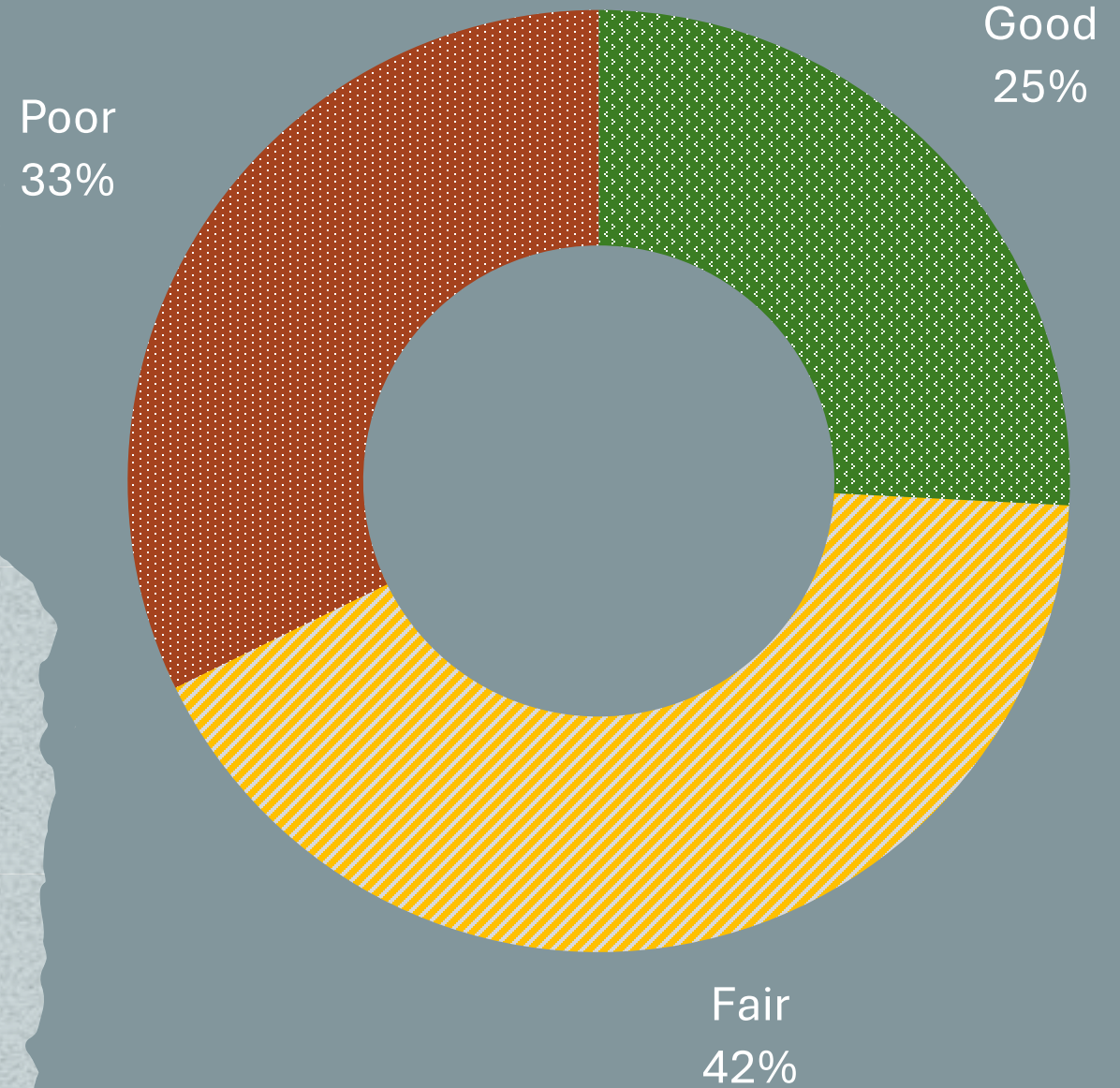
According to Michigan's Act 51 (P.A. 499 in 2002 and P.A. 199 in 2007), each local road agency must annually report the mileage and condition of the road and bridge system under their jurisdiction to the Michigan Transportation Asset Management Council (TAMC).

Michigan Asset Management



Why rate road condition?

Informed decision making





How do we get reimbursed?

Two categories

Federal aid eligible

&

Non-federal aid eligible



Each year TAMC
funds condition
ratings for 50%
of a road
agency's federal
aid eligible
network



What about our non-federal aid eligible roads?

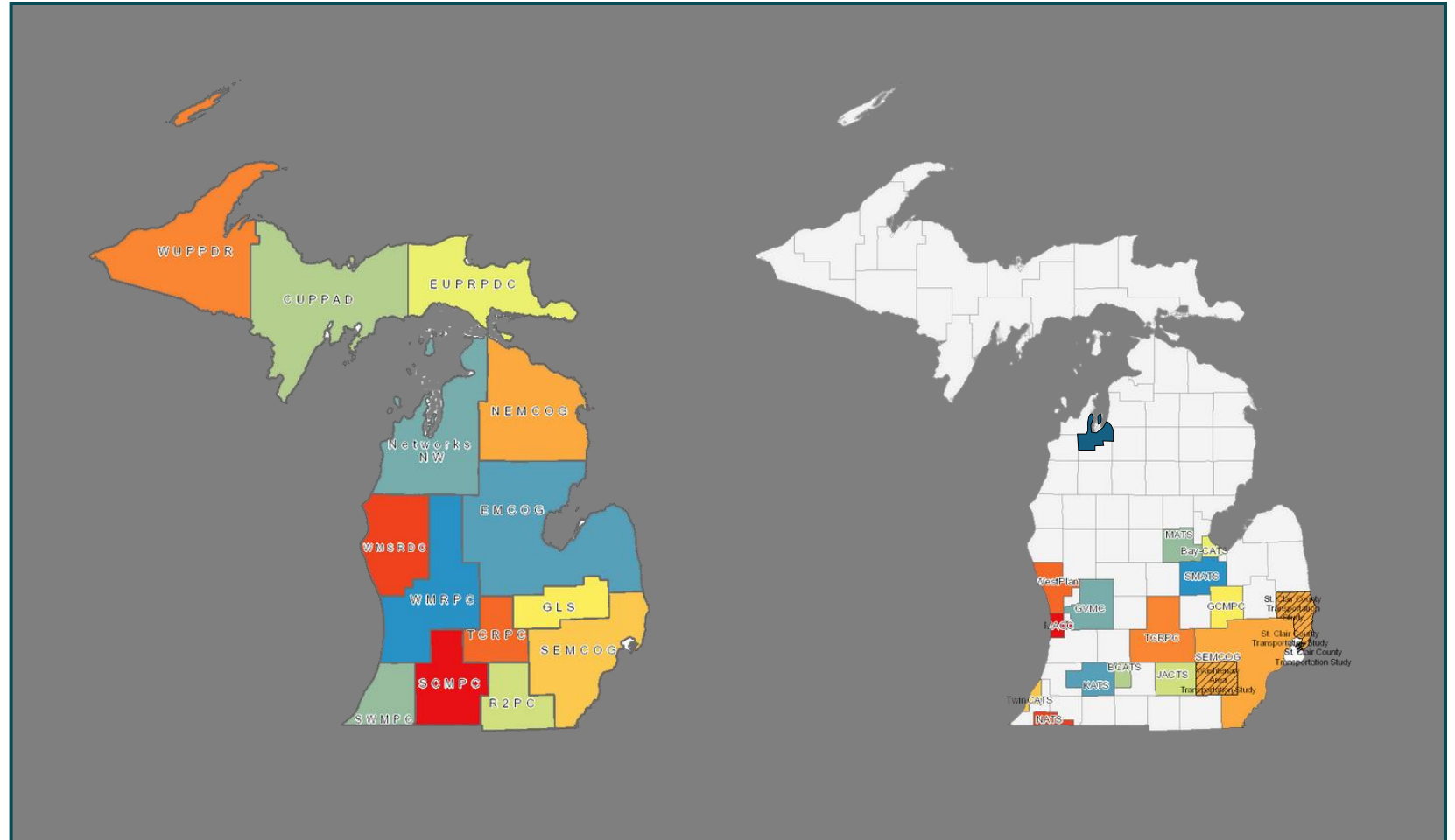
How do condition ratings for those roads get funded?

A dark grey, textured paper is torn on the left side, revealing a light blue background. The word "FUNDING" is written in a black, serif, all-caps font on the light blue background. The tear in the paper is irregular, with a jagged edge. A small, cylindrical piece of the torn paper is visible on the left side of the tear.

FUNDING

MPOs

Regional and Metropolitan Planning Organizations



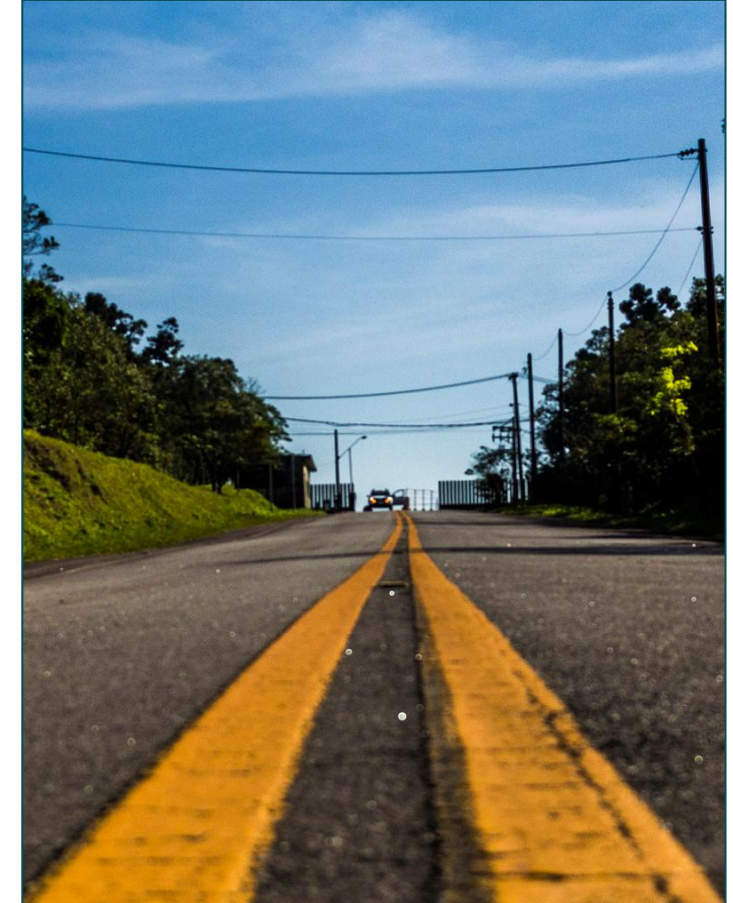
Speaking of funding...

Federal Aid
Eligible

Non-federal
Aid Eligible

National Functional Classification

Federal aid eligibility is divided into two categories based on the National Functional Classification of that road



1



Interstates

2



Freeways

3



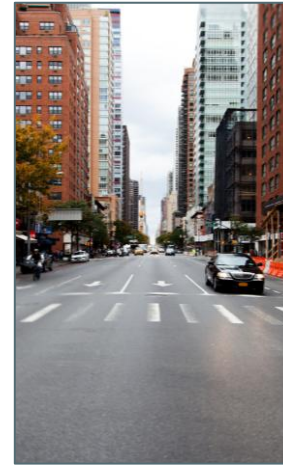
Arterials

4



Minor
Arterials

5



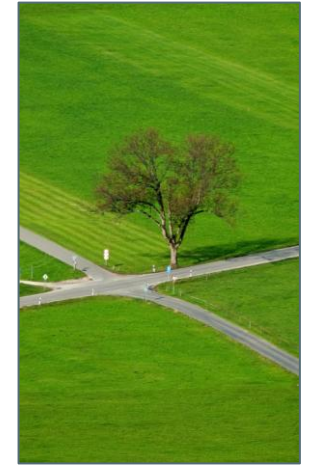
Major
Collectors

6



Urban Minor
Collectors
~~and~~
~~Rural Minor~~
~~Collectors~~

7



~~Local Roads~~

Rate based on distress not importance

Rate what you see... nothing else.



IBR

Inventory-Based Rating (IBR)
is the rating system for gravel roads



Federal Aid Eligible



Gravel Surface

The pavement surface
is not an indication of
eligibility



Dead End

A dead end does not
disqualify a road from
eligibility



Urban vs Rural

Not always obvious!

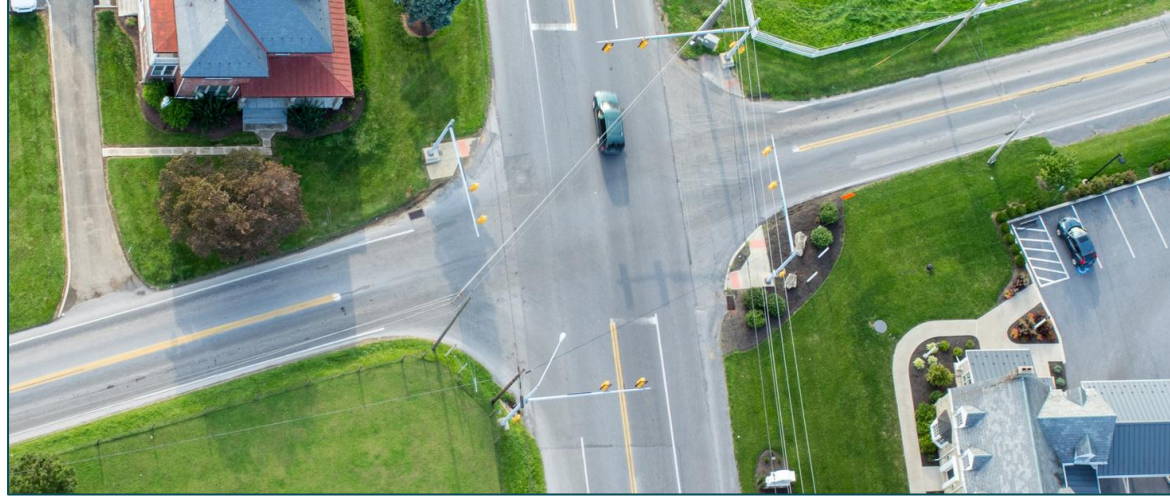
Federal Aid
Eligibility is not
dependent on
number of
lanes



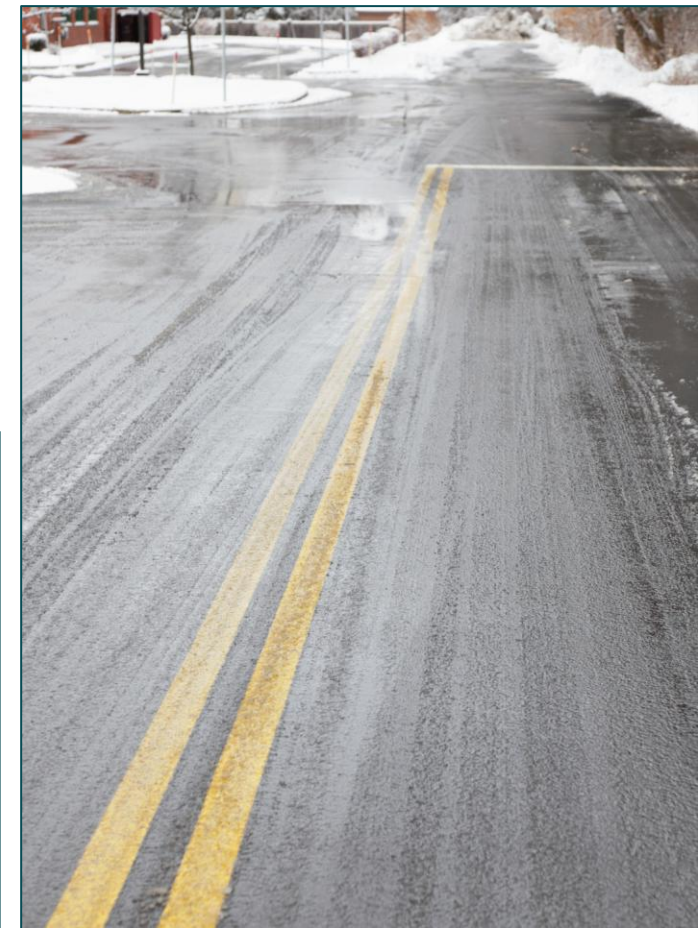
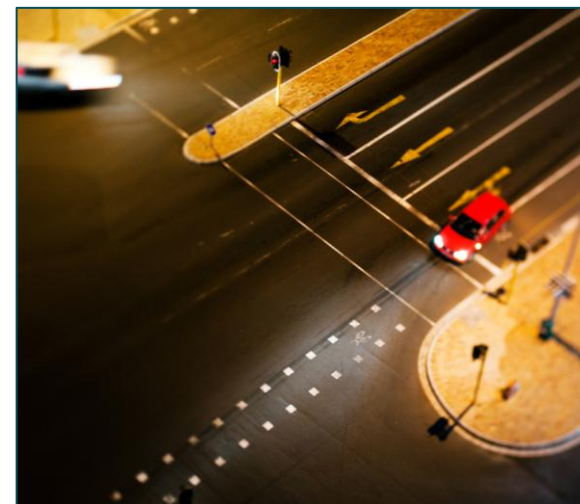
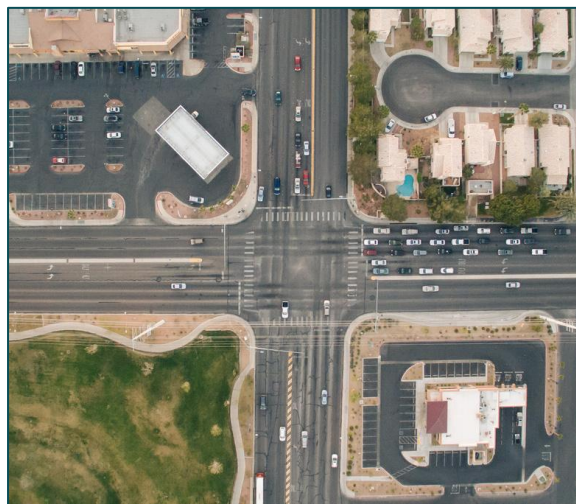
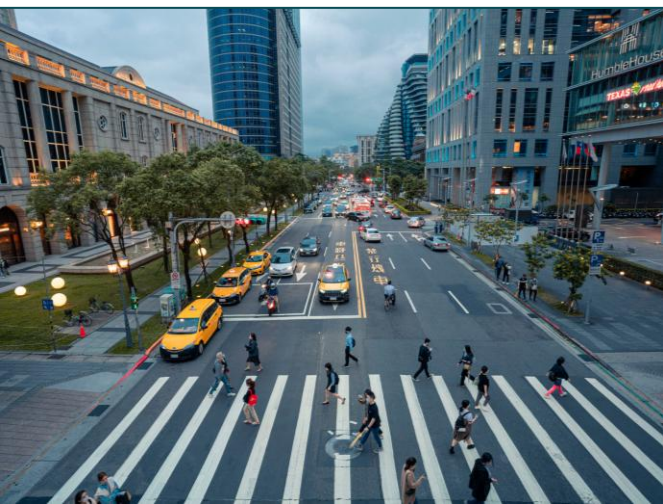
Which lane gets rated?

Trick question...





How is a lane
defined?



What is a lane?



Through lanes

Lanes that continue throughout the segment



Continuous left lanes

Dedicated left turn lane



Short turn lanes

Shoulders aren't
constructed the
same as lanes

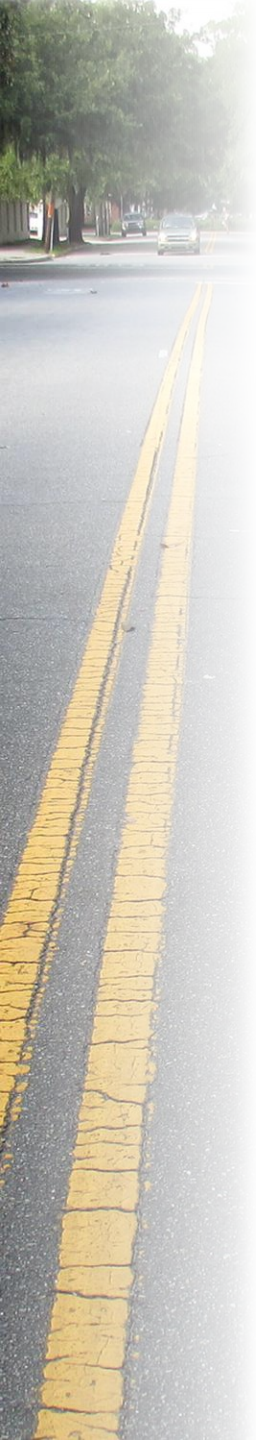
Shoulders don't
experience the same
traffic as lanes

Shoulders may not
be consistently
present

How do we know what needs to be rated?

Roadsoft can generate a network based on the federal aid roadways that were rated last year





Why PASER?

Visual classification system



History of PASER

Created by WI

Used in states throughout US

MI formally adopted use in 2004

Visual
Classification
Systems

Quantitative
Classification
Systems

Quantitative Classification



Based on measurements

Distresses are measured

- Crack widths
- Crack spacing
- Area of distress



Detailed data

Lots of information about the condition of your pavement



Time-consuming

Takes time to collect and time to process all of the data

Visual Classification



Based on visual
assessment

Quantities are estimated
instead of directly
measured



Less detail

Precise information about
specific distresses and their
locations is not gathered



Efficient

Data collection is
relatively fast with
minimal post-processing

What is PASER?

Visual classification system

Type

What is it?

Extent

How much?

Severity

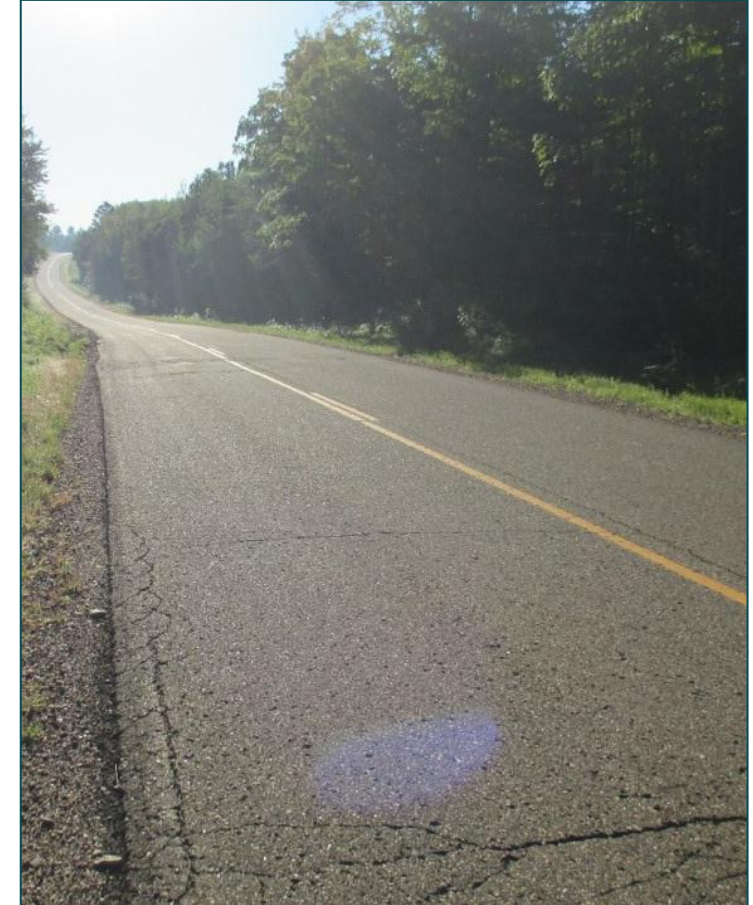
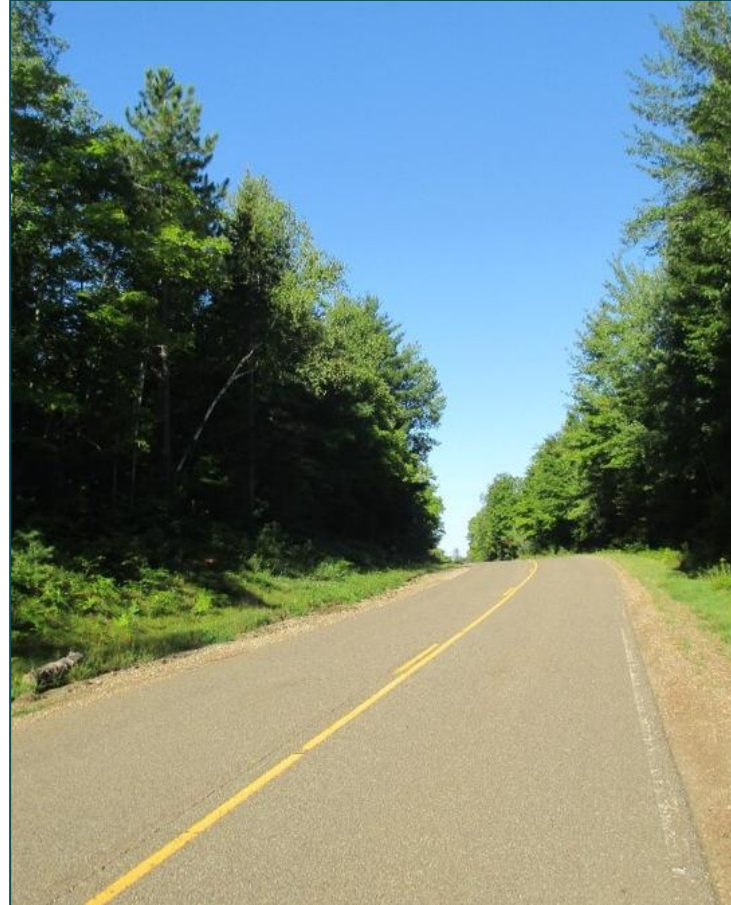
How bad?

