

Stabilized Dirt Road Withstands Hurricane Rains

Baldwin County, Alabama

A satellite image of a hurricane with a red arrow pointing to Baldwin County, Alabama. The hurricane is shown as a large, swirling cloud system with a distinct eye. The image is overlaid with a red outline of the state of Alabama and a green outline of Baldwin County. The text "Stabilized Dirt Road Withstands Hurricane Rains" is written in yellow at the top, and "Baldwin County, Alabama" is written in red at the bottom right.

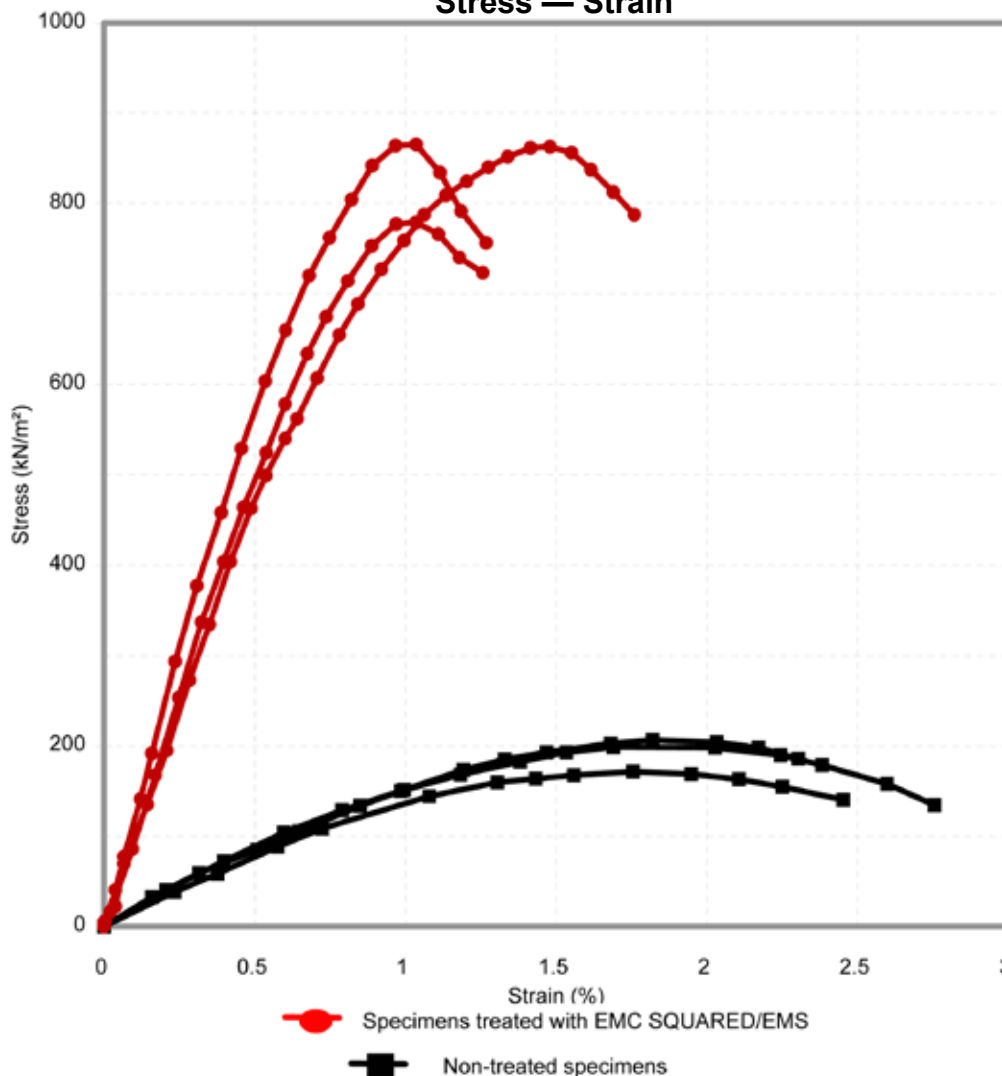
Hurricane Danny hit the Mobile Bay area and dropped 48 to 60 inches of rain (depending upon the specific location with the area) in a period of days. Even prior to this event, a road in Baldwin County, Alabama, rutted so badly and driving conditions were so hazardous that school buses were unable to service the area, a situation that drew repeated coverage from a local TV station.

Stabilization of unpaved roads is generally motivated by the need for reducing maintenance costs and improving the quality of the road as an all-weather running surface. With unpaved roads and other areas of bare earth coming under increasing scrutiny for their contribution to air and water pollution through fugitive dust emissions and sedimentation of nearby waterways, the EMC SQUARED® and EMC SQUARED/EMS® stabilizer treatments are increasingly being called upon for stabilization of unpaved roads and runways, test ranges, landfill covers in arid and semi-arid areas, and for other projects where large areas of compacted

soil must be hardened to resist wind and rain erosion without additional protective cover.

Silty soils and silty fine sands are typically poor load bearing materials and erosive in nature. The EMC SQUARED/EMS Dual Component System is unique among stabilizers in its performance and cost-effectiveness in treating a wide range of problem soils. As demonstrated in the strength tests graphed below, the EMC SQUARED/EMS treated material (a silty fine sand) is more than four times as strong as the untreated material. Another treated specimen retained full strength when tested after a ten day period of saturation in the triaxial cell. Because of the high fines content of the particular soil tested, the standard rates for cement treatment would range from seven percent by weight of soil and higher. Resulting costs would be several times the expense of EMC SQUARED/EMS treatment, which, as demonstrated in field service, fully met the project requirements for effective soil stabilization.

SILTY FINE SAND (SM) Stress — Strain



Test Sample: Reddish brown silty fine SAND (SM)

EMC SQUARED/EMS Application to unpaved road material in Baldwin County, AL

Stress-Strain Curves Unconfined Compression Tests

Test performed by TERRA-MAR, Inc. Dallas, TX

These laboratory tests show excellent correlation with the field performance of this stabilized soil when utilized as a running surface for a county road in the Mobile Bay area of Alabama's Gulf Coast. A six-inch deep (150 mm) EMC SQUARED/EMS Dual Component System treatment proved to be the answer, providing a solid running surface during a time when the average annual rainfall was doubled over the year (from 60 to 120 inches) and almost equaled by the single hurricane rainfall event.

The stabilized soil performed so well, in fact, that county engineering staff reported that the stabilized surface

retained full traction and felt as solid as a concrete pavement during the extremely heavy hurricane rainfall. Typical of many similar stabilization installations, after more than a year of supporting traffic without a protective surface, this county placed hot mix asphalt pavement directly on the stabilized soil base, further upgrading the road as part of a "staged" or incremental road improvement project. In the meantime, school buses and county motorists had a nearly maintenance-free all weather road and the sensitive Mobile Bay estuary has been protected against further sedimentation by the erosion resistant stabilized soil.



EMC SQUARED and EMS Dual Component Liquid Stabilizer products being applied in Baldwin County, Alabama.

Stabilizer products being mixed into road soil before compaction in Baldwin County, Alabama.





Stabilized road in service. Prior to stabilization, the road rutted so badly and driving conditions became so hazardous that school buses were unable to service the area.



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