



Case History No.: 02-7307

Date: August, 2002

Description: 36"ø FRP Pipe, Fittings and Field Labor for Alafia River Crossing Project (Directional Bore)

Owner: Tampa Bay Water Authority
Hillsborough County, FL

Engineer: King Engineering

Contractor: Tom Allen Construction Company

Scope:

As a result of experience with our FRP Pipe which was used extensively on the Desal Plant for Tampa Bay Water Authority, King Engineering contacted us regarding the project for a directional bore river crossing of the Alafia River. Fiberglass had never been used for this service. We provided the design calculations plus results of extensive material tests to satisfy them that FRP pipe had the mechanical capabilities for this service. FRP was selected over steel and HDPE, based on the comparison of properties and price.

The overall project involved running an NSF approved 42"ø cement lined ductile iron pipeline handling potable drinking water. The line intersected two rivers each requiring a directional bore crossing. King Engineering determined that flow through a 36" I.D. FRP pipe would match or exceed the flow of the 42"ø ductile iron pipe.

The crossing of the Alafia River required 2040 LF of pipe installed 50 feet below the river. The installation procedure included complete assembly of the pipe on the riverbank and positioning the pipe on rollers to aid in making the pull. Because of concern for the effect of abrasion on the exterior of the FRP pipe when pulled through the borehole, IPS had to satisfy the engineers that we could solve this problem. When steel pipe is used, a special coating is applied. We compared the test results of that special coating with our own abrasion resistant product and duplicated their test by installing four 10" square FRP abrasion coated panels in the corners of a specially fabricated pallet. We placed a 3500-pound load on the pallet and pulled it down a concrete pad. Under these conditions the coating used on the steel pipe survived for a 50' pull, while our own coating was pulled for 200' with only a partial wear experienced.

The actual installation involved boring a hole under the river, hooking to a pulling head welded to our pipe, pumping the drilling mud into the bore and pulling the pipe under the river. The pull was successful but not uneventful. The section of pipe just past the steel pulling head cracked and partially opened up during the pull. After completion of this repair, the pipe was pressure tested, and the pull finished without incident.



The contractor was sufficiently satisfied with our product and performance to place an additional order with us to pull an 880' length of 36" I.D. pipe under Bull Frog Creek. Originally the contractor had intended to use steel pipe for this section.

For these projects IPS developed an external weld that allowed us to have a perfectly smooth O.D. With this type of joint the pipe has to be laid out in a straight line a length equal to the pull length. In many crossings the luxury of having this amount of space available adjacent to the pull may not be possible. In the probability of space limitations, we have developed a locking bell x spigot O-Ring sealed joint that can be assembled in the field as the pull is taking place.

On both pulls, we experienced cracks in the pipe just past the pulling head. Both section were repairable. The difficulty with the second pull (Bull Frog Creek) was compounded when a dewatering pig exploded gouging the inside of the pipe. The damage was repaired and the line was accepted for use.

