T his year, the municipal grouting industry celebrates 50 years as the original trenchless technology. It is appropriate to honor our past, but — more importantly — prepare for the future and the renewed focus on our failing infrastructure, in particular, the need for municipalities to control inflow and infiltration (I/I) into the collection system. According to the EPA, I/I increases flow to the wastewater treatment plant by as much as 50 percent, increases operating costs to the rate-payer, and reduces the lifecycle of underground assets.

The Past

The initial use of chemical grouts in the United States dates back to the 1950s when acrylamide grout was used primarily for soil stabilization. In the 1960s, after further developments by Reuben H. Karol of Rutgers University and American Cyanamid, municipalities began using the same grout to stop water leaks in sewer systems. Injecting a low viscosity, two-component solution grout through joints and defects created a positive, soil-sealing matrix to form an impermeable barrier for water intrusion and stabilize the soil outside of the pipe. The first decade of grouting was largely exploratory, with early pioneers working to improve procedures and conveyance technologies. Projects were mostly contractor-driven and the next two decades saw consistent advancements in CCTV (closed circuit televising), pumping technologies, remote packers, and grout chemistry. There were no national standards for grouting until the formation of NASSCO in 1976.

The trenchless era was launched with a solution to control mainline sewer infiltration. In the 1970s and 1980s, urethane, acrylate and acrylic grouts were developed, and their uses led to stopping infiltration throughout more of the collection system, including manholes and lateral connections. Important technology alternatives were also introduced. In the early 1980s, the CIPP industry gained traction as a structural repair option, minimizing the need for traditional excavation and replacement of failed pipelines. Grouting, on the other hand, is non-structural and engineered to stop infiltration. From the beginning, these two technologies have been complementary alternatives.

In the last decade, the grouting industry has evolved responsibly by including standard practices from ASTM and suggested operating specifications from NASSCO/ICGA. Specific ASTM standards for mainline pipes, laterals, and manhole structures have recently been renewed. The first Suggested Standard Specification from NASSCO/ICGA for injection grouting was created in April 2012, from a collaboration of industry leaders including municipalities, engineers, technology vendors, and contractors. After further refinements, the second edition was released in January 2014. These standards have aligned engineers, contractors, collection system owners with well-defined procedures, yielding predictable outcomes.

The Present

If there is a single word to define the current state of the municipal grouting industry, QUALITY would get the vote. The grouting community is very different now than it was in the past. It remains a multi-vendor solution, but today, industry leaders are united in education, science advancement, and certification programs to deliver long-term value. NASSCO and ICGA are now moving forward with an Inspector Training Certification Program (ITCP) specifically for Injection Grouting. Value-engineering can now occur for site-specific conditions, knowing the specification will be executed with high confidence. Contractors continue to invest in grout schools so operators are trained on why procedures exist and how they should be followed precisely. Manufacturers of CCTV/Grout trucks offer improved technologies for visual confirmation of the testing, sealing, and validation process. Injection grouting has become more of a science executed by trained technicians.

Back to the Future

Infiltration increases treatment costs and accelerates deterioration of our infrastructure. Municipalities are taking a proactive role to defeat this force to stay ahead of costly structural repairs to their collection systems. Injection grouting is part proactive maintenance practice and part engineered construction project. Complementary to CIPP lining and other trenchless alternatives, injection grouting remains the only technology specified and designed to stop infiltration at all four points of entry — mainlines, laterals, lateral connections and manholes. Past, present and future, the resurgence of the original trenchless technology is a direct result of the municipal requirement to control infiltration long-term, while making municipal dollars go further.

The Infiltration Control Grouting Association (ICGA) is a division of NASSCO.