

# Bump Formation in Hot Mix Asphalt Overlays

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# **SPEED OF THE ROLLER**

**THE ROLLER SHOVES THE HMA FORWARD  
OF THE COMPACTION PROCESS**

**SLOWER SPEED = REDUCES OR  
ELIMATES BUMPING/SHOVING**

**FASTER SPEED = MORE  
BUMPING/SHOVING**

A large, powerful ocean wave is crashing over a concrete barrier. The water is a deep blue, and the white foam of the wave is prominent. The barrier is visible in the bottom left corner.

# **TYPE OF ROLLER**

**SINGLE DRIVE**

**DUAL DRIVE**

**PNEUMATIC TIRE**



A large, powerful ocean wave is crashing over a concrete barrier. The water is a deep blue-green color, and the crest of the wave is white with foam. The barrier is a light-colored concrete wall. The text is overlaid on the image in white, bold, sans-serif font.

# COMPACTION PROCESS

**DO NOT OVER ROLL**

**EXCESSIVE PASSES CAN CONTRIBUTE  
TO BUMPS/SHOVING**



# **SURFACE CHARACTERISTICS**

**UNIFORM CONDITION**

**NO BUMPS/SHOVING**

**IRREGULAR / NON-UNIFORM CONDITION**

**MORE OPPORTUNITY FOR BUMPING/SHOVING**







# **HOT MIX TYPE**

**OPEN, DENSE OR GAP GRADED**

**ANGULAR / FRACTURED AGGREGATE =  
LESS BUMPS/SHOVING**

**LOW ANGULAR/FRACTURED AGGREGATE =  
MORE BUMPS/SHOVING**

# **WARM MIX**

**NO HISTORY OF BUMPING**



# **HOT MIX TEMPERATURE**

**NEWER MODIFIED HMA's REQUIRE ELEVATED  
TEMPERATURES FOR PLACEMENT AND  
ROLLING**





# STIFFNESS OF THE TACK COAT

STIFFER TACK COATS = LESS  
BUMPING / SHOIVING





**CFCO**  
CONCRETE FLOOR CRACK REPAIR





# **CRACK SEALANT**

**AGE OF THE SEALANT**

**SEALANT TYPE**

**APPLICATION METHOD**

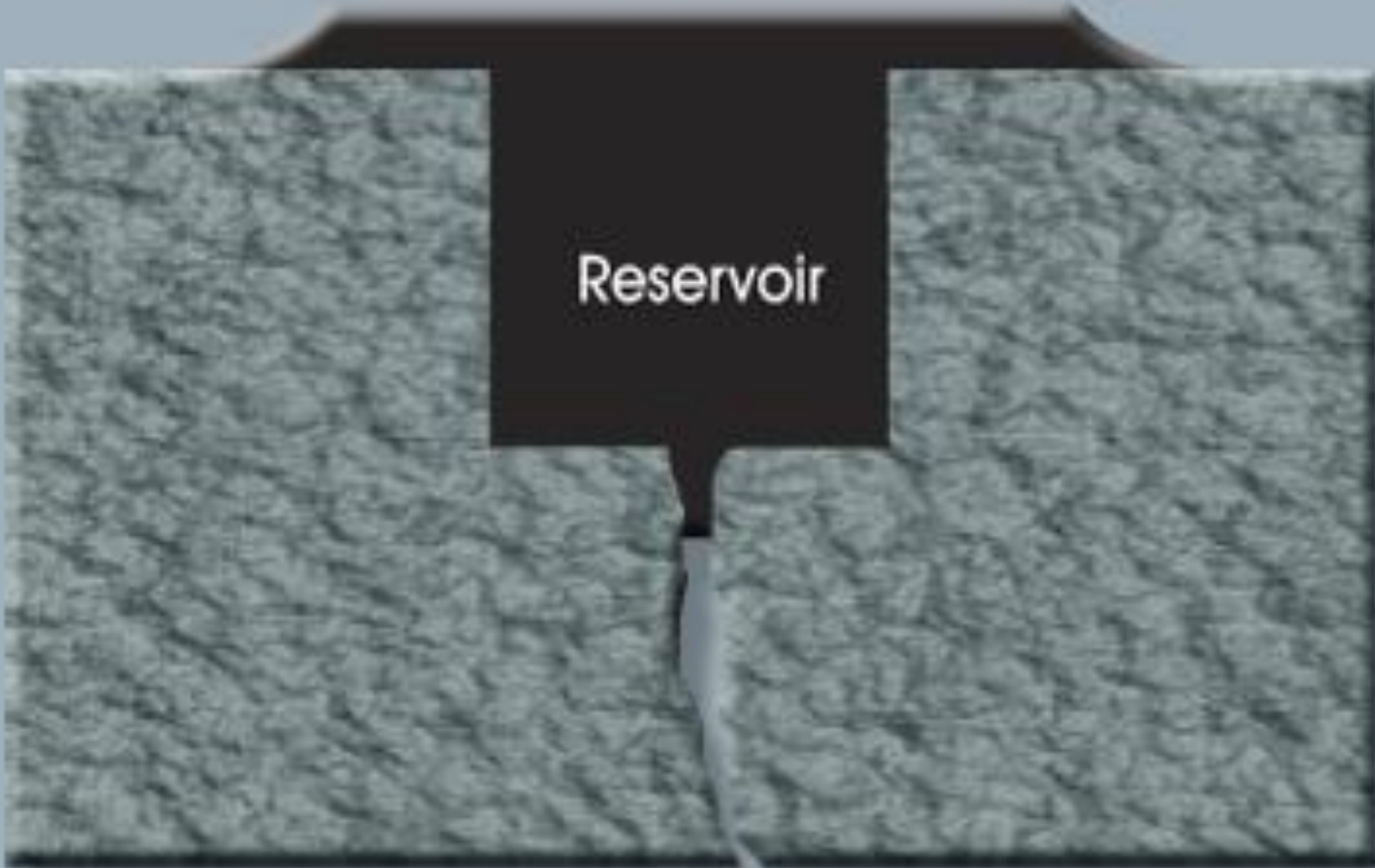












Reservoir



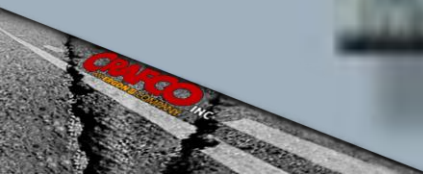


**CFCO**  
CONCRETE FLOOR CRACK REPAIR

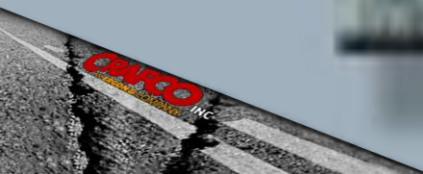
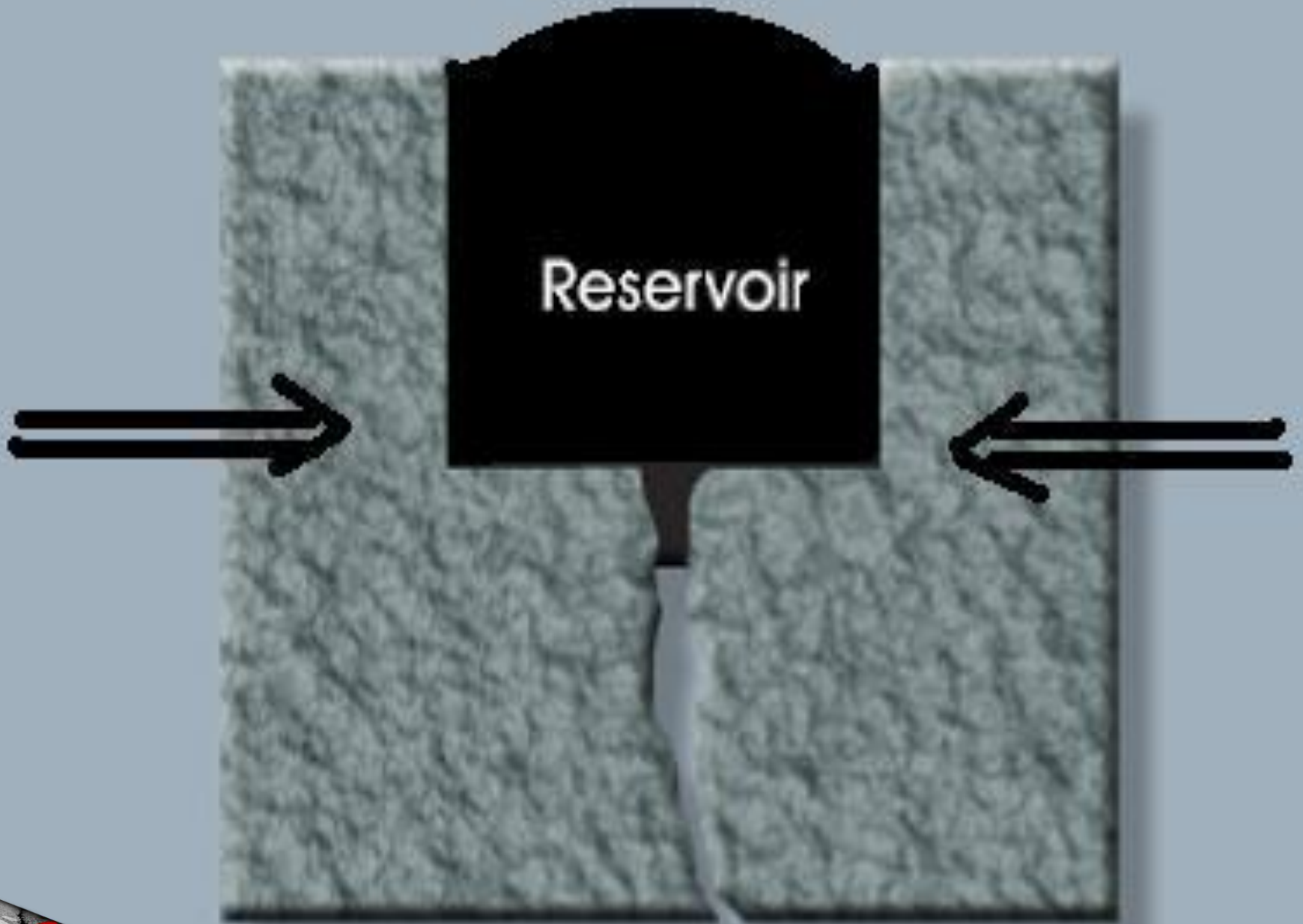




Reservoir









## History

Colorado and Nevada conducted projects to determine what causes bumps in new HMA pavement.

They could not make the pavement bump.

University Road about 15 years ago

Between McClintock and Rural.  
Bumping near the intersection.



## **SOLUTION**

- **SLOW THE ROLLER DOWN – 3 TO 5 mph MAX**
- **USE THE PROPER ROLLER**
- **DO NOT OVER ROLL**
- **CORRECT SURFACE INCONSISTANCIES**
- **USE STIFFER TACK COATS**
- **USE 2 LIFT PAVING WHEN POSSIBLE**

# SOLUTION

- **CRACK SEAL AS EARLY AS POSSIBLE**
- **REMOVE EXCESSIVE SEALANT FROM PAVEMENT**
- **APPLY CRACK SEALANT IN A ROUTED RESERVOIR WITH A 3/8" RECESS**



A large, powerful blue wave is crashing over a concrete barrier. The water is a deep, vibrant blue, and the crest of the wave is curling over, creating a thick spray of white foam. The barrier is a light-colored concrete wall, and the wave is breaking over its top edge. The overall scene is dynamic and energetic, capturing the raw power of the ocean.

**THANK YOU**

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