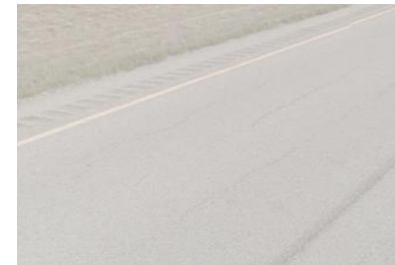


FHWA-IDOT

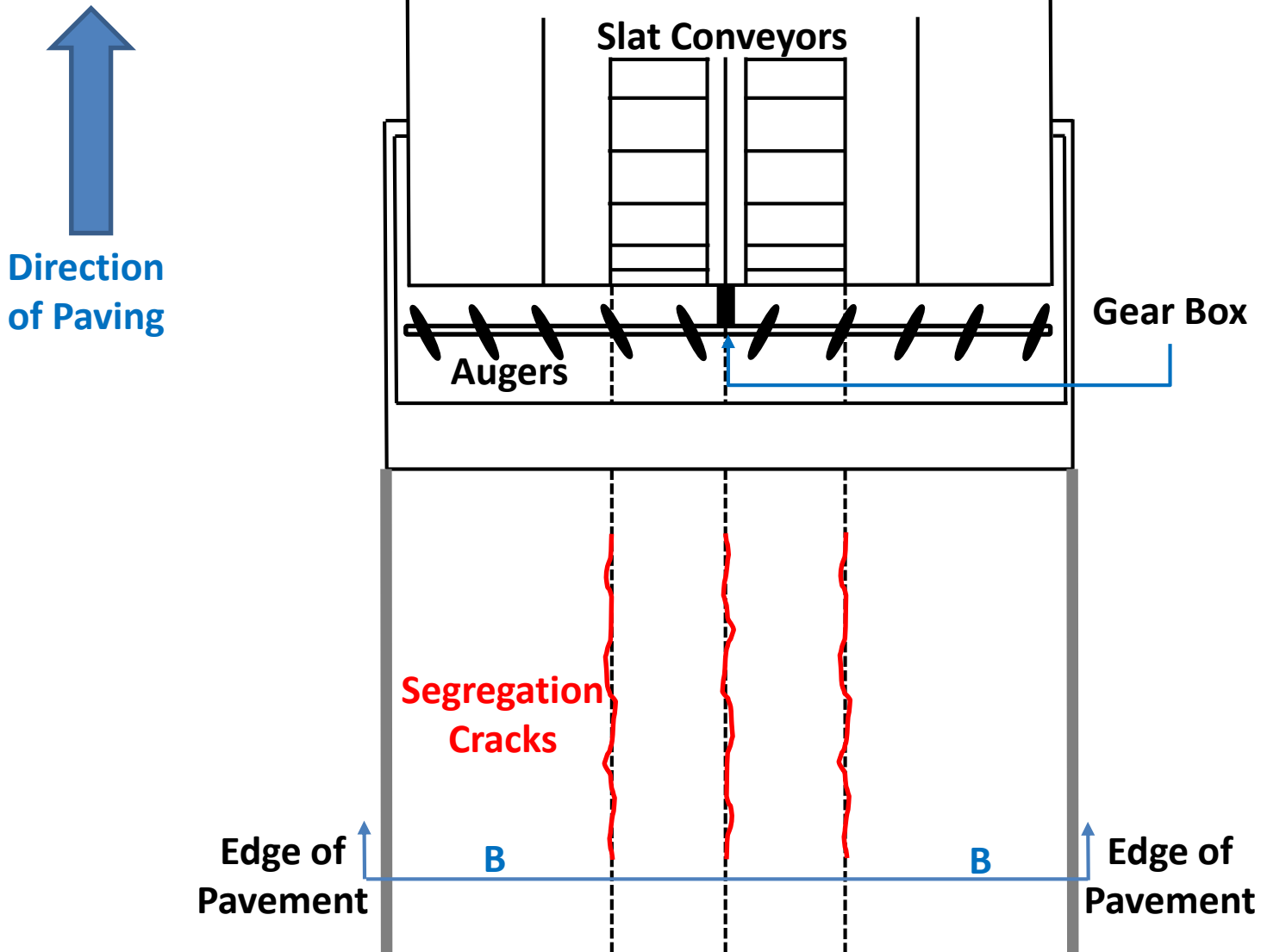
Paver Segregation Process Review

Preliminary Findings

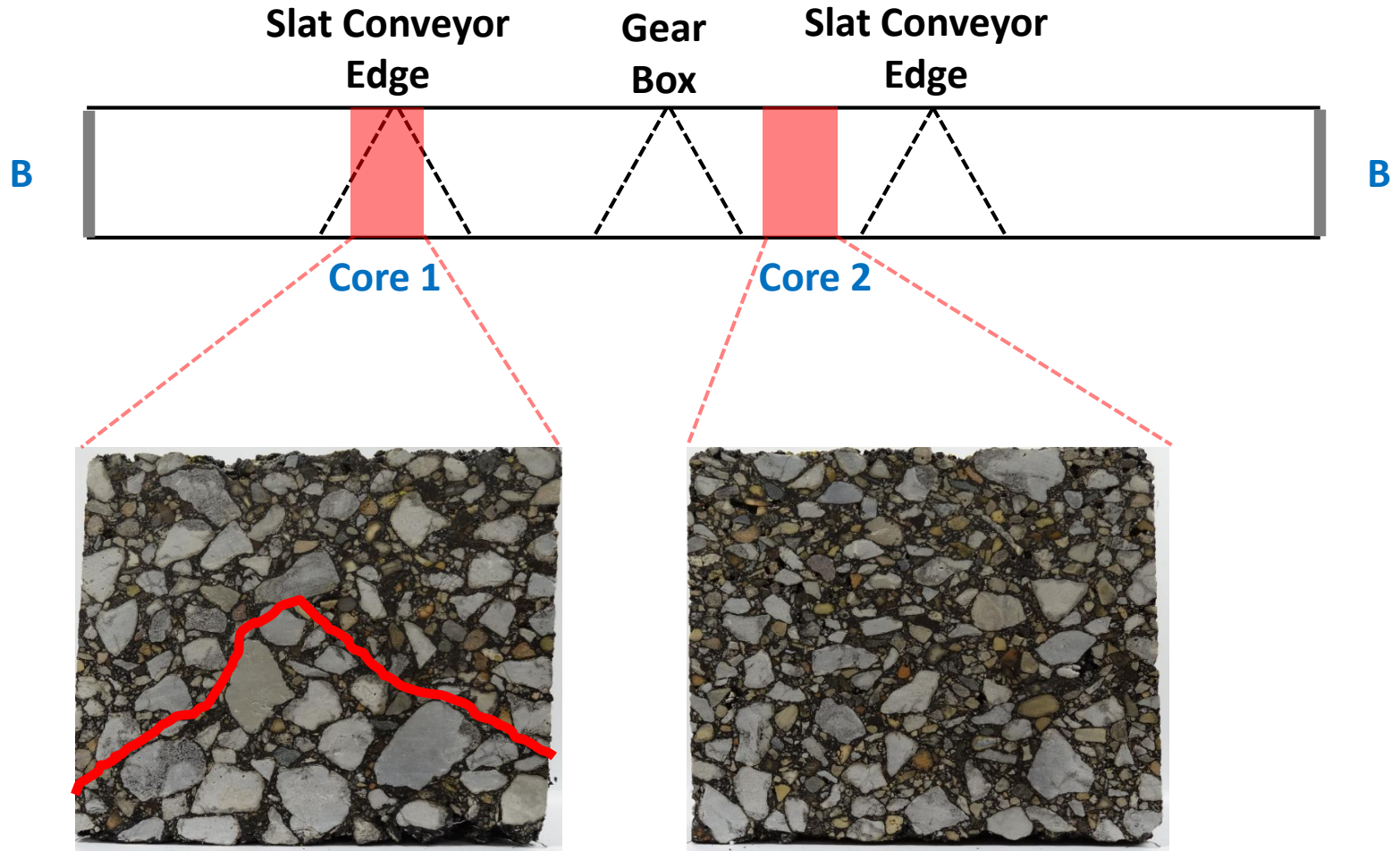


What is Paver Segregation?

Paver Segregation Schematic



Paver Segregation Schematic – Section B-B





**Opened in 1997
IL-4 / Veterans Parkway Ext.
Crack Sealed in 1999**

Trepanier, J. (2018) *History of Paver Induced Longitudinal Cracking in Illinois*. Presented at the Illinois Department of Transportation Spring 2018 Hot-Mix Asphalt Technical Working Group Meeting, Springfield, IL.

