

ISSUE
NUMBER
EIGHTEEN

Excavation **SAFETY**

GUIDE & DIRECTORY™



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The **Excavation Safety Guide** is designed to be a reference for readers to use all year long. The articles are concise, to the point and focus on current industry trends and technologies. The resources include the CGA Excavation Best Practices, a complete One Call Center listing along with the state laws and provisions, a pull-out Emergency Response poster plus much more. Protecting the buried infrastructure is becoming more of a challenge every day and this guide will help you navigate through these challenges.

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This manual is an informational and educational guide, but it is not intended to provide you with any definitive information regarding legal issues. You need to follow your specific state laws and OSHA rules. If you have any questions on issues raised in this guide, please consult with legal counsel and/or your state One Call Center.



FREE

Excavation Emergencies Poster

LOOK ON PAGE 29 TO FIND YOUR COMPLIMENTARY PULL-OUT POSTER with complete information on how to recognize and respond to the hazards inherent in utility excavation.

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A public right-of-way is a type of easement granted or reserved over the land for transportation purposes; a street, highway, public footpath, rail transport, canal, as well as various utilities including electrical transmission lines, fiber optic / telecommunications cables, and oil and gas pipelines. These rights-of-way are reserved for the purposes of transporting, operating, maintaining, or expanding

by other utilities. These laws also usually allow municipalities to establish rules and regulations governing the use of these rights-of-way if the rules are competitively neutral and not unreasonable or discriminatory.

Utilities have varying degrees of authority and responsibility when installing their facilities in the public roads and streets rights-of-way. Their authority and

responsibility depend upon state laws and regulations, which typically differ between states. Utilities may also depend upon franchises, local laws, and ordinances, which may differ by municipality within a state.

As our society becomes more dependent on the modern conveniences brought to our homes and businesses through these many times buried facilities, utility networks

Understanding ROW PC

BY AL FIELD

for Different Municipalities and Agencies

existing services within the right-of-way. Private rights-of-way are typically deeded to an entity for a single purpose, typically a utility. Private rights-of-way enable facility workers to gain access for inspection, maintenance, testing or emergencies, typically without permitting requirements.

In most areas of the country cities, counties, and the state have the responsibility of maintaining public streets and roads. The rights-of-way to construct, operate, and maintain these roads have been obtained by various means including road petitions, purchase, condemnation, and dedication through platting. To provide our communities with the conveniences we are used to, it is necessary that public utilities be allowed to use these same rights-of-ways.

Most often state laws authorize public utilities to use road rights-of-way, provided they do not obstruct or hinder the usual travel, adversely affect public safety, or obstruct the legal use

Right-of-Way Defined

1. The legal right, established by usage or grant, to pass along a specific route through grounds or property belonging to another
"They found their right of way barred by locked gates"
2. The legal right of a pedestrian, vehicle, or ship to proceed with precedence over others in a particular situation or place.
"He waves on other drivers, even when it's not their right of way"
3. The right to build and operate a railroad line, road, or utility on land belonging to another.
"The government has continued to evade the upgrading of rights of way, tracks, and signaling"

continue to grow in size and complexity in the rights-of-way that are usually not expanding with them. With pipes and cables representing oil and gas, water and sewer, telecommunications, electric, and other facilities, the possibility of two or more similar networks occupying a common right-of-way continues to increase. As a result, problems may arise due to the construction, maintenance, and operations of one network affecting the other networks.

A common concern for many local governments is lack of contact information for a utility company if there is a problem or question, especially those companies

discuss issues from previous years and how to avoid them in the next.

Each municipality has a geographic limit and is required to manage their public rights-of-way on behalf of their residents and other rights-of-way users. Since municipalities usually have differing policies and requirements for working within their public rights-of-way, users of the public rights-of-way must become familiar with each municipality's geographical limits as well as policies and requirements to work in their public rights-of-way. Each municipality can present different challenges as they can have

- Human resources to handle all the above
- Budgeting for all the above
- Asset Management, i.e., asset records, inventories of pavement and utility condition(s), records/as-builts of utilities owned as well as permitted, etc.

Public rights-of-way inspectors must deal with a similar list of issues including:

- Ensuring public safety is maintained
- Ensuring accurate as-builts are recorded and transmitted to affected parties
- See ASCE/UESI Standard 75-22
- Coordinating various on-going projects
- Understanding project and contractor needs

POLICIES

that utilize contractors. The contractor may be the main contact point for a certain project, but communications to the utility through a third party may not always be effective. Additionally, job turnover, both at the local government and the utility company, may hinder communications unless efforts are made by both sides to keep communications open. Short annual meetings between each agency and each utility company, including the agency officials who approve utility permits, the street maintenance supervisors, the utility company engineers who designs the work, the utility company maintenance supervisors and the utility company's contractors can improve communication and facilitate better relationships between the parties. This meeting can be used to obtain/update important contact information, cover new permitting procedures, explain/refresh familiarity with emergency work procedures, discuss pending projects from each party that might affect the utility or the municipality, and offer all parties an opportunity to

differing staff sizes with differing experience and qualifications as well as differing budgets which are usually pre-allocated.

Public rights-of-way managers are responsible for ensuring that their rights-of-way network is accessible, and that it is used with care. To coordinate the use of these areas, and to ensure that all necessary safety measures are taken to protect the public's interests, the right-of-way manager deals with a large variety of issues including:

- Public projects and development
- Private development and off-site drainage
- Private utility installations and coordination
- Special events and associated traffic control for parades, protests, etc.
- Over-size and over-weight vehicle and loads
- Liability and litigation
- Encroachments such as building protection bollards, sidewalk dining, awnings, newspaper, and bicycle racks, etc.
- Work-zone traffic control and clean up
- Public information and meetings

Municipalities have a legal duty to manage and balance these essential (and sometimes competing) uses of the ROW for the health, safety, and economic well-being of their community. Utility owners and utility contractors, as users of these rights-of-way, have responsibilities of their own – to be aware of the rules, regulations and laws that govern the rights-of-way in which their facilities reside or are being installed, and maintaining their facilities, including identifying areas where certain activities are prohibited to protect public safety and the integrity of their facilities, while protecting the public, the environment, and utility users from loss of service, as well as issues due to emergencies created by damaged utilities. **ES6**

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THE RIGHT TRAINING:

EFFECTIVE TRAINING IS SUBJECT MATTER EXPERTISE TRANSLATED INTO YOUR INDUSTRY'S UNIQUE LANGUAGE AND PRESENTED IN A MANNER THAT ENGAGES EVERYONE IN THE ROOM, AND IT'S A RARE COMMODITY.

If you work for an electric power utility, would you hire a local electrician to conduct power line training? Why not? Don't they "know about electricity"? How about those in the natural gas and water/wastewater infrastructure sectors? Do you hire local residential plumbers to train your technical staff? Again, why not? Isn't it all "pipe installation"?

By now, you're wondering what's the point of these absurd questions. And I'll get to that in a minute but moving on, the obvious

answer to both questions is the same – "of course not; you look for professionals with the necessary expertise to do the training."

EXPERTISE – You understand the skills needed for technical infrastructure work are too unique, too important, and too dangerous to leave to chance, so you engage professionals with sector-specific expertise. Now to be fair to commercial and residential electricians and plumbers, the same goes the other way, their skills are unique, and their training also requires

sector-specific expertise. The key is that its sector-specific expertise that makes a professional trainer. So, you engage subject-matter experts that can interpret and transfer industry specific knowledge.

Now, the point to the earlier questions is this; if we engage professionals to provide sector-specific technical skills training, why do we engage people with no sector expertise to provide security training?

For some, the answer is simple; security isn't our forte. We're good at sourcing qualified trainers and consultants for subjects we're familiar with but not so good at retaining these services for areas beyond our own fields of experience. We also tend to generalize expertise outside our own, and we often take a cavalier attitude towards such expertise as a coping mechanism. Operational security is a foreign concept



Expertise, interpretation, and engagement are the keys to effective security training

BY JIM WILLIS, MSC, CMAS, CHS-V

for most in the utility field, and it's often deemed less relevant than technical training. The outcome is the belief that when it comes to security training, any training and trainer will suffice.

But, like technical training, sector-specific expertise is essential to building effective security skills. Simply put, the application of security skills, such as situational awareness, de-escalation, and violence prevention, are not the same across sectors. Operational circumstances, environments, and situations are always sector unique, so training that works well in one industry doesn't work for another, this is especially true in the utility field.

INTERPRETATION – It's a simple fact that effective training occurs when the trainer has the knowledge and experience to interpret and translate relevant concepts into the

language of an operational sector. In the infrastructure field, this applies to security skills as well as technical skills. However, we often fail to employ trainers with the relevant expertise because we misinterpret the actual expertise that's required.

People often associate security expertise with defense and enforcement experience. But just as serving in the Air Force doesn't necessarily make you a pilot, military or law enforcement experience doesn't necessarily equate to security expertise. In reality, most law enforcement and military experience is as different from operational security as infrastructure construction and maintenance is from its commercial and residential counterparts. Though they're based on similar principles, they're vastly different in application. And unless you have training and experience in both, your skills will be limited to one or the other. This is why all

branches of the military engage military and civilian specialists to provide a myriad of law enforcement, protection, and security services. For example, all US Marines are qualified as riflemen, but only a few are qualified as embassy security. It takes specialized training and skills to be a member of the Marine Corps Embassy Security Group, so only a limited number will have this expertise.

Let's look at a utility example. When tasked with providing de-escalation training for utility workers, our go-to response is often to look to local law enforcement to provide it. This response is based on our belief that they've received de-escalation training, and if their training works for them, it should work for us. No big deal, right? Well yeah, it is a big deal, and yes, it is a mistake. In fact, many tactics and techniques taught by the military and law enforcement backfire when utilized outside their intended application. The critical flaw is the training intent and focus. Law enforcement training is intended for those with legal standing to compel compliance. And their approach to training and its application and tactics are all designed around this intent.

The training focus is critical. An essential fact about training is that people replicate the training they receive. If a trainer's own training has been restricted to a singular focus, that trainer will inevitably duplicate that focus. Another fact is that many trainers fail to grasp this phenomenon and will haphazardly apply incompatible training for an audience without considering the outcomes or consequences. The wrong training focus is, at a minimum ineffective, very often detrimental, and sometimes downright harmful.

Let's go back to our earlier de-escalation example. If the trainer you selected has only received law enforcement-focused training, then they'll provide a version of that training. In this situation, you'll be using law enforcement training that focuses on control from a position of power and legal authority. This training is for tactical de-escalation, which focuses on compelling compliance. The tactical nature of the approach is why popular law enforcement de-escalation program names often reference martial arts (verbal judo,

“THE ABILITY TO ENGAGE A FULL-SPECTRUM AUDIENCE IS A SKILL THAT CAN BE HARDER TO ACQUIRE THAN KNOWLEDGE OR EXPERIENCE.”

etc.). And while this training works well for law enforcement, it doesn't work nearly as well for civilians facing a hostile encounter.

For law enforcement, de-escalation is one of several tactical tools at their disposal. They employ it to gain control over a situation before resorting to physical force. However, if de-escalation efforts fail, the ultimate resolution of the encounter will be found on an officer's duty belt.

In the civilian realm, de-escalation is the only tool available. If de-escalation doesn't work, civilians don't have the additional tools or legal standing to compel compliance, so the outcome of a hostile encounter will be far from certain. For civilians, de-escalation is always a defensive tool. Its tactics must focus on preventing a situation from spiraling out of control. The defensive nature of civilian de-escalation requires a different skillset. Utility workers are, by default, civilians, and their training requires different expertise and an entirely different approach.

ENGAGEMENT – The final element of effective security training is engagement. Successful training entails a symbiotic relationship between the trainer and trainees. In this relationship, the trainer provides the needed information to the trainee, and the trainee provides positive feedback to the trainer. For technical skills training, engagement is seldom a problem. Most trainees are at least mildly interested in the subject. And they're usually willing to give the trainer their time and attention with little resistance or pushback. Most people assume that the same applies to utility security training. However, this isn't the case, and in security training, engagement, it turns out, is often the most challenging obstacle to overcome.

Unlike technical skills training, which usually has selected attendees, security training programs are typically “all-hands” affairs with a full-spectrum audience. On one end of the spectrum will be those ready to dive headfirst into the training, hoping for any opportunity to try physical


techniques and talk tactics. On the other end of the spectrum are those so apprehensive about the subject they can become physically and emotionally ill just thinking about it. And though the levels of interest span the emotional spectrum, it's the trainer's job to try to engage everyone. Experienced security trainers understand this phenomenon and work to overcome it.

The ability to engage a full-spectrum audience is a skill that can be harder to acquire than knowledge or experience. Engagement requires the ability to look at the training from a variety of viewpoints. A trainer must understand that not everyone feels the same about the subject and that every viewpoint is equally valid. So, the trainer must try to see the differing perspectives and work to guide everyone onto middle training ground. Middle-ground training is the space where serious training takes place. Middle-ground training doesn't employ overly aggressive tactics that create fear and anxiety, nor is it so weak and watered down that it misses the training goal. An experienced trainer will realize that by using middle-ground training techniques, the enthusiastic attendees will likely be a little disappointed by the toned-down approach. In contrast, the apprehensive attendees must be gently nudged out of their comfort zones. When done correctly the outcome will be effective training that benefits everyone.

Many trainers with excellent credentials have failed to comprehend the necessity of providing training that engages all attendees. A real-life example happened to a security colleague just before the pandemic. The gentleman had outstanding credentials. He had been a military officer and worked for the Department of Homeland Security (DHS) before he secured a position as the security manager of a mid-sized electric distribution utility. He asked me to consult from time to time, and we met three times over the first year of his new position. He told me about his planned active shooter training at our last meeting. As we talked, it became clear that the training had all the earmarks of a military exercise. It was going to be intense, aggressive, and

graphic. I realized he hadn't considered the characteristics of his audience, and I expressed concern about his approach and offered to help. However, he believed that his previous training experience gave him a solid handle on the situation, and he wanted to go it alone. His goal was to make an indelible impression on the attendees and create an experience that they wouldn't soon forget. Well, that he did. The active shooter training took place the first week of November that year. Unfortunately, the session was so intense that he alienated half of the attendees, and the corresponding pushback was so great that he lost his job the week after Thanksgiving. His unfortunate incident proved two things: civilian training isn't the same as military training, and scaring people isn't training them.

THE BOTTOM LINE. You need a trainer with relevant expertise when looking for effective security training. Relevant expertise includes knowledge, experience, and the ability to translate that critical information into the language and circumstances of a specific industry. Finally, relevant expertise includes the skill to present challenging and complex subject matter in a manner that engages the entire audience without undue fear or apprehension or diluting the seriousness of the subject.

Effective security training takes unique skills that aren't always easy to find and seldom free. When considering security training, don't just consider the initial cost and ease of implementation; also consider the ultimate cost of getting it wrong. 

About the Author: Jim Willis is the CEO of InDev Tactical, a security training and consulting firm. Jim has more than 40 years of experience working with electric power utilities and infrastructure security. Jim holds a bachelor's degree in electrical engineering and a master's degree in international development and security. He is a credentialed homeland security specialist and anti-terrorism expert with expertise in training, security consulting, threat assessments, and security operations. Jim can be reached at 703-623-6819 or jim.willis@indevtactical.net



Pre-Excavation Checklist Before **EVERY** Excavation

IN THE OFFICE

- ☐ Review all drawings, plans, engineering blueprints for existing buried facilities
- ☐ Proposed excavation area has been marked in white paint and/or flags
- ☐ Contact 811 at least 2-3 business days before excavation (check your state One Call laws)
- ☐ Locate ticket number is posted at the work location
- ☐ Onsite meeting scheduled with all high profile facilities in locate area (gas/oil pipelines, high-voltage cables, fiber optic)

ONSITE

Complete a pre-excavation walkthrough of the entire jobsite and adjacent areas

Visual Inspection of Jobsite: Permanent markers:

- ☐ Signs or marking posts
 - Pavement markers (stamped nails, pavement decals, A-tags™)
 - Surface markers
- ☐ Other surface signage for landscaped areas
- ☐ Locate marks
- ☐ Consult any maps or field sketches of the location
- ☐ Identify all services to buildings such as:
 - Gas meters
 - Farm taps

- Pipeline valves
 - Cable pedestals
 - Electric cables
 - Water valves
 - Telephone closures
- ☐ Look for evidence of trench lines from previous excavation
- ☐ Look for cleared pipeline ROWs
- ☐ Talk with the property owner or general contractor to identify potential private facilities that may not be marked:
 - Lighting
 - Outbuildings
 - Pools/Spas
 - Irrigation
 - Sewer laterals
 - Propane tanks
 - Communications lines

Document of Jobsite:

- ☐ Compare actual jobsite to One Call ticket
 - One Call ticket covers the scope of the work
 - One Call ticket "Work to Begin" date is valid
 - All utilities have responded
 - All facilities are marked within the excavation area
- ☐ Photograph the jobsite
 - Locate marks and flags from 360° at varying distances for perspective
 - Permanent signage and location relative to the dig area:

- Note location, height, and operator of overhead lines
 - Note all required safety signage

- ☐ Video and/or sketches where pertinent

BEFORE YOU DIG

- ☐ Review safety information with anyone working the job
- ☐ Confirm with facility owner vacuum or hydro excavation is scheduled for all pipelines impacted
- ☐ Locations for hand digging within the tolerance zone are noted
- ☐ Representatives for all critical facilities are present
- ☐ Emergency equipment available when hazardous atmospheres are potentially present
- ☐ List of all emergency contact numbers for assets in and adjacent to the dig zone is readily available
- ☐ The location and route to the nearest hospital is known by onsite supervisors

This document is provided for informational purposes only and does not constitute professional advice. It is intended to be used as a guide in the development of a checklist specific to your situation and may not be inclusive of all pre-excavation activities required of your situation. Consult your company's appropriate management before implementation. Excavation Safety Guide and Excavation Safety Magazine, its employees and agents accept no liability and disclaim all responsibility for the consequences of acting, or refraining from acting, in reliance of the information contained in this document or for any decision based on it, or for any consequential, special, incidental or punitive damage to any person or entity for any matter relating to the contents of this document.

In early November of 2021, President Biden signed the Infrastructure Investment and Jobs Act into law. It is bipartisan negotiated \$1.2 trillion of funding designated for infrastructure improvements. Transportation, broadband, and utilities will be receiving the following allocations of these funds.

- **\$110 billion for improving roads**
- **\$73 billion for upgrading electrical infrastructure**
- **\$66 billion for freight and passenger rail**
- **\$65 billion for broadband**
- **\$39 billion for public transit**

Children were forced into remote learning, and many adults found themselves working remotely from home. As COVID-19 restrictions were lifting, many employers found their workforce choosing to be hybrid or remote. Unfortunately, many people did not have access to a broadband resource, and many of those who found themselves without an adequate broadband resource. The infrastructure bill is a good thing.

Since there is such a great need for our infrastructure to be repaired, improved, or expanded, what possibly could be the bad or ugly side of the Infrastructure Bill? For us, as contractors and others with boots-on-

Excavation support networks, similar to utility locators, are having a hard time recruiting and retaining employees. Obtaining timely locating of utilities is difficult if the workforce is not available to do the work. Some may say the utility locators just need to increase their compensation to attract more people into the utility locating world. Keep in mind that utilities either have their own locators, or they contract out to a locate partner. If a utility is not willing to increase the wages of their locators, or pay more for their contract locating, then how is it going to be possible to attract the desperately needed locators?

BY GEORGE KEMP, PH.D.
VP OF SAFETY FOR METRONET

Infrastructure Investment & Jobs Act The Good, The Bad, & The Ugly

There is a consensus that all these infrastructures are in desperate need of repairs, improvements, and expansion. One only needs to search the internet for a report generated by the ASCE detailing the failing reports for each of our infrastructures. Many bridges and roads throughout the USA are in poor condition. Our current electrical grid has had its share of strains on the system, and that is without the capacity needed for the increasing number of electric vehicles that will need access to the grid for charging.

COVID-19 brought awareness to the need for broadband upgrades and expansions.

the-ground, there are number of concerns that need our attention. The broad topics of labor shortages and material/supply shortages are two of the greatest concerns.

The excavation world is already experiencing labor shortages and we are just at the beginning of the Infrastructure Bill being spent over a period of five years. There is a shortage of contractors, and the current contractors are having a hard time finding employees. Once a contractor finds an employee, they must work hard to keep that employee from running to another contractor for slightly better compensation.

We also must remember that locating is a skilled trade and it takes time to develop a new locator to the point where they can be on their own locating complex situations like heavily congested urban areas or heavily congested ROWs.

The infrastructure repairs, improvements, and expansions are also dependent upon a supply chain, which is also having labor issues. Even if you have the manpower and locates needed to do the excavating, there is still the question of whether you will be able to get the supplies you need to complete the job on time. Manufacturing is having a hard time finding people to

fill their workforce needs. Supply chain transportation is experiencing a shortage of truckers. If the materials are available, will they arrive in time for you to complete your project on time. Utility locators have experienced a shortage of paint and other locating materials, and it could continue. Are you going to be able to purchase the vehicles and excavation equipment you need, and if you can, how long will it take?

The Infrastructure Bill has the good, the bad, and the ugly. So, what can we as excavators and others with boots-on-the-ground do to at least minimize the impact of the bad and the ugly on our projects? The first and

The writers of the Infrastructure Bill may not have realized the various stress points and dangerous implications that would result from the implementation of the bill. Think about these points. The bill is distributed over five years. Those receiving the money must place strict deadlines on the excavators to complete the work within the required spending deadlines. The locators with a labor and material shortage must try and accomplish the impossible act of completing locates under a system not setup for today's locating demands.

The race to the last mile is an implication that should also be contemplated for those

forecasting. These three areas are key if we are going to do our best to keep everyone safe and prevent damages to utilities. We need to view others as our partners and not our adversaries. When we don't get what we want, how far do we get and how fast do we get there when we fight against each other? Commit to working through concerns with each other. We are in this together. Build those relationships and commit to finding resolutions that can mutually benefit all sides. Excavators, get to know the boots-on-the-ground workers locating for the utilities. Utility locators, reach out and get to know the excavators working in your area.

