

IOWA 811

ONE CALLSM

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Excavator

QUARTERLY



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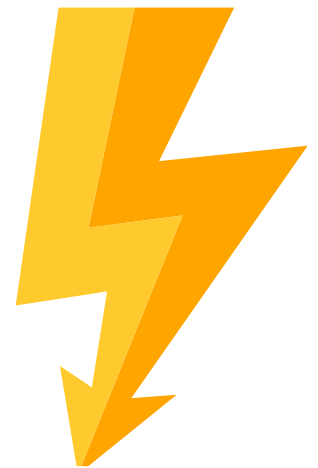
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WHAT'S UP BELOW



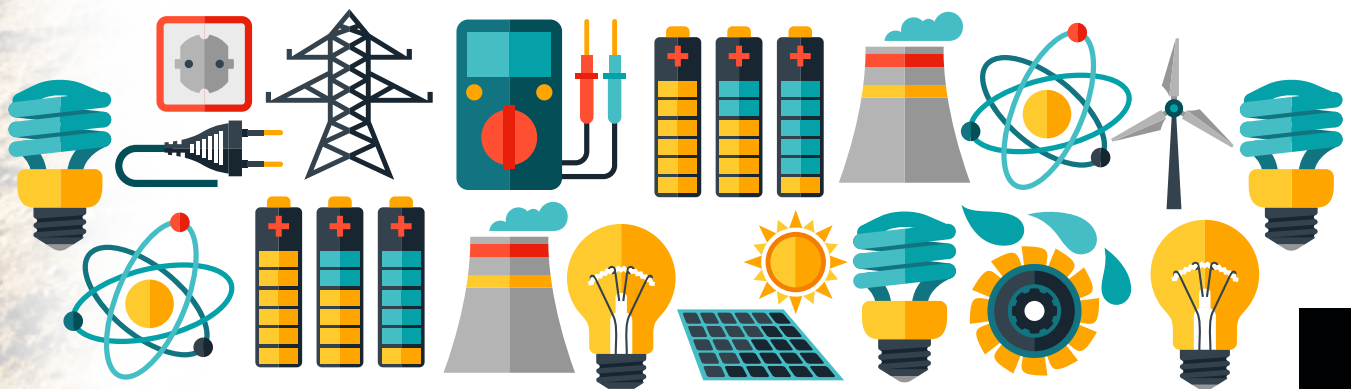
Understanding the Process of Locating Underground Facilities

To better understand the process, and limitations, involved in locating and marking underground facilities, it's important to understand some fundamental elements of electricity. Because locating technicians (locators) use electric current to locate underground facilities, they must understand how and what impedes the flow of electrical current (electrical impedance), and how electromagnetic (EM) fields behave. In essence, EM fields are a byproduct of electricity; whenever electrical current flows, EM fields are produced perpendicularly to the direction in which the current flows. It is the EM field generated by the electric current, not the actual underground facility and not the electric current, that locators use to identify where an underground facility is buried.



The science involved in locating EM fields is straight forward, but there are always potential obstacles present at any given worksite that can create challenges for locators. In a perfect environment, EM fields will be circular in shape as they expand outward and towards the ground surface. The locating instruments used by locators will easily detect these round EM fields as they 'peak' at the surface; and because of the circular shape, these 'signals' will be directly centered above the underground facility. Therefore, in a perfect environment, determining where the center of an underground facility is buried should be a pretty straight forward process. Unfortunately, and as locators can confirm, encountering perfect locating environments is anything but typical.

Locators use a transmitter and receiver system to generate and track EM fields. The most common approach is to create an electrical circuit with the underground facility by clamping one lead of a transmitter directly to the underground facility (typically, at a point where the facility is located above ground) and the other lead to a grounding rod (a return path that completes an electric circuit). A locator will use the transmitter to apply current, at a predetermined frequency, to the newly established circuit, which will travel along the entire length of the facility, and in doing so, create an EM field. The locator will then use a receiver, which will be tuned to the frequency of the applied



current, to track the peaks of the EM field. Again, this is a straight forward process as long as the electric circuit is maintained. Any interference or changes to the flow of electricity will cause corresponding changes to the EM fields.

