



**HERITAGE RESEARCH GROUP**

Innovation – Quality - Service

# **Repairing Low Volume Roadways**

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# How might we fix these roads?

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# Low Volume Road Repair

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- Preservation
  - Chip Seals
  - Microsurfacing
- Structural Solutions
  - Hot Mix Asphalt
  - Cold Mix Asphalt
  - In-place Recycling
    - FDR
    - CIR
    - CCPR





# Cold Mix Asphalt

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- Materials
  - Aggregates
    - Dense Graded
    - Open Graded
  - Asphalt
    - Emulsified Asphalt
    - CM Technology
- Production
  - Pugmill
- Handling
  - Stockpile until ready
- Application
  - Conventional Paving
  - Handles Differently than HMA





# Cold Mix Asphalt

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- Patching
- Wedging / Leveling
- Overlays
- Utility Cuts
- Emergency
- Slope Protection  
@ Culvert Ends
- Railroad Use







# Cold Mix Asphalt

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- Emulsified Asphalt
  - Dense Graded Aggregates
  - Emulsion attracted to fines



- CM Asphalt
  - Open Graded Aggregates
  - Thicker film coatings





# Stockpiling CMA

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- Initial coating will vary depending on aggregate moisture
  - “Salt and Pepper Effect”
- Work the pile while loading trucks





# Paving Train

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# Placed with Conventional Paver

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# Compaction

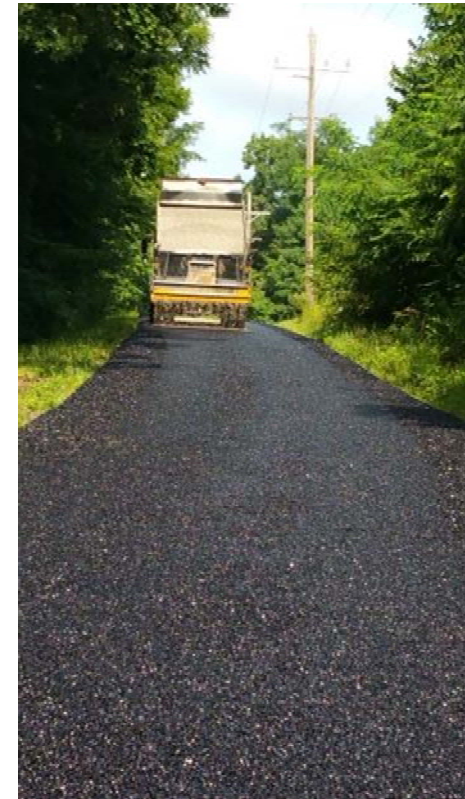
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# Applying Blotter Aggregate

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# Finished CCAP Product

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# Why Pavement Recycling?

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- Additional tools in the road construction toolbox
  - FDR: Full Depth Reclamation
  - CIR: Cold In-Place Recycling
  - CCPR: Cold Central Plant Recycling



- Using less resources, proven construction methods

- Engineered process, engineered technology







# Pavement Recycling Processes

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Full Depth Reclamation  
(FDR)

Typical Depth: 5 - 12 inches

Stabilizer: Emulsified/ Foamed  
Asphalt or Portland Cement

Agency Usage:  
- Alternate to Reconstruction



Cold In-place Recycle  
(CIR)

Typical Depth: 3 – 5 inches

Stabilizer: Emulsified/ Foamed  
Asphalt

Agency Usage:  
- Alternate to Deeper Mill and  
Fill



Cold Central Plant Recycle  
(CCPR)

Typical Depth: 3 - 6 inches

Stabilizer: Emulsified/ Foamed  
Asphalt

Agency Usage:  
- Structural Base Layer



# What is FDR?

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- Deepest Recycle Treatment (5 - 12 in.)
- Uniformly crushed, pulverized and blended with stabilizer
- Results in stabilized base course
- Requires Wearing Course