Communication is always vital to success in any situation. Communicate early. Communicate often. Don't forget that a key component of successful communication is listening. Excavators, it is important that you forecast as far out as you can for the local utilities and their locators. If you are in a competitive market, Non-Disclosure Agreements can be helpful. It's important to plan to have the locators your workload will require. Utility locators, it is important for you to share your concerns with the excavators as early as possible and commit to finding a mutually agreeable solution. Utility locators, when you see or know in advance that there is a complication like an unlocatable utility line, tell the excavator. Work out a solution that will help the contractor while you find the utility.

There are so many ways we can work together for all of us to accomplish our goals if we are committed to building these key relationships and working together. Safety and damage prevention must be our priority.

If you are able, I highly encourage you to commit to being at the Global Excavation Safety Conference. In 2023 we will be meeting in Tampa the week of February 13 (<https://globalexceptionsafetyconference.com/>). We will be sharing many concrete ways about how we can all accomplish our goals by working together through the Infrastructure Bill. Future years for the Global Excavation Safety Conference are also on the calendar; March 19-21, 2024 in New Orleans, LA and February 24-26, 2025 in Phoenix, AZ. **ESG**

most important thing we all must do is take ownership for our actions and commit to doing what is right. Commit to these three letters, ADM. ADM stands for Advanced Decision Making. I decided many years ago that my character, everyone's safety, and the damage prevention of utilities is not for sale. I took a stand, and nothing is going to change it. We cannot take shortcuts or cheat the system. We all know what these shortcuts or cheating the system are, but we must commit to integrity. Pointing our finger at others who are not committed, will not get us where we need to be. I am committed to doing what is right! You must decide to do what is right, and not waiver from it.

utilities like telecommunications. It is a competitive market for the telecoms. Who is going to get there first and convince the residents and businesses they are the broadband option to choose? Pouring \$1.2 trillion into an infrastructure market over a tight time frame of five years during a time when there is a race among telecoms to get to potential customers is not an environment that encourages safety and damage prevention as a priority.

After you have decided in advance to keep safety and damage prevention first in your work, the next step is to work hard in communicating, building relationships, and



CHANGE:



BY LINDSAY SANDER



it may be difficult, but not changing can be fatal

Our industry does some things incredibly well, like keeping the astoundingly large volume of energy resources transported each year in the pipelines. No one does it better. At the same time, we are constantly pushing ourselves to do better, and to evaluate what we can change to achieve this continuous improvement. We have come to embrace the truth that while change may be difficult, not changing can be fatal.

Enter Teri Anderson, Senior Manager for DOT Regulatory Compliance for ONEOK,

Inc. and the Chair of the American Petroleum Institute's Pipeline Engagement and Awareness Group. One of Teri's first tasks when joining ONEOK in 2018 was to assist with the transformation and update of the company's procedural manuals. The project was daunting in that manuals from multiple operating groups needed to be merged, streamlined and updated.

Teri knew that once the manuals were overhauled, an effort to communicate

the changes would need to occur but, more importantly, there would need to be a mechanism to deploy the manuals and communicate future changes to their employees throughout the organization. "Having current and organized procedures doesn't matter if your employees aren't using them," Teri remembers. "We looked at all kinds of options to assist with our overall needs. Despite this, no such system existed. Everything offered just provided a document or SharePoint-style system. Nothing

provided for two-way communication with our employees, in addition to the need to collect and analyze the data we needed.”

Teri didn’t settle. She sought out the development of a system that would do what she needed. That system ultimately became the DigiManuals™ mobile app, which is now deployed to ONEOK’s 2,000 employees. To Teri’s satisfaction, the system does more than she initially desired and continues to evolve based on her needs from a compli-



ance standpoint, the needs of the employees and the overall needs of ONEOK. A simple concept that did not exist has transformed the way the company communicates change with its employees, manages processes, secures feedback and has even begun to deploy additional information about emergency response and stakeholder engagement.

Teri’s vision for compliance was simple, and yet it has turned into a mechanism sophisticated enough to implement Pipeline Safety Management Systems – not to mention new regulatory requirements – in a way that had never been contemplated before. “We expect so much from our employees,” Teri commented. “We need to provide them the tools and resources they need to do their jobs. If we send our employees or contractors out to the field without access to information and our processes, they are set up for failure. They are put in a position to guess, or take more time from their packed day to return to a local office – sometimes taking hours – to try and do the right thing. Either way it is a loss for them and the company.”

The process wasn’t easy. Teri had to first overcome the inertia surrounding current methods. She had to convince departments that were reluctant to try something new, to share

her vision of the future, and to see the benefits of embracing a change in the way manual deployment had always occurred. “We knew we had a winner when some of our most difficult employees liked the system” Teri commented. “Everyone has those employees that comment on everything no matter how big or small. When you make them happy you have this tremendous sense of accomplishment.”

ONEOK has seen incredible benefits by embracing the DigiManuals™ system and the overall concept of harnessing technology to modernize its compliance efforts. Once difficult tasks like measuring the effectiveness of its procedures or capturing the man-



agement of change have become so incredibly simple to accomplish and document.

“We are now applying technology, and specifically apps, to all kinds of our compliance activities,” Anderson continued. “Activities that we have been undertaking for decades have not been leveraged to the extent now possible. For example,

we are required to maintain emergency responder lists and to determine the capabilities of emergency response agencies. They get submitted in paper form and scanned, but for most operators, little is done with them after that.” ONEOK now has a program that encourages emergency responders to get information about its operations through a mobile app called Buxus™. Responders keep their contact information updated to have access to the system and that information flows into DigiManuals™.

“The process helps us in all kinds of ways we never anticipated,” Teri continued. “We now have the capabilities of our responders available at the touch of a button. We now have the ability to evaluate almost instantaneously who has the resources or equipment to help us. Our guys even use the information to fill out their daily work permits as it helps them to pre-plan and identify resources needed to complete information about who can provide resources in the event an emergency does occur. More importantly it provides responders information about our operations at the touch of a button. If they need anything, simply anything, all they have to do is touch a button and we are there.”

These concepts can be applied to damage prevention as well. Technology is quickly transforming the manner in which companies process and evaluate data to calculate the risk associated with certain activities.

“We are firm believers that promoting safe digging through the education of the youth in the communities we operate in is critical. We have partnerships with key groups like the Future Farmers of America and sponsor state fairs and livestock shows. We just earned the Partner in Education from Birdville ISD for our efforts. At the same time, we are now using AI to evaluate and analyze their performance and that of others that have a direct stake in the integrity of the system,” Teri stated. “We learn everyday about how these new tools can help us in ways we never dreamed.”

Technology will continue to revolutionize the way the industry manages virtually every issue surrounding pipeline safety – planning, maintenance, damage prevention, stakeholder engagement, and integrity just to name a few. What can be done and how it can be looked at is exciting and game-changing. Life and change will always be difficult; however, it is up to our industry to overcome whatever that looks like in the pursuit of being better and safer.

As 2023 begins, ask yourself what are you doing to embrace technology. If you don’t have an answer, you may want to speak to Teri Anderson or someone like her. The information and guidance you get may be the beginning of an incredibly bright future. **ESG**

Understanding the Marks: Locating and Marking Practices

TAKEN FROM CGA BEST PRACTICES 18.0

Operator markings of facilities include the following:

- The appropriate color for their facility type
- Their company identifier (name, initials, or abbreviation) when other companies are using the same color
- The total number of facilities and the width of each facility
- A description of the facility (HP, FO, STL, etc).

Use paint, flags, stakes, whiskers, or a combination to identify the operator's facility(s) at or near an excavation site.

1. Marks in the appropriate color are approximately 12 in. to 18 in. long and 1 in. wide, spaced approximately 4 ft to 50 ft apart. When marking facilities, the operator considers the type of facility being located, the terrain of the land, the type of excavation being done, and the method required to adequately mark the facilities for the excavator. (Illustration 1)

2. The following marking examples

illustrate how an operator may choose to mark their subsurface installations:

a. Single Facility Marking: Used to mark a single facility. This can be done in one of two ways

- placing the marks over the approximate center of the facility. (Illustration 2a1) or
- placing the marks over the approximate outside edges of the facility with a line connecting the two horizontal lines (in the form of an H) to indicate there is only one facility. (Illustration 2a2)

These examples indicate an operator's 12 in. facility. When a facility can be located or toned separately from other facilities of the same type, it is marked as a single facility.

b. Multiple Facility Marking: Used to mark multiple facilities of the same type (e.g., electric), where the separation does not allow for a

separate tone for each facility, but the number and width of the facilities is known. Marks are placed over the approximate center of the facilities and indicate the number and width of the facilities. **Example:** four plastic facilities that are 4 in. in diameter (4/4" PLA). (Illustration 2b)

c. Conduit Marking: Used for any locatable facility being carried inside conduits or ducts. The marks indicating the outer extremities denote the actual located edges of the facilities being represented. **Example:** four plastic conduits that are 4 in. in diameter (4/4" PLA), and the marks are 16 in. apart, indicating the actual left and right edges of the facilities. (Illustration 2c)

d. Corridor Marking: Used to mark multiple facilities of the same type (e.g., electric), bundled or intertwined in the same trench, where the total number of facilities is not readily known (operator has no record on file for the number of facilities). Marks are placed over the approximate center of the facilities and indicate the width of the corridor. The width of the corridor is the distance between the actual located outside edges of the combined facilities. **Example:** a 12 in. corridor (12" CDR). (Illustration 2d)

Illustration 1

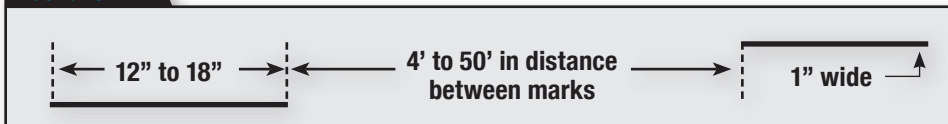


Illustration 2a1

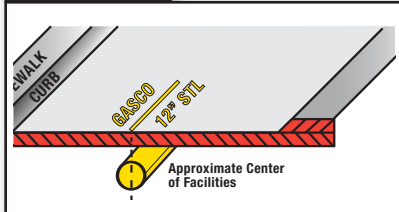


Illustration 2a2

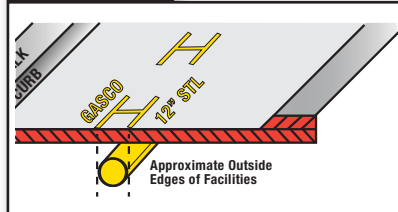


Illustration 2b

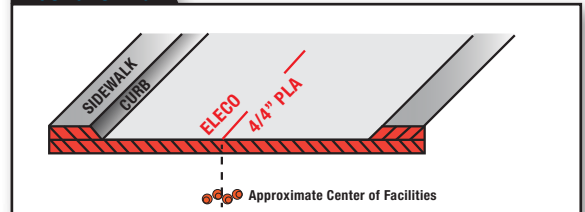


Illustration 2c

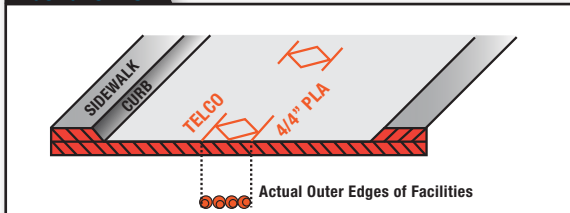
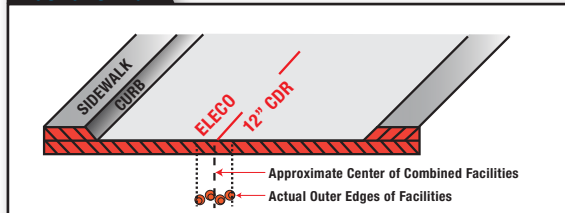


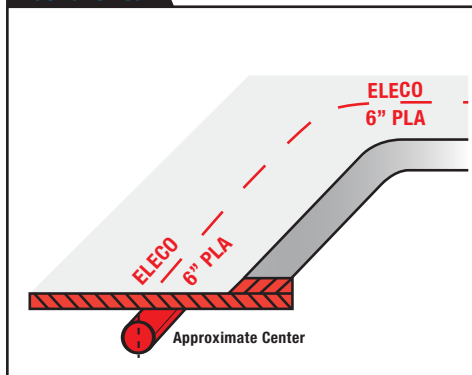
Illustration 2d



3. Changes in direction and lateral connections are clearly indicated at the point where the change in direction or connection occurs, with an arrow indicating the path of the facility. A radius is indicated with marks describing the arc. When providing offset markings (paint or stakes), show the direction of the facility and distance to the facility from the markings.

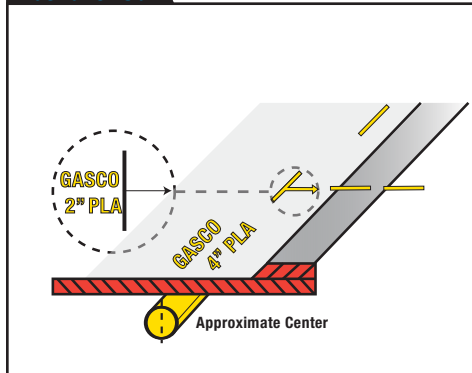
Example: radius (Illustration 3a)

Illustration 3a



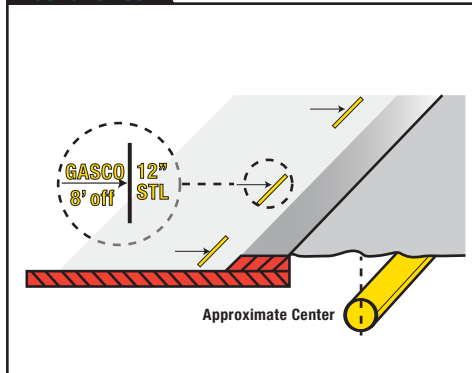
Example: lateral connection (Illustration 3b)

Illustration 3b



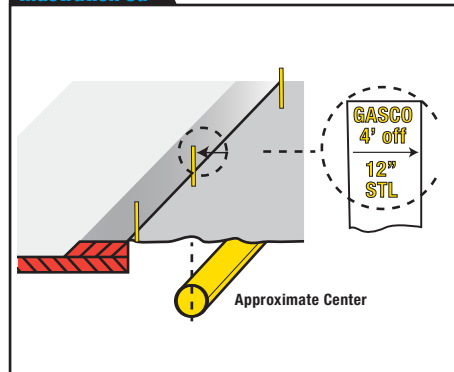
Example: painted offset (off) (Illustration 3c)

Illustration 3c



Example: staked offset (off) (Illustration 3d)

Illustration 3d



4. An operator's identifier (name, abbreviation, or initials) is placed at the beginning and at the end of the proposed work. In addition, subsequent operators using the same color mark their company identifier at all points where their facility crosses another operator's facility using the same color. Reduce the separation of excavation marks to a length that can reasonably be seen by the operator's locators when the terrain at an excavation site warrants. **Examples:**

CITYCO **ELECO** **TELCO**

5. Information regarding the size and composition of the facility is marked at an appropriate frequency. **Examples:** the number of ducts in a multi-duct structure, width of a pipeline, and whether it is steel, plastic, cable, etc.

TELCO **GASCO** **WATERCO**
9/4\"/>

6. Facilities installed in a casing are identified as such. **Examples:** 6 in. plastic in 12 in. steel and fiber optic in 4 in. steel.

GASCO **TELCO**
6\"/>

7. Structures such as vaults, inlets, and lift stations that are physically larger than obvious surface indications are marked so as to define the parameters of the structure. **Example:**



8. Termination points or dead ends are indicated as such. **Example:**



9. When there is "No Conflict" with the excavation, complete one or more of the following:

- Operators of a single type of facility (e.g., TELCO) mark the area "NO" followed by the appropriate company identifier in the matching APWA color code for that facility. **Example:** NO TELCO

- Operators of multiple facilities mark the area "NO" followed by the appropriate company identifier in the matching APWA color code for that facility with a slash and the abbreviation for the type of facility for which there is "No Conflict." **Example:** NO GASCO/G/D illustrates that GASCO has no gas distribution facilities at this excavation site. The following abbreviations are used when appropriate: /G/D (gas distribution); /G/T (gas transmission); /E/D (electric distribution); /E/T (electric transmission).

- Place a clear plastic (translucent) flag that states "No Conflict" in lettering matching the APWA color code of the facility that is not in conflict. Include on the flag the operator's identifier, phone number, a place to write the locate ticket number, and date. Operators of multiple facilities indicate on the flag which facilities are in "No Conflict" with the excavation (see the previous example).

- If it can be determined through maps or records that the proposed excavation is obviously not in conflict with their facility, the locator or operator of the facility may notify the excavator of "No Conflict" by phone, fax, or e-mail, or through the One Call Center, where electronic positive response is used. Operators of multiple facilities indicate a "No Conflict" for each facility (see the previous examples).

COLOR CODE IDENTIFIERS

WHITE	Proposed Excavation
PINK	Temporary Survey Markings
RED	Electric Power Lines, Cables, Conduit, and Lighting Cables
YELLOW	Gas, Oil, Steam, Petroleum, or Gaseous Materials
ORANGE	Communication, Alarm or Signal Lines, Cables, or Conduit
BLUE	Potable Water
PURPLE	Reclaimed Water, Irrigation, and Slurry Lines
GREEN	Sewers and Drain Lines

FACILITY IDENTIFIER

CH	Chemical	E	Electric
FO	Fiber Optic	G	Gas
LPG	Liquefied Petroleum Gas	PP	Petroleum Products
RR	Railroad Signal	S	Sewer
SD	Storm Drain	SL	Street Lightning
STM	Steam	SP	Slurry System
SS	Storm Sewer	TEL	Telephone
TS	Traffic Signal	TV	Television
W	Reclaimed Water "Purple"	W	Water

UNDERGROUND CONSTRUCTION DESCRIPTIONS

C	Conduit	CDR	Corridor
D	Distribution Facility	DB	Direct Buried
DE	Dead End	JT	Joint Trench
HP	High Pressure	HH	Hand Hole
MH	Manhole	PB	Pull Box
R	Radius	STR	Structure (vaults, junction boxes, inlets, lift stations)
T	Transmission Facility		

INFRASTRUCTURE MATERIAL

ABS	Acrylonitrile - Butadiene - Styrene	ACP	Asbestos Cement Pipe
CI	Cast Iron	CMC	Cement Mortar Coated
CML	Cement Mortar Lined	CPP	Corrugated Plastic Pipe
CMP	Corrugated Metal Pipe	CU	Copper
CWD	Cresote Wood Duct	HDPE	High Density Polyethylene
MTD	Multiple Tile Duct	PLA	Plastic (conduit or pipe)
RCB	Reinforced Concrete Box	RCP	Reinforced Concrete Pipe
RF	Reinforced Fiberglass	SCCP	Steel Cylinder Concrete Pipe
STL	Steel	VCP	Vertrified Clay Pipe

- Place "No Conflict" markings or flags in a location that can be observed by the excavator and/or notify the excavator by phone, fax, or e-mail that there is "No Conflict" with your facilities. When the excavation is delineated by the use of white markings, place "No Conflict" markings or flags in or as near as practicable to the delineated area.

Caution: Allow adequate space for all facility mark-outs.

"No Conflict" indicates that the operator verifying the "No Conflict" has no facilities within the scope of the delineation; or when there is no delineation, there are no facilities within the work area as described on the locate ticket. **Example:**



Guide for Abbreviation Use

Follow these guidelines when placing abbreviations in the field:

- Place the Company Identifier at the top or at the left of the abbreviations.
- Place the abbreviations in the following order: Company Identifier / Facility Identifier / Underground Construction Descriptions / Infrastructure Material. **Example:** TELCO/TEL/FO/PLA indicates that TELCO has a telecommunication fiber optic line in a single plastic conduit. The use of the abbreviation /TEL is not necessary, because the orange marking would indicate that the facility was a communication line; but its use is optional.
- To omit one or more of the abbreviation types, use the order described above but omit the slash and abbreviation that does not apply. **Example:** to omit /TEL, the result would be TELCO/FO/PLA. **ESG**

LOCATE REQUESTS: COVERING THE BASICS

*Originally published in the 2019 Excavation Safety Guide

1

Excavation Site Accuracy

Clearly defining the excavation site is critical when requesting a locate. The precision of this information improves the locator's ability to provide accurate marks in the appropriate space. Describing the dig site eliminates confusion. Driving directions and GPS coordinates can save time for the locator - especially in rural, newly-developed or difficult-to-find areas. Pre-marking the area with white paint or flags ensures an onsite visual for areas that are difficult to describe on the ticket.

2

Non-Members/ Private Utilities

Even if you call your One Call center for every ground disturbance you undertake, you may still have unmarked facilities in your dig site. Laws vary between states and even municipalities on who is required to be a One Call member; and the ownership of many utilities transfer to the property owner at a specific demarcation point. For these facilities, a private utility locator is necessary to indicate their location. A few visual signs of private utilities on a dig site include utility meters, signs, markers, pedestals, hydrants, valve boxes, farm taps, regulators, lighting, or irrigation taps; especially if there is no paint or flags leading to them.

3

Locate Longevity

Each state has different laws governing when the ticket request should be submitted, how long the locate ticket is valid, how soon the work must begin, and what to do if the marks become illegible. It is important to know the law for the state you are working in. Review the One Call Directory beginning on page 27 for the law in your state.

4

Second Requests: Remark/ Refresh Requests, Incomplete Marks, No-Shows

Requests for locates to remark the same location may be required for a variety of reasons. Normally these requests occur because the ticket expired before the project was completed, the initial marks were illegible or incomplete, one or more facility owners did not complete their marking with the required time or the marks were made but need to be refreshed due to activity at the dig site.

5

Emergency Locates

The exact definition of an emergency locate may vary, but this type of ticket is typically only allowed if there is a situation constituting an imminent danger to life, health, or property, or a utility service outage, which requires immediate repair or action. It is a good idea to have a clear understanding of what qualifies in your state as an emergency locate before an emergency occurs.

6

Onsite or Joint Meeting Requests

An onsite meeting is scheduled when the scope of the work may be confusing or extends over a large geographic area. It is also useful when maps, plans, and schedules need to be shared. This type of meeting also allows excavators to discuss the project and any special circumstances with all concerned parties.

