

## **Safe Excavation: A Step by Step Process**

By: Kevin Vine

In 2016 it was estimated that nearly \$975 million was spent in Canada on societal costs related to damage to underground plant; this figure refers to costs associated with emergency response, evacuation, environmental contamination, interruption to service, and the use of safety services such as 911. According to the Canadian Common Ground Alliance (CCGA) DIRT Report, 43% of the damages that occurred in 2016 were a result of not securing locates prior to digging or not providing sufficient information to provincial One Call centres.

There's no doubt that contacting your provincial One Call notification centre to have pipelines and utilities located prior to digging or drilling is the most important step a contractor or homeowner can take to ensure project safety. However, committing to damage prevention extends far beyond Call or Click Before You Dig. There are vital subsequent steps that need to be taken to ensure safety on an excavation project.

**Plan ahead.** As a best practice, try to request your locate at least 5 days in advance to ensure enough time is provided in order to avoid project delays. If you need your locate completed sooner, you can provide your anticipated dig date to Ontario One Call. Members of Ontario One Call will try to meet your request timelines as best they can, depending on their available resources and your particular situation.

Emergency locates are available to utilities, municipalities and their respective contractors to deal with serious, life threatening emergencies.

**Mark your site.** Where possible, white-line the boundaries of your project site prior to having locates performed. This involves pre-marking your dig or drill site with white paint, flags, stakes or a combination in order to accurately communicate the boundaries of excavation to both the Locate Service Provider and facility owners.

**Wait for everyone to respond.** Make sure you receive a complete locate package for all utilities within your project site before proceeding with construction work. All utilities present on the site should be marked with spray paint, flags, or both, and you should be provided with documentation confirming completion. Take time to read and understand the locate documentation. Protect field markings and sweep away any dirt that may be covering them.

**Respect the marks.** Once utilities are located and marked on your project site, there are a few best practices to keep in mind. The excavator should carefully hand dig around the marks to the depth of the excavation. Never dig directly on top of the marks as this is always an unsafe practice. Even minor inaccuracies or discrepancies in depth data could create a dangerous situation. Be sure to limit excavation to the area covered by the utility locate request. If the limits of the project site change, submit an additional locate request through your provincial One Call notification centre. For many utilities, ground marks are considered valid for one month, after which time they should be repainted. Be sure to check the expiration date of your marks, which you can find on the locate ticket. It's also a good idea to become familiar with the spray paint colour coding so that you understand what type of utilities are buried on your project site.

**Don't run on instinct.** Utility damages have been known to occur even when the utility has been accurately located, the work area has been marked and the marks are valid. How does this happen? Often it comes down to relying on assumptions. Assumptions about the depth of buried utilities can create a dangerous situation. An excavator digs down a few meters and when nothing is detected, continues to drill, until contact is made. If depth data is required, it may be necessary to perform test pits as part of the utility locating process.

**Arm yourself with knowledge.** It's important to have a general understanding of locating processes and technology so that you'll know what is required for your particular project. With the wide variety of lines that run underground – power, communications, gas, sewer, water, etc., different detection techniques are often required for different types of buried lines. For instance, metal cables and pipes can be detected

using standard Electromagnetic (EM) induction techniques, whereas non-metallic utilities such as clay or plastic pipes, require additional techniques such as Ground Penetrating Radar (GPR).

EM is a common locating tool that operates by sensing either a background signal or a signal introduced into a conductive utility line using a transmitter. In order for this technique to work effectively, there must be a direct connection to a piece of utility hardware and the utility must be comprised of a conductive material, such as a metal pipe or cable. GPR is a non-destructive geophysical tool that transmits high frequency radio waves into the ground and analyzes the reflected energy to create a profile of the subsurface features. It is extremely effective at locating buried non-conductive linear infrastructure such as PVC pipes, concrete sewers and other utilities. An additional advantage lies in the fact that a direct connection is not required to discern utilities and other underground features.

**Assess qualifications.** Working with a qualified Locate Service Provider is key to reducing risk, ensuring accuracy and transferring liability. Ask a few key questions of the service provider that will be locating utilities within your project site to ensure they are properly qualified. For example, what is the training program in place for Field Technicians? Does the company abide by a Health & Safety policy? What is the Quality Management process? Does the service provider have experience successfully completing projects of a similar size and scope? What level of accuracy can be expected? Is there a damage investigation process in place? Working with a qualified service provider will greatly reduce your level of risk.

**Communicate consistently.** Damage prevention is a shared effort and there are often many stakeholders involved, so communication plays a big role in ensuring safety. Make sure that everyone on your project team is briefed on the One Call process. When placing your locate request, be sure to provide the One Call notification centre with as much information as possible. For example, the contact information of the person that will be excavating, when and where this will occur, the maximum depth of excavation and the method of excavation. Always follow up on the status of your locate request prior to proceeding with the work and be sure to communicate the status to your team.

**A final thought.** When it comes to safe excavation, the key lies in awareness. The good news is that there are plenty of resources available to arm yourself with the knowledge you need to minimize risk. A good place to start is the Ontario Regional Common Ground Alliance (ORCGA) website [www.orcga.com](http://www.orcga.com) where you can find numerous educational resources, marketing materials, industry updates and best practice documents.

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