# Avoiding Utility Strikes

## Toolbox 2: Locating underground utilities – transcript

Welcome to SafeWork SA's toolbox series on avoiding utility strikes. This series is all about avoiding utility strikes while digging or working near overhead powerlines. This is the second episode – Locating underground utilities. This toolbox episode explains how to locate underground utilities by looking for visual clues, using cable locators and why potholing is a critical process in avoiding a utility strike.

Walking your worksite is an important part in finding visual clues of what utility services are present. Looking for signs of services and utilities above ground indicates things that may lie below ground.

Before You Dig plans give you an idea of the services you should be able to identify even if you can't see them. Your Before You Dig plans need to be available on site.

Using these plans, walk your site and look for clues of:

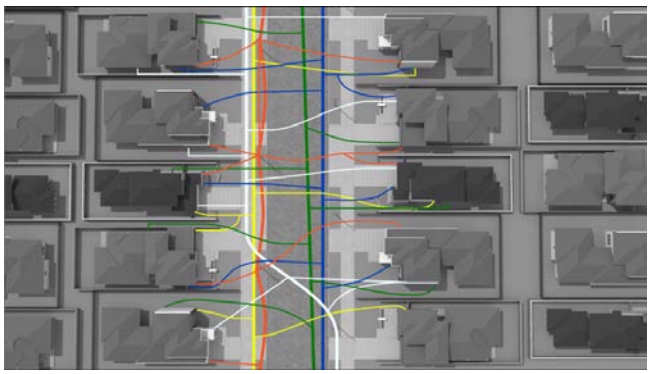
- electricity
- communications
- gas
- street lights
- water and waste

Look for physical clues like:

- access chambers
- pits
- valves
- marker posts and warning signs
- kerb markings
- damaged footpaths, driveways or depressions which may indicate the presence of a trench.

If you intend to dig deeper than 30 centimetres within 3 metres of any electrical infrastructure, you are legally required to request a network access permit from SA Power Networks.

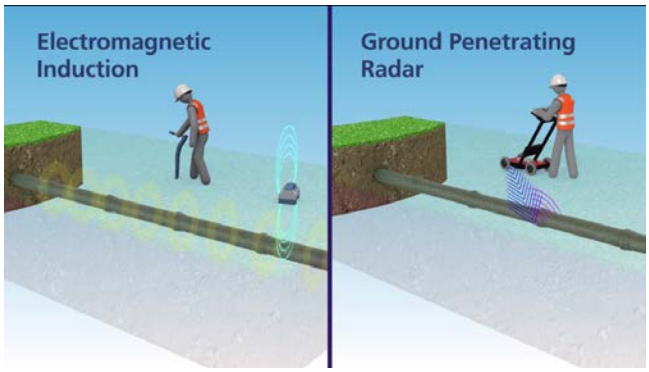
All these services are connected to buildings or other infrastructure and are not always in a straight line.



One way to take the worry out of locating buried underground assets is to use the services of an accredited locating company.

### Underground locators

There are two main techniques for utility location – Electromagnetic Induction and Ground Penetrating Radar.



Electromagnetic Induction uses a transmitter to energise the utility with a current, setting up an electromagnetic field. This is then detected using a receiver.

Ground Penetrating Radar uses radar pulses emitted into the ground. When these pulses strike a charge in the subsurface, like a pipe or cable, they are reflected back to the radar unit and the results are displayed on a screen for the operator to interpret.

If you are using your own locating equipment, ensure the operators are trained in how to use it and aware of its limitations.

The equipment must be calibrated and capable of detecting all types of cables and pipes.

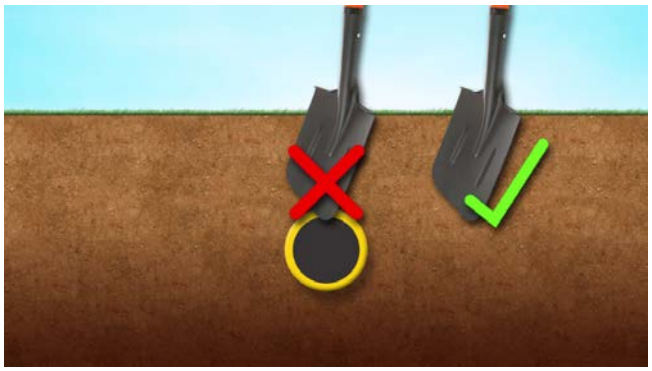
Some locating equipment may not detect an electric cable unless there is current flowing through it, and may not be able to detect non-metallic pipes or cables.

