



Water Transmission and Storage Structures

In addition to increasing the structural performance of existing PCCP, RC and steel pipes, Tyfo® Fibrwrap® systems can also be used to upgrade other pressure vessels, such as storage tanks. Many other structural elements found in treatment plants can also be strengthened (see specific pages for [columns](#), [beams](#), [slabs](#), [walls](#) and [beam-column connections](#)). The potential structural uses include the following:

- Increase available hoop stress (increase internal pressure capacity)*
- Leak remediation and prevention
- Protection from corrosion and replacing strength lost due to corrosion
- Seismic upgrades
- Emergency repairs*
- Increase bending strength
- Increase compression strength due to external loading*

*These applications involve more complex designs. Special detailing and coordination will typically be involved.

Water transmission lines or large-diameter pressure pipes are strengthened installing the Fibrwrap® system, either internally or externally. Decades of continuous service of large-diameter buried pressure pipelines have led to deterioration that threatens the structural integrity of these lines. Pre-stressed concrete cylinder pipe (PCCP) lines, which depend heavily on pre-stressing wires for strength and long term durability, are in a state of distress due to the loss of these wires due to corrosion and other factors. Similarly, reinforced concrete pressure pipes, steel and ductile iron pipelines are also in need of structural renewal for extended service life.

The Tyfo® Fibrwrap® system application is a *trenchless technology* (for internal applications) that provides a full structural repair to these distressed pipe sections. This patented ([US patent # 5,931,198](#)) process has been successfully utilized worldwide for over a decade to rehabilitate many miles of pipelines ranging in diameter from 36 inches to 201 inches. The Tyfo® Fibrwrap® system provides an NSF listing for usage in potable water environments.