

Agra installs new water system with help from KAN STEP

Agra, Kan. is located in western Phillips County just east of Phillipsburg on U.S. Highway 36. The town has taken on a significant project. The community is working to replace 92% of the city's water distribution system and all the meter pits. In 2004, the community of Corning in Nemaha County replaced their entire water system with a KAN STEP grant. So why doesn't Agra? Some of the aging ductile iron system had already been replaced with PVC pipe in recent years at considerable cost to the city and since the design was to use similar PVC pipe in the new system, that existing plastic line was to be incorporated into the new plans. This is why only 92% will be

replaced. But leaving 8% poses challenges greater than replacing all of the existing lines.

Mixing old and new

Agra's system improvements involve the installation of 13,420 feet of new main

pipeline. Installing a new water system on top of an existing system without disrupting services is a daunting task. To do so requires tying into the old system and working out from the city's elevated water storage tank. None of the old system can be disconnected until all the new pipeline is installed, flushed, tested and disinfected. Because



The Agra, Kan. project volunteers pose for the ground-breaking ceremony picture on May 23. Volunteers appreciated attendance by State Senator Janis Lee, Kensington, who is on the right side of the shovel at the right of the picture..

some of the existing system is not being replaced, the interconnections between the old and the new system pose logistical problems for volunteers doing the

kept in service until those customers are switched over to be supplied solely from the new pipeline. In one instance, that meant using a 3/4-inch "jumper

In Agra, the pipelines are segmented so that strategically placed valves can control sections. For testing, the individual sections are pressurized to proper test pressures and allowed to stand for two hours.

work in Agra. At a point of interconnection, several issues need to be addressed before cutting into new pipe. If there are customers on an existing line or a line adjacent to a new line, both old and new main lines need to be

line" from the old pipe to the new 4-inch PVC main so that the six users continued receiving water service. The result was a few low pressure showers in the morning, but the inconvenience lasted for only a day.



*Pete Koenig
KAN STEP/Mapping Tech*

Before hooking a customer up to the new line, a series of checks need to be performed. The new line must first be “pigged,” a process where debris such as gasket lube, grass and dirt is pushed out of the pipeline with a

was the first section installed. I guess we’ll chalk that one up to inexperience. Because of the sandy soil conditions in Agra, it is difficult to locate a leak in a newly excavated area. The soil allows for the water to follow the trench line.

before attempting to fix it. “We might also cut in another valve to split the section. It’s a seeper,” he adds.

Following pressure testing, the line is dosed with a chlorine mix that is way beyond what is



Volunteers Larry Hall and Wes Diercks install another length of pipe on the new line. The gasket lube that Larry has his left hand in helps the tight-fitting pipe slide together.



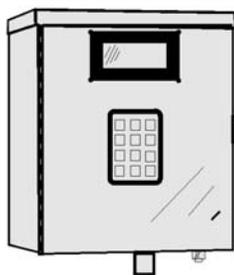
Agra Mayor Scott Bretton, left, and volunteer Melvin Shaffer “puddle the mud” in Main street. Flowable fill, a weak concrete mix, is used on many projects for fast set up and to eliminate settling problems in high traffic areas.

foam swab. This foam “pig” is pushed by water from the tie-in on the old system, so not only is the inside of the pipe cleaned, the pig forces out air. Once the line is loaded, KRWA’s responsibility is to conduct the pressure testing. In Agra, the pipelines are segmented so that strategically placed valves can control sections. For testing, the individual sections are pressurized to proper test pressures and allowed to stand for two hours. Sometimes, because of the late hour at which the volunteers end their day, a pressure test is left overnight, which allows the crew to really see if they’ve done a good job constructing that system segment.

Who says volunteers can’t install near perfect water systems? As of September 21, 2005, all sections of pipe have held adequate pressure with one exception. This section, known as the “lake loop”

City operator Francis Gordon says that he will probably, “just have to wait until it decides to show up,”

necessary to oxidize anything. This ensures sanitizing the line before it gets water.



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inch polyethylene service pipe that is being used in Agra is both tough and flexible. It allows for connection to some of the trickiest

New hydrants included

The project will see the replacement of 13 of Agra's 17 fire hydrants. Four of 17 are



setters/pits. This innovative design allows an operator to maintain the meter and take readings without the help of a flashlight. The 3/4-

meter locations. Couple this with the fact that it is copper tubing size and you have a very usable service line.

Left: Smile! Nobody's sense of humor gets in the way of production in Agra. A light touch like this sign on the back of the trencher helps everyone's mood on 100+ degree days.

Above: Marvin Hines rests for a minute after lifting one of the Mueller retractable meter pits into place. The blue poly service line behind Marvin will be connected from the new main to one side of the new setter and the other side will be spliced into the existing service line leading to the residence.

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already connected to PVC mainline; those will not be replaced. The concrete sidewalks and asphalt streets make for some difficult digging, but with the help of a hot saw, provided by KRWA, and a backhoe provided through the KAN STEP grant, the job will go much faster.

Because trench lines settle for many months and in cases, for years, the decision was made to use flowable fill to cover some sections of pipeline installed in streets within a couple of inches of the pavement. This self-leveling sand and cement mix, hardens quickly. It's then covered with road rock until all of the digging

through surface streets is done. Cold-patch asphalt will be brought in to fill the trench line and return the streets to their normal

are the fuel that keeps these little engines humming. Without services, people won't stay. No government agency is going to come in and make a town better. People should understand that they need to help themselves. Even with greatly appreciated funding from the Dept. of Commerce, Agra's waterlines would never have been put in the ground, tested, sanitized, and hooked up without the tireless efforts of the farmers, mayors, council members, and volunteers who

contractors, teachers, telephone technicians and especially those who prepare and donate food for the workers. They all help keep this many faceted project going.

It is a privilege for me to learn a little about the community, listen to volunteer's stories, meet families and work with volunteers to help accomplish the community goal of creating a new water distribution system that will be a great benefit for many generations to come.

The KRWA Web site at www.krwa.net has many more photos of the 19 KAN STEP projects where KRWA is presently assisting communities. It's a great program that is providing benefits to water systems and community facilities.



Cool and clear! After pressure testing and disinfection, the result is evident. Agra's new water system will soon be delivering water to another section of town.

condition when the pipeline is completed.

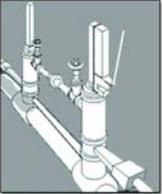
Valves are heavy

Agra's new water system includes 18, 4-inch valves and three, 6-inch valves. These new valves will allow operators to isolate sections of the new system with a level of control never experienced before. All of the old valves that have been dug up during the course of this project have been exactly that – dug up! Some of the risers for those valves were buried by as much as 2 feet! Add this 2 feet to the 3 ½ to 4 feet of valve riser and one can begin to get the picture of just how deep many of the old Agra lines were installed. There's an advantage in that most of the new system is shallower than the old, causing somewhat fewer crossings.

People are key

Agra's new system is being built to provide safe, efficient water service for decades to come. Residents of small communities

work jobs all day at places like Tamko Shingle and then volunteer on the water system in the evening or on weekends. The city's diversity of workers also includes clerks, librarians, building



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