

SPHERE OF OPERATIONS

Gamajet spray systems are designed to enable efficient manhole and lift station cleaning without the risks of confined-space entry

By Gil Longwell

Manholes, pump stations, dry wells and similar vertically-oriented spaces in sewage systems require periodic cleaning to remove debris, solidified grease, and other deleterious materials. Much like artery-clogging plaque, if these materials build up, they can restrict the flow of wastewater. Keeping these facilities clean is essential — and the work can be both unpleasant and hazardous.

Traditionally, these periodic cleaning tasks were done by workers climbing

down or being lowered into the structure. Cleaning one manhole could consume several hours and require two or more people. Human entry into these OSHA-regulated confined spaces is risky, costly, and labor intensive.

Waterjet cleaning devices from Gamajet Cleaning Systems are designed to enable efficient cleaning of structures without confined-space entry. During an operating cycle, the devices subject the entire interior face of the structure to high-pressure spray cleaning action.

The Plainfield Area Regional Sewerage Authority, about 20 miles west of New York City, hosted a demonstration of the Gamajet Model VIII machine.

The agency has used the cleaning machine for two years to maintain manholes along its 135,000 feet of regional interceptor sewer lines and to clean 10 pump stations. The demonstration was given by Jack Martens, operations manager, and Bob Snyder, assistant operations manager, along with a work crew. Gamajet sales manager John Homisak and sales representative Bill Sterling were present. The agency

generally assigns a two-person crew to clean with the Gamajet system.

Walk-around

The Gamajet machine is a water-driven rotating spray nozzle system attached to a hose that supplies clean, high-pressure water. As the water enters the machine, it turns a small turbine blade. This turns a planetary gear mechanism that both rotates the machine on its vertical axis and drives two spray arms that project perpendicularly from the body of the machine. These arms also rotate, but on a horizontal axis.

At the end of each spray arm is a spray nozzle. Each machine has two nozzles, designed to confine and con-

centrate the water stream. The device remains in one stable position throughout the cleaning cycle; there is no whipping of the hose.

The demonstration was supported by a Vac-Con combination sewer cleaning truck, equipped with an 80-gpm pump that delivered 2,500 psi. During the demonstration, about 1,200 gallons of water was used to clean the pump station and 600 gallons to clean a manhole.

The Gamajet system must be supported by a water source delivering 20 to 1,000 psi at 25 to 100 gpm. While the pressure does the work of rotating the various components, the sheer volume of water directed in a spray does the

The Gamajet cleaning system is designed to clean manholes and other structures thoroughly, efficiently and without confined-space entry.



TECHNOLOGY TEST DRIVE

EQUIPMENT:

Gamajet Model VIII manhole/basin cleaner

MANUFACTURER:

Gamajet Cleaning Systems Inc., Devault, Pa. 877/426-2538 www.gamajet.com

LOCATION OF DEMO:

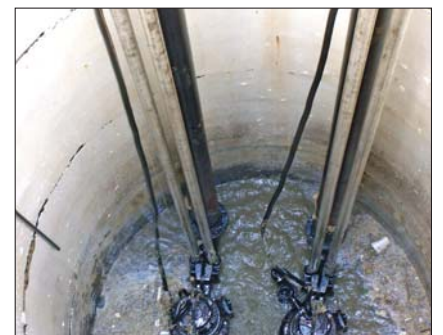
Plainfield Area Regional Sewerage Authority, Watchung, N.J.

DEMONSTRATED BY:

Jack Martens and Bob Snyder, Plainfield Area Regional Sewerage Authority

LIST PRICE:

\$4,300 as demonstrated (excluding vehicle)



Left, a manhole before cleaning. Center, a manhole after cleaning with the Gamajet system. Right, a pump station after cleaning.



Above, the Gamajet system operates inside a wet well. Right, the hose connected to the cleaning tool passes beneath the wet well cover.



