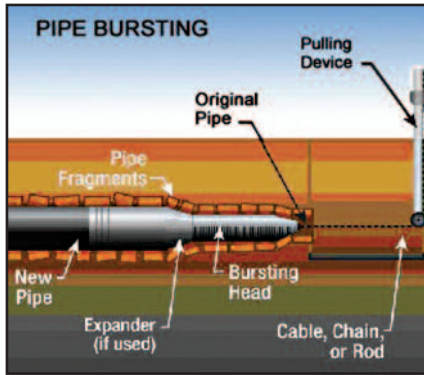


Basic Pipe Bursting

Information provided by the
International Pipe
Bursting Association

One of the many facets of directional drilling is pipe bursting, a widely-used method of replacing existing and deteriorated pipe.



Pipe bursting diagram courtesy of
drainsplus.com

Pipe bursting is a cost-effective option and reduces damage to pavements and disruptions to traffic, which reduces the social costs. However, there are limits to

the use of pipe bursting methods and certain conditions can make its successful use challenging.

With pipe bursting, the existing pipe is broken by using mechanically applied force from within the pipe. A cone-shaped tool, called a bursting head, is inserted into the existing pipe, shattering it, and forcing the fragments into the surrounding soil by pneumatic or hydraulic action. At the same time, a new pipe, of the same or larger diameter, is pulled or pushed in behind the bursting head.

To reduce friction and provide space for the new pipe, the base of the bursting head is larger than the inside diameter of the existing pipe and slightly larger than the outside diameter of the new pipe. The back of the bursting head is connected to the new pipe and the front is connected to a cable or pulling rod.

Based on the bursting system used (hydraulic or pneumatic), the force used to break the existing pipe comes from pushing or pulling cable or rods. This force breaks the old pipe into pieces, and expands the diameter of the hole. The bursting head is pushed or pulled through the pipe debris creating a cavity as it pulls the new pipe in behind it.

The most common pipe bursting method is the pneumatic system. The bursting head is a soil displacement hammer which uses compressed air to create force. The pneumatic hammer assembly enters the old pipe through the insertion pit. Using a winch located in the pulling pit, constant tension keeps the bursting head centered in the old pipe. The percussive action of the hammer cracks and breaks the existing pipe. Pneumatic pipe bursting does have its limits. For example, it can only be used with old pipes that are fracturable and only HDPE (high-density polyethylene) pipe can be installed using this method.

Static/hydraulic pipe bursting has the ability to pull in a variety of new pipe types including fusible PVC, restrained joint PVC, and clay, as well as HDPE. It can also be used to burst both fracturing and nonfracturing types of pipe such as steel and ductile iron.

No hammering action is used. Instead, steel rods are inserted into the existing pipe from the pulling shaft. The rods are connected using different types of connectors. Once the rods reach the insertion shaft, the bursting head is connected to the rods and the new pipe is connected to the rear of the head. A hydraulic unit located in the pulling shaft pulls the rods one at a time. The bursting

head and the new pipe are pulled with the rod which fractures the old pipe. The process continues until the bursting head reaches the pulling shaft where it is separated from the new pipe.

HDD Used to Replace Cable

Adapted from an article by
Victoria A. Rocha
at *Electric Co-op Today*



Peninsula Light Company celebrated the completion of a new underwater submarine cable with a ribbon-cutting ceremony.

The city used horizontal directional drilling (HDD) to drill 30 to 70 feet* underneath the Puget Sound seabed in Fox Island, Washington. The company bored underneath to the seabed to the mainland, installing a conduit to hold the new cable and protect it from sea water. This was a new process for the company who previously installed cables by laying them across the bottom of the seabed.

The new cable will have to be replaced in about 50 years; however, with the old method of installation, the co-op was replacing cables every 30 years. Using the new method will also allow for easier upgrading of the cable. Now when upgrading the cable, the company can simply pull the electrical cable out of the conduit and thread a new cable through.

"This project was completed on time and under budget," said Chief Executive Officer of Peninsula Light Company Jafar Taghavi. "It is unique, and I'm very impressed. And I've been in the business for a long time."

*(1 foot ≈ .304 meters)

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