

# LARGE PRODUCER OF SUGAR BEETS

North Dakota, USA



**PROJECT:**  
PRODUCTION ROADS FOR LARGE  
PRODUCER OF SUGAR BEETS

**LOCATION:**  
NORTH DAKOTA, USA

**INSTALLATION DATE:**  
JULY 2015

**PRODUCT:**  
ECO-PAVE

**PROJECT SIZE:**  
200,000 SQUARE FEET

**BACKGROUND:** This North Dakota company is the largest producer of beet sugar in the U.S., and each year, they have only a 14-day window in which to harvest and stockpile over 30 million tons of sugar beets. Any delay can result in a significant loss of product, an unacceptable outcome for the farmers who work on the large agricultural commune.

The company trucks the beets along dirt roads to 1,500 foot conveyor belts, where they are frozen and stored on large concrete slabs. Unfortunately, as little as ¼ inch of rain can render the unpaved unloading area mucky and unnavigable, forcing a complete shutdown of activity. Operators constantly have to scrape as far as 12 inches down to remove mud and beet spillage that becomes driven into the roadbed from nearby piles. For the beet producers, bringing stability to these unpaved areas had become an urgent priority.

**CHALLENGES:** The beet producer has 51 nearby grow sites positioned strategically for a fast turnaround. With such a short production window, stoppages may not only result in an immediate loss of product, but disrupt a tight transport schedule, hurting productivity and negatively impacting total yield. To eliminate road-related stoppages, the roads had to be made capable of doing three things: withstanding inclement weather, supporting heavy traffic, and preventing spillover from being driven into the road surface.

*They have a 14-day window in which to harvest, freeze, and stockpile over 30 million tons of sugar beets-any delay would result in a significant loss of product.*





## SOLUTION

*GreenPave creates a durable, pavement-like driving surface at a considerably lower cost than asphalt.*



**SOLUTION:** After consulting with the company about their unique requirements, considering both their primary objectives and the heavy clay composition of the site's native soils, Midwest Industrial Supply, Inc. opted to treat the most vulnerable areas with their GreenPave engineered stabilization solution. Midwest used GreenPave with amended soils to create a durable, pavement-like driving surface at a considerably lower cost than that of asphalt paving. Perfect for heavy-use areas, GreenPave surfaces continue to increase their load-bearing capacity (CBR) as they support traffic over time.

The scope of work was accomplished in three steps:

- Step 1:** Dig to a depth of 6-8" and supplemented native soils with sand, blending to 25% consistency.
- Step 2:** Blend amended soils with GreenPave green product before compacting.
- Step 3:** Finish road surface with topical Eco-Pave spray.

**RESULT:** The trial project was an immediate success, transforming loosely-composed roads into robust surfaces that will withstand any weather and operating conditions without degradation. As a result, the company has requested that Midwest work with them as an ongoing consultant, finding solutions for other worksite areas, reducing costs of operation, and improving performance on a continual basis.

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# SANTA MARIA EVENT CENTER

Santa Maria, California



**PROJECT:**  
SANTA MARIA EVENT CENTER  
ROADS

**LOCATION:**  
SANTA MARIA, CALIFORNIA

**INSTALLATION DATE:**  
NOVEMBER 2014 TO PRESENT

**PRODUCT:**  
ECO PAVE

**PROJECT SIZE:**  
2 MILES

**BACKGROUND:** The Santa Maria Event Center hosts two major sanctioned rodeo events a year with 5000-8000 vehicles traveling on their roads a day. The event center is also the bedrock of the community, hosting high school rodeo, junior rodeo and charity events.

The event center's three main entrance roads are unpaved, two of which are directly off the freeway ramp, and huge clouds of dust and debris would go airborne whenever they experienced traffic. For most visitors, this makes for an unpleasant experience; for those with respiratory issues, the situation became downright hazardous. Furthermore, dusty, unstable roads can lead to slow or unsafe driving conditions, backing up traffic for miles.

These stability issues made the event center roads not only aggravating, but also considerably more expensive. The loose sediment forming their surface makes them vulnerable to the area's inclement weather, and last year, a severe storm event washed away entire swathes of roadway. 500 feet of road had to be completely rebuilt, requiring the use of expensive equipment and threatening to shut down activity at the event center.

The SMEC quickly realized that it needed a fix for its road problem. But the organization relies on donations for funding, and the administrators knew that asphalt would be a cost-prohibitive option. They contacted Midwest Industrial Supply, Inc. in search of a lasting solution that wouldn't break the bank.



