Full-Depth Reclamation Using a Cement Slurry Spreader Attached to a Ready Mixed Concrete Truck

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Cement-Based Pavement Materials

- Roller-Compacted Concrete
- Pervious Concrete
- Conventional Concrete
- Soil-Cement
- Cement-Treated Base
- Full-Depth Reclamation
- Cement-Modified Soil
- Flowable Fill

Water Content vs. Cement Content

- No Wearing Course Required
- Wearing Course Required

Rolled vs. Cast
Definition of Full-Depth Reclamation (FDR)

“...technique in which the full flexible pavement section and a predetermined portion of the underlying materials are uniformly crushed, pulverized, or blended, resulting in a stabilized base course; further stabilization may be obtained through the use of available additives.”

- Asphalt Recycling and Reclaiming Association
FDR is most appropriate under the following conditions:

- The pavement is seriously damaged and cannot be rehabilitated with simple resurfacing.
- The existing pavement distress indicates that the problem likely exists in the base or subgrade.
- The existing pavement distress requires full-depth patching over more than 15 to 20 percent of the surface area.
- The pavement structure is inadequate for the current or future traffic.
Advantages of the FDR Process

- Uses in-place materials
- Little or no material hauled off and dumped
- Maintains or improves existing grade
- Conserves virgin material
- Saves cost by using in-place “investment”
- Saves energy by reducing mining and hauls
- Very sustainable process
Benefits of FDR Using Cement

- Increased rigidity for distributing loads
- Elimination of rutting below surface
- Reduced moisture and frost susceptibility
- Reduced fatigue cracking
- Thinner pavement sections
# Rehabilitation Strategies

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Rehabilitation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reclamation with Cement</td>
</tr>
<tr>
<td>New pavement structure</td>
<td>✓</td>
</tr>
<tr>
<td>Fast construction</td>
<td>✓</td>
</tr>
<tr>
<td>Minimal traffic disruption</td>
<td>✓</td>
</tr>
<tr>
<td>Minimal material in/out</td>
<td>✓</td>
</tr>
<tr>
<td>Conservation of resources</td>
<td>✓</td>
</tr>
<tr>
<td>Maintenance of existing elevation</td>
<td>✓</td>
</tr>
<tr>
<td>Low cost</td>
<td>✓</td>
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</tbody>
</table>
FDR Construction Process
Pulverize, Shape, Add Cement, Mix In Place, Compact, Cure, Microcrack, and Surface

<table>
<thead>
<tr>
<th>Bituminous Surfacing</th>
<th>Pulverized</th>
<th>Removed</th>
<th>Removed</th>
<th>New Surfacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granular Base</td>
<td>Pulverized</td>
<td>Stabilized</td>
<td>Stabilized</td>
<td>Stabilized</td>
</tr>
<tr>
<td>Subgrade</td>
<td>Subgrade</td>
<td>Subgrade</td>
<td>Subgrade</td>
<td>Subgrade</td>
</tr>
</tbody>
</table>

Existing road
Pulverization to desired depth
Addition of cement, mixing, reshaping, and compacting
Curing and microcracking
Final surface course applied
Pulverization
Reshaping
Cement Spreading
Cement Spreading
Material Blending
Compaction
Grading
Curing
Minimal Disruption
Microcracking
Microcracking
Surfacing
Summary

- FDR with cement stabilization provides a durable structural layer with many engineering, environmental, and economic benefits.
- Cement can be applied on urban projects with a slurry spreader attachment to ensure uniformity and eliminate all fugitive dust.
Thank You!

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