Paver Segregation History in Illinois

Background

- 1993 Crack Investigation of I-72 & I-155
 - Full Depth HMA Pavements (1989-1991 Construction)
 - I-72 - 35 miles
 - I-155 - 29 miles
 - Extensive Cracking on Both Routes
 - Longitudinal Cracking Attributed to Paver Induced Segregation Especially on I-72

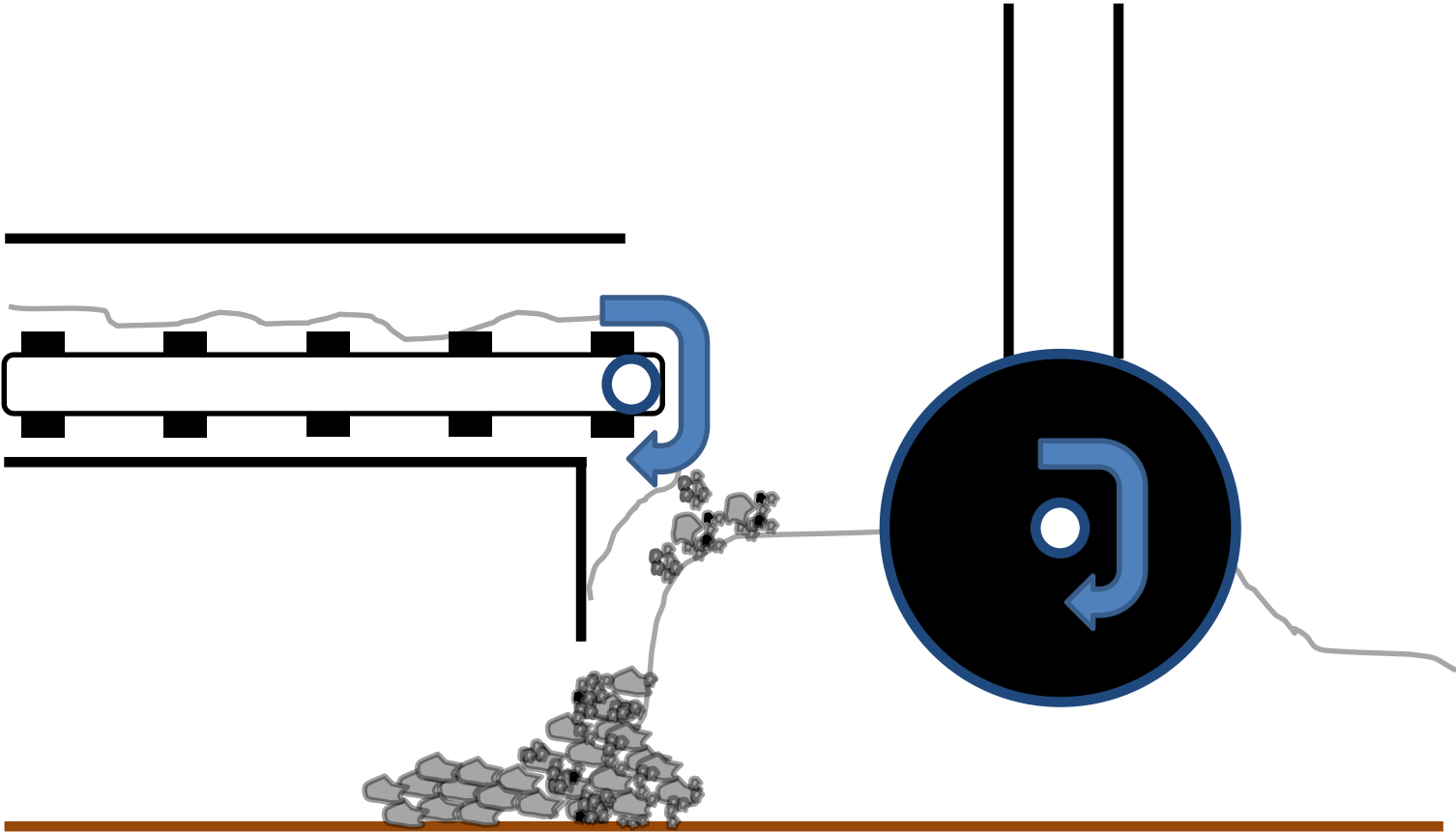
Trepanier, J. (2018) *History of Paver Induced Longitudinal Cracking in Illinois*. Presented at the Illinois Department of Transportation Spring 2018 Hot-Mix Asphalt Technical Working Group Meeting, Springfield, IL.