**You can't rate what
you can't see**



Sun angle

Driving into the sun is less pleasant but it highlights crack interfaces



You can't rate what you can't see



**Rate distress
not ride quality**



**What best represents
the whole segment?**



RPO/MPO

Provide uniformity

Prevent reporting mishaps

Lend support

Who is allowed to collect data?

Federal Aid Eligible Roads

2 PASER/IBR trained people

Different agencies
(road agency and PO)

Non-federal Aid Eligible Roads

1 PASER/IBR trained person from road agency

Separate driver

Gravel Roads

Requires IBR training



0/0

Join at: vevox.app

ID: 118-657-033

Question slide

What does TAMC require to be collected?

All roads every 2 years

0%

All FA roads every 2 years

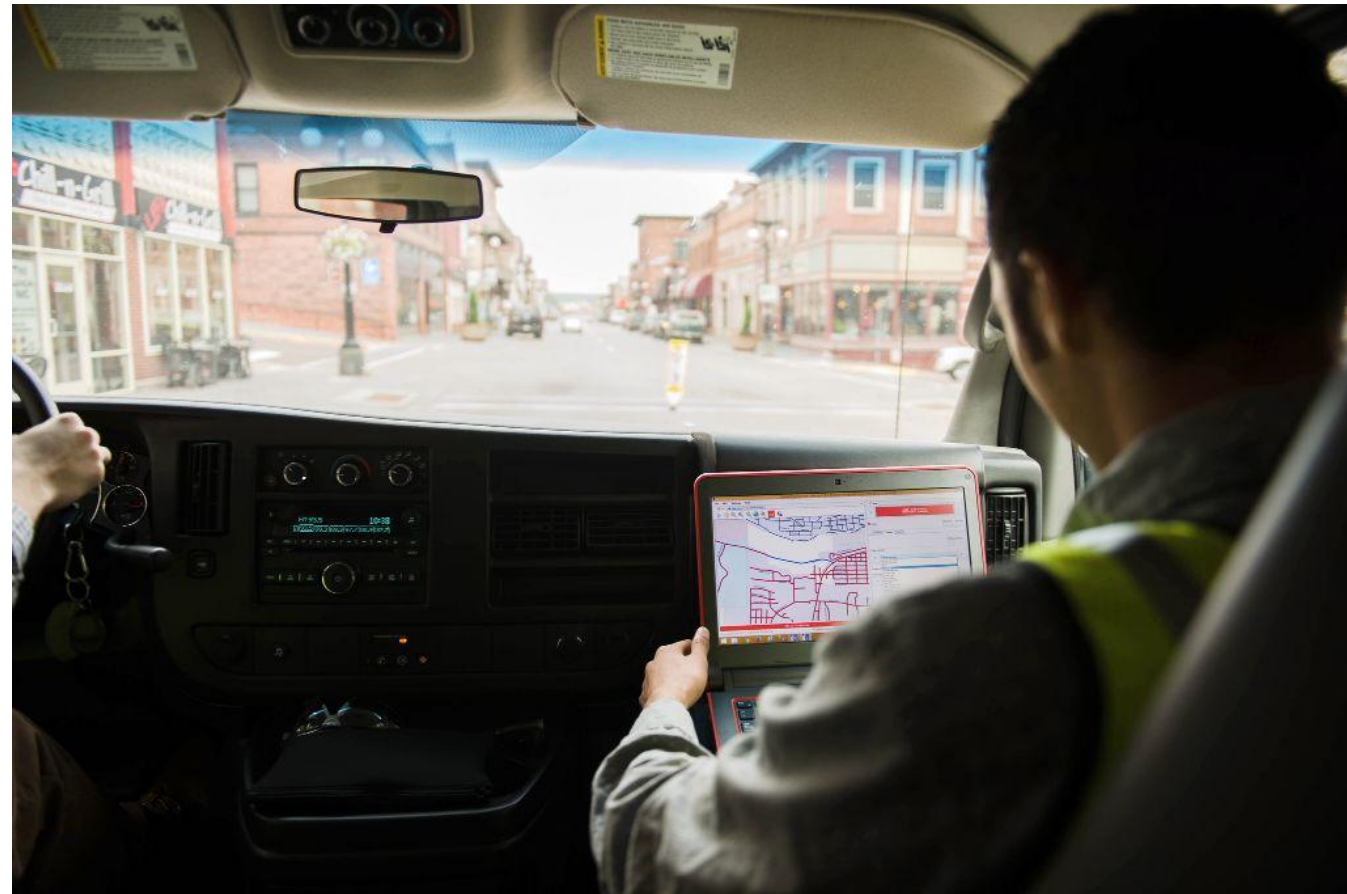
0%

All FA roads every year

0%

All FA roads every two years and all Non-FA roads every 3 years

0%





0/0

Join at: vevox.app

ID: 118-657-033

Preparing Results

What does TAMC require to be collected?

All roads every 2 years

0%

All FA roads every 2 years

☒

0%

All FA roads every year

0%

All FA roads every two years and all Non-FA roads every 3 years

0%



RESULTS SLIDE

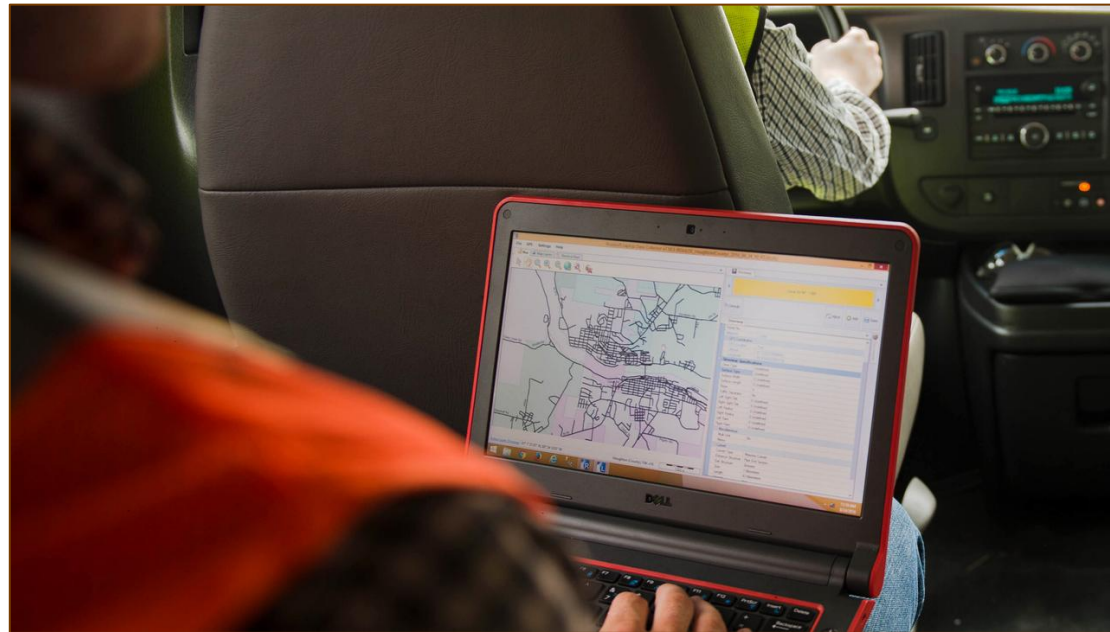
What do I need?

PPE

GPS

Rating resources

Laptop with framework



What is recorded?

Crew first
and last
names

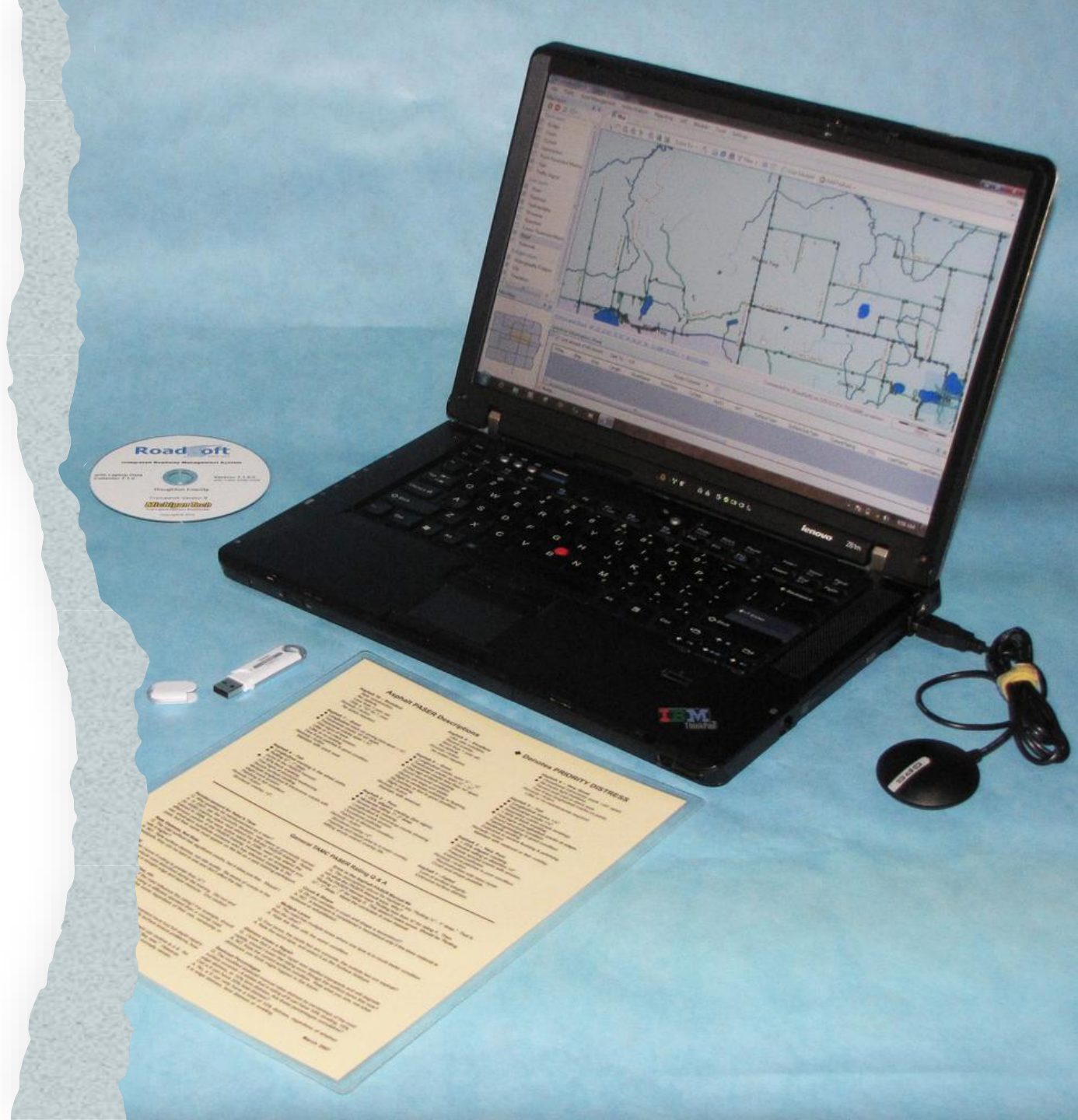
Pavement
surface

Number of
lanes

PASER
Rating

How do I keep track of all the data?

Roadsoft Laptop Data Collector (LDC) lets you collect your condition ratings and keep all your data organized

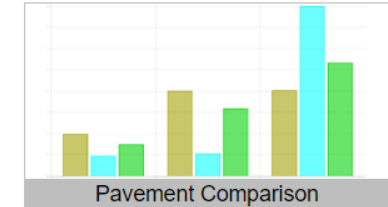
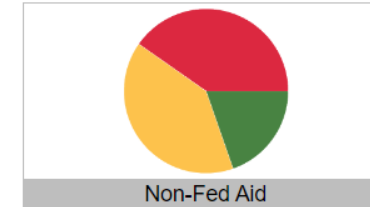
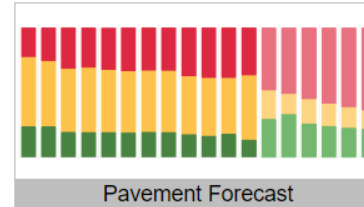
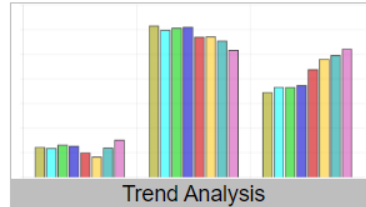
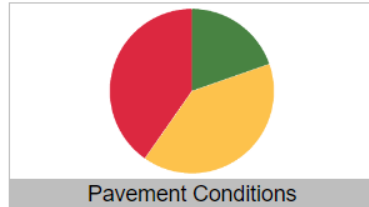




PAVEMENT

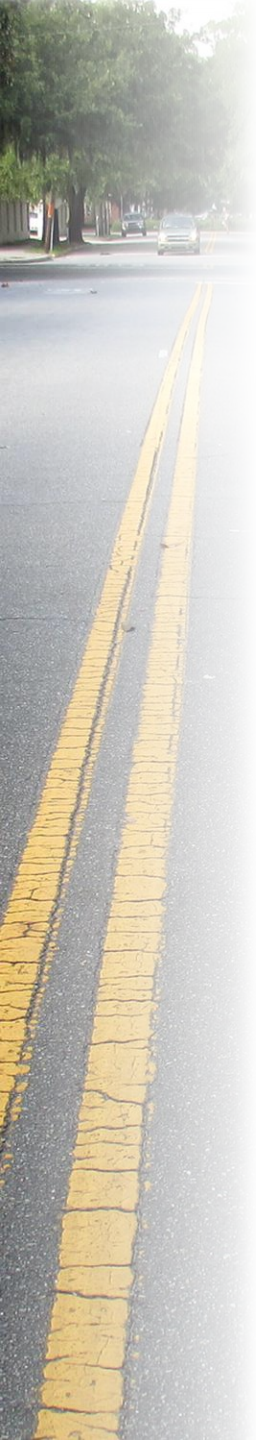
NOTE: 2020 Collection of Road Ratings were limited due to COVID-19. Majority of data for 2020 is Non-Federal Aid data. This affects both the IRT and IMAP maps, as well as the Pavement Dashboards.

Please choose a Pavement Report from the below options.

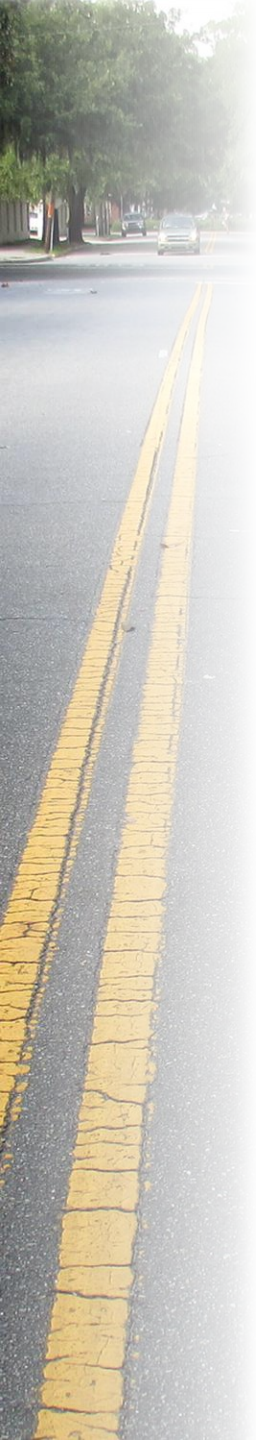


Where does the data go?

Center for Shared Solutions



Pop Quiz



Overview of Rating Systems

that are used to rate pavements

Asphalt Cheat Sheet

Asphalt PASER

Modified for Michigan TAMC Data Collection

◆ Denotes Priority Distress

	Asphalt 10	Asphalt 9	Asphalt 8
Good	New construction (<1 year old) No defects <u>Recent base improvement</u> <i>Possible Action:</i> PPM	Like new condition (>1 year old) No defects <u>Recent overlay with or without a crush and shape</u> <i>Possible Action:</i> PPM	◆ Transverse cracks: >40' apart Cracks: tight (hairline) or sealed Longitudinal cracks: few, on joints <u>Recent seal coat or slurry seal (*see below)</u> <i>Possible Action:</i> Crack seal (PPM)
	Asphalt 7	Asphalt 6	Asphalt 5
	◆ Transverse cracks: 10'-40' apart Cracks: open < ¼" Crack erosion: none or little Surface raveling: none or little Patches: none or few in excellent condition <u>First signs of wear</u> <i>Possible Action:</i> Maintain with crack seal, fog seal	◆ Transverse cracks: <10' apart ◆ Block cracking: 6'-10' Blocks (large, stable) Cracks open ¼" - ½" Surface raveling: slight Patches: few in good condition Polishing or flushing: slight, moderate <u>Sound structural condition</u> <i>Possible Action:</i> Maintain with sealcoat	◆ Block cracking: 1' - 5' blocks ◆ Longitudinal cracks: first signs, at edge ◆ Secondary cracks: first signs Cracks open >¼" Surface raveling: moderate Patches/wedging: good condition Flushing & polishing: extensive, severe <u>Sound structural condition</u> <i>Possible Action:</i> Maintain with sealcoat or thin overlay
Fair	Asphalt 4	Asphalt 3	Asphalt 2
	◆ Block cracking: <1' blocks ◆ Wheel-path cracking (longitudinal) ◆ Rutting: ½" - 1" deep Transverse cracks: slight erosion Longitudinal cracks: slight erosion Surface raveling: severe Patches: fair condition <u>First signs of structural weakening</u> <i>Possible Action:</i> Structural overlay >2" Underseal	◆ Block cracking: severe (like alligator) ◆ Alligator cracking: initial, < 25% ◆ Rutting: 1" - 2" deep Transverse cracks: extensive erosion Longitudinal cracks: extensive erosion Patches: fair/poor condition Potholes: occasional <i>Possible Action:</i> Structural overlay >2" Patching & repair prior to an overlay Milling to extend overlay life	◆ Alligator cracks: > 25% ◆ Rutting or distortion: >2" Cracks: closely spaced, with erosion Patches: extensive, in poor condition Potholes: frequent <i>Possible Action:</i> Reconstruction with base repair Crush and shape
Poor			Asphalt 1 Like PASER 2 but with visible base and: Surface integrity: lost Surface distress: extensive <i>Possible Action:</i> Reconstruction with base repair

General Rating Tips

Rate surface distress, not ride quality. Be aware of cracks in the wheel path; they can be hard to see and do not affect the ride.

Disregard the shoulder. Rate only the drivable pavement, edge line to edge line.

Do not ignore reflective cracks. Rate by assessing the type of crack (e.g. transverse, longitudinal, alligator).

Rate the current surface condition. If construction is in progress (i.e., work is active) but you are driving on the old surface, rate the new surface. Some barrels by the roadside is not construction in progress.

Rate the lane with the worst condition when lanes have differing conditions. For variable surface types, rate the worst lane and select it as the *Surface Subtype*.

Rate what you see, not what distresses you think might happen in the future.

Rate roads with the same scrutiny regardless of their use, ownership, or functional class.

Rutting often has visual cues like plow scars. Get out and measure using a straight edge and tape measure. Use caution! Rutting measurement changes are detailed in the *TAMC Data Collection Training Manual's* "Michigan-specific Asphalt Road Rating Guide" section, page 7.

Composite Pavement consists of a concrete pavement overlaid with asphalt; rate it based on the uppermost surface (e.g. asphalt); and note the *Surface Subtype* as composite. A repaired concrete pavement's highest rating is a 9. While it may have had concrete joint repairs, no other defects can be present and the condition is "like new". Note, this is *not* what the *Concrete PASER Manual* says.

Sealcoat pavements are sealcoat over gravel whereas sealcoat treatment is sealcoat applied over asphalt. See pages 6-7 of the TAMC Data Collection Manual for rating sealcoat pavements. *With proactive sealcoat treatments, do not downgrade an asphalt PASER 9 or 10 (no defects) to an asphalt PASER 3 because of the treatment. Rate it based on the distresses that are visible (see *TAMC Data Collection Training Manual's* "Proactive Sealcoat Treatments on Asphalt PASER 9" section, page 8).