## CHALLENGES

*The unpaved roads were comprised of varying grades of sediment that supported a heavy traffic load.*



**CHALLENGES:** The three unpaved entrance roads, Gates 1, 2, and 3, were comprised of a variety of different native soils, silty sediments, and other unevenly applied aggregates used to strengthen the roadway over the years. Their poor underlying soil structure gave weak support to the roadway -- trucks were getting stuck in sugar sand portions of the road. Midwest had to devise a solution that could accommodate the varying grades of sediment while also supporting a heavy traffic load.

Upkeep and cost were equally crucial considerations. The new road surface would have to perform well under punishing weather conditions, but require sufficiently little maintenance over time so as to remain within the confines of a tight budget. After careful consideration, Midwest's experts concluded that their cost-effective and adaptable alternative to traditional paving methods, GreenPave, would be an ideal solution for the SMEC and its unique needs.



## SOLUTION



*The GreenPave solution is completed faster and at shallower depths than traditional paving, lowering construction costs.*

**SOLUTION:** GreenPave is an innovative natural paving solution that uses a variety of custom-designed solutions to blend natural soils into a robust, pavement-like surface. It's also completely sustainable, making zero ecological impact on surrounding areas. This makes GreenPave ideal in situations like the one in which the SMEC found itself, because it can transform a wide variety of soil and aggregate compositions into a smooth, uniform road surface. Plus, the installation process can be completed much faster (in days, rather than weeks), and at a shallower depth than traditional paving, which means that construction costs are greatly diminished.

The use of GreenPave also eliminated the need for the SMEC to haul in expensive aggregate for the construction of new roadways, and the speedy turnaround meant that there would be no disruptions to the center's busy schedule. Midwest's application of GreenPave allowed for different solutions to match the needs of different areas. It also made quick work of heavy sugar sand areas, where soil quality was particularly poor; Midwest added fiber and palliative to the roadway to increase its durability to road-ready standards. Best of all, the SMEC should expect its new roads to perform better over time, as GreenPave becomes harder and more durable with continual use.



RESULT



*GreenPave becomes harder and more durable with continual use.*

**RESULT:** Once the application was completed, it became clear that Midwest had not only solved the SMEC’s dust problem, but completely transformed its roadways. Rutted roads that once caused coughing and congestion were replaced with pristine and beautiful-looking surfaces.

After 18 months of heavy use, Midwest’s GreenPave roads are in as good a shape as the day construction finished. As a token of thanks, the SMEC recently presented Midwest with an award for their work at a recent rodeo.

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# SAND DUNE ACCESS ROADS

Lompoc, California

GREENPAVE® CASE STUDY



**PROJECT:**  
SAND DUNE ACCESS ROADS

**LOCATION:**  
LOMPOC, CALIFORNIA

**INSTALLATION DATE:**  
SEPTEMBER, 2014

**PRODUCT:**  
GREENPAVE

**PROJECT SIZE:**  
225,000 SQUARE FEET

**BACKGROUND:** A California-based power company owns power lines that run through the dunes of Nipomo and Lompoc, and it must regularly cannon wash those lines in order to clear dust and debris. The utility provider has a right of way through the dunes in order to perform this maintenance, but because the dunes are protected by the California Coastal Commission, it cannot build a traditional access road to do so.

Unfortunately, removing built-up dirt, dust, and salt from power lines requires a high-pressure stream of water, which in turn requires the use of heavy vehicles and machinery. In order to transport these AWD vehicles through the dunes, the power company had to use a dozer to tow them in and out of the work site, a process that proved inefficient, slow, and costly.

The company's most pressing concern was an expected heavy rain season -- meteorologists were anticipating an intense El Niño that year, and excessive rain could create dangerous conditions in the dunes. Workers feared that service trucks would sink into the wet sand, and that the dozers tasked with hauling them would not be able to get traction. Rescuing stalled or submerged vehicles increased the likelihood of environmental disturbance, and therefore, of heavy fines levied by the Coastal Commission.

Seeking a solution that would stabilize the path towards its power lines without violating any of the strict regulations that protect the dunes, the power company reached out to Midwest Industrial Supply, Inc. for help.



## CHALLENGES



*Every aspect of the road solution had to be carefully planned to avoid endangering the dunes' ecosystems.*



**CHALLENGES:** One of the most difficult challenges facing the client was the prohibition of traditional roadways. The pathway would have to not only be built sustainably with native soils, but look as little like a road as possible to discourage trespassing by ATV riders and other vehicles. The natural paving solution would have to prioritize not only sustainability, but aesthetics as well.

