


SOIL STABILIZATION & SOIL DRYING

E. J. BRENEMAN, L.L.C.: INDUSTRY LEADER

E. J. Breneman, L.L.C. is in the business of soil drying and soil cement stabilization, processes that permanently alter existing soils by using a stabilizing additive.

E. J. Breneman, L.L.C. is the contractor of choice with many commercial site contractors as well as gas and oil operators. We are often called upon where deadlines are tight and safety is a priority. Our crews and management team are accustomed to working within tight time constraints. We can deploy multiple crews and equipment to sites in order to meet challenging schedules.

E. J. Breneman, L.L.C. projects can be found in the following states:

Connecticut, Delaware, Kansas, Maryland, Michigan, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Vermont, West Virginia and Wisconsin.

We work with over 35 different gas and oil operators and commercial developers throughout the United States.

With years of experience and a large fleet of specialized equipment, E.J. Breneman, L.L.C. should be your choice for soil stabilization, soil modification, and full depth reclamation services on your next project.

SOIL CEMENT STABILIZATION

Soil cement stabilization involves mixing Portland Cement into existing soils in order to chemically and permanently alter the soils from being unsuitable or weak to stronger, more suitable soils. Prior to the start of the project, organics and topsoil should be removed and soils should be sampled so that a project-specific mix design can be completed. This specially prepared design will determine the Portland Cement application rate required to achieve acceptable strengths, as well as proper depth of treatment. Typically, 200 PSI is a target range capable of supporting traffic at a depth of 12 inches. Stabilization can be achieved up to a depth of 15” in a single pass if the extra depth is required due to poor soil conditions. Depending on estimated traffic loadings, this depth can be increased or decreased by adjusting the cement application rate. A completed project-specific mix design allows for the proper cement application rate, preventing the over or under application of cement. In this way, our customized process eliminates wasted cement and money.

It is difficult to estimate the life span of soil cement. Drainage and proper cement application are crucial to maximizing the life of the product. As with any project, drainage must be handled correctly. Water that penetrates under the surface may cause failure. Designing the project with accurate traffic loading estimates is also crucial. The soil stabilized base must be covered by a driving surface, which may consist of aggregate, oil and chip or asphalt paving. The ultimate driving surface should be considered when determining the project mix design so that the structural strengths of the driving surface can be factored into the design. Soil stabilization often allows the depth of the driving surface to be reduced when compared to conventional construction. By utilizing a typical 12-inch soil cement base, stone thickness can be reduced by as much as 50%, significantly reducing construction costs. In addition, maintenance costs are significantly reduced or even eliminated as the aggregate is placed on a stable base.

A properly designed and maintained road can last in excess of 10 to 15 years. The Portland Cement Association (PCA) reports soil cement project life expectancy upwards of 20 years.

Soil drying involves mixing quicklime (hot lime), Calciment or Lime Kiln Dust into existing soils in order to chemically and permanently alter existing soils by reducing moisture content. The use of lime can modify almost all fine-grained soils to some extent, but clay soils of moderate to high plasticity undergo the most dramatic transformation. The clay surface minerology is altered due to the introduction of calcium cations supplied by the hydrated lime. The resulting soils show a reduction in plasticity and swelling, reduction in optimum moisture, and improved stability.

A general rule of thumb is that a 1% drying agent will reduce moisture by approximately 4% to 6 %. Quicklime is the most effective of the drying agents and is the preferred drying agent when existing moisture content is significantly higher than optimum moisture. Calciment and Lime Kiln Dust are effective when existing moisture content is slightly higher than optimum moisture content.

All drying agents will create heat when mixed into saturated soils as they combine with existing moisture. Soil drying allows construction operations to continue year-round and minimizes lost construction days due to muddy and unsafe conditions. Soils can be dried and placed in fill areas in multiple lifts allowing the use of existing, on-site soils without removing and importing materials.

