

# The Surveyor and Buried Utilities

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(Reprinted with permission from *Side Shots*, May 1992 Issue, Volume 23, Number 2)

**Editor's Note:** Although this is an American-based article, the destruction of the apartment building in St. Hyacinthe, Quebec, opposite, highlights the dangers of buried utilities.

Buried utilities are like land mines to the surveyor. Pipelines and cables are located beneath highways and roads, on public lands and across private property. In making surveys for retracement purposes, or for title insurance companies, or for design professions, the surveyor has the responsibility of showing encumbrances that might affect title or may inhibit construction.

A surveyor can't really locate a buried pipeline or cable (unless he digs it up); he can only locate evidence of the utility, like a shut-off valve at the surface of the ground, or a marker at a dog-leg, or where the pipe crosses the road. Lacking such physical, observable evidence, the surveyor must rely on maps showing the purported location of the utility. In dealing with these maps, the surveyor is faced with three types of problems:

- (1) Maps insufficient to demonstrate the location of utility to the accuracy satisfactory to the surveyor's needs.
- (2) Maps that are design documents showing where the utility was supposed to have been built, not necessarily where it was built.
- (3) There is no map showing the utility, either as it was designed or as built.

The prudent surveyor will deal with his own liability risk in such situations by employing exculpatory language on the face of his plan, citing the source of information upon which he has shown the location of the utility, and declining responsibility for the actual location. The surveyor's disclaimer will have to be broad enough to account for underground utilities that may exist, but for the existence of which the surveyor has no evidence or indication.

By such devices the surveyor can protect himself from charges of negligence or failure to fulfil his contract for a data collection survey. But the conscientious surveyor will be bothered by the fact that his survey is incomplete, and frustrated by his inability to serve the needs of the title transfer industry or the design professionals who rely upon his plan.

The fact that the American landscape is laced with buried and inaccessible features is well known to the surveyor in private practice. Attorneys, bankers, title insurers, and others seem not to be aware of the problem, however, and still ask the surveyor to certify to the existence or non-existence of such feature. It often takes careful explaining by the surveyor to convince a lawyer that it is impossible to certify to the non-existence of something that is not observable.

For civil engineers, architects, and backhoe operators, the problem is less abstract and more immediate. A last minute design change in an engineer's site plan, because of an unreported pipeline, can result in unfortunate delays and unwelcome fee overruns. But for the backhoe operator, an unreported pipeline or cable can be (and has been) a life or death matter.

In an attempt to avoid these close encounters of the worst kind, the utilities industry has developed the Dig Safe system, (in Wisconsin, it is "Digger's Hotline") by which a contractor calls a single telephone number to co-ordinate with all utilities before opening the ground. Unfortunately, in order to initiate the Dig Safe system, the contractor has to know, or at least suspect, that there is something in the ground to be avoided. When plans prepared by the surveyor and the site designer give no hint of buried danger, contractors are not apt to delay their work by calling Dig Safe. At least that is one explanation for the construction accidents that occur with depressing regularity involving buried utilities, either unreported or reported in the wrong place.

An obvious solution to this problem, from the point of view of the surveying profession, is to require accurate "as built" drawings for all buried utilities.

The American Congress on Surveying and Mapping (ACSM), through its government's affairs program, was able to have inserted into the Pipeline Safety Re-authorization Act of 1988, requirements for both gas and hazardous liquid pipeline operators to provide

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accurate mapping to show the location of pipeline facilities. It is up to the office of Pipeline Safety to promulgate regulations required "accurate mapping". ACSM has recommended that the standard for mapping of new pipelines be the National Map Accuracy Standards as published by the U.S. Geological Survey.

These standards require that for horizontal accuracy of maps at a scale larger than 1:20,000, "not more than ten percent of points tested shall be in error more than 1/30 inch". One thirtieth of an inch on a 1:20,000 scale map is about 55 feet on the ground. This seems to be, if anything, a very liberal requirement for maps that may be relied upon for the location of high pressure gas lines or pipelines carrying hazardous materials.

In reply to ACSM's appeal for adoption of this standard, the Director of the Office of Pipeline Safety has written that "we do not believe that such a high level or precision is required". Final rule-making by OPS is expected this Fall. In the meantime, ACSM will continue to argue for acceptable standards for these maps. The current concentration on construction site safety (see Findings and Recommendations from the Civil Engineering Summit Conference, June 5, 1989, Washington, D.C.), the frustration of surveyors, and the concerns of the whole land development industry make the effort worthwhile. Letters from concerned civil engineers might help. Write to Richard L. Beam, Director, Office of Pipeline Safety, U.S. Department of Transportation.

