Full Depth Reclamation Process

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Why FDR?

• FDR typically costs approximately $8/sy or $9.60/m², including cement. The price can go as high as $12/sy or $14.25/m² depending on quantity, location, working time, and other factors that affect the reclamation contractor’s productivity.

• Conventional patching typically costs around $45/sy or $54/m², also varying with conditions.

• So, if patching exceeds around 15% to 20% of surface, it is more economical to reclaim than patch prior to resurfacing.
Why FDR?

• FDR typically uses from 35 to 60 pounds of cement per square yard (19 to 33 kilograms per square meter), depending on existing materials, depth of reclamation, and strength desired.

• The completed reclaimed pavement can be covered with a bituminous surfacing (rock chips and liquid asphalt emulsion), conventional hot-mix asphalt, or, less-commonly, PCC.

• Roads in the US have not been maintained optimally due to funding shortages over the last 15 to 20 years.

• This has resulted in an increasing number of roads that require more than 15% patching and are candidates for FDR with cement.
Steps in FDR process

1. **Asphalt Surfacing**
   - Granular Base
   - Subgrade
   - Existing road

2. **Pulverized**
   - Pulverization to desired depth
   - Subgrade

3. **Pulverized**
   - Removal of excess material (if necessary) and shaping
   - Subgrade

4. **Stabilized**
   - Addition of cement, mixing, reshaping, and compaction
   - Subgrade

5. **New Surfacing**
   - Stabilized
   - Subgrade
   - Final surface application
Pavement reclaimer pulverizes the Blue Ridge Parkway in preparation to mix in cement.
Pavement reclamer typically pulverizes and mixes 200 to 300 mm deep.
Carbide hammer tips on reclaimer head are field-replaceable.
Pulverized pavement is required to have no particles larger than 50 mm.
Cement spreader places cement on Virginia Route 30 near Richmond at the rate determined from laboratory testing and analysis.
Reclaimer makes second pass to mix cement while pushing water tanker and injecting water to get appropriate moisture content.
Traffic continues to use adjacent lane during all operations except spreading of cement. Adjacent lane was reclaimed the previous day.
Motor grader is used to shape the cement/pavement mixture while a water truck keeps the surface moist and offsets evaporation.
A padfoot roller is used to compact the pulverized pavement and cement mixture after the grader has roughly shaped it. Compaction must be completed within 2 hours of cement addition.
After compaction and shaping, liquid asphalt emulsion is sprayed on the surface promptly to retain moisture.
Immediately after the emulsion is placed, a chip spreader is used to drop specifically graded stone chips on the asphalt to create a temporary riding surface.
Traffic is barely inconvenienced.

- At the end of each work day, all the FDR has been covered with the chip seal, temporary traffic markings are placed, and traffic is then allowed to use the lane. No overnight lane closures are allowed.

- Within a week, the asphalt paving contractor places 50 mm of asphalt over the FDR and chip seal.

- Once the entire project has been covered with the first 50 mm lift of asphalt, a second 50 mm lift is placed and the pavement is ready for permanent use.

- A typical reclamation project 8.5 meters wide (including shoulders) uses 185 metric tons per kilometer.