SAFETY

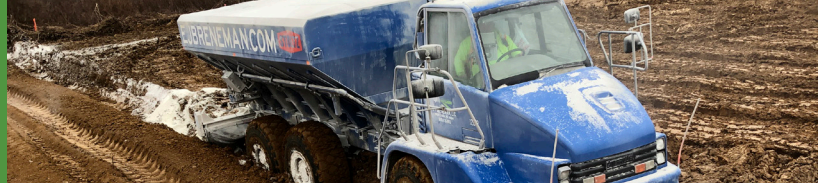
E. J. Breneman, L.L.C. is a member of ISNetWorld, PEC, TPS Alert, and Avetta safety programs. Our safety record with these organizations is exemplary. Our TRIR and EMR are well below industry averages.

We conduct annual, mandatory, companywide training every winter for all employees. We ensure our employees receive respirator fit testing, MVR updates, and various safety training in compliance with current industry standards. We stress a safety culture in all our activities.

All of our crews conduct daily Job Site Analysis meetings to identify potential hazards, both for the immediate day's work as well as long term project concerns. Every crew member is required to attend the JSA meeting every day. Upon request and where required, we also develop site-specific safety plans.

We have conducted air quality studies with an Industrial Hygienist to ensure that dust levels around our operations are below the allowable silica levels. In addition to respirators, our crews are equipped with proper personal protective gear. All of our spreaders are equipped with skirting designed to minimize dust while applying additive to the ground. A copy of our safety manual is available upon request.

EQUIPMENT



Our typical crew for the complete soil stabilization process is nine people. Cost savings can be realized when the site contractor is utilized to complete the grading and compacting behind our mixing and spreading operation.

As a result of the size of our fleet, we can place multiple crews on a site or on multiple projects concurrently. E. J. Breneman, L.L.C. has the equipment required for high production projects and includes the following:

7 - Wirtgen 250 / 2500 reclaiming machines
1 - Wirtgen 240 reclaiming machine
1 - MTH-225 tractor mounted grinder
6 - Stoltz tow-behind spreaders with heavy duty farm tractors – 12 to 15-ton capacity
8 - Stoltz truck-mounted road spreaders – 25-ton capacity
6 - Stoltz articulated spreaders – 25-ton capacity
3 - Storage blimps – 100 to 150-ton capacity
3 - Motor graders
2 - Pneumatic tanks with tractors to deliver material from suppliers
12 - Water trucks – 3500 to 4500-gallon capacity

In addition, we have an extensive fleet of owner operators to deliver material from suppliers to ensure ample material supply during projects. Our equipment fleet also includes pickup trucks, mechanic trucks, low beds, pad foot rollers, and steel drum rollers used to support operations.

Our equipment is maintained on a regular basis and our fleet manager aggressively pursues preventative maintenance in order to minimize breakdowns. As a result of our extensive equipment fleet, we can provide alternate equipment should we encounter a mechanical breakdown.

E.J. BRENEMAN, L.L.C. HIGHLIGHTS

- Consulted to conduct forensics on projects done by others when a project does not meet expectations or industry standards.
- Participated in a Penn Dot Task Force that rewrote and updated specifications for full depth reclamation and introduced a new specification for the use of cement slurry in full depth reclamation. We were the only independent contractor (not affiliated with any industry association) invited to be a part of the Task Force.
- Assisted in writing specifications for the oil and gas industry for soil stabilization and full depth reclamation. We introduced several construction methods within those specifications which allowed for significant cost savings to the construction industry.
- Equipped to assess and determine the stabilizing agent that is best suited for specific project requirements.
- Instrumental in the development and application of cement slurry as a tool for full depth reclamation. As part of those efforts, we completed the first cement slurry project in the Commonwealth of Pennsylvania so that data could be recorded, analyzed and submitted to the Federal Highway Administration and Penn Dot for approval.
- Operations designed to achieve optimal production on a sustainable and repeatable basis with a high priority placed on safety. We play an active role in research and development of equipment with our equipment suppliers in order to help us achieve these results.
- Ability to deploy multiple crews and equipment to sites in order to meet demanding schedules.
- Mix and place over 100,000 tons of Portland Cement and Quicklime per year.

FOR THE REGION'S LEADER IN SOIL STABILIZATION, SOIL MODIFICATION, AND FULL DEPTH RECLAMATION (FDR) SERVICES, CALL

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