

## Your Foundation Is The Soil.

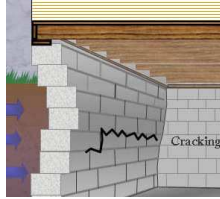
Your building or home rests on soil that provides the support for what most people consider the foundation. **A building foundation is only as sound as the soil upon which it rests.** In your area, the local soil conditions may be ideal. That is, they may contain

stable materials such as sandy or rocky mixtures. However, if your soil has a considerable amount of clay, then this soil is considered by structural engineers as an unstable material upon which foundations can be built.

## Soil Containing Clay Is A Problem.

We have clay soil in most of Oklahoma. Clay is always cycling between being moist (expanding) and holding water, to shrinking and becoming dry and cracked. For this reason, untreated clay is not a stable building surface. Clay has been used for centuries to create firm, smooth surfaces for buildings, dams, even ponds. However, clay has one "imperfection." It possesses tiny electrical charges that attract water. While these charges are very small and pose no problem individually, when millions of them are combined into a large clay mass, their ability to attract water becomes significant. Clay masses attract moisture on a grand scale, attracting huge quantities of water. The vast numbers of small voids or capillaries act as passageways for the water.

These capillaries exist throughout the clay mass, like infinite "veins" where water can travel. As the water is pulled into these tiny pathways, the soil swells to make room for the water. After clay has absorbed water once, the capillaries provide passageways for the water to flow in and out of the clay depending on factors such as rainfall, irrigation, temperature, etc. This causes the characteristic cracked look of dry clay, as it shrinks back to its normal size. Depending upon the depth of the clay, the swelling creates pressures that could easily be 5,000 to 9,000 lbs/SF against foundations, swimming pool walls, and paved surfaces. As a result, **these pressures can easily break apart roads and lift**



**a home or office building off its pier foundation.** Our own testing of Tulsa soils revealed a clay/loam mixture with an expansion of at least 3.5% of volume. This may not sound like much, but if you consider one dimension of your building foundation can easily be 50 feet, your foundation could move horizontally by as much as 21 inches! If your building sits on clay that is only 5 feet deep, your foundation or floor slab could move over 2 inches vertically!

## How Do I Fix Expansive Clay Soil?

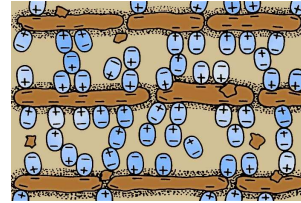
The expansion and contraction of soil with clay content can be minimized by injecting Condor SS - Soil Stabilizer. This can be done **either before or after construction**, working to prevent further damage or to correct problems. Treatment is fast, easy, economical, and permanent. Changes in moisture due to the changing seasons or other factors will no longer cause significant damage from heaving and swelling soil.



Condor SS®

## What Does Condor SS Do To Clay Soil?

Since the swelling in clay is caused by powerful, electrical charges present in the clay, Condor SS® neutralizes this problem by introducing more ions with an opposite charge from those of the clay.



Once the ions in the clay have been neutralized, the clay no longer attracts water. Normal weight applied on top of the clay will compress it, collapsing the capillaries that had previously carried water.

With the capillaries collapsed, and no attractive force pulling water into the clay, the clay becomes ideal for supporting roads, runways, homes, and other structures. Condor SS is a Sulphonated oil product derived from a petroleum industry's waste product. Sulphonated oil is particularly effective as a soil electrolyte because of its high chemical stability with powerful ionizing capabilities. It causes the water to separate from the clay particles and breaks its



electrochemical bond, thus becoming free water. The free water then drains through gravity, evaporation, and compaction. Because of textural changes caused by these reactions within the soil, **the strength and moisture stability of these soils is improved and swelling is reduced.** The compressive strength of the soil approaches that of concrete.

## How Is It Installed?

Condor SS can be installed in the soil for both new building pad sites and under foundations and slabs of existing buildings. It is installed around or under existing surfaces by using high-pressure water injection from a premixed solution that is pumped from a trailer mounted injection system.



The trailer's size allows the typical installation to be accomplished from a driveway or the street without disruption to lawn surfaces. The injection method allows for a minimal impact on the soil and vegetation around a



home or building. Instead of large diameter excavations, such as those required for piers, the **hole created by the injection process would typically measure less than 1-inch!** Vegetation or turf does not need to be removed and replanted. Condor SS can be installed under new road surfaces using plowing and water trucks for dispersion of the mixture.

## Is Condor SS Safe?

In the concentrations used for application, Condor meets EPA requirements for drinking water. Condor has passed numerous tests demonstrating it to be harmless to fish, animals and people, as well as living plants. Condor SS has been tested and approved by the State of California Natural Resources Agency.



