

# SUCCESSFUL TREATMENT OF FROST AND MOISTURE SUSCEPTIBLE AGGREGATE IN ARKANSAS

## National Forest Service Project

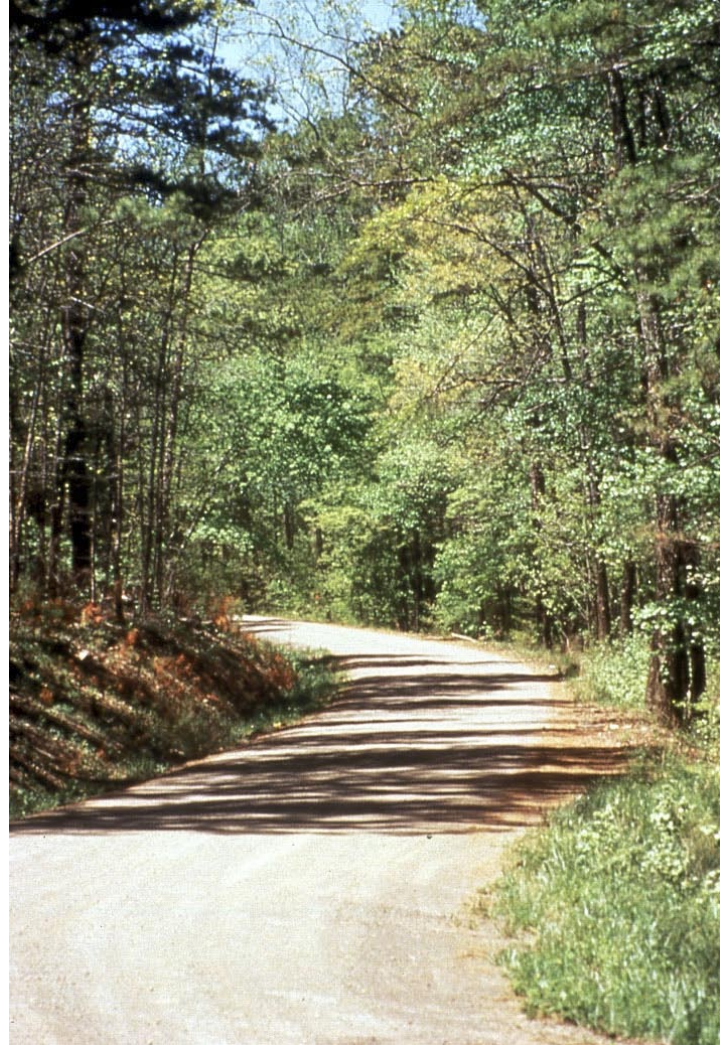
**20  
YEARS**

A forest road improvement project was completed in 1988, upgrading a heavily traveled gravel surfaced road with a new aggregate surface course material which was treated at the time of placement with EMC SQUARED® Stabilizer. A copy of the letter from Gary McElroy, Road Engineer for the Ozark - St. Francis National Forest, summarizes the construction and performance of the stabilized road is provided on the following page.

After thirteen years of service, minor rutting occurred in a few limited areas following unusually heavy snow accumulation. The problem areas were well shaded by the forest and snow melt ponded in the ditches adjacent to the road, saturating the untreated subgrade soils and leaving the stabilized aggregate surface course subject to damage under heavy truck traffic. The forest road maintenance crew quickly repaired the damaged areas by scarifying, adding more aggregate and treating the mixture with EMC SQUARED Stabilizer. Given the challenging conditions, as Road Engineer Gary McElroy commented during a review of the project, it is not likely that a six inch thick asphalt pavement would have survived a similar length of time with so few repair requirements. Now going on twenty years of service, the stabilized aggregate surface course remains solid throughout, providing a safe and stable running surface for this winding road running through steep terrain.

In review of this EMC SQUARED case study, the permanency of this stabilization treatment throughout a monitoring period of almost twenty years has been obvious and impressive. Moisture and frost susceptibility have been effectively addressed and the shale/aggregate blend has been strengthened to provide an all-weather running surface for truck and vehicular traffic. These service conditions are far more severe than would be appropriate for conventional stabilization treatments such as cement and lime; products which are rarely, if ever, used for stabilization of unpaved roads (much less a gravel surfaced road with grades "in excess of 12%"). These improvements have been achieved as the result of a single treatment with the economical and environmentally friendly EMC Squared Stabilizer product. The investment in application of stabilization treatment has been repaid many times over, just by elimination of the need for grading maintenance. The savings to road users in auto and truck operating costs and the safety benefits of the smooth running surface have been significant. The initial investment in construction costs and in gravel surfacing materials has been retained. Nearby streams have

been protected from road generated sedimentation. This well designed and well constructed Forest Service project certainly deserves the title the USFS engineer gave it in his summary letter on the following page, "Arkansas Success Story."



### *Prior to Stabilization*

"During the winter months, freezing and thawing, shrinking and swelling of the clay soils and the steep grade would make the road almost impassible."

### *After Stabilization*

"The freezing and thawing of the clay soils are no longer a problem with the road."

Quotes above from a summary letter written by  
Road Engineer Gary McElroy in 1995

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# LETTER FROM A USDA FOREST SERVICE ROAD ENGINEER

September, 2005

Soil Stabilization Products Company, Inc.  
P. O. Box 2779  
Merced, CA 95344

Re: Arkansas Success Story  
Ozark-St. Francis National Forests - Mount Magazine Ranger District, Paris, Arkansas



This is an update on the reconstruction of the 2.0 miles of New Blaine Road No. 1600, which was completed in spring of 1988. This road was reconstructed by constructing a 6-inch compacted base using shale material. The surface course was created by mixing 6 inches of shale plus a 6-inch depth of 1" minus aggregate with the fines within the 12% range. EMC Squared was incorporated with the surface course materials, mixed, brought to optimum moisture, and compacted with a steel wheel drum roller.

In 2001, we had some minor rutting and erosion due to poor maintenance practices. We addressed this problem by adding additional aggregate and scarifying the existing damaged area to a depth of 12 inches. Again, we added the EMC Squared soil stabilizer, mixed, and compacted the surface course.

This road receives maintenance only twice a year. At this time, the road continues to service the forests with outstanding performance. The original surfacing is still intact. The 12% plus grades remain free of corrugations and we continue to maintain a smooth running surface to support an arterial transportation system, which supports management of national forest resources. Since seeing the early success with the New Blaine Road, we have continued to use these products with the same results. At this time, we have approximately 20 miles of roads in our inventory with soil-stabilized surfaces.

I do wonder why more folks are not on board with these products. The savings in surface replacement and reduced maintenance in addition to increased road strength far exceed the additional cost incurred during reconstruction.

For comparison, I am attaching an updated picture taken near the area of your original photo.

Sincerely,  
/s/Gary Mc Elroy

Road Engineer  
Ozark-St. Francis National Forests  
Supervisors Office  
Russellville, AR 72801

To learn more about Soil Stabilization Products Company and the EMC SQUARED System visit  
[www.sspco.com](http://www.sspco.com)

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