

## **Annual Sewer Maintenance Projects Cured In Place Pipe**

Each year sections of sewer line are relined by a process of placing a new pipe within the existing pipe. The new "pipe-within-a-pipe" is a flexible, resin absorbent, fabric tube, coated on the outside with an elastomeric material which is custom engineered and manufactured to fit the cross-section and impregnated with a liquid thermosetting resin. This resin material is installed in the existing pipe through a manhole or other access point via an inversion standpipe and inversion elbow (Stage 1). Water from a nearby hydrant is used to fill the inversion standpipe. The force of the water turns the tube inside out and into the pipe being reconstructed. Constant water pressure keeps the tube pressed tightly against the walls of the old pipe (Stage 2). This technique allows the material to negotiate bends, accommodate changes in pipe alignment and size, and span missing pipe segments.

After the tube reaches the termination point, the water in the line is circulated through a heat exchanger where it is heated and returned to the tube. The hot water cures the thermosetting resin and the pliable new pipe hardens to a structurally sound inner pipe which is as strong as or stronger than the pipe it replaces (Stage 3). Service connections are reinstated internally with a remote control cutting device or by man-entry techniques (Stage 4). No excavation was involved in the process and the newly installed pipe is ready for immediate use.

This project is done by an outside contractor who is selected through a bidding process. Lining these sections helps to prevent breaks, eliminates groundwater infiltration and leakage from the main, saves reconstruction costs, prolongs the life of the line and results in a savings in sewage treatment costs. The city council authorizes funds annually for lining operations.

Approximately 50 miles of sewer line, or one-third of the lines in the city, are cleaned each year with a high-velocity sewer-cleaning machine called a jetter. The machine utilizes high pressure water--1500 gallons of water and 1500 pounds of pressure--to clean pipes of grit and grease. The debris is jetted to a downstream manhole where it is vacuumed into the vehicle's containment body for disposal.