There are a number of common factors that present locators with problems, of which most locators will encounter at least one or more on a daily basis. Experienced locators can often overcome problems caused by electrical interference by employing creative workarounds involving adjustments to the transmitter and receiver and by establishing/reestablishing different electric circuits with the underground facility. Finding effective workarounds can be time-consuming, requiring trial and error methods. In some instances, due to various circumstances, underground facilities may not be locatable at all. This is why “tracer wires” are commonly installed by utility operators to underground facilities that would otherwise not conduct electric current. Tracer wires are critical components of underground facilities and must be observed and protected by excavators. In the event a tracer wire is damaged during an excavation, the excavator must immediately notify the underground facility operator so that a proper connection can be reestablished.

Common Factors that Impact the Locating Process

- ▶ Material composition of an underground facility
- ▶ Insulation of an underground facility
- ▶ Proximity to other underground facilities
- ▶ Common bonding of underground facilities
- ▶ Depth of the underground facility

COMMON FACTORS THAT IMPACT THE LOCATING PROCESS

- **Material composition of an underground facility**
 Electric current cannot be conducted via non-conductive materials, such as plastic and rubber. The same is true of otherwise conductive materials that utilize non-conductive joints and couplers, such as metal piping or conduit sections that utilize rubber gaskets at the joints. Additionally, if metal becomes severely corroded, it can be rendered non-conductive. Non-conductivity or low conductivity breaks or impedes the flow of current and therefore stops or impedes any generated EM fields. Failure to generate adequate EM fields equates to failure to locate underground facilities. Iowa law requires all underground facility operators to maintain their underground facilities in a manner that is suitable for standard locating procedures. New and existing underground facilities that do not adequately conduct electric current must include some means for traceability, such as tracer wires.



- **Insulation of an underground facility**
 Maintaining a strong current in a circuit requires proper insulation techniques. Weak current will result in weak EM fields. Insulated utilities are typically easier to locate because they can convey current with minimal loss and in turn generate stronger EM fields that can be detected at greater distances. If a ‘bare’ conductor, such as a metallic facility, comes in direct contact with soil, current will be greatly restricted or lost as it travels from the facility into the

surrounding soil. The more surface area of an underground facility that comes in contact with surrounding soil, the greater the current loss will be. The current will eventually travel through the soil back to the transmitter, but the current may then be greatly reduced resulting in weak or non-detectable EM fields.

- **Proximity to other underground facilities**

As noted above, in a perfect environment an EM field generated from electric current traveling the length of an underground facility, will expand outward from the facility in a circular shape and then peak at the surface, providing an easily detectable center point where the facility is buried. When, however, there are multiple underground facilities in close proximity to one another, that “perfect environment” is effectively negated. In any electric circuit, electricity will follow the path of least resistance. An underground facility in close proximity to an electric circuit – created with a different underground facility – may provide a path of least resistance back to the transmitter. When this occurs, the current will jump to the nearby facility as it travels back to the transmitter. With two facilities in the same circuit, both will generate their own EM fields, oscillating at the same frequency. The interaction of the two EM fields can cause gross distortions making it difficult to detect the target facility. These distortions can alter the size and shapes of the two EM fields and alter where the peaks occur – which may no longer be centered above the target facility. Additionally, parallel facilities may produce a single EM field making it appear as if only one underground facility is present, when in reality there may be two or more present.

- **Common bonding of underground facilities**

Common bonding is a practice used to join two conductors together to ensure the same electrical potential. Bonding is done for safety reasons; primarily to prevent someone touching two pieces of equipment at the same time from receiving electrical shock by becoming the pathway of equalization (the danger occurs when two pieces of equipment have different electrical potentials). Additionally, facilities that are bonded in common typically share a ground. When a locator adds current to commonly bounded facilities, that current will flow, at the same frequency, on every facility that is bonded together, making it extremely difficult to isolate the target facility. In order to isolate a specific facility, the locator would need to break the bond, which may not always be possible or feasible.

- **Depth of the underground facility**

Remember, it's the peak of the EM field that a locator is trying to detect as it expands beyond the surface of the ground. As an EM field moves further away from its source, it will begin to ‘fade’ or degenerate. This degeneration can be accelerated when the EM field encounters resistance. Soil is a poor conductor and therefore increases resistance; the deeper a facility is buried, the more soil and resistance the EM field encounter. There is a point where depth will render an EM field undetectable to the standard locating equipment used by the majority of locators.

In summary, locating underground facilities safely and effectively is definitely not always a straight forward procedure. There are always potential factors, manmade or environmental, that can impede the process. Locators must possess a strong understanding of the processes involved, including a working knowledge of how electric circuits and electromagnetic fields interact and behave, and how they can be impacted by unforeseen anomalies.