No Defects

Less than 1 year old

10

More than 1 year old

9



Priority Distresses

Denoted on the Cheat Sheet

Transverse Crack Spacing

>40 feet apart

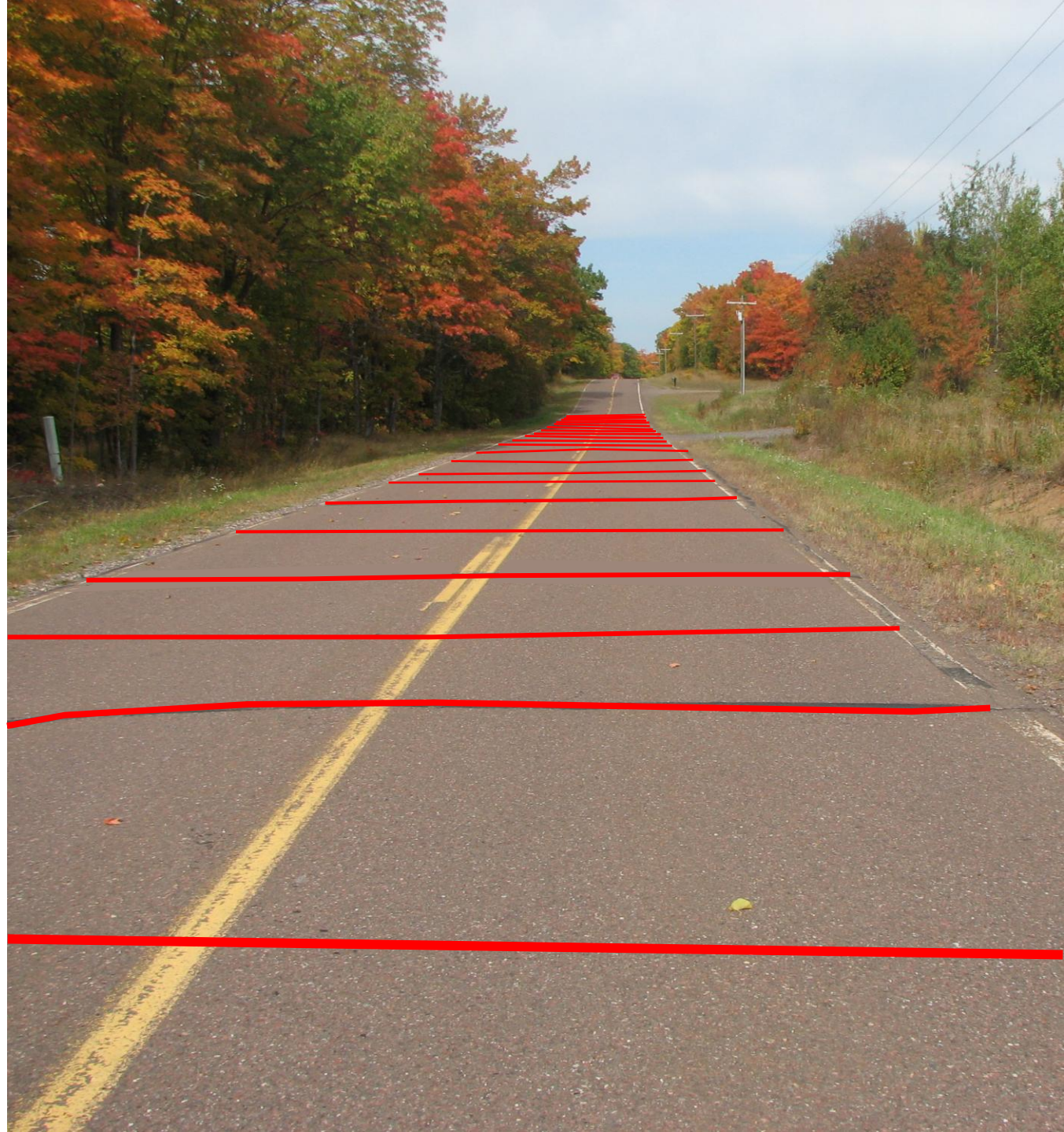
8

10 feet to 40 feet apart

7

Less than 10 feet apart

6



Block Cracking Size

6' to 10' blocks

6

1' to 5' blocks

5

Less than 1' blocks

4

Severe

3



Longitudinal Edge Cracks

First signs

5



Secondary Cracks

First Signs

5





Structural Distresses

When present the *highest* possible rating is a 4

Wheel Path Cracking

Any consistent amount

4



Rutting

1/2" to 1" deep

4

1" to 2" deep

3

Greater than 2" deep

2



Alligator Cracking

Less than 25%

3

Greater than 25%

2



Asphalt PASER **1**

Same Distresses as PASER **2**

Severe Loss of integrity

Visible base



Non-Priority Distresses

Listed on the Cheat Sheet

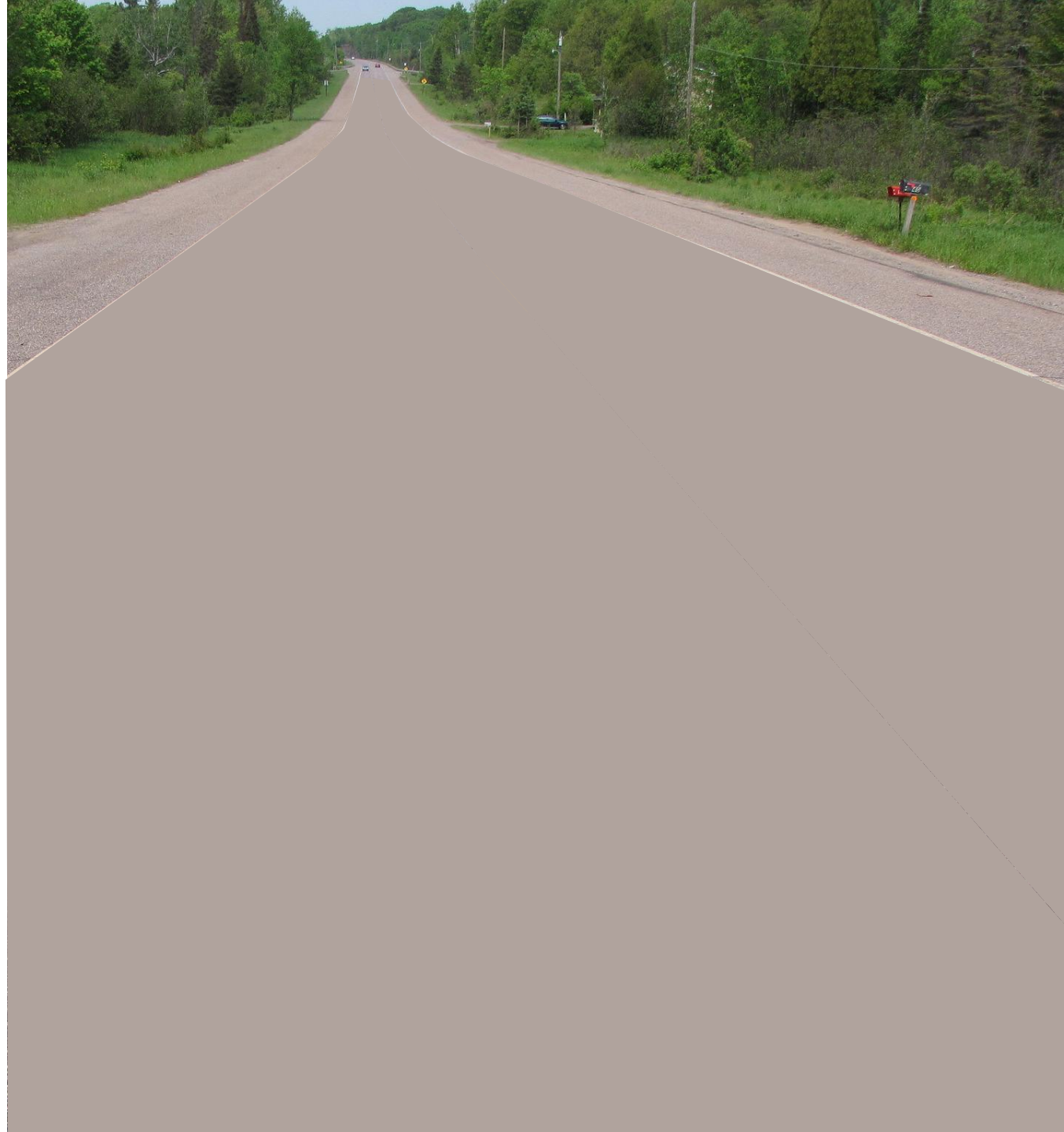
Polishing or Flushing

Slight to moderate

6

Extensive to severe

5



Raveling

Very slight

7

Slight (loss of fines)

6

Moderate (loss of aggregate)

5

Severe

4



Crack or Joint Width

Tight or sealed

8

Open less than 1/4"

7

Open 1/4" to 1/2"

6

Open more than 1/2"

5



Patching

Few, all excellent

7

Few, all good

6

Good condition (wedging)

5

Fair condition

4

Fair/poor condition

3

Extensive, all poor

2



Repair Resets

Reconstruction

10

Overlay

9

Sealcoat

8

Crack seal

8



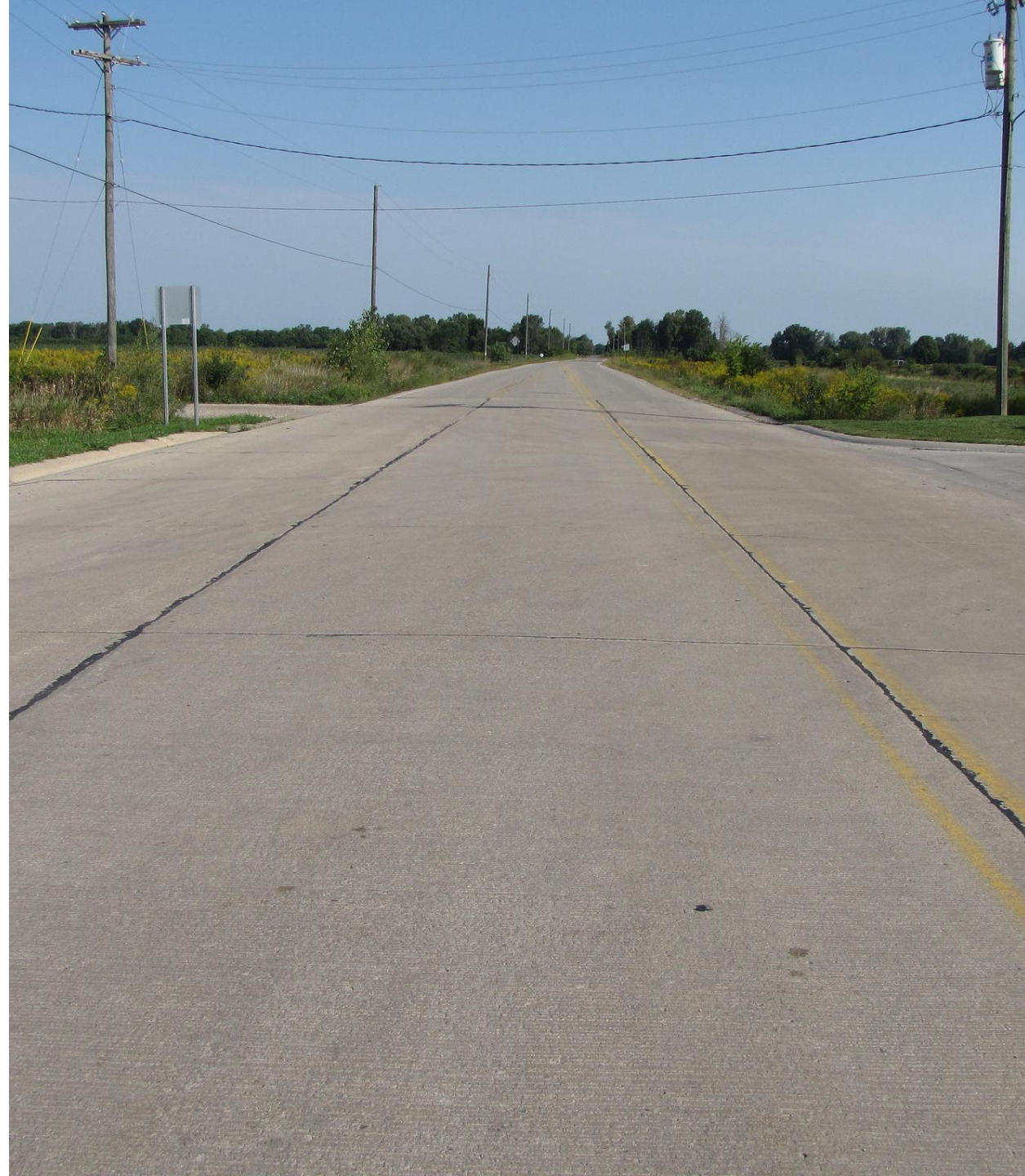
No Defects

Less than 1 year old

10

More than 1 year old

9



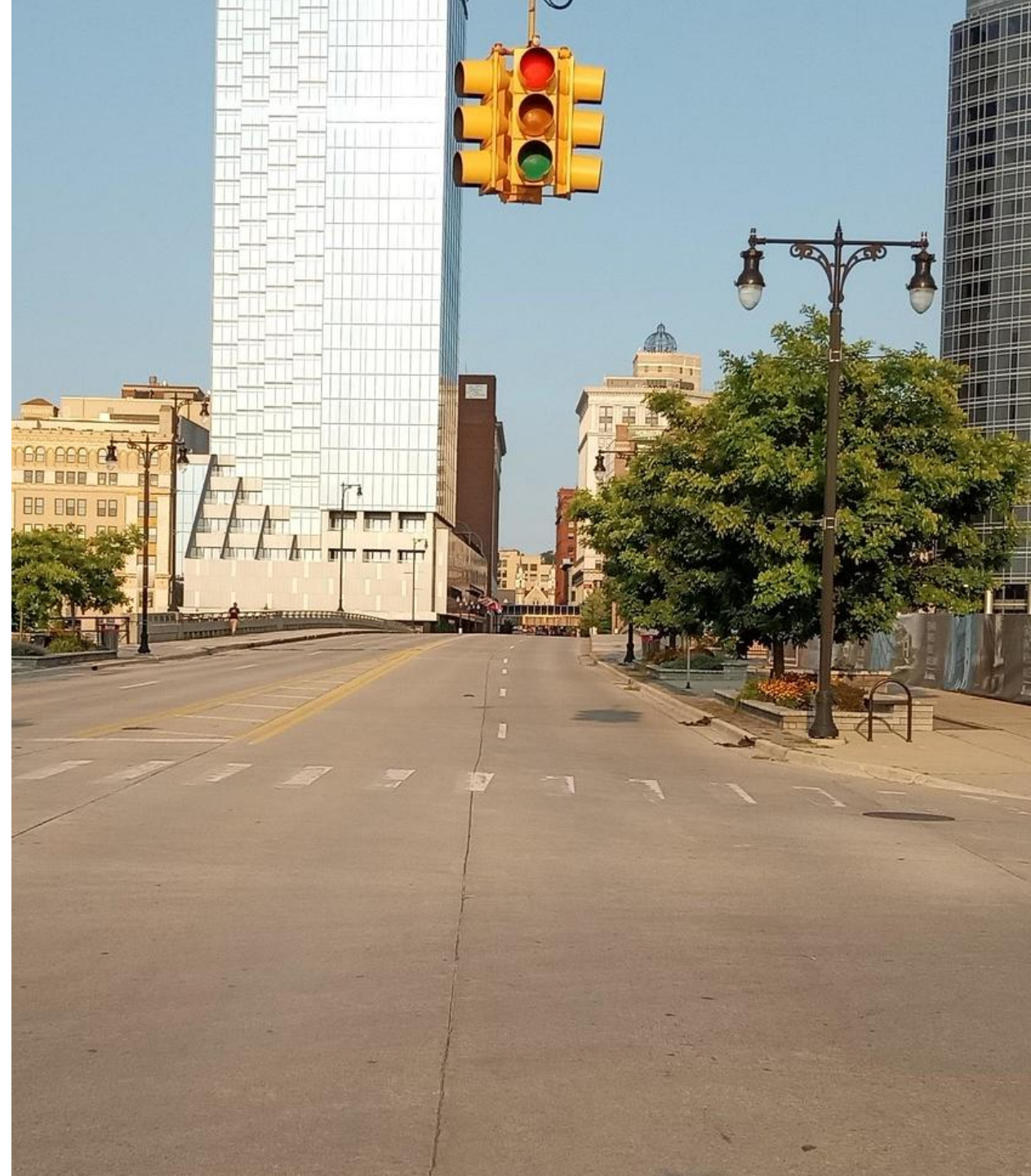
Surface Wear

Light, in wheel path

9

Light

8



Pop Outs

Few

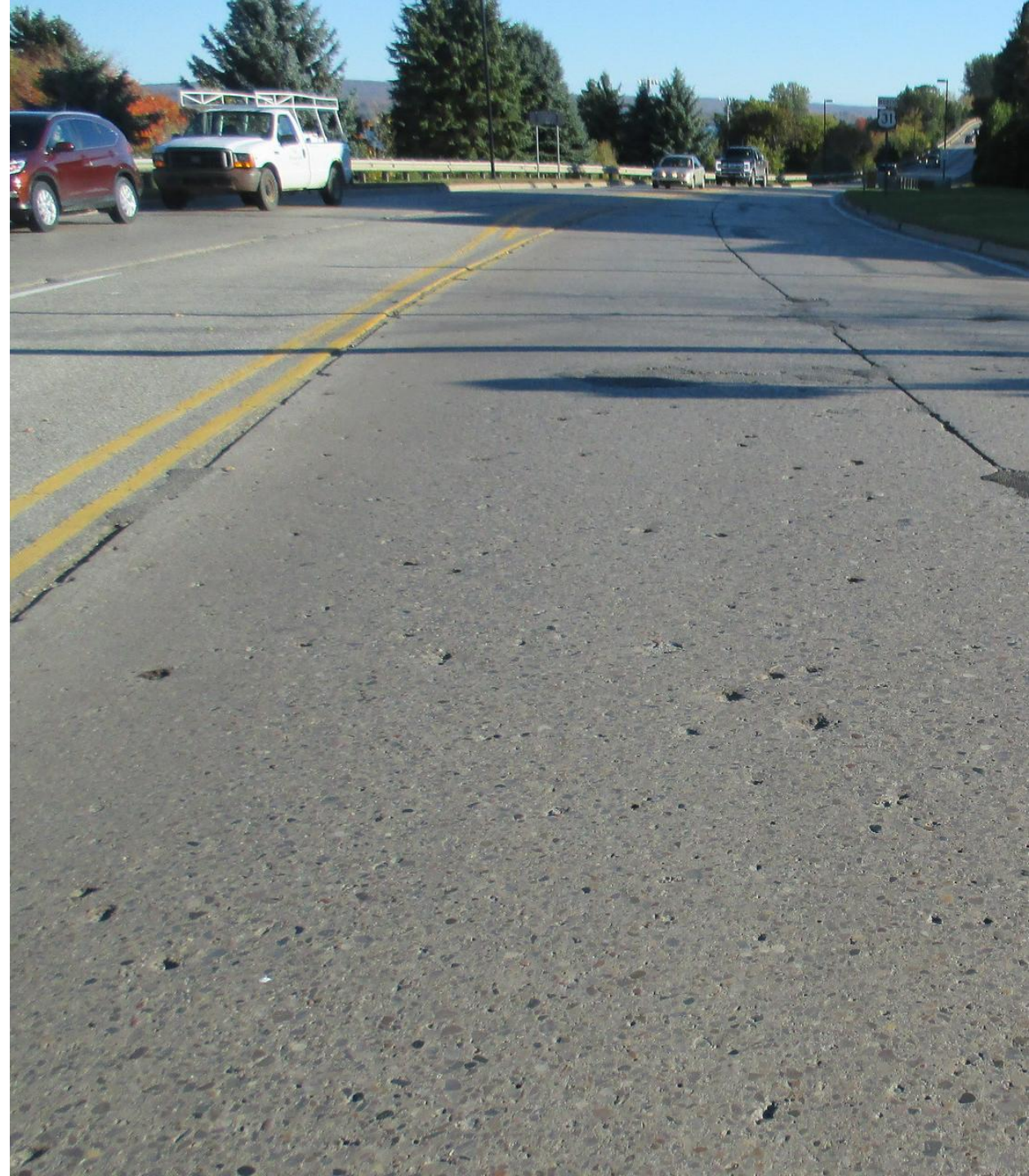
9

Minor

8

Extensive but sound

7



Joint Condition

Partial loss of sealant

8

Some open

7

Most open

6

Spalling (first signs)

5

Moderate spalling, broken spalls

4

Severe spalling (most slabs)

3

Failed

2



Crack Condition

- Isolated meander (tight)
- Isolated transverse (tight)
- More frequent and open 1/4"
- Spalling (first signs)
- Moderate spalling, broken spalls
- Several shattered slabs, stable
- Severe spalling (most slabs)
- Extensive, severe and patched

8

7

6

5

4

4

3

2



Map Cracks

Slight

9

Minor

8

Over 50% of surface

4



Manhole Cracks

Isolated (tight)

8

Some

7



Scaling or Surface Spalling

Slight (first signs)

8

Minor

7

Up to 25% of surface

6

25% to 50% of surface

5

Over 50% of surface

4

Extensive

3



Shallow Reinforcement

Cracking (first signs)

6

Spalling

5



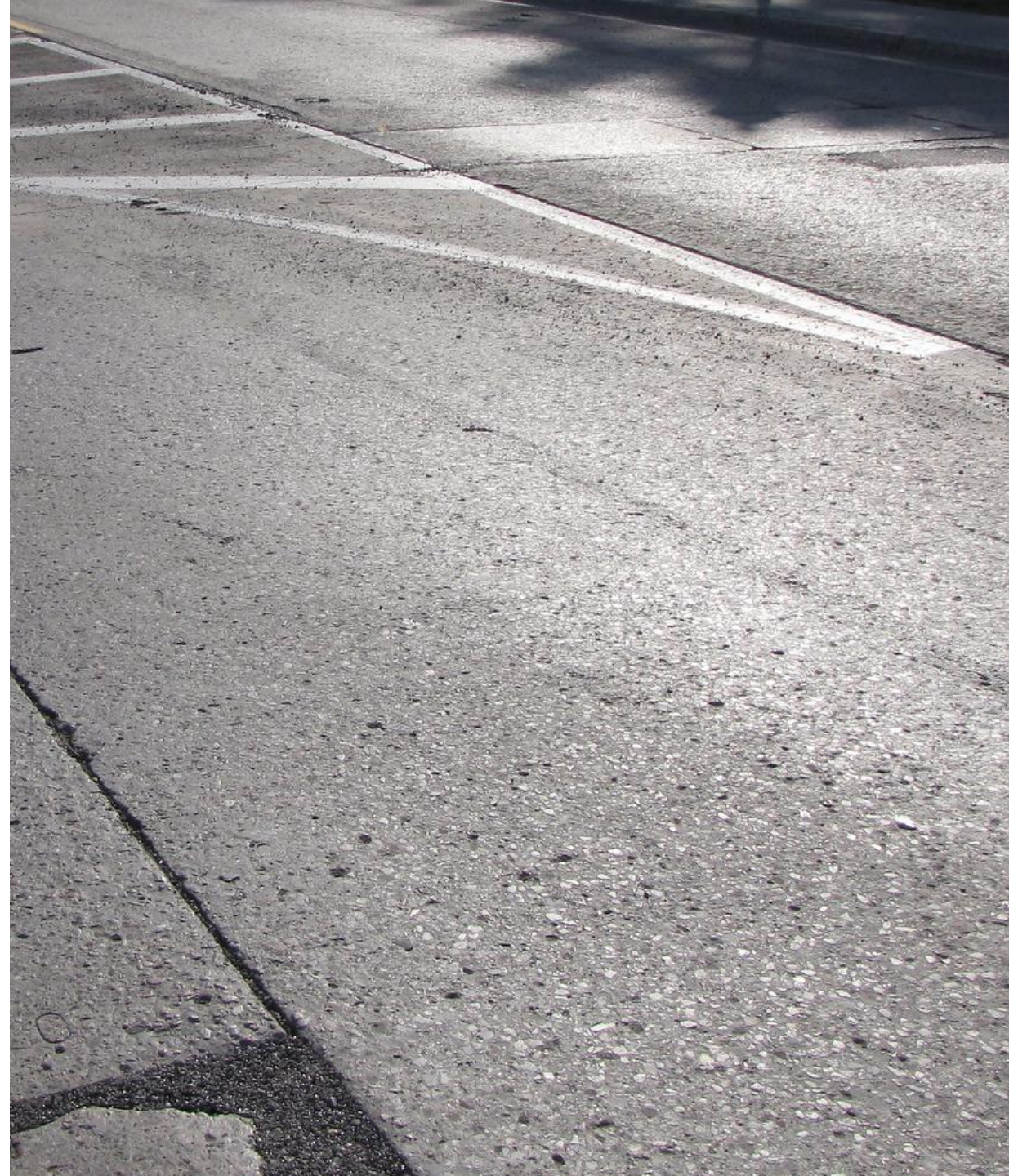
Polishing

25% to 50% of surface

5

Over 50% of surface

4



Corner Cracks

Several (tight)

