



SMALL-TOWN SPORTS COMPLEX HAS BIG-TIME DRAINAGE SYSTEM

Editor's note: This article was supplied by SCA Communications, North Baldwin, NY on behalf of the Plastics Pipe Institute.

Due to the expectation of today's sports enthusiasts, the growing trend is for every sports complex to have a storm water drainage system. Youngsville, LA, with a population of 8,100, is one such town.

The Youngsville Sports Complex is a 70-acre complex that opened in May 2014. Costing approximately \$16 million, it was funded with a dedicated 1% sales tax, approved by Youngsville voters. The complex has six soccer, four softball, and five baseball fields, 10 tennis courts, a 1-mile long walking path, fully stocked fishing pond, a playground, plus concession stands, shops and facilities for festivals and corporate events. First-year attendance was projected at 500,000. The complex next month will host the 2015 PONY Baseball Mustang World Series with teams from across the US, Mexico, the Caribbean, and Asia/Pacific.

The use of corrugated high-density polyethylene (HDPE) pipe on the site

reduced the cost for the drainage system portion of this publicly funded project. Large diameter corrugated HDPE pipe along with more than 500 catch basins were used to construct the system.

"We are certainly seeing expansion of the trend to provide underground drainage to community sports facilities," said Tony Radoszewski, president of Plastics Pipe Institute, Inc. (PPI), the trade association representing all segments of the plastic pipe industry. "Players, management, owners and fans have always wanted a way to get water off the field quickly. In the old days, the only way to prevent rain from getting on the field was to roll out the tarp, but that would often kill the grass. Or for local fields, the games were just cancelled, and many times the field was unplayable for several days." Underground drainage systems were developed that would collect and move the water. Sometimes these pipe systems even have a vacuum to speed up the process. Yankee Stadium, for example, is also equipped with a fan

system that draws water into the system and can also be reversed to provide airflow for quicker drying and promote better root growth.

"Following the success at some of the most venerable pro-sports stadiums," Radoszewski continued, "local fields such as Youngsville put in what is basically the same underground drainage system. The nearby town of Broussard with a population of 8,600 broke ground in October for its own sports park, similar to Youngsville's complex. These are the fields that everyone dreams about, and these communities are making them a reality."

The pipe used at Youngsville is made with at least 40% recycled content (Advanced Drainage Systems, Inc.). More than 23,800 linear feet of the pipe in diameters ranging from 10 to 48 inches was used on the project; it meets ASTM F2648 standard specifications and will support H-25 live loads. Design engineering firm, C. H. Fenstermaker (Lafayette, LA), selected HDPE pipe

based on price, shallow burial depths, ease of installation, long life, and the recycled content of this particular product.

"Most times the fundamental concept for a sports complex facility is that drainage be handled in a conservative fashion," explained Dax Douet, P.E., engineering director for Fenstermaker. "Too many times I have seen facilities that are at the minimum slope requirements or don't provide enough drainage so both players and spectators walk through mushy ground and mud. I was determined not to have that happen. We have a lot of slope everywhere on our fields. We designed the Youngsville drainage system for a 10-year storm event."

"We truly feel that today, the goal is to use sustainable construction materials that also provide a top performance level," said Daniel Currence, PE, director of engineering, CPPA Division, PPI. "Sustainability certainly includes longevity, but also the environmental impact of material production and the use of recycled materials. HDPE pipe production is a very clean process, capable of reusing materials without sacrificing performance.

"Corrugated HDPE pipe produces a much smaller impact on the environment than traditional pipe materials like reinforced concrete or corrugated metal. Carbon footprint is the most widely accepted measure of the environmental impact of activity or production in terms of greenhouse gases produced, measured in units of carbon dioxide. Reinforced concrete pipe, according to a Cardiff University (UK) study, has a greater carbon footprint than HDPE pipe. Also, HDPE pipe made with recycled material helps projects to qualify for LEED certification."

PLAYING CATCH WITH WATER

Basins were another key to the rapid water drainage. Douet elected to use Nyloplast structures that combine a ductile iron grate with a PVC structure.

"The Nyloplast catch basin has about a 6-inch sump underneath the pipe connection," Douet explained. "On a sports complex like this, they will apply a lot of fertilizer on these fields, and I thought it was a great idea that each of these catch basins had a sump, which basically allows sediment and runoff fertilizer to drop out the pipe, cross over the catch basin and into the sump. The use of these drainage structures helped improve our water quality outflow into our outfall drainage features."

To get the grade and slopes as accurate as possible on all the playing fields, Douet had the construction crews use GPS equipment along with laser levels.

"To understand every nook and cranny of this park and how it drains, we actually created a three dimensional ground surface of this entire park. Based on that 3D surface model we created, we were able to know exactly where we would need to catch the water. And that's where the catch basins were put. That's how it all started.

"All the fields and all the common areas and parking lots," he continued, "could be graded only with GPS equipment that had a vertical tolerance of 1/100th of a foot," he continued. "The contractor used laser levels and GPS units following my 3D



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model. This way I would get exactly the drainage I wanted. That's my biggest takeaway; if I was going to do a facility like this again, I would do it in the same way. The only way to do it right is to utilize the technology that the construction world has today and that's with equipment that has a global positioning system. This means the computer drives the tractor so to speak, and grades that dirt exactly like we want it."

Douet made the call to put in native soil as backfill for all sub-surface drainage not under the loading of vehicular traffic. The crew compacted the haunch, bottom and sides.

"As far as backfill, we originally bid the project using aggregate backfill, which is really what that pipe calls for, but when we bid the project we were over budget so I really needed to find areas where I could save money. One of the choices I made was to allow native soil to be put back in the trench, but only in areas that weren't subject to traffic. Where the pipe is underneath parking lots, however, that was backfilled with aggregate. For most of complex, there's no weight on top of it, just people walking on it and that's nothing. I think we saved about \$700,000 by allowing earthen backfill."

The storm water management system was put to the test just before the grand opening event, but Douet wasn't worried. "About 3 days before the grand opening we had close to a 9-inch rain within 12 hours," he said. "And about 4 hours later all the water was out and about. None of the fields had a drop of water on them." **SI**