The heavy regulation protecting the dunes was another significant obstacle. The dune system hosts over a hundred endangered animal species and over two dozens kinds of imperiled plants. Every aspect of the road-building solution, from its chemical makeup to its method of implementation, had to be carefully planned so as to avoid endangering any of the birds, animals, or plants that thrived in the ecosystems supported by the dunes.

Finally, the project was facing what the power company felt was a race against time. With experts anticipating a particularly heavy rain season, work could be halted by flooding that would make the dunes impossible to traverse. The right of way needed long-term erosion protection, but as concerns of a major rain event built, that need was becoming more and more immediate.



## SOLUTION



*Because the GreenPave solution relies on in-place soils and requires minimal digging, it minimizes environmental disturbance*

**SOLUTION:** Midwest was able to meet all these requirements by engineering a solution with Midwest's GreenPave™ system. GreenPave is Midwest's innovative soil stabilization technique for road construction and maintenance, and it uses high-tech binding agents to blend natural soils into a durable, pavement-like surface without the need for aggregate. Because GreenPave relies on the strength of in-place soils rather than hauled-in materials, it minimizes environmental disturbance and requires less digging in order to implement.

To ensure that the installation had zero impact on the endangered plants and animals, the Coastal Commission sent a botanist to guide Midwest through the environmental consequences of each step of the process. Midwest's team was able to complete the entire project without disturbing the dune's ecosystems, a considerable feat given the area's diverse and delicate array of wildlife.

Completing the entire scope of the project was a three-step process:

**Step 1:** Excavated 18 inches of sand.

**Step 2:** Filled in with three six-inch lifts. First and second lifts stabilized with Eco-Pave product and fiber, then compacted.

**Step 3:** Final lift was stabilized with only Eco-Pave (no fiber) and compacted.



## RESULT

*GreenPave roads grow in strength  
as they're used over time.*

**RESULT:** The resulting pathway was stable enough to be traversed by AWD vehicles, had little to no impact on the surrounding environment, and provided long-term protection against erosion. The road also experiences zero ATV traffic because it was designed to blend naturally with the surrounding dunes, rather than welcome or encourage passersby to use it as an access route to the protected area. Impressed with the project's overwhelming success, the power company has contracted Midwest to build three more roads using the same technology.

And because Midwest's natural paving techniques create roads that actually grow in strength as they're used over time, the utility provider has also saved on future maintenance costs. This pathway, along with the others that Midwest is contracted to build, will be a safe and sturdy route to the provider's power lines for years to come.

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# VILLAGE ROADS IN SENEGAL

Senegal, Western Africa



**PROJECT:**  
VILLAGE ROADS IN SENEGAL

**LOCATION:**  
SENEGAL, WESTERN AFRICA

**INSTALLATION DATE:**  
OCTOBER 2013

**PRODUCT:**  
SOIL-SEMENT® ENGINEERED  
FORMULA

**PROJECT SIZE:**  
5KM OF VILLAGE ROADS

**BACKGROUND:** The Senegal Ministry of Transportation needed a new alternative paving method that could strengthen the quality of village roads in Senegal, which are crucial to the transport of food, livestock, supplies, and services.

Much of the country's transportation networks that connect villages and towns to major highways aren't paved, which means that seasonal changes can have hugely detrimental effects on commerce. When washboarding, rilling, and potholes occur, roads become unreliable and even dangerous, causing damage to vehicles and heightening the risk of accidents.

Durable, all-season roads also dramatically improve the quality of life for rural Senegalese communities by improving ecological health and reducing hazards to human, plant, and animal life. Specifically, water, wind, traffic, and other factors can push large, PM10 and PM2.5 dust particles into streams and rivers, where they may impact water quality. Loose dust kicked up by unpaved roads can also harm air quality and negatively impact surrounding ecosystems.

All these factors made an improved road building solution a key priority for the AHA, which contacted Midwest Industrial Supply, Inc. in search of an environmentally friendly stabilization solution.



## CHALLENGES



*Most of the material composition of the roadway being treated was formed with non-acceptable soils.*



**CHALLENGES:** Because these roads were so integral to local commerce and day-to-day life, extensive maintenance could prove dangerously disruptive. The road being considered for stabilization is a major thoroughfare between villages, which meant that residents were almost always walking and driving down them, as well as herding cattle, sheep, pigs, and goats. Shutting down this network for even a day could greatly inconvenience the people who used them.



Also in consideration was the actual soil in need of stabilization. Most of the material composition of the roadway being treated was formed with non-acceptable soils. The surface was made up four inches of fatty clay soils; below that there was four inches of caliche soils; and under that were four inches of good soil. This problem was compounded by a lack of proper equipment, which meant that the solution would have to be unobtrusive and not reliant on a good mixture of soils.