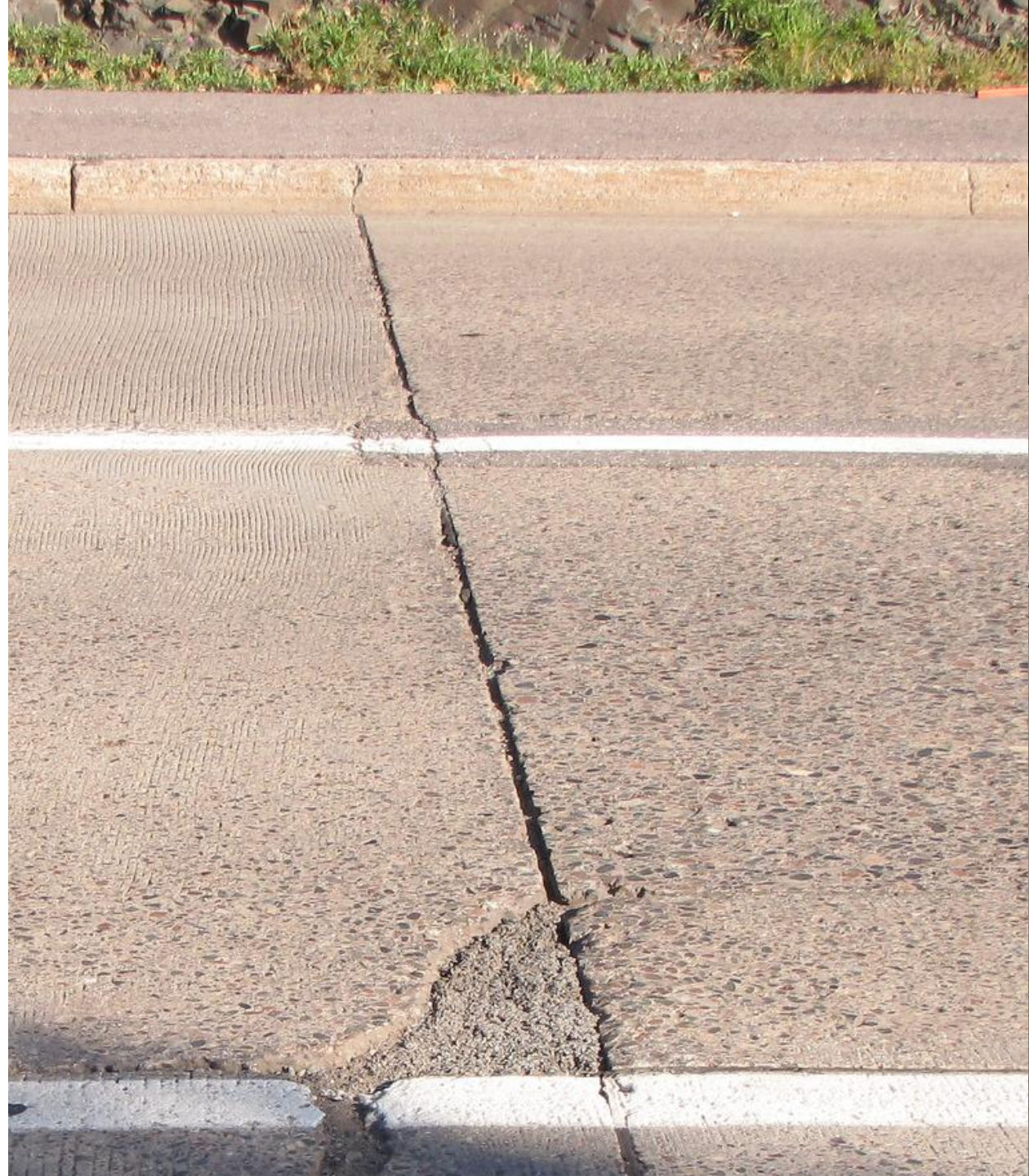
6

Multiple (broken pieces)

5

Missing pieces or patched

4



Settlement or Heaves

Isolated

7

Blowups

4

Extensive and severe

2



Faulting

Up to ¼"

5

Up to ½"

4

Up to 1"

3



Durability Cracking

Evident

3



Asphalt Patches

Few, all in good condition

7

Few, showing distress

5

Extensive, fair to poor

3

Extensive, failed

2

Extensive potholes

1



Sealcoat Cheat Sheet

Michigan Sealcoat Rating Guide

	Rating	Condition/Defects	Remedy/Action	Typical Age (years)
GOOD	10	New construction	None	< 1 year
	9	Like new	None	1 to 3
	8	First signs of distress Edge distress limited	Routine maintenance Minor edge seal	3 to 5
FAIR	7	Minor distress Edge distress <5%, Lane distress <5%, OR Raveling <5%	Minor asphalt or spray-injection patching Possible single-application sealcoat	4 to 6
	6	Moderate distress Edge distress <10%, Lane distress <10%, OR Raveling <10%	Moderate asphalt or spray-injection patching Single-application sealcoat	5 to 7
	5	Distressed Edge distress <20%, Lane distress <20%, OR Raveling <20%	Moderate asphalt or spray-injection patching Single-application sealcoat With up to 50% double-application sealcoat	6 to 8
POOR	4	Edge distress <30%, Lane distress <30%, OR Rutting of ½" to 1"	Asphalt or spray-injection patching and double-application sealcoat	7 to 9
	3	Edge distress <50%, Lane distress <50%, OR Rutting of 1" to 2"	Wedge and/or asphalt or spray-injection patching and double- or triple-application sealcoat Possible crush-and-shape first	8 to 10
	2	Edge distress <50%, Lane distress <50%, OR Rutting greater than 2"	Reconstruct by crush-and-shape prior to new sealcoat surface, possible return to gravel	>9
	1	Extensive distress >50% of surface area	Reconstruction by crush-and-shape prior to new sealcoat surface, or return to gravel	>10
Not rated	0			

NOTE: To be used for Michigan TAMC data collection on sealcoat pavements instead of *PASER Sealcoat Manual*



Michigan
Transportation Asset
Management Council



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Prepared by Center for Technology & Training—Michigan Technological University
on behalf of the Michigan Transportation Asset Management Council

Sealcoat



Asphalt



Sealcoat



Asphalt



Good

No Defects

Less than 1 year old

10

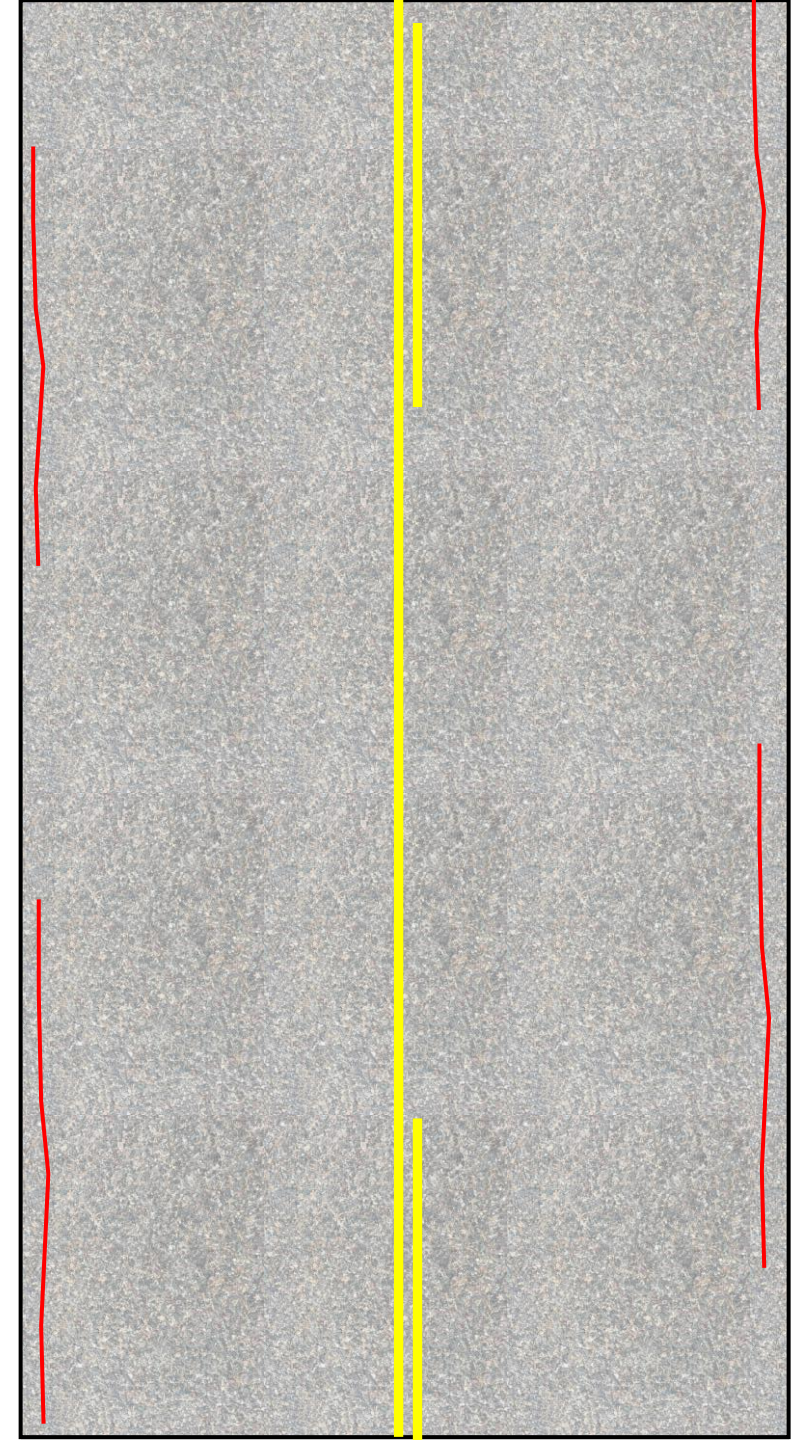
More than 1 year old

9

Edge Distress

Limited, first signs

8



Fair

Edge Distress, Lane Distress, or Raveling

Less than 5%

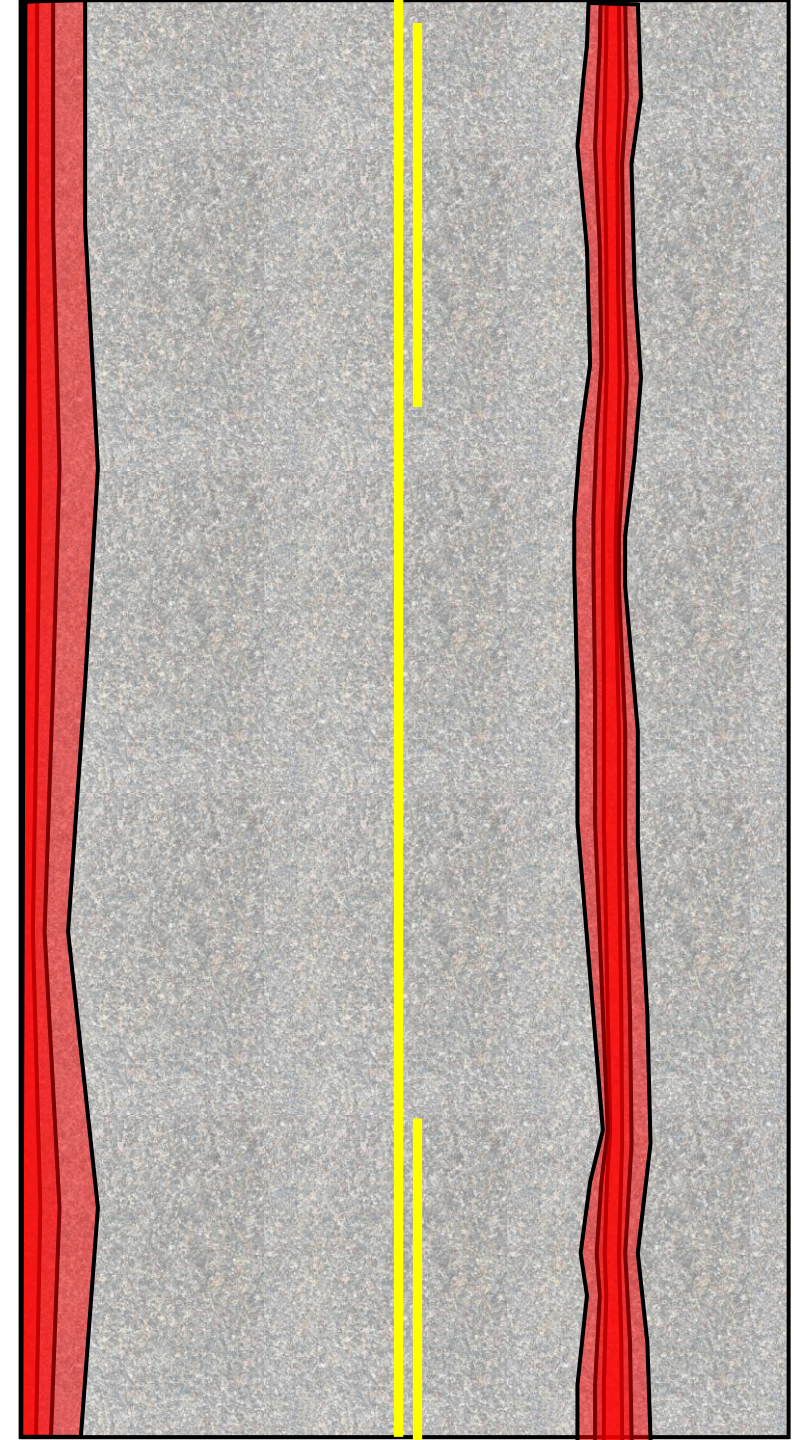
7

5% to 10%

6

>10% to 20%

5



Poor

Edge Distress or Lane Distress

>20% to 30%

4

>30% to 50%

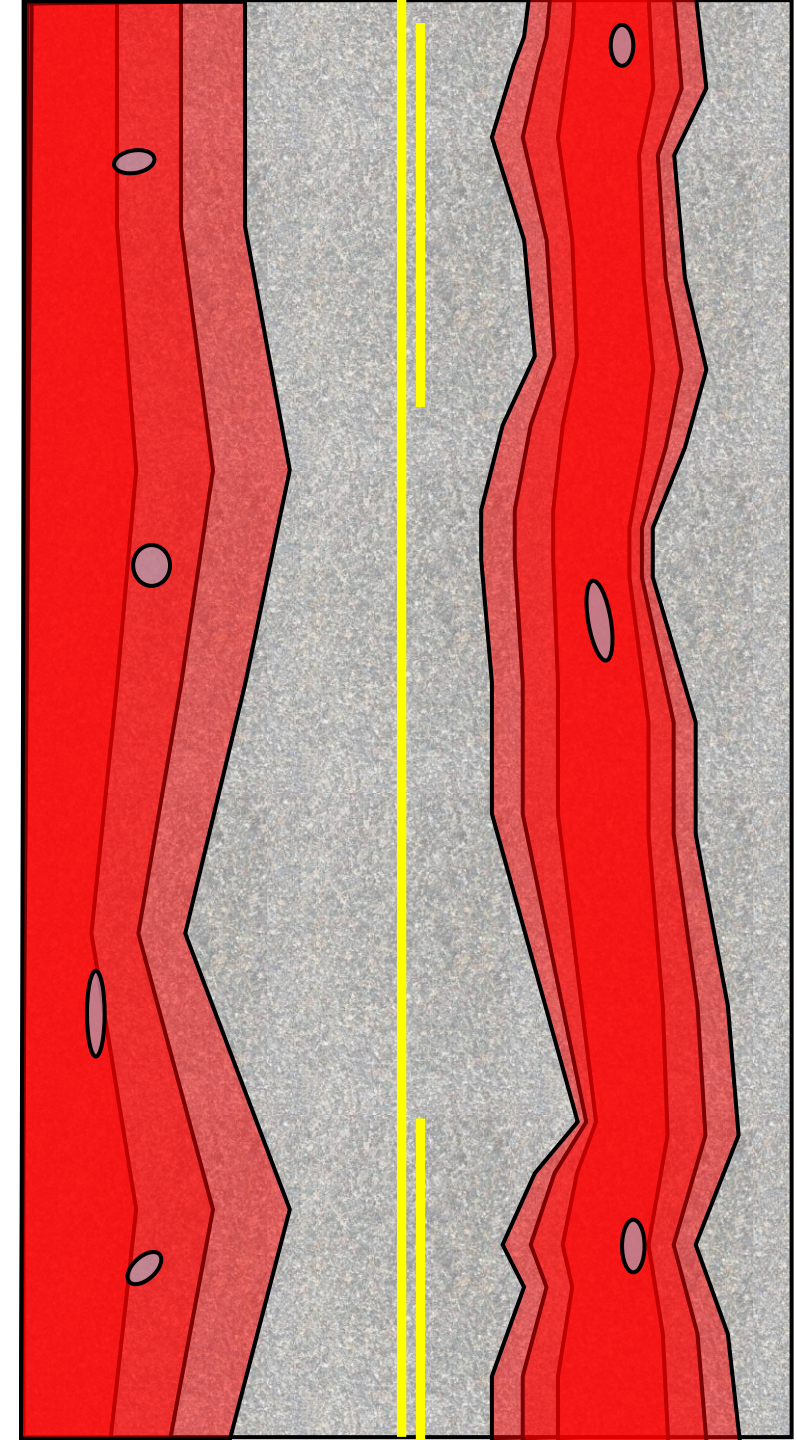
3

>50%

2

>50% with visible base

1



Poor

Rutting

1/2" to 1"

4

1" to 2"

3

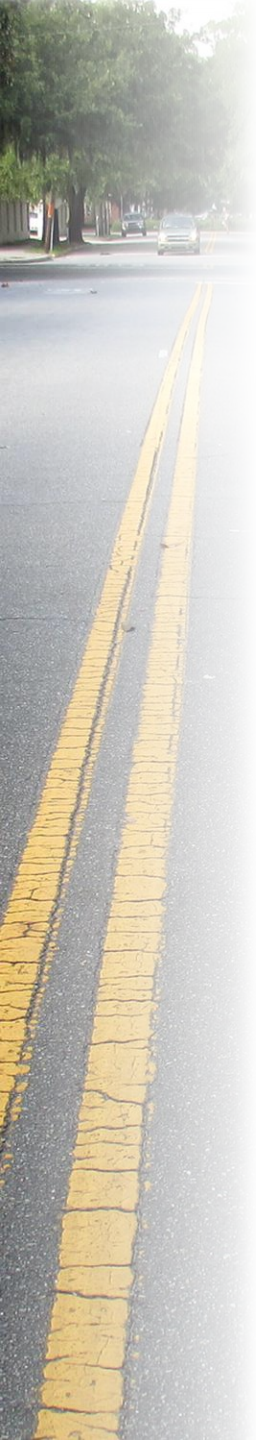
Over 2"

2

Over 2" with visible base

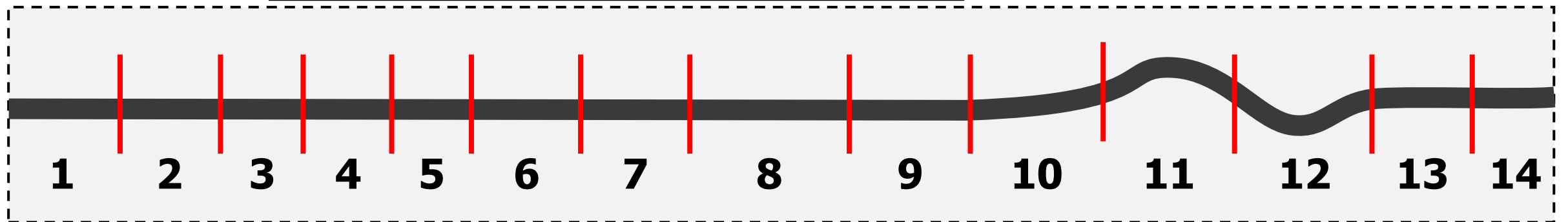
1

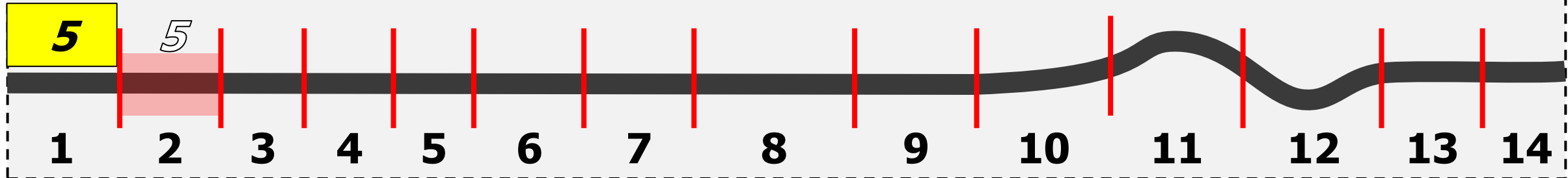


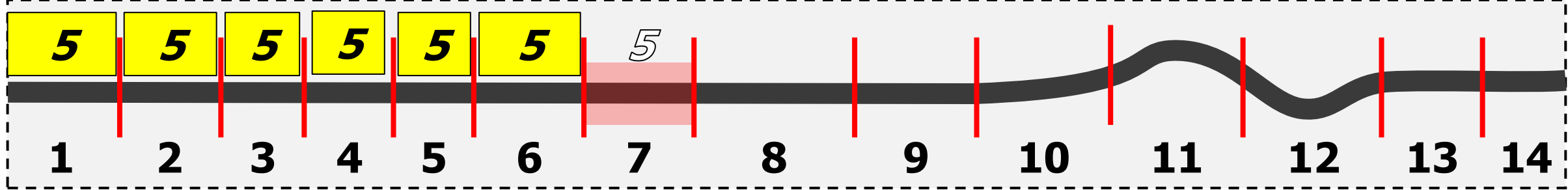


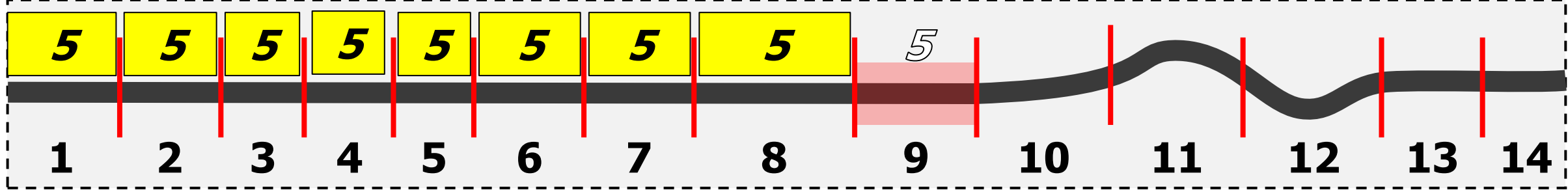
Rating Demonstration

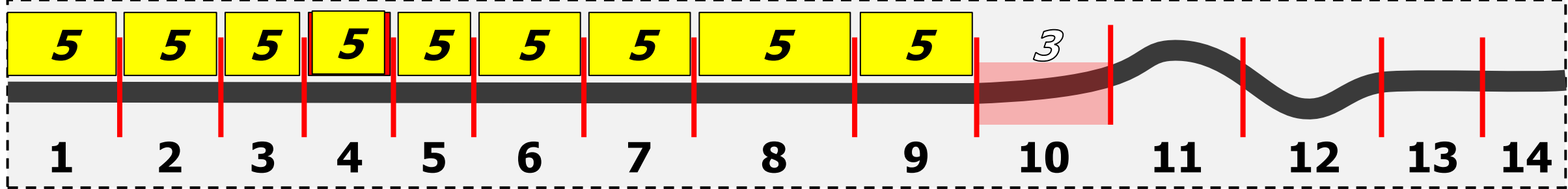
Rating Demonstration

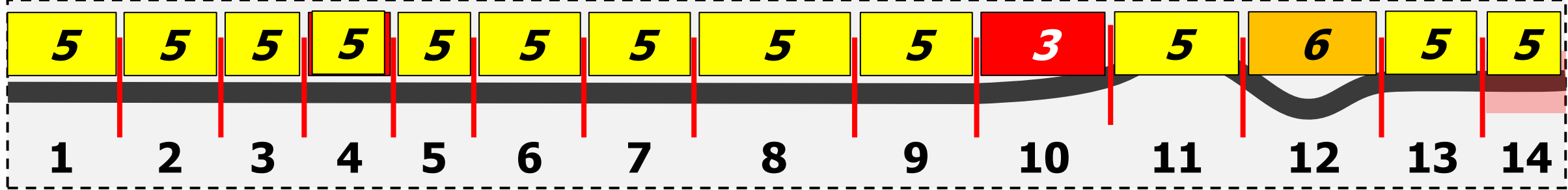




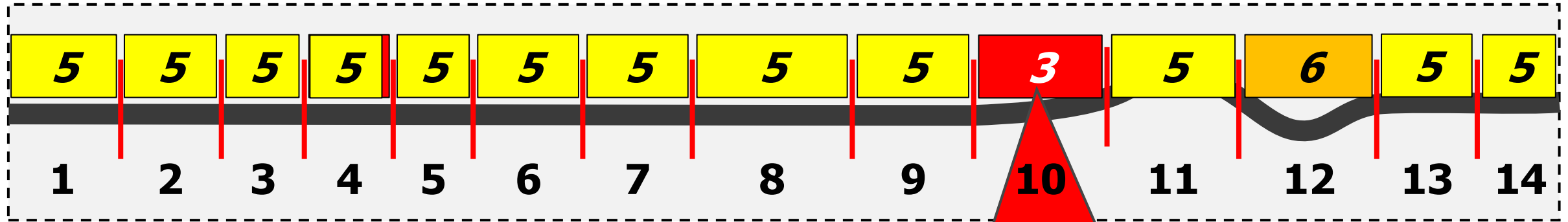








What were the distresses?



