



Trenchless Lateral Rehabilitation with **Chemical Grouting:**

Doing it Well, Doing it Right!

By Marc Ancill

Chemical grouting of sewers has been used to stop infiltration and exfiltration in collection systems for more than 50 years. As one of the first trenchless and few available technologies of the time, it was often considered as a “fix all” approach and thereby misunderstood by owners and specifiers.

Chemical grouting will not provide you with a new pipe but it will — in structurally sound pipe — stop infiltration of groundwater and fines into the system and exfiltration of sewage. Chemical grouting of lateral connections from the mainline made its debut in the early 1990s and has been growing in use ever since as the awareness of laterals contributing in great portions to the clear flow of water is being observed from this portion of the system.

Often misunderstood, chemical grouting is not used to fill the joint, but actually uses the defects of the pipe as a pathway for the grout to be pumped beyond this point and out into the surrounding soil or bedding forming a cohesive watertight collar around the structure. This is still misunderstood today as some people believe that the internal grout ring is the seal. This internal grout ring is actually residual material from the “grout mixing chamber.” The external grout ring is the permanent seal.

Work is being done all across North America where lateral connection grouting is an integral part of grouting and lining projects. In many cases the bid documents call for “Lateral Grouting of the Connections” without referring to any or brief specifications, grouting distances, testing or grouting pressures, approved materials, mixing ratios or volumes, gel times vs. pumping rates vs. voids etc. This leaves little room for the contractors to understand what is requested of them and what the system owners are obtaining in return.

A Successful Chemical Grout Project

In order to increase the chances of obtaining a successful project the following points should be considered:

- Have good specifications and defined objectives (see ASTM & NASSCO).
- Have a knowledgeable operator and inspector
- Preparation work (well documented CCTV inspection reports) cleaning, root and grease removal, etc.
- Grout mix must take into consideration that the first few gallons of grout may be diluted by active infiltration.
- Grout gel times must be appropriate (depending on the volume of the void between the packer and the

pipe vs. the pumping rate) in order to exit the pipe defects. Premature gelling of the grout may plug up crevices and prevent the grout from exiting the pipe defects.

- Pump until refusal (refusal can be defined as a sudden spike in the void pressure under continuous pumping with the above conditions respected). Always monitor the void pressures (testing and grouting).
- Volumes of grout pumped should be paid as a separate item as no one can predict the actual amount of grout necessary to permanently seal the defects (the specifications should allow a certain volume of grout to be included in the bid tab and any supplemental volumes be paid at a predetermined rate). This serves as an incentive to pump enough grout to obtain a permanent seal without penalizing the contractor.
- A post-grouting air test and or visual confirmation of the sealed leak should be an integral part of the work being performed.
- Test and seal log must be handed in and be part of the job report.

Over the years it has become standard practice in many cities across North America to grout the lateral connections after lateral reinstatement (post-sewer relining). Some cities have adopted an even more proactive approach and request not only that the lateral connections be grouted but also the first 6 ft of the lateral.

Some grouting projects have pushed the envelope even further to seal laterals as far as 20 and 30 ft from the connection.

These projects were well defined in their approach and have established bench marks for future projects.

No other rehab process is as versatile as chemical grouting, as it is not dependent upon mechanical bonds or pipe shapes, all it needs is a defect so that the grout may exit the pipe and seal it from the outside of the structure.

As the technology is beginning to be better understood by system owners and specifiers, more defined projects are hitting the streets. Recent ASTM standards are being used for more test-and-seal projects around the country and are gradually gaining acceptance within the engineering community.

A few years back, a group of grouting equipment manufacturers and grout providers saw the need to educate and train users. They decided to get together to form the "Grout Boot Camp" to educate and train operators, inspectors and municipal users on the different techniques and equipment to do it well and do it right and understanding the components of the system enabling them to troubleshoot and increase productivity. Attendees — more than 150 — have either been long-time users, rookies, municipal users, inspectors, business owners wanting to learn more about this proven technology and the equipment used in delivering the grouting materials.

Not one technology solves all the problems that can be encountered in the underground. There are different tools for different situations and when the tools are better understood, they can be used more effectively for a successful project.

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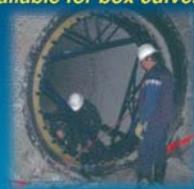
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