Held at the excavation site, or as close as practical, these meetings normally require more advance notice than a standard locate request. For jobs covering a large area, it is normally best to segment your request into reasonable sections. Identifying these sections on a map will facilitate communication between you and the locators, facility

owners, and One Call center. Call centers often need very specific information about your excavation site to request joint meets, so be prepared before you call.

7

Design Notifications

Design notifications are done as a part of the development and preconstruction planning process to accommodate existing utilities and reduce problems during construction. Each state and/or facility owner will likely have specific policies on how these notifications are handled.

8

Tolerance Zone

The tolerance zone is a defined horizontal distance extending from either side of the outer edge of a buried utility. The exact distance of this tolerance zone varies from state to state, ranging from 18 inches to 30 inches on either side of the line or pipe, and is defined within the state's One Call law. To determine the tolerance zone for a given facility, you must know the state's law and the size of the utility. For example, in a state where the defined tolerance zone is 18 inches, the total size of the tolerance zone would be 38 inches for a two-inch pipe: 18 inches on either side of the pipe plus the two-inch diameter of the pipe itself.

CGA Best Practices call for the size of the pipe to be included in the locate marks on the ground, but caution should always be used when excavating within the tolerance zone as these indicators may be missing or incorrect.

Since locating equipment detects the electromagnetic field surrounding a pipe, and not the pipe itself, the science of locating underground facilities is not exact. The tolerance zone, therefore, serves as a warning to an excavator to proceed with care and caution while working in the area. Hand (or sometimes soft) digging is required within the tolerance zone. **ESG**



BY MICHAEL A. TWOHIG

SUBSURFACE UTILITY MAPPING USING WIDE-ARRAY MULTI-FREQUENCY GPR SYSTEMS: APPLYING MODERN TECHNOLOGY TO IMPROVE A HISTORIC PRACTICE

The streets of Culver City, California, were bustling with construction and pedestrian traffic on June 16, 1976. A public transportation project was underway to widen one of the city's streets when tragedy struck; a front-end construction material loader hit a high-pressure petroleum line, causing the gas line to rupture and form a wall of fire. The explosion poured more than 16,000 gallons of gasoline over the city streets and onto innocent bystanders. The disaster claimed nine lives and injured 26.

The subsequent investigation into the explosion uncovered the inadequacies and dangerous circumstances under which the excavation was performed. Ultimately, the failure began at the project owner level. Leading up to the petroleum line strike, there were issues with the planning, design, and construction practices. The report concluded that an 18-inch utility

location error caused the explosion. The discrepancy was a mere foot-and-a-half off from what was mapped and depicted on the construction plans; and the depth-of-cover of the pipeline wasn't communicated to the workers on site.

Safer Surveying and Damage Prevention

The mistakes made by our predecessors provide us with valuable information about project safety, including what to avoid and how to improve. While One-Call industry best practices and legislation have improved greatly in recent years, the surveying profession continues to be unpredictable. Underground surveying and mapping could benefit from the widespread adoption of modern technology and a defined Standard of Care for all projects. A few states have focused on improving Subsurface Utility Mapping (SUM), including Pennsylvania,

Colorado, and Montana. These states have laws requiring defined Standards of Care for underground mappings, such as the ASCE 38-22, replacing the older ASCE 38-02 guideline.

For boots on the ground, utilizing modern utility locating technology is critical to excavation project safety. While hand-held utility locating devices (EMI Pipe Locators) and small push-cart Ground Penetrating Radar (GPR) systems are the most widely used tools for utility locating professionals, and offer a very good, inexpensive and reliable way to collecting data, they leave workers exposed to the risk of traffic. According to a report based on data from OSHA, almost 40% of pedestrian fatalities in work zones were on-the-clock employees primarily engaged in utility and surveying work. Fortunately, mobile mapping – the technology that can dramatically reduce utility surveyors' work on

roadways and keep professionals out of harm's way – already exists.

Advancing Subsurface Utility Mapping Practices: How GPR Systems are Modernizing Data Collection

Today, there are many professionals capable of deploying wide-array GPR systems, like radar tomography, to easily locate, identify, and map underground facilities, tunnels, culverts, chambers, abandoned utilities, buried rails, and voids in busy city streets. Metallic pipelines, as seen in Culver City, are especially easy to locate and map. The wide array platform can map a project the size of Culver City in a single day and add great value to the existing composite utility files utilized by civil designers. If a wide-array system had mapped the streets of Culver City, the location and depth of the lines would have been published in the construction plans alerting contractors and subcontractors of the hidden dangers.

In the current digital world, there's no need to rely on paint and flags when highly reliable subsurface information can be processed and shared on site to augment the One-Call responders' mark outs. The early days of processing GPR data on rolls of paper are over. Today, the process is more user friendly and accessible. For example, the data collected from wide-array, multi-channel systems is accurately positioned by numerous internal and external GPS systems and wheel encoders to help position the data accurately on projects State Plan Coordinate Systems.

In many of today's wide-array systems, ten or more GPR antennas are often less than ten centimeters apart. This provides the high-fidelity required to review complex utility networks. It has become clear that using a pushcart system containing one or two antennas inside a road closure is more time consuming and costly than using a high-speed multi-array system traveling near posted speed limits in open traffic lanes. Additionally, the post-processing software provides more detail as the data can be expanded and viewed in a 3D environment. Thankfully, gone are the days of staring at radargrams on rolls of paper on a job site.

Mobile Mapping in Action

Now, let's take a look at real-life examples of mobile mapping.



Project Details: DGT was contracted by a local energy provider to locate above and below ground site conditions on North Washington Street in Boston and City Square in Charlestown.

Work Completed: We provided Subsurface Utility Mapping (SUM) utilizing mobile mapping platforms and mobile lidar. Additionally, we provided terrestrial lidar and photogrammetry to map the site conditions.

Project Outcome: DGT provided 3D utility locating and mapping to begin the compilation of a master digital utility file that included the above and below site conditions.



Project Details: To build a more robust energy grid, a leading energy provider hired DGT to map numerous city streets to help identify the most feasible route for building a new high voltage line. The final streets selected will be used to find the most feasible route to connect new and existing substations to existing power plants.

Work Completed: DGT was contracted to provide over 60 miles' worth of ASCE 38-02 Quality Level B, C and D survey data.

Project Outcome: Upon completing the Quality Level B survey, which included radar tomography, DGT presented the

findings to the design firm working with the energy provider for more detailed analysis.

Project Details: Sunrise Wind, one of the largest offshore wind farms located within the U.S., hired DGT to map the subsurface environment.

Work Completed: Utilizing DGT's mobile mapping technology to verify and enhance prior compilations of buried utilities along 17 miles of onshore transmission routes.

Project Outcome: Sunrise Wind is expected to begin operating in 2025 and will generate enough clean energy to power over half a million homes.



The Product of Modern Mapping Technology

As we learned from Culver City, one misstep in the excavation or construction process can prove destructive and fatal. GPR and similar modern mapping methods can efficiently and effectively create a map of what lies beneath, prevent unnecessary damage during subsequent development phases, and create a long-lasting record for future generations to reference.

Ready to learn more about modern mapping technology? Contact DGT. 

Michael A. Twobig is a Subject Matter Expert in Subsurface Utility Mapping (SUM). Michael has more than 38 years of industry experience across the U.S., Australia, India, and Europe, focusing his talents on integrating traditional utility locating procedures with land survey best practices. As head of SUM at DGT, Michael spearheads the firm's subsurface utility locating, 3D utility mapping, and underground utility damage prevention programs. mtwobig@dgtassociates.com

BY GREG JOHNSTON

GETTING THE MOST FROM GPR UTILITY DATA



EMI (Electromagnetic Induction) locators are the standard tool around the world for locating metallic utilities. However, EMI locators do not have the ability to find non-metallic utilities such as PVC or plastic pipes and fiber optic cables. To provide the most complete utility locate possible, GPR is now often used as a complementary tool to EMI. The critical factors for using GPR for utility-locating are:

1) The host soil must have low attenuation so the GPR signal can travel as deep as the utilities before getting absorbed. Soils with high attenuation, typically clay-rich soils, can limit penetration to 3 feet or even less in some cases.

2) The utility must contrast with the host soil enough to produce a strong reflection. For metallic utilities, this is not an issue because metal targets provide 100% reflectivity, but for non-metallic utilities, the contrast between the soil and material inside the pipe (water, gas, air) and the diameter of the utility become key to producing a reflection strong enough to be detectable with GPR.

When these two factors are met at your survey, using GPR is can be quite easy. A strong hyperbolic reflection in your data is hard to miss (*Figure 1*) and GPR data collected in grids or pseudo-grids (GPR data collected over an area using GPS for positioning) and processed into depth slices will easily show the strong response from a utility (*Figure 2*).

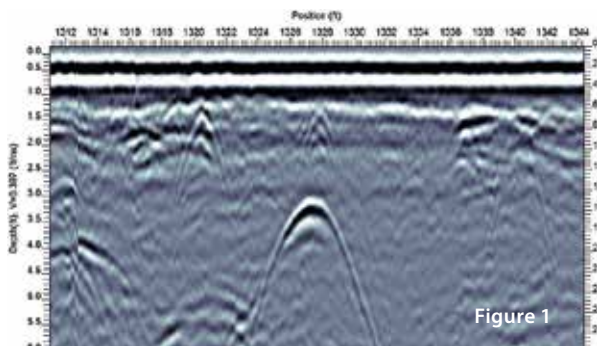


Figure 1

Figure 1: When soils have low signal attenuation and the contrast between the target and the soil is large, utilities produce strong hyperbolic responses that are hard to miss in a GPR cross-section image.

Understanding the GPR data becomes much more challenging when there are many hyperbolic responses in the survey area – varying in depth and strength. How do I go about determining which ones are utilities and which ones are point targets?

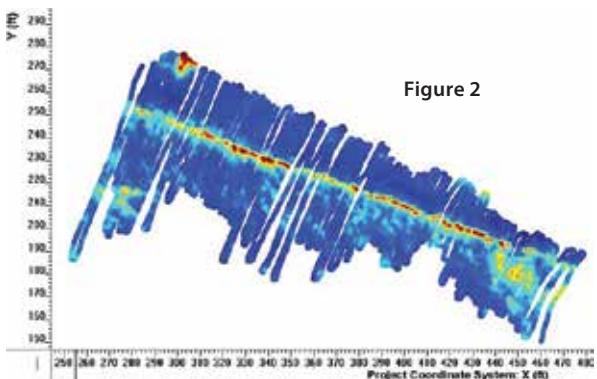


Figure 2

Depth slices may provide maps of the stronger hyperbolas, but how do I create maps of the utilities that only generate weak hyperbolas? This article focuses on getting the most out of your GPR utility data in these situations.

Challenge #1:

Too Many Targets

When there are many buried targets present, sorting out the identity of responses from utilities at different depths, oriented in different directions, and separating utilities from other targets (such as rocks, tree roots, etc.) – can be challenging. *Figure 3* shows an example of a complex multi-target GPR cross section.

Challenge #2:

Weak Targets

The strength of a hyperbola is dependent on the depth of the target, the contrast between the target and the soil and the diameter of the target. Larger

Figure 2: Strong hyperbolic responses, such as the one shown in Figure 1, show up well in depth slices. Plotting GPR data collected in a grid or a pseudo-grid (as in this example) as depth slices is very effective for mapping the path of a utility.

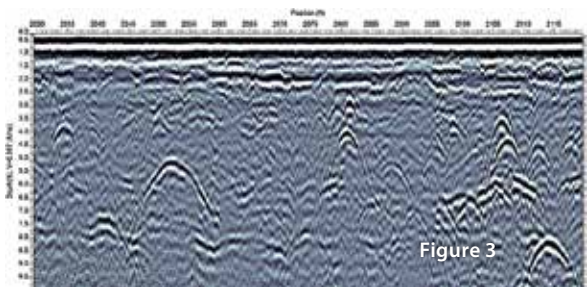


Figure 3: When there are many hyperbolic responses in GPR data, it is challenging to know which ones are from utilities and which ones are from objects of no interest to a utility locator.

diameter targets, metal targets and shallow targets generally produce the strongest hyperbolas. Not surprisingly, smaller diameter targets, non-metallic targets and deep targets produce weaker hyperbolas. In many instances, a desired target may be overlooked if the response is weak, for example, the utility at 8 feet in *Figure 4*.

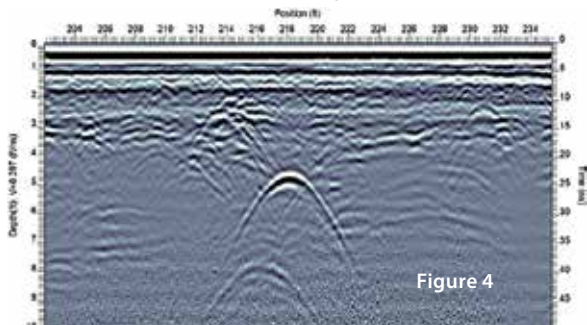


Figure 4: The weak response from a deeply buried utility such as this one at a depth of 8 feet, can often be missed if only strong hyperbolic responses are noted.

Even if weak hyperbolas ARE visible in the GPR cross-section, it is difficult or impossible for them to appear in depth slices because depth slices are maps of GPR signal strength and therefore weak hyperbolas will never appear in them like the utility in the depth slice in *Figure 2*.

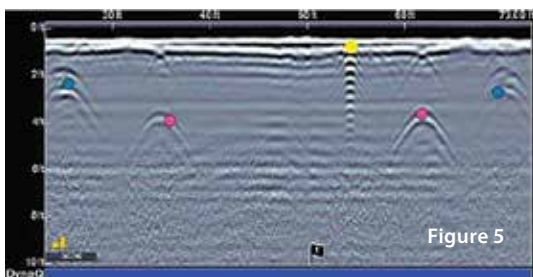


Figure 5: User marks interpretations on the screen while collecting data. (Pink – deep response, Blue – medium, Yellow – shallow).

Let's look at some strategies to help to get the most from your data in these situations.

Interpretations & Map Views

The simplest way to make weak hyperbolic targets visible in map view displays

is, during data collection, to add color-coded dots (interpretations) on all hyperbolas by touching the GPR data logger screen at the top of the hyperbola (*Figure 5*). Little discrimination is

needed – just add an interpretation to every hyperbola visible on the screen. Targets at similar depths with similar character visible on adjacent lines should be given the same color dot to start the process of distinguishing obvious targets from others. Using this methodology, attention should be given to the pattern, direction and spacing of the GPR data collection path to ensure that the survey area is sufficiently covered - the more times the GPR passes over the top of a target, the greater the likelihood of detecting it.

When displayed in a map view, the colored interpretations show patterns that are not evident in cross-sectional images alone. In the example in *Figure 6*, the blue and the pink interpretations clearly form long, generally linear lines, suggesting that these are utilities, while the yellow targets are randomly spaced around the survey area, suggesting that these are point targets – targets of no interest to utility-locators. Displaying interpretations in a map view is a powerful method for differentiating utilities from localized soil features.

Interpretations overlaid on Depth Slices

Just as color-coded interpretations displayed in a map view of the GPR data reveal the linear patterns from weak utilities that may have been missed, they can do the same thing for depth slices. Combining depth slices and interpretations is especially beneficial in areas with complex utility situations. Some point

interpretations will line up, indicating a linear object, probably a utility. Some interpretations will not line up with any others; these are from point targets and are usually not of interest to utility locators.

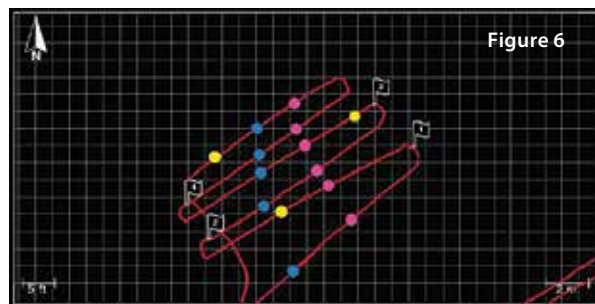


Figure 6: A map view of the interpretations added to the hyperbolas in *Figure 5*, showing linear utilities (blue and pink) and point targets (yellow).

Figure 7 shows a depth slice with and without color-coded interpretations added. The interpretations reveal a linear utility that may have been missed if the operator was relying on the depth slice image only.

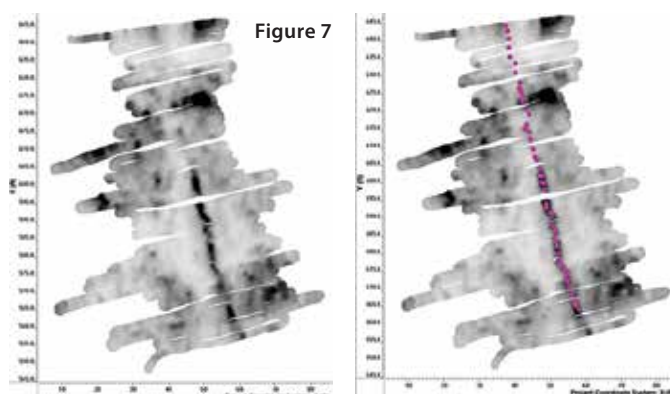


Figure 7: Depth slice (left) does not show any obvious linear utilities, but after adding interpretations to all hyperbolas, including very weak ones (right), the interpretations reveal the full extent of a utility that could easily have been missed.

Summary

Utility-locators experienced using GPR know that hyperbolas from utilities do not always appear as strong responses. A localized patch of soil with high electrical conductivity over the utility can reduce the strength of the hyperbola and make it easy to miss. Map views and interpretations are two key methods to help unravel complex sites and reveal weak responses from utilities that are often missed. Use all the weapons in your arsenal to improve your GPR data interpretations and resolve the challenging utility locating problems you face. **ESG**

BY SHANE HART, CEO, COMPETERS

Starting Your Own Locate Division as an Excavator or Contractor

Excavators and contractors can get stuck in a cycle waiting for locate requests to be fulfilled and then having projects pushed back, which not only costs time but also inflates budgets for their projects. Increasingly excavators with enough resources have been starting their own locate divisions, to solve this problem. I am going to address the benefits and drawbacks of starting up a locate division within your excavation business and then outline a plan for getting started. It should be noted that locating is a skilled profession in its own right and due care needs to be taken to not sacrifice safety for the sake of expediency.

Let's define what a locate division is, "a locate division is an internal team that can safely and effectively locate underground utilities."

If you're looking at starting a dedicated locate division as an excavator or contractor, then you probably know that it could save you vital time on your projects and potentially money, but there are additional benefits also.

"The general increase in the ratio of transmissions per million dollars of construction spending over time may be an indication of increasing 811 awareness and compliance. However, another contributor may be an issue that has generated discussion in the damage prevention industry in recent years – the use of "just in case" locate tickets. When demand is high and unpredictable, locators (contract and in-house) struggle to keep up with demand, resulting in locates being late or not getting done. In response, excavators have acknowledged requesting more locates than needed in an effort to have one jobsite ready for work on a specific start date, ensuring their crews are not idle. This adds to the total number of locates being requested without an overall increase in construction activity (or spending)." - CGA DIRT REPORT 2021

The number of locate tickets processed in the US increases every year and is forecasted to continue to increase in 2023. Creating your own locate division will help you

take control, minimize waiting times, and avoid requesting unnecessary locates. This in turn will mean you can manage project scheduling better and reduce expenditure.

In addition, diversification can be a bonus to your business and could allow you to expand your locate services in the future and offer them to other companies that aren't competitors.

In order to be realistic about setting up a locate division within your excavation or contracting company you need to think about the potential drawbacks too. Safety is the number one concern, and you need to be sure that your team will be as precise as a dedicated locating company when determining where underground utilities are located and as diligent in marking and recording these locations. You can mitigate these risks by providing the right training and tools for your team but there is also a certain level of experience which cannot be easily replicated, so it is worthwhile to

hire someone who has previously worked as a locator.

Distraction from core business activities could also be a risk, as setting up a locate division will take resources and time away from your core business activities. You may be able to justify the cost and time spent in setting up and operating a locate division by measuring the time and money lost from waiting on locates, which delay projects, but this will depend on your scale of operations.

Simply put, waiting on locates costs contractors and excavators money, but working without a locate is also dangerous and the costs there could be higher still. Some enterprising excavators have started their own locate divisions in the last few years, due to the aforementioned pressures. This article seeks to lay out a viable plan for excavators or contractors to start their own locate division.

Now that you're aware of the benefits and drawbacks of creating a locate division within your company you can start to think about how to proceed. In order to create a locate division you'll need a plan that includes:

Acquiring Locate Specific Equipment

- Team members - either dedicated or dynamic
- Education / Training for your staff
- An 811 ticket management system
- Measurable Goals

Here's an example plan:

1. Determine what utilities you're going to locate

This might seem simple, but you need to decide whether you are going to locate every single underground utility on your projects or if you're only going to do select ones. This will inform the training your team needs, the equipment you supply for them.

2. Find your Team

You need to determine who is going to be doing the locating. Several questions arise

when determining who is going to be doing the locating, and who is going to be managing office activities. For example, are you going to hire more staff? Are you going to have dedicated locators, or expect your current team to take on more duties? Does your current staff have enough time to handle more duties? How many people are going to be required?

3. Training & Education

If you're hiring dedicated staff, then you may be able to find a locator who is already trained on equipment and locat-

4. Equip Your Team

You need to acquire the tools that your locate division will need to perform their tasks. You may already have some of these, but each locator will need:

- Company Vehicle
- Mobile Phone / Laptop / Tablet
- Line Locator
- Line Transmitter
- Flags & Paint
- Signal Clamps
- A-frame fault locators
- Cart
- PPE

5. Get a Ticket

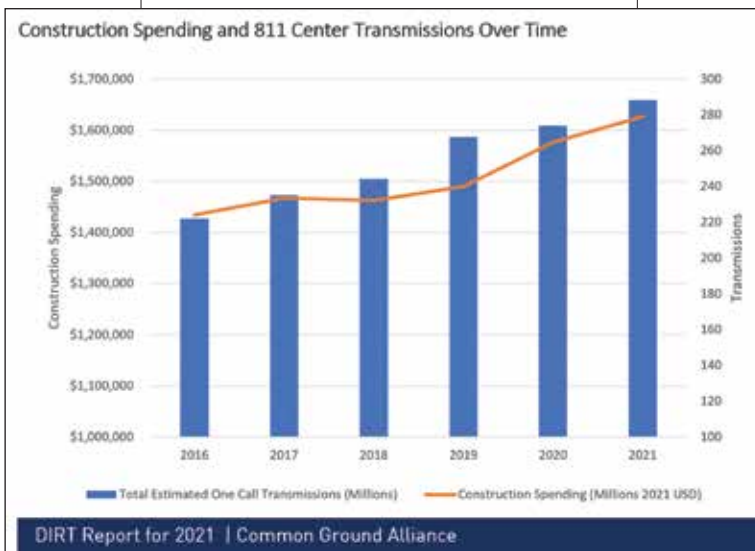
Management System

It is possible to do your locates without a ticket management system, but it's a lot more laborious and time consuming, which would contradict the reason for creating your own locate division in the first place. A good TMS will automate a lot of actions for you and simplify the process of connecting with your local One Call Center.

