PROJECT SPOTLIGHT:
RURAL ROAD INFRASTRUCTURE

Midwest's Nanotechnology Achieves Massive CBR Gains in Native Soil Stabilization Across Five Columbian Subregions

>1,300%	>5,800%	100%
Increase in average CBR value after stabilization	Increase in CBR value achieved in Southwest Region	Native soils stabilized – no imported material

CHALLENGES

- Stabilize diverse native soils across 5 subregions and climates.
- Increase the strength of the moisture susceptible, native clay soils to support traffic in wet climates.
- Perform the installation with the available equipment - which varied in type and capability based on region.
- Develop a long-term solution that requires minimal maintenance and upkeep.

SOLUTION

- Applied and constructed Soil Sement Engineered Formula® into the upper 15 centimeters of native soil roads in 5 regions of Antioquia.
- Two local universities led the installation as well as the performance monitoring and data collection activities.
- Dynamic Cone Penetrometer testing was performed before and after stabilization to compare performance and quantify improvements in strength.

RESULTS

- **Average CBR Increased by Over 1,300%:** Independent testing showed the average CBR increased from 8 to 115 after stabilization.
- **Highest CBR Increase was Over 5,800%:** Independent testing conduct in the Southwest region demonstrated a CBR improvement from 5 to 296 after stabilization.
- **Effective in All 5 Local Climates and Soil Types:** Soil Sement Engineered Formula® successfully stabilized the native clay soils in each of the 5 subregions.
- **100% Native Soil Stabilized:** Stabilized only native soils – eliminating the need and cost for importing aggregate.

PROJECT SUMMARY

Location: Antioquia, Columbia
Industry: Rural Road Infrastructure
Customer: Government of Antioquia

The Government of Antioquia, in collaboration with the University of Antioquia and University Network Innovial, conducted a field study across five diverse subregions of Antioquia, Colombia, to evaluate the effectiveness of alternative stabilizers for rural road stabilization– including Midwest's advanced polymer-based nanotechnology, Soil Sement Engineered Formula®.

In each subregion, Soil Sement Engineered Formula® was blended into native soils to a depth of 15 cm. No additional aggregate or surface layers were installed on top of the stabilized soil. Independent filed testing demonstrated that the stabilized soil achieved substantial strength improvements—averaging over 1,300% increase in CBR value across all 5 sites.

This project confirmed Soil Sement Engineered Formula®'s ability to increase strength and engineering properties in various soils and climates – confirming its viability as a sustainable, high performing solution for stabilizing marginal soils in challenging environments.

LOOKING FORWARD

This project demonstrated that Soil Sement Engineered Formula® delivers exceptional strength increases in weak and moisture susceptible native soils across various subregions of Columbia. Its proven performance provides a scalable and practical solution for rural infrastructure projects in challenging environments.