



INTENT

The intent is to replace lime stabilization with Roadbond EN 1 soil stabilizer in the subgrade soil of the parking and driveway areas prior to paving. The purpose is to contribute to a sustainable environment, reduce the carbon footprint of the project and to gain LEED™ credit for “Innovation in Design.”

Growth and construction have a profound impact on our environment, economy and productivity. ROADBOND EN 1 is a well established, proven soil stabilizer that addresses the important challenges of our time. These challenges are to:

- Reduce the consumption of water and natural resources during construction
- Lessen the dependence on non-sustainable sources of energy
- Lower greenhouse gas emissions

ROADBOND EN 1 significantly reduces the environmental impact when compared to conventional calcined soil stabilizers.

SAVE WATER, DIESEL FUEL AND REDUCE TRAFFIC

ROADBOND EN 1 reduces carbon emissions and saves fuel because it is concentrated and can be transported to the job site in a pick-up truck. One five-gallon pail of concentrated Roadbond EN 1 will replace 12 tons of lime. That is over 1 1/3 transports loads of lime slurry that is not transported to the jobsite and the corresponding relief in traffic congestion, noise and diesel exhaust fumes.

To understand how dramatically Roadbond EN 1 will reduce the environmental impact of construction, consider a typical 54,000 SY project, stabilized 6-inches deep. This project would require 720 tons of lime slaked with 405,000 gallons of water delivered in more than 80 tanker trucks.

Compare this to 300 gallons of concentrated ROADBOND EN 1 and only 60,000 gallons of water, which will be mixed at the jobsite. This represents a water savings of 675% and a fuel savings to deliver the lime to the jobsite of at least 675%.

REDUCE THE NEED FOR NON-SUSTAINABLE SOURCES OF ENERGY

ROADBOND EN 1 will significantly lower energy consumption compared to conventional stabilization. For instance, lime is produced by mining and crushing limestone and then burning that limestone in kilns during a process called calcination. The Department of Energy reports that more than eight tons of limestone must be quarried and processed in order to produce one ton of lime. After the material is crushed and screened several times, it is washed, processed and delivered to the kiln. The calcination of limestone requires temperatures in excess of 1400^o Fahrenheit over an extended period of time.

While this requires a vast amount of energy, the quantity varies according to the impurities in the limestone and the type and efficiency of the kiln. However, the Intergovernmental Panel on Climate Change has determined that the theoretical sum of energy consumed for the production of lime in the US and Canada is 7.2 GJ per ton of lime produced.

That is equivalent to 2000 kWh of electricity consumed per ton of lime produced. For reference, in 2007 the Energy Information Administration calculated that the average monthly residential electricity consumption per home was 936 kWh.





Therefore, replacing 12 tons of lime with 5 gallons of ROADBOND EN 1 is equivalent to taking 16 average homes off the power grid for one month. For the example 54,000 SY project, replacing 720 tons of lime with 300 gallons of ROADBOND EN 1 could offset the energy consumed by 960 average homes in one month.

REDUCE AND OFFSET CO² EMISSIONS

ROADBOND EN 1 also contributes to a sustainable environment by significantly reducing greenhouse gas emissions. CO² is one of the greenhouse gases that contribute to global warming and is subject to the Kyoto Protocol.

CO² emission is a direct result of limestone calcination and the amount of CO² produced is a function of the calcium carbonate, magnesium carbonate and impurities in the limestone feedstock. However, the Intergovernmental Panel on Climate Change has estimated that CO² emission produced by calcination is over 1700 pounds for every ton of lime produced.

Fuel consumption during mining and processing will add an additional 900 pounds of CO² per ton of lime produced. This totals more than 1.3 tons of CO² emitted into the environment for every ton of lime used on the project.

Replacing 12 tons of lime with 5 gallons of ROADBOND EN 1 will reduce CO² by 15.6 tons. Again, referring to the 54,000 SY project, replacing 720 tons of lime with 300 gallons of ROADBOND EN 1 will reduce CO² by 936 tons.

For comparison, according to the EPA, the CO² emission of the average automobile based on 12,500 miles per year is 6.8 tons. The use of ROADBOND EN 1 on the example project will offset the CO² produced by 1,650 vehicles in one month. That offsets the CO² produced by driving over 1.7 million miles.

Other CO² research funded by the EPA has shown that reforestation of land will sequester up to 2 tons of CO² per acre per year. This indicates that a single 54,000 square yard project with Roadbond EN 1 instead of lime could replace the yearly carbon sequester of over 400 acres of reforested land.

AIR QUALITY

The EPA has also identified the lime manufacturing industry as a major source of hazardous air pollutants that include:

- Lead
- Arsenic
- Cadmium
- Mercury

CONCLUSION

The use of ROADBOND EN 1 to replace or reduce conventional stabilization is a comprehensive strategy that demonstrates quantifiable environmental benefits. It promotes a sustainable environment in the areas that matter most:

- Energy savings
- Reduced water usage,
- Reduced CO² emission
- Stewardship of resources.

“WORLD LEADER IN GREEN SOIL STABILIZATION TECHNOLOGY”