6. Measure your success

Your goals should align with your reasons for setting up your locate division. Measuring your goals will allow you to rate your locate division a success or a failure. Some potential goals could be: Reducing damages and/or wait times by a defined percentage. Measuring your success is made a lot easier by having a proficient ticket management system from which you can build reports and export data.

The potential opportunity to reduce waiting times for locates and speed up your projects cannot be ignored. Safety must remain the paramount concern when dealing with underground utilities, but there are ways to mitigate the risks associated with locating them yourself, including training, education, and equipment provision. If you're going to setup an internal locate division, you should aim to do it 'right'. Prioritize safety, select your team, provide them training and the tools they need and measure their success. Now is a great time to start locating, but you need to commit to reducing damages and not just time! **ESG**



ing. That would be an enormous advantage and speed up the creation of your locate division. If you want your current staff to learn how to locate then you'll need to find a course and register them for locating.

Companies like Staking University, BTS Training, and Utility Training Academy offer certification courses, which your team will need to complete before locating any underground utilities. Training costs can vary but you should budget around \$800 per employee for basic training. Some courses are done in person and some online, so you can find what works best for you and your team.

Further training may be required to up-skill your staff to use different technologies including GPR, and EM depending on what you're locating. In addition, your local Call Center might have some training available, so it's worthwhile checking with them too.

Town Hall: Late Locates CAN IMPROVED COMMUNICATION BE A “SILVER BULLET?”

BY SCOTT LANDES



Moderator: Meghan Wade, President & CEO, Georgia 811

Panelists:

- Louis Panzer, Executive Director, NC 811
- Bruce Campbell, CEO, MISS DIG 811
- James Moskal, Corporate Counsel, Corby Energy Services
- Kelley Heinz, Damage Prevention / Claims Investigator, ComEd
- Randy Bern, President/Owner, Vanguard Utility Partners Inc.

On April 14, Infrastructure Resources held our first Excavation Safety Alliance (ESA) virtual Town Hall titled **Late Locates: Partnering with Notification Centers**. The goal of our ESA Town Halls is to give everyone in the industry a voice and to provide a forum to work together towards solutions to common problems. The beauty of the ESA virtual Town Halls is that they allow people from all around the world to participate. There are tens of thousands of stakeholders in the damage prevention and excavation safety industry, but only a small percentage are regularly active in industry groups, and even fewer get to attend industry conferences where they get to exchange ideas and learn.

It was great to hear the many great ideas shared. It was also interesting to see that while some ideas were old hat to some people because of the state they were in, the same idea was an exciting new idea to someone else. In this article, I am simply sharing some of the ideas and discussions that took place in this hour-long Town Hall that came in via the chat and the follow-up survey. In order to see the full comments in their context you need to watch the Town Hall and read the Chat log, but this will cover the highlights. All the ideas may not work for everyone, but they will get the wheels rolling. You can watch the entire hour-long Town Hall and read the summarized chat log at ExcavationSafetyAlliance.com.

Here are the basic statistics:

- Over 300 stakeholders registered
- 93% of survey respondents rated the Town Hall as *absolutely impartial or very impartial*. Only one person rated it as *not at all impartial*.
- 65% of respondents rated the Town Hall as *absolutely worth attending* and not one person said it was *not worth attending*.
- 77% of attendees said they are *very likely* to attend future Town Halls and not one person said they were *not likely* to attend again.
- 69% said they were *very likely* to recommend ESA Town Halls to a peer and another 29% were *likely* to.

This is great news to me because it sounds like everyone, regardless of stakeholder group, is interested in talking about working together to improve the industry. Below are a few of the suggestions for reducing late locates both in the short term and in the long term. In order to cover more ideas, some of these comments are abbreviated. In the digital edition, and on the ESA Town Hall page, you will see expanded suggestions as well as more ideas and comments. ESA will not be recommending solutions, but we will be a place where all stakeholders can go to see solutions that do work for some people as well as new ideas, which you may find can help you.

Improving Communication: Many things fall into this category, but it was clear that improving communication and all stakeholders having clear expectations will go a long way to solving most problems:

- **Randy Bern:** We don't get to control the volume, nor do we get to control the start time. So, what we

do on an annual basis is go out and shake the trees and figure out what utilities we are going to be doing, as far as the amount of work. And we also try to talk to the excavators in the field to see what kind of work they're going to do in the coming year. So, from that, then we try to figure out what the staffing is.

- **Bill Kiger:** PA provides "Coordinate PA" with over 16,000 active projects in the four year old system. The 34 regional Utility Coordinating Committees across the state meet to discuss the active projects. PennDOT has their projects in by county for the next 12 years with weighted indications of likelihood and priority code. There are 23,000 registered users.
- **Louis Panzer:** Some of this is a process problem with a disconnect between field and office entering tickets. We have seen some success with addressing process individually to try and bridge the gap, but it is an ongoing challenge
- **Tracy Pursell:** At JULIE in Illinois, we have a group that regularly meets called our Locate Summit group. They are provided a report that recognizes those excavators calling in requests when no work is being performed. Utilities' subs are at the top of this list consistently.

Improve Map Accuracy: Facility owners can use accurate maps and shrink the footprint. This reduces the number of tickets which lowers the burden on the system, making it easier for locators to keep up. Operations provide maps and then keep them up to date. Constantly updating the maps will reduce the number of locate request over time. Accurate maps also help the locator save time and improve accuracy. Include abandoned facilities on maps so contractors do not have to stop work and request verification that the facility is no longer in service.

Electronic White Lining: Michigan uses electronic white lining which allows the excavator to choose the exact location and tighten up their buffer. They are also working with their members to improve their maps so fewer locate tickets are issued. Per Bruce Campbell, this takes the "steam off the top of the pot" making it easier for locators to keep up.

Locate Demand Management Tool: Michigan uses this to allow excavators to enter their planned start date and see the likelihood of an on-time locate. This information may allow them to modify their start date.

Scope of Work: James Moskal says that they keep their scope of work as narrow as possible to ensure the locates will be completed on time and that the locates are not requested before they are actually needed. Kelley Heinz says ComEd does the same thing and in addition to spreading out the locate workload, if the scope of work changes during the project, this also ensures the locates are being requested for the correct area.

Midnight Tickets: According to Jim Sanders with Johnson Locating Services, their tickets are due at midnight on the due date not 48 hours (or whatever the time is for the specific state) from when the request was logged. This makes it easier for the locators to plan their work knowing they have the full day to complete the request rather than having to jump all over town trying to complete tickets in the order they were requested.

Longer Ticket Life: People expressed the belief that a longer ticket life would reduce requests to remark simply because the ticket expired. Per Arch York, in Kansas, they have a 15 day ticket life and about 22% of their ticket volume are renewals. In Georgia, they increased the ticket life from 21 to 30 days. Per Kemp Garcia, Project Manager at Linescape LLC, Washington State did not have a ticket expiration date until 2013, but now tickets have a 45 calendar day life.

Narrowing Remarking Requests: Tina Brownlee, a Transportation Specialist at Clayton County, GA, suggested that when you ask for a remark, only ask for the section you need, not the complete ticket.

"Piggy Back" Tickets: Kemp Garcia indicted that some states have "Piggy Back" tickets and we are looking at that system to reduce response to tickets. If the general contractor calls in the locate, subs can fall under that ticket as long as they are digging in the same area.

Permitting Analysis: Randy Bern (locator) said that CO811 does permitting analysis and uses the information to forecast workloads for the coming year.

Areas of Continuous Excavation (ACE) Tickets: Laura Simkus, Call Center Supervisor at Before You Dig, Inc., said that in CT they have an ACE ticket that is used for properties and that excavation is a part of their everyday operations, otherwise their Routine work tickets expire 30 calendar days from issue.

Uncontrolled Volumes with Unpredictable Spikes: Up-front information to the locators, both contract locators and facility owner locators, would be a big help on fiber projects. Kelley Heinz (electric utility) mentioned some pilot projects with some large fiber jobs starting at the design phase, and there is a pilot underway in Illinois. Louis Panzer said UCC pre-construction meetings and transparency are possible when large scale work is coming.

Geospatial Boards: Brenda V. Reigle, Executive Director, NUCA Pennsylvania, suggested each state have a Geospatial Board that can look at tying in the projects for mapping utilities.


Mark Once: James Wingate, Executive Director at Underground Service Alert of Northern California and Nevada (USA North 811), said he heard some buzz about the concept of "mark once" in which the utility operators would mark a ticket only once and the excavator is responsible to maintain and refresh the markings themselves for the duration of the project. Does anyone know if that is being done anywhere? And if yes, is it working? In his opinion, the operators would have to not only mark, but also provide their plans and photos of markings, etc., so the excavator has all of the tools to maintain & refresh accurate markings.

- **Mark Bruce**, Executive VP, Hydromax USA, said that "mark once" would be solved by creating accurate maps that can be served up time and time again, fast and low cost.

- **Tabatha Waugh**, Damage Prevention Specialist at Rogers Communications in Ontario, said that Bell Canada has implemented this here. If the marks cannot be maintained due to the excavation the contractor can request a remark but at a cost to them.
- **James Moskal** indicated that a maintain the marks program has been proposed in Michigan, but has not been implemented yet. The proposal calls for excavators to be vetted to ensure they are qualified/trained to locate facilities and would allow operators to opt into the program. Hopefully, this will be piloted later this year.
- **Bruce Campbell** said maintain the marks may not work for all Industries...we are partnering with ATT and Lumen primarily for the start of the program...Natural Gas and Petro have more concerns about the program, but they are interested.

Make Locating a Career: Roy Rogers, Utility Manager at Blount Construction Company, suggests that the industry should work towards making locators an actual career legacy type job with state licensing and certification. Labor crisis has hit contractors as well, but work is not stopping and we have to find a way to bring the labor to us. We are paying higher wages and more incentives.

Singapore System: Foo Zhi Rui from Singapore, said Singapore doesn't have an 811 system, or legislation that mandates SUE. Utility detection is the responsibility of the contractor, and typically clients hold contractors liable for any strikes (essentially, lots of fines and kicking the bucket down the road). As a contractor, we are definitely feeling the squeeze on our bottom line in the current situation. This is one of the key reasons why we're looking to SUE and SUM as guidelines/inspiration to flesh out a better system in Singapore. Coupled with adopting technology (GPR and 3D scanning to supplement the current standard of EMI/EML), we're trying to push for a more accurate, and critically, a common (under)ground truth. There's still a lot of groundwork to be done, but the system in America is a great reference of what could be.

Here is a quote from a participant in our first ESA Town Hall which really summarizes the feeling of what we hope the Town Halls will reflect: **"As an excavator company, I would like to see what locators would like us to do that would help them with their work. I have a Locate Spreadsheet for updating, pausing and ending tickets, which I check every day. But can I do more? Keeping everyone safe is a team effort!"** 

Check out additional ideas and comments, along with future Town Hall Topics and how to register to participate, at ExcavationSafetyAlliance.com.

Industry Publications

811 Magazines

Now published in 9 states and growing. It is not just printing the dig safely message that gets the job done. It's about connecting with the right people. Working with the One Call systems in each state, we reach the people you're looking to reach. Ask us how we do it!



African Energy & Infrastructure

Africa Energy and Infrastructure Magazine, AEI is an Africa focused publication, conceived as a response to the skeletal information available on Africa's energy & Infrastructure sectors. AEI is one of Africa's trusted knowledge source for Energy & Infrastructure news. www.africaenergyandinfrastructure.com



American Gas Magazine

provides natural gas industry professionals with the information they need to enhance their effectiveness and that of their companies by publishing leading-edge reports on the industry and on American Gas Association activities that offer value to its members.



Broadband Communities

aims to accelerate the deployment of FTTH and FTTP while keeping readers informed on the available solutions for serving their practical needs. BC offers in-depth news, expert insights, and practical know-how on the technical, business, financial, and legal aspects of outfitting properties and communities with broadband solutions. For your free subscription, visit www.bbcmag.com.



CoatingsPro

Magazine takes a real-world look at coatings projects from the contractors' viewpoint. The magazine includes coatings on concrete and steel pipelines, foundations, and utilities. Featuring industry news and case studies to provide practical and cost-effective solutions to its 27,000+ readers, the magazine reaches contractors, applicators, specifiers, engineers, and facility managers in 16 unique market segments of the commercial and industrial coatings industry.



Compact Equipment

focuses on small and versatile construction equipment, used in markets as diverse as construction, landscaping, agriculture and private sectors. Editorial content specifically targets equipment considered to be "tool carriers," with the ability to wield an assortment of attachments – both PTO and hydraulically driven – from skid steers to mini excavators.



Construction Equipment Guide

Founded in 1958, it is a national publication and website that provides industry news; articles on construction equipment, projects and legislation; auction coverage; business profiles and events and more. CEG also has more than 100,000 new and used equipment listings from dealers and auction companies across the country, plus a full auction calendar to keep you up to date with the industry, and a historical database of equipment specs at your fingertips.



Dig Different

print magazine, along with its website and E-newsletters serve professionals involved in traditional excavation, vacuum excavation, trenching, directional drilling and boring, bursting and tunneling, using the most innovative technology.



Excavation Safety Magazine

In 2010, Infrastructure Resources, LLC launched dp-PRO. In 2023, dp-PRO has become Excavation Safety Magazine continuing to be published quarterly and reaches over 40,000 decision-makers through print and digital each issue. Dedicated to protecting the buried infrastructure and expanding the industry's knowledge on damage prevention and public awareness, Excavation Safety Magazine offers relevant and thought-provoking articles and feature written by industry professionals. Each issue offers a spotlight focus on a specific industry.



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CONOZCA LOS PELIGROS

- El gas natural y otros productos de petróleo son inflamables y queman. Si la piel está expuesta, serias irritaciones pueden ocurrir. Los gases escapados pueden desplazar el oxígeno.
- La electricidad hará descargas o cortocircuito a tierra produciendo temperaturas que son cuatro veces más intensas que la temperatura del sol. Como mínimo quemaría la piel y dañaría los órganos internos. Los altos voltajes de electricidad pueden hacer arco a distancias considerables a través del aire. Usted debe estar consiente de cables aéreos de alto voltaje y aleje cualquier parte del equipo por lo menos a 10 pies de distancia de los cables aéreos.
- El agua a alta presión pueden causar heridas graves. Las aguas residuales contienen bacterias que puede ser de alto riesgo para la salud. Los gases del alcantarillado son inflamables y queman.

RECONOZCA LAS CONDICIONES PELIGROSAS

- Los charcos de líquido, la tierra soplando, los sonidos siseantes, las nubes de vapor, los olores a gas, las burbujas en agua estancada, la vegetación completamente seca, y la tierra congelada o hielo alrededor de gasoductos/oleoductos son todas señales de escapes de gas natural o petróleo y deben de ser tratadas como una emergencia.
- Trate el contacto con cualquier cable eléctrico como una emergencia sin tener en cuenta si aparece dañado o no o si está cortado. Ésto incluye el contacto con cables aéreos de alto voltaje.
- Con frecuencia los servicios usan zanjas conjuntamente poniéndolo a usted en un mayor riesgo en las zanjas que también tienen electricidad.
- La tierra mojada o descolorida es un indicio de un escape de agua/alcantarillado y debe ser tratada como una condición de emergencia potencial.

EXCAVATION EMERGENCIES



SAFETY POSTER

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KNOW THE HAZARDS

- Natural gas and other petroleum products will ignite and burn. If exposed to the skin, serious irritations may occur. Escaping gases can displace oxygen.
- Electricity will arc or short to ground producing heat that is up to four times greater than the heat of the sun. At a minimum, it will burn skin and damage internal organs. High voltage electricity can arc significant distances through the air. Be aware of all aboveground high voltage lines and keep any part of the equipment at least 10 feet away from overhead lines.
- Water under high pressure can cause serious injury. Wastewater contains bacteria that can be a significant health risk. Sewer gas will ignite and burn.

RECOGNIZE UNSAFE CONDITIONS

- Pools of liquid, blowing dirt, hissing sounds, vapor clouds, gaseous odors, bubbles in standing water, dead vegetation, and frozen soil or ice next to pipelines are all signs of a natural gas or petroleum pipeline leak and should be treated as an emergency.
- Treat contact with any electric line as an emergency regardless of whether it appears undamaged, damaged or severed. This includes contact with aboveground high voltage lines.
- Utilities often jointly use trenches placing you at greater risk in trenches that also have electricity.
- Wet or discolored soil is an indication of a water/sewer leak and should be treated as a potential emergency condition.

EMERGENCY CONDITIONS INVOLVING UNDERGROUND FACILITIES INCLUDE:

Leaks, ruptures, explosions, fires, severe settling or soil movement, weakened or damaged facilities and similar instances where immediate action is necessary to prevent loss of life, injury to persons, or damage to property and the environment. Every situation is different and must be evaluated on the individual circumstances. Below are general emergency response guidelines for various emergency/damage situations involving underground facilities.

RESPOND IMMEDIATELY

NATURAL GAS & PETROLEUM LIQUIDS

1. Turn off equipment, if it can be done safely.
2. Abandon all equipment and get a safe distance away.
3. Avoid open flames or anything that might start a fire. Do not start motor vehicles or electrical equipment. Remove all ignition sources (cigarettes, cell phones, or anything that could create a spark or static electricity).
4. Evacuate the area and keep people out.
5. Do not make contact with escaping liquids.
6. Do not operate any pipeline valves.
7. Call 911 or your local fire, police, or sheriff's office.
8. Do not try to put out a fire. If it's burning, let it burn; ask local firefighters to observe and protect adjacent property.
9. Contact the facility operator immediately to report the condition.

ELECTRICITY

1. Only move equipment in contact with overhead or underground electric lines if you can move it away safely.
2. If excavator equipment remains in contact with electric equipment, it's safest to stay on equipment (unless on fire) until rescue workers arrive; keep others away. If you must abandon equipment, jump clear of it, landing with both feet on the ground at the same time, and then only shuffle or hop away.
3. If a buried electrical line is struck in wet soil/conditions, the ground may become energized for a large area around the strike. *(Hopping or shuffling away will help reduce your risk to step potential.)*

4. Contact the facility operator immediately to report the condition.
5. If appropriate, call 911 for local emergency response.

WATER/SEWER

1. Evacuate the area immediately and keep people out. Leaking water can fill a trench quickly making escape extremely difficult.
2. Do not close valves in order to stop flooding. Closing the wrong valve may affect fire flows and/or possible containment of potable systems.
3. Be careful of damaged high-pressure water lines because even the slightest scratch or vibration can cause pipelines to break.
4. Move carefully around trenches with wet walls. Wet soil can easily cause suffocation.
5. Avoid contact with wastewater. Do not wade in or work around wastewater.
6. Sewer gas is flammable; avoid open flames or anything that might start a fire.
7. Contact the facility operator immediately to report the condition.

FIBER/COMMUNICATION

1. If a fiber optic cable is cut, do not look into the end of it. Serious eye damage may occur.
2. Contact the facility operator and report the condition.

NEVER BURY A DAMAGED FACILITY!

Even a minor scrape, nick, cut, tear, break, or dent should be reported to the facility owner immediately. If not promptly repaired, it could result in a future leak, service outage, explosion, accident, injury, or death.

The above information is intended for educational purposes only. Infrastructure Resources, LLC and Pipeline Association for Public Awareness assume no liability for any individual's use of or reliance upon the above information. While every effort is made to provide accurate and reliable information, Infrastructure Resources, LLC and Pipeline Association for Public Awareness do not guarantee or warrant that the information is complete, accurate or up-to-date.

CONDICIONES DE EMERGENCIA que afectan las instalaciones subterráneas incluyen: escapes, rupturas, explosiones, incendios, hundimiento severo o movimiento de tierra, debilitamiento y daño de gasoductos/oleoductos/acueductos, y casos similares donde es necesaria la acción inmediata para impedir pérdida de vidas, heridas a personas, o daños a propiedad y el medio ambiente. Cada situación es diferente y debe ser evaluada individualmente según las circunstancias. A continuación se dan directrices generales de emergencia para reaccionar ante varias emergencias/situaciones donde hay daños que afectan las instalaciones subterráneas.

REACCIONE INMEDIATAMENTE

GAS NATURAL Y LÍQUIDOS DERIVADOS DEL PETRÓLEO

1. Apague el equipo, si lo puede hacer con seguridad.
2. Abandone todo el equipo y aléjese a una distancia segura.
3. Evite llamas abiertas o cualquier cosa que pueda prender fuego. No arranque vehículos de motor o equipo eléctrico. Retire todas las fuentes de ignición (cigarillos, teléfonos celulares, o cualquier cosa que pueda crear una chispa o electricidad estática).
4. Evacúe el área y no deje pasar a la gente.
5. No haga contacto con escapes de líquidos.
6. No maneje las válvulas de gasoductos/oleoductos.
7. Llame al número de emergencia 911 o llame a las oficinas locales del cuerpo de bomberos, policía, o sheriff.
8. No trate de apagar el fuego. Si está ardiendo déjelo quemar; pídale a los bomberos que observen y protejan la propiedad adyacente.
9. Inmediatamente póngase en contacto con a la compañía que opera los gasoductos/oleoductos para reportar las condiciones.