Early 2000's Paver Modifications

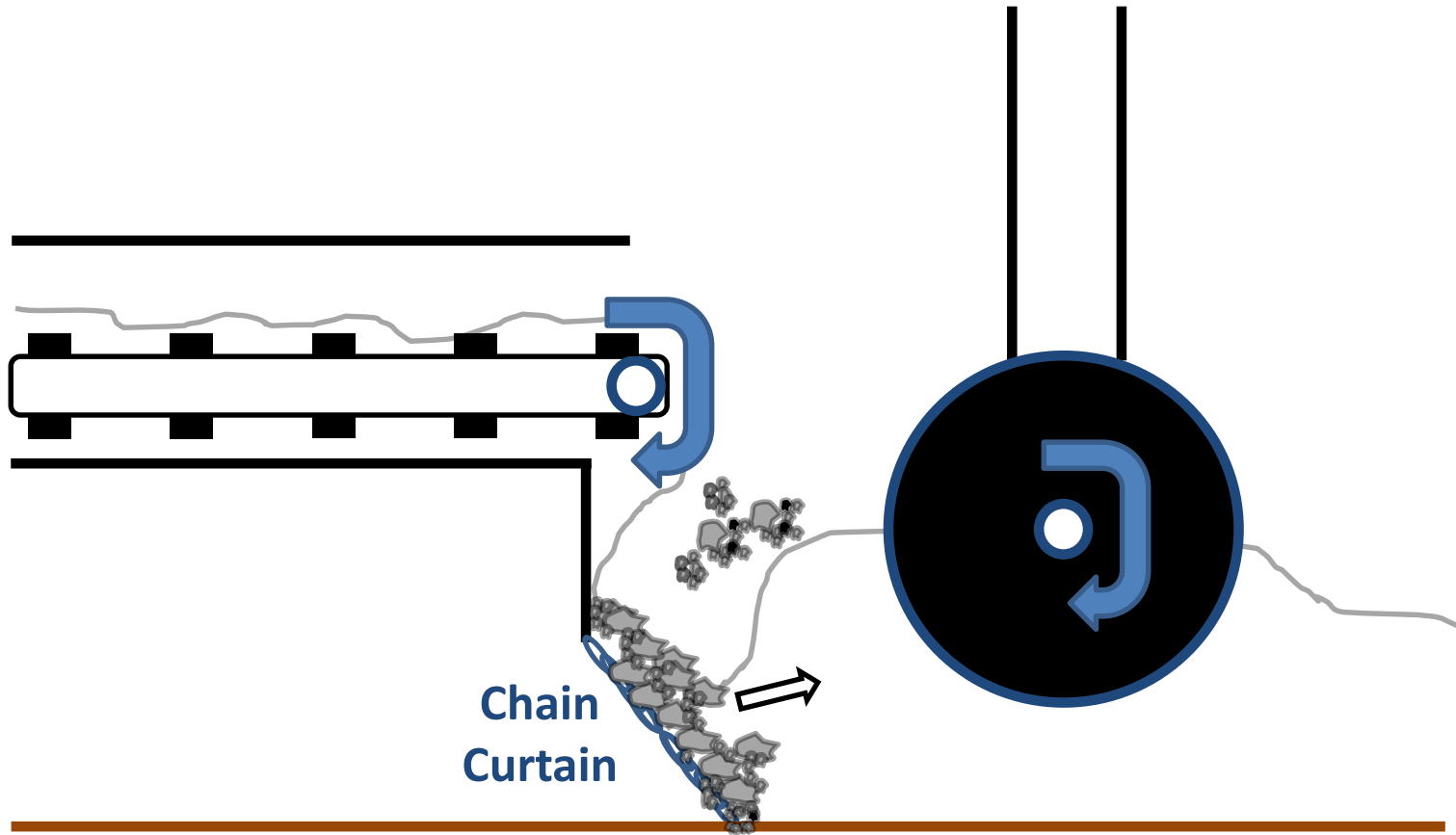
- **Paver Segregation Kit Installation**
- **Paver Manufacturer Check Sheets**
- **Modified Standard Specifications (Art. 1102.03)**
 - Contractor submit cert. kit installed & operational
 - Contractor/RE perform paver inspection prior to paving using manuf. checklist
 - Completed checklist provided to RE

Trepanier, J. (2018) *History of Paver Induced Longitudinal Cracking in Illinois*. Presented at the Illinois Department of Transportation Spring 2018 Hot-Mix Asphalt Technical Working Group Meeting, Springfield, IL.