Edge Cracking

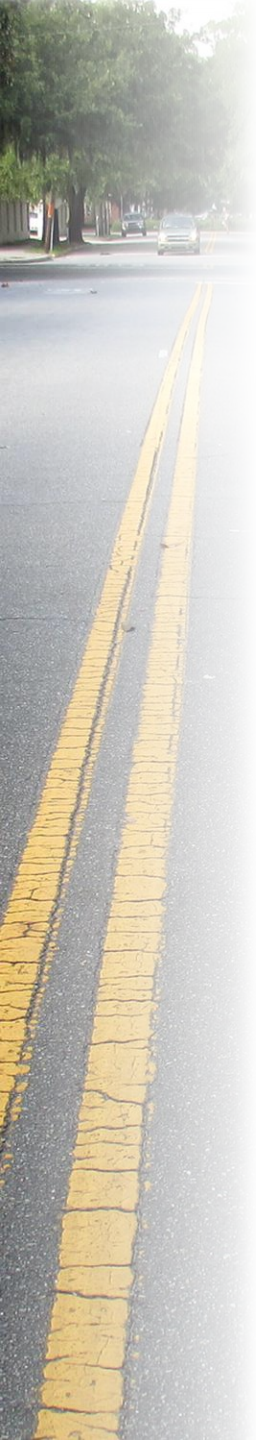
Transverse Cracks

Block Cracking

Alligator Cracking

Rutting

Shear Cracking



Final Thoughts

Upcoming Trainings & Final Thoughts

Review PASER Manuals and print Cheat Sheets prior to next training

IBR

Learn the basics of using the Inventory-Based Rating (IBR) System™ for rating unpaved roads.

- January 21, 2025 9am - 11am ET (Webinar)
- February 25, 2025 9am - 11am ET (Webinar)
- June 24, 2025 9am - 11am ET (Webinar)

IBR sessions are virtual only.

PASER Class 1

Class 1 covers distress identification for asphalt, concrete & sealcoat roads and sets the foundation for the PASER visual rating system.

- February 18, 2025 9am - 12pm ET (Webinar)
- March 4, 2025 9am - 12pm ET (Webinar)
- May 13, 2025 9am - 12pm ET (Webinar)
- August 26, 2025 9am - 12pm ET (Webinar)

PASER Class 1 sessions are virtual only.

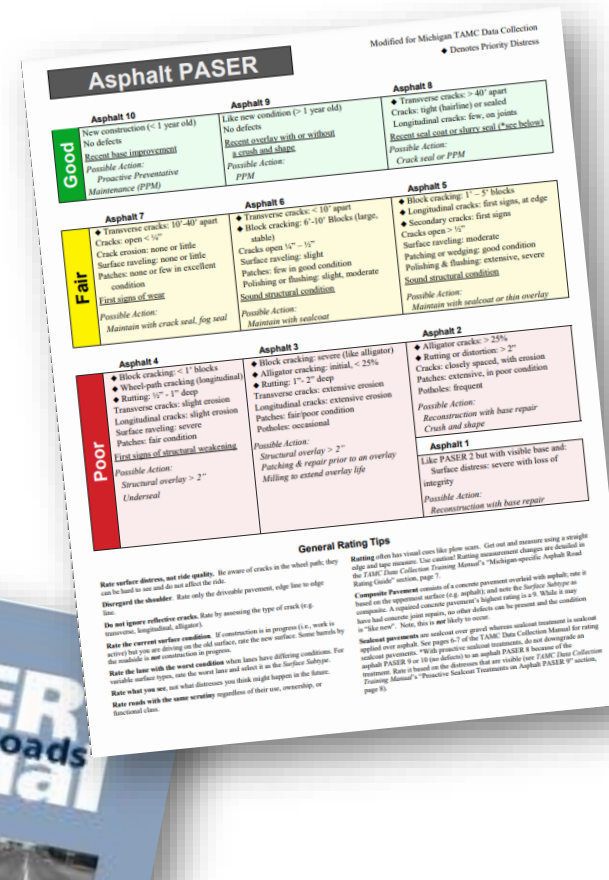
PASER Class 2

Class 2 is an intro to the PASER system. It includes TAMC updates on data collection & council updates, rating rules and tips, interactive rating exercises on asphalt, concrete, and sealcoat roads.

- February 19 & 20, 2025 9am - 12pm ET (Webinar)
- March 5 & 6, 2025 9am - 12pm ET (Webinar)
- May 14 & 15, 2025 9am - 12pm ET (Webinar)
- May 20, 2025 8am - 12pm ET (Houghton)
- May 22, 2025 8am - 12pm ET (Gaylord)
- June 4, 2025 8am - 12pm ET (Livonia)
- June 5, 2025 8am - 12pm ET (Grand Rapids)
- August 27 & 28, 2025 9am - 12pm ET (Webinar)

PASER Class 2 is available virtual or in-person.

The virtual training is separated into two days; both days must be attended. In-person training is one day, but contains the same amount of information as the virtual training.





Michigan Technological University • Department of Civil, Environmental, & Geospatial Engineering

PASER TRAINING

CLASS TWO
DAY TWO

Sponsored by:



Michigan
Transportation Asset
Management Council

Housekeeping

Please use the Q&A pod for questions

- Your questions are submitted to presenters only
- You can submit questions anonymously

Pavement photos

If you have photos please submit them to us!

ctt@mtu.edu

Be sure to fill out the self-certification survey!



E-mailed Certificates of Attendance

Certificate of Attendance

The Center for Technology & Training and the
Transportation Asset Management Council

Certifies that

Your Name Here!

has completed 5.0 Hours of Instruction at the

Pavement Surface Evaluation & Rating Training
Webinar on June 15, 2022



Timothy Colling, P.E., Ph.D, Director
Center for Technology & Training



Center for
Technology & Training



Today's Agenda

9:00 am



Sealcoat
Exercises

9:15 am



Asphalt
Exercises

10:15 am



Concrete
Exercises

11:15 am



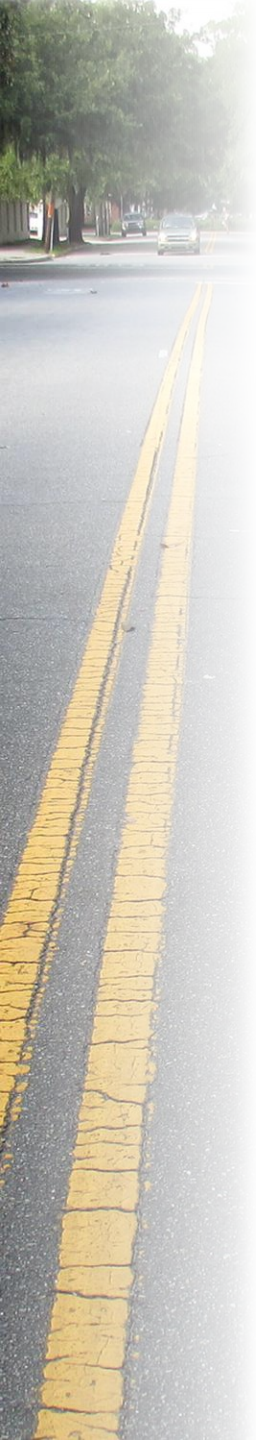
Your Choice

12:00 pm



Adjourn





Sealcoat Rating Exercises

Edge

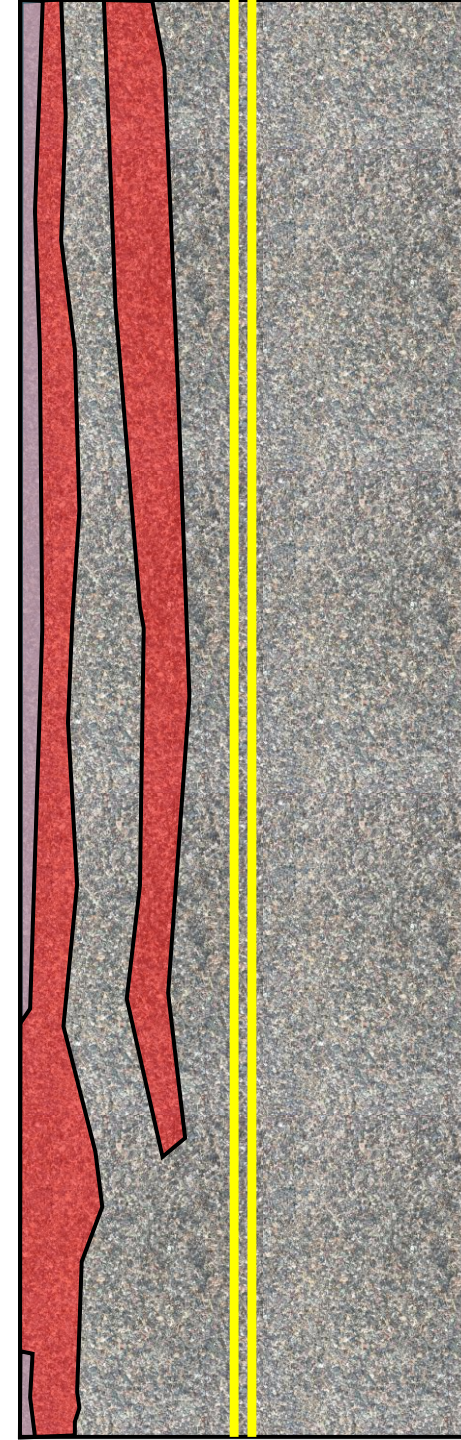
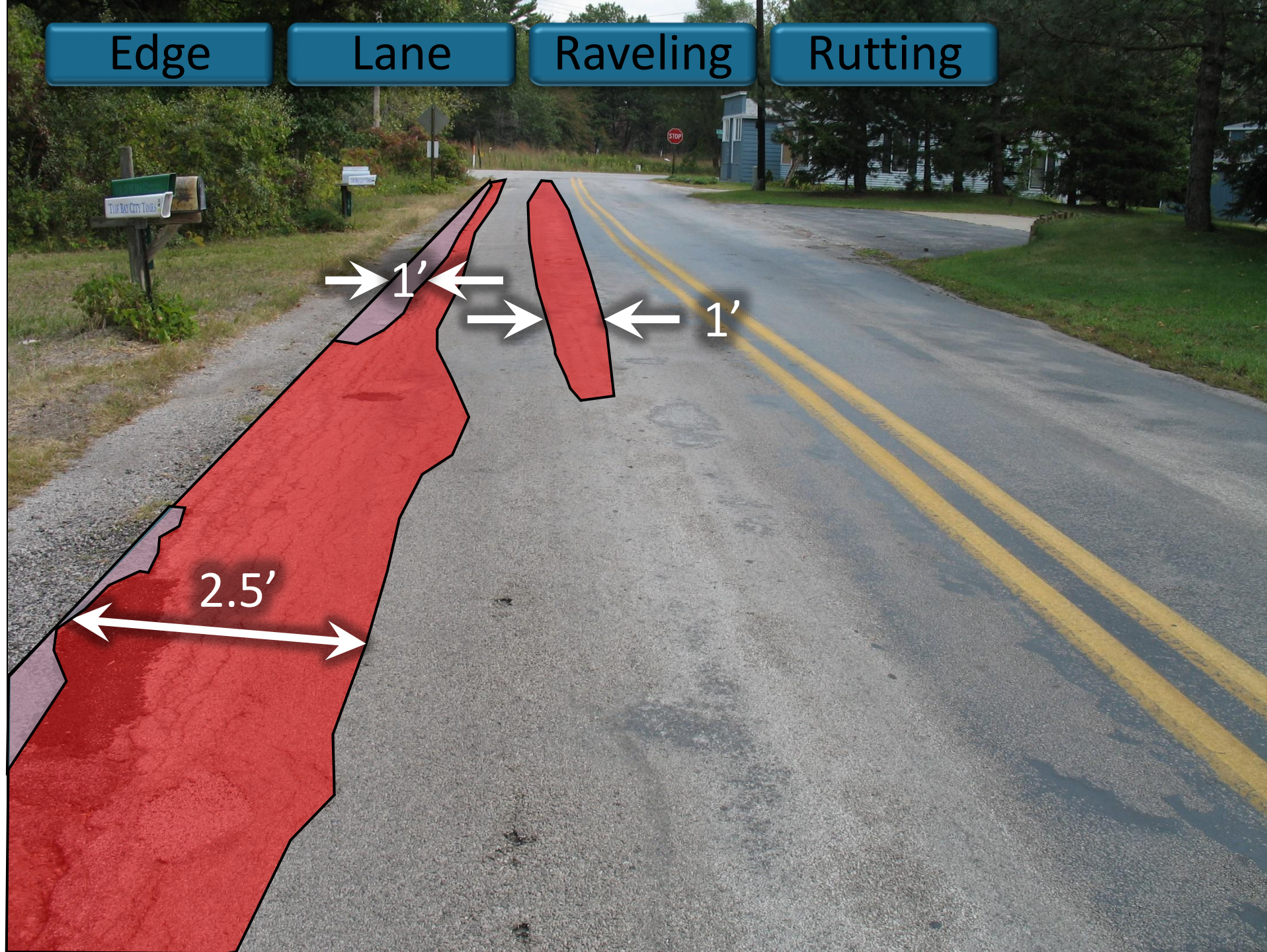
Lane

Raveling

Rutting

1' 1'

2.5'

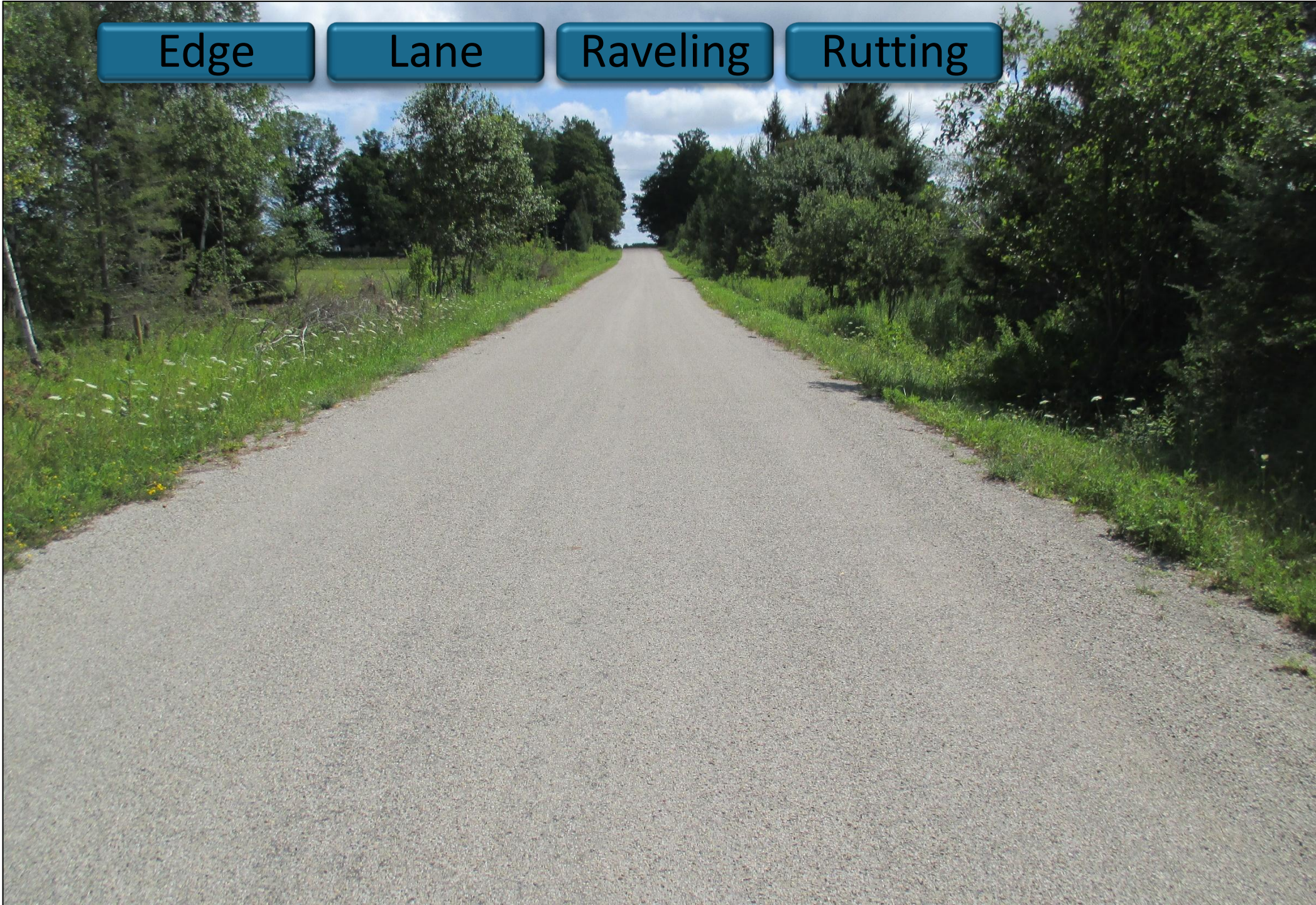


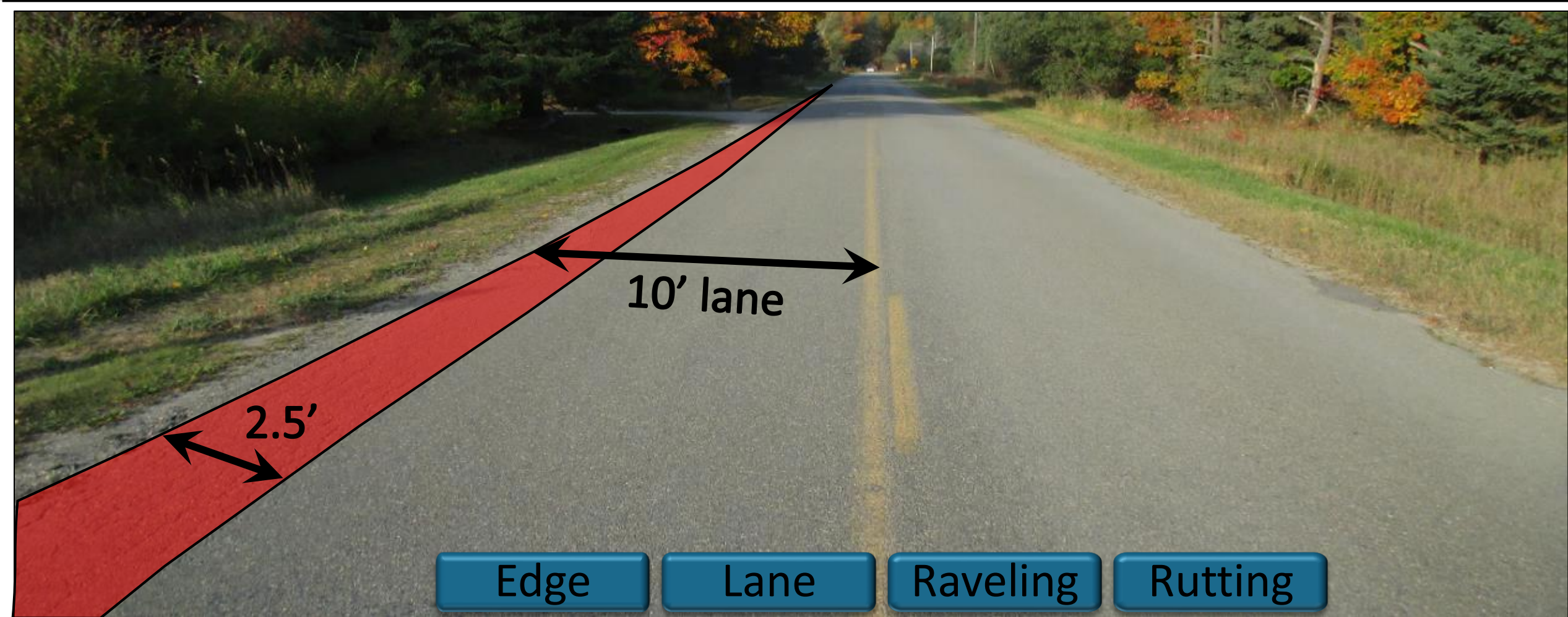
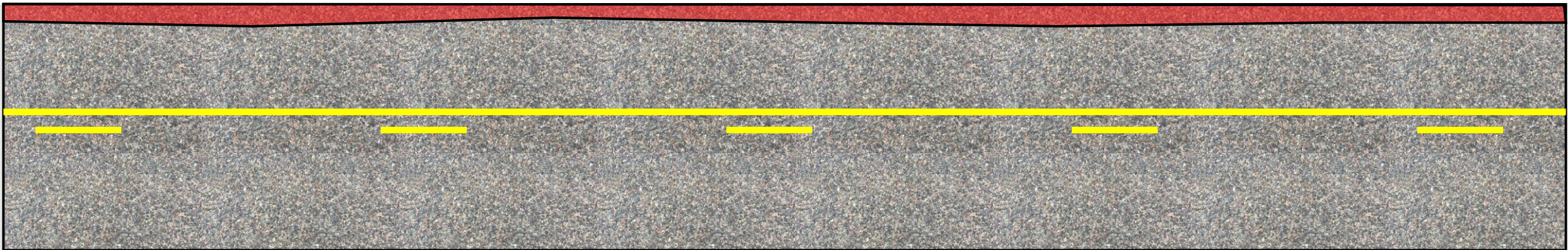
Edge