INTRODUCING THE Safe Excavator App



State laws pertaining to excavation (or digging) vary – and finding the specific information you’re looking for quickly can be a challenge.

The **Safe Excavator App** makes it easy to find state-specific excavation information including the following requirements or events:

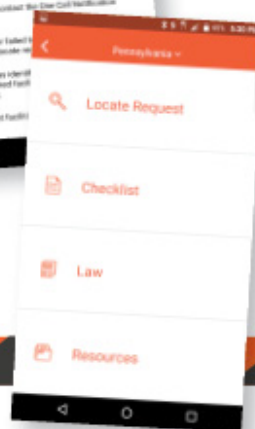
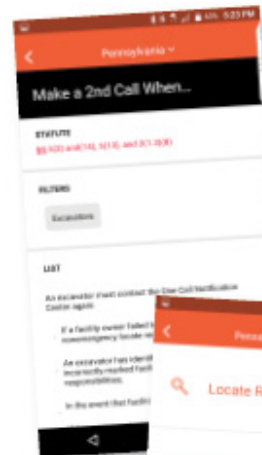
- ▼ Advance notice or wait time
- ▼ Pre-marking ('whiteline')
- ▼ 811 ticket information
- ▼ Names of local enforcement agencies and 811 call centers, also connecting you electronically to submit a locate request
- ▼ Includes safe digging tips + checklist

PLEASE CONTACT
Lindsay Sander
713.208.0273
LNS@SanderResources.com
WITH ANY QUESTIONS.



FREE to download in the App store (Apple) and Google Play (Android)!

Search "safe excavator" or "safeexcavator" and look for the orange shovel



As simple as...
1...2...3!

- 1 Select a state
- 2 Pick an activity
- 3 Research your topic

www.safeexcavator.com



Know what's below.
811 before you dig.

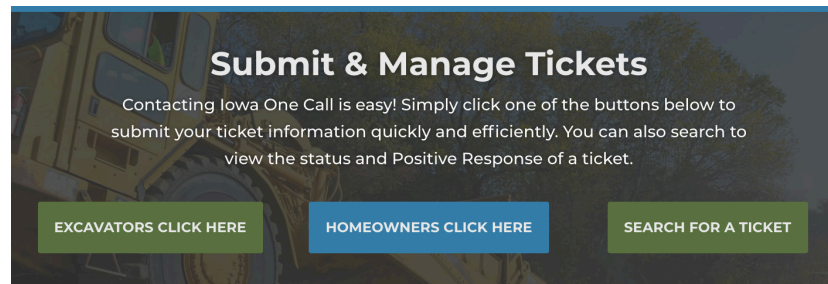
The National Excavator Initiative is an effort to raise the awareness of a critically important program 811.

Contacting 811 before digging is the single most critical action an excavator can take to help ensure their health and safety are protected, while at the same time preventing financial harm and environmental impact.



NEW LOOK, SAME PURPOSE

The Iowa One Call website received a significant redesign in recent weeks. The intent of the redesign was to streamline how you find the information you need. We know that creating an online ticket is what nearly 70 percent of our visitors are intending to do. With the user in mind, we placed ticketing details front and center.



Things To Remember

A ticket is valid for 20 calendar days.

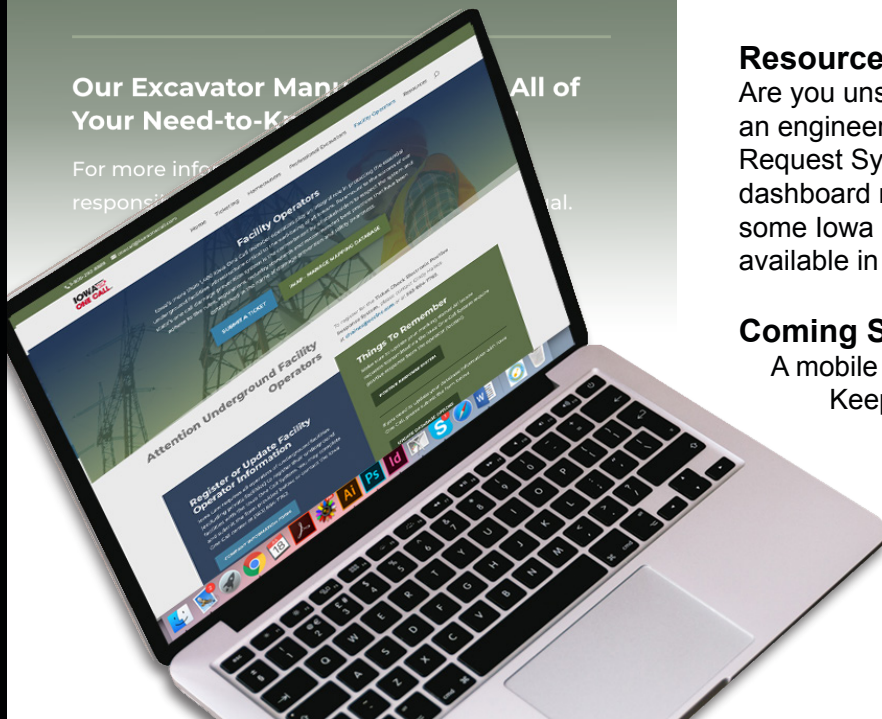
ALWAYS check your ticket status before beginning excavation using Iowa One Call's Positive Response System.

