

CASE STUDY

CERTA-LOK® PVC PIPE OFFERS TWO-DAY AERIAL INSTALLATION FOR MUCH-NEEDED POTABLE WATER DELIVERY

The summer of 2022 brought record heat to Oklahoma City with temperatures reaching 110 degrees. The extreme heat along with drought conditions challenged the city to meet water demands. The conditions were compounded by an out-of-service 18-inch steel pipeline located on a bridge crossing, the steel pipe had become damaged during an extreme cold weather event in the area.

CHALLENGE

In February of 2021, an 18-inch steel water pipeline installed along a 600-foot aerial crossing over the North Canadian River suffered a number of cracks during a fierce snowstorm. The cracks put the water line out of service until repairs could be started that summer. Water delivery to the west side of town was still possible with the line out of operation, but it was less than ideal. Summer arrived and the repair process was underway. With the old steel pipe pressurized, the team identified the location of the leaks. The pipe was then de-pressurized to install the first clamp and re-pressurized to test the repair. Using this process, seven repair clamps were installed to the aerial line with the pipe continuing to leak, at this point it was decided no further restoration attempts would be made. The city moved forward with approving a project to replace the damaged line and Project WC-1022 was scheduled for the 2023 construction season. The new design outlined installation of the pipeline under the North Canadian River instead of replacing the line in the same aerial position, over the river, exposed to the elements. There was still a need to address the current water demand and the team reviewed an immediate and speedy solution for an emergency repair.



APPLICATION

To have the line back in service as soon as possible, the city engineer and contractor met to review different pipe solutions along with availability of inventoried materials for each solution. With a short turnaround time to make the repairs, the city decided on C900 restrained joint Certa-Lok® PVC pressure pipe in 40-foot lengths. The pipe options originally considered for the emergency repair were ductile iron and C900 PVC pressure pipe, but these products were quickly off the list due to the long lead times for both the ductile iron and the external restraints for the conventional PVC pipe. Although the cost of Certa-Lok was slightly more than ductile iron, the deciding factors were the availability of Certa-Lok along with the immediate need for the repair.

SOLUTION

The original plan for the replacement pipe was to strap the new PVC pipe to the existing 18-inch steel line already secured to the bridge. The new pipe would then be connected to the 18-inch steel pipe at either end of the pipe-bridge. An alternate option using the existing supports was also considered by the contractor. "The steel rollers supporting the existing steel pipe were in excellent shape," said Wade

Project Type:
Potable Water

Application:
Temporary Bypass

Owner:
City of Oklahoma City

Product Used:
18" Certa-Lok® RJ
(Restrained Joint)
PVC Pipe

Contractor:
Krapff Reynolds
Construction Company

Engineer:
City of Oklahoma City

Vakulick, project manager for Krapff Reynolds Construction Company, “and (rollers) could drastically simplify the removal and installation process.” Vakulick further explained, “By cutting the existing steel pipe into two 300-foot sections, we could pull the old pipe sections along the rollers and cut 20 feet off at a time allowing our excavator to load the old pipe directly on a truck for removal from site.” This cleared the rollers and allowed the team to load the new Certa-Lok pipe on the rollers, easily moving the pipe into place along the same path where the old pipe was positioned. The city liked the proposal, especially since it allowed the installation to be accomplished more quickly. When the new pipe was in position on the rollers, the previous support location of the steel pipe, new inverted U-straps were used to secure the PVC pipe. “Fusible PVC would have created an installation problem because there was no way to get the fusion machine onto the crossing superstructure and we didn’t know if the superstructure could bear the additional weight,” Vakulick added. “There was also limited laydown area and we did not want to block the hike and bike trail if at all possible. With these considerations, fusing long joints of PVC before loading onto the superstructure was off the table.”



The simplicity of Wade Vakulick’s plan resulted in the 600 feet of pipe being installed in less than two days. The crew started swinging the new pipe onto the bridge in the afternoon and finished the following morning. Once all the pipe was in place, the workers manually assembled the pipe-to-coupling joints. Finally, the nylon spline was inserted into the spline insertion holes completing the “spline lock” and the joint was fully restrained.

“This project is the first that I have used Certa-Lok restrained joint pipe on,” said Dustin Segraves, P.E. project manager for the City of Oklahoma City, “and seeing the ease that it was installed was very impressive. The city may not use this pipe regularly, but we are always open for new ideas and are always looking for creative solutions to meet the project needs and this was a great fit for this project.”

*AFTER – 18” CERTA-LOK® FINISHED INSTALLATION
SHOWN HERE PAINTED FOR UV PROTECTION*

ORIGINAL STEEL WATER PIPELINE

