

# Toolbox Talk

UK/ZHEC/003  
16 May 2016

## Underground Services Avoidance

The striking or disturbance of underground services from breaking ground activities can cause fatalities, serious injuries and significant disruption to the facilities that rely on them.

Both high and low voltage electricity cables and even some communication cables can explode or cause electric shock if damaged. Fire and explosion can result from damaging gas or fuel pipelines and fractured water mains may cause significant injury as a result of being struck by high pressure water.

### What does breaking ground mean?

Some examples of breaking ground are:

- ❖ Excavation, both mechanically and using hand tools
- ❖ Drilling, boring or probing
- ❖ Road planing or milling
- ❖ Piling
- ❖ Driving fence posts or pins
- ❖ Vegetation removal

### How do we control breaking ground activities?

#### Planning:

Where possible, we should eliminate or reduce the need to break ground in proximity to underground services by thorough planning.

If breaking ground is necessary, there must be sufficient planning carried out before any breaking ground activity can begin. This includes:

- referring to underground service drawings
- undertaking site surveys to positively identify services
- having a robust Safe System of Work (SSoW) in place

Permit to break ground requirements must be adhered to in accordance with your procedures. These permits follow a step-by-step process to ensure that the risks of striking utilities are controlled.

#### Survey for underground services:

A Cable Avoidance Tool (CAT) and signal generator (Genny) must be used to scan for services before breaking ground and also as excavation progresses. Services should be visually identified using trial holes. Trial holes must be excavated by hand or other safe non-mechanical methods (e.g. vacuum excavation) before the main breaking ground works are started to determine the exact location and depth of any utilities present.

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## Safe digging practices:

- Assume all services are 'live' unless it has been proved without doubt that it has been isolated or is redundant
- Anyone likely to be exposed to fire or explosion must wear flame retardant clothing, including gloves
- Only use electrically insulated tools
- Where possible, employ non-contact methods such as vacuum excavation and air picks to loosen and remove soil from around services
- Services encased in concrete MUST be isolated BEFORE being exposed. If not possible, a robust SSoW must be in place
- Everyone involved with breaking ground must be competent, and some will require specific qualifications
- The work area must continue to be scanned as the work progresses
- Re-establish service markings that are removed as the works proceed
- Very importantly – follow the Golden Rules and stop work if anything changes!

## Exclusion zones:

An exclusion zone is a defined area immediately around a utility within which safe excavation practices must be adopted and must be defined within the safe system of work.

- Ensure that you are familiar with the exclusion zones relevant to your task
- Comply with these exclusion zones at all times
- There must be no mechanical excavation undertaken within an exclusion zone unless there is specific permission given and strict controls are applied
- If in any doubt, ask your supervisor.

## Personal Protective Equipment (PPE):

Everyone working near to live utilities that have the potential to explode (gas and fuel pipes, low and high voltage electric cables) must wear flame retardant clothing as an outermost layer. Waterproof and high visibility, flame retardant clothing is available.

## Dos and Don'ts:

- ✔ **Do stop work if an unknown or unexpected utility is identified. Inform your Supervisor**
- ✔ **Do scan for utilities as the excavation proceeds.**
- ✔ **Do assume that all utilities are 'live' unless it has been proved without doubt that it has been isolated or is redundant.**
- ✔ **Do ask your Supervisor if you are unsure about anything.**
- ✔ **Do ask for any service markings that are removed as the works proceed to be re-established.**

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- ❗ Don't use sharp hand tools when working near to underground utilities, e.g. pick axes and wrecking bars.
- ❗ Don't attempt to remove any hard material that surrounds a utility, e.g. concrete, unless you have clear instruction to do so as part of a robust SSoW.
- ❗ Don't use utilities as a means of getting into or out of an excavation.
- ❗ Don't work outside the limits of the work area.

**Remember: Utilities can maim and kill if damaged**

**Stop if anything changes!**