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Rob Villee

Plainfield Area Regional Sewerage Authority

bulk of the cleaning. “This is referred to as rotary impingement cleaning,” says John Homisak.

Nozzles in a variety of sizes enable proper matching of the device to the facilities being cleaned and the pressure and volume of the water source. Once manufactured, the unit is ready for use; the end user typically does not



Technicians show two cleaning unit configurations.

change the nozzles.

The effective reach of the spray depends on the water pressure, flow and the nozzle configuration. In one complete cycle (one rotation of the machine), the spray pattern is spherical, and every surface within the sphere is cleaned. A cycle takes 10 to 12 minutes, during which the machine makes one revolution on its vertical axis. Some deep facilities require two cycles to reach all interior surfaces.

The Model VIII demonstrated was rated at 600 psi/80 gpm and was equipped with two 1/4-inch nozzles.

Operation

The first demonstration site was a 200,000 gpd pump station about 25 feet deep with an internal diameter of 8 feet. Two rail-mounted pumps and their control floats are the primary components inside. After lifting the control floats out of the way, the crew lowered the hose bearing the cleaning unit about halfway into the chamber. The access doors were closed to minimize escaping spray, and the procedure began.

Because of the depth of the installation, the unit ran through one cycle, then was repositioned in the cham-

ber for a second cycle. After the second cycle, the pump was shut down and the doors were opened to reveal a clean interior.

When the chamber was cleaned, all that remained was to reinsert the float controls, reel in the hose, secure the hose reel in its traveling position, remove and stow the cleaning machine, close the cover doors, lock the perimeter fence, and drive to the next cleaning site. From arrival to departure the process took less than 40 minutes.

The second site was a manhole in a residential area. The cleaning process was the same as for a pump station. The in-street manhole location, however, required traffic control. The vehicle was parked to protect the operators from one lane of traffic, while safety cones provided additional visibility to passing motorists.

The manhole cover was removed, the Gamajet unit was lowered to about the vertical midpoint of the structure, and the lid was slid back into place to hold the hose in position. While the machine ran through its cycle, the operator monitored the controls and assisted with traffic control. At the end of the cycle, the cover was rolled back revealing a clean manhole. Including traffic control, the process took about 25 minutes.

Observer's comments

The Gamajet machine transforms a hazardous, time-consuming job into an easily repeatable, low-risk task. It improves cleaning efficiency and allows a two-person crew to do in one day what previously required a week of work. The cleaning machine was easily lifted and held by one technician.

The machine appears applicable to any confined space oriented on a vertical axis. The company also offers models for portable restrooms, anaerobic digesters, meter pits, and vessels in which liquids are stored.

The unit's basic 12-month warranty can be extended indefinitely through a flat-rate inspection fee. When returned for inspection, the unit is completely disassembled, parts are replaced as necessary (at additional charge) and the machine is reassembled, tested, packaged and shipped

back the same day. Each inspection adds 12 months to the warranty.

Manufacturer/demonstrator comments

Sales manager Homisak observes that the machine's performance “is always uniform; it delivers the same cleaning result job after job.”

Rob Villee, executive director of the Plainfield Area Regional Sewerage Authority, observes, “From an administrative standpoint, the system has delivered a huge increase in efficiency and productivity, allowing us to reassign staff and get more done with the same number of employees.”

Homisak noted that the cleaning system is available with a clutch drive, which eliminates the risk of major internal component destruction, should a nozzle be suddenly stopped. “Tight tolerances and attention to detail in design and manufacturing make the machine a reliable, day-in, day-out worker,” he says. ♦

COLE Publishing invites manufacturers of innovative equipment to provide demonstrations of their technologies for reporting in this monthly feature of *Municipal Sewer & Water*. To arrange a demonstration, e-mail editor@mswmag.com or call 800/257-7222.

The Gamajet cleaning device is attached to high-pressure sewer hose.



MORE INFO:

80 Gamajet Cleaning Systems Inc.
877/426-2538
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