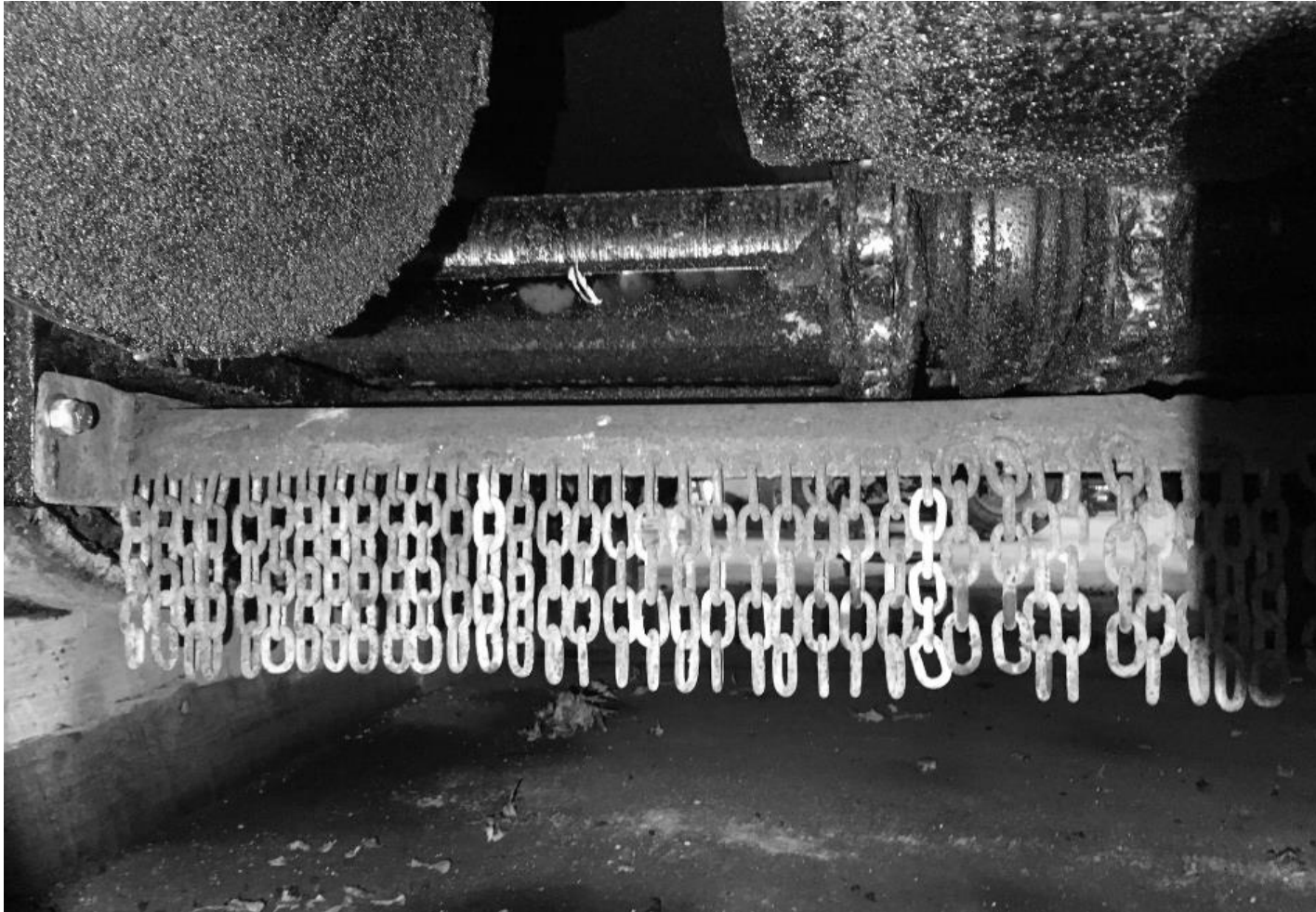
No Paver Modifications



Chain Curtain

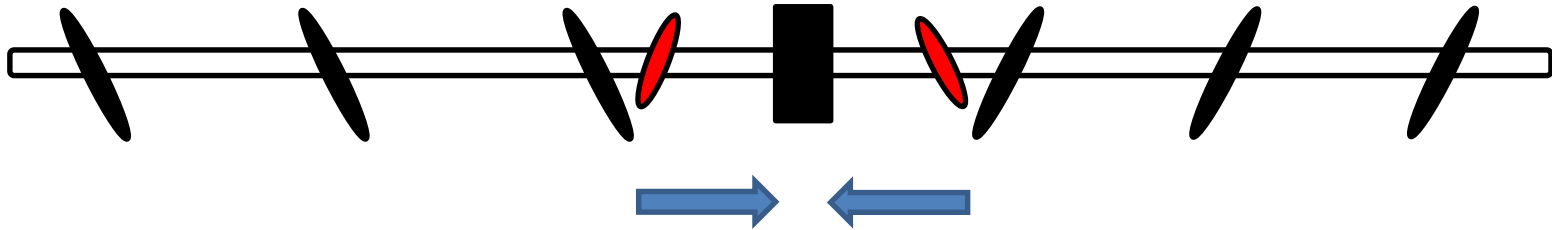


Chain Curtain Example

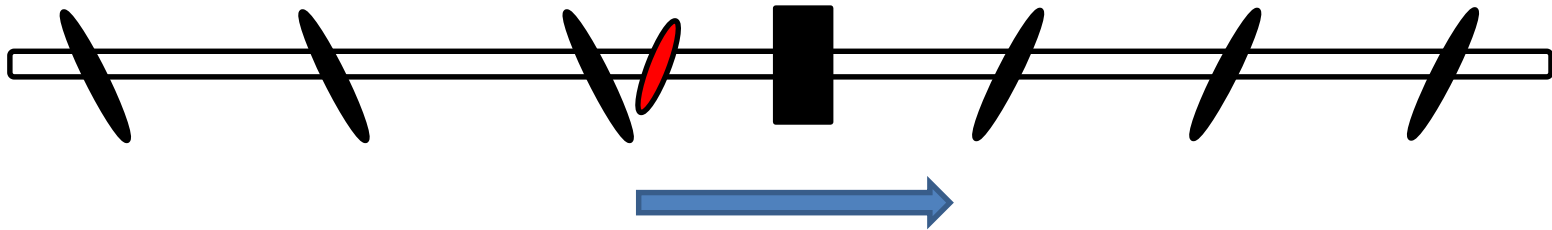


Reverse Augers

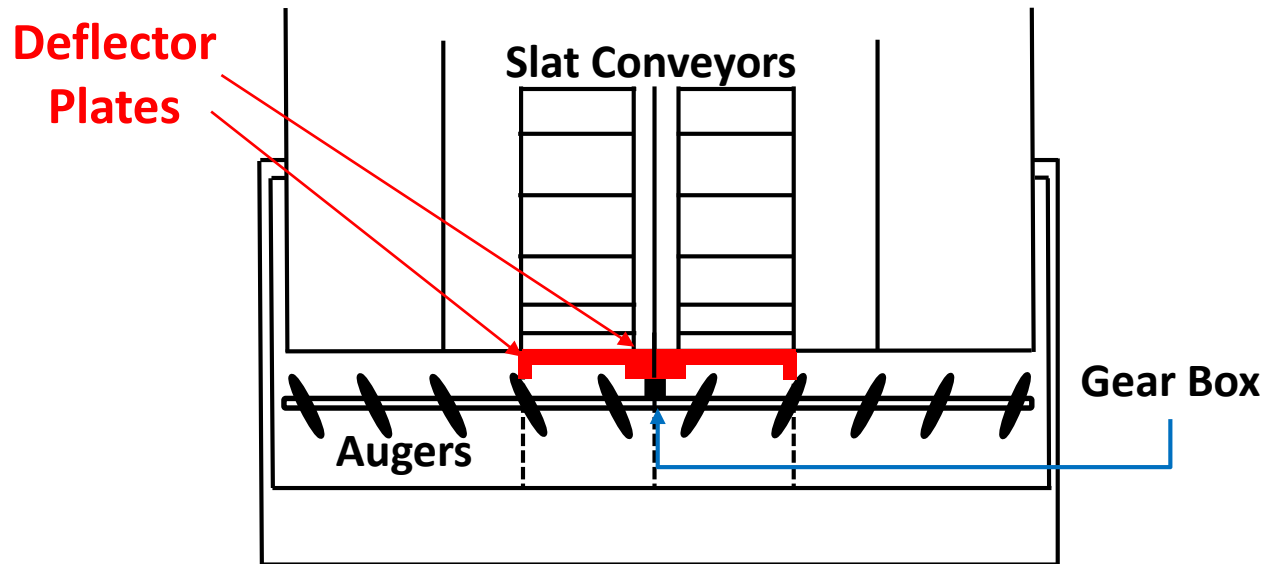
Pushing Material Under Gear Box



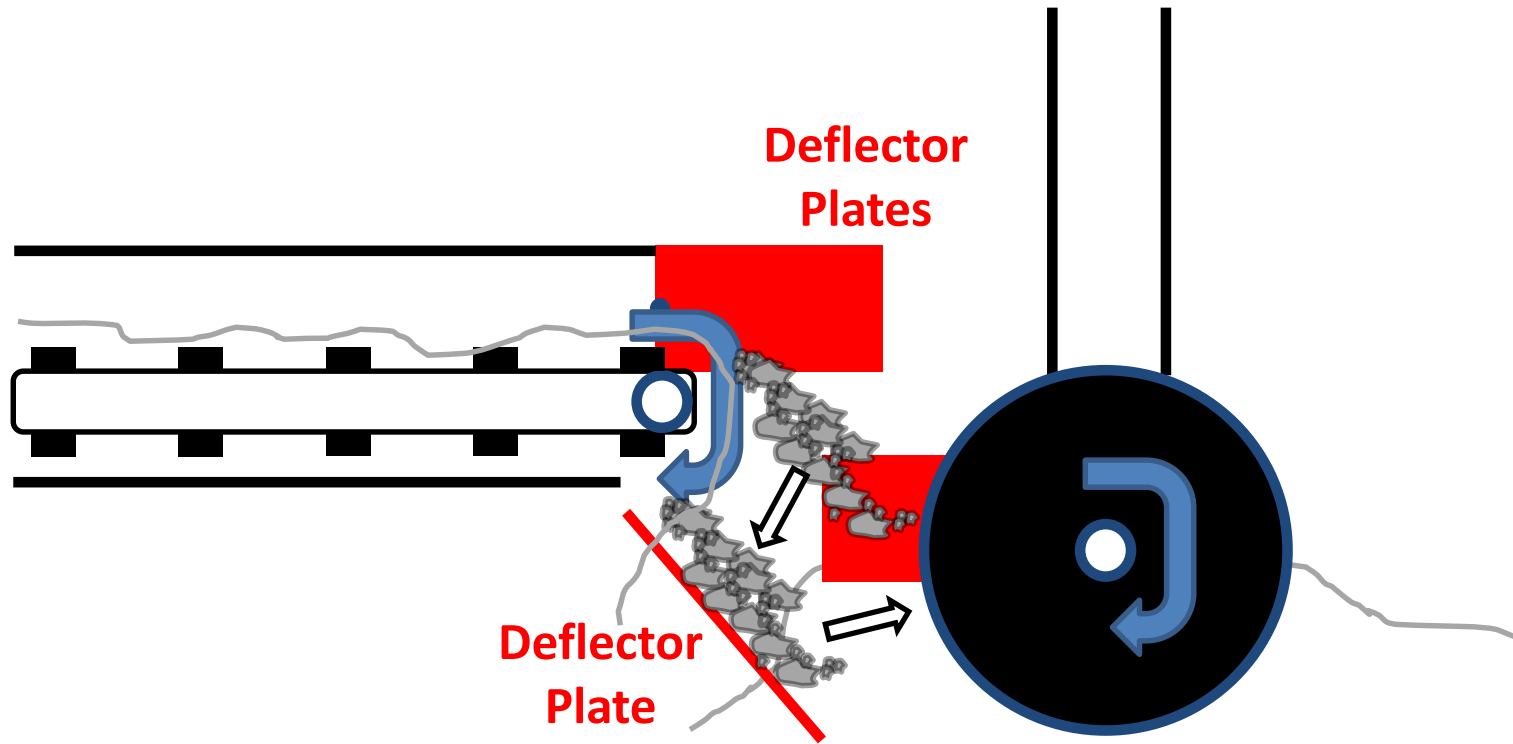
Sweeping Material Under Gear Box



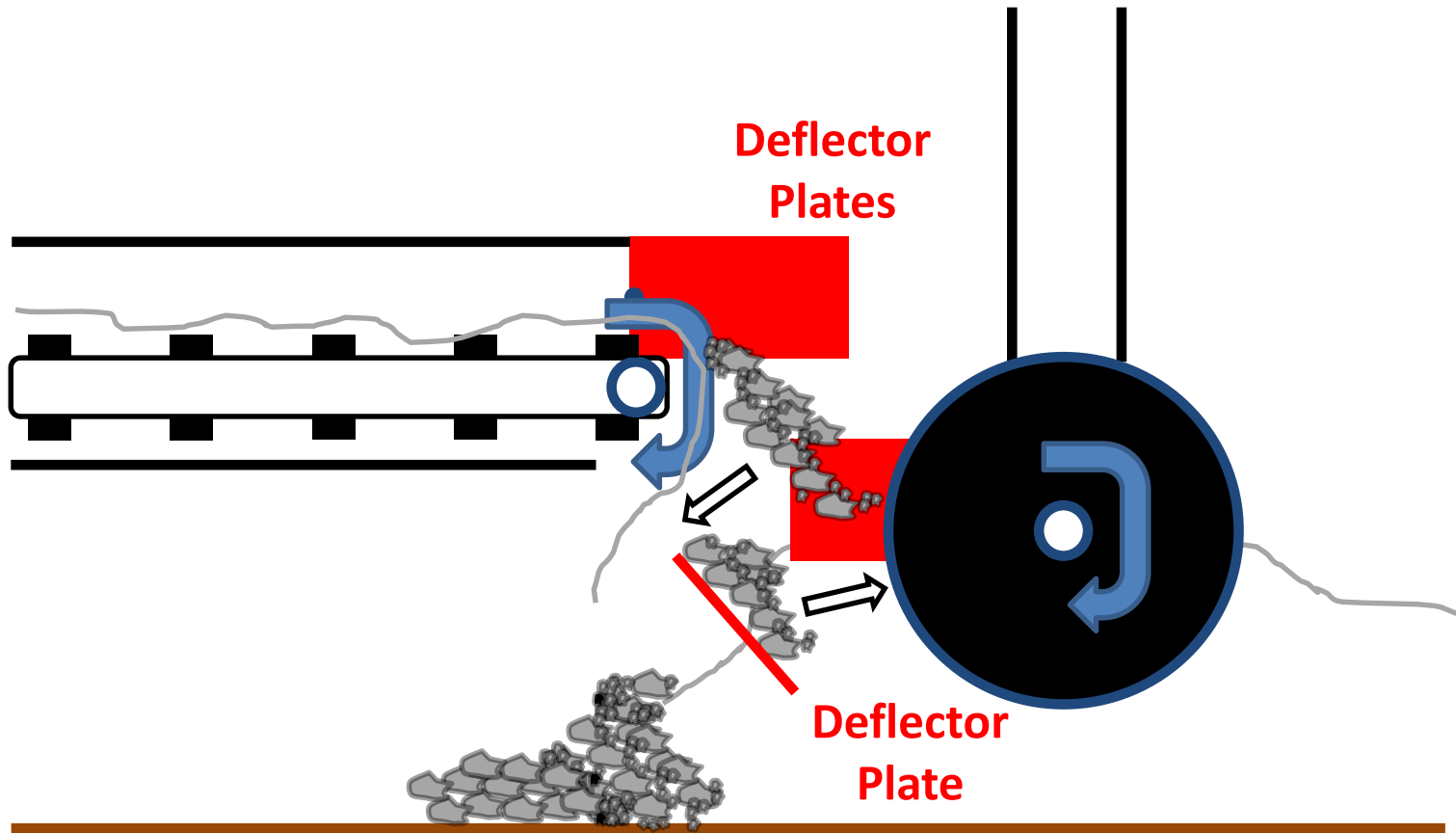
Deflector Plates – Top View



Deflector Plates – Side View



Deflector Plates – Side View



Paver Segregation Recurrence in Illinois

Paver Segregation Example

