



# Batten Down the Hatches

Corrugated PE pipe reduces flooding risks at new athletic field complex

By Sarah Humphreys

Mother Nature took the eastern seaboard by surprise in 2011 when Hurricane Irene landed ashore, but the next time this happens, at least one site will be ready.

The expansive grounds of the new Madison Recreation Complex in Madison, N.J., are poised to stay dry under nearly any condition after some new construction. The modern materials used resulted in a smoother installation and fields that are protected from flooding for the next century.

The project—which turned a tired grass athletic field into a two-field, synthetic-turf complex for soccer, football, lacrosse, field hockey, baseball and softball—used JM Eagle corrugated high-density polyethylene (HDPE) pipe for its storm drainage. The complex was completed in October 2011.

“HDPE was the material they wanted,” said Tyler Perry, sales representative for JM Eagle on why the facility chose Eagle Corr PE. “It lasts 100 years and it can handle a 100-year storm.”

## Changing It Up

Hurricane Irene, which struck in late August 2011, dumped about a foot of rain in some areas, pushing rivers to record flood levels in New Jersey and at least nine other states, according to the U.S. Geological Survey website. Damage to the area was in the billions of dollars.

Civil engineers across the country thought they were covered when they rebuilt after Hurricane Floyd, a 50-year storm, in 1998. No one predicted that

the storm of the century was just a little more than the decade behind.

“Twenty years ago, I don’t know that we would have designed for more than a 25-year storm,” said Madison Borough Construction Manager Dennis Harrington.

In the past, Harrington said, drainage for a complex such as this might have relied on concrete or corrugated metal, both of which have disadvantages. He said the municipality and designers kept these shortcomings in mind when planning the recreation complex.

“The original design had 48-in.-diameter pipe,” explained Harrington, who supervised the project for the borough. “If you use that in concrete, it’s very heavy and difficult to install. We also might have used corrugated metal pipe, but that corrodes and rusts, and its life is questionable, particularly in acidic soils.”

Corrugated HDPE’s inherent

qualities were obvious pluses in product selection. Research completed in 2009 by the Plastics Pipe Institute and Jana Laboratories found that PE can last more than 100 years. JM Eagle’s Dual Wall Eagle Corr PE features a dual-crown corrugated exterior for greater pipe stiffness values and a hydraulically smooth interior for maximum efficiency, as well as flexible conduit design.

New federal laws for storm water management also came into consideration. The old field previously drained naturally via peripheral drains and sub drains, also known as French drains, that were put in place in the 1960s or ’70s and are unacceptable by today’s standards: Storm water detention is now required under storm water management laws according to the federal Clean Water Act.

The project team reconsidered the 48-in. perimeter plan and decided on a different design that used even larger



Left: The ground of the athletic field was still damp when work began, meaning no heavy equipment could be used to transport pipe. Right: 60-in. perforated corrugated HDPE and manholes were installed to collect the water and convey it to a detention system.

diameter—up to 60 in.—perforated corrugated HDPE and manholes to pick up the water and convey it to a detention system.

“We use HDPE on basically every project that we do, so we’ve done many fields using the HDPE piping systems,” said Dave Sullivan, project manager for LandTek, the construction company for this job.

He agreed with Harrington that the weight of the pipe made it easier for

LandTek to do its job. The ground was still wet from recent flooding when the construction took place, which meant that no heavy equipment could be used for installation. Workers needed to carry the pipe around the two-field, 10-acre complex by hand.

“We did have a wet summer, and the corrugated HDPE is obviously easy to handle and transport,” Sullivan said. “It’s light, although it’s still rugged.”

The pipe’s ruggedness was important not only for the construction, but also the lifespan of the complex. It supports H-25 live loads with a minimum cover of 1 ft, while allowing for cover heights of 100 ft.

“The double-wall capability adds strength [during] the pipe application,” said Harrington, since there might be some vehicle loads on the fields.

### Savings & Protection

As an administrator for the borough, Harrington not only is concerned about the longevity of the project, but also its cost to taxpayers. Again, corrugated HDPE scored highly over other materials.

“They were able to ship a lot more linear footage of the plastic pipe because you don’t have the weight constraint of concrete pipe,” said Harrington, describing how as many as four 60-in.-diameter pipes were brought in on one truck. “There were savings on shipping and gasoline costs because you can ship more in a single delivery.”

Harrington confirmed that the city saved money with corrugated HDPE by reducing the labor costs with ease of installation and not having to employ heavy equipment.

Most importantly, though, corrugated HDPE will protect the borough’s residents if another disaster like Hurricane Irene strikes again any time in the next century.

“We meet all the Clean Water Act and storm water control requirements,” said Harrington, referring to guidelines in groundwater storage and recharge. “This complex is built to accept a 100-year storm in regard to both water quantity and water quality—the two components for storm water management.” **[SWS]**

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