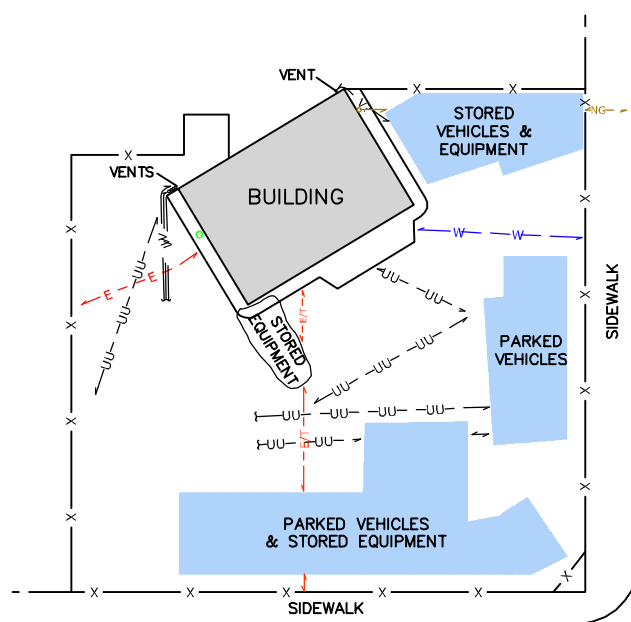


UTILITY LOCATING



Underground utilities are located using electromagnetic line location techniques and ground penetrating radar. The electromagnetic techniques use a specialized receiver operated over the ground surface to detect the electromagnetic field resulting from an electric current. These fields can arise from currents already on the utility line (known as passive, or ambient signals) or currents applied to a line with a transmitter (active). Active signals can be introduced onto conductive utilities by connecting a transmitter to the line at accessible locations such as at meters or valves. The conducted signal travels along the specific utility where it can then be detected by a receiver on the ground surface above the line.



The detection of underground utilities is dependent upon the composition and construction of the line of interest. Utilities detectable with standard line location techniques include most continuously connected metal pipes, cables/wires or nonmetallic utilities equipped with tracer wires. Utilities that are not detectable using standard electromagnetic line location techniques include those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. For these situations, ground penetrating radar may be used since it can detect both metallic and nonmetallic lines in situations where smaller diameter lines are shallower than larger lines, and utility line depths are typically less than 3 to 4 feet. See ground penetrating radar description.