ELECTRICIDAD

1. Sólo mueva equipo que esté en contacto con cables eléctricos aéreos o subterráneos si usted lo puede mover con seguridad.
2. Si el equipo excavador continúa en contacto con equipo eléctrico, es más seguro quedarse en el equipo (a no ser que esté en llamas) hasta que lleguen los trabajadores de rescate: no deje que otros se acerquen. Si tiene que abandonar el equipo, salte lejos del equipo, cayendo con ambos pies a la misma vez, y luego sólo aléjese arrastrando los pies o saltando
3. Si hay impacto con un cable enterrado y la tierra está mojada, la tierra en el área alrededor del impacto puede estar energizada. (Reduzca el riesgo de electrocutarse alejándose saltando o arrastrando los pies.)
4. Inmediatamente póngase en contacto con la compañía que opera las instalaciones para reportar la emergencia

5. Si es apropiado llame al número de emergencia 911 para ayuda local.

ACUEDUCTO/ALCANTARILLADO

1. Evacúe el área de inmediato y no deje que la gente se acerque. Un escape de agua puede llenar una zanja rápidamente haciendo su escape sumamente difícil.
2. No cierre las válvulas para impedir inundaciones. Cerrar la válvula equivocada puede impedir que el agua pase por los ductos de agua que usan los bomberos para apagar fuegos y/o posiblemente contaminar el sistema de agua potable.
3. Tenga cuidado con los ductos de agua de alta presión debido a que cualquier leve rasguño o vibración puede causar una ruptura.
4. Muévase con cuidado alrededor de zanjas que tienen las paredes mojadas. Tierra mojada puede derrumbarse fácilmente y causar asfixia.
5. Evite contacto con aguas residuales. No camine o trabaje alrededor de aguas residuales.
6. Los gases del alcantarillado son inflamables: evite llamas abiertas o cualquier cosa que pueda iniciar un incendio.
7. Inmediatamente póngase en contacto con la compañía que opera los acueductos y alcantarillados para reportar la emergencia.

FIBRA ÓPTICA/COMUNICACIÓN

1. Si el cable de fibra óptica está cortado, no mire adentro de la punta del cable. Graves daños a los ojos pueden ocurrir.
2. Inmediatamente póngase en contacto con la compañía que opera la fibra óptica para reportar la situación.

NUNCA ENTIERRE EQUIPO DAÑADO

Nunca entierre equipo dañado como cables eléctricos, gasoductos, oleoductos, o ductos de cualquier tipo. Informe de inmediato a la compañía afectada cualquier leve rasguño, corte, rotura, o abolladura. Si la reparación no es hecha rápidamente en el futuro pueden resultar escapes, interrupción de servicios, explosiones, accidentes, heridas, o muerte.

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Industry Publications

LECTURA

LECTURA has been the leading provider of machinery intelligence on the market since 1984. Our database contains information and data on more than 170,000 heavy machinery models and provides evaluation of used machines through our online tools and digital solutions. This extensive database of equipment information attracts over 1.2 million professional visitors every month, when researching machinery before their purchase decision. Our buyer's guide represents a perfect platform to reach buyers and decision makers.



Materials Performance

(MP) is the world's largest circulation magazine dedicated exclusively to corrosion prevention and control. MP covers the latest technologies used in industries and infrastructure worldwide including protective coatings, cathodic protection, chemical treatment, and materials selection and design.



Trenchless Today

focuses on the utility and application of trenchless methods in gas distribution pipeline repair and new construction programs.



North American Energy Pipelines

is the premier publication covering the business of oil and gas pipeline construction in North America, from the shale deposits to the oil sands, and all places in between. Editorial content includes the latest news on market developments that are shaping the industry, the most efficient methods of pipeline construction and maintenance and managerial strategies that enhance your company's bottom line.



Opflow

presents new and established technologies and ideas that readers can apply to water treatment and distribution, as well as wastewater operations.



The Locator

is an annual publication geared toward line locating and ground disturbance. It is focused on CAPULC initiatives, best practices, and damage prevention topics. 2023 Highlights: Locator Stories From the Trenches, and Working Toward the Underground Facility Locating and Marking Standard!



Trenchless North America

is the flagship publication of the North American Society for Trenchless Technology (NASTT). Published three times per year, Trenchless North America is a publication about the industry featuring project and equipment news, trenchless innovations, industry personnel profiles and NASTT training and conference information.



USA HeavyQuip Journal

is the digital magazine for heavy-duty equipment and machinery specific for the US OTR machinery market. It's the digital magazine where you can find industry news, the latest in new product introductions, and a comprehensive directory of manufacturer.



Utility Contractor

is the official magazine of the National Utility Contractors Association (NUCA), the largest trade association working solely for the excavation and underground utility construction industry. Utility Contractor presents the latest and most current information affecting every aspect of the industry, including technological advancements, safety issues, important legislative developments and instructional advice and more.



Trenchless Technology

is the worldwide premier communications vehicle for the promotion and development of the trenchless technology industry. Now entering its third decade, the expanded editorial calendar provides cutting-edge information on the hottest areas of the underground construction market. 





COMPLETING THE SAFETY PUZZLE

BY WYLIE DAVIDSON



HOW MANY TIMES

have you done a puzzle in your lifetime? 20? 50? 100? At least a few times I'm sure, and if you have children that number may be even higher!

Regardless of how large or small that puzzle was, you probably started in the same way most do. Many of us start in the same way by creating the borders, finding the edges and corner pieces, and from there we work our way toward completing the image. Often referring to the box top for guidance.

As safety professionals, we often approach our safety programs the same way: start with the basics and then focus on the rest. For many of us, we are at the tipping point. We have the corners and sides in place. We have most of the image figured out with our policies, procedures, guidelines, and our proper gear and equipment. What we are missing are the few last pieces of the puzzle to make it complete. Those missing pieces are what we personally bring to the puzzle: the pieces that define who we are and what is most important.

One of the toughest challenges we face in attempting to create, grow, and sustain a positive safety culture program is getting our employees to buy into the program, to comply and engage. Compliance and engagement are the standards we use to measure how well our safety programs track with employees, but a standard we often find more important is how much an employee wants to comply and engage. So, how do we close the gap between asking them to be safe and them intrinsically wanting to be safe?

It's simple. We need to make safety

personal. We need to help them determine who and what are most important to them. Placing those pieces in their own personal safety puzzle empowers them to create their own safety legacy.

Let's face it, we will all leave a legacy, good or bad. We don't really have a choice in that fact. We do have a choice however in the type of legacy we leave. Making the conscious choice to start creating a positive safety legacy is the first step. A lot of what will create that legacy is formed by our character, how we act and treat others – and our competence, what we bring to the table every day.

your character, and the impact you made on those around you. It's ironic because the dash is so small, but it means so much. He encouraged people to "live your life on the dash" because that's where you do your living, make your impressions, and ultimately where you will leave your legacy for others to follow.

The goal is not to live forever. We all know that's not going to happen. The goal is to create something that will live forever; a legacy for others to follow. Make yours legendary!

So how do we complete the puzzle?

We start by finding the passion to comply and engage. By determining who and what are most important to us and by placing them in our own personal safety puzzle, and by leaving a legacy that others will follow and look up to.

When you're not sure why you should work safely or start to lose focus, take a step back and refer to your own personal puzzle box top for clarification. Everything you need to know about leaving your own safety legacy is right there between the corners and edges. **ESG**

Wylie Davidson is the founder of Legacy Safety Solutions, a safety and leadership provider with a focus on personal behavior in and away from the workplace. As a motivational speaker and safety culture specialist, his ability to energize

audiences while getting them to realign their personal values to better connect with company safety standards has been an effective resource with hundreds of companies and conferences all over the United States, Canada, and Mexico.

For more information on how to contact Wylie or read more of his content, please find him at: <https://leavingasafetylegacy.com>

TOP 5 Pieces to Your Safety Puzzle Legacy

1. Know Your "Why"

What means the most to you? Your family, your quality of life, your future

2. Know Your Value

Know your role in what makes up your "why" and the impact you have on them

3. Know What You Can Give Back

Identify ways you can share your knowledge and experience with others, both on and off the job

4. Unleash the Energy

Put forth the energy to share your knowledge, mentor others, and lead by example

5. Constantly Keep Building

Continually build, share, and grow your own legacy

Now, no one likes to discuss dying, especially in a safety magazine. Many may find it counterintuitive, but I recently attended a service for a lifelong friend of mine whose father passed away. At his service the pastor spoke of his life, his accomplishments, and his character. He said it's not the dates on the tombstone that make a difference, but it's the "dash" in between. Your dash represents everything you've done in your life, your accomplishments,

With our members, jobsite safety is paramount. Bluntly put, excavations can injure or kill, so nothing is more important than keeping everyone safe on a worksite.

The National Utility Contractors Association (NUCA) prides itself on its top member benefit: their safety programs offered to members. Safety must be a vital component of every utility construction jobsite and across every employee activity.

The program evaluates a company's safety program in four core areas: Leadership, Records Management, Culture, and Procedures. Under these areas are subsections scored on a point system meeting specific guidelines that a company must meet for each category.

Leadership is extremely important in a company's safety program. Company executives must be involved across the company's safety culture and support its programs and goals. The evaluation also includes

procedures and policies, safety rules and policies, toolbox talks and employee safety training, inspection processes, personal protective equipment procedures, and vehicle and mobile equipment procedures and policies.

Records and Data Management is measured through a company's documentation procedures and their organization. This includes maintaining accurate and current records for OSHA injury and illness, company safety

NUCA STAR CASTS LIGHT UPON THE EXCAVATION INDUSTRY'S SAFE JOBSITES

BY ROBERT BAYLOR,
NUCA DIRECTOR OF COMMUNICATIONS



Beginning in 2022, their leadership introduced the NUCA Safety, Training, Awareness, and Recognition (NUCA STAR) program. The NUCA STAR program was developed by the association's Safety Committee to help evaluate, update, and recognize a member company's safety program and practices.

The NUCA STAR program is rapidly becoming a carefully focused analytical tool to aid NUCA member companies in evaluating, updating, and recognizing their company's safety program and practices. Members who volunteer to participate should see lower incident rates and accidents on their jobsites and in their company facilities.

The program allows every company in the American utility construction industry to measure the effectiveness of their safety program against industry benchmarks and recognize how their program could be improved. The NUCA STAR program categories of Bronze, Silver, Gold and Platinum allow companies to review their processes and evaluate their safety program's strengths and potential areas of improvements.



carefully examining the company existing safety mission statement, safety procedures, safety training and allocated resources, and individual employee safety evaluations and performance reviews.

Culture is measured through analyzing employees' engagement in safety awareness, a company's substance abuse and awareness program, leadership safety meetings, new hire orientations and training, and the company's safety program goals and reviews.

The Procedures category includes questions about a company's accident and incident investigation process, incident response



training, equipment inspections, incident investigations, and overall company safety recordkeeping policies.

The NUCA STAR program is available year-round for members and non-members to use. Submissions for the program can be made at any time during the year.

Once a company's application is submitted to NUCA STAR with all supporting documentation, the NUCA STAR Review Board will

have 10 business days to evaluate the application. The Review Board will consist of four members of the NUCA Safety Committee. Since the program started, several industry safety programs have been evaluated. Two have been awarded the top Platinum Level status. One of them is Petticoat-Schmitt

Club to further the association's educational and training programs. A detailed outline of the NUCA STAR program is available online, along with the application.

"NUCA STAR has the promise to deliver an improved safety envelope for both each NUCA member and the entire utility construction industry," said Flowers. "NUCA members can promote for bids and labor needs their company's safety culture through NUCA

training programs coming in 2023 to help the industry keep their employees safe in the trenches. NUCA will put a stronger focus on our Train-the-Trainer program, seeking to host a class in each of the five NUCA regions. The idea behind this expansion is to train as many Competent Person and Confined Space Instructors for the industry. This would allow members more flexibility in training more "boots on the ground" employees. NUCA also will be offering in 2023 a Project Management Course. This will be a 4-day course and is designed for more senior leadership personal. NUCA is also in the early stages of implementing an Apprenticeship Program that will hopefully be available in late 2023 to early 2024.

OSHA reported that in the first six months of 2022, 22 workers have fallen victim to the deadly hazards present in trenching and excavation work – surpassing the 15 fatalities reported for all of 2021. NUCA supported OSHA's actions in early July for increased safety regulation enforcement at excavation sites.

NUCA and the utility construction industry members seek out every measure possible to reduce risks on our jobsites, which we all know can be a dangerous place to work if someone is unaware of its hazards.

"Time and time again, evidence shows that the key to significantly reducing the risks

associated with our industry is employee training and reinforcement through safety events and program evaluations," concluded Flowers. "NUCA STAR can be the detailed checklist a company needs to appraise if it seeks to install a culture of safety into their workplace."

Non-members have access to NUCA STAR. However, with a NUCA membership a company gains additional access to NUCA's elite educational program, technical assistance, and training programs to ensure that they are protecting their most important investment – their employees. **ESB**

More information about NUCA STAR can be found at nuca.com/nucastar.



Civil Contractors of Jacksonville, Fla. "Congratulations to Petticoat-Schmitt," said Mike Flowers, NUCA's director of safety, education, and training. "Their safety program is a shining example of a company that puts an emphasis on jobsite safety. Their leadership's strong leadership commitment and support ensures that their employees make it home safely when the working day is through."

Their company leadership found the program to be very helpful for their existing procedures. "Benchmarking ourselves against our NUCA partners and raising awareness for better practices in the industry are qualities that make NUCA's safety programs great," remarked Kirk Blomgren, safety VP at Petticoat-Schmitt.

There is no fee to participate in the NUCA STAR program, but members can make a donation to the NUCA Safety Ambassador

STAR's standardized industry rating system. Making jobsite safety a top priority will attract and retain employees who see that the company recognizes the importance of a safe working environment."

NUCA's safety programs also include the annual Trench Safety Stand Down, which saw in the June 2022 event 23,007 employees participating in a training event held by 345 companies on 1,978 jobsites across the nation. The association's safety program includes company crew leader training opportunities, as well as an ongoing Train-the-Trainer program for advanced industry safety professionals.

NUCA also has several new safety and

PIPELINE TASK FORCE

BY KARIN STRUB

How many of you think of yourselves as an excavator who has a need for a maritime ticket? I began attending Pipeline Task Force meetings believing our focus would be coastal states and large waterways. The biggest take-away has been a “waterway” is any water: stream, creek, river, lake, ocean, marsh. Landlocked states should be just as engaged because if there are utilities below, a marine ticket should be created, and proper considerations need to be taken.

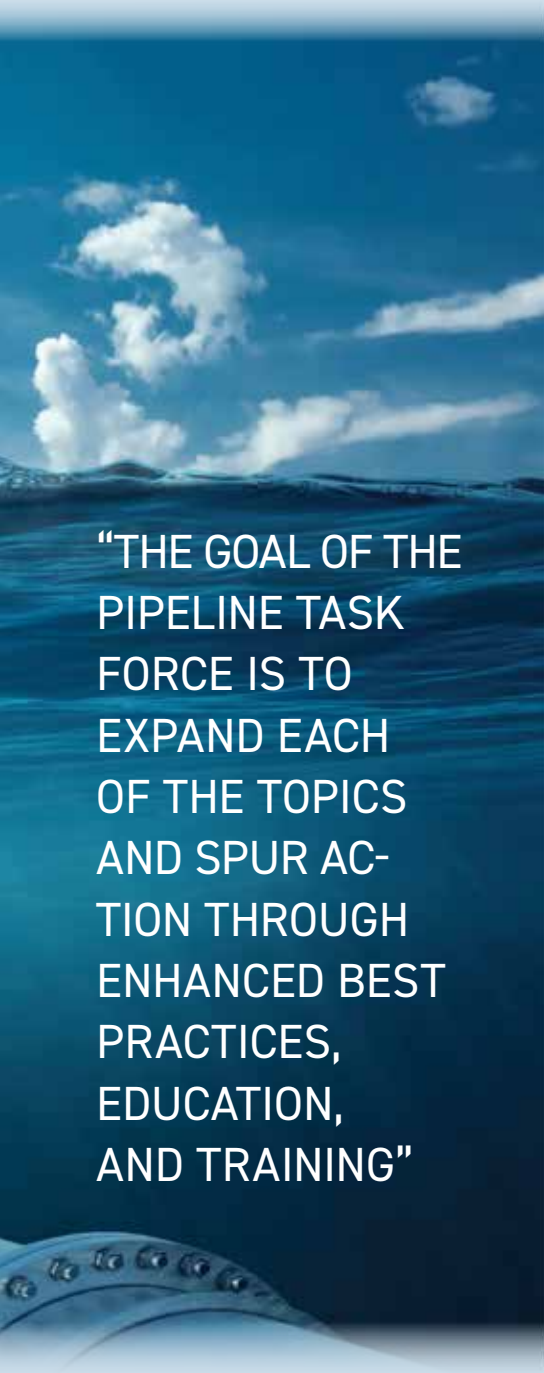
The Council for Dredging & Marine Construction Safety (CDMCS) is the leader

for raising safety standards and promoting a safety-first culture supporting American maritime infrastructure and the wellbeing of maritime workers coast-to-coast.

A subset of the CDMCS is the Pipeline Task Force; a joint inter-agency, public-private initiative focused on ensuring safe operations in waterways with submerged oil and natural gas pipelines through enhanced communications, collaboration, and exchange of best practices among all stakeholders. Preventing loss of life, injury and environmental pollution, and

destruction of assets is the mandate and focus of the Pipeline Task Force.

Co-Chaired by Devon Carlock, President of CDMCS, and Ed Landgraf, Pipeline Safety Director of CAMO and Texas811, in-person Pipeline Task Force meetings take place quarterly. The June 2022 meeting took place on the 23rd Anniversary of the pipeline rupture in Bellingham, Washington. With an at capacity room, a moment of silence was observed to honor the young men killed, Liam Wood, 18, Wade King and Stephen Tsiornas, both age 10; a somber moment that reinforced our purpose.



“THE GOAL OF THE PIPELINE TASK FORCE IS TO EXPAND EACH OF THE TOPICS AND SPUR ACTION THROUGH ENHANCED BEST PRACTICES, EDUCATION, AND TRAINING”

The Pipeline Task Force working group consisted of over 50 diverse participants representing the dredge, marine construction, 811, pipeline, PHMSA, NTSB, and US Coast Guard sectors.

The agenda for the June meeting discussed the National Transportation and Safety Board (NTSB) findings from the August 21, 2020, Corpus Christi incident that killed six crewmen after a cutter suction dredge struck a propane pipeline in the Inner Harbor. The gas ignited, causing an explosion aboard the dredge. NTSB investigators recently released

their findings outlining events leading up to the Port of Corpus Christi dredge explosion. The NTSB report finds the incident was caused by a series of events that began when the dredge vessel hit an underwater propane pipeline and ended in the deaths of five of its crew and others injured after the dredge originally caught fire. The report continues to give an account of the fire reigniting later that night, precipitating the dredge sinking overnight. Pieces of the pipeline and the barge have been transported to NTSB labs for further examination.

The team evaluated the NTSB findings, recommendations, current dredge and pipeline company positions and captured feedback from the Pipeline Task Force stakeholders resulting in over 40 proactive suggestions. A consensus was reached to expand on key topics to enhance safety and reduce risks.

The goal of the Pipeline Task Force is to expand each of the topics and spur action through enhanced best practices, education, and training with the hope of being recognized as consistent national practices across the Dredge, Marine Construction, Pipeline, Regulatory, 811, and Agency stakeholder groups. The following meeting saw breakout task teams formed to dive deeper into the key topics identified.

Key Topics:

- Enhanced Training and Education
- Modify Marine Tolerance Zones
- Mapping, Survey and Marking
- One Call, Damage Prevention for Underwater Excavation, Communications and Planning
- Communications, Project Design and Planning

Enhanced Training and Education

Craft messaging to reinforce assumptions for a location of a utility cannot be made. Are all involved in the project aware of all equipment used? Discuss utility hazards and responses to them, emergency and otherwise. Recognize there are multiple definitions for an Emergency Shut Down (ESD) and steps that may be taken so a consistent standard will help all involved. Provide training with the Notification Centers to detail how to utilize 811 while discussing what it is, and more importantly, what it isn't.

Modify Marine Tolerance Zone

Create state agency recommendations that may be standardized from state-to-state. While there is no guidance for Federal waterways, CDMCS recommends 75'. Work to increase engagement and communications between all parties which includes Emergency Shut Down (ESD) definitions and requirements. No initiative would be a success without training; the Tolerance Zone Committee hopes to promote training between mariners and Notification Centers.

Mapping, Survey, and Marking

Engaging the Corps of Engineers for accurate utilities mapping processes is an imperative to enhance safety and damage prevention. Utilizing the best technology available for survey is a key component for mapping and marking lines. Share information through shared GIS data so all parties have consistent information for a heightened level of safety.

One Call, Damage Prevention for Underwater Excavation

Create a standard marine environment / waterway ticket using language developed by utilities, marine operators, heavy constructors, and Notification Centers. Develop specialized personnel within each of those organizations to become well-versed in handling waterway tickets.

Communications, Project Design and Planning

Take a back-to-basics approach and begin the conversation at the beginning. Do people know how dredging and marine equipment operates as it relates to utility safety? Do people understand their utilities may be impacted simply from the displacement of water? By focusing on front-end communications, they will work to involve the correct stakeholders.

The goal of the PTF is to expand each of these working groups to spur action through enhanced best practices, education, and training with the hope of being recognized as consistent national practices across the industry. **ESG**

*To learn more about the CDMCS PTF visit: <https://cdmcs.org/pipeline-task-force/>
To learn more about the Pipeline Task Force and Pipeline Safety, visit: www.camogroup.org or <https://cdmcs.org/pipeline-task-force>.*

BY ANJU SURESH, HINSHAW & CULBERTSON LLP

The Legal Process of a Damage Suit



Even the best excavation business can cause damage at some point during its operation. While it won't eliminate the pit that develops in your stomach upon learning that you or your company are the subject of a lawsuit involving a damage incident, knowledge of the litigation process will hopefully move you past the fear of the unknown and directly into addressing (and hopefully resolving) a damage claim.

Summons and Complaint

A damages lawsuit, like any other lawsuit, begins with the service of a Summons and Complaint. The person or company making the claim (the "plaintiff") must have the Summons and Complaint served on each individual or business from whom the plaintiff seeks payment or other relief (the "defendants").