I-72/US-36



Paver Segregation Example

I-74



FHWA-IDOT Paver Segregation Process Review

Process Review Members

- Dennis Bachman (FHWA)
- Craig Cassem (FHWA)
- Kevin Burke III (IAPA)
- Ryan Sheley (IDOT)
- Jim Trepanier (IDOT)
- Tom Zehr (IDOT)
- Brian Hill (IDOT)

Process Review

- What is it?
 - Evaluation of processes comprising an element of a program
- What are the goals?
 - Evaluate Level of Compliance
 - Recognize Best Practices
 - Pinpoint Areas for Improvement

National Highway Institute Training Course.
Conducting Effective Program Reviews.

Scope and Methodology

- Review Existing Cases of Paver Segregation
- Inspect Pavers, MTD's, and Paver Hopper Inserts at Contractors & Dealerships
- Collect Current Anti-Segregation Part Documents
- Evaluate Existing Specs & Special Provisions
- Identify Best Practices & Recommend Changes

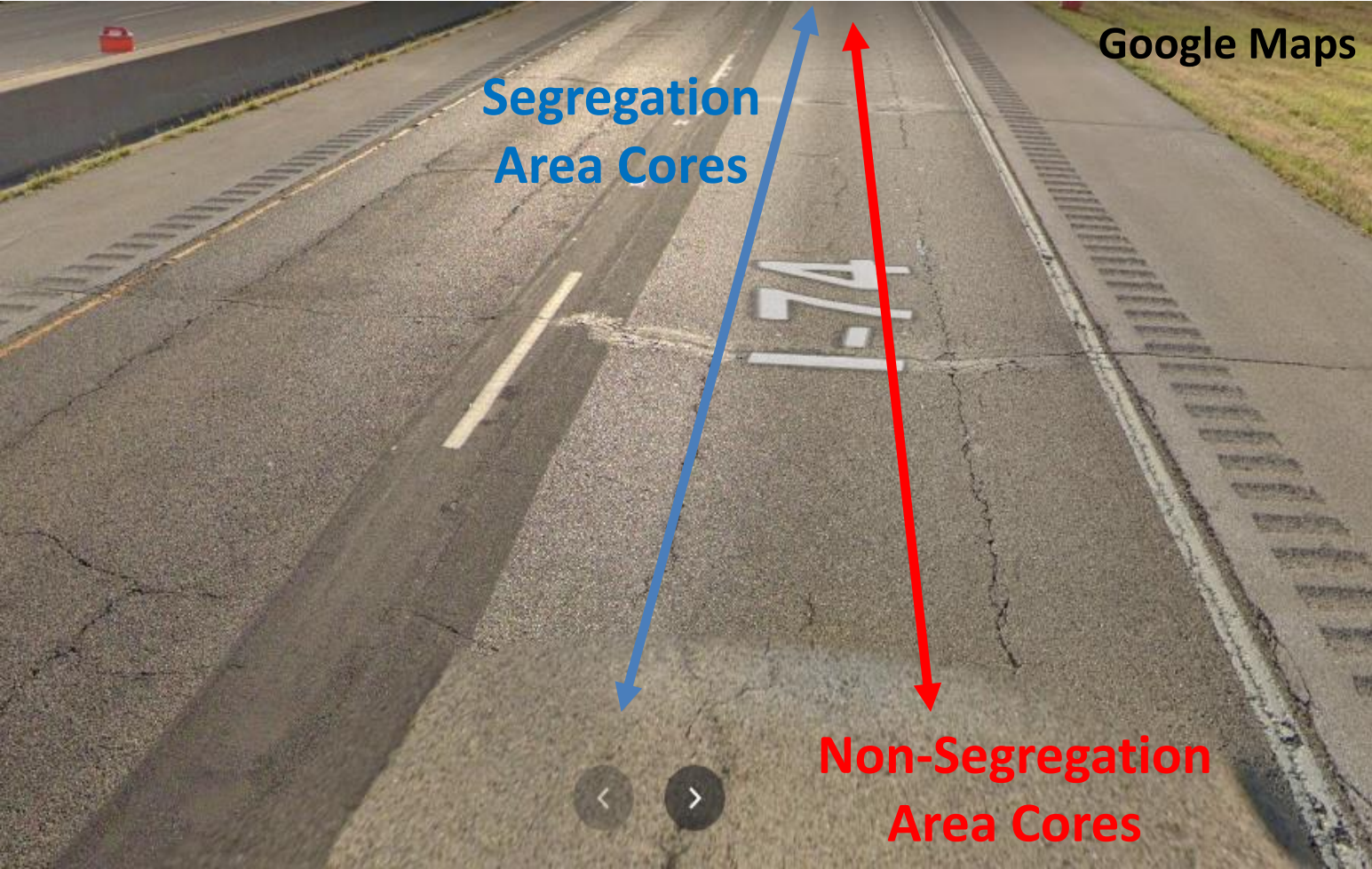
Scope and Methodology

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Core Testing



Core Testing



Core Locations

- District 2 - US-30
- District 3 - US-24
- District 4 - I-74
- District 5 - US-36
- District 6 - IL-29
- District 9 - US-51



