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**Trenchless  
Technology Case  
Studies**

**A New FRP  
Solution for  
Reconstruction of  
Deteriorated  
Pipes and  
Culverts**

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**A NEW FRP SOLUTION FOR RECONSTRUCTION OF  
DETERIORATED PIPES AND CULVERTS**

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**ABSTRACT:** Pipelines are a major component of the infrastructure that often get damaged by corrosion. In many cases, the repair may require restoring the strength of the pipe to its full original capacity, including the effect of external gravity loads. Access is always a challenge as these structures are buried deep and cutting trenches to replace the damaged pipe can add significant cost and time to the project.

This paper introduces a new type of Fiber Reinforced Polymer (FRP) pipe developed by the author that utilizes sandwich construction technique to achieve high stiffness. The technique received the 2016 American Society of Civil Engineers (ASCE) Innovation Award as the world's first green and sustainable pipe. This technology allows two methods of repair. In one case a custom pipe can be built to any shape and size in segments of any length up to 10m long that can be used to slip-line the old pipe. In the other case, the host pipe is used as a mold to build a fully structural pipe below ground on site.

The paper focuses on several successfully completed projects in the US, Australia and Puerto Rico where both pressure pipes and gravity flow culverts have been repaired under some unique challenging conditions.