

# CONCRETE PIPE. HERE TO STAY.

For long-term structural integrity  
and value, rigid concrete pipe  
sets the standard



American  
**Concrete Pipe**  
Association



AMERICAN  
**Concrete Pressure Pipe**  
ASSOCIATION



# SPECIFY THE RIGHT PIPE FOR YOUR PROJECT



**All pipe systems are not the same.** There are significant differences, including pipe material, installation procedures and durability, to name only a few. Every pipe material — precast concrete, corrugated steel, high-density polyethylene, ductile iron and PVC — performs differently on the job — and each has unique properties that it pays to understand. Choose the wrong pipe and you could jeopardize the entire project.



### Rigid Concrete Pipe Outperforms All Others

New pipe materials may come and go ... but not concrete. Precast concrete pipe and concrete pressure pipe have a long history — nearly 100 years — of proven performance. No other pipe material comes close in terms of reliability and durability, so don't be misled by claims about supposedly superior alternatives.

### Understand the Difference between Flexible and Rigid Pipe

One basic difference between flexible and rigid pipe is the length and weight of available pipe segments. However, the more important difference is how each material gains its strength and stability. Flexible pipe is heavily dependent upon bedding material and construction procedures, which require strict adherence to installation specifications. What's more, over time, moderate changes in the soil envelope will compromise the structural integrity of the pipe.

In contrast, the strength and stability of rigid concrete pipe are engineered and manufactured directly into the product. Its short- and long-term performance depends far less on bedding material and construction procedures, making it much more contractor-friendly. Moderate changes in the soil envelope have little to no effect on the structural integrity of the pipe; and since concrete pipe is heavier than flexible pipe, it is also less susceptible to flotation.

Concrete pipe is strong, durable and easy to install — but that's only the beginning of its advantages. Just as importantly, over the total life-cycle of a project, it is by far the most affordable alternative. Flexible pipe may seem cheaper at first, but when you consider the cost of installation and additional maintenance it will likely require, concrete almost always emerges as the most cost-effective choice.

### Choose Concrete: Reliable, Durable, Cost-Effective

The more you know about precast concrete pipe and concrete pressure pipe, the more you realize they are the obvious choice for most sanitary sewers, storm drains, culverts and water distribution systems. For your next project, specify the performance champion: reliable, durable and cost-effective concrete pipe.



## Why Flexible Pipe Systems Fail ... And What Happens When They Do

Flexible pipe systems have a tendency to fail in a variety of ways, each with its own characteristic causes and results. In every case, these problems could be avoided by selecting rigid concrete pipe systems instead.

FAILURE TYPE	MOST COMMON CAUSES	IMPACTS & RESULTS
<b>DEFLECTION</b> — Vertical/horizontal change in pipe diameter	<ul style="list-style-type: none"> <li>• Improper compaction of bedding material</li> <li>• Unexpected load on pipe</li> <li>• Trench width too narrow</li> </ul>	<ul style="list-style-type: none"> <li>• Unexpected stresses in pipe wall</li> <li>• Loss of hydraulic efficiency</li> <li>• Uneven settlement at soil surface/pooling</li> <li>• Reduction in flow capacity</li> </ul>
<b>JOINT SEPARATION</b> — Detachment or misalignment of pipe sections	<ul style="list-style-type: none"> <li>• Shifting of lightweight pipe during backfilling</li> <li>• Shifting soils</li> <li>• Differential settlement</li> <li>• Thermal contraction &amp; expansion of HDPE pipe</li> </ul>	<ul style="list-style-type: none"> <li>• Unexpected stresses in pipe wall</li> <li>• Migration of bedding material</li> <li>• Loss of pipe support</li> <li>• Uneven settlement at soil surface/pooling</li> </ul>
<b>CORRUGATION GROWTH</b> — Longitudinal elongation of internal pipe wall	<ul style="list-style-type: none"> <li>• Soil pressure on pipe corrugations</li> <li>• Thin pipe wall</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of hydraulic efficiency</li> <li>• Reduction in flow capacity</li> </ul>
<b>CRACKS, RIPS &amp; TEARS</b> — Fissures in pipe wall	<ul style="list-style-type: none"> <li>• Poor manufacturing</li> <li>• Poor resin quality</li> <li>• Improper installation</li> </ul>	<ul style="list-style-type: none"> <li>• Weakened pipe</li> <li>• Loss of hydraulic efficiency</li> <li>• Reduction in flow capacity</li> </ul>
<b>INFILTRATION &amp; EXFILTRATION</b> — Movement of fluid or solids into/out of pipe system	<ul style="list-style-type: none"> <li>• Improperly sealed joint, service connection or cracked pipe</li> <li>• Differential deflection of pipe at joint</li> </ul>	<ul style="list-style-type: none"> <li>• Migration of bedding material</li> <li>• Loss of pipe support</li> </ul>
<b>BUCKLING &amp; CRACKING</b> — Bends, warps or bulges in pipe wall	<ul style="list-style-type: none"> <li>• Inability of pipe to carry design load</li> <li>• Improper compaction of bedding material</li> <li>• Poor resin quality</li> <li>• Excessive load on pipe</li> </ul>	<ul style="list-style-type: none"> <li>• Unexpected stresses in HDPE pipe wall</li> <li>• Loss of hydraulic efficiency</li> <li>• Migration of bedding material</li> <li>• Reduction in flow capacity</li> <li>• Loss of pipe support</li> </ul>
<b>CORROSION</b> — Loss of pipe material due to oxidation	<ul style="list-style-type: none"> <li>• Prolonged exposure of steel pipe to water &amp; oxygen</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in pipe wall thickness in waterway areas</li> <li>• Loss of pipe strength</li> </ul>
<b>DELAMINATION</b> — Separation of interior liner from external corrugated pipe wall	<ul style="list-style-type: none"> <li>• Poor manufacturing</li> <li>• Poor resin quality</li> <li>• Excessive load on pipe</li> <li>• Inability of pipe to carry design load</li> </ul>	<ul style="list-style-type: none"> <li>• Unexpected stresses in pipe wall</li> <li>• Loss of hydraulic efficiency</li> <li>• Reduction in flow capacity</li> <li>• Increased corrosion for metallic pipe</li> </ul>

## DISCOVER THE CONCRETE PIPE ADVANTAGE

To learn more about the advantages of precast concrete pipe and concrete pressure pipe, contact the staff at ACPPA or ACPA. You can also visit [www.acppa.org](http://www.acppa.org) and [www.concrete-pipe.org](http://www.concrete-pipe.org) to download design software, reference manuals and other technical information.



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