Chemical Grout Maintains Trenchless Popularity, Viability

The use of chemical grout, the original trenchless method, continues to grow, year after year. Both awareness and sales are up significantly over five years ago, industry statistics show.

There are two main reasons for this growth: more people are using chemical grouting than ever before, and chemical grout is being used in more places than ever before.

Since its introduction almost 45 years ago, chemical grout has been used to seal sewer systems, dams, tunnels, buildings and in many other applications all over the world. It is even used as a containment method for hazardous wastes. For many municipalities, it is the first line of defense against groundwater infiltration into structurally sound sewer pipes and structures.

Pipe liners have been used extensively to stop groundwater infiltration, but studies have shown that full-length lining of a mainline sewer from manhole to manhole will seldom reduce infiltration by more than 50 percent if the lined section has lateral service connections which are not sealed. As a result of this important finding, equipment manufacturers such as American Logiball, Aries, and Cues have developed special grouting systems to seal those connections, as well as long sections of service lines, with chemical grout.

Rick Harris, sewer maintenance supervisor for the Borough of Downingtown, PA, has over 20 years of experience with chemical grout. The first half of those years was spent as a grout contractor while the last half has been spent in his current job. "Chemical grout is definitely the most cost-effective way to stop groundwater infiltration into a sewer system," he said.

Economic benefits

"Shortly after I was hired, I checked a pipeline which had been lined with a CIPP process," he continued. "It was a 5,000-foot section of 10-inch pipe which had been lined at a cost of about $250,000. We discovered that groundwater was just pouring in at the lateral connections. We used a Logiball lateral packer and sealed the connection and the first 6 feet of every lateral line. That reduced infiltration from 62,000 gpd to 2,000 gpd. We can see the other 2k leak, but it's a little out of reach with the equipment we have, and it's a broken pipe on private property, anyway."

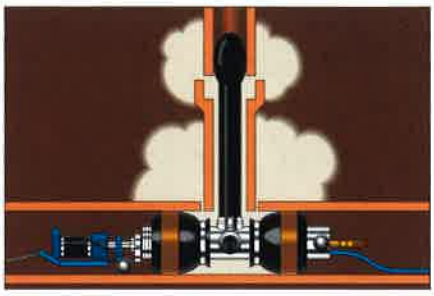
Harris explained that Downingtown is actually making money with their grouting program. By 1995, infiltration had been reduced enough to allow Downingtown to sell 300,000 gallons of their treatment plant allotment to a neighboring community for $2.4 million. The borough has recently agreed to sell 120,000 more gallons of their allotment for another $2.4 million. The per-gallon price has increased from $8 to $20 in just four years. "In our case, it definitely pays to grout," he said.

While many professionals like Harris are using more chemical grout, others are just beginning to use it. Cal Newton, operations supervisor, Battleground, WA, was recently introduced to the technology. "We have a bad I&I problem here, and we've been looking for ways to solve it without digging up the streets," he explained. "After I attended several seminars and demos on trenchless technologies, I decided that we should try chemical grout."

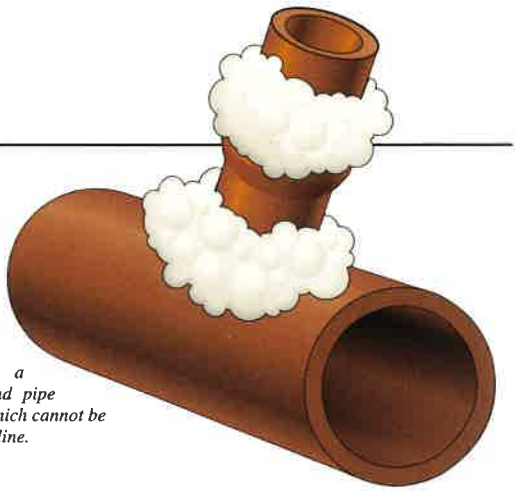
Newton explained that he and Kelly O'Dell, vice president, Gelco Grouting Services, Salem, OR, selected an area with severe I&I problems as a test. Chemical grout was used to stop leaks in manholes, mainline joints and about 100 lateral connections. Follow-up flow monitoring

Chemical grout application requires high-tech equipment and highly trained professionals.

Reprinted from Rehabilitation Technology July 1999



Chemical grout can stop leaks at service connections and in service laterals quickly and economically.



Chemical grout forms a waterproof collar around pipe joints and connections which cannot be forced back into the pipeline.

revealed that 90 percent of the basin's 100,000 gpd infiltration had been stopped. "I didn't believe the numbers when I saw them, so we checked again," Newton said.