POSITIVE RESPONSE SYSTEM

Hand dig or vacuum excavate within the tolerance zone to expose the facility (18" on either side of the markings).

Our Excavator Manager... All of Your Need-to-K...

For more info... responsi...



Submit and Manage Tickets

The home page allows users to submit or search for a dig ticket. Excavators and homeowners have separate buttons to lead them to the proper online ticketing site. Excavators use the NextGen system, giving them control over the entire ticket, including tools to precisely identify the excavation site. Homeowners are led to ITIC, a platform suited for general home projects. Each platform requires quality information to be submitted.

Things to Remember

Each project brings new challenges. Facilities may be installed at various depths, the locate markings are not always dead center and private facilities may be in the area. The new website offers these reminders for the professional contractor, farmer and homeowner. The safest excavations occur when these reminders are taken seriously.

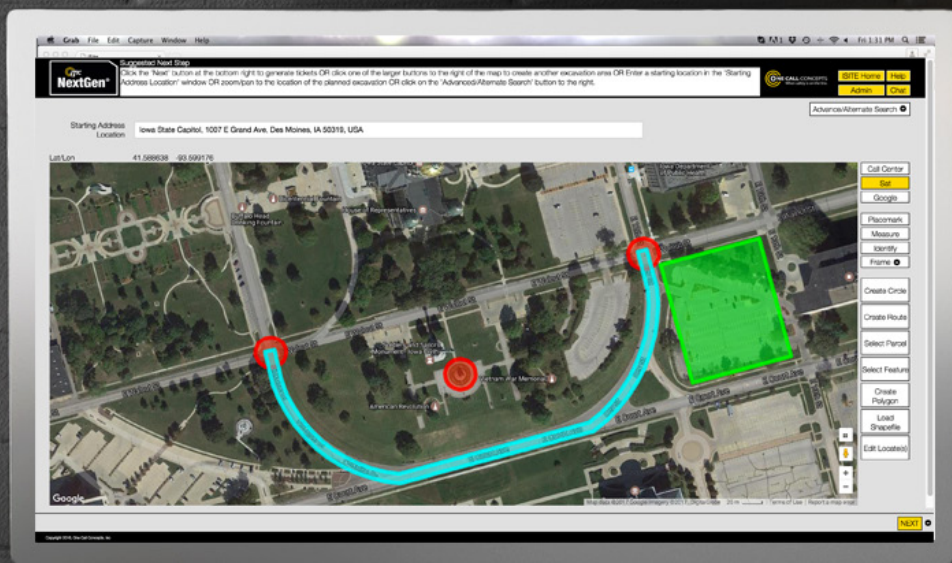
Resources

Are you unsure of how to create a ticket online? Are you an engineer needing to learn how to use the Design Request System? Maybe you'd like to review our call center dashboard report or read an old newsletter? Do you need some Iowa One Call promotional items? These items are all available in the Resource section of the site.

Coming Soon

A mobile application will be released in the coming weeks. Keep an eye out in the App Store and Google Play. The application will allow you to submit and manage tickets and find resources relevant to Iowa One Call.

TIPS FOR MAPPING PRECISELY AND ACCURATELY



**CHECK OUT THE NEXTGEN ONLINE
TICKETING TUTORIAL [HERE!](#)**

1. Use the right tool for the job – ITIC NextGen offers a diverse array of mapping options to fit every scenario.
2. Don't over-map – ITIC NextGen builds the locate request from the mapping. Over-mapping a work area can result in wasted time and resources.
3. Double-Check your work – use the different map views and/or google street view to help ensure you've mapped accurately and completely.



THE IMPORTANCE OF ORANGE

Utility lines buried in the ground may be unseen, but the benefits they provide are a part of every hour of our day. Communication lines are marked with orange paint and flags, and it's not all social media applications and YouTube videos. These utilities are the reason you can successfully make a phone call and buy lunch with a rectangular piece of plastic. Local businesses rely on internet and communication lines for day-to-day operation. Health care is moving toward telehealth technologies and connected medical devices to monitor patients at a distance. Life is truly on the line in some cases.

It's important to view the paint and flag markings as a reminder of the benefits the resources provide to our lives, not an obstacle or inconvenience to the project. Safe digging reduces the likelihood of an excavation-related damage and keeps our communities free from service outages. While safety and protection of the underground facilities is the most important element of an excavation, the financial impact should be considered.

Let's say a fiber optic cable is damaged that was supplying service to a local cell tower. The excavator will be responsible for the repair to the facility, which may total several thousand dollars. Communication companies often have service agreements in place with the providers of the cell tower. If service is disrupted, the cell tower operator may send a bill for the outage.

Another scenario might be cutting a communication line supplying 911 service to a community. If someone encounters a medical emergency during that outage, they may not receive timely help. A few minutes can drastically change the outcome of a person's health.

Since 2005, the amount of employees working from home has increased by 140 percent. This number does not include the small businesses and entrepreneurs working from the home office. Taking communication away from these operations could be devastating to their business.

Remember, there are individuals and entities depending on a stable connection the next time your excavation is near orange paint and flags. Modern technology provides much more than mindless entertainment. It is a foundational element to our society. Do your part in protecting what matters.

ELECTRICITY
SEWER
WATER
GAS
COMMUNICATIONS



IOWA ONE CALL BOARD MEMBERS GET IN THE ACTION

The board of directors held a meeting at the Iowa One Call call center in Davenport on Sept. 6. Our board members took time to sit with a call center representative to understand the ticket creation process.

The call to 811 is the first step to digging safely. The call center representatives are diligent in collecting accurate information about the proposed excavation.

This information is transmitted to facility operators in the proposed area, who are then responsible for marking their facilities. If poor information is provided on the initial phone call, locators will have a tough time completing their job. Our call center representatives are well-trained, ready to capture all the required information.

Please be prepared to provide an excellent description of your proposed excavation when calling the call center.



FUN FACTS

400,000+

Tickets were made through August, 2018



Resulting in nearly

2 MILLION

coordinated locates



Percent of Dig Tickets

70%+

Submitted Online



Iowa One Call center has parcel data information from **ALL** counties in Iowa

QUOTES FROM BOARD MEMBERS



I was able to listen to a wide variety of calls and I was impressed with the amount of information readily available for the call center representative to help in each different situation. The ability of the representative to smoothly jump from one topic to the next to meet each caller's specific needs was excellent."

– Mark Woofter,
MidAmerican Energy Company



I was surprised by the level of detail it takes to get a locate request out to the locators from the first call to the actual locate itself."

– Randy Brown,
Mediacom



Having had the opportunity to sit with an IOC representative during live calls gave me insight into how much the software and processes have improved over time. It also helped me understand that more improvements can continue to be made to help assist making the process more streamlined and precise for both the caller and Iowa One Call."

– Scott Johnson,
Aureon



As someone that uses the system quite regularly I was very impressed with the professionalism and the knowledge that I was listening to. I happened to listen to an emergency locate request and for them to listen and speak with them as if we were just down the road not hundreds of miles away. They know their job and do it very well. It was a very nice experience"

– Scott Long,
T.I.P REC

IN THE NEWS



Local Excavation and Safety News From Around the Web



Iowa One Call Has a Brand New Website!

www.iowaonecall.com

Our website has a new look! We hope you enjoy the new layout and more easily find what you're looking for. [\[www.iowaonecall.com\]](http://www.iowaonecall.com)

PHMSA Hearings Open to News Organizations

www.lexology.com

In a letter issued to the Reporters Committee for Freedom of the Press (RCFP) and E&E News last week, PHMSA's new Chief Counsel Paul Roberti announced its intention to publicly post advance notice of hearings requested by operators. ... [\[more\]](#)

5 Safety Tips for Yard Projects this Fall

JULIE1call

All good things come to an end, and that includes the warm-weather growing season. As temperatures fall and days grow shorter, the lawn and garden need a little TLC before winter's arrival. ... [\[more\]](#)



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ONE CALL



www.IOWAONECALL.com

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