

Choices for Sewer Rehabilitation

By Jim Heyen, Wastewater Technician

Over 50% of my job consists of videoing sewer lines because of problems or for preventive maintenance. Many communities are finding problems in sewer lines caused by use, abuse and nature.

Most sewer lines in Nebraska were constructed in the 1930's and after. The majority of sewer lines were constructed of clay tile, but some systems throughout the state have concrete or ductile mains.

I am always looking for new and innovative ways to repair or rehab damaged lines. I recently read an article in the March 2004 edition of the *Water Environment Federation*, which explains some options and new technologies to be considered, they are:

Cut-and-Cover

The traditional sewer replacement method, cut and cover involves replacing portions of old pipes with new pipes. It is one of the only ways to correct sags and humps due to different soil settlement (compaction of soil). However, cut and cover replacement is disruptive at the surface. Utilities crossing and the vicinity of the trench lines need to be carefully protected and traffic needs to be controlled around construction.

Pipe Bursting

Pipe Bursting has made strides in sewer replacement over the last several years, allowing pipe replacement without having to remove existing pipes. This method involves inserting a cone-shaped bursting tool into the existing pipe, pulling it through the host pipe using a pull cable, breaking the pipe as the bursting tool moves forward. Afterward, a length of replacement pipe is assembled above ground to the appropriate length, attached to the bursting tool, and then piled into a newly fractured host pipe, thereby replacing it.

Generally, pipe bursting works best with clay, cast-iron, or unreinforced concrete sewers, because the bursting tool can easily fracture these materials.

Pipe Bursting is not always appropriate even if the soil is appropriate for the procedure. It can heave the soil, lifting the surface, which can damage utilities. Depth is another consideration.

Pipe Bursting may be ideal for many situations, however, don't expect pipe bursting to perform miracles. Such things as sags will still exist after the procedure.

Pipe Lining

Pipe lining is another method in which the existing pipe does not have to be removed. This procedure involves inserting a liner into the existing pipe, which renews the interior integrity of the surface and increase the structural capacity of the old pipeline. The most common types of lining are:

1. Thermoplastic (fold and form) liners
2. Thermoset (cure in place) liners
3. Slip liners

Thermoplastic (fold and form) liners

Thermoplastic (PVC) liners have been deformed to fit easily within the existing pipe. The liner is then heated with steam to soften it and then it is inserted into the existing line through a manhole. Once the liner is in place, the line then is cooled to retain its shape, fitting snugly inside the pipe.

Theroset (cure in place) liners

Thermoset liners are cloth-like fiber shells filled with resin, usually polyester. Liner is placed into the pipe via a manhole. Next the material is filled with water to invert the tube into the pipeline. Finally, curing begins.

Curing the pipe involves heating the water and circulating it in the pipe. When this completed the liner is mechanically bonded to the interior of the existing pipe.

Slip Liners

Slip lining involves inserting a new pipe usually made of PVC into an old pipe. The process leaves a space between the original pipe and the liner. Slip lining is not flexible as other pipe lining options but may be a good option for many replacement problems.

Point Repairs

Often, a sewer problem is limited to one or two areas, so point repairs are more economical.

Emerging Technologies

The pipe rehabilitation industry shows no signs of slowing and is becoming the preferred solution for most municipalities. Dig and replace used to be the only method, but cost effectiveness and acceptance of rehabilitation have really just allowed to grow.

Hopefully, this gives you some options if your sewer lines are in need of repair or rehabilitation.