

Freehold Company Cites Better Plant Treatment And Reduced Maintenance Costs

The contractor's specially-designed camera detected and pinpointed the exact locations of infiltration in piping as small as 6 inches in diameter.

Video Pipe Grouting Eliminates Sewer Problems

Video Pipe Grouting, Inc., Newfield, New Jersey, recently did an infiltration/inflow study and infiltration reduction program for Freehold Sewer Company, Freehold, N.J.

Over a period of three months, Video's crews did all the work necessary to pinpoint the problem sources in a sewer system totalling 131,000 lineal feet, establish normal and excess flow rates, repair manholes, visually inspect the problem lines via closed-circuit television, and seal the leaks.

The contractor's work has been responsible for cutting rainy weather infiltration in half, per daily recordings made at the plant's flowmeter.

With the decreased flow, treatment efficiency at the original plant has been raised from 60 to 75 percent to a range of 80 to 95 percent.

Reduced pumping needs have substantially decreased electric power costs.

Cleanout and other maintenance have been reduced as well.

A new 0.6 mgd secondary treatment plant will now have more usable capacity due to the reductions in overall flow.

So effective was Video's program

and the owner's new plant that the New Jersey State Department of Environmental Protection has allowed both residential and commercial building, suspended for eight years throughout Freehold's sewer service area, to be resumed.

Since its inception in 1963, Freehold Sewer Company has owned and operated the sewage collection and treatment system serving the Stonehurst Subdivision in Freehold. Their activated-sludge plant provides primary-secondary treatment for a rated flow of 0.8 mgd from a total of 1,535 homes, one hospital, five schools and 23 commercial establishments located over a 5-square-mile area. Over 24 miles of pipe carry the wastewater. All are made of asbestos-concrete, in the following sizes:

8-inch—	103,459 feet
10-inch—	7,014 feet
12-inch—	12,426 feet
14-inch—	2,678 feet
18-inch—	1,720 feet

There are also 3,700 lineal feet of 6-inch force main in the system and 403 manholes, each 48 inches in diameter.

In recent years, infiltration and in-

flow had become obvious. Figures provided by the Freehold Township Water Department showed total water usage for the subdivision of 575,000 gallons per day.

By way of comparison, the plant treated an average of 1,575,000 gallons per day throughout one entire month. Some days, levels exceeded 1,750,000 gallons per day. Exactly what the flow was then, no one knows. Approximately 1,750,000 gallons per day was as high as the plant flowmeter could register.

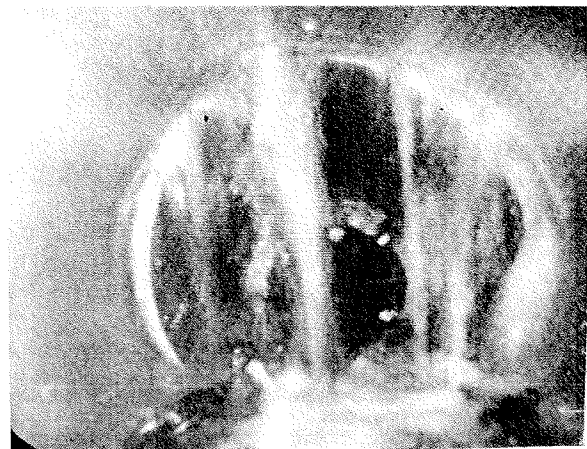
Before authorizing plant expansion or additional building, the State required the company to provide an infiltration/inflow study plus an analysis of cost-effective solutions to whatever problems were discovered.

Sewer company officials were already familiar with I/I specialists Video Pipe Grouting, Inc. Trade publication writeups had frequently described projects in which the firm had helped other companies and communities. Freehold called the contractor and asked for a proposal.

"Their people came in, inspected the site, and showed us they had the equipment, the expertise and the time



Dropped through manholes into successive sewer line sections, rehabilitation was done by a grout injector packer, left, guided by a closed-circuit TV inspection camera, right.



A typical leaking pipeline joint, as photographed from the TV screen.

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to do what we needed," recalls John Germann, plant manager for Freehold Sewer Company and a veteran of 20 years at four sewage treatment plants.

Contract awarded, Video started work by assigning two technicians to locate the sources of inflow and infiltration and estimate the amount of flow from each. Study areas were selected on the advice of Plant Manager Germann, whose ten years of sewer-line experience in the Freehold area made him well aware of the potential problem spots.