The Complaint outlines the facts of the alleged incident and resulting damages

should document any conversations notifying your insurer about the Complaint with written confirmation, if that is required by the terms of your policy. If you have any doubt as to which policy might cover the claims asserted in the Complaint, contact your insurer(s) and let them sort it out. The insurance company will review the Complaint, determine if you have insurance coverage for the claim, and, if you do, will usually hire an attorney for you to evaluate the claim and defend through litigation, if necessary. Be sure to inform the insurance company of your response deadline during each conversation you have with them so that all evaluations are undertaken in a timely manner.

Consult an attorney

If you don't have insurance, or if your insurance doesn't provide coverage for the particular claim made in the Complaint, your next call should be to a qualified litigation

information, documents, and (sometimes) testimony regarding the incident facts. And then there are those claims that require the entire litigation process, through discovery, mediation, and even trial, before a resolution can be reached.

Many Complaints are resolved through alternative dispute resolution (ADR) programs such as mediation or arbitration. Mediation is a process where the parties meet with a mutually selected impartial and neutral person who assists them in the negotiation of their differences. Arbitration, on the other hand, is a procedure in which a dispute is submitted, by agreement of the parties, to one or more arbitrators who make a binding decision on the dispute. Your attorney will determine whether ADR is mandatory or voluntary. Some local and State courts require parties to participate in ADR, such as mandatory mediation programs. Mediation

“Simply put, the best thing you can do to protect your business when faced with a lawsuit involving a damage incident is to seek immediate assistance from your insurer and attorney when the Complaint reaches your doorstep”.

and identifies the legal basis for plaintiff's damages claim. The Summons specifies the deadline by which a defendant must file a formal response to the Complaint.

Once a defendant receives a copy of the plaintiff's Complaint, there are a few simple steps that should be taken each and every time to ensure the lawsuit is appropriately handled. It is quite important to keep in mind that these steps must be taken quickly, because often a defendant must file its formal response by the deadline identified in the Summons, which can be as little as twenty days after receiving the Complaint in some States. Failing to meet the deadline can result in a judgment for the plaintiff in the full amount of all payment demanded.

Consult your insurance companies

With a Complaint in hand, your first call should be to your insurance company. You

attorney. Gather and provide the attorney all documents and information you have relating to the case. The attorney will review the allegations in the Complaint, discuss your understanding of the history behind the incident, evaluate any relevant contract provisions between you and the plaintiff that may impact certain procedural aspects of the lawsuit, and will advise you on the next recommended steps.

Resolving the Lawsuit

It is at this point in the process where each damage suit takes its own path. Some Complaints can be settled quickly and informally, needing only a few phone calls between your attorney and the attorney for the plaintiff. Other matters may take some more time and be resolved either informally between lawyers or more formally through a mediation, after the preliminary stages of litigation and the exchange of

and arbitration may also be mandatory if there is an agreement between you and the plaintiff that includes a provision requiring mediation or arbitration of plaintiff's damages claims.

Simply put, the best thing you can do to protect your business when faced with a lawsuit involving a damage incident is to seek immediate assistance from your insurer and attorney when the Complaint reaches your doorstep. They can guide you through the litigation process and keep you apprised every step of the way so that you can do what you do best - focus on your business. **ESG**

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DEVELOP AN EXCAVATION

Laws and rules on underground workplace safety have been around since the 1980s. So have different versions of OSHA's National Emphasis Programs on Trenching and Excavations. These typically short-term emphasis programs are now over 37 years old and are not going away. Still, cave-ins happen and there are serious consequences for the health and safety of impacted employees. 2022 has not been a good year when it comes to trench collapses, even with the laws and programs. Why does soil collapse still happen? If the rules have always been there, then it just might be the chosen behavior of those with the responsibility of enforcing their company policies to follow the rules. Our industry needs to get better. We should all consider some changes that may help reform our safety culture. What might that culture look like?

An excellent safety culture might include:

- **A company safety policy, written:** Make sure to have a thorough, written policy that outlines the responsibilities and practices to be followed. A company policy cannot allow activity outside of the law. Know what the laws are and that the law requires the employer to designate a properly trained

competent person to be on the job, to make the right decisions to protect employees exposed to excavation hazards.

- **Effective and ongoing safety training:** Every employer is required to provide his employees with workplaces free from recognized hazards, and must comply with all rules found in the excavation standard. Each employee is to follow those rules. Ensure that the training that your employees need comes from a knowledgeable source that can clearly, and accurately, communicate what the safety regulations are. Reinforce the training at every opportunity.

- **A clear, demonstrated commitment to safety:** Eliminate double standards, and show that safety rules are not to be selectively enforced. A rule for an employee is a rule for the CEO. When bidding on underground work, build the protective systems needed into the projected costs. This sets clear expectations that there is a commitment to a plan for the protection of the employee.

- **Accountability:** A robust safety culture may include repercussions for non-compliance. First offenses for minor issues will carry a different consequence than a violation of significance. To look past the absence of a protective system in a trench sends a signal that the decision not to protect employees is acceptable. Ensure that you have a properly trained competent person to know what the laws require, and give that person the authority to eliminate any observed hazards.

- **Encourage worker involvement:** Involving all team members in the creation and implementation of a safety program can go a long way toward the buy-in and participation of the safety practices.

- **Stop-work authority:** Give workers the authority and responsibility to stop work if a task or situation presents danger to themselves or others. A competent person may not always be on a trench job at all time. Train all of your employees on the hazards



SAFETY CULTURE

BY JOE WISE & BRUCE MAGEE

of underground work, and empower them to stop any activity that does not conform to the training they have had. This will help instill a touch of ownership, and a teamwork approach to their sense of responsibility in your safety culture.

The right protective equipment.

Having the right protective system in place is critical, but do we all know what is right, and when it is required? A protective system is required at all times when an excavation is 5' or greater in depth; there is also a requirement for a protective system at shallower depths if the competent person observes the potential for a cave-in.

There are four types of OSHA-compliant protective solutions available – sloping, benching, shoring and shielding – and it is imperative that contractors know what questions to ask and how to choose the most effective system for a particular jobsite.

Understanding the soil is the first step to selecting the proper protective system. The competent person will have to determine many things, including whether the soil is cohesive or granular. Other questions to answer will include whether water is present, or whether the site subject to unique surcharges or vibrations. Water, surcharges and vibrations will have an adverse effect on the way the soil behaves.

The competent person is required to identify existing and predictable hazards,

and must be authorized to take corrective measures to eliminate them. This person must have training in, and be knowledgeable of, soils, acceptable protective system options, and the requirements of the standard. If the competent person recognizes that there is a cave-in hazard, and there is a deficiency in the protective system, then they have a duty to discontinue work and correct that issue.

Team and subcontractor alignment

Working with subcontractors is commonplace. Keep in mind that their behaviors in trenches and excavations could affect the safety of all workers and teams onsite. Subcontractors perform work for, at the pleasure of, and in the place of, the general contractor. It is not okay to look past safety infractions on their end. To dismiss an infraction on the part of a sub will also send that double standard message to your people, and will undermine the development of your safety culture.

To help ensure your subs are aligned with trench and excavation safety, here are some considerations:

- Make sure every subcontractor on your jobsite understands and complies with relevant safety rules and regulations. Set expectations that all rules and laws will be followed.

- Each employer is required to provide their own competent person, and their employees are required to follow all safety rules. It is smart to be knowledgeable about what your sub is supposed to be doing, but make sure each employer has their own competent person.

- Meet with the subcontractor prior to excavation work to ensure that proper consideration has been given to pending excavation work.

Misunderstandings around excavation safety protective systems

At times, it is helpful to get advice and guidance from seasoned field specialist. In the case of trench and excavation work, make sure that the source is knowledgeable of the law. When it comes to underground work, there are a number of mistaken beliefs that are repeated. Know that repeating them never makes them right.

It is common to hear that the only time an engineer's approval in excavation work is required is when the trench is 20' or more in depth – and that is not correct, in that that is not the only time. An engineer's approval is required when the excavation is greater than 5' and the contractor is using something other than the OSHA-supplied charts, or is deviating from the OSHA charts. Let's break this down.

OSHA tried to make things simple, and gave engineered data and charts for sloping/benching systems, timber systems, and aluminum hydraulic systems, for anyone to use, provided that the user did not deviate from the plans and charts. OSHA stipulated that the depth limits of the various methods would be 20', and that all other restrictions found in these OSHA appendices are followed. However, if there were a deviation from any limitation, then written approval from a PE would be required. Even at less than 20'.

What is the "something other than the OSHA-supplied charts" mentioned previously? These things could be vertical shores,

consider this – if you deviate from the manufacturer's tab data, you need specific approval from a PE. What type of deviation do we mean? Placing a road plate across the end of a trench box, or using a system with a greater-than-allowed surcharge (from the spoil pile, construction equipment, or other sources), are examples of deviations often taken, not allowed by the manufacturer's tabulated data, requiring written approval from a PE. This deviation must be approved by a PE, even if the depth of the excavation is less than 20'.

How about things that are manufactured by a company for distribution that does not have the manufacturer's tabulated data? Road plates, beams, and corrugated interlocking

supports, these would be instances requiring the written approval of a PE. The PE assesses the soil at the site, surcharges in adjacent areas, and other factors, and from that determine how these individual parts can be used together to build a protective system. This analysis is required at any depth, not just greater than 20'.

Safety as a Core Value: Invest in Safety, Invest in Your Employees

Safety should not be a priority, because priorities will change. Make safety a core value. A core value is principle that cannot be changed by external influence. A safety culture will not happen with the stroke of a pen. Instead, an enduring safety culture will develop when all employees see that safety is non-negotiable, no matter who you are in an organization.

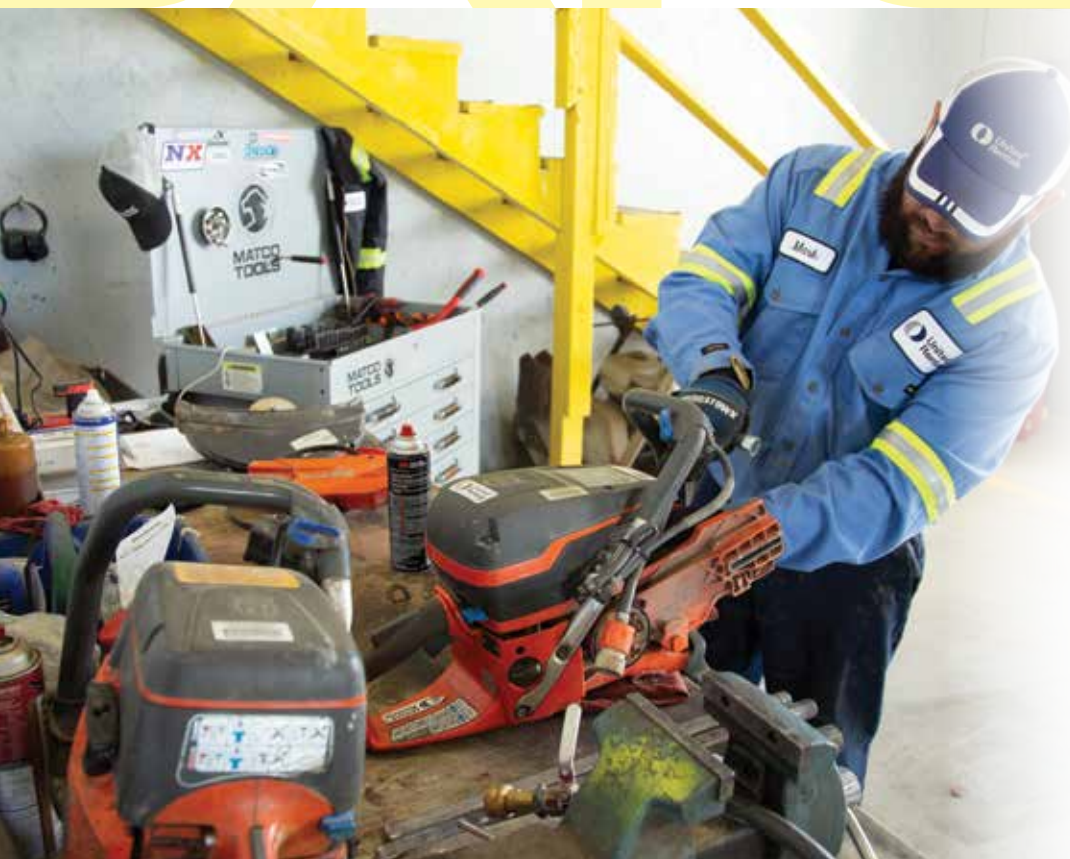
Invest in quality products for employees. Whether it is training or equipment, there are varying levels of quality – get your team the best. This will send a powerful message, that there is a serious effort to deliver the essential knowledge, and gear, to do the job right.

Training should not just be for the field employees. Estimators need to be trained in what is required and when it is needed, so the bid can be properly completed. Construction managers need to know the "why" behind the requests from their staff so that they can support their superintendents. All levels of management need to know why the investments are required; otherwise, they might conclude the investment is unnecessary.

"Too often, employers doing this type of underground work think a trench collapse won't happen to them," said Joe Wise at United Rentals. "But it can happen, it has happened, and it will continue to happen until employers commit to safety as a core value, employee training, and necessary equipment to keep workers safe. Employers with a thriving safety culture have a far greater chance for going home each night and avoiding these unnecessary trench accidents." **ESG**

trench boxes, or other things manufactured by a company for distribution. These manufactured things often come with the manufacturer's tabulated data. This data, approved by a registered professional engineer, provides generic engineering for generic work, typically with limitations or restrictions on surcharges, groundwater, depth limits, width limits, placing plates behind boxes, and so on. The manufacturer's tab data will describe how the assembled parts will work as a system. Now,

or overlapping steel sheeting are common examples of these things. To be sure, there is data on these things that reflect the structural strength properties, but be aware that there is no generic tabulated data for any of these that give the stand-alone guidance that the manufacturer's tabulated data offers to create a protective system. If you were to want a cantilevered wall that could be built with beam and plate, or a cantilevered sheeting wall, or even a braced sheeting pit with welded beam





Q:

What is the “Danger Zone” when a Gas Line is Fractured?

A:

By David Heldenbrand, Bison Engineering, Inc.

Data has been collected that shows that a Danger Zone exists after a gas line has been fractured. While it is challenging to determine the severity of a fractured gas line leak before the leak is located, data has shown that very few fires or explosions occur past a 50-foot radius from a significant gas leak.

This information can be highly beneficial to operators, construction workers, HDD crews, fire departments, and any other first responders. Buildings or structures within this radius are more likely to be subjected to a fire or explosion than buildings located farther away. Safety and evacuation decisions can be prioritized quickly and confidently with this information.

There are a number of factors that have been theorized to cause a building to explode from a gas leak, but examination of the data from hundreds of NTSB reports and other studies have shown that fires and explosions, even from a major leak, more than 50 feet from a building are rare. Obviously, the closer the leak is to a building, the more likely the


building is to be affected. Structures closer than 50 feet are more likely to be affected, but buildings farther than 50 feet are less likely to be affected.

Bison Engineering, Inc. has studied these issues for more than 30 years. Many people have theorized numerous issues and causes, but little data has actually been sorted and compared until now. Damage prevention to all underground utilities is very important, but serious consequences can result when a gas line is impacted. Reducing risk exposure to people and structures is of utmost importance. Collecting and utilizing the correct information is critical.

It is interesting to note that distribution pipeline pressure and the distance from the leak to the affected structure is relatively independent of the initial pipeline pressure within the range of distribution line pressures. It is also interesting that data that has been collected shows that relating soil type and the distance from a leak to a structure fire or explosion is, similarly, not proportional.

The furthest recorded distance from a gas line damaged by a contractor to an explosion is 240 feet. In that case, all the utilities were laid in the same ditch and were backfilled with fractured shale all the way to the foundation of the houses. The explosion occurred an hour after the gas line was damaged. Most incidents do not involve new backfill or loose backfill, however. Most incidents involve fully compacted, non-select backfill.

It has also been documented that natural gas has caused explosions and fires both uphill and downhill from pipeline damage from a significant leak. There are numerous examples of gas from fractured gas lines causing fires and explosions where the gas is coming from a source uphill from the explosion.

Extensive research has been conducted on this subject and the research has revealed some interesting facts. You can learn more by visiting www.bisonengineering.com. 

Common Ground Alliance Excavation Best Practices 18.0














The Best Practices Committee of the Common Ground Alliance (CGA) developed the following guide based on the Common Ground Study. The Best Practices document is considered the “go to” resource by all stakeholders, governments, and associated industries when addressing safety and damage prevention issues internally, as well as on the local, state, and national levels.





To view or download the complete Common Ground Alliance Best Practices Field Manual, visit CommonGroundAlliance.com








5-1:	One Call Facility Locate Request
	<p>Practice Statement: The excavator requests the location of underground facilities at each site by notifying the facility owner/operator through the One Call Center. Unless otherwise specified in state/provincial law, the excavator calls the One Call Center at least two working days and no more than ten working days prior to beginning excavation.</p> <p>Practice Description: Currently 50 states and 5 Canadian provinces have One Call legislation and/or established One Call Centers recognizing that excavation performed without prior notification poses a risk to public safety, excavators, and the environment, and can disrupt vital services provided by facility operators. Increased participation in this One Call system provides for improved communication between excavators and facility operators necessary to reduce damage.</p>
5-2:	White Lining⁶⁷
	<p>Practice Statement: When the excavation site cannot be clearly and adequately identified on the locate ticket, the excavator designates the route and/or area to be excavated using white premarking, either onsite or electronically (when available through the One Call Center), prior to or during the request for the locate ticket.</p> <p>Practice Description: The route of the excavation is marked with white paint, flags, stakes, lines, polygons, or a combination of these to outline the dig site prior to or during notification to the One Call Center and before the locator arrives on the job. Electronic white lining when available provides an alternative method where excavators may indicate their defined dig area visually by electronic data entry (lines or polygons) without the need for a physical site visit. The technology allows the excavator to identify for the locate technician a clear delineation of their proposed excavation area. Premarking allows the excavators to accurately communicate to the One Call Center, facility owners/operators or their locator where excavation is to occur. The 1997 safety study “Protecting Public Safety through Excavation Damage Prevention” by the NTSB reached the conclusion that premarking is a practice that helps prevent excavation damage. Maine was one of the first states to have mandatory premarking for non-emergency excavations. Connecticut also adopted a premarking requirement; however, the law provides for face-to-face meetings between operators and excavators on projects that are too large for or not conducive to premarking. Facility owners/operators can avoid unnecessary work created when locating facilities that are not associated with planned excavation. (See Appendix B for additional practice information)</p>
5-3:	Locate Reference Number
 	<p>Practice Statement: The excavator receives and maintains a reference number from the One Call Center that verifies that the locate was requested.</p> <p>Practice Description: All calls from excavators processed by the One Call Center receive a unique message reference number, which is contained on all locate request messages. The excavator records this number; it is proof of notification to the members. The computer-generated request identifies the date, time, and sequence number of the locate request. Each locate request ticket (notification) is assigned a unique number with that One Call Center, the requestor, and the facility owner/operator. This number distinguishes this ticket from all other tickets so that it can be archived and retrieved upon request to provide the details of that request only.</p>









5-4:	Pre-Excavation Meeting
 	<p>Practice Statement: When practical, the excavator requests a meeting with the facility locator at the job site prior to marking the facility locations. Such pre-job meetings are important for major, or unusual, excavations.</p> <p>Practice Description: The meeting facilitates communications, coordinates the marking with actual excavation, and ensures identification of high-priority facilities. An on-site pre-excavation meeting between the excavator, facility owners/operators, and locators (where applicable) is recommended on major or large projects. This includes projects such as road, sewer, water, or other projects that cover a large area, that progress from one area to the next, or that are located near critical or high-priority facilities. Such facilities include, but are not limited to, high-pressure gas, high-voltage electric, fiber-optic communication, and major pipe or water lines.</p>
5-5:	Facility Relocations
 	<p>Practice Statement: The excavator coordinates work that requires temporary or permanent interruption of a facility owner/operator’s service with the affected facility owner/operator in all cases.</p> <p>Practice Description: Any temporary or permanent interruption requires the active participation by the facility owner/operator and the excavator to ensure protection of facilities through a joint preplanning meeting or conference call. One Call Centers note on the ticket any special contractor requests for a joint meeting that require the facility owner/operator to initiate the process.</p>
5-6:	Separate Locate Requests
 	<p>Practice Statement: Every excavator on the job has a separate One Call reference number before excavating.</p> <p>Practice Description: There are often several excavators on a job site performing work. The construction schedule may dictate different types of work requiring excavation from different specialty contractors simultaneously. In these situations, it is imperative for each excavator to obtain a One Call reference number before excavation to ensure that the specific areas have been appropriately marked by any affected underground facility owner/operator.</p>
5-7:	One Call Access (24/7)
 	<p>Practice Statement: The excavator has access to a One Call Center 24 hours per day, 7 days a week.</p> <p>Practice Description: Utilities service the public needs 24 × 7 and thus should be protected during that same time. Certain conditions may exist that require excavators to work during off-hours (city/road congestion, off-peak utility service hours). Although most excavators are on the job site during regular work hours, they need to be able to call in future work locations after 5:00 p.m. This allows them more flexibility to schedule work and to avoid peak hours of locate requests at the One Call center.</p>

