

TxDOT Field Test Project



Application of EMC SQUARED® System Stabilizer Treatment

Mixing And Compaction of Treated Clay Soils



STABILIZED CLAY WORKING PLATFORM SATISFIES FIELD TEST REQUIREMENTS FOR STATE TRANSPORTATION DEPARTMENT



Compaction of Treated Clay Soil

Rubber Tire Rolling of Working Platform Surface

Stabilization Products LLC



CLAY STABILIZED WITH EMC SQUARED® SYSTEM SERVES AS WORKING PLATFORM FOR CONCRETE BATCH PLANT OPERATION

Major freeway and highway construction projects often require construction of yards for equipment parking and maintenance operations, project offices, and pads for portable batch plants and stockpiling of aggregate materials. While the construction project itself may last only a year or two, these construction yards and pad areas nevertheless undergo severe service with high frequency use by trucks and heavy construction equipment, including large wheel loaders for the handling of stockpiled materials. To provide all-weather working platforms in areas with soft ground conditions usually requires placement of thick aggregate structural sections of eighteen-inches or more to support the heavy loads.

Dallas, Texas, is well-known in the field of soil stabilization as an area with highly expansive clay soils. Lime application is a relatively expensive form of soil treatment and it has proven to be highly counterproductive to stability values when added to sulfate-bearing clay soils. With both of these issues of concern for a major Dallas area highway contractor on a Texas Department of Transportation (TxDOT) highway project, the contractor and the TxDOT Dallas District made the choice to conduct a field test and familiarize their construction crew and TxDOT engineers with the application and performance of the **EMC SQUARED** System stabilizer products. While the contractor had previous experience using lime treatment for stabilization of their construction yard and batch plant sites, the low cost and simple application of the **EMC SQUARED** System was attractive. The effectiveness of the treatment with sulfate rich Dallas area soils had been recently documented in research funded

by TxDOT and conducted at the Texas Transportation Institute (TTI). The contractor's previous experiences with lime treatment for these unpaved yard areas was also less than exciting as the addition of gravel would normally be required to repair muddy and rutted areas while the yards and pads were in use.

In service for more than one year, the **EMC SQUARED** System stabilization treatment successfully supported three mobilizations of the portable concrete batch plant, aggregate stockpiling and loading operations, transport trucks, cement trucks, and the heavy and frequent traffic of large CAT 980 wheel loaders transporting stockpiled aggregate and sand materials to the concrete batch plant. The eight inch (200 mm) deep stabilized clay working platform (PI ranging from 37 to 44, and 83.9 to 93.3 percent passing No. 200 sieve) required no repair.

The contractor noted that the treated clay soils functioned as an impermeable barrier, shedding water in areas with proper drainage and ponding water when drainage was interrupted. A layer of crushed aggregate of equivalent thickness (8") placed into service above such soft ground conditions and under such severe loading would have required constant replacement during the frequent wet weather events that this stabilized working platform was subjected to during the three mobilizations of the concrete batch plant. Following this successful field test, TxDOT approved the use of EMC SQUARED System stabilizer products for a series of freeway and highway projects in the Dallas area.



Concrete Batch Plant with Concrete Placement in Progress

As much as 20,000 tons of aggregate was hauled in and stored for each production run. The stabilized working platform supported the stockpiling operations as well as thousands of loaded truck trips and thousands of front-end large wheel loader trips.

The EMC SQUARED® System treatment proved to be highly effective, and at a fraction of the cost of cement or lime treatment.



**Stabilized Concrete Batch Plant Site One Year After Stabilization
With Scattered Aggregate Remaining From Footprint of Large Aggregate Stockpile**

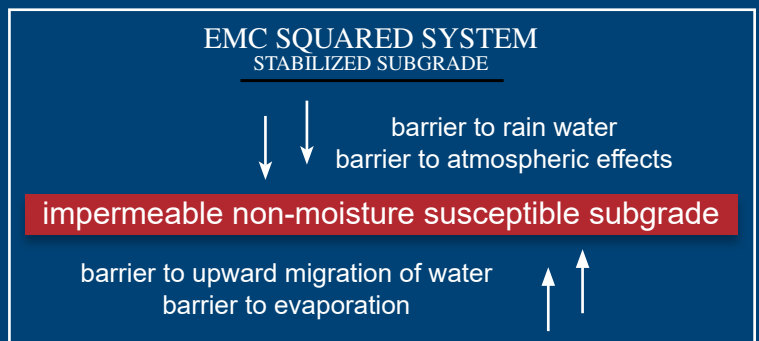
Advanced Stabilizer Technology



When cement and lime are utilized for soil stabilization treatment, they typically create rigid soil layers that provide strength without necessarily reducing moisture flow through the layer. Rigid layers are subject to cracking, similar to concrete pavements, which must be constructed with expansion joints to compensate for natural shrinkage phenomenon that otherwise propagate random cracking. In soil and base course stabilization there is no way to provide expansion joints, so cracking is an expected side effect of cement and lime treatment. This reduces their overall effectiveness and often subjects pavements above to reflective cracking generated from below.

The clay soil layer treated with the EMC SQUARED System stabilizer products retains elastic behavior and supports loads without a tendency to cracking. Equally important, it ordinarily reduces the rate of moisture flow through the layer, shedding water off the surface and impeding the upward capillary flow of moisture from groundwater sources below. This ability to function in this manner as a moisture barrier is a revolutionary and fundamental advance in stabilization of expansive clay soils. The stabilized layer impacts the stability of native soils below the constructed layers by promoting a more consistent and stable moisture distribution. Stabilization in this manner is largely achieved by stabilizing moisture content in the constructed layers and soils below, rather than by constructing a single rigid layer with cement and

lime treatment that remains susceptible to moisture flow moving through the layer. As evidenced in profilometer monitoring of freeway projects, this ability of EMC SQUARED System treatments to beneficially influence stability at a deeper level is resulting in smoother running roads and highways with extended service life. This is the multiplier effect, the exponential power of the EMC SQUARED System (EMC²) Stabilizer Technology. It promotes greater stability in soils below as well as within the treated layer.



EMC SQUARED System products are unique and uniquely effective. The moisture barrier aspect separates them from cement and lime, as does their ability to beneficially improve soils with organic and high sulfate content.

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