# Full Depth Reclamation

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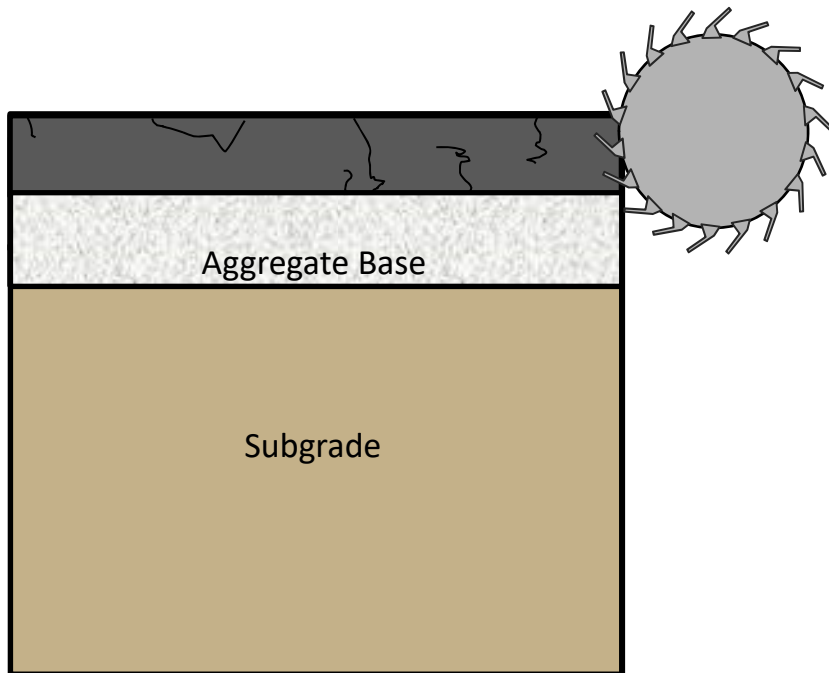
- Three Types of FDR
  - Mechanical Stabilization
    - Pulverization
    - Compaction
  - Bituminous Stabilization
    - Emulsified Asphalt
    - Foamed Asphalt
  - Chemical Stabilization
    - Cement