5-8:	Positive Response
   	<p>Practice Statement: The underground facility owner/operator either 1) identifies for the excavator the facility's tolerance zone at the work site by marking, flagging, or other acceptable methods; or 2) notifies the excavator that no conflict situation exists. This takes place after the One Call Center notifies the underground facility owner/operator of the planned excavation and within the time specified by state/provincial law.</p> <p>Practice Description: If a facility owner/operator determines that the excavation or demolition is not near any of its existing underground facilities, it notifies the excavator that no conflict exists and that the excavation or demolition area is "clear." This notification by the facility owner/operator to the excavator may be provided in any reasonable manner including, but not limited to face-to-face communications; phone or phone message, facsimile or other electronic means; posting at the excavation or demolition area; or marking the excavation or demolition area. If an excavator has knowledge of the existence of an underground facility and has received an "all clear," a prudent excavator will attempt to communicate that a conflict does indeed exist, and the locator will make marking these facilities a priority before excavation begins. Better communication between the excavator and the facility owner/operator is required as an area of excavation becomes more crowded with new underground facilities.</p> <p>"Positive response" is a term used to describe the two types of action taken by a facility owner/operator after it receives notification of intent to excavate. The facility owner/operator must 1) mark its underground facilities with stakes, paint, or flags; or 2) notify the excavator that the facility owner/operator has no underground facilities in the area of excavation. This process allows the excavator to begin work in a timely manner.</p> <p>When the excavator makes the request to the One Call Center, the excavator is told which facility owners/operators will be notified. The excavator logs these facilities on a job sheet and identifies which facility owner/operators have responded by marking and which have cleared the area. When a facility owner/operator does not respond by marking or clearing, it may indicate that the facility owner/operator did not receive a locate notice or that the One Call Center's contact information for that facility owner/operator may be incorrect, incomplete, or corrupt (which could result in calamity).</p> <p>When the excavator has obtained all required information, the excavation can commence with confidence that the safety of the work crew and the public at large has been considered.</p>
5-9:	Facility Owner/Operator Failure to Respond
  	<p>Practice Statement: If the facility owner/operator fails to respond to the excavator's timely request for a locate (e.g., within the time specified by state/provincial requirements) or if the facility owner/operator notifies the excavator that the underground facility cannot be marked within the time frame and a mutually agreeable date for marking cannot be arrived at, then the excavator re-calls the One Call Center. However, this does not preclude the excavator from continuing work on the project. The excavator may proceed with excavation at the end of two working days, unless otherwise specified in state/provincial law, provided the excavator exercises due care in all endeavors.</p> <p>Practice Description: The facility owner/ operator and the excavator partner together to ensure that facilities are marked in an acceptable time frame to allow for underground facility protection.</p>
5-10:	Locate Verification
	<p>Practice Statement: Prior to excavation, excavators verify that they are at the correct location, verify locate markings and, to the best of their ability, check for unmarked facilities.</p> <p>Practice Description: Upon arrival at the excavation site and prior to beginning the excavation, an excavator does the following:</p> <ul style="list-style-type: none"> • Verifies that the dig site matches the One Call request and is timely • Verifies that all facilities have been marked and reviews color codes if in doubt • Verifies all service feeds from buildings and homes • Checks for any visible signs of underground facilities, such as pedestals, risers, meters, and new trench lines • Checks for any facilities that are not members of the One Call Center and contact someone to get them located. <p>Use of a pre-excavation checklist is recommended by insurers and practiced by responsible excavating contractors.</p>
5-11:	Documentation of Marks
	<p>Practice Statement: An excavator uses dated pictures, videos, or sketches with distance from markings to fixed objects recorded, to document the actual placement of markings.</p> <p>Practice Description: In most situations when underground facilities are not properly marked, excavators have no way of knowing where underground utilities are located. If locate markings are adequately documented through the use of photographs, video tape, or sketches before excavation work begins, it is easier to resolve disputes if an underground facility is damaged as a result of improper marking, failure to mark, or markings that have been moved, removed, or covered. It is important for excavators and locators to document the location of markings before excavation work begins. The primary purpose of this best practice is to avoid unnecessary litigation and expensive legal fees for all parties involved.</p>
5-12:	Work Site Review with Company Personnel
	<p>Practice Statement: Prior to starting work, the excavator reviews the location of underground facilities with site personnel.</p> <p>Practice Description: Sharing information and safety issues during an on-site meeting between the excavator and the excavating crews helps avoid confusion and needless damage to underground facilities.</p>
5-13:	One Call Reference at Site⁵⁹
	<p>Practice Statement: Except in case of an emergency, the excavator at each job site has available a complete description of the dig site, a list of the facility owner members impacted at that dig site as identified by the One Call Center, and the One Call Center ticket number.</p> <p>Practice Description: The availability of locate request details on site is useful because excavators can easily access information about the location and extent of work, the valid start time, and the list of operators notified. The documentation also provides an excavator with appropriate information for daily tailgate meetings for crews; provides quick references for excavation equipment operators; and facilitates communications between the excavator and the One Call Center with respect to that particular locate request, should it become necessary. When multiple crews are working on the same project at separate locations or when different employers have crews working at the same location, each crew has the information.</p>
5-14:	Contact Names and Numbers
	<p>Practice Statement: The excavator's designated competent person at each job site has access to the names and phone numbers of all facility owner/operator contacts and the One Call Center.</p> <p>Practice Description: Situations arise on the job site that require immediate notification of the facility owner/operator, One Call Center, or local emergency personnel. To avoid costly delays, the excavator ensures that the designated job site personnel have all appropriate names and phone numbers. If telephone communication is unavailable, radio communication to the "home office" is available so that timely notification can be made. The "home office" also has immediate access to all appropriate names and telephone numbers.</p>
5-15:	Facility Avoidance
	<p>Practice Statement: The excavator uses reasonable care to avoid damaging underground facilities. The excavator plans the excavation so as to avoid damage or to minimize interference with the underground facilities in or near the work area.</p> <p>Practice Description: Foremost on any construction project is safety. Excavators using caution around underground facilities significantly contribute to safe excavation of existing facilities.</p>





5-16:	Federal and State Regulations
	<p>Practice Statement: The excavator complies with all applicable federal and state/provincial safety regulations, and, when required, provides training as it relates to the protection of underground facilities.</p> <p>Practice Description: Although most existing state/provincial damage prevention legislation does not include reference to federal and state/provincial regulations, it is important to include reference to worker safety and training in the best practices. Excavators are required to comply with federal and state/provincial occupational safety and health requirements to protect employees from injury and illness. These regulations include reference to training each employee to recognize and avoid unsafe conditions in the work environment and to control or eliminate any hazards or exposures to illness or injury. Therefore, the excavator's crew, as part of its safety training, is informed of the best practices and regulations applicable to the protection of underground facilities.</p>
5-17:	Marking Preservation
	<p>Practice Statement: The excavator protects and preserves the staking, marking, or other designation of underground facilities until no longer required for proper and safe excavation. The excavator stops excavating and notifies the One Call Center for re-marks if any facility mark is removed or is no longer visible.</p> <p>Practice Description: During long, complex projects, the marks for underground facilities may need to be in place far longer than the locating method is durable. Painting, staking, and other marking techniques last only as long as the weather and other variables allow. When a mark is no longer visible, but work continues around the facility, the excavator requests a re-mark to ensure the protection of the facility.</p>
5-18:	Excavation Observer
	<p>Practice Statement: The excavator has an observer to assist the equipment operator when operating excavation equipment around known underground facilities.</p> <p>Practice Description: The excavator designates a worker (an observer) who watches the excavation activity and warns the equipment operator while excavating around a utility to prevent damaging that buried facility.</p>
5-19:	Excavation Tolerance Zone
	<p>Practice Statement: The excavator observes a tolerance zone that is comprised of the width of the facility plus 18 in. on either side of the outside edge of the underground facility on a horizontal plane. This practice is not intended to preempt any existing state/provincial requirements that currently specify a tolerance zone of more than 18 in.</p> <p>Practice Description: (See Practice Statement 5-20)</p>

5-20:	Excavation Within Tolerance Zone
	<p>Practice Statement: When excavation is to take place within the specified tolerance zone, the excavator exercises such reasonable care as may be necessary for the protection of any underground facility in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include hand digging when practical (pot holing), soft digging, vacuum excavation methods, pneumatic hand tools, other mechanical methods with the approval of the facility owner/operator, or other technical methods that may be developed. Hand digging and non-invasive methods are not required for pavement removal.</p> <p>Practice Description: Safe, prudent, non-invasive methods that require the excavator to manually determine the actual location of a facility are considered "safe excavation practices" in a majority of state/provincial laws (38 states). A majority of states outline safe excavation practices to include hand digging or pot holing (16 states). Some states specifically allow for the use of power excavating equipment for the removal of pavement. Each state/province must take differing geologic conditions and weather related factors into consideration when recommending types of excavation within the tolerance zone.</p>
5-21:	Mismarked Facilities
  	<p>Practice Statement: The excavator notifies the facility owner/ operator directly or through the One Call Center if an underground facility is not found where one has been marked or if an unmarked underground facility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the facility, unless specified otherwise in state/provincial law.</p> <p>Practice Description: When an excavator finds an unmarked or inaccurately marked facility, excavation stops in the vicinity of the facility and notification takes place. If excavation continues, the excavator plans the excavation to avoid damage and interference with other facilities and protects facilities from damage.</p>
5-22:	Exposed Facility Protection
	<p>Practice Statement: Excavators support and protect exposed underground facilities from damage.</p> <p>Practice Description: Protecting exposed underground facilities is as important as preventing damage to the facility when digging around the utility. Protecting exposed underground facilities helps ensure that the utility is not damaged and, at the same time, protects employees working in the vicinity of the exposed facility. Exposed facilities can shift, separate, or be damaged when they are no longer supported or protected by the soil around them. Excavators support or brace exposed facilities and protect them from moving or shifting, which could result in damage to the facility. This can be accomplished in different ways; for example, by shoring the facility from below or by providing a timber support with hangers across the top of an excavation to ensure that the facility does not move or bend. In addition, workers are instructed to not climb on, strike, or attempt to move exposed facilities that could damage protective coatings, bend conduit, separate pipe joints, damage cable insulation, damage fiber optics, or in some way affect the integrity of the facility. The Occupational Safety and Health Administration (OSHA) also has addressed this issue in Subpart P—Excavation Standard 29 CFR 1926.651(b)(4), which states "While the excavation is open, underground installations shall be protected, supported, or removed as necessary to safeguard employees." For example, an unsupported sewer main could shift, causing the pipe joints to separate, which could result in the trench where employees are working to flood, endangering the safety of employees.</p>

5-23:	Locate Request Updates	<div><div><div></div><div></div><div></div></div><p>Practice Statement: The excavator calls the One Call Center to refresh the ticket when excavation continues past the life of the ticket (sometimes, but not always, defined by state/provincial law). This recognizes that it is a best practice to define ticket life. If not currently defined in state/provincial law, ticket life is ideally 10 working days but does not exceed 20 working days. Original locate request tickets are generated so that the minimum number of locate request updates are necessary for the duration of a project. After all the excavation covered by a locate request is completed, no additional locate request updates are generated. Communication between excavation project planners, field personnel, and clerical personnel is essential in accomplishing this task.³⁶</p><p>Practice Description: Refreshing the ticket recognizes that markings are temporary and provides notification to facility owners/operators of ongoing excavation when a job is started but not completed as planned. Any excavation not begun during the life of the ticket is recalled to the One Call Center. Any excavation that covers a large area and will progress from one area to the next over a period of time is broken into segments when notifying the One Call Center in order to coordinate the marking with actual excavation. The possibility exists that new facilities have been installed in the area where the excavation is to be conducted after the original notification and marking. This practice also helps in situations where multiple excavators are working in the same area at essentially the same time. An example of when this can occur is when two facility owners, such as a cable television company and a telephone company, are planning to serve a new section of a subdivision. In their pre-planning process, they see a vacant space in the right-of-way to place their new facility. Each excavator (internal or external) calls the One Call Center for locates and each facility owner/operator comes and marks their respective facilities indicating that nothing exists. For one reason or another, one of the excavators gets delayed and does not start construction as planned, and when returning to the job site to place the new facility, finds new lines have been installed in the previously vacant space. Many facility owners/operators do not perform their own locates and utilize the services of a contracted facility locator. These contracted facility locators may not be aware of work planned in the near future. By excavators refreshing the locate ticket, the contract locator has another opportunity to identify newly placed facilities. This practice also gives the facility owner/operator another chance to identify the location of their facilities and to avoid possible damage and disruption of service if something was marked incorrectly or missed on a previous locate. Excellent planning, generation, and updating of tickets enhance safety and reduce the unnecessary use of locate resources.³⁷</p></div>
5-24:	Facility Damage Notification	<div><div><div></div><div></div><div></div></div><p>Practice Statement: An excavator discovering or causing damage to underground facilities notifies the facility owner/operator and the One Call Center. All breaks, leaks, nicks, dents, gouges, grooves, or other damages to facility lines, conduits, coatings, or cathodic protection are reported.</p><p>Practice Description: A majority of states require notification for damage or substantial weakening of an underground facility (27 states). The possibility of facility failure or endangerment of the surrounding population dramatically increases when a facility has been damaged. Although the facility may not immediately fail, the underground facility owner/operator is provided the opportunity to inspect the damage and make appropriate repairs.</p></div>
5-25:	Notification of Emergency Personnel	<div><div><div></div><div></div><div></div></div><p>Practice Statement: If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid or endangers life, health, or property, the excavator responsible immediately notifies 911 and the facility owner/operator³. The excavator takes reasonable measures to protect everyone in immediate danger, the general public, property, and the environment until the facility owner/operator or emergency responders arrive and complete their assessment⁴.</p><p>Practice Description: This practice is already required by many of the states' One Call legislation. This practice minimizes the danger to life, health, or property by notifying the proper authorities to handle the emergency situation. In these situations, local authorities are able to evacuate as appropriate and command substantial resources unavailable to the excavator or underground facility owner/operator. The excavator takes reasonable measures based on their knowledge, training, resources, experience, and understanding of the situation to protect themselves, people, property, and the environment until help arrives. The excavator responsible remains on-site to convey any pertinent information to responders that may help them to safely mitigate the situation.⁴</p></div>
5-26:	Emergency Excavation	<div><div><div></div><div></div><div></div></div><p>Practice Statement: In the case of an emergency excavation, maintenance or repairs may be made immediately, provided that the excavator notifies the One Call Center and facility owner/operator as soon as reasonably possible. This includes situations that involve danger to life, health, or property or that require immediate correction in order to continue the operation of or ensure the continuity of public utility service or public transportation.</p><p>Practice Description: This practice allows excavation to begin immediately to restore service or to stop a hazardous situation from getting worse in the case of a gas or pipeline leak, cut telephone cable, or other facility damage.</p></div>
5-27:	Backfilling	<div><div><div></div></div><p>Practice Statement: The excavator protects all facilities from damage when backfilling an excavation. Trash, debris, coiled wire, or other material that could damage existing facilities or interfere with the accuracy of future locates are not buried in the excavation.</p><p>Practice Description: Extra caution must be taken to remove large rocks, sharp objects, and large chunks of hard-packed clay or dirt. No trash or pieces of abandoned lines are backfilled into the trench. This helps prevent inadvertent damage to the facility during the backfill process.</p></div>
5-28:	As-built Documentation	<div><div><div></div><div></div><div></div></div><p>Practice Statement: Contractors installing underground facilities notify the facility owner/operator if the actual placement is different from expected placement.</p><p>Practice Description: For a facility owner/operator to maintain accurate records of the location of their facilities, it is critical that the contractor installing the new facility be required to notify the facility owner/operator of deviations to the planned installation. Some facility owners/operators do not require a full-time inspector and use a sampling process to ensure that a new facility is correctly installed in compliance to specifications. When this occurs, it becomes much more critical for the contractor to notify the facility owner/operator of changes. For example, it is common for the contractor to make adjustments in the location of the new facility when rocks or other underground obstructions are encountered or when the location of the new facility conflicts with another existing underground facility. This change in plan can represent changes in horizontal or vertical distances from the specified plans. The facility owner/operator establishes standards that require notification if a deviation is beyond specified tolerances, such as changes in depth of 6 in. or more and lateral measurement changes of greater than 1 ft. When these changes to the expected location are communicated to the facility owner/operator, it is the owner/operator's responsibility to take appropriate action to update their records so that an accurate locate can be conducted in the future.</p></div>
5-29:	Trenchless Excavation¹³	<div><div><div></div><div></div><div></div><div></div><div></div><div></div></div><p>Practice Statement: All stakeholders comply with all best practices and the following general guidelines prior to, during, and after any trenchless excavation (as applicable).</p><p>Practice Description:</p><ul style="list-style-type: none">• The excavator requests the location of underground facilities at the entrance pit, trenchless excavation path, and the exit pit by notifying the facility owner/operator through the One Call Center.• The trenchless equipment operator performs a site inspection, walking the trenchless excavation path prior to commencing work, and has a good understanding of the job.• The trenchless excavation operator confirms and maintains the path and minimum clearances established by the project owner and design engineer by tracking and recording the path of the trenchless excavation until complete. Means of tracking trenchless excavations include electronic locating/guidance devices, pipe lasers, water levels, visual inspection, etc.• When existing facilities are known to be present but cannot be potholed as a result of local conditions, the facility owner and the excavator meet to discuss how to safely proceed with the excavation.• The excavator stops the trenchless excavation operations if an abnormal condition, unknown substructure, or other hidden hazard is encountered. The excavator proceeds safely only after making positive identification. (Refer to Practice Statements 2–13 and 4–19 for additional information.)</div>

5-30:	Emergency Coordination with Adjacent Facilities¹⁶
     	<p>Practice Statement: Emergency response planning includes coordination with emergency responders and other aboveground and/or underground infrastructure facility owner/operators identified by the Incident Commander through the Incident Command System/Unified Command (ICS/UC) during an emergency.</p> <p>Practice Description: During emergency situations, there are many stakeholders involved: excavators, locators, owner/operators, first responders, One Call Centers, and the general public. Any actions taken by one stakeholder could adversely affect other stakeholders. Accordingly, emergency planning and response are coordinated.</p>
5-31:	No Charge for Providing Underground Facility Locations²³
 	<p>Practice Statement: Upon notification by One Call Centers, locations of underground facilities are provided by operators at no cost to excavators.</p> <p>Practice Description: It is the basic underpinning of the call-before-you-dig process that persons involved in excavation activities receive facility locates at no charge when they contact their local One Call Center to give notice of intent to excavate. This service is critical to maintaining the communication between operators and excavators. Call-before-you-dig education and marketing campaigns, such as 811 and those promoted by One Call Centers and associated industries, advise persons involved in excavation activities, including the public, homeowners, and professional excavators, that the service is provided by facility operators at no charge to the person providing the notice of intent to excavate.</p>

3. 11/30/2001 Amendment approved by the CGA Board via TR-2001-02A
 4. 09/27/2002 Amendment approved by the CGA Board via TR-2001-02B
 13. 09/16/2005 Amendment approved by the CGA Board via TR-2002-03
 16. 09/08/2006 Amendment approved by the CGA Board via TR-2005-02
 23. 08/08/2008 Amendment approved by the CGA Board via TR-2007-06
 36. 07/16/2010 Amendment approved by the CGA Board via TR-2009-16
 37. 07/16/2010 Final wording approved by the CGA Board via TR-2009-16
 39. 09/10/2010 Amendment approved by the CGA Board via TR-2009-09
 59. 06/19/2014 Wording approved by CGA Board via TR-2011-11
 64. 12/13/2016 Approved by CGA Board via TR-2014-01
 67. 12/13/2017 Approved by CGA Board via TR-2016-01

5-32:	Vacuum Excavation³⁹
 	<p>Practice Statement: Vacuum excavation, when used appropriately, is an efficient, safe, and effective alternative to hand digging within the designated underground facility tolerance zone. Use of equipment also follows state/provincial laws and/or local ordinances.</p> <p>Practice Description: The safe exposure of underground facilities within the tolerance zone is essential to damage prevention. Site conditions may make the use of hand tools to expose underground facilities difficult or even impractical. Vacuum excavation is often an appropriate alternative. Locates must be obtained prior to the commencement of work (see Practice Statement 5-1). Many underground facility owners/operators have specific criteria for safe excavation/exposure practices around their facilities. Some underground facility owners/operators accept vacuum excavation as equivalent to hand excavation for exposing their facilities, and others have restrictions on its use. Vacuum excavation is an appropriate method of excavating safely around underground facilities provided that the equipment</p> <ul style="list-style-type: none"> • has been specifically designed and built for this purpose; • is operated by a worker trained and experienced in its operation; • is operated in accordance with practices that provide appropriate levels of worker and public safety and prevent damage to buried facilities; and • is used in compliance with state/provincial laws and/or local ordinances.
5-33:	Facility Owner Provides a Monitor During Excavation⁶⁴
 	<p>Practice Statement: If a facility owner/operator considers it necessary to be on site during excavation activities to work with the excavator in protecting their existing facilities, the facility owner/operator makes arrangements with the excavator to be present during those excavation activities within the time specified by state/provincial law.</p> <p>Practice Description: The facility owner/operator may determine it necessary to be on site during excavation activities taking place near their facilities to help protect them. A facility owner/operator has access to information and resources that may not be available to the excavator. This practice should be considered in conjunction with Practice Statement 2-4: Utility Coordination.</p>

Community Liaison Services

Formerly known as the Community Assistance and Technical Services (CATS) Program

PHMSA has renamed its CATS program to "Community Liaison Services" to more appropriately align with current roles and responsibilities and better interface with various stakeholders.

Mission:

To advance PHMSA's pipeline safety mission by proactively engaging with pipeline stakeholders, providing technical expertise, and leveraging technology, data, and information to reduce pipeline risks and influence change through program and policy development.

Vision:

To serve as "trusted" and "credible" stewards of public safety and environmental protection by raising awareness and influencing change to continuously improve pipeline safety.

If you need assistance with any of the following pipeline safety related matters, please contact a PHMSA Community Liaison today:

- Pipeline safety policy/programs (damage prevention, public awareness, emergency response, PIPA, etc.)
- Pipeline stakeholder engagement and outreach
- Pipeline technical services and support (public inquiries, whistleblowers, post incident/accident communications, siting and permit initiatives)
- Questions about pipeline safety in your community

Community Liaisons are located within each PHMSA region.

Community Liaison Services Program Manager

Karen Lynch: karen.lynch@dot.gov • Phone: (202) 366-6855

Central Region:

Illinois; Indiana; Iowa; Kansas; Michigan; Minnesota; Missouri; Nebraska; North Dakota; South Dakota; Wisconsin.

Angela Pickett: angela.pickett@dot.gov • Phone: (816) 329-3823

Sean Quinlan: sean.quinlan@dot.gov • Phone: (816) 329-3800

Southern Region:

Alabama; Florida; Georgia; Kentucky; Mississippi; North Carolina; Puerto Rico; South Carolina; Tennessee.

James Kelly: james.kelly@dot.gov • Phone: (404) 990-1848

Arthur Buff: arthur.buff@dot.gov • Phone: (404) 226-6153

Eastern Region:

Connecticut; Delaware; Maine; Maryland; Massachusetts; New Hampshire; New Jersey; New York; Ohio; Pennsylvania; Rhode Island; Vermont; Virginia; Washington, D.C.; West Virginia.

