

Avoiding Utility Strikes

Toolbox 3: Excavation work – 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 third episode – Excavation Work. Excavation work can introduce many high-risk work activities, in this toolbox we will be looking at excavating techniques to minimise those risks.

Excavating

Excavations are any activities that penetrate the soil.

It could be as simple as using a shovel to dig a hole, using an excavator to dig a trench or using a vacuum truck to remove soil. Excavation work should be carefully planned before work starts so it can be carried out safely.



Before starting any excavation activities, you must take all reasonable steps to obtain current underground essential services information, and locate all services within the areas you are working. Toolboxes 1 and 2 explain this in more detail.

Permit to excavate

For all mechanical excavation activities, it is good practice to use a permit to excavate, as this will help clearly define:

1. persons with key responsibilities
2. the scope of works
3. preliminary planning requirements, including permits from relevant authorities
4. specific controls and hold points with respect to identifying and locating services

A permit to excavate helps work crews understand the process. A permit to excavate will need to be completed by someone who has been trained and deemed competent by your organisation.

However, everyone is responsible for making sure that all steps on the permit have been completed and are understood. (For more information on the permit to excavate process, please visit SafeWork SA website).

Safe Work Method Statement

Excavation work can introduce many high-risk construction work activities.

A documented Safe Work Method Statement will need to be developed for those activities identifying site specific hazards and the appropriate risk controls. The Safe Work Method Statement must also describe how the control measures are to be implemented, monitored and reviewed, and should include what actions are required in the event of contact with gas or electricity lines.

Prior to excavating, ensure all relevant personal protective equipment is available on site as identified in the Safe Work Method Statement.

Interfacing with existing services and public

When planning an excavation consider the following:

- Have all access authorisations been confirmed?
- Are there man-made structures?
- Have overhead power lines been identified if mechanical excavation or large plant is to be used?

- Have all underground assets been physically located and marked prior to breaking ground?
- Have you notified all persons who are affected by the work prior to commencing?
- Will the planned trench be close to pedestrian or vehicle traffic?
- Is Work Zone Traffic Management required? Barricading, cones and traffic control are examples of this.
- Is the excavation going to be within a rail corridor? If so, has the appropriate authority been notified, approved spotter engaged, and the required rail safety induction undertaken?
- Is there a risk of falling into the trench during the day or night? If so, consider covering or barricading the trench area.



- Do exposed services need to be protected from falling objects?
- If the work is being performed on or near a country road, give consideration to the level of compaction density on the verge of the road, as it may not be as solid as that on a major road.

Size and access

- How big will the trench need to be? Can workers safely move around the site e.g. in and out of the trench and the movement of plant and equipment?



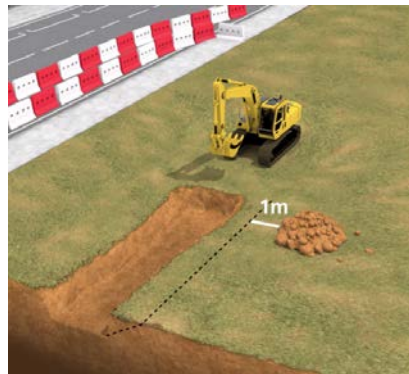
- Are ladders required to assist workers safely get in or out of the trench?
- Consider an emergency situation where you needed to rescue a worker from the trench, plan how you would get them out.
- If the excavation is greater than 1.5 metres deep, you must install trench support – shoring, battering or benching.
- What equipment will be in use? If it is needed in the trench, how will you get the tools and equipment in and out?
- How long will the trench be open for? The longer it is exposed to the elements, the greater the risk of collapse.
- All open excavations and assets shall be secured in a safe manner when there are no workers on site.

Machinery

Operators of excavators and backhoes must be trained and competent prior to operating any machinery on site.

If mobile plant is in use, ensure all workers remain outside the operator's blind spots. Operators can often have severely restricted visibility of ground workers or nearby pedestrians, particularly those close to the plant.

Consider the placement of the spoil. Where possible, place it on the low side or opposite to previous excavation at least 1 metre from the 'zone of influence'.



Consider heavy fleet accessing the site – all need space planning, safe bringing to site, use, and removal. Also consider possible weight effects on trench sides.

Heavy loads should not be located in the zone of influence of an excavation, unless the ground support system installed has been designed by a competent person, for example, a geotechnical engineer, to carry such loads.

The zone of influence will depend on the ground conditions. It is the zone in which there may be an influence on the excavation, including possible ground collapse.

Trench soil assessment

Some soils are more stable than others. The type of soil is one of the factors that determine the chance that an excavation may cave in.

- Hard cohesive is very stable. Clay is an example of a hard cohesive material.
- Soft cohesive is less stable. This generally includes crushed rock, silt, and soils containing an equal mixture of sand and can incorporate silt material.
- Non cohesive is even less cohesive. Gravel and coarse sand are examples.

Consider the soil's granularity. This refers to the size of the soil grains; the larger the grains, the less stable the soil e.g. clay has very small grains.

- Saturation means how much water soil will absorb. Saturated soils are subject to slumping.
- Cohesiveness means how well soil holds together – remember clay is a cohesive soil.

When adjoining man-made structures, all soil types will lose their normal cohesiveness. They will not bond to man-made materials like concrete, brick and metal.



Also, man-made structures may introduce a large downward force on the soil below. For this reason, excavating near man-made structures requires special safety consideration.

Normal battering and benching designs may have to be revised around man-made structures. More soil removal may be required.

If in doubt seek professional engineering advice.

Summary

Conduct appropriate searches for overhead and underground utilities

Where high-risk construction work has been identified, complete a documented Safe Work Method Statement, based on a risk assessment and consider a permit to excavate process.

Notify the public and protect them from machinery and fall hazards. Consider traffic management.

Consider the proximity of machinery to workers and the sides of the trench. Machinery operators must have the appropriate training and competency.

Consider trench depth and size. Workers need to enter and exit the trench safely and must have the appropriate personal protective equipment and tools.

Is the trench at risk of collapse? Conduct analysis of soil type and length of exposure to the elements. Support the trench appropriately.

Practice emergency procedures regularly.

Toolbox 4 of the series outlines the safe approach limits for people and minimum safe clearance distances for machinery when working near overhead power lines.

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.

