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BUILDING COMMUNITY



CORNFIELD 'TILED' AND PLANTED IN ONE DAY

HDPE Pipe System Resolved Compaction and Drainage Problems

WILLMAR, MN – In one day, how do you install a 24,000 foot drainage system on 40-acres of farm ground and then plant the field with corn? For Terry Vreeman and his 5-man construction crew the answer, according to the Plastics Pipe Institute (PPI), was high-density polyethylene (HDPE) pipe.

The drainage system was necessary to breathe new life into the property that had been dug up and later refilled.

A portion of the Olson Farm in Willmar, Minnesota about 100 miles west of Minneapolis was used to supply fill for a local highway project. A few years later, in late 2006, this soil was replaced by a half a million yards of black dirt from a business park.

“The farm property had a lot of clay underneath, which was taken out to build the four-lane highway, lowering the grade of the property by three feet,” explained Vreeman of Vreeman Construction (Clara City, MN), “so black dirt was brought back to rebuild the field. It took about a year for the new soil to settle.”

It was at this point that he started on the drainage system. “Because of all the traffic from the dump trucks packing down the soil both when it was taken out and when the new soil was put in, it was important to get good drainage in there and to get air

back into the soil to promote root growth on this property.

“The system will allow any excess water that comes through the soil to drain into the pipe and then off the farm. This keeps the soil moisture at an optimum.”

Water from the farm moves through the tiling system into a ditch and eventually into the Hawk Creek watershed.

“First, we put in a 12-inch smooth wall pipe in December 2007 that would act as the main,” Vreeman explained. “Then, in the spring of 2008 after the soil was drier, we put in the corrugated high-density polyethylene pipe that most call ‘seepage tile’. There were a lot of quarter-mile long runs so it went very quickly with the pipe coming directly off the coils that held more than a half-mile of pipe. We put in and connected these runs to the 12-inch main in one day. All 40 acres were planted with corn that same day. We actually started at six in the morning and the planter came in at four o’clock.”





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The drainage system is set on a grid pattern and consists of the 12-inch main outlet lines, and 24,000 feet of four-inch pipe to collect the seepage. Some eight- and six-inch diameter corrugated pipe was also used. The pipe, connections and fittings were manufactured and supplied by Prinsco (Willmar, MN). The company's environmentally sustainable ECOFLO® corrugated HDPE pipe was used for the 12-inch mainline.

"What's unique about our ECOFLO pipe is that it is manufactured using a blend of material containing a minimum of 50 percent recycled HDPE," explained Joe Larkins, director of quality for Prinsco. "There is a great deal of technology and scrutiny that goes into our polymer science and manufacturing operations to assure that our customers receive environmentally conscious products with unparalleled performance. Our ECOFLO product is manufactured with recycled materials targeting a 30-hour Notched Constant Ligament Stress (NCLS) value to ensure superior resistance to cracking and a long service life."

Prinsco's GOLDLINE® corrugated HDPE pipe provided the required perforation pattern for the subsurface drainage. The 4-inch diameter pipe was delivered to the farm in 3,000 foot-long coils. Geotextile wrap was not required and installation was done with a self-contained plow, eliminating the need for a more expensive and time consuming cut and cover operation.

The all important grid pattern for the drainage system was mapped-out by Bonnema Surveys (Willmar, MN).

"The most critical factor is a good outlet for the water," Duane Bonnema explained. "Every piece of land lies differently and we strive to lay out the pipe system in such a way that it maximizes the productivity and crop yield of the acreage.

"This property was a little different than most because we covered about 80 percent of the farm with the seepage system. This land has a few low spots where water will stand, but it's fairly flat. And that makes the layout all the more important. We designed the system to maximize the grade, which leads to a long-life, healthy drainage system. This gives the farmer higher yields, greater crop margins and increases the enjoyment of farming. That's why we enjoy doing these systems – they always comment on what an improvement the drainage system makes."