"That was three years ago, and we haven't sprung any leaks in that area yet," Newton explained. "We'll continue to grout while we wait to see how long it will last. It will be awhile before I can comment on the longevity of the product, but I can tell you that so far I've been amazed and pleased with the results," he said.

Permanent repair

Other than Newton, every person who was interviewed for this story said chemical grout is a permanent repair when it is installed properly. As Harris said, "I don't know where the idea that chemical grout is just a Band-Aid came from because there are millions of joints sealed with grout that are still dry after more than 20 years. Any time you can buy a 20-year Band-Aid for the price of chemical grout, you need to go for it."

O'Dell explained that his company has been applying chemical grout since 1967, and that the future of the industry looks brighter than ever. "We offer a wide variety of pipeline rehabilitation technologies because none is right for every situation, but when you need to stop leaks in a structurally sound pipe or structure, chemical grout can't be beat," he said.

O'Dell explained that a lot of people who could benefit from chemical grout do not try it because they have the idea that it is not a long-term solution to their problem. "Some engineers think it's some kind of jelly that goes away after a few years," he said. "But, nothing could be further from the truth. I've seen grout that was dug up after being in the ground 20 or 25 years. It was still as good as the day it was installed," he said.

Chemical grout is often misunderstood. Perhaps it is because it is equated with cement grout and other gasketing materials used simply fill cracks and joints to make them watertight. Chemical grouts used in sewer lines usually have a viscosity similar to water when they are applied. This allows the grout to pass through cracks and leaking pipe joints, saturating the soil surrounding the pipe. Very soon after the chemical grout is injected into the soil, usually within a minute or less, the grout-saturated soil cures into a waterproof mass outside the pipe. This waterproof grout-soil matrix actually adheres to the pipe and cannot be forced back into the pipe or structure.

Expanding market

Don Layton, project development vice president, Altair Environmental Group, Inc., Longwood, FL, pointed out that chemical grout has a long history of use in Florida. "Chemical grout has been an important part of our I&I abatement programs since it was first introduced," he said.

"Chemical grout is often used alone to stop leaks, but it is also used to stop leaks before and after liners are installed," he continued. "If you don't stop leaks before liners are installed, you can get serious resin washout. After a liner is installed it is not unusual for groundwater to migrate to the lateral connections. As a result, liner contracts often specify that lateral connections must be sealed after they are reinstated," he said.

While lateral connections have expanded the market for chemical grout, so have storm sewers. Only a few years ago, leaks into storm sewers were not considered to be a problem, but that is rapidly changing. Engineers and sewer system owners are becoming aware that any infiltration into a sewer system washes away sidefill support and leads to subsidence, road damage, and even collapse. Many new installations specify rubber connectors to prevent future infiltration, but chemical grout is the best, most cost-effective way to stop leaks in existing systems.

Dick Schantz, PE, vice president, Aries Industries Inc., Sussex, WI, indicated sales of grout-related equipment has been growing at a rate of about 25 percent over the past four years. He said every test-and-seal rig they have sold in the last two years has been equipped to seal laterals. "Grouters realize lateral connections are a source of major infiltration, so they are gearing up to seal them," he said.

High tech

The application of chemical grout is an extremely high-tech process with a high startup cost. A typical test-and-seal rig costs around $150,000, and is composed of a wide array of sophisticated subsystems. As a result, grout applicators have to be dedicated professionals to enter the industry and survive there.

Another benefit of the newer grout equipment is that it is a lot easier to use and more efficient. The camera, control and lateral packer systems in common use today could only be dreamed of just a few years ago. Modern, high-resolution, pan-and-tilt cameras and monitors allow grout applicators to see inside mainlines and laterals better than ever before. Highly sophisticated systems allow remote-controlled equipment to be precisely positioned for optimal effect and minimal waste. Grout chemicals have been vastly improved.

David Magill, president, Avanti International, Webster, TX, said that his grout business has more customers than ever before, and his customers are using more grout than ever before. "Since its introduction in 1956, chemical grout has always been the most widely used method to stop infiltration of groundwater into sewer systems and other buried structures," he said.

"A lot of manufacturers of rehabilitation processes brag about how much product they have in the ground, but none can match chemical grout," Magill continued. "I was amused a while back when I noticed that microtunneling claimed they had installed over 300,000 feet of pipe in the past 10 years. When you consider there are about 1,000 grout rigs in the USA, and each one is capable of sealing between 300 and 400 feet of pipe per day, you realize grout matches microtunneling's 10-year record every day. The oldest CIPP company in America claims to have installed over 7,000 miles of pipeline. The U.S. chemical grout industry can match that record every 93 days," Magill said.

Whatever the exact numbers may be, it seems clear that chemical grout is the most widely used trenchless method today. It certainly is firmly established as the first line of defense against infiltration while the industry continues to grow.