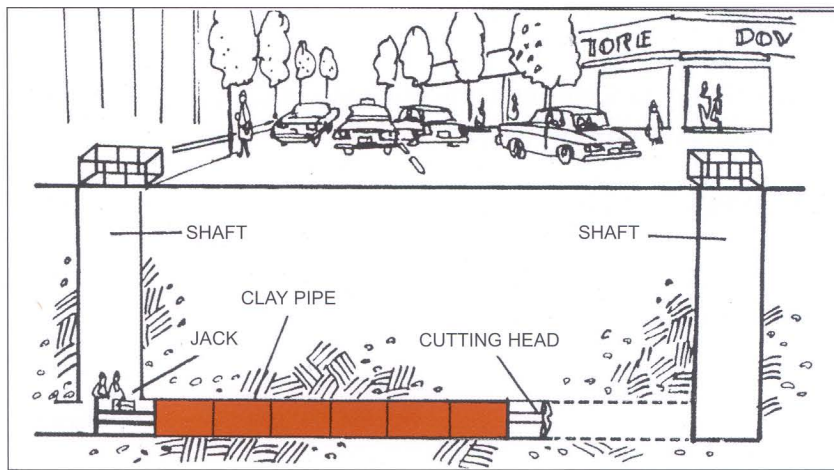


MICROTUNNELING WITH CLAY PIPE

THE PROCESS

Microtunneling is a precise method of installing pipelines without digging trenches or dewatering. Pipe are jacked through the ground from a launch shaft to a reception shaft by the use of a laser guided articulated cutting head. Hydraulic jacks apply pressure to the pipe which advances the pipe and cutting head forward. Jacking forces can be extremely high requiring a pipe that has high



compressive strength. As the pipe moves through the ground, the spoil is removed either by auger inside the pipe or by transporting the excavated soil as a pumpable slurry. Drive distances in excess of 500 feet are possible depending on the soil type. Depths are limited only by the practical depths of the shafts. Accuracies of the installed line are typically within 1" of line and grade. The development of computer controlled steering systems may replace manual steering resulting in even greater accuracy.

THE PIPE

Vitrified clay jacking pipe are an excellent choice for the microtunneling process. The compressive strength of clay pipe is naturally high, exceeding the minimum compressive strength of 7,000 psi required by ASTM C 1208. The jacking loads are transmitted through precision ground ends separated by compression disks which help to distribute the jacking forces as the pipe is steered through the ground. Clay pipe has excellent abrasion and corrosion resistance throughout the entire wall thickness. It does not require coatings or linings for protection.

THE JOINT

Vitrified clay pipe has diamond ground ends and jointing surfaces which provide for highly reliable air and water tight joints. The precision rebated surfaces on both ends of the pipe are designed to use an elastomeric compression joint seal against a low profile stainless steel collar. The stainless steel collar is applied at the factory on one end of the pipe and when joined in the field results in an air tight, water tight and root-free joint.

THE PERFORMANCE

The life expectancy of vitrified clay pipe has been demonstrated to be in excess of 100 years. Modern compression joints, first pioneered by NCPI and the member companies, have long ago added to the natural advantage of vitrified clay pipe. The performance of today's vitrified clay microtunneling pipe has made it the North American and world leader for this modern installation method.

Vitrified clay jacking pipe are available in diameters from 6" through 48" and in lengths to meet the requirements of the project.

THE APPLICATIONS

Microtunneling pipe are also used for sliplining, pipe bursting, tunnels and the pilot tube microtunneling method.