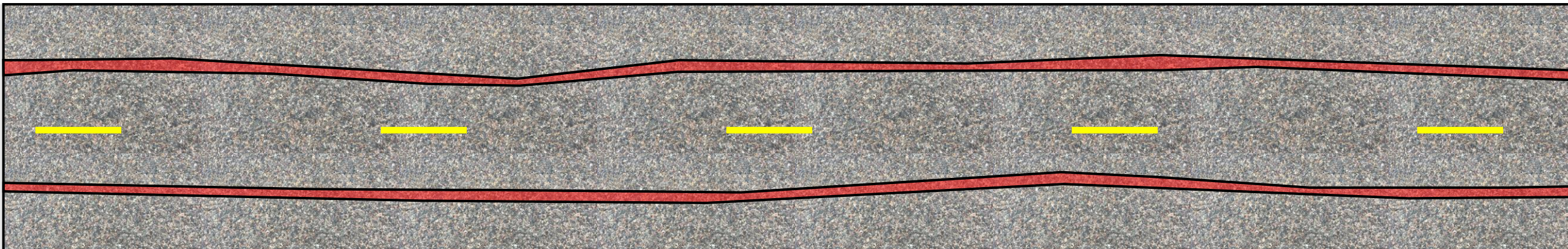
Lane

Raveling

Rutting





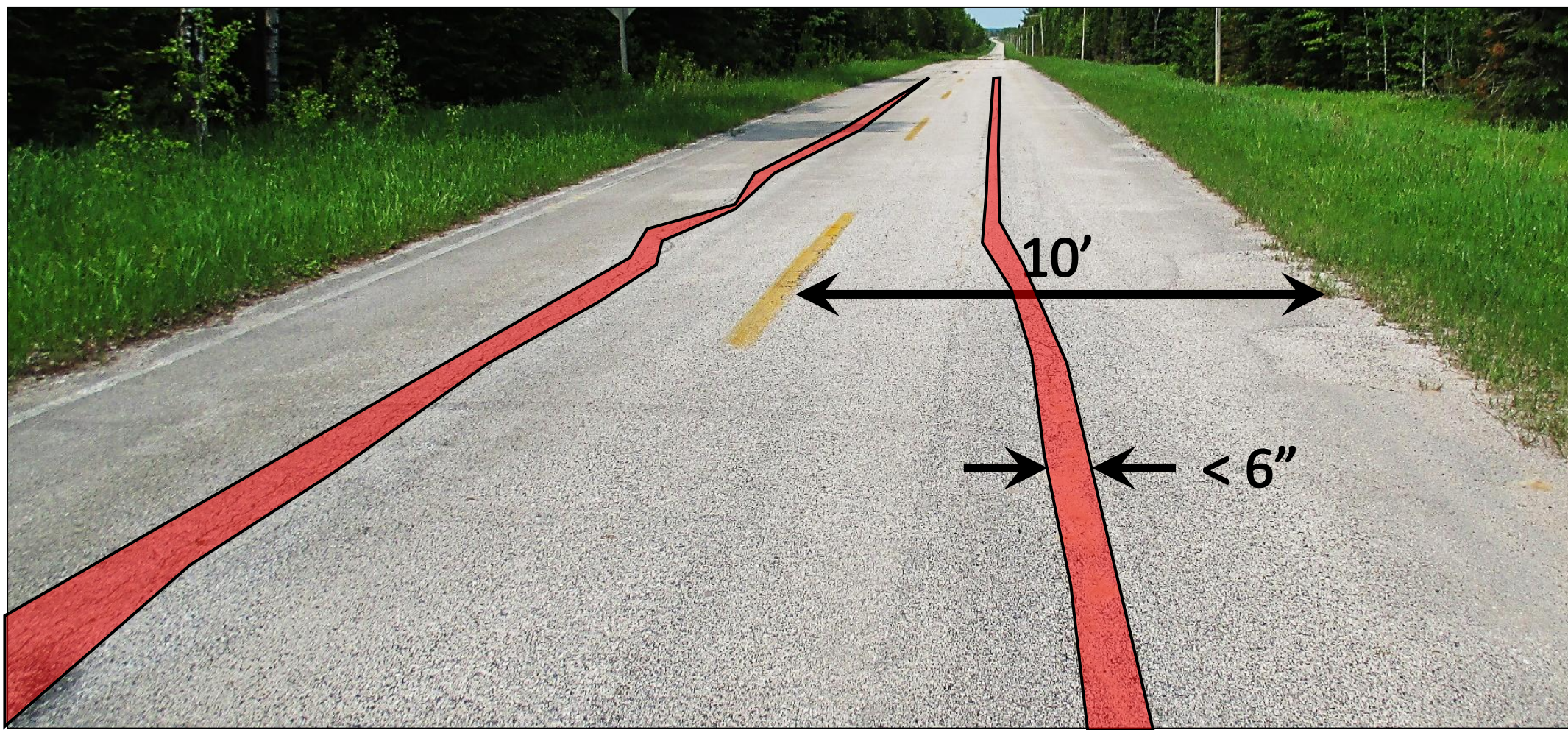


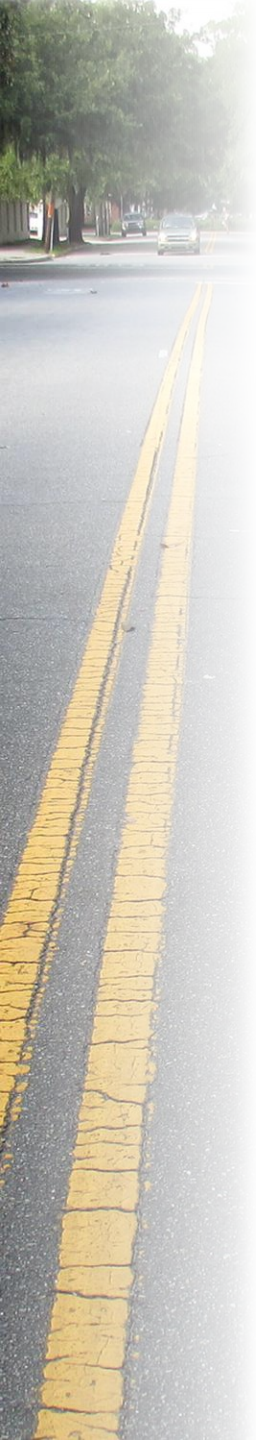
Edge

Lane

Raveling

Rutting





Asphalt Rating Exercises

Wheel/Edge

Ruts

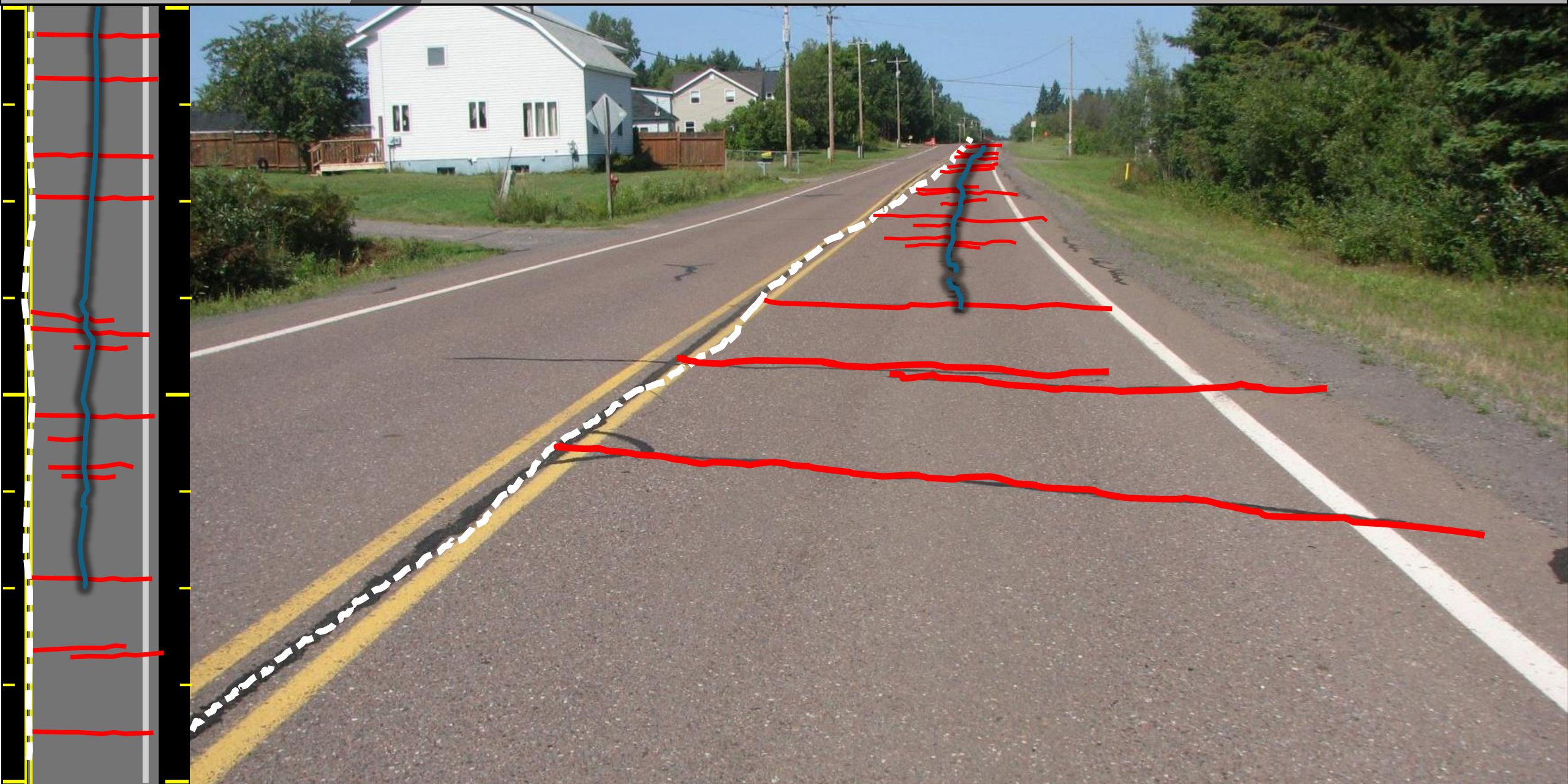
Alligator

Transverse

Long

Block

Hide All





Wheel/Edge

Ruts

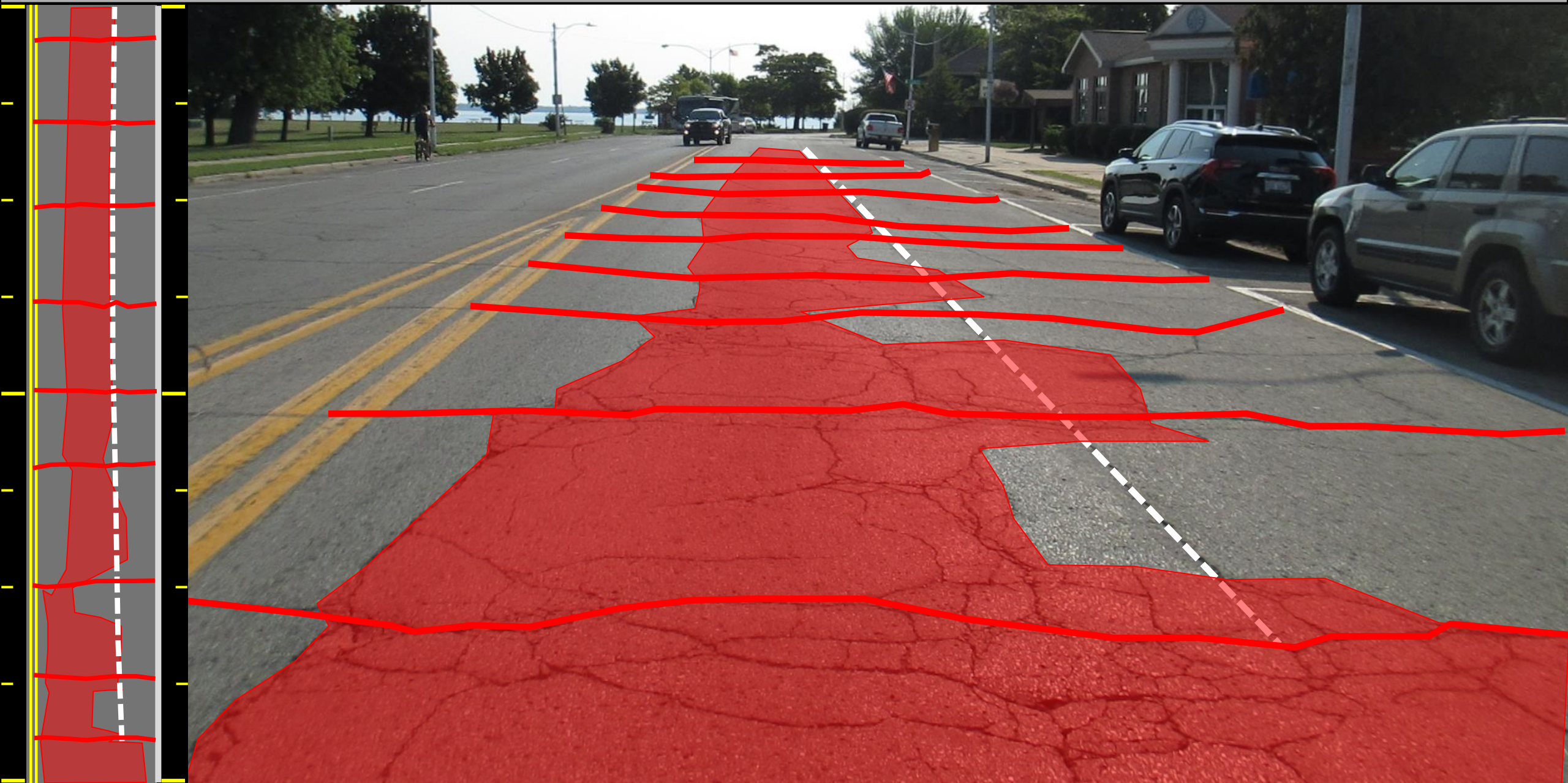
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

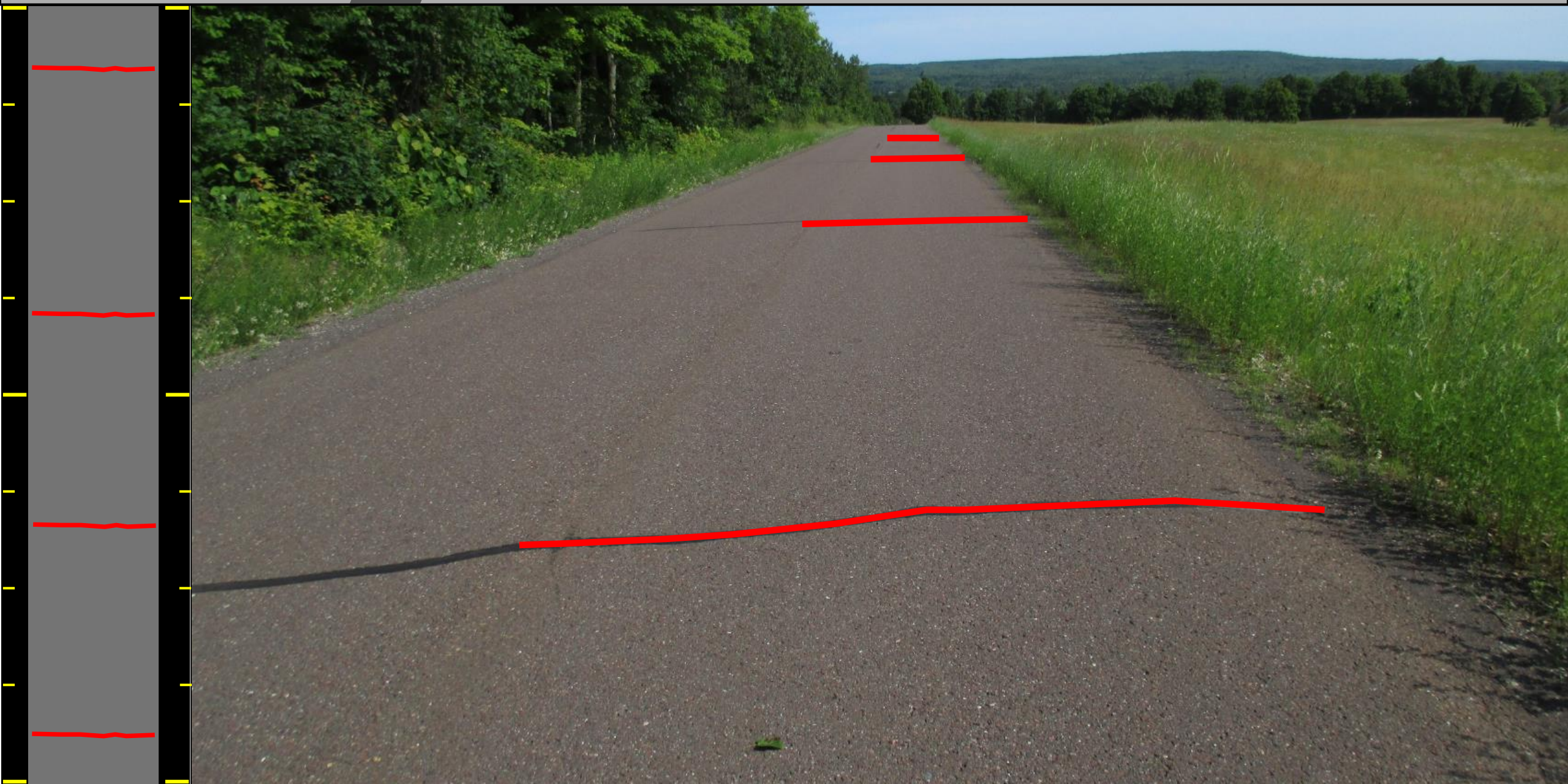
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

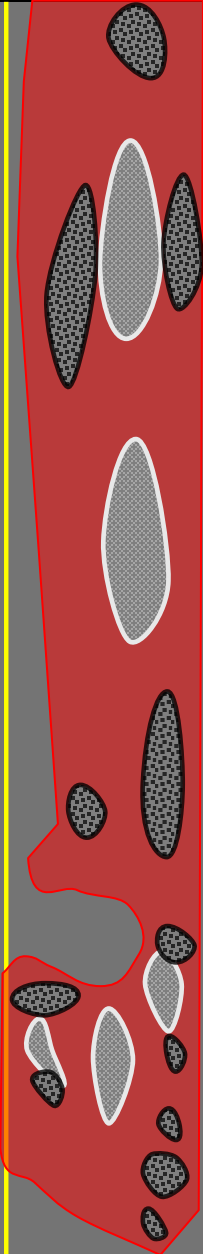
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

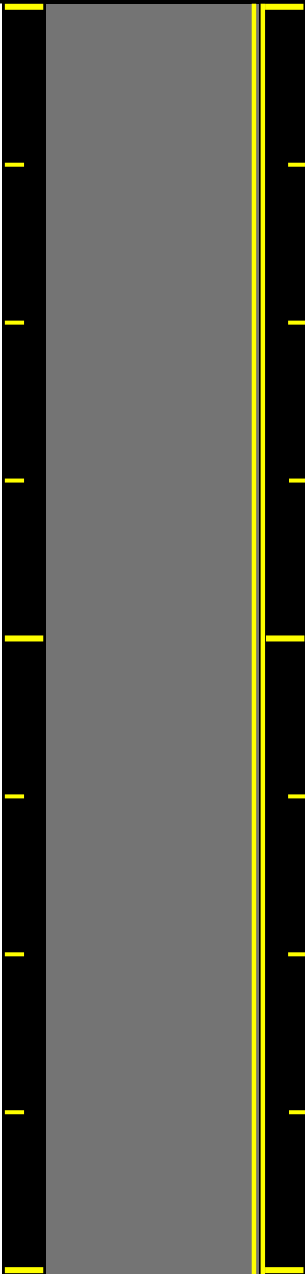
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

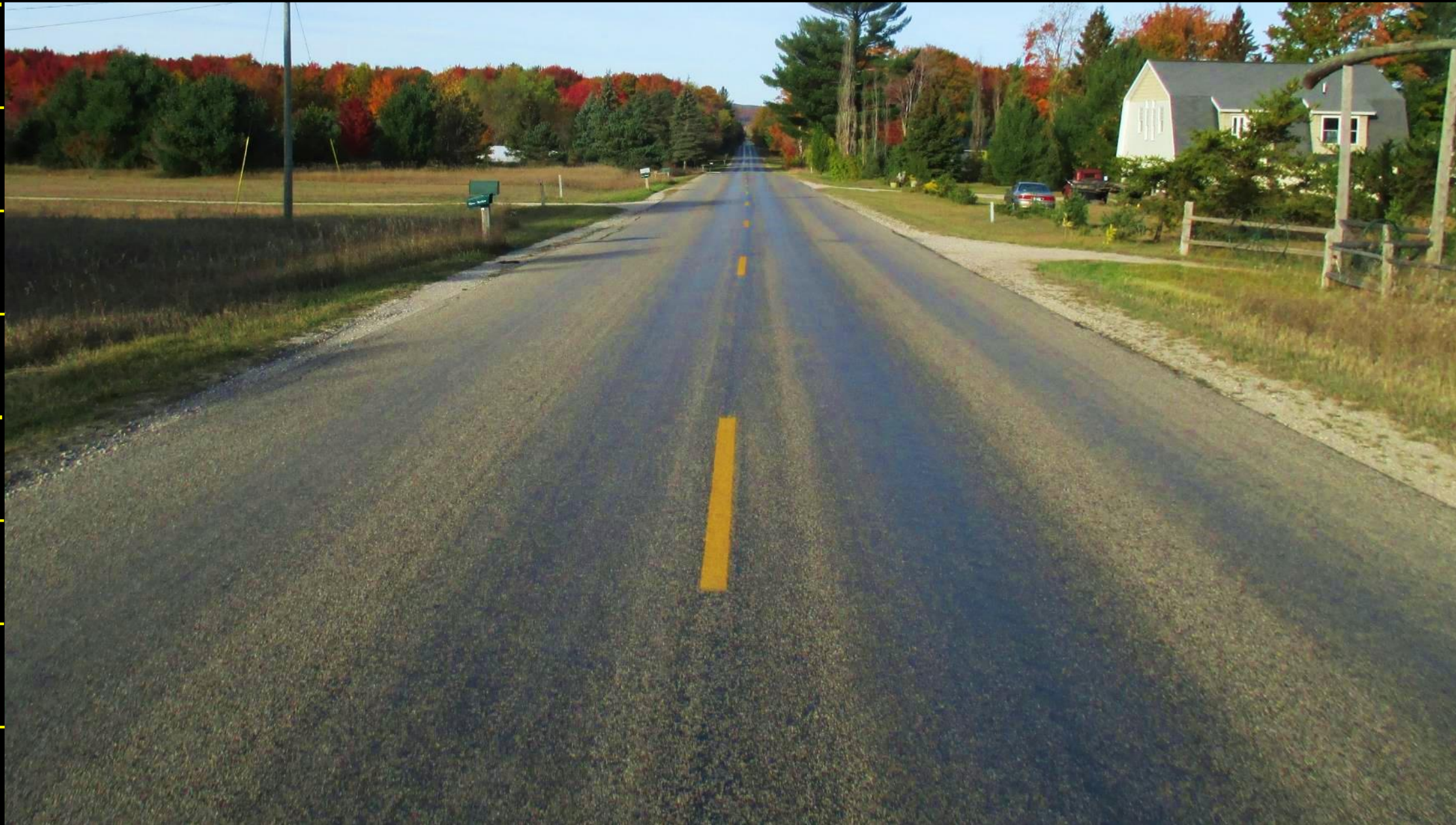
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

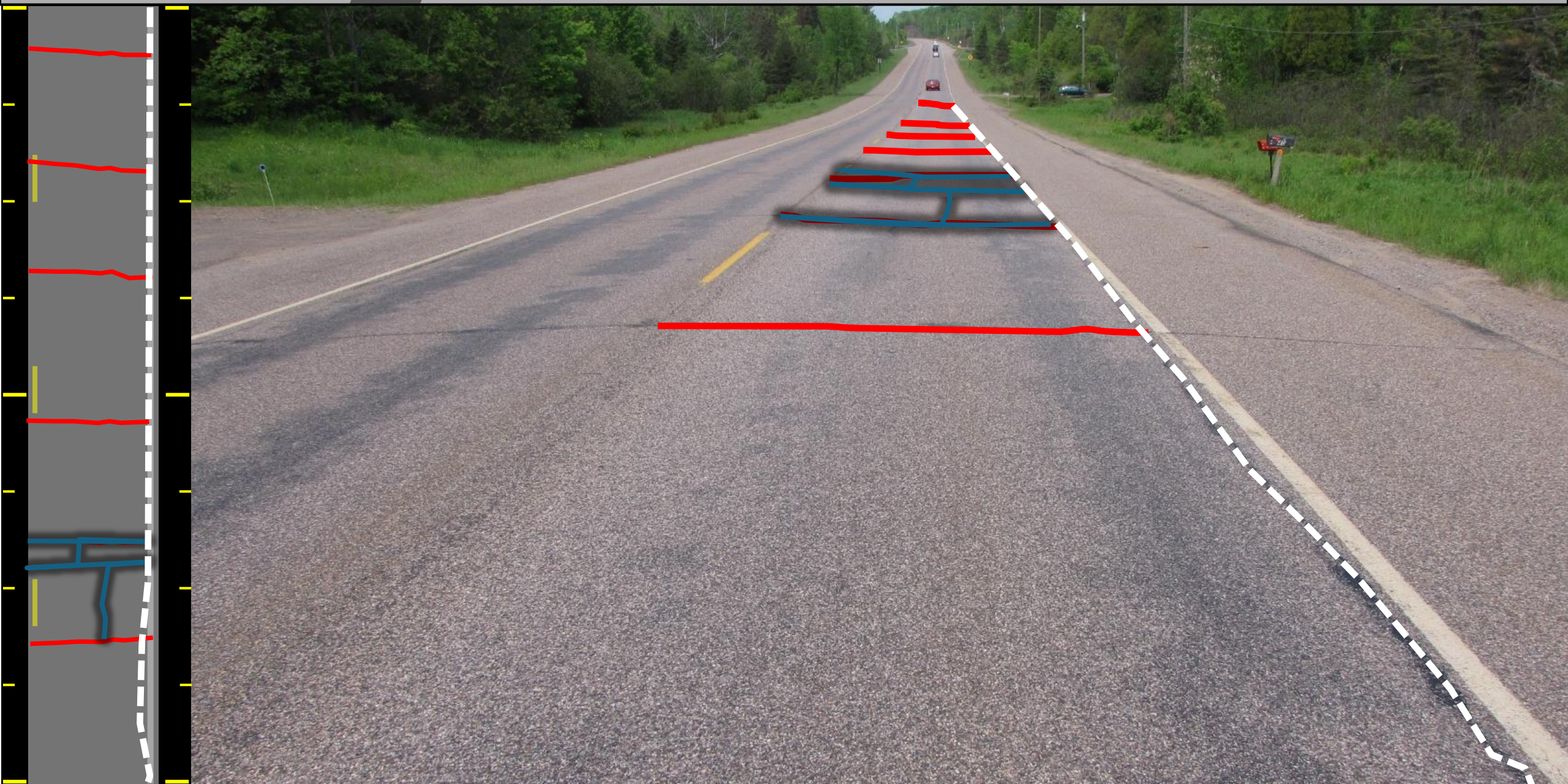
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