Karen Gentile: karen.gentile@dot.gov • Phone: (609) 433-6650

Nita Raju: Nitander.raju@dot.gov • Phone: 609) 771-7806

Southwest Region:

Arkansas; Louisiana; New Mexico; Oklahoma; Texas.

Bill Lowry: bill.lowry@dot.gov • Phone: (713) 272-2845

James 'Jay' Prothro: james.prothro@dot.gov • Phone: (713) 272-2832

Western Region:

Alaska; Arizona; California; Colorado; Hawaii; Idaho; Montana; Nevada; Oregon; Utah; Washington; Wyoming.

Tom Finch: thomas.finch@dot.gov • Phone: (720) 963-3175

Dave Mulligan: david.mulligan@dot.gov • Phone: (720) 963-3193

Notification Center and State Law Directory

Informational purposes only. Information and laws are subject to change. Consult your local Notification Center website for updated information. Infrastructure Resources, LLC attempted to verify all information as of publication date, and accepts no responsibility for missing or incorrect information.



You can reach your local One Call center in the U.S. by dialing 811.

Know what's below. Call before you dig.

TICKETS			STATE LAWS & PROVISIONS										NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED					Tolerance Zone (either side of the utility plus the width of the utility)
FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects		
N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	12”*	Y	Y	Y	N	N	18”	
*Agricultural purposes only																							
3121																							
N	Y	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	N	Y	N	Y	Y	Y	N	Y	24”*	
*24-30” based on proposed depth of dig																							
N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	Y	N	N	Y	Y	N	N	24”	
N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	Y	18”	
N	Y	Y	N	Y	Y	Y*	Y	Y	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y	24”	
N	Y	Y	N	Y	Y	Y*	Y	Y	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y	24”	
*DOT and non-pressurized sewer lines, storm drains and drain lines exempt																							
N	Y	Y	Y	Y	Y	Y*	N	N	Y	N	Y	N	N	N	Y	Y	Y	Y	Y	N	Y	18”	
* DOT exempt																							
N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	N	Y	18”	
N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	N	N	N	N	Y	Y	N	N	24”	
N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	24”	



Notification Center and State Law Directory

HELP US STAY UP TO DATE.

Directory information is also available online at dp-PRO.com. Report any updates to this directory by calling 866-279-7755.



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TICKETS			STATE LAWS & PROVISIONS									NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED				Tolerance Zone (either side of the utility plus the width of the utility)	
FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead		Large Projects

GEORGIA / Georgia 811 / 800-282-7411

Website: Georgia811.com
Hours: 7:00 AM - 6:00 PM, M-F • (24/7 emergency)
Advance Notice: 2 business days (excluding day of call)
Marks Valid: 30 calendar days
Law Link: georgia811.com/index.php/laws-policies/

N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N*	N	N	N**	N	Y	Y	Y	Y	Y	18"

* Routine road maintenance
 ** Farming activities

HAWAII / Hawaii One Call Center / 866-423-7287 / Tickets Fax: 877-695-2466

Website: callbeforeyoudig.org
Hours: 24 hours, 7 days
Advance Notice: 5 working days, not to exceed 28 calendar days
Marks Valid: 28 calendar days
Law Link: callbeforeyoudig.org/law.htm

Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	N	N	N	Y	Y	Y	N	N	30"
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IDAHO

DIG LINE / 800-342-1585
Website: digline.com
Hours: 24 hours
Advance Notice: 2 business days
Marks Valid: 21 Days
Law Link: <https://legislature.idaho.gov/statutesrules/idstat/title55/T55CH22/>

N	Y	N	N	Y	Y	Y	N	Y	N	Y	Y	N	15"	N	Y	15"	Y	Y	Y	Y	Y	24"
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BONNER/BOUNDARY One Call / 800-626-4950
Website: passwordinc.com
Hours: 24 hours, 7 days
Advance Notice: 2 business days
Marks Valid: 21 days
Law Link: legislature.idaho.gov/statutesrules/idstat/Title55/T55CH22/

N	Y	N	N	Y	Y	Y	N	Y	N	Y	Y	N	15"	N	Y	15"	Y	Y	Y	Y	N	24"
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SHOSHONE/BENEWAH One Call / 800-398-3285
Website: passwordinc.com
Hours: 24 hours, 7 days
Advance Notice: 2 business days
Marks Valid: 21 days
Law Link: legislature.idaho.gov/statutesrules/idstat/Title55/T55CH22/

N	Y	N	N	Y	Y	Y	N	Y	N	Y	Y	N	15"	N	Y	15"	Y	Y	Y	Y	N	24"
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KOOTENAI COUNTY One Call / 800-428-4950
Website: kootenaicounty811.com
Hours: 24 hours, 7 days
Advance Notice: 2 business days
Marks Valid: 21 days
Law Link: legislature.idaho.gov/statutesrules/idstat/Title55/T55CH22/

N	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	15"	N	Y	15"	Y	Y	Y	N	Y	24"
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ILLINOIS

JULIE, INC. / 800-892-0123
Website: illinois1call.com • **Hours:** 24 hours, 7 days
Advance Notice: 48 hours notice (two business days), but no more than a 14 calendar day advance notice prior to the start of excavation.
Marks Valid: 28 calendar days
Law Link: illinois1call.com/lawandenforcement/

N	Y	N	N	Y	Y	Y	N	Y*	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	N	N	18"
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811 CHICAGO / 312-744-7000
Website: ipi.cityofchicago.org/Digger
Hours: 24 hours a day, 7 days a week
Advance Notice: 48 hours • **Marks Valid:** 28 days
Law Link: https://codebook.amlegal.com/codes/chicago/latest/chicago_il/0-0-0-2651040

N	Y	N	N	Y	Y	Y	Y	Y*	Y	Y	Y	N	N	Y	Y	N	Y	N	Y	N	N	18"

*When possible

INDIANA / Indiana 811 / 800-382-5544

Website: indiana811.org • **Hours:** 24 hours, 365 days
Advance Notice: 48 hours notice (two working days), but no more than a 20-calendar day advance notice prior to the start of excavation.
Marks Valid: 20 calendar days
Law Link: indiana811.org/wp-content/uploads/2019/06/IC-8-1-26-1.pdf

N	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	N	N	24"
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IOWA / Iowa One Call / 800-292-8989

Website: iowaonecall.com • **Hours:** 24 hours, 7 days
Advance Notice: 48 hours, excluding Saturdays, Sundays, and legal holidays
Marks Valid: 20 calendar days
Law Link: iowaonecall.com/Default.aspx?tabid=404#iowa

N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	Y*	N	Y	Y	Y	N	Y	18"


*Normal farm operations less than fifteen inches



Know what's below. Call before you dig.

Expand public awareness by visiting call811.com. You will find a variety of downloadable elements available for use free in your company/organization's existing campaigns.



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	FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead		Large Projects	
KANSAS / Kansas 811 / 800-344-7233																								
Website: kansas811.com Hours: 24 hours, 7 days Advance Notice: 2 full working days(not including day of notice) Marks Valid: 15 calendar days Law Link: kansasonecall.com/static/pdf/KUUDPA_04.03.2010.pdf	N	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N	Y*	Y	Y	N	N	Y	Y	N	N	24"	
*Homeowner retains responsibility for any damages due to digging																								
KENTUCKY / Kentucky 811 / 800-752-6007																								
Website: kentucky811.org Hours: 24 hours/7 days Advance Notice: 2 working days Marks Valid: 21 calendar days Law Link: kentucky811.org/the-dig-law	N	Y	N	Y	Y	Y	N	N	N	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	N	Y	24"	
LOUISIANA / Louisiana 811 / 800-272-3020																								
Website: louisiana811.com Hours: 7:00 AM - 6:00 PM, Emergency Locates 24/7 Advance Notice: 2 Business Days Marks Valid: 20 Days/30 Days for Forestry Law Link: louisiana811.com/index.php/dig-law	N	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	N	Y	N	Y	N	Y	Y	Y	N	N	18"	
MAINE / Dig Safe System, Inc. / 888-344-7233																								
Website: digsafe.com Hours: 24 hours, 7 days Advance Notice: 72 hours(excluding weekends and holidays) Marks Valid: 60 days; must start within 30 days Law Link: http://www.digsafe.com/laws_rules.php	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y	18"	
MARYLAND / Miss Utility (Western Shore) / 800-257-7777																								
Website: www.missutility.net Hours: 24 hours, 7 days Advance Notice: 2 full business days Marks Valid: 12 business days Law Link: www.missutility.net/maryland/	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	Y*	N	N	N	N	Y	Y	N	N	18"	
*Hand dig only up to a depth of 6". Mechanized equipment must call.																								
Miss Utility of Delmarva (Eastern Shore) / 800-441-8355 Website: missutilitydelmarva.com Hours: 24 hours, 7 days Advance Notice: 2 full business days Marks Valid: 12 business days Law Link: www.missutility.net/maryland/	N	Y	Y	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	N	N	N	N	Y	Y	N	N	18"	
MASSACHUSETTS / Dig Safe System, Inc. / 888-344-7233																								
Website: digsafe.com Hours: 24 hours, 7 days Advance Notice: 72 hours(excluding weekends and holidays) Marks Valid: 30 days Law Link: digsafe.com/laws_rules.php	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y	18"	
MICHIGAN / Miss Dig System, Inc. / 800-482-7171																								
Website: missdig811.org Hours: 24 hours Advance Notice: 3 business days(excluding weekends and holidays) Marks Valid: 3 weeks to 6 months Law Link: missdig811.org/education/public-act-174.html	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	N	N	N	Y	Y	Y	Y	18"	
MINNESOTA / Gopher State One Call / 800-252-1166 or 651-454-0002																								
Website: gopherstateonecall.org Hours: 24 hours Advance Notice: 48 hours(excluding weekends and holidays) Marks Valid: 14 days Law Link: revisor.leg.state.mn.us/statutes/?id=216D	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	N	Y	24"	
MISSISSIPPI / Mississippi 811, Inc. / 800-227-6477 / Tickets Fax: 601-362-7533																								
Website: ms811.org Hours: 24 hours, 7 days Advance Notice: 2 working days Marks Valid: 14 working days Law Link: ms1call.org/One Call-law	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	24"	12"	Y	Y	Y	N	Y	18"	
*Less than 16"																								
MISSOURI / Missouri One Call System / 800-344-7483 / Tickets Fax: 573-635-8402																								
Website: mo1call.com Hours: 24 hours, 7 days Advance Notice: 2 working days, not counting day of request Marks Valid: As long as visible Law Link: mo1call.com/manual_law.php	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	Y	Y*	N	Y	Y	Y	N	N	24"	



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FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects												
MONTANA																																	
811 / 800-424-5555 Website: montana811.org Hours: 24 hours, 365 days Advance Notice: 2 business days Marks Valid: 30 days Law Link: montana811.org/montana-dig-law.html												N	Y*	N	Y	Y	Y	N	Y*	N	Y	Y	Y	Y	Y	N	N	18"					
NEBRASKA / Nebraska811 / 800-331-5666																																	
Website: ne1call.com Hours: 24 hours, 365 days Advance Notice: 2 to 10 business days excluding holidays and weekends Marks Valid: 17 Days Law Link: ne1call.com/ne-law-enforcement/nebraska-statutes/												Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	N	N	18"					
NEVADA / USA North 811 / 800-642-2444																																	
Underground Service Alert of Northern CA & NV Website: www.usanorth811.org Hours: 24/7 Advance Notice: 2 working days, not including the date of notification Marks Valid: 28 days Law Link: usanorth811.org (Quick Links/Law & Excavation Manual)												N	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	N	Y	N	N	24"				
NEW HAMPSHIRE / Dig Safe System, Inc. / 888-344-7233																																	
Website: digsafesystem.com Hours: 24 hours, 7 days Advance Notice: 72 hours(excluding weekends and holidays) Marks Valid: 30 days Law Link: digsafesystem.com/laws_rules.php												N	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y	18"				
NEW JERSEY / New Jersey One Call / 800-272-1000 / Tickets Fax: 800-705-4559																																	
Website: nj1-call.org Hours: 24 hours Advance Notice: 3 full business days Marks Valid: 45 business days Law Link: nj1-call.org/nj-law/												Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	Y	N	N	24"				
NEW MEXICO / New Mexico One Call, Inc. dba NM811 / 800-321-2537 / Tickets Fax: 800-727-8809																																	
Website: nm811.org Hours: 7:00 AM - 5:00 PM, M-F / Emergencies & Damages: 24 hours Advance Notice: 2 working days Marks Valid: 15 Days Law Link: nm811.org/new-mexico-811-law/												Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	N	Y	18"		
NEW YORK																																	
DIG SAFELY NEW YORK / 800-962-7962 Website: digsafelynewyork.com Hours: 24 hours, 365 days Advance Notice: 2 to 10 working days(Excluding day of call) Marks Valid: 10 working days Law Link: digsafelynewyork.com/resources/nys-code-rule-753												N	Y	N	N	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	Y	N	N	24"
NEW YORK 811 / 800-272-4480 Website: newyork-811.com Hours: 24 hours, 7 days Advance Notice: 2 to 10 business days Marks Valid: 10 working days Law Link: newyork-811.com/excavators/code-753-at-a-glance												N	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	Y	N	N	24"
NORTH CAROLINA / North Carolina One Call Center, Inc. / 800-632-4949																																	
Website: nc811.org Hours: 24 hours, 365 days Advance Notice: 3 full working days Marks Valid: 15 working days Law Link: nc811.org/north-carolina-law.html												N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	N	N	24"	



Know what's below. Call before you dig.

You can also reach your local Notification Center by dialing 811 anywhere in the United States. This is a FREE call and a FREE service.



TICKETS			STATE LAWS & PROVISIONS										NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED					Tolerance Zone (either side of the utility plus the width of the utility)
FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects		
N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	N	N	24"	
N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N	Y	N	Y	Y	Y	N	Y	18"	
N	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	N	Y	24"	
4 / Tickets Fax: 503-293-0826																							
Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	12"	N	Y	N	N	Y	Y	N	N	24"	
0-242-1776																							
N	Y	Y	Y	Y	Y	Y**	N	Y	Y	Y	Y	N*	N	N	Y	N	Y	Y	Y	N	Y***	18"	
* PennDot minor routine maintenance exempt if without 24" depth from highest spot in ROW ** Municipal Roads - minor routine maintenance if within 18" depth from highest point in ROW ** Exemptions include PennDOT within state road DOT, Stripper Well Lines in Class 1 areas *** Large projects accepted online only																							
N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y	18"	
N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	N	24"	
N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y*	N	N	N	N	N**	Y	Y	Y	N	Y	18"	
* Damage reporting required. All damage must be reported to the facility operator, or if the operator is unknown, to South Dakota 811 Center. ** For agricultural tilling and road and ditch maintenance to a depth of 18" only; homeowners have a 12" depth exception for tilling of soil and gardening																							
N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	N	N	24"	



Notification Center and State Law Directory

HELP US STAY UP TO DATE.

Directory information is also available online at dp-PRO.com. Report any updates to this directory by calling 866-279-7755.



You can reach your local One Call center in the U.S. by dialing 811.

Know what's below. Call before you dig.

TICKETS			STATE LAWS & PROVISIONS										NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED					Tolerance Zone (either side of the utility plus the width of the utility)	
FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects			
TEXAS / Texas811 / 800-344-8377																								
N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	16"	Y	Y	Y	N	N	18"	
UTAH / Blue Stakes of Utah 811 / 800-662-4111																								
N	Y	Y	Y	Y	N	Y	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	24"		
VERMONT / Dig Safe System, Inc. / 888-344-7233																								
N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	Y	N	Y	N	N	Y	18"		
VIRGINIA / Virginia 811 / 800-552-7001																								
N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	24"		
WASHINGTON / Washington 811 / 811 / 800-424-5500																								
N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	25"		
WASHINGTON D.C. / District One Call / 800-257-7777																								
N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	18"		
WEST VIRGINIA / West Virginia 811 / 800-245-4848																								
N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	N	N	24"		
WISCONSIN / Diggers Hotline / 800-242-8511																								
N	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	N	Y	Y	Y	Y	Y	18"		



Know what's below. Call before you dig.

Expand public awareness by visiting call811.com. You will find a variety of downloadable elements available for use free in your company/organization's existing campaigns.



TICKETS			STATE LAWS & PROVISIONS									NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED					Tolerance Zone (either side of the utility plus the width of the utility)
FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects	

WYOMING / One Call of Wyoming / 800-849-2476 / Tickets Fax: 800-217-3719

Website: onecallofwyoming.com

Hours: 24 hours

Advance Notice: 2 full business days

Marks Valid: 14 business days

Law Link: onecallofwyoming.com/wp-content/uploads/2019/08/2019_Wyoming_Law.pdf

N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	N	N	24"
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GULFSAFE / Covers state and federal waters in the Gulf of Mexico, the Florida Straits and Atlantic Coast / 888-910-4853 (GULF)

Website: gulfsafe.org

Hours: 24 hours

Advance Notice: 7 working days

Marks Valid: Not Applicable

Law Link: Not Applicable

N	Y	N	N	N	N	N	Y	N	N	N	N	Y	N/A	N/A	N/A	N/A	Y	Y	Y	N/A	N	N/A
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Canadian One Call and Provincial Law Directory



Canadian One Call Centres Committee

TICKETS			PROVINCIAL LAWS & PROVISIONS									NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED					Tolerance Zone (either side of the utility plus the width of the utility)
FAX	Online	Mobile	Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Membership	Excavator Permits Issued	Mandatory Premarks	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects	

ALBERTA / Utility Safety Partners / 800-242-3447

Website: utilitiesafety.ca

Hours: 8:00 AM - 4:30 PM, M-F (Emergency or Online: 24/7)

Advance Notice: 3 full working days

Marks Valid: up to 30 days, determined by member

N	Y	Y	Y	N	N	N	N	N	Y	Y	Y	N	N	N	N	*	Y	Y	Y	Y	Y	1m (39")

* 300 mm (12") hand tools only

BRITISH COLUMBIA / BC 1 Call / 800-474-6886

Website: bc1c.ca

Hours: 24 hours / 7 days

Advance Notice: 3 working days excluding Saturdays, Sundays & holidays

Marks Valid: 30 calendar days

N	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	N	N	N	N	Y	Y	Y	N	Y	VARIES
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MANITOBA / Click Before You Dig Manitoba / 800-940-3447

Website: ClickBeforeYouDigMB.com

Hours: 8:00 AM - 5:00 PM

Advance Notice: 3 full working days excluding weekends and holidays

Marks Valid: Determined by member

N	Y	Y	Y	N	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	N	Y	N	Y	VARIES
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ONTARIO / Ontario One Call / 800-400-2255

Website: OntarioOneCall.ca

Hours: 24 hours, 365 days

Advance Notice: 5 working days

Marks Valid: Minimum 60 days

Law Link: www.ontario.ca/laws/statute/12o04

N	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	N	N	Y	Y	Y	N	Y	VARIES
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ATLANTIC PROVINCES / Info-Excavation / 800-663-9228

New Brunswick, Nova Scotia, Newfoundland & Labrador, Prince Edward Island, Quebec

Website: info-ex.com

Hours: 24 hours/7 days

Advance Notice: 72 hours (3 working days)

Marks Valid: Maximum 180 days

N	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	N	N	N	N	Y	Y	Y	Y	Y	1m (39")
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SASKATCHEWAN / Sask 1st Call / 866-828-4888

Website: sask1stcall.com

Hours: 8:00 AM - 4:30 PM, M-F (Emergency 24/7)

Advance Notice: 3 full working days

Marks Valid: 30 days

N	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	Y	Y	N	Y	VARIES
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We listen. We adapt. We dig in.



“I really enjoyed the webinar, and I was glad to speak. It’s a big topic in our county and I just presented your farm and ranch guide to my county commission stating I’m going to be handing it out during future training and pesticide applicators renewals in the spring.”

- *Extension Agent, Dunn County, NDSU*

Enhance your public awareness efforts with a unique, engaging approach to rural outreach. The Pipeline Ag Safety Alliance works closely with the National Association of County Agricultural Agents to help deliver safe digging education to farmers and ranchers across the nation. Tracking our “educate the educator” approach with annual documentation, we realize there is no one size fits all.

“Thanks for a great presentation last week! It was very good, and as the Farm & Ranch Safety Coordinator for NDSU Extension, I look forward to resources like this to help our Extension staff across the state!”

-*Extension Agent, Steele County, NDSU*

Learn more at PipelineAgSafetyAlliance.com

Let's
Grow
Safely Together





Global Locate MASTERS

Celebrating Locate Technician Excellence

2023 Global Locate Masters

The World's Best Locate Technicians Compete
for International Recognition at Global ESC 2023

February 14-16, 2023 • Tampa, FL

The Global Locate Masters takes skills competition to the next level! This unique competition tests the abilities of top locate technicians from around the world using UTTO's VR simulators. These simulators create complex locate experiences in an immersive environment that challenge a technician's training,

skill, experience and the attention to detail required for a successful locate.

To learn more about competing or sponsoring the Global Locate Masters, visit GlobalLocateMasters.com



ABOUT THE TECH: UTTO'S VIRTUAL LOCATE SIMULATOR

The UTTO Virtual Locate Simulator creates a fully immersive and accurate locating experience. The locate device behaves as if it were detecting pipes and cables

under true electromagnetic signal conditions (both simple and complex), making it an invaluable tool for training and fair competition!



The Inaugural Global Locate Masters

The Inaugural Global Locate Masters took place in Phoenix, AZ at Global Excavation Safety Conference 2022. This unique competition, using UTTO's Virtual Locate Simulator, drew utility locators from around the nation looking to test their skills against the best in the business.



"AT FIRST, I WAS HESITANT TO COMPETE. LOCATING IS MY PROFESSION AND PASSION. I WAS ENCOURAGED TO ENTER BY MY BOSS AT MULE SERVICES. THE VR SETUP WAS AMAZING. I WASN'T SURE WHAT TO EXPECT, BUT IT REALLY FELT LIKE A FIELD LOCATE. AS IN A NORMAL LOCATE, PROCEDURES HAD TO BE FOLLOWED. I WAS SUPER EXCITED, AND IT WAS A GREAT FEELING."

FIRST PLACE: PAT BELLACERO, MULE SERVICES

INFRASTRUCTURE RESOURCES

3800 American Boulevard West, Suite 1500
Bloomington, MN 55431

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