



## LARGE DETENTION SYSTEMS PROVIDE STORM WATER MANAGEMENT AND HELP BUILD SALES

MECHANICSBURG, Pennsylvania - A new Faulkner Automotive car dealership built here found a way to maximize sales by increasing its display area while also being able to meet environmental requirements. For storm water management, detention systems were constructed under the sales display areas using large diameter, corrugated high-density polyethylene (HDPE) pipe.

"Instead of proposing a traditional open pond detention/retention system, two large underground detention systems were installed to maximize useable area on the property for vehicle sales display," explained Todd Wilson, project manager for Alpha Consulting Engineers, Inc. (New Cumberland, PA), and designer of the systems. "The property is underlain with limestone making it susceptible to sinkholes. This meant that rather than meeting the water infiltration requirement of Pennsylvania's Control Guideline 1 (CG1), the stormwater facilities were designed to comply with CG2 requirements and included more extensive water quality BMP's. The proposed BMP's to control the peak flows and also meet the EPA's retention water quality facilities ordinance requirements. Also, we wanted to come up with the most cost effective design that we could."

According to the Plastics Pipe Institute, Inc. (PPI), the major trade association representing all segments of the plastic pipe industry, there are ever-increasing needs for proper storm water management.

"The U.S. Environmental Protection Agency's Storm Water Management Model - SWMM - was first developed in 1971 and has since undergone several major upgrades," explained Daniel Currence, director of engineering, CPPA Division, PPI. "It continues to be widely used throughout the world for planning, analysis and design related to storm water runoff, combined sewers, sanitary sewers, and other drainage systems in urban areas, with many applications in non-urban areas as well. Storm water management has traditionally required that there be no increase in the rate of runoff from development as compared to the rate of runoff before the development. This is for storms ranging from the 2-year, 24-hour event to the 100-year, 24-hour event. Now, there is also the need to meet other Federal, state and local environmental protection requirements including the trapping and controlling of Total Suspended Solids (TSS). This project required the system be designed to manage the 100-year flow rate of 44.5 cfs."



The detention systems, located in the front and the back of the property, were installed by JVH Excavating (Lemoyne, PA.). Excavation area measured 158 x 246 feet for the 48 inch



system and 119 x 206 for the 36 inch system with 3 to 4 feet of cover to finished grade.

For Retention System One with capacity gauged at 0.75 acre-foot of water, 4,800 linear feet of 36-inch diameter corrugated HDPE pipe was used. Detention System Two has 5,640 linear feet of 48-inch diameter HDPE pipe to meet the capacity of 1.5 acre-foot of water.



The HDPE pipe and custom fabricated manifolds were manufactured by Lane Enterprises, Inc. (Camp Hill, PA.) at the company's production plant in Shippensburg, PA. Lane is a member company of PPI.

"Even with the extensive amount of pipe - 24 rows of HDPE pipe - and manifolds, it was quick to install," said Wilson. "From the beginning of installation, it was completed in about a week.

"The systems are designed to reduce flow for the entire 14.5 acre site which includes four, 20,000- square-foot buildings. Peak flows are controlled by means of a stainless steel orifice plate installed within a junction box directly down-slope of the detention facility. From the

detention system, water is directed into the existing public storm sewer service."



Eventually, there will be a total of eight new Faulkner Automobile dealerships located at this area southeast of Harrisburg. The next dealership is being built directly across the street in 2015 and will have four HDPE detention systems constructed from a total of 6,300, 24-inch diameter HDPE pipe and fabricated manifolds.

Additional information can be found at the PPI website: [www.plasticpipe.org](http://www.plasticpipe.org).

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**About PPI:**

The Plastics Pipe Institute Inc. (PPI) is the major trade association representing all segments of the plastic pipe industry and is dedicated to promoting plastics as the material of choice for pipe applications. PPI is the premier technical, engineering and industry knowledge resource publishing 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.