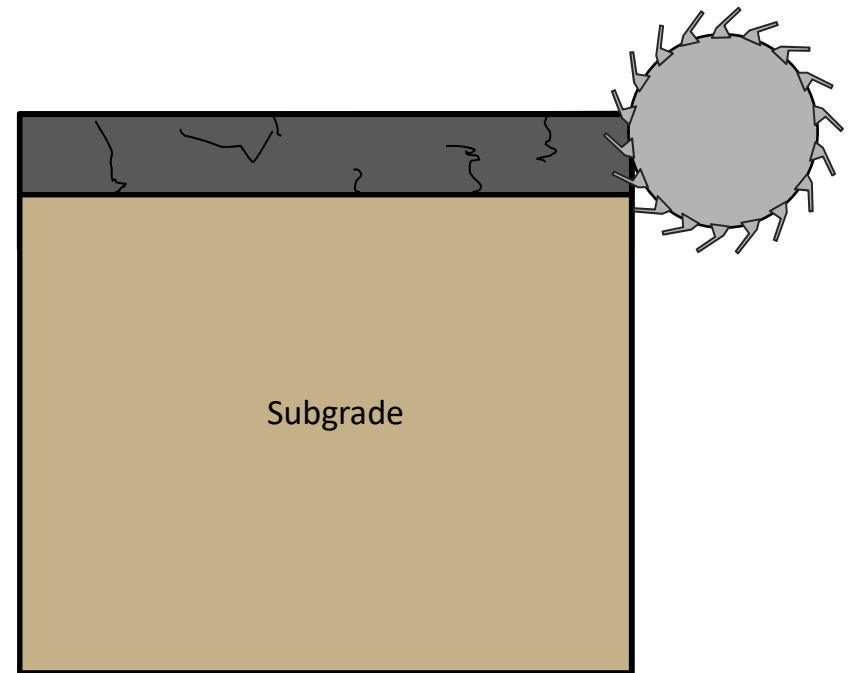


# Full Depth Reclamation

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Bituminous Stabilized FDR

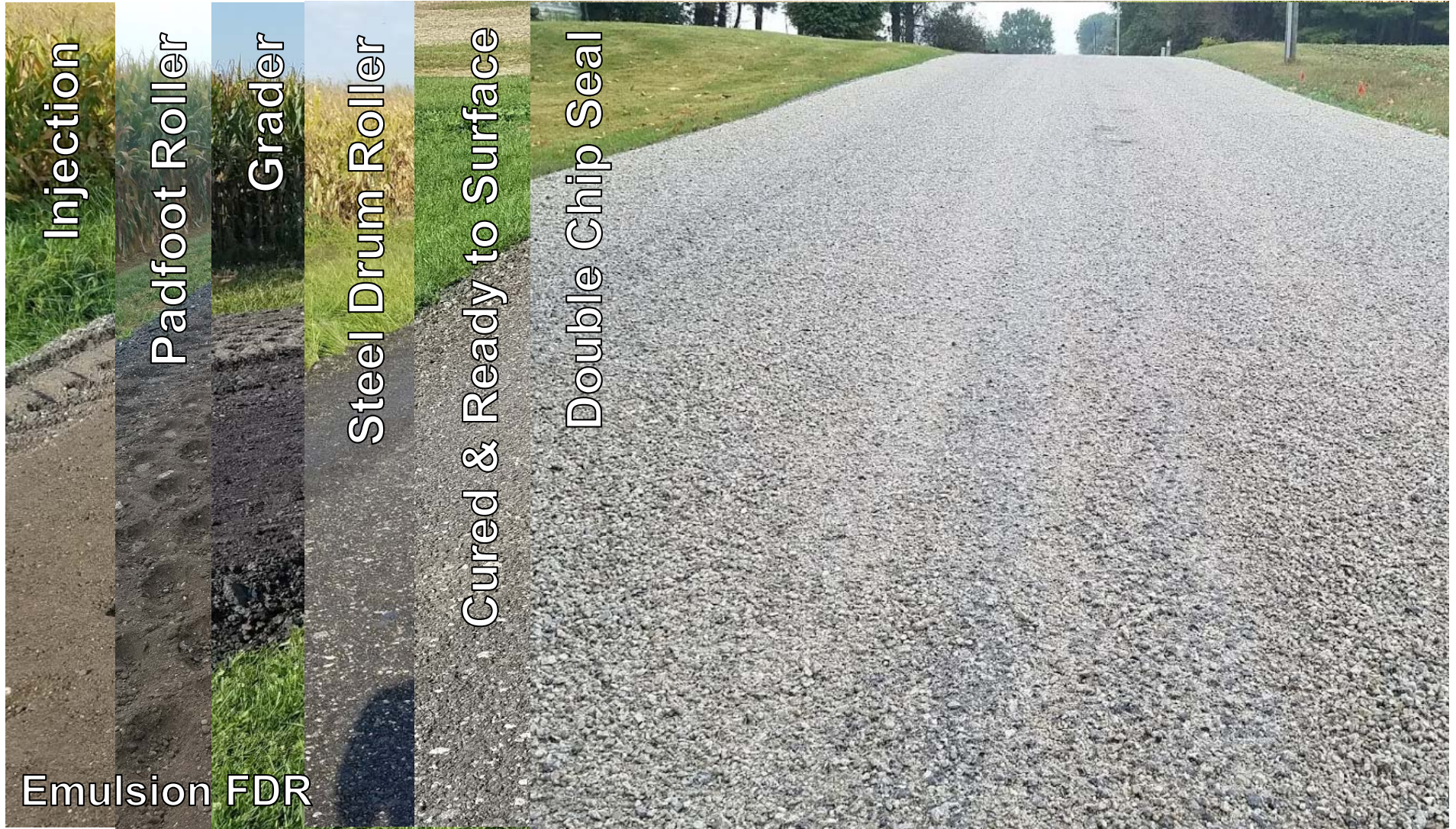


Chemical Stabilized FDR



# FDR Operation

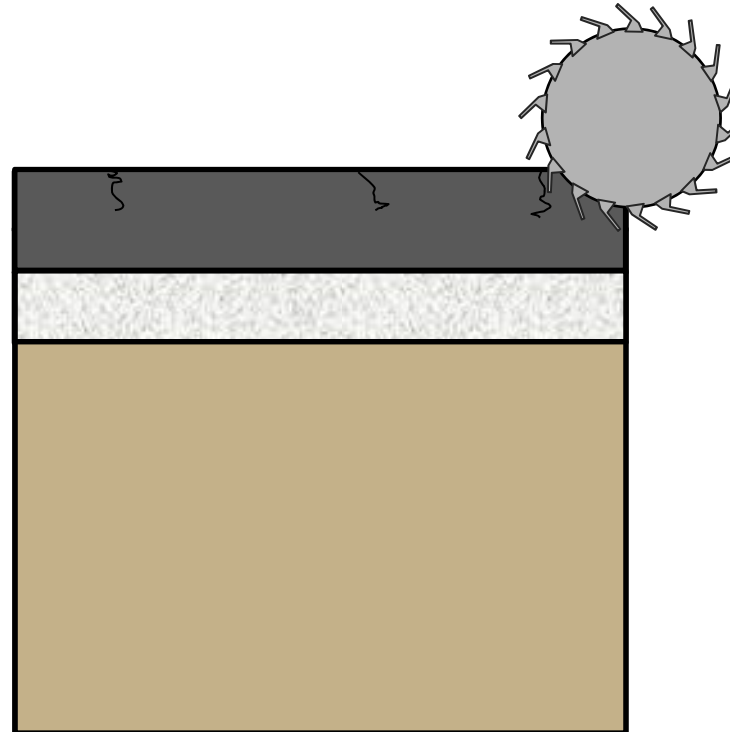
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# What Is Cold In-place Recycling?

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# What Is Cold In-place Recycling?

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# CIR Operation

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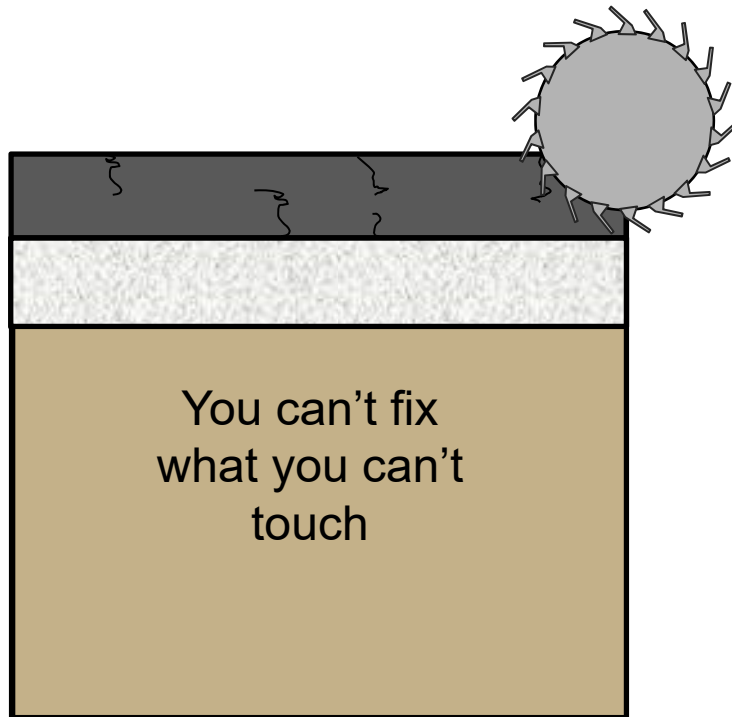






# Cold Central Plant Recycling

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Stockpile at  