Average Core Air Voids

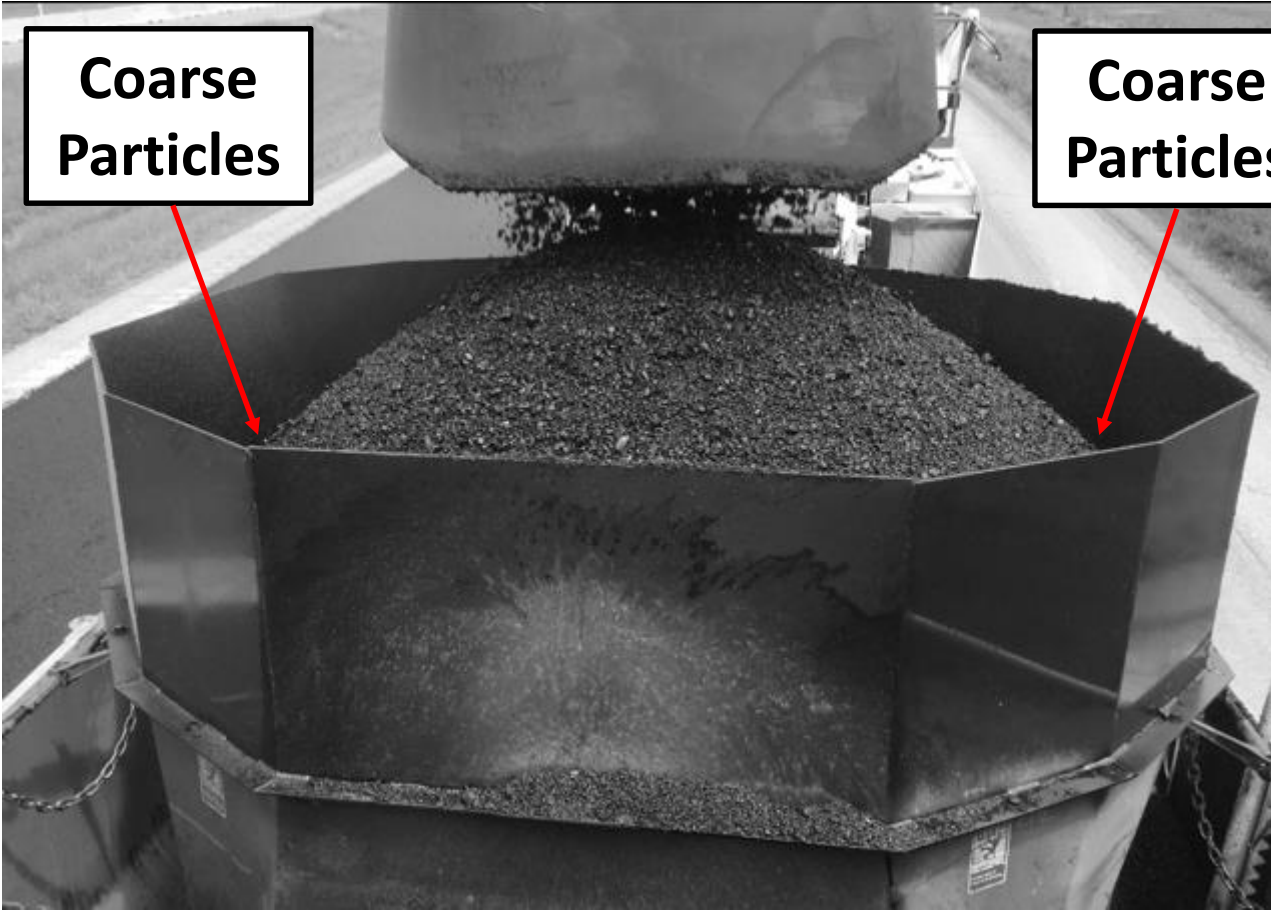
Area	Air Voids (%)
Segregation	6.7
Non-Segregation	5.1

Average Core Asphalt Contents

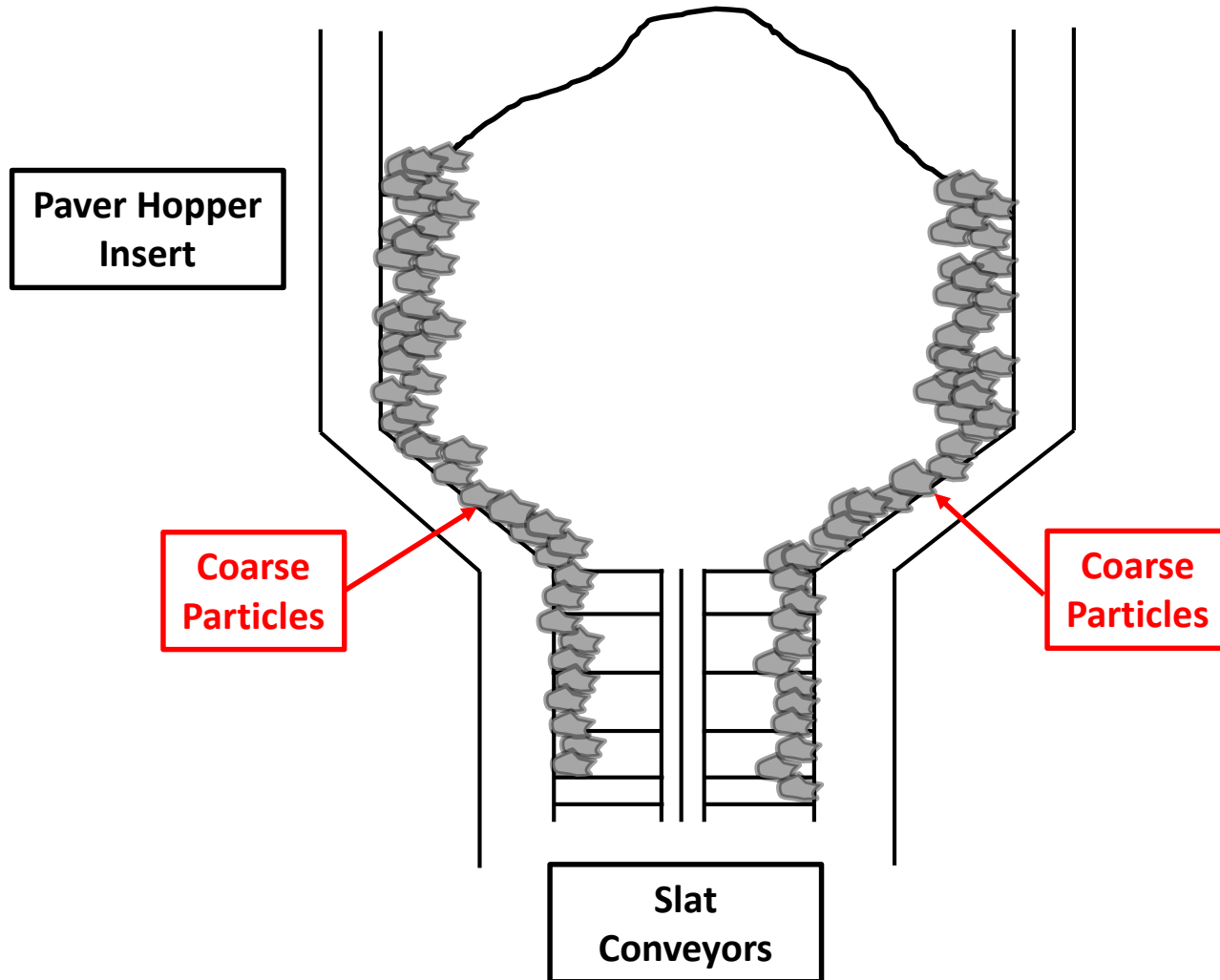
Area	AB Content (%)
Segregation	5.2
Non-Segregation	5.4

