



# Paver-placed Stabilized FDR

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## Do you have a pavement management plan?



## "Insanity is doing the same thing over and over and expecting different results."





#### **Existing Conditions Analysis**





\*Please Note: Unit pricing accounts for curb-to-curb improvements only; does not include any drainage, sidewalk, ADA, gravel sub-base or utility improvements.



#### **Asphalt Distress Curve**



#### **Asphalt Deterioration Curve**

(an unfortunate fact of life)



#### RoadResource.org



Treatment	Unit Cost (Per Sq. Yard) 😧	Life Extension	Structural Coefficient	Unit Cost (Per Sq. Yard Per Inch) 😧
Bonded Wearing Course	7.98	10.0	N/A	N/A
Cape Seal	6.93	10.0	N/A	N/A
Chip Seal	2.63	6.0	N/A	N/A
Crack Seal	0.50	2.0	N/A	N/A
Fog Seal	1.00	2.0	N/A	N/A
Micro Surfacing- Double Lift	4.72	8.0	N/A	N/A
Micro Surfacing- Single Lift	2.92	5.0	N/A	N/A
Rejuvenating Fog Seal	1.25	3.0	N/A	N/A

- ✓ Create custom treatments
- ✓ Input unit costs
- ✓ Input treatment life extensions



# How important is sustainability in your community?





# Bottom of the Curve Treatments



#### CIR/FDR/SFDR/PPSFDR What's the Difference?

- CIR: Cold-In-Place Recycling Recycles 3-5" of HMA ONLY
- FDR: Full Depth Reclamation Traditional Approach Recycles ALL HMA layers AND subbase, non-stabilized, typically 50/50 blend to 12".
- SFDR: Stabilized Full Depth Reclamation Injects liquid asphalt performance additive into the recycled layer of HMA & subbase layers
- Paver-Placed SFDR (PPSFDR): similar to SFDR except much less disruptive since material goes directly from the recycling machine to the paver.

#### Traditional FDR





Better roads today. Stronger networks tomorrow.





#### Unstabilized vs. Stabilized FDR Structural Number Comparison Chart

Coefficient Source = Roadresource.org

SN = Structural Number









## INFR SENSE

"The overall average layer coefficient is 0.28. However, foamed-asphalt FDR layers require time to cure, during which the layer will continue to gain strength months and even years after construction. Diefenderfer and Apeagyei (2011) showed the layer coefficients of a new foamedasphalt FDR layer increased by 25% to 50% during the 2 years after construction."



Paver-placed Treatments: Engineered Process









- Ratio of RAP & subbase matches existing field condition
- Cores mixed with subbase material
- Frozen and crushed
- RAP is screened and recombined to meet target gradation









#### Wirtgen Lab Foamer

- Expansion Ratio and Half-Life are measured
- Optimum water injection rate is determined



2**3 Indus** roads. bridges. airports.



#### Wirtgen Lab Mixer

- Pug-mill design
- Better mixing
- Minimal material breakdown





#### **Sample Fabrication**

- 3 asphalt contents
- SGC (Superpave Gyratory Compaction) – 30 gyrations
- Max Theoretical Density
  & Bulk
  Specific Gravity



#### **Optimum AC Content**

- Indirect Tensile Strength (Wet & Dry)
- Modified Proctor to establish moisturedensity & optimum moisture for compaction





Paver-placed, Stabilized Full Depth Reclamation (SFDR)

Similar to traditional FDR except liquid asphalt is added & is much less disruptive because material goes directly into paver.





## **PPSFDR**

- Reduces construction time and traffic delays
- Adding foamed liquid asphalt and portland cement stabilizers substantially strengthens the base layer
- A stronger base layer requires less new HMA on top to support the traffic loads
- Less new HMA on top of the reclaimed layer saves money and reduces greenhouse gas emissions

#### INCLUS roads. bridges. airports.





## Dartmouth Massachusetts



#### Woodcock Road Dartmouth, MA





### 2022 Dartmouth, MA Woodcock Road



Paver-Placed Stabilized Full Depth Reclamation (PPSFDR)

20' x 3,840': approximately 8,600 sy

4 Structures lowered and raised by town

8" recycled layer

1.5" HMA wearing surface

Independent testing performed to verify structural coefficient of recycled layer





























#### **BECOME A ROADVOCATE**

PPRA

#### At Our Road Resource Network Bootcamp

April 11 - 13 11:00 - 1:30 CT via Zoom

Norfolk/Bristol/Middlesex County: MEMBERS					
Members	Spent	How Much	Available		
11	All	\$3,623,966	\$ 3,623,966		
6	Portion	\$ 925,516	\$ 1,571,139		
35	None	\$-	\$12,778,671		
52		\$4,549,482	\$17,973,776		
Members taken from current NBM map					
Data from 3/17/23 update					

WRAP FUNDING STATUS

# We appreciate your time today!

#### **CONTACT US**

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#### Cold In-place Recycling (CIR)

- Fast construction and return to traffic
- Reduced environmental
- impact
- Long-lasting, durable repair at half the cost of FDR