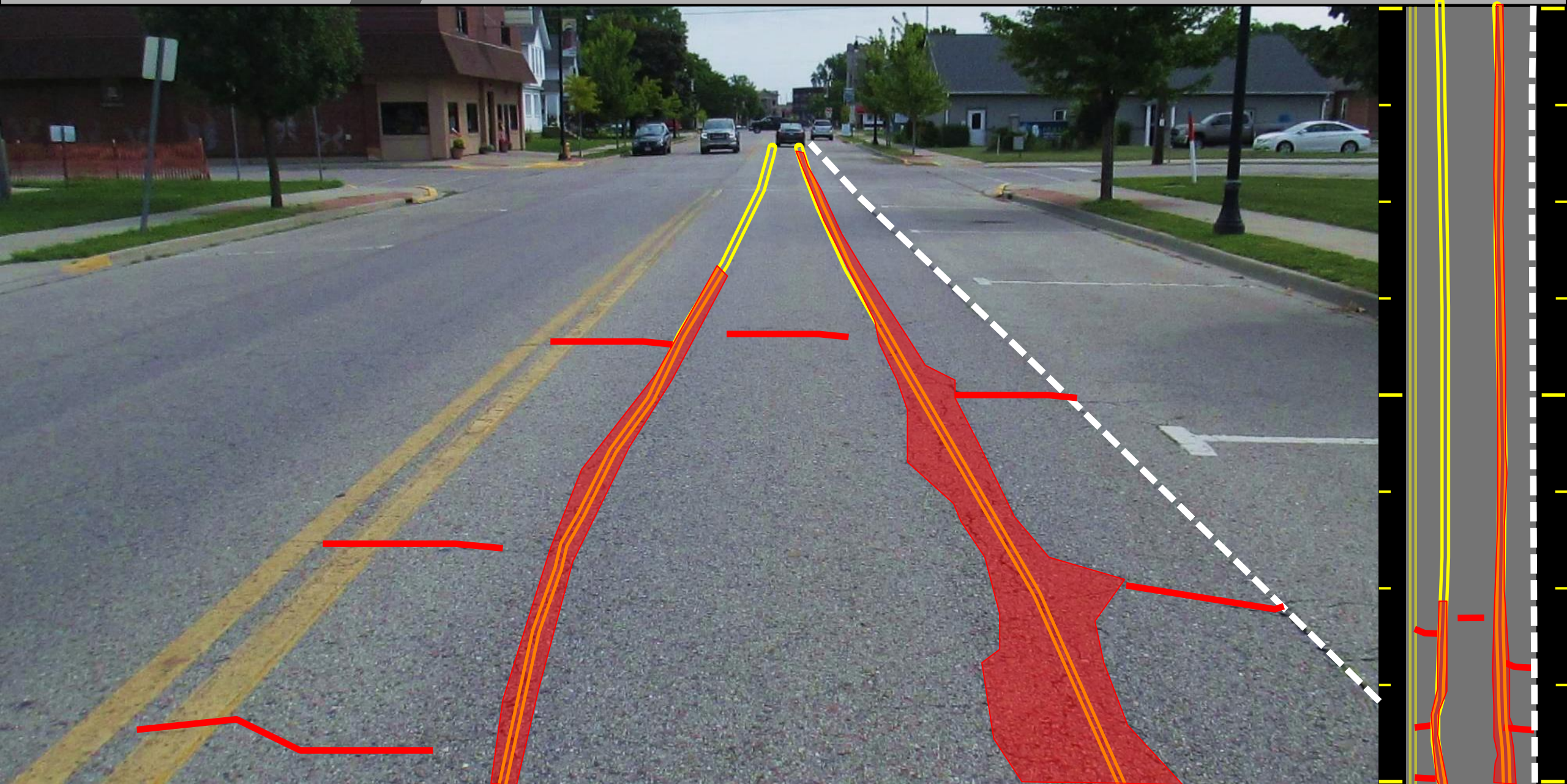
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

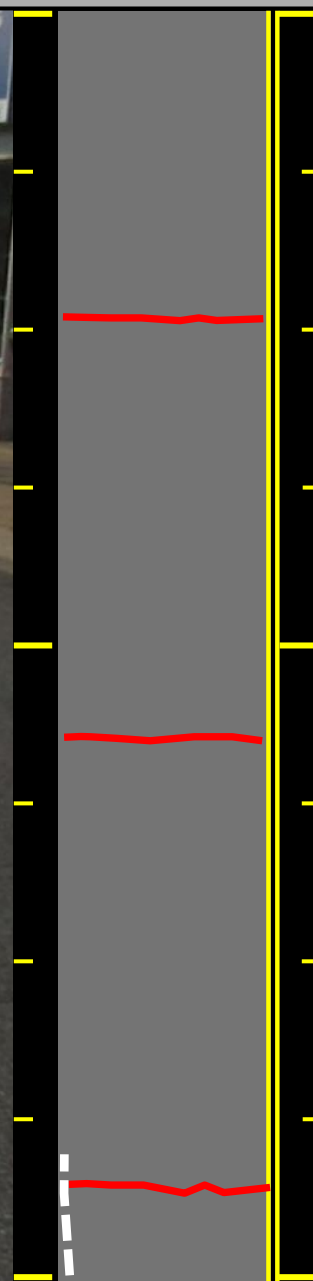
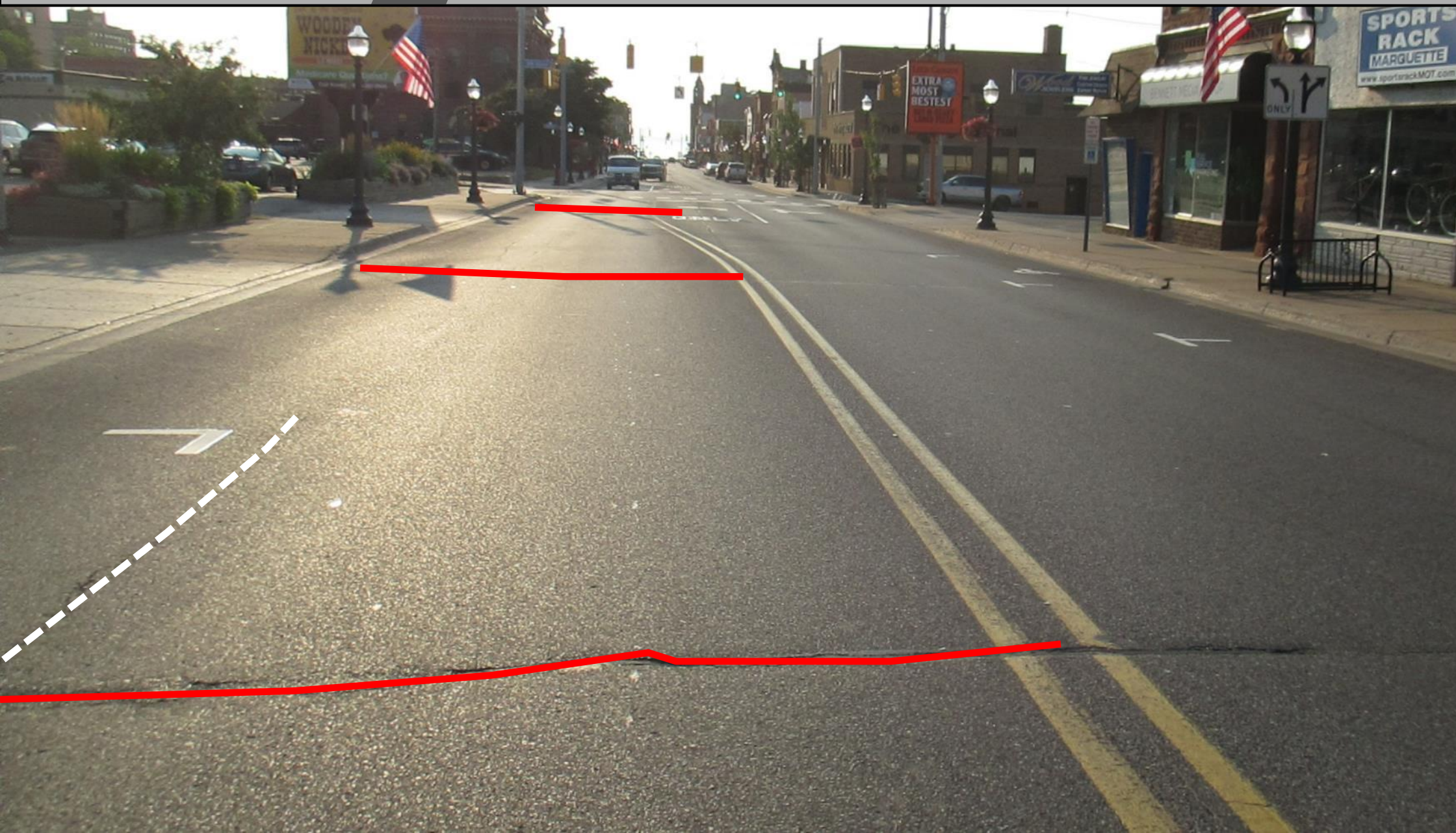
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

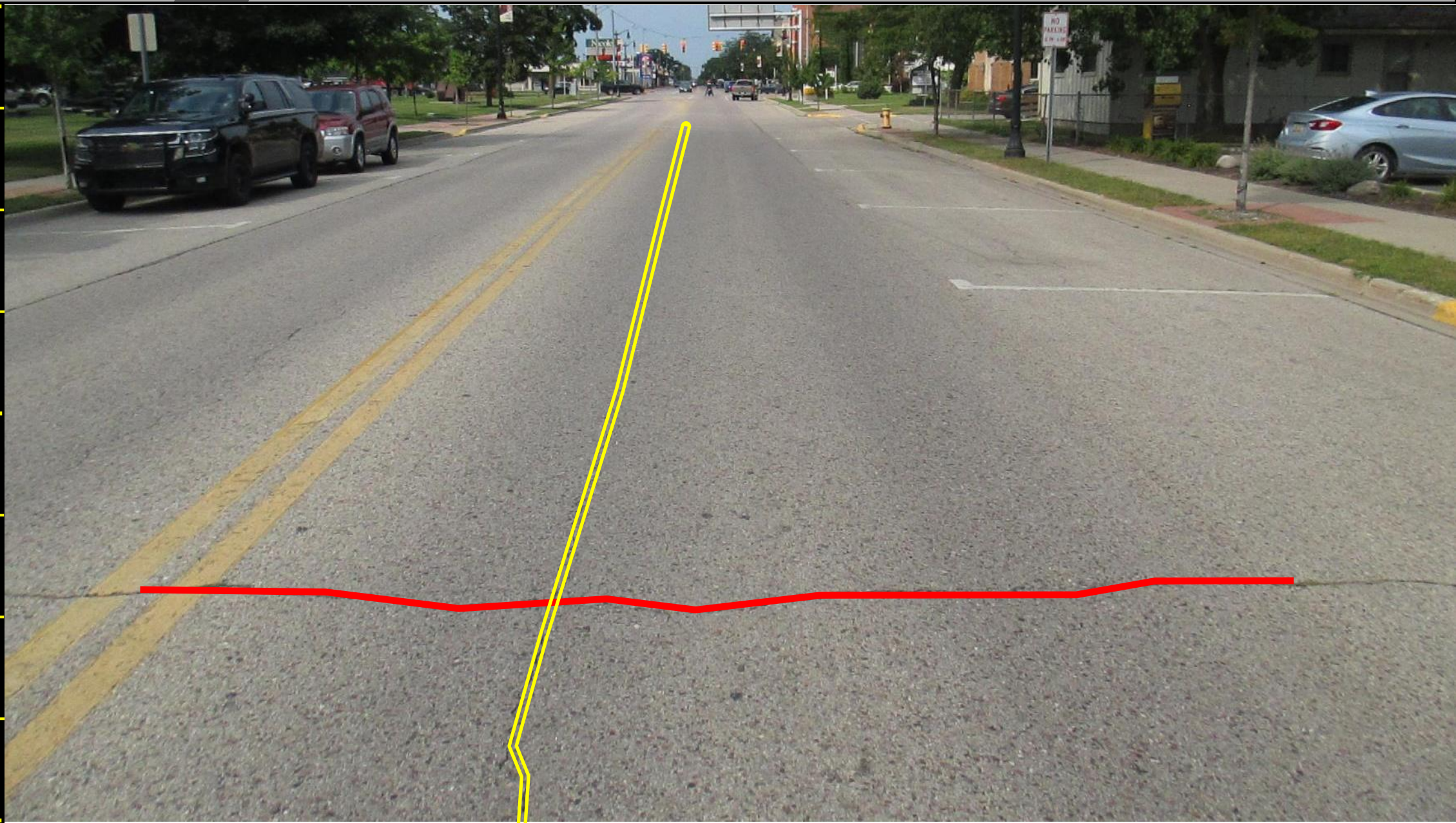
Alligator

Transverse

Long

Block

Hide All



Wheel/Edge

Ruts

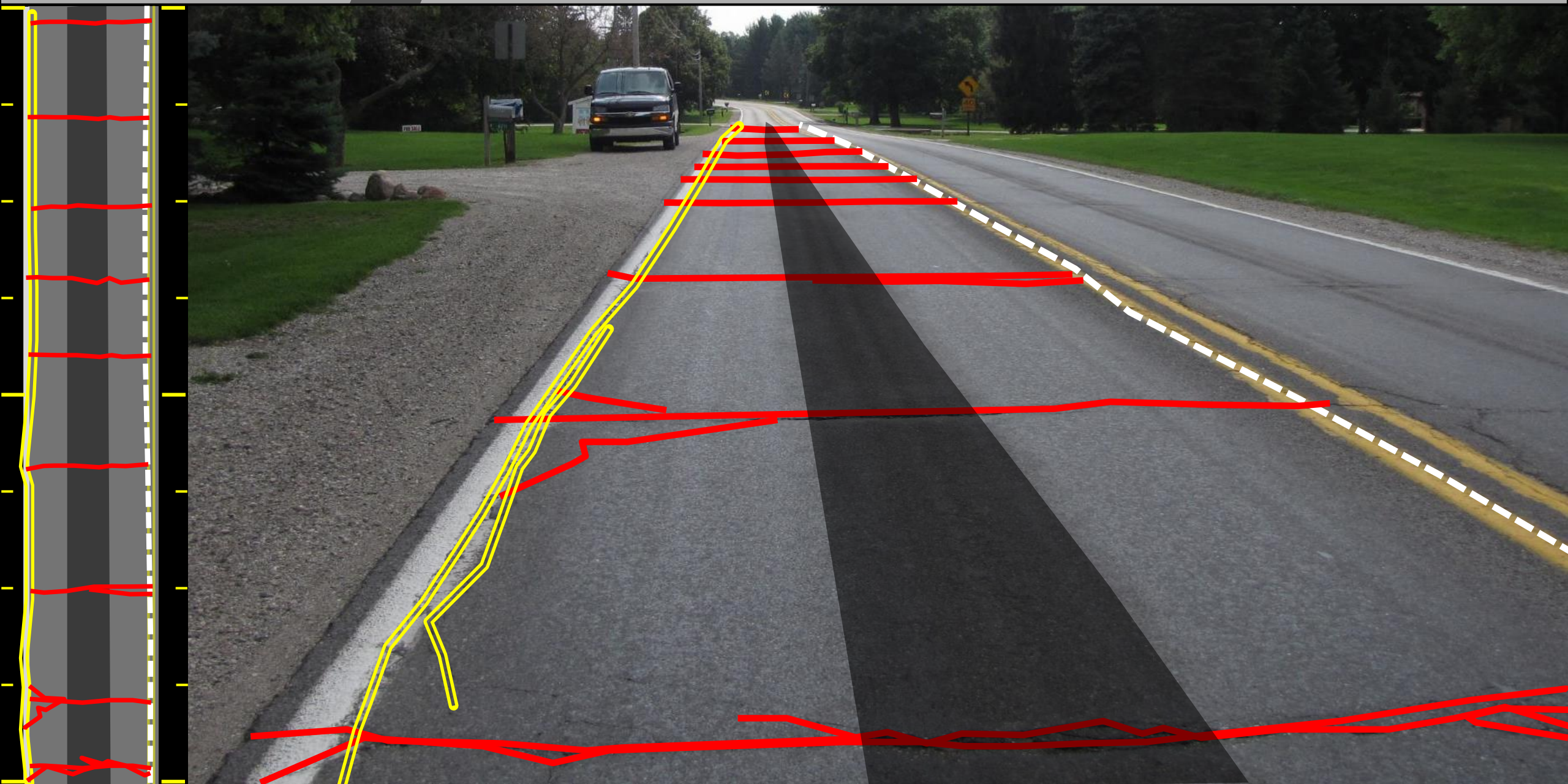
Alligator

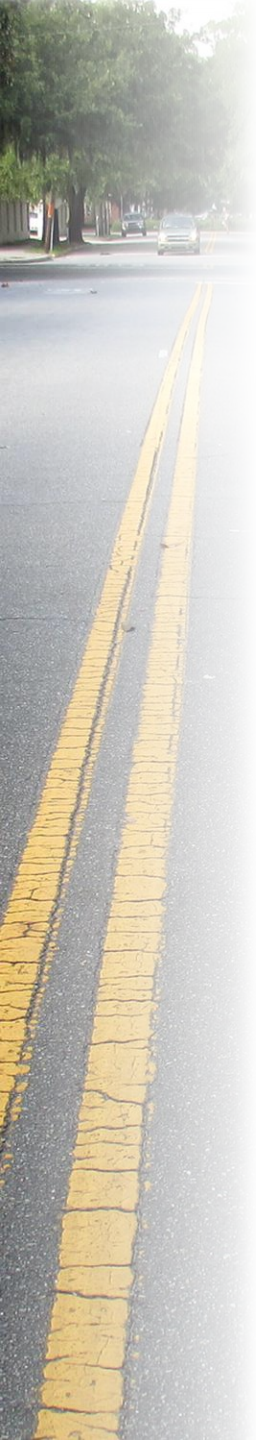
Transverse

Long

Block

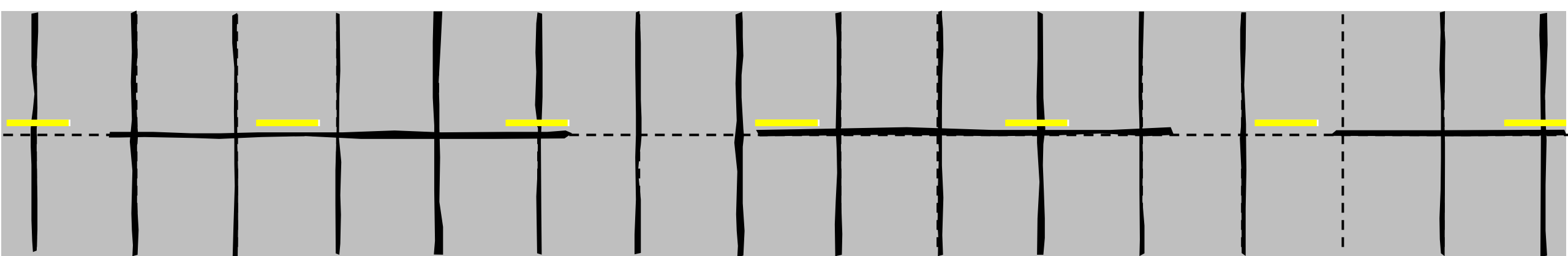
Hide All





Concrete Rating Exercises



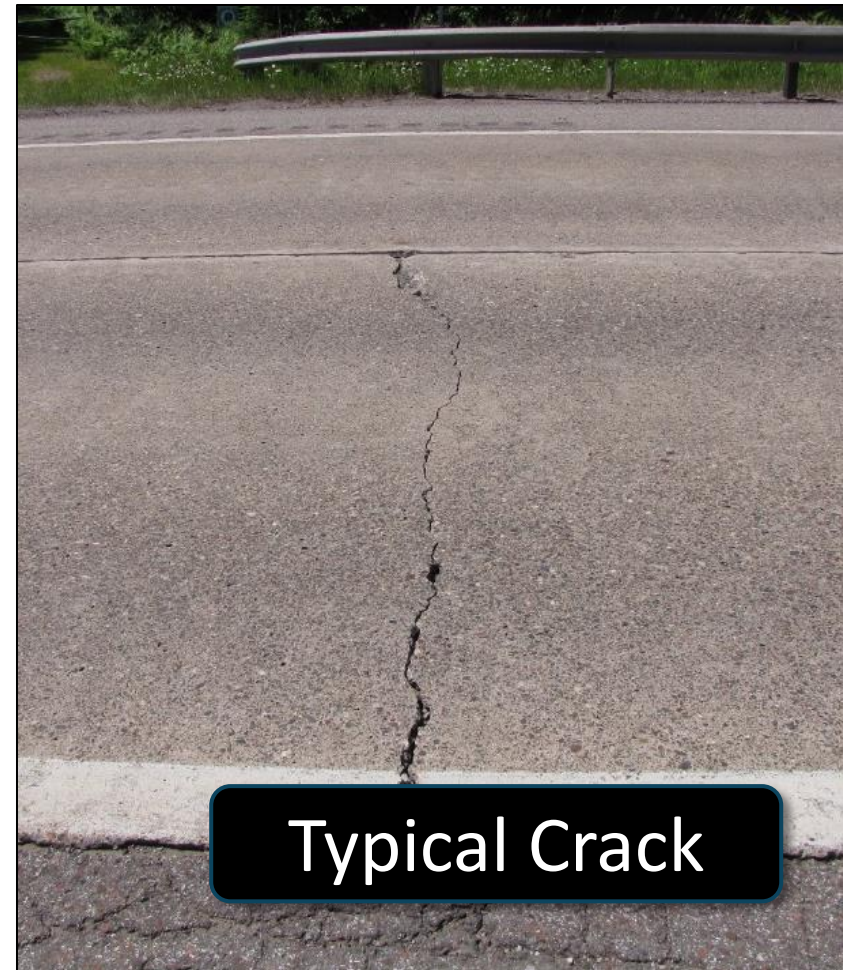


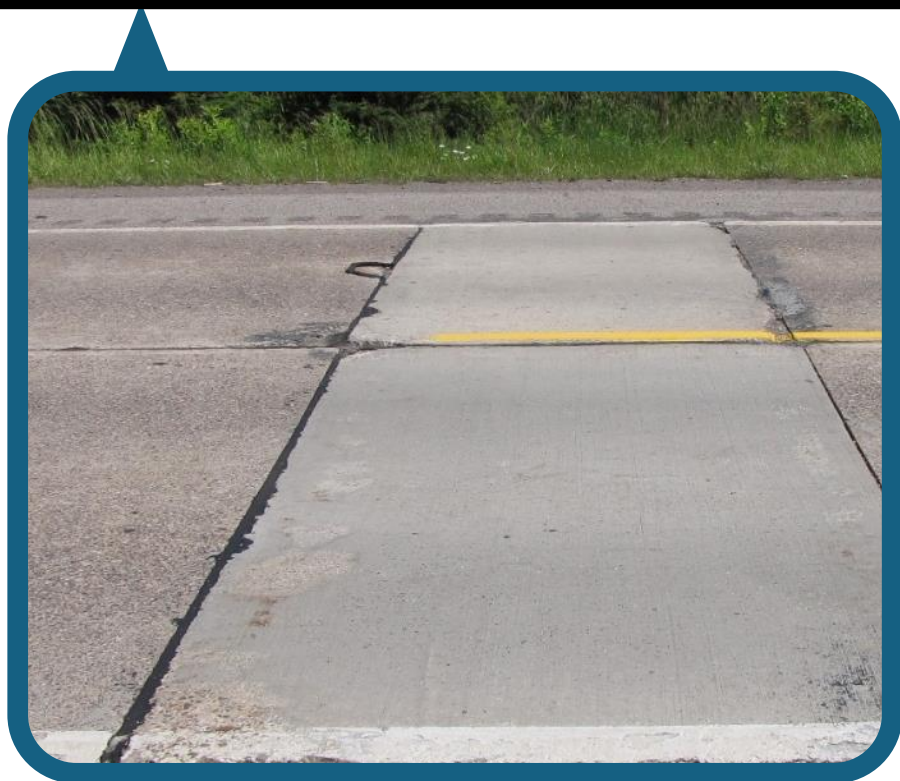
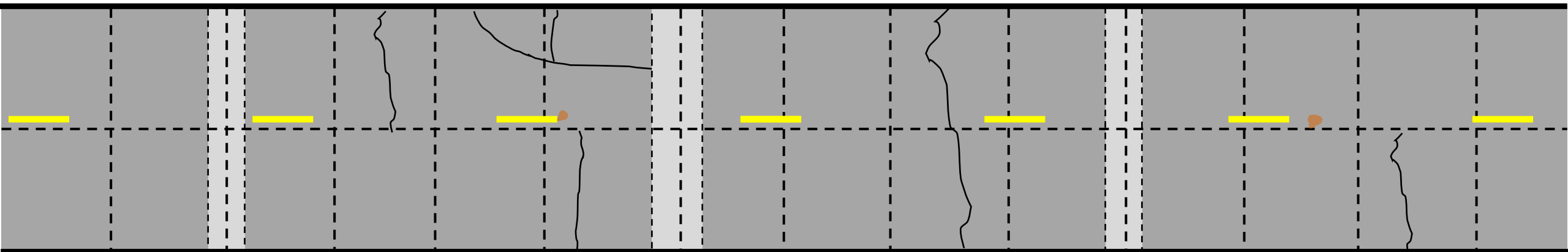


