

0022 FEET ASTM D 1513 1/2" SDR 11.25" UNDR UAC 1000 PE-2409 GEC 102 2 1 9 FOR GAS ONLY

A Few Words Regarding Utilities

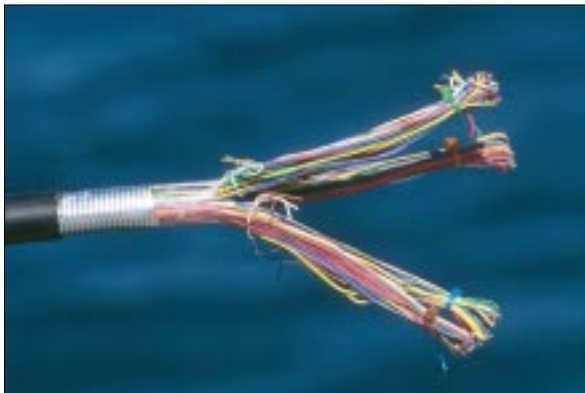
If it's not made of metal, it can't be located. And just because it's made of metal doesn't mean it can be *easily* located. What locates easily isn't always what you're trying to locate.



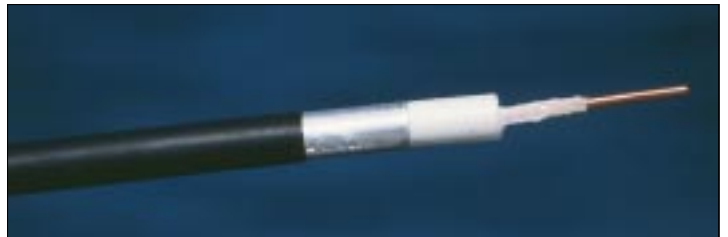
In a perfect world, all utility lines would be continuous, wrapped in flawless insulation and made only of highly conductive metals. Of course, it is not a perfect world in which we locate.

Utilities can be located because they generally consist of a continuous metallic conductor that can be accessed at above ground points. These conductors are shown in the following pictures:

Telephone
Sheath



CATV
Sheath



Electric
Neutral



Gas
Welded steel pipe





Utility Design that Effects the Locating Signal

- Type of material
- Size of Material
- Lack of continuity
- Common grounding
- Joints, transitions, and splices
- Lack of insulation or condition of insulation



Type of Materials



Properties of Metals Used in Utility Construction

Conductivity relative to copper (copper=100)

Aluminum:	60
Steel:	10
Copper-clad steel:	30
Aluminum-clad steel:	20

Weight relative to copper (copper=50)

Aluminum:	15
Steel:	42
Copper-clad steel:	45
Aluminum-clad steel:	35



Size of Materials

Telephone

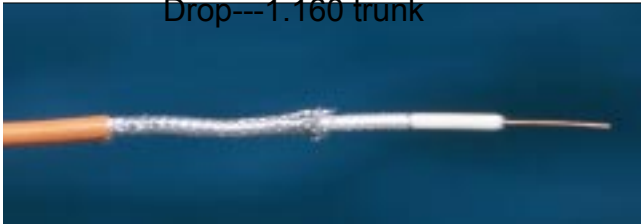


5 pair drop---1800 pair toll cable



CATV

Drop---1.160 trunk



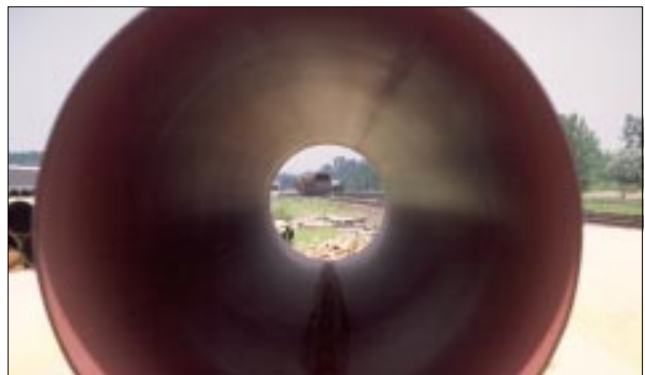
Electric

1/0 secondary---lead
network cable



Gas

5/8" service---36" trans. main



Lack of Metallic Continuity

Locating becomes difficult when there is a breach in the metallic continuity of the facility to be located.

Telephone

Non-bonded ground connection
Sheath faults
Repair splices

CATV

Non-bonded ground connection
Sheath faults
Repair splices

Electric

Corroded neutral
Repair splices

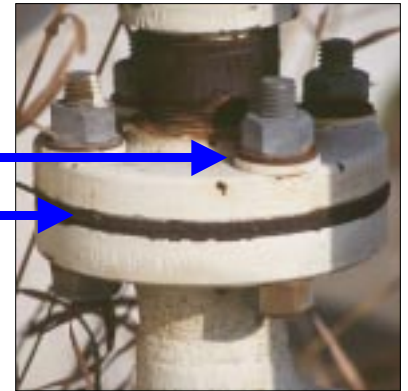
Water

Rubberized slip joints

Gas

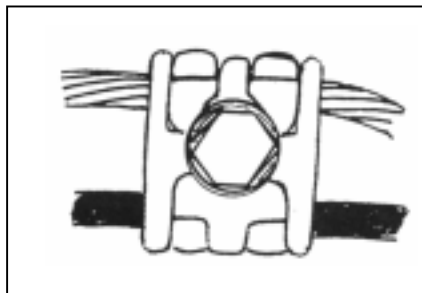
Broken or corroded wires
Insulator

Insulated flange uses non-metallic components to separate metal bolts and flange halves.



Common Grounding

Inadvertent energizing of a conductor can be caused by: 1) direct contact with energized wires, or 2) induction onto conductors located close to changing electric and magnetic fields created by high voltage lines or lightning. Lightning can induce high voltages into the utility system without a direct strike. Proper grounding and bonding will dissipate these voltages safely. Any inadvertent energizing of the utility system can be dangerous to personnel, the general public and the electronic equipment used in the utility system.



Joins, Transitions and Splices



Lack of Insulation or Condition of Insulation