## SOLUTION



*GreenPave can be applied at a more shallow depth than traditional methods thereby stabilizing roads at a lower cost.*

**SOLUTION:** Midwest's team of experts decided that its GreenPave natural paving solution would be the perfect fit for the Senegal Ministry of Transportation. GreenPave is Midwest's innovative soil stabilization solution for road construction. It uses high-tech binding agents to blend natural soils into a durable, pavement-like surface without the need for aggregate. This approach allows for stabilization at a more shallow depth than traditional methods thereby stabilizing road at a lower cost.

The Midwest team worked on only one side of the road at a time so that heavy loads like herds of cattle could pass through while construction was ongoing. And to help accelerate the process, residents would join hands along the side of the road to keep cattle diverted away from the construction activity. Neighbors also stopped by the site to offer whatever equipment they could drop off -- a few children even offered to lend a hand in the application.

Completing the entire scope of the project was a three-step process:

- Step 1:** Cut one foot deep into the road and blade mixed the three different types of soil, combining them to create an acceptable road material.
- Step 2:** Worked in four-inch lifts and built an eight-inch base in two lifts, adding moisture and compaction. Then, the team incorporated Soil-Sement® Engineered Formula into a four-inch surface lift utilizing the GreenPave solution.
- Step 3:** Top-coated the road surface.



## RESULT

*Midwest's stabilization techniques and products actually cause the roads to get stronger as they're used over time.*

**RESULT:** When the project was finished, the result was a surface that was clearly more stable, safe, and visually pleasing than what had existed previously. The revitalized road network has already improved the quality of life for those living in rural Senegal, strengthening a key aspect of the country's infrastructure by connecting citizens in remote communities both to one another and to major urban centers of commerce.

Midwest's stabilization techniques and products will actually cause the roads to get stronger as they're used over time. That means that this network of roads will be free of potholes, dust, and washboarding long after the project's official completion.

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# SANTA BARBARA BOTANIC GARDEN

Santa Barbara, California



POROUS PAVE®

**PROJECT:**  
GARDEN PATHWAY SYSTEM

**LOCATION:**  
SANTA BARBARA, CALIFORNIA

**INSTALLATION DATE:**  
SEPTEMBER 2015

**PRODUCT:**  
POROUS PAVE

**PROJECT SIZE:**  
1/4 MILE PATHWAY

**BACKGROUND:** The Santa Barbara Botanic Garden is one of the country's most esteemed living museums, and it's visited by nature lovers around the world. There are few institutions more concerned with ecological impact than the Santa Monica Botanic Garden. For almost a century, the SBBG has served to conserve California's native plant life, provide its ecologists with a site for research, and educate its residents on the value of sustainable practices. Twenty three of the Garden's 78 acres have been deemed Historic Landmarks by Santa Barbara County, which is why the Garden strives to keep visible changes to the facilities and their surrounding environment to an absolute minimum.

Recognizing its responsibilities as a role model for sustainability, the SBBG decided that it needed a pathway system that was more organically constructed, aesthetically pleasing, and environmentally friendly than the pavers they had in place. Hoping to implement a solution without disturbing visitors or the surrounding plant life, the Garden contacted Midwest Industrial Supply, Inc. in search of a customized natural paving solution.



## CHALLENGES



*The paths needed to be replaced with permeable pavement to allow toxic residuals to be absorbed by the pavement without impacting the environment.*



**CHALLENGES:** After visiting the site to consult with leadership at the Garden and spec out potential solutions, Midwest immediately understood the risks involved in keeping its pavestone pathways. Storm runoff from pathways carries dangerous toxins and residuals into surrounding ecosystems, which can do serious harm to both plant and animal life. These paths would need to be replaced with permeable pavement to allow potentially toxic residuals from tire tracks, fertilizers, and other pollutants to be absorbed by the pavement and consumed by microorganisms living below without impacting the surrounding environment.



The facility itself also presented a set of unique challenges. Located as it is in temperate California, the seasons don't have much of an impact on traffic, meaning that there are plenty of visitors throughout the year. Midwest had to replace the miles-long system of pathways without blocking visitors' access for a significant period of time.

Aesthetics also played an important role in the project's specifications. The Garden has been cultivating a signature look for decades, and any solution that wouldn't maintain that appearance wasn't likely to be approved by SBBG leadership.



## SOLUTION

*Porous Pave can be customized to whatever color or shade best fits the surrounding area.*

**SOLUTION:** After several consultations, the Santa Monica Botanic Garden agreed to a solution that would use Midwest's new Porous Pave solution to create pathways more suitable to its conservationist goals.