Typical Patch



Typical Crack



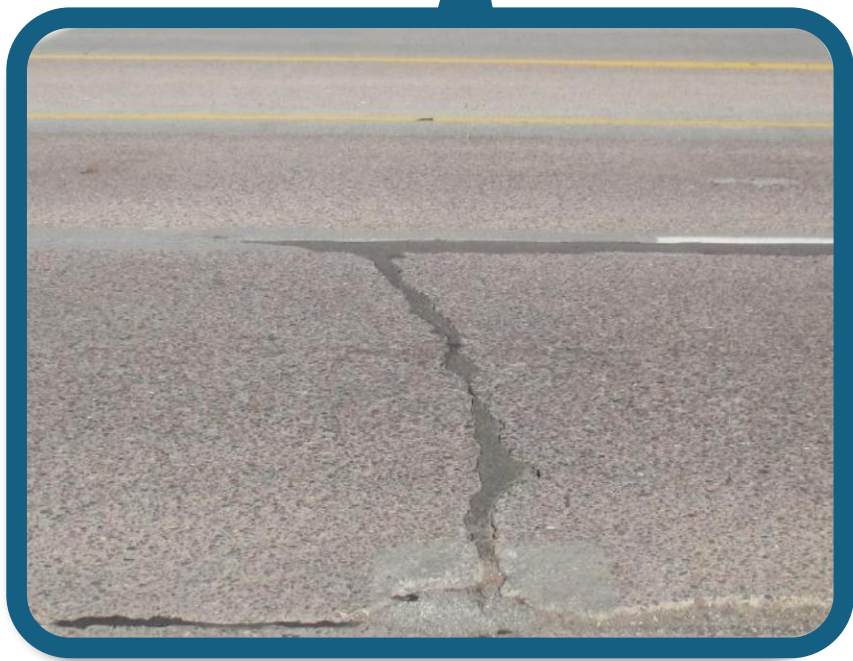
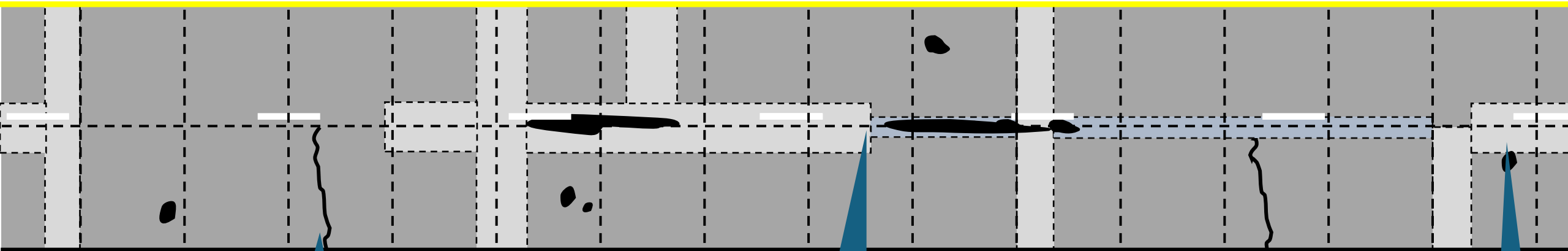


Looking East

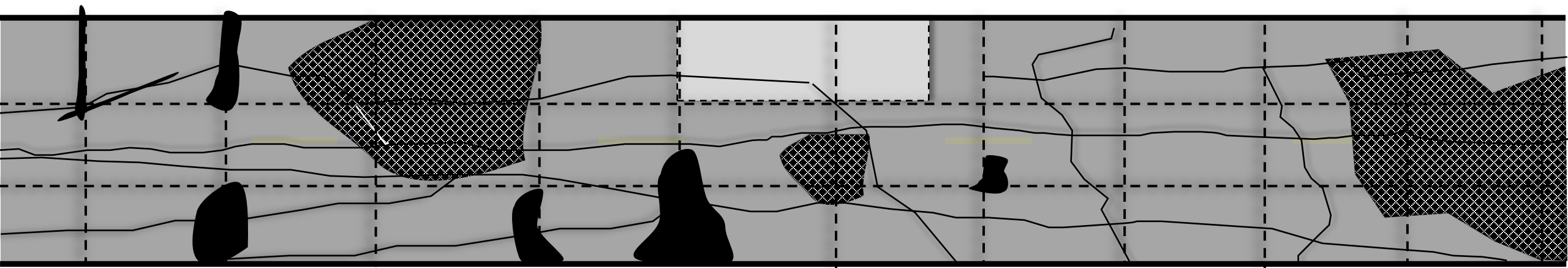


Looking West



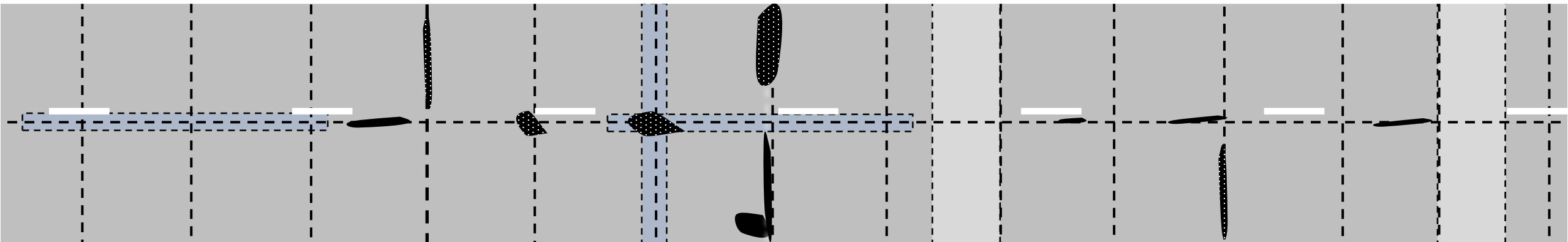




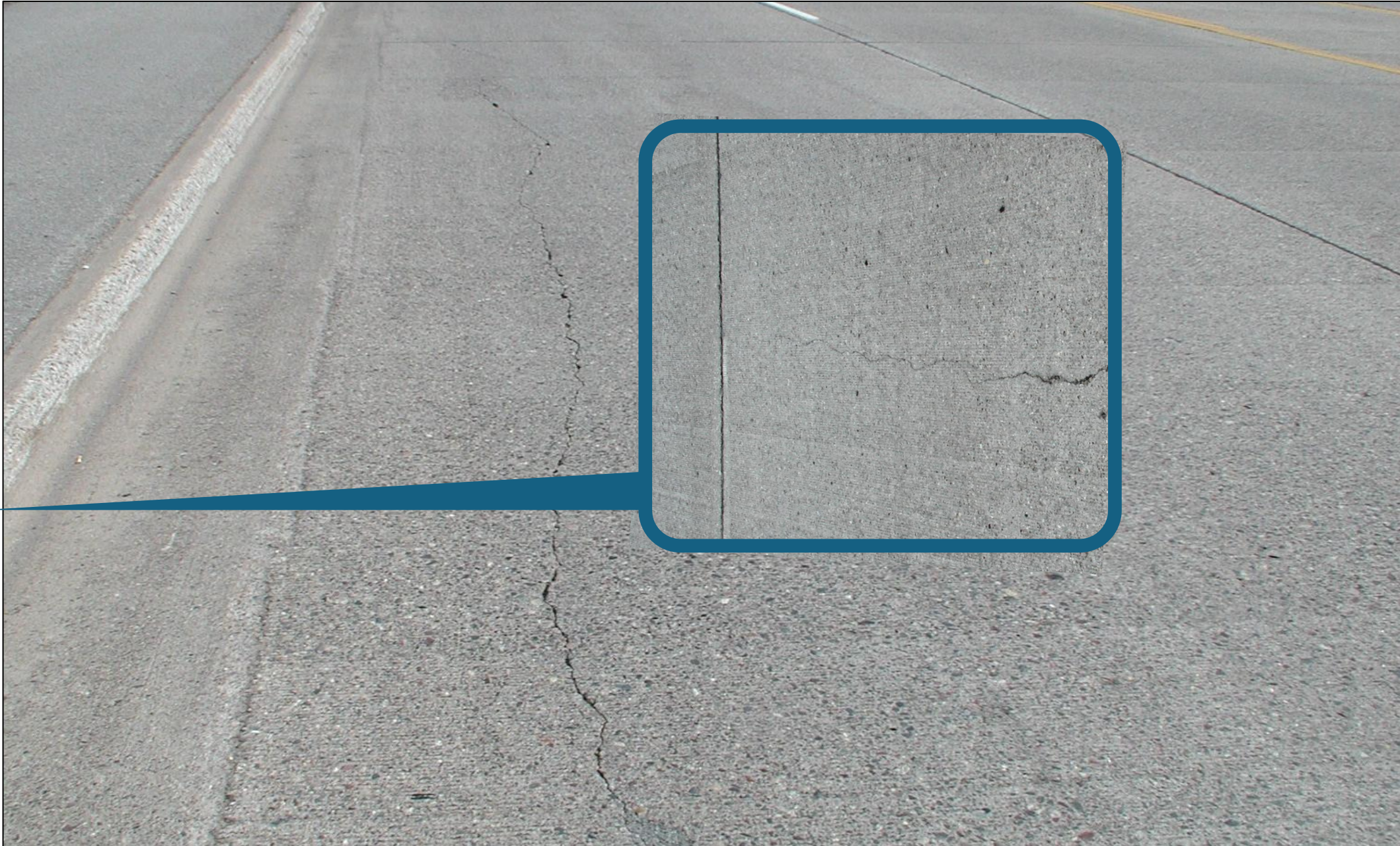
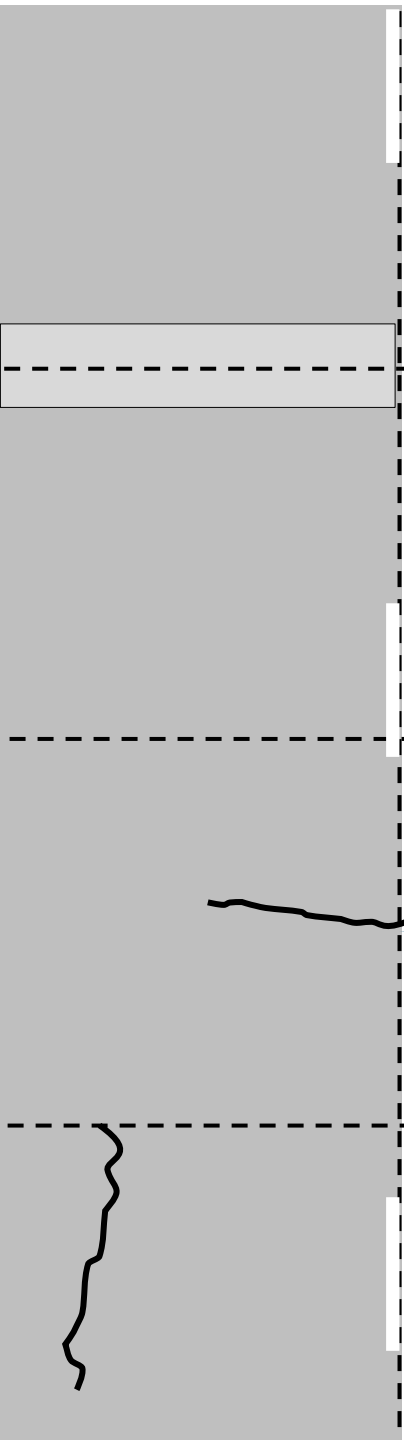










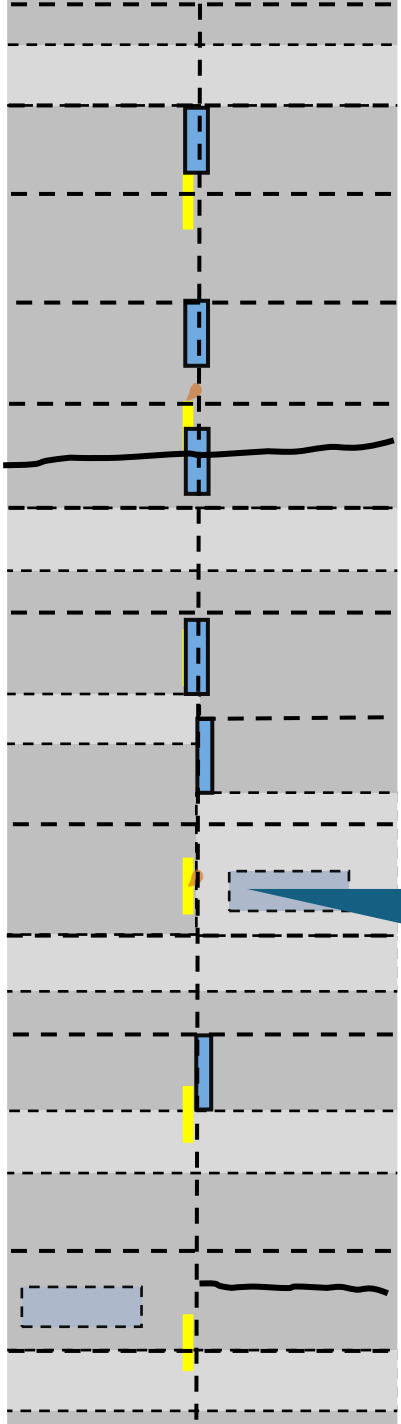


Looking West



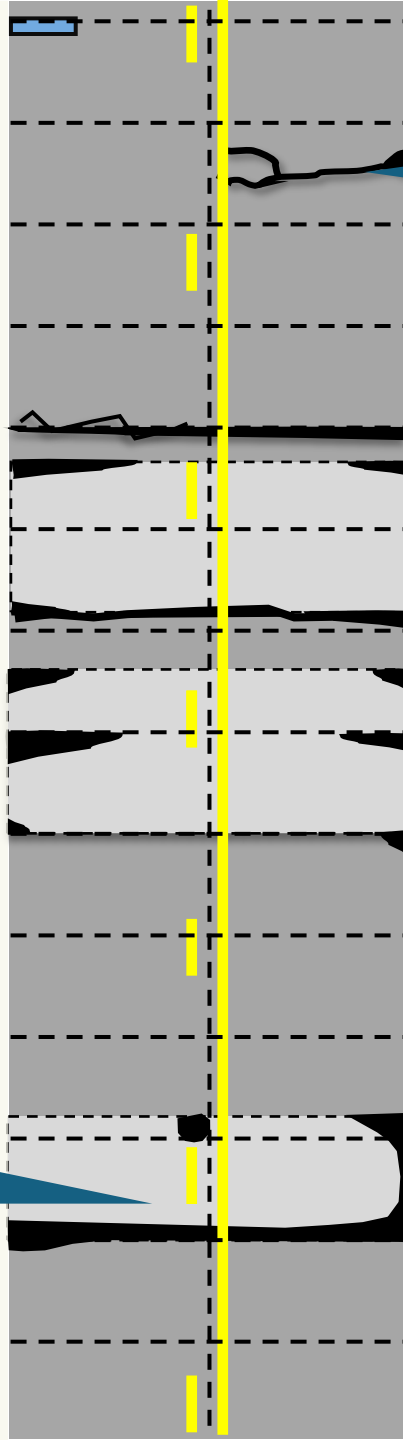
Looking East



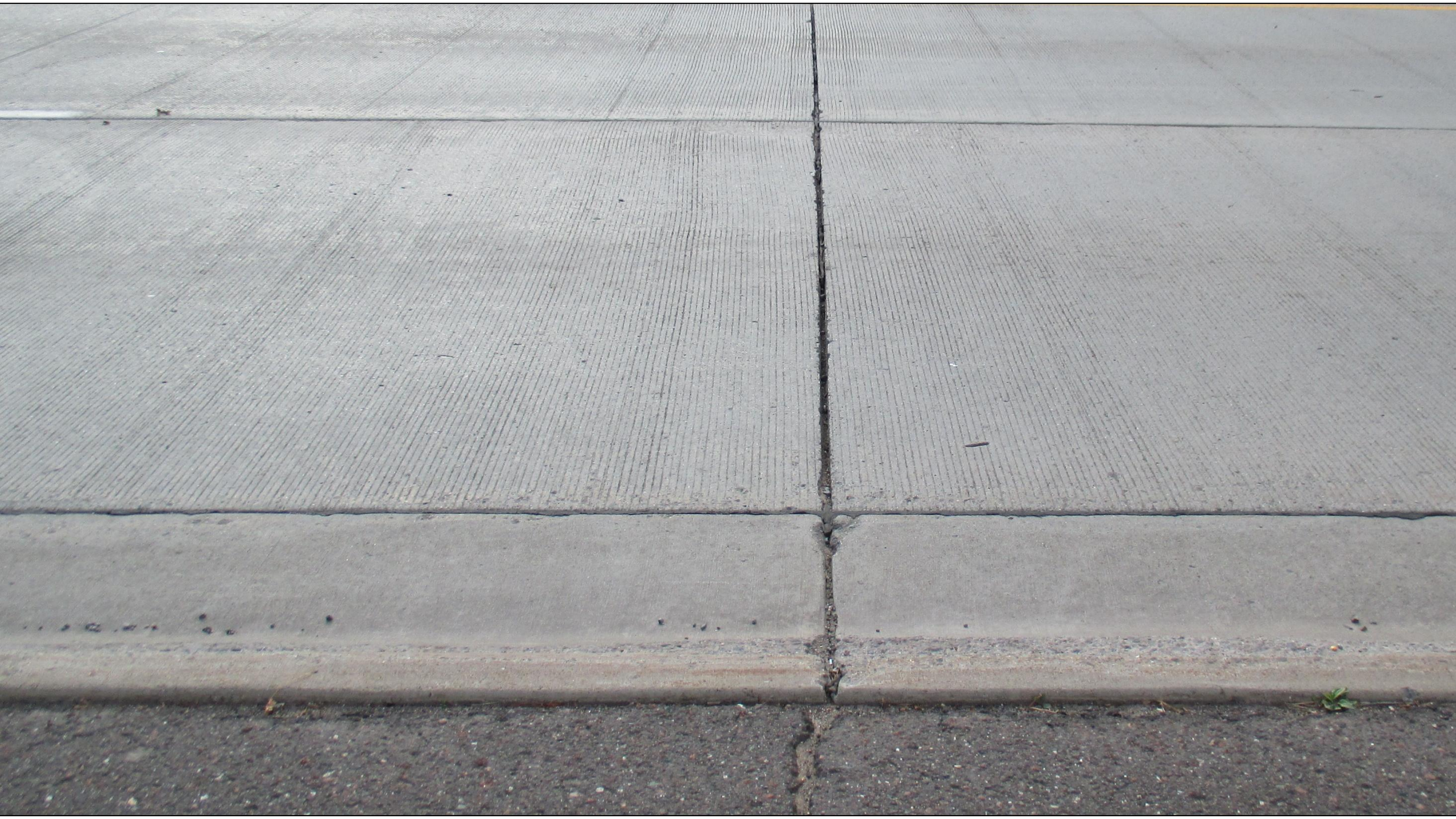


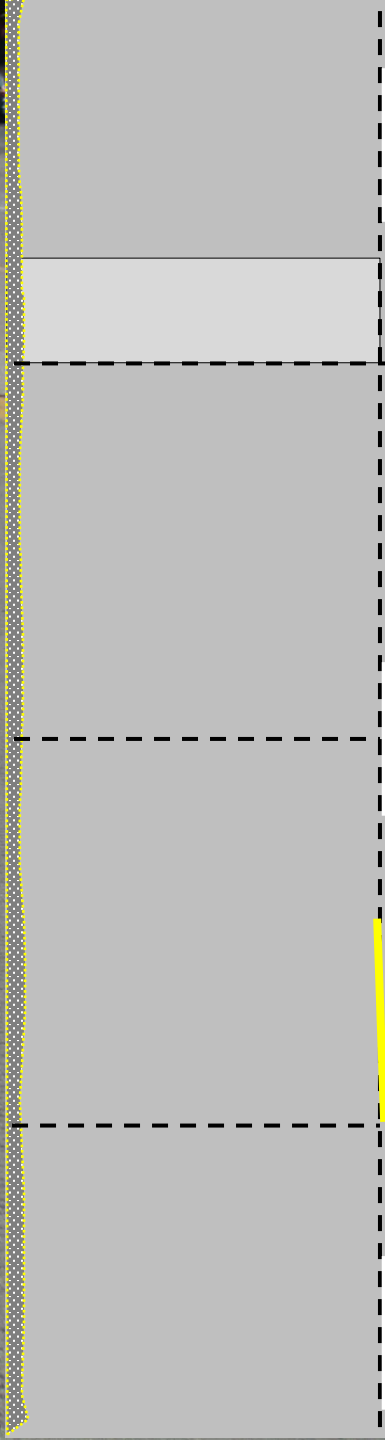








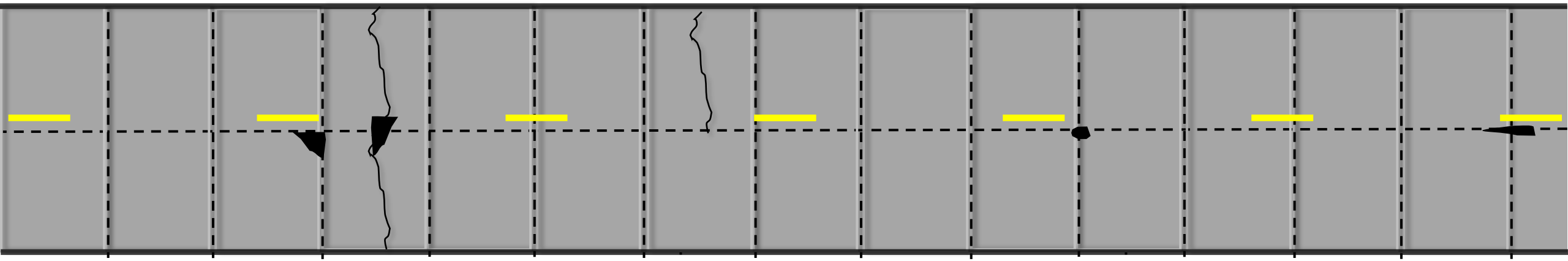












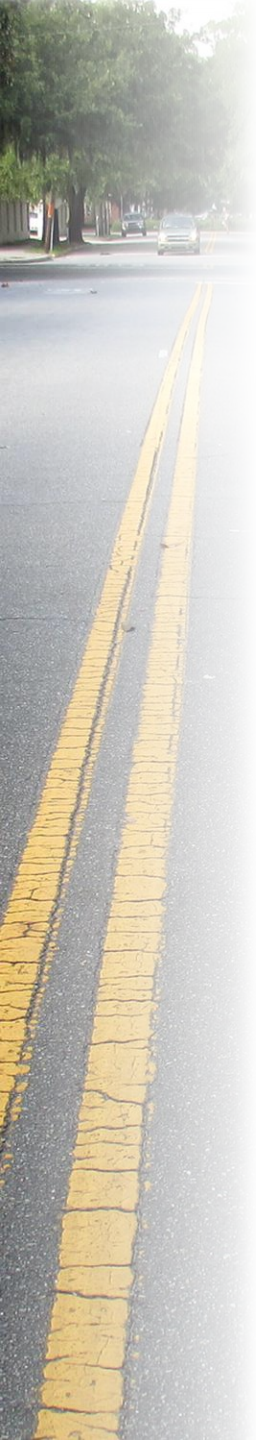


PASER TRAINING

CLASS TWO
DAY TWO
BONUS EXERCISES

Sponsored by:





Final Thoughts

Upcoming Trainings & Final Thoughts

Safety when Rating

IBR Training – June 25th 9:00am-11:00am

Online & Free

Complete Evaluation

Additional PASER Rating Practice

Contact Information

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