"Central Plant"



# CCPR Construction

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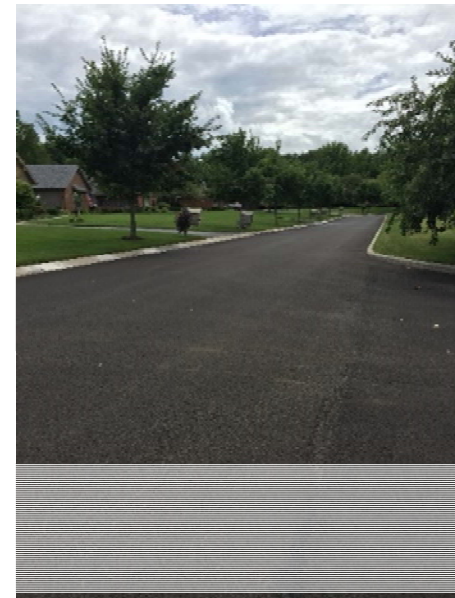




# Low Volume Road Repair

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- Reduced Costs to Agency
  - Proven Technologies
  - Can Be More Cost Effective than Traditional Methods
  - Used with other technologies
    - soil stabilization/ base reconstruction
- Successful Jobs Need
  - Proper Scoping
    - Right road, right time
    - Structure
    - Consistency
    - Drainage
  - Mix Design/ Materials Testing





Questions?

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# Thank You!

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