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The solution they sought resulted in testing and chemically grouting to seal nearly two dozen laterals from a record 30 feet from the main line sewer in one operation – something both the project’s contractor and manufacturer of the rehab equipment had never tried or even heard of before.

Logiball Inc., which is headquartered in Ste-Foy, Quebec, Canada, was brought into the project in June 2004 when it was asked by Larry Neitzul, Director of Brown Deer’s Public Works Department, if it was possible to test and seal laterals 30 feet from the main line sewer. The request was a first for Logiball, which has been in business since the early 1980s.

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To make this project work, Logiball had to head to the drawing board to create a tool that would be able to enter and clean the laterals first in order to give access to the lateral packers that were used to apply the chemical grout – all from the main line, some 30 feet away from the lateral. What Logiball came up with was the Lateral Launcher, a motor on a set of skids that rotates a guiding arm in which there is a cleaning hose. The equipment was tested in the shop before the project went out to bid, Anctil said.

What followed was a never-before done lateral cleaning, testing, and sealing project.
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“That’s how we established which homes we wanted to work on,” Neitzul said. Groundwater monitoring wells were also placed along some of the lateral lines to check the groundwater flows afterward.

And everything went well with the pilot project – except for the weather in the months that followed. Whereas heavy rains brought the overflow problems to the public works department’s attention, a return to such weather was also needed to determine if the lateral liners had solved the problem.

“Basically after we got done with the project, we really didn’t have any significant rainfall for about a year,” Neitzul said. “So we didn’t have much data” to go on in determining if the lateral seals had solved the I/I problems.

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Cleaning the laterals before rehab was not at all unexpected, Healy said, but “The question was how we are going to do it?”

That’s where Logiball stepped in with its Lateral Launcher cleaning tool, which guides the half-inch hose and nozzle into the lateral connection from the main line sewer. Winched in tandem with the CCTV camera, the 0-90 vdc motor is used to rotate the guiding arm and nozzle into the lateral connection. When the pump from the vacuum truck is turned on, the back jets on the nozzle shoot the hose into the lateral for cleaning.

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The cleaning of the laterals took approximately two days. Now Healy and his crew could begin sealing the laterals using Logiball’s 38-foot lateral bladder with Avanti International’s AV-100 chemical grout. Testing and sealing laterals from this distance creates a series of unknowns. One that concerned Ancrtil was the speed at which the grout would be pumped before it would gel.

Before the laterals could be tested for leaks and then sealed, a way needed to be developed on how to ensure that the lateral packers could be injected and then removed without getting hung up. That meant the lines had to be televised for obstructions.

“We had to verify what the condition of the lateral was,” said Jeff Healy, Owner of Great Lakes TV & Seal. “We had to know if the pipe was in good condition. We had to know if there were roots or if there was some reason the grout packer wouldn’t seal in there and if it would inflate. Was there any broken pipe? We had to make sure all of those things were checked.”

Great Lakes TV & Seal utilized Aries CCTV equipment and its lateral evaluation TV system (LETS) camera to televise the laterals 45 feet from the main. The inspection revealed that the laterals, which were between 25 and 40 years old, had some visible leaks, which were the cause of the overflows. The condition of laterals otherwise showed that clearing was necessary before any rehab work could begin.

Cleaning the laterals before rehab was not at all unexpected, Healy said, but “The question was how are we going to do it?”

“You want the grouting material to go on the outside of the pipe to stop the leaks. In this case, we needed a gel time of anywhere from two to three minutes and we were pumping six gallons per minute,” he said. “We knew the void area between the inflated bladder and the inside of the pipe but we didn’t know how many gallons of grout it would take to actually seal this and fill up the voids on the outside of the pipe.”

Some laterals took 20 gallons while others took 75 gallons, he said. An Ariens truck with electric pumps was used to pump the grout.

Other questions that needed answered throughout the project included: How do you know when the lateral bladder has been fully inverted out of the mainline packer? Will the grout travel 30 feet from the packer ports before it gels? Will the lateral bladder get stuck on its way back? How long will it take to vacuum back the lateral bladder?

“Everything has gone well,” Neitzul said of the work. “The first couple of days, of course, were done slowly with only three or four laterals being done a day. As they went along, they started to get a good seven-plus laterals done a day with the system. Once they had the system down and really knew what they were doing and what to look and listen for, then things moved smoothly.”

As for using this system of addressing laterals in the future, Neitzul said the Village will wait until it can monitor the work. “If we see a definite improvement, we will then expand the program out to the remainder of the subdivisions, which is about 350 homes.”

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The Problem

The Village of Brown Deer is a suburb on the north side of Milwaukee and has a population of approximately 12,500, with the usual mix of commercial and residential dwellers. Starting in 1996, one of its residential subdivisions began experiencing high overflows of its sewers after heavy rains. Village officials tried to address the problem using chemical grout sealing at the main line and the manholes but they still saw a lot of water coming from the laterals, according to Neitzul.

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Chemically Reactive Gels

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To solve the I/I problems, Neitzul said. “So we didn’t find any significant rainfall for about a year,” Neitzul said. “We did find some leaking, which was expected. We also had the cleaning problems of grease, roots, and other debris, such as mineral deposits.”

Great Lakes TV & Seal’s Greg Healy stands beside the packer just brought out of the sewer with help from the bumper crane.

Phase II

The second phase of Brown Deer’s project is currently under way and is being done independently of Milwaukee Metropolitan Sewage District, which had provided the funding for the initial phase. The Village contracted with Great Lakes TV & Seal, Green Bay, Wisconsin, through the bidding process to re-televise the laterals that were done, as well as clean, test, and seal 22 additional laterals in the same subdivision.

Lateral bladder extended out ready for lubrication.

Great Lakes TV & Seal was no stranger to Brown Deer, having previously done manhole rehab and chemical grouting in past years. The contractor specializes in rehab work, such as cured-in-place pipe, chemical grouting, manhole rehab, lateral lining, as well as using robotic cutters to remove obstructions in pipelines.

The major difference in Phase II of the project was the stipulation that the entire scope of the work be done without infringing on the private property and rights of way (ROW) of the residents. The work would have to be done 30 feet from the main line sewer to the lateral.

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Conclusion

“Our system is 80%-90% successful,” Healy said. “The question was how are we going to do it?”

“At this point I would say that the project worked, but it is a little slow.”

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“Aries CCTV Camera System – Designed and Engineered to Meet the Needs of Our Customers.”

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AvantiGrout stops leaks. Permanently.

Avanti thumps stops leaks, permanently.

Great Lakes TV & Seal patented Logiball cleaning system. Definitely a good idea! Just wish the contractor was a little better organized. Wish we had a better system of getting up to the lateral packers before they were pumped off.
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