



British Precast Drainage Association

Publications from the British Precast Drainage Association (BPDA):

BPDA was formed in 2017 from the integration of the Concrete Pipeline Systems Association (CPSA) and the Box Culvert Association (BCA).

Information published by both CPSA and BCA will be rebranded and replaced as BPDA in due course. New material will be branded BPDA.

All CPSA and BCA web traffic will be redirected to the new BPDA web site at www.precastdrainage.co.uk



CASE STUDY FROM USA:

WHO IS LIABLE FOR FLEXIBLE PIPE PROBLEMS? THINGS TO CONSIDER

HDPE sewer pipe collapses in the City of Fort Myers, Florida raised questions over the causes of flexible HDPE pipe failure and how installation may not be the only problem. The collapses suggest that contractors may not be the only liable party and that the designers and engineers may be failing to specify sufficiently robust solutions.

On September 21, 2012, a sinkhole formed on McGregor Boulevard at Olmeda Way in Fort Myers, Florida revealing a collapsed 30-inch (762 mm) diameter, Type S wall HDPE storm pipe. This was around one year after a similar failure for another HDPE storm sewer pipe (18-inch diameter) along the same boulevard. Both failed pipes were only installed 12 years earlier by the Florida Department of Transportation. Samples of the failed 18-inch and 30-inch HDPE pipes showed signs of longitudinal cracking through the walls along the invert and crown. Longitudinal cracks traversed the springline of the outer corrugation. The HDPE material of both failed pipes appeared brittle and the corrugations and bell could be easily manipulated by hand, suggesting the pipe's initial material properties may have diminished¹.

It is unknown if this incident will have any impact on Florida's DoT decision a few years ago to consider a 100 years service life for HDPE pipes. However, what the incidents point out is that while proper installation is critical for an HDPE pipe to structurally perform without exceeding the 5% deformation limit, it is also essential that professional engineers actively engage in the design, specification and inspection of the flexible pipe installation².

In a well-documented plastic pipe failure incident at *Greenfield Place, Deerfield Township, Ohio* in 2007, the consulting engineer and HDPE pipe manufacturer concluded that the contractor may have been responsible for the HDPE pipe collapses³.

However, in other failure incidents, engineers and specifiers had significantly more financial liability than their underground utility contractors. In another Florida case (INCA storm water and water main project at Boynton Beach, Florida) the contractor was actually awarded \$1.2M from the consulting engineer following a legal dispute^{4,5}.

In the aftermath of the East Texas Fish Hatchery HDPE storm pipe failure the consulting engineer settled for \$3.3M in favour of the Texas Parks and Wildlife Department and the contractor⁶.



In a third Florida case, 2007 collapse of sections of a corrugated HDPE storm pipe under a parking lot during the construction of Gateway Shoppes in Naples, Florida⁷, subsequent litigation involving the developer, contractor and engineer was not disposed until November 2010⁸.

As a general rule, flexible thermoplastic pipes are essentially liners that can lack the stiffness to support service loads unless properly installed within an engineered soil embedment. Strength certification of flexible pipe installation is a comprehensive process that should include engineering design for buoyancy, strain, deflection at service loads, and buckling resistance using long term material properties, verification of geotechnical / groundwater conditions, actively managing proper installation, and post-installation inspection for deformation and other failure modes. Otherwise, the community, owners, contractors and engineers can all be at risk.

REFERENCES

1. Onsite observations and discussions September 24 2012
2. This example is noted only for illustration and discussion purposes. No opinion is offered as to any specific cause of the conditions noted in this article.
3. Greenfield Place Stormwater Investigation, Deerfield Township, Ohio. Report by Camp, Dresser and Mckee Inc. for the Deerfield Regional Storm Water District, May 2007
4. Letter to Town of Golden Beach, Florida from Ric-Man Construction regarding Capital Improvement Program Project #734-01 dated May 15 2005.
5. Meeting with City of Boynton Beach, Florida, September, 3, 2008.
6. HOPE Design and Construction. Lessons Learned from the East Texas Fish Hatchery Incident. American Concrete Pipe Association, April 2011
7. Field observations at Gateway Shoppes development in Naples, Florida, August 2007.
8. Uniform Case Number: 112008CA0017320001XX, Collier County Clerk of the Circuit Court, Public Enquiry.

For further information please contact your usual supplier

CPM Group

Tel: 0117 981 2791
www.cpm-group.com

Stanton Bonna

Tel: 0115 944 1448
www.stanton-bonna.co.uk

F P McCann

Tel: 0153 024 0000
www.fpmccann.co.uk

Milton Pipes

Tel: 0179 542 5191
www.miltonprecast.com

Concrete Pipeline Systems Association – 60 Charles Street, Leicester. LE1 1FB
Tel: 0116 253 6161, Fax: 0116 251 4568, Email: mail@concretepipes.co.uk, Web: www.concretepipes.co.uk