

# Excavations



During excavations, there is a danger that electricity and telecommunication cables and gas, water and sewer pipes can be struck, causing injury to anyone nearby and damage and significant disruption on-site and in the surrounding areas.

Key risks include collapse, material falling in from the sides, falls over the edge or from ladders and other climbing or access apparatus, overturning plant and driving into or too close to the area (increasing the risk of collapse).

Recognising the relevance of other associated health and safety legislation, excavations (except those carried out for archaeological, quarrying and mining purposes) are specifically addressed in the Construction (Design and Management) Regulations 2015 (CDM 2015).

Areas covered include the prevention of danger to workers in or near excavations, the need to take suitable and sufficient steps to prevent anyone or anything falling into an excavation, and to prevent overloading on any part of an excavation or nearby ground. Arrangements for inspection by a competent person are also addressed.

It's important to also consider associated risks, such as contact with underground services (resulting in fire, explosion, electrocution and/or burns), drowning (where water ingress is a potential issue), asphyxiation (caused by a lack of oxygen or inhalation of toxic fumes) and leptospirosis.

### **Key actions to manage the risks associated with excavations**

- Employ appropriate expertise (qualified and competent structural engineers and temporary works engineers, for example) at the design stage ensuring that it's retained as works progress.
- Consider the use of trenchless techniques when appropriate as they may provide an opportunity to avoid major excavations.
- Use relevant service drawings, service locating devices and safe digging practices (including permits to dig) to ensure underground services aren't disturbed.
  - Make sure workers are aware of any underground services, such as electricity, gas, water and sewage, and understand how to avoid them.

- If there is a potential unexploded ordnance (UXO) risk on site, a UXO specialist should be hired by the client during the early stages of project planning. Use the [Construction Industry Research and Information Association's \(CIRIA's\)](#) four-phase approach (as set out in priced publication '[Unexploded ordnance \(UXO\): A guide for the construction industry \(C681\)](#)') to evaluate and manage the risk of UXO on site.
- Check that the stability of scaffold footings, buried services and structural foundations for nearby structures will not be affected by the excavation.
- Decide what support (trench sheets, trench boxes, props and baulks to prevent collapse, for example) and safety measures will be needed at each phase of the work and ensure that the right equipment and appropriately trained people are available on site before work starts.
- Consