



## STORM WATER INFRASTRUCTURE REBUILDING AND ENVIRONMENTAL REGULATIONS RESOLVED WITH PIPE INDUSTRY INNOVATION AND COST- EFFECTIVE PRODUCTS

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Storm water drainage projects offer a variety of options to optimize funding and provide value to the public for infrastructure enhancements. Regardless of project scope or the size of investment, engineers and utility managers must always be prepared to ensure top value and that the best solutions for the long term are implemented.

Public infrastructure investment receives its fair share of media coverage. Frequently, that coverage takes the form of elected officials touting public infrastructure investment as a way to stimulate jobs and the economy. Sadly, and often, it's only those directly involved in water management who recognize the huge gap between available financing and what is needed to address the challenging issues related to our nation's aging infrastructure.

And the need continues to grow, propelled not only by required new systems and aging pipelines that need to be replaced, but also by the new EPA regulations and the requirement for Combined Sewer Overflow (CSO) projects to separate storm water from an existing sanitary sewer system. Also impacting new and existing systems is the need to meet other Federal, state and local environmental protection requirements including the trapping and controlling of Total Suspended Solids (TSS).

To help stretch the storm and sanitary infrastructure dollar and maximize value for future generations all of the following areas, not just the cost of the pipe, should be taken into account when planning any project:

- Product
- Innovation
- Installation time
- Life cycle cost
- The 'Green' Effect

### Product

By allowing different types of pipe materials to compete for the infrastructure dollar, the installed cost can be frequently reduced by 10 to 25 percent, and in some cases as high as 50 percent. It is not just the material cost of one product versus another, but the total installed cost, which includes materials, equipment and labor and life-cycle maintenance – all these factors impact budgets allocated toward infrastructure improvements.





In 2014 there are many proven materials, each with a good track record. Large diameter, corrugated high-density (HDPE) polyethylene pipe with a smooth interior, for example, has been used in culvert and storm sewer drainage applications for the past 30 years, and is often the most cost-effective product.

Numerous variables should be considered when making material selection for any job, but plastics offer superior abrasion and corrosion resistance, and offer exceptional jobsite compatibility even in demanding applications or when there is difficult terrain.

### **Innovation is Alive and Well in the Pipe World**

Within the plastic arena there has been more innovation during the past 30 years than in any other pipe sector. And that will continue as new materials and combinations of materials are developed and evaluated. One recent development in the United States is the use of polypropylene to manufacture large diameter pipe up to 60 inches. Used in Europe for years it is now growing in popularity for storm and sanitary sewers in the U.S. due to its higher level of stiffness, ease of installation and years of projected service.



### **Installation Time**

Materials such as HDPE and polypropylene enable pipe to be strong and light, which speeds installation time and can reduce crew size plus add to the safety of a project. It is possible to use smaller equipment and fewer pieces. The pipe, even in 20 foot sections, doesn't have to be picked up using heavy equipment. When you use concrete or cast iron pipe, however, more substantial equipment is required.

Simplicity of movement along with the 20-foot long stick length speeds installation. Concrete and cast iron pipe are limited in length due to the heavy weight. The larger the diameter, the shorter the lay length, generally four to eight feet long. Compared to 'off the shelf' 20-foot sections of HDPE and polypropylene pipe, the longer length and lighter weight can reduce the installed cost and speed of installation. The efficiency of an experienced crew can also favorably impact the overall project cost.

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### **Life Cycle Costs**

The durable and inert plastic materials extend service life and reduce life cycle costs. The Florida DOT gives HDPE and polypropylene pipe a 100 year service life. Other states and municipalities, set service life to 75 or 50 years, comparable with concrete pipe. But that is just the minimum expected



use life of the pipe. HDPE pipe is proven to stand up to the most aggressive environments and soil conditions. Beyond issues of abrasion and corrosion, joint repair presents the greatest long-term maintenance issues for storm drainage and sanitary pipe. Longer pipe lengths reduce the number of joints and plastic pipes also offer some of the most impressive water tight capabilities. The long-term maintenance and pipe longevity must be factored into the total installed cost of a project, and that cost spread over the expected life span of the pipe for a true analysis.

### The Green Effect

Today, designers, agencies, and the constituents they serve are looking for sustainable construction materials. Sustainability certainly includes longevity, but also considers the environmental impact of material production and the use of recycled materials. HDPE pipe production is a very clean process, capable of reusing waste materials. For years, HDPE pipe has been produced with recycled resins without sacrificing performance. Over the years, the quality and consistency of recycled materials streams has provided the opportunity to elevate the performance of HDPE pipe made without increasing costs and making it appropriate for a widening variety of applications. Today, industry estimates that one for every four HDPE plastic bottles recycled ends up in a plastic pipe. Performance of pipe with recycled HDPE content is supported by ASTM standards and is being evaluated by AASHTO for culvert and other live loads applications.

With budgets as tight as ever and the need growing as never before to add, repair and

replace existing pipelines, careful scrutiny must be made of products, innovation trends, installation time, projected system longevity and favorable environmental implications.

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

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### Author Background:

Daniel Currence, P.E. is Director of Engineering, CPPA Division for the Plastics Pipe Institute, Inc. (PPI). He is a senior Civil/Environmental engineer with technical sales and leadership experience with a B.S., Civil Engineering and an M.S., Environmental/Sanitary Engineering from the University of Missouri, Columbia.

### About The Plastics Pipe Institute, Inc

PPI is the major trade association representing all segments of the plastic pipe industry and dedicated to promoting plastics as the material of choice for pipe applications. The CPPA Division focuses on the use and development of corrugated plastic pipe used in applications such as agricultural, sewer and storm water management systems. 031814