Porous Pave uses Midwest's powerful binding agents to blend a layer of stone between two and six inches thick with small aggregate, creating a permeable system. This porous surface allows potentially toxic residuals from tire tracks, fertilizers, and other pollutants to be absorbed by the pavement and consumed by microorganisms living below.

Because Porous Pave naturally binds with in-place soils, there was no need to haul in construction material, making the implementation process both faster and less obstructive to visitors. The resulting permeable material can also be customized to have whatever color or shade best fits the surrounding area. Midwest sent several samples to the Garden's administrators to ensure that the color was exactly to their liking just before beginning the project.



## RESULT



*The project was entirely self-contained, meaning that it caused little to no disruption of daily visiting activities.*

**RESULT:** While the entire scope of work on the project was expected to be completed in three to four days, Midwest's specialists were able to finish it in less than two. The project was entirely self-contained, meaning that it caused little to no disruption of daily visiting activities. The Botanic Garden was impressed enough by the results to exhibit an 1,800-foot stretch of its Porous Pave pathways in the Garden's annual open house, which puts new, sustainable landscaping practices on display each year.

The resulting pathway is safer not only for plant life, but for visitors as well. Porous Pave offers more traction than the Garden's former paverstone pathways, even when it's wet.

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# LA COUNTY SANITATION

Lancaster, California

## GREENPAVE® CASE STUDY



**PROJECT:**  
LA COUNTY SANITATION

**LOCATION:**  
LANCASTER, CALIFORNIA

**INSTALLATION DATE:**  
OCTOBER 2015

**PRODUCT:**  
SOIL-SEMENT® ENGINEERED  
FORMULA

**PROJECT SIZE:**  
580,000 SQUARE FEET

**BACKGROUND:** The Los Angeles County Sanitation District processes roughly 510 million gallons of water daily, and all that water can take a toll on processing facilities. Last year, a Lancaster, California-based water reclamation plant began to experience rill erosion on the 5.5 miles of linear slopes bordering its four massive retention ponds, as well as on the unpaved roads that crest those slopes.

Troublingly, the site also began to experience “blowouts” -- events in which a hole forms in the cresting road and, when flushed with water (such as during periods of heavy rainfall), blows out the side of the slope, carrying soils away from the roadbed. In the face of increasingly dire El Niño storm predictions, site operators feared that a major rain event could compromise one or more of the pond walls. The site had 30 such areas in need of attention.

**CHALLENGES:** The site has clay-rich soils that serve effectively as pond liners, yet can easily become dislodged, at which point they will actually float on the water. Unlike with typical potholing, the soil’s erosion patterns when blowing out are often unusual and hard to predict. The crest roads were also in need of erosion protection, as any precipitation would make their soils too slick for maintenance trucks to safely traverse.

Faced with the challenge of stabilizing soil with such a unique composition, Midwest’s field professionals had to find a solution that would not only secure the crest roads for vehicle traffic, but protect the linear slopes from blowouts and rill erosion.

**SOLUTION:** First, Midwest patched the holes by table mixing soils with our Soil-Sement® Engineered Formula before both filling and backfilling the tunnel until the surface was level and consistent. Soil-Sement is an environmentally safe polymer emulsion that stabilizes materials into a durable, water- and weather-resistant surface.

After the holes had been filled, Midwest blended Soil-Sement into the crest roadway before topically applying a sealing coat to protect against slickness and erosion. In addition, this process promised to increase the road’s load-bearing capacity.



## RESULT



*Environmentally-safe Soil-Sement stabilizes materials into durable, water- and weather-resistant surfaces.*

As for reducing rill erosion on the clay pond slopes, Midwest experimented with three different application strategies to find the solution best suited for LA County Sanitation:

1. Topical application of Soil-Sement to the as-is hillside
2. Grooming slopes prior to a topical application
3. Prepping and grooming slopes by loosening two inches of topsoil before blending Soil-Sement into that layer.

**RESULT:** Once the project was completed, the resulting pondside roads were clearly more stable, safe, and durable. Months later, following the El Niño storm season, Midwest performed a site inspection and found that only six small areas of road surface required additional treatment since installation, a dramatic improvement over the previous conditions. Since that time, there have been no blowouts, nor is there any evidence to suggest that one might occur in the future.

Even so, Midwest is committed to helping LA County Sanitation reduce or eliminate any future erosion problems at a number of sites, and is monitoring slopes on a continual basis to determine the most effective long-term abatement solution.

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