# Application Engineering Bulletin

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## Thompson Pump Successfully Performs 35MGD Bypass in Memphis, TN

In Memphis, TN, White Contracting of Cordova, TN, was working on one of the largest construction projects they have ever worked on.

White Contracting was installing several thousand feet of new 72" diameter gravity flow sewer pipe. The final step of the project was to connect the new pipe into the existing sewer system. A temporary sewer bypass system would be needed to divert the existing 54" sewer line and it needed to be able to handle 35 millions of gallons of sewage per day – and even more during peak flows. Space was also an issue for this project. The limited space available would require that the number of pumps used for the bypass to be at a minimum.

White Contracting, a long time customer of Thompson Pump's Mississippi Branch, asked Jim Templeton, sales representative, to review the application to see if they could use Thompson pumps for the bypass. White Contracting had relied on Thompson Pump to handle the other dewatering applications for this project, and used Thompson Pump on many other projects with successful results. In order to find the most competitive price and service, White Contracting also requested quotes from other pump suppliers to submit bids.

The quotes submitted by the other pump suppliers were not promising. In order for them to handle the requirements of the bypass, competition had quoted a large number of pumps. This would compromise the small space available for the project. The number of pumps proposed by the competition would also have significant cost in fuel and service. Templeton visited the jobsite and gathered all of the information necessary to submit the best bypass system.

Thompson Pump proposed using four 16" Compressor-Assisted Solids Handling High Pressure Pumps, each capable of a maximum 11,000 gallons per minute (gpm); and two 12" Compressor-Assisted Solids Handling High Pressure Pumps, each capable of a maximum 8,500-gpm. Thompson Pump also proposed using 18" high-density polyethylene (HDPE) pipe, which

Four 16" and two 12" Compressor-Assisted High Pressure Pumps used for a bypass operated extremely well on White Contracting's largest construction job.

Five HDPE pipe suction lines entering the manhole at the start of the bypass.

would be more than capable of handling the amount of sewage required. Each pump was fitted with 18" flanges to couple the HDPE pipe directly to the pump's suction ports. All four of the 16" Compressor-Assisted Solids Handling High Pressure Pumps and one of the 12" Compressor-Assisted Solids Handling High Pressure Pumps were used for the primary pumping. The remaining 12" Compressor-Assisted Solids Handling High Pressure Pumps was for back up purposes.

In order to better direct the five different discharge lines, Thompson Pump also proposed using a manifold with five inlets, and two outlets. The HDPE pipe from the outlet ports of the manifold would run approximately 750-feet away from the pumping area to the desired manhole that would accept the discharge. The manifold's inlet ports would each have a gate valve in order to isolate each pump – allowing pumps to be disengaged from the system at any time without upsetting the system.

A manifold was used to redirect the discharge from the pumps and reduce the system to two lines which fed into a manhole 750' away from the pumping site.

With this information, White Contracting only had one choice: White Contracting chose Thompson Pump to handle the temporary bypass on this project. Crews from Thompson Pump's Mississippi Branch immediately came onsite to begin fusing the HDPE pipe system together using White Contracting's fusing machine, and began positioning the pumps and manifold. The bypass system was positioned one manhole upstream of the tie-in site, where the 72" line was to be connected to the 54" line, and discharged into a manhole on a previously installed section of the new 72" line downstream of the tie in site.

The bypass system was installed and operating efficiently. But only days later, the Thompson Pump bypass system would be put to the ultimate test.

With the bypass installed and in operation, Hurricane Ivan was threatening the Gulf Cost. Residents evacuated the beach side and low-lying regions, and headed north to escape the hurricane. Hotels in Memphis were quickly booked to full capacity as the evacuees came into town. This caused millions of gallons of more sewage that would eventually enter the sewer system Thompson Pump was bypassing.

Thanks to a system design that allowed for additional capacity, the bypass was capable of handling the extra sewage and continued to operate efficiently as the hurricane made landfall.

"We did notice the flows increase but [the pumps] did not have any problems keeping up," reported Templeton. "We did not have any mechanical failures; we did not have any spillage of sewage; and never had a problem maintaining flows," said Templeton.

The fact that sewage didn't spill onto the jobsite is a serious issue in sewage bypass pumping. All of the pumps used on this bypass were equipped with Thompson Pump's exclusive ENVIROPRIME® Priming System. The ENVIROPRIME® Priming System has proven to be a valuable pumping feature because of it's ability to prevent blow-by. Blow-by occurs when pumping fluid enters the air-handling portion of the priming system and eventually leaks onto the ground. Thompson Pump engineers recognized that blow-by is a major issue on sewage bypasses and developed a modular, stand-alone priming system that prevents blow-by altogether.

The overall outcome of this bypass was very positive, which thoroughly pleased Clayton Webb, project manager for White Contracting. He said, "It's unusual – this is the biggest sewer bypass we have ever done, and it has also been the most trouble free sewer bypass we have done."