HOW ROADBOND EN1 WORKS

Expansive clay soils are a real problem in the DFW Metroplex and many other areas of Texas. They are detrimental not only to building foundations but to road structures as well. The DFW area seems to have an abundance of that class of clay mineral with a high Plasticity Index known as Smectite.

This particular mineral has a very complex molecular structure, multiple layers and a large number of electrically charged places where water molecules can attach. Under an electron microscope it would look like an agglomeration of fish scales.

The large surface area per unit weight gives this type of clay a very large electrical charge. The water molecules act like a bar magnet with a positive end and a negative end. A particle of clay can attract and hold a large number of water molecules. Water can also be contained within the surface layers of the mineral. This characteristic is what gives Smectite clays their expansive properties.

The "swelling" of the clay in the presence of water can be dramatic and damaging. However, water is said to be "weakly ionized" with a valence of only one. It may act like a magnet, but it is a very weak magnet. The high valence compounds in the clay mineral would rather hold a strongly ionized acid radical than the weakly ionized water, so it lets the water go and attaches the acid radical when available.

Roadbond EN1 provides strongly ionized acids which allow an ion exchange process to take place on the surfaces of the clay minerals in which much stronger bonds are formed and free water is released. The water evaporates or moves to drier material. In addition, the metals and other materials in the clay combine with the sulphonated materials in Roadbond EN 1 to form stable compounds of Aluminum Sulfate (Alum) and Magnesium Sulfate (Epsom salts).

Alum is widely used in water treatment as a flocculating agent and Epsom salts is a stable solid compound which binds a large amount of water. The soaps and oils in Roadbond EN 1 break the surface tension of water and allow the process to take place more readily. They also act as a compaction agents.

The process takes place quite rapidly and is controlled to take place just below optimum moisture. Additional water is then added to bring the soil mass to an optimum condition for compaction. Curing time is typically less than 24 hours and no remixing is required.

Roadbond EN1 does not contain Calcium and so the presence of high sulfate soils does not create a problem with "soil heave" as the Calcium/aluminum/sulfate hydrate known as Ettringite cannot form.

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