



NEW FREIGHT TRAIN YARD SWITCHES TO CORRUGATED HDPE PIPE FOR STORM WATER DRAINAGE

*Hundred-Ton Trains Roll Over System at
 Memphis Intermodal Shipping Hub*

MEMPHIS - Using some seven miles of corrugated high-density polyethylene (HDPE) pipe in a drainage system under a freight train yard earned top honors from the Plastics Pipe Institute, Inc. (PPI). The Norfolk Southern Memphis Regional Intermodal Facility project was named the Project of the Year by the PPI, the major trade association representing all segments of the plastic pipe industry. The award was presented to the manufacturer of the pipe and PPI member company, Advanced Drainage Systems, Inc. (ADS) (Hilliard, Ohio), at the PPI's annual meeting.

Spanning some 380 acres, the truck-to-rail terminal that opened on July 1, 2012 used HDPE pipe, a material recently approved by American Railway Engineering and Maintenance-of-Way Association (AREMA) to reduce costs, increase efficiencies and add longevity for stormwater management. The new facility is to be heavily traveled and the underground pipe system will be subjected to hundreds of tons of weight from anticipated rail traffic. For the project costing some \$129 million, the use of HDPE pipe also ensures the water drainage system is in compliance with state and federal water quality regulations.

Historically the railroad had specified heavy gage, riveted, annular corrugated metal pipe with a bituminous coating, or reinforced concrete pipe. However, new focus on the benefits of using corrugated HDPE pipe,

including superior corrosion resistance, favorable cost of construction, and proven structural capacity under Cooper E80 Loading conditions, led to its selection as the best choice.



AREMA's (Lanham, MD) approval of corrugated HDPE pipe in railroad applications was published in the AREMA design manual in April 2012. Additional data supporting the pipe's use also came from a PPI-sponsored industry study that yielded results showing optimal performance in long-term use of corrugated HDPE pipe under railroad systems.

The PPI-sponsored research evaluated the use of corrugated HDPE pipe for under heavy rail car loads with shallow cover. Testing and data collection was conducted by the Transportation Technology Center, Inc. at the Facility for Accelerated Service Testing (FAST) in Pueblo, Colorado where it operates a test bed for railroad track. The methodology for analysis involved repeatedly running a train consisting of four locomotives with eighty, 315,000 pound rail cars over 48-inch corrugated HDPE pipe with only four-feet of cover from the top of the pipe to the bottom of the rail.



In addition to the dynamic performance evaluation, the long-term impact of heavy, static loads on the pipe was assessed by parking rail cars with one set of wheels on the track directly over the same pipe for six weeks. The corrugated HDPE pipe used for both the test and the new Norfolk Southern facility was ADS-manufactured product.

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An intermodal facility is a rail terminal for transferring freight from one transportation mode to another -- trains to trucks -- without handling the freight itself. Because of its strategic location, the Memphis facility makes intermodal freight transportation more truck competitive between the south and major northeast markets.

With a projected capacity to handle more than 327,000 truck trailers and containers a year, the complex has four trains arriving and departing daily, offloading cargo. The facility is part of the multi-state \$2.5 billion Crescent Corridor initiative to establish an efficient, high-capacity intermodal freight rail route between the South and the Northeast on Norfolk Southern's rail network. The Crescent Corridor is a program of independent projects and improvements geared toward creating a high-capacity, 2,500 mile intermodal route from New Jersey to Louisiana.

The pivotal part of the entire facility's design was to get the ground as flat as possible, giving locomotives a level run of track which means less power to start rolling. The location where the facility now sits was an area comprised largely of woods that was excavated down to approximately 25 feet below grade to establish a level surface.

The storm water drainage system used some 36,216 feet of corrugated HDPE pipe that ranged in diameters from 6 to 60 inches. Another 5,700 feet of perforated corrugated HDPE pipe was also used to allow water to



seep into the pipe. Burial depths under parking lots and train tracks ranged from 2.5 to 28 feet deep from bottom of the railroad tie to the top of pipe.

According to ADS design engineer, Shawn Coombs, P.E., "For our 48-inch diameter pipe we require at least four feet of cover for Cooper E80 Loading. In one 80-foot section, however, there could be only about 2.5 feet of cover, and so we did a custom design to modify the backfill to allow it to perform under those conditions. That was the only real challenge we had."

Memphis project also reflects the Railroad Community's acceptance of PPI's efforts to initiate under-track testing at Transportation Technology Center, Inc's Facility for Accelerated Service Testing. This ground breaking work with HDPE pipe was done at a time that matched the railroads explosive growth, proving to be both timely and beneficial. That is why the project was named Project of the Year by the PPI."

For additional information, click on: www.plasticpipe.org.

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"The Memphis Norfolk Southern Intermodal Facility is the culmination of more than five years of effort working with AREMA and the Railroad Community to advance the use of HDPE pipe into railroad's heavy haul operations, where proven performance under Cooper E80 Loading is required," stated Tony Radoszewski, president of the PPI. "The

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 method.

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