"Proper soil drainage is one of the most important success factors for a farm from both an environmental and productivity level," said Tony Radoszewski, executive director, PPI. "It started out nearly 200 years ago with foot-long clay tiles laid by hand to manage the subsurface water. As technology evolved it quickly became apparent that flexible and durable pipe made from high-density polyethylene could be made in coils of several thousand feet. This would not only permit a system to have optimum water flow and maximize crop productivity, but would also be quick



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to install and last for a very long time. The Vreeman crew can testify to that. The Olson Farm and its customers will reap the benefits of the new drainage system for many years.

“HDPE pipe is also versatile enough to be manufactured with various perforation patterns. This enables water to drain from the soil no matter what the contour or condition of the field may be and without diminishing the performance or longevity of the pipe.”

Surveyor and drainage layout expert Bonnema said “This was a typical project. We went in and took some preliminary elevations to see how to best utilize the natural grade of the farm land to insure a long-lasting functional layout of corrugated polyethylene pipe under the property. Basically, what we’re doing is giving the farm land three feet of non-saturated and aerated soil so that the crops will be healthy and productive.

“We’ve been laying out drainage tile systems for about 30 years. The biggest change we’ve seen is that when we started it was all foot-long concrete tiles laid end to end. Then the corrugated HDPE pipe came along and completely took over the market. It’s just a wonderful product. You rarely have a washout.”

This was a major problem for farmers, according to Bonnema, especially in Minnesota. “Washouts were a big maintenance headache in the old days. If the frost action or shifting soil caused damage to one of those foot-long concrete tiles, the storm runoff water would eventually dig out a sink hole and a couple of yards of top soil would end up flowing down into the tile system, clogging the tile. And that would have to be dug up and repaired. You won’t have that problem with HDPE pipe because it’s a continuous pipe. Plus it’s a much easier product to ship to the field and install. If it’s installed properly it will last many, many years.”

Known for the coldest winters in the nation, the frostline is also a concern.

“Our frost can go down six feet here. That’s another thing...HDPE pipe can take the frost where the historic concrete field tile will deteriorate. These days we install HDPE pipe 100 percent of the time,” he said.

Prinsco has been producing drainage solutions for the agricultural, construction and landscaping industries since 1975. Based in Minnesota, it has facilities in the Midwest and the west coast. Prinsco is a PPI member company and part of the Institute’s corrugated plastic pipe division. Please visit: www.prinsco.com.



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From the PPI Director

From the earliest of times, mankind has looked for methods to improve life, especially in the way to grow crops. One way to make a farm more efficient and increase yields was, and still is, to control the amount of excess water in the ground. In the 1800s, using simple clay roofing tiles to make underground pathways to route water was the wave of the future. As with all things, this was true until a better product was possible.

Farming, it is said, depends on necessity, which is the mother of invention. From the need to control water grew the tiling system. And from this starting point farmers sought out a better way to make that benefit even better. In the early 1960s they saw a new wave of the future being created...plastic pipe. They quickly recognized the benefits it would provide for their tiling drainage system including an easier and less labor installation plus longer life. Farming was actually one of the first areas corrugated polyethylene pipe was used.

Today, high-density polyethylene pipe has replaced the tile, and is being seen in more and more applications from farming to major infrastructure reconstruction. Light weight with proven durability, plastic pipe is now the product of choice for agriculture, civil engineering, industrial and utility projects. And it all started literally in a grassroots industry, and proven by the backbone of America, our farmers.

Tony Radoszewski
Executive Director

About PPI

The Plastics Pipe Institute, Inc. (PPI) is a Texas-based, non-profit organization, founded in 1950, that is the major trade association representing all segments of the plastic piping industry. PPI is dedicated to expanding awareness about plastic pipe systems and promoting plastics as the material of choice for pipe applications. It is the premier technical, engineering and industry knowledge resource that publishes data for use in development and design of plastic pipe systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods. For more information about PPI and available information, go to: www.plasticpipe.org.