To attain accurate readings, the contractor team first plugged each upstream manhole with a blowup bag. A measuring device was then placed at a downstream manhole. The resulting readings more clearly defined areas and extent of infiltration.

Next, Video's two specialists cleaned the selected piping.

In areas where buildups were heavy, material, loosened by high-pressure jetting, was removed by vacuuming from the upper side of a temporary sandbag dam placed at the downstream manhole.

In one location which serves a number of restaurants, 2,000 feet of pipeline were cleaned with high-pressure jetting and spray nozzles to remove a heavy buildup of grease and other debris.

Even with complications of this kind, all cleanout was handled in two days.

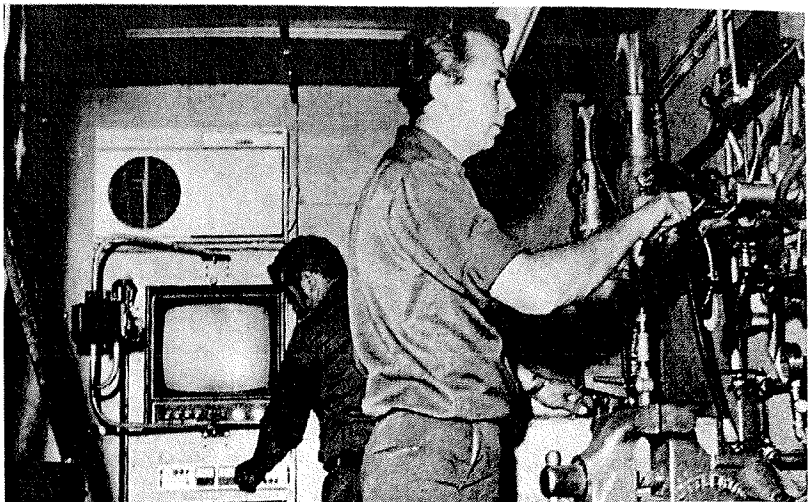
Next step in the program was closed-circuit television inspection and grouting, particularly of four mains which followed and crossed under natural streambeds.

For each section, the two-man crew threaded a 1/4-inch cable from the upstream manhole 500 feet through the pipe to a remote-control winch at the first downstream manhole. To the cable they attached the TV camera and lowered it and a grout injection packer into the interceptor.

Once in the line, the equipment was positioned by the cable. Actions were controlled by one of the technicians working inside a TV-grouting van. As TV pinpointed each joint, the grouter was cabled to the spot and positioned so its rubbers straddled the connection. Again by remote control, the diaphragms were air-inflated. Only about 10 percent of all joints met test-loss specifications. The rest failed and required treatment.

Seal each leaking joint

Grouting was accomplished with the packer still in place, pump pressure forcing the sealing materials into the annular space between the inflated packer diaphragms and out through the openings in the joint into the surrounding soil.



Within the truck a technician (left) controlled and monitored both underground camera and grouting machinery while a second technician (right) remotely selected, formulated and placed the chemical/catalyst grout sealant itself.

The process was continued for as long as the soil continued to accept the material. Most joints took 2 to 3 gallons. Some places required more depending upon void conditions outside the pipe.

After each grouting, air testing was again applied. Continuous pressure indicated the joint was now successfully sealed and the camera and packers were cabled to the next joint. In the few cases where pressures dropped, grouting was repeated and the test run again until specified air pressures were maintained.

Besides line work, contractor personnel similarly repaired damage to the manholes in the system. Most manholes took 50 to 70 gallons each; a few as much as 250 gallons due to multiple leaks.

Flows substantially reduced

Result of the work done to date has been a very substantial reduction in flows.

As soon as grouting started, daily flow-meter readings show average

monthly flows to be much lower. And they continued to fall as more and more grouting has been completed.

"We're getting better treatment at our plant," says John Germann, plant manager. "BOD removal rates have improved 30 percent.

"Because less pumping is required, electrical costs have been reduced 30 percent.

"Maintenance costs have been cut. Pumps, for instance, previously required cleaning once a day. Now we rarely need to clean them more than every seven to ten days.

Plant addition okayed

"But the most important benefit, we feel, is that the work has aided us in obtaining state approval for our plant expansion," says Germann.

"The increased capacity will permit home and commercial building to proceed for the first time in eight years.

"Plant expansion will also increase the profit potential for our company."

Video Pipe Grouting's self-contained television/laboratory/grouting control truck brought both inspection and repair functions direct to the work site.