## Who Makes Condor SS?

Condor SS has been manufactured by Earth Science Products of Portland, OR for over 35 years. Full information of this international company can be found on the Web at:

[www.earthscienceproducts.com](http://www.earthscienceproducts.com)

## Will Condor SS Move My Building Back To Its Original Position?

Condor SS will virtually eliminate wet/dry cyclic movement in a foundation and provide a continuous support for the foundation. Whether it moves a foundation or slab back to its original positions depends on the moisture content of the soil present during the construction of the foundation or slab. If excessively moist or dry conditions were present during construction, then the presence of Condor SS will not put the foundation back in its original position. However, once the foundation or slab has been stabilized by Condor SS, then other means can be used to move portions of the building back into place. In fact, **Condor SS will enhance the performance of other foundation repair methods such as piling, mud jacking, or other methods.** That is because these repair methods also require firm contact with stable soil for proper performance. Piers installed after the construction of a building are typically forced into the ground using high vertical pressures. The pier installation depth typically stops at a point where vertical resistance meets the pier installers support requirements. In clay soils, the moisture content of the soil during installation controls the depth of penetration, unless of course, one is lucky enough to encounter a rock formation. Anyone who has pushed a shovel into the ground of clay soil knows how much difficulty one encounters when the clay soil is wet as opposed to dry conditions. The pier will perform as designed as long as the moisture content of the clay remains stable. Unfortunately, there is no possibility of the moisture content remaining the same. High rainfall or severe drought will change the moisture content. Trees located on a property will draw moisture away from soil in an area 1-1/2 times their height. **It has been our experience that no amount of perimeter watering will keep things stable under a slab, paved surface, or foundation.** Once any moisture is removed from the clay soil surrounding the pier, the clay will shrink and pull away from the pier. This leaves only air supporting the pier laterally. Where the pier had adequate vertical support from the friction of the soil along its entire length, it now has only the small portion of the bottom surface area supporting your foundation. Result, the pier settles and the foundation settles. Horizontal movement is also a problem. The forces of the clay pushing the foundation horizontally

are too strong for most piers. Thus, the pier is pushed horizontally right along with the rest of the foundation. **Stabilization of the clay soil is as important to the performance of piers as it is to any other foundation design.**

### How Much Does It Cost?

**Total costs are typically many times less than that required for installation of piers, select fill placement, or underpinning.**

Costs for the injection-treatment of existing foundations vary but perimeters can be treated for less than \$30 per lineal foot of perimeter. If treatment beneath an existing slab is required, then additional cost will be incurred to drill small 5/8" holes in the slab. The best solution is to have the clay treated prior to construction. This would result in the lowest costs and reduce the cost of construction to a fraction of that required to excavate, import, and place select backfill. The process for treating an existing building requires a soil test, a before and after survey of the structure to ensure movement has been reduced to acceptable limits, and of course the actual injection of the Condor SS. If desired, Condor SS can be purchased in 1-gallon bottles or 15-gallon drums. Call for pricing.

### Is Condor SS Guaranteed?

Condor SS is guaranteed by the manufacturer to be effective in the stabilization of virtually all clay soils. Extended warranties for home and building foundations are available. The warranty is only valid if oversight of the installation is made by Soil Stabilization of Oklahoma, Inc.

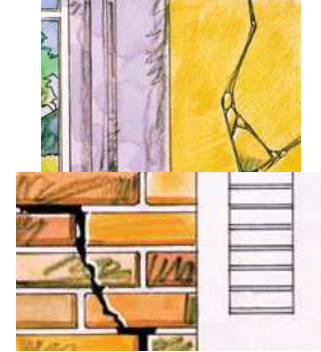
### How Will I Know That It Worked?

Other than the fact that you will notice fewer or no new cracks in interior and exterior building finishes, part of the installation service involves before and after vertical measurements of your entire foundation and floor slab. Measurements are documented and a copy is provided as part of the installation contract. These measurements are required if you desire a written warranty.

### Contact Us

Soil Stabilization of Oklahoma is a distributor and installer of Condor SS and the full product line of Condor and Woods products. Give us a call at **918-744-7198** or visit us on the Web at: [www.ssokinc.com](http://www.ssokinc.com)

## CRACKS IN YOUR FLOORS OR WALLS?



## PAST FOUNDATION REPAIRS INEFFECTIVE?

**THERE IS A SOLUTION AND IT COSTS LE\$\$!**



918-744-7198

Tulsa, OK

[www.ssokinc.com](http://www.ssokinc.com)