



Best Practice for Locating Lines

Importance of locating buried objects:

It is critical to accurately locate and identify pipelines/utilities before any excavation begins. Sources for locating utilities are construction maps, drawings and alignment sheets.

Types of equipment for use:

Probe rod:

- Care must be taken using probe rods because of potential damage to the pipe and/or coatings.
- There is also the risk of hitting electric lines.
- Probe rods should be made of non-conductive materials and have a blunt tip
- Some Pipeline Operators do not allow the use of probe rods. Check with your Operator before using one.

Electromagnetic Line Locator:

- These locators detect the alternating magnetic fields that surround a metallic line. They cannot locate **non-metallic** lines, such as plastic pipe, unless it is installed with tracer wires.

Active Line Locating Method:

There are two methods of placing active signals on a pipeline:

1. Direct Connection

The most accurate method of locating pipe is by connecting directly to the pipe. This method isolates the signal to one pipe.

- Use the lowest frequency that will work.
- Proper grounding is critical. If the conductor is not well grounded, or if the transmitter connection to the ground rod is poor, the signal will also be poor and not detectable.
- Connect the **red lead** to the pipe and the **black lead** to the ground rod.
- Follow your specific models manufacturer's guidelines when operating but generally, using low frequency, hold the receiver vertical and parallel to the pipe location.
- Make short, sweeping motions across the path of the pipe.
- The strongest signal (peak) will be over the pipe and fade on either side.
- In the null mode, the signal will be weakest directly over the pipe and will be at strongest on either side of the pipe.
 - ***CAUTION***: Electric shock or equipment damage can result if transmitter is connected to live cable. Follow all manufacturer guidelines and safety precautions when connecting to the pipeline. ⚠

2. Induction Method

This method induces a frequency into the ground which will radiate back from the pipe to the receiver.

- Induction works well especially when you don't have a place to make a connection.
- Multi-frequency systems allow you to tune the frequency you are putting into the ground to the type of line or pipe you are trying to locate.
- Follow your specific models manufacturer's guidelines but generally, you should test the signal level by placing the receiver 50 feet away from the transmitter on the ground near the pipe.
- The transmitter and receiver should be in a vertical position and parallel to the supposed location of the pipe. Begin walking toward the location of the pipe.
- The signal will be strongest when directly above the pipe and be weakest as you move away from the pipe.
- Pipelines with impressed current cathodic protection systems can be located using the induction method also.

CAUTION: Depth of pipeline must be verified by others means. The use of a line locator should never be used as a method relied upon when verifying the depth of a pipeline.

Temporary markings:

- The American Public Works Association (APWA) color codes include:

Red – Electric

Yellow – Gas/Oil

Orange – Communications/CATV

Blue – Potable Water

Purple – Reclaimed Water

Green – Sewer

Pink – Temporary Survey Markings

White – Proposed Excavation

- Temporary markings must be installed where activities may endanger pipelines.
- Temporary markers must be durable and visible during the entire activity requiring marking.
- Utilities not identified through the one call system must be notified prior to excavation.
- Common types of temporary markings:

Stakes

Flags

Paint

Buoys

Signs

Marker post

Through the OSHA and American Pipeline Contractors Association (APCA) Alliance, APCA developed this Best Practices for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. 10/2011

