

# LASTING EVEN LONGER

NEW STUDY SHOWS LIFE EXPECTANCY OF HDPE TO SURPASS 100-YEAR SERVICE REQUIREMENT

**D**rexel University researchers, led by Dr. Grace Hsuan, have recently developed a new test protocol for corrugated high density polyethylene (HDPE) pipe, utilizing the rate-process method (RPM). The results were published and presented at the recent international Plastics Pipes XIII conference in Washington, D.C.

According to Hsuan's data, the pipe

- Service life of 949 years at 6% deflection (600 psi material stress in the pipe wall); and
- Service life of 2,893 years at 5% deflection (500 psi material stress in the pipe wall).

To predict the actual service life of the corrugated HDPE drainage pipe, a test protocol utilizing the RPM was

assessment and a similar test applied to the junction.

"As we look to rebuild our underground infrastructure, engineers are paying more attention to the service life of their construction materials and structures," said E. Lyn Heying, project manager from MECO Engineering Co., Inc. "The goal is to avoid plaguing future generations with the same dire infrastructure situation that our generation is currently facing."

The service life of most drainage pipes is estimated to be between 20 and 100 years, depending on the material.

Prior to Hsuan's most recent study, the Florida Department of Transportation (FDOT) had done the most extensive research on the subject of service life of corrugated HDPE pipe. In establishing its protocol for 100-year service life of corrugated HDPR pipe, FDOT agreed that the limiting factor for service life would not be based on abrasion or wear of the inner wall.

FDOT identified cracking via the slow crack growth mechanism as the primary mode of failure and concern for HDPE pipe. This decision was based in part due to research conducted on some older pipe that had exhibited circumferential cracking in the smooth waterway liner of the pipe wall.

While FDOT acknowledged the liner is not a structural component of the overall pipe structure (it exists for hydraulic purposes only), it was their desire to have crack-free pipes, and thus establish a protocol that will ensure the material will not crack over its intended service life.



Researchers at Drexel University have found through the development of a new test protocol that the life expectancy of HDPE pipe surpasses the estimated 20- to 100-year service life.

tested surpassed the 100-year service requirement in the harsh environmental conditions of Florida. The results were dramatic enough to remove any doubt about the 100-year issue and reset the baseline much higher for corrugated HDPE pipe. Highlights of the data include:

- Service life of 572 years at 7.5% deflection (675 psi material stress in the pipe wall);

applied to the junction where the corrugated meets the pipe liner. Hsuan's paper states that the 100-year stress crack resistance (SCR) of corrugated HDPE pipes was evaluated using a 600-mm diam. pipe. The SCR tests were performed on the finished pipe at the liner and junction locations. The notched constant ligament stress test (ASTM 2163) was used for the pipe-liner



Since the slow crack growth mechanism for failure has been well researched and documented in the pressure pipe industry, and an ASTM test method was already in place to predict service life based on this failure mechanism, it was relatively easy to adapt to corrugated HDPE drainage pipes.

In 2002, material changes were incorporated into AASHTO M294, the national specification for state DOTs for corrugated HDPE pipe, which ensured the material's long-term resistance to the slow crack growth failure mechanism.

Independent research like the Drexel University study is taking the service-life issue to unprecedented levels. Since corrugated HDPE pipe is relatively new in storm sewer applications, the testing provides additional confidence and security in the integrity of the product.

## IECA'S NORTHCUTT TO RESIGN

The International Erosion Control Association (IECA) has announced that Executive Director Ben Northcutt will not be seeking renewal of his contract with the association. He will fulfill the term of his contract, which ends June 30.



Northcutt, who has served as the association's executive director for 19 years, is leaving the organization to pursue a new opportunity in the field of conference and exposition planning. He is joining Hemisphere Expo Services, Inc., based in Steamboat Springs, Colo.

"My time at IECA has been one of the most rewarding experiences of my life," Northcutt said. "And even though the IECA of today is vastly different than it was back in the mid '80s, I'm still very proud of to be part of an organization that truly cares about the people it serves as well as the people that lead it."

Ron Faucher, CPESC, newly elected president of IECA's board of directors, praised Northcutt for his work with the association. "Ben stepped in to lead IECA when we were in our infancy and has successfully brought us through all those years of growth. He has worked alongside many volunteer boards, guiding IECA's development over the years and helping to make this organization a major player in our industry."

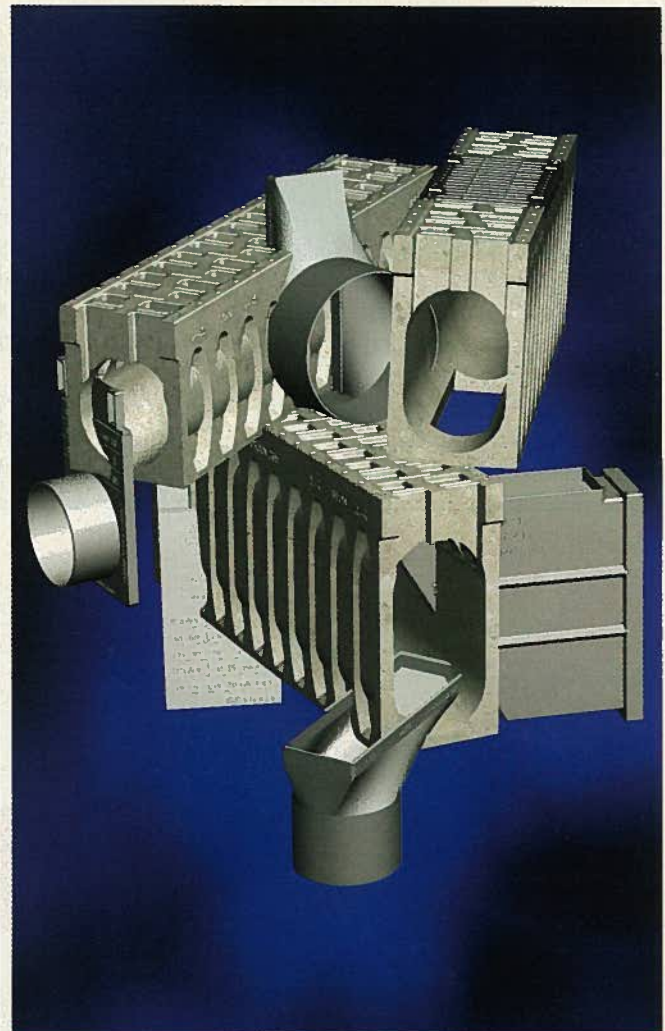
Northcutt's involvement with IECA began as an invited speaker for the 1984 annual conference in Denver. In 1988, he was hired as executive director at a time when there were about 300 members.

Northcutt said he has been thankful for the opportunities his work at IECA has provided for him. "I've been fortunate to see the world, to impart a sense of purpose to the people I've met and, in some small way, help our environment better endure the never-ending challenges presented by the human race."

## FLA. ROAD IMPROVEMENTS

Parsons Brinckerhoff (PB) was awarded a contract in early April to provide comprehensive construction engineering and inspection (CE&I) services for a \$17 million design-build roadway improvement project in southeastern Tallahassee, Fla.

The project is being undertaken on behalf of BluePrint



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## Airports face increasingly complex storm water regulations