Paver Hopper Inserts

Conical Pile in Paver Hopper Insert



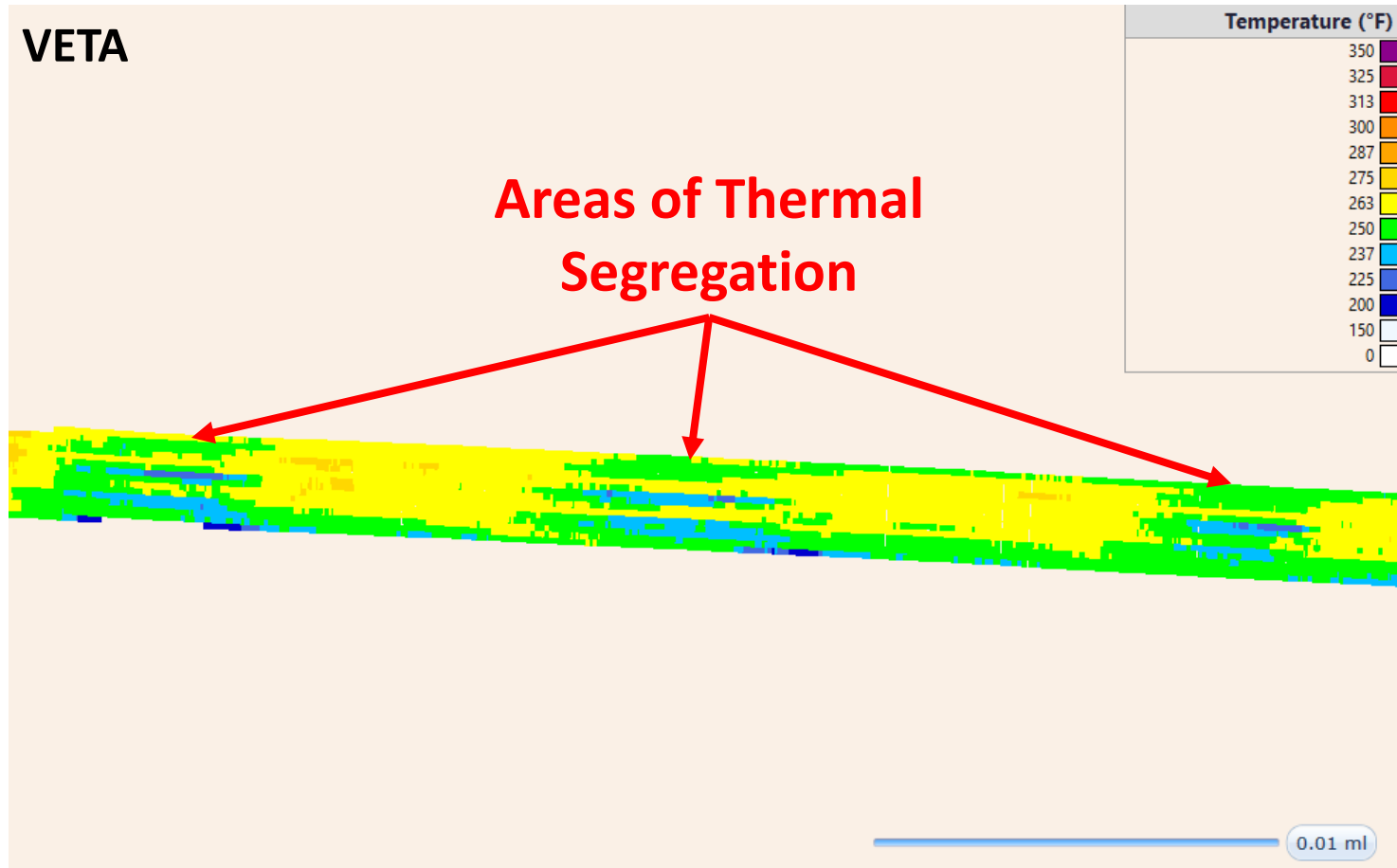
Coarse Particle Movement in Paver Hopper Insert



Best Practices

- **Winter Paver Evaluations/Meetings**
 - Equipment Suppliers/Contractors/Department
- **Contractor Modifications**
- **Use of Thermal Measurement Technology**
 - Paver Mounted or Handheld Thermal Cameras

Paver Mounted Thermal Camera Example



Areas for Future Improvement

- **Communication**
 - Equipment Suppliers/Contractors/Department
- **Electronic Storage of Equipment Use**
 - Daily Paving Records
- **Paver Segregation Distress Identification**
- **Paver Hopper Insert and Paver Anti-Segregation Technology**

Thank You for Your Attention!