It is common for some assets to be laid with detectable, foil-backed marker tape, or non-detectable marker tape and a tracer wire making it easier to locate, but this is not always the case. Some assets like fibre optic cable cannot be located without specialised equipment.

## Potholing

Once the asset location has been found, dig a pilot hole where you intend to excavate. This is known as potholing and is used before excavation to identify how the lines run underground.

Every effort should be made to excavate alongside an asset rather than directly above it.

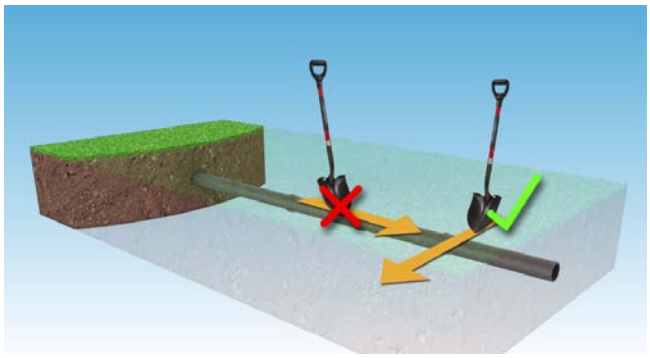


Using appropriate personal protective equipment and insulated hand tools is a safe method for potholing.

How you use your hand tools is important – they are a common source of incidents and can damage the asset if used incorrectly.

Spades and shovels should have curved edges and should not be thrown or spiked into the ground, but eased in with gentle foot pressure.

Always dig across the asset and not along its length.



Another safe method of potholing is vacuum excavation which is a fast and usually non-destructive way to locate and expose underground utilities services. It must be noted that water jetting at some high pressures can damage cables and pipe coatings.

Whichever method is chosen, you need to apply it with care. Remember, the more risky the job, the more frequent the potholing.

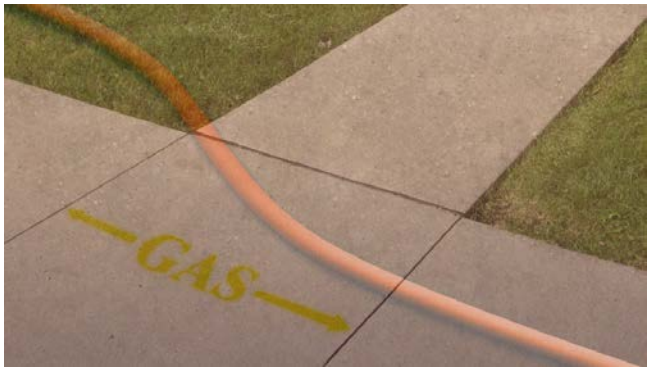
If you are excavating near high voltage electrical cable or high pressured gas lines, always contact the asset owner for a permit and onsite assistance, if required.


## Excavation work

Prior to excavating, clearly mark all services on the ground with the correct colour paint to mark the locations of the service. Australian Standard 5488 uses the following colours for common service types:

Yellow – Gas
Orange – Power
White – Communications
Blue – Water
Red – Fire services

Once an asset location has been marked and confirmed, excavation can start. Extreme care should be taken when digging above or close to the asset location. If a marker tape is found, use extreme caution if you continue digging. Excavation work is discussed in more detail in the next episode.




## Network Access Permits & Notifications

If you come across electrical infrastructure, the risks associated with any live electricity should be controlled before digging, including potholing. To do this you will need to contact SA Power Networks. A network access permit may then be required (Allow at least 28 business days to process). If you require a permit, the power will be controlled until the permit is returned.

When digging near high pressure gas lines, APA Group requires a Third Party Works Authorisation and possible attendance on site by an APA representative during excavation. The form will be sent with your Before You Dig plans, covered in the first episode.

## Summary

Always have s plans available on site.

Look for visual clues of services.

Use cable locators to identify hidden assets.

Clearly mark all services on the ground.

When working near electricity assets, do not proceed until a permit has been issued.

Always pothole prior to excavating, using insulated tools carefully and wear appropriate personal protective equipment.

Remember, never assume services marked on the ground are correct, run in a straight line, or have been installed at a consistent depth. Always verify location by using careful potholing at frequent intervals along the services.

Now that you know more about locating underground utilities, the next episode will explain how to carry out excavation work.

## More information

For further information on work health and safety matters, visit the SafeWork SA website at safework.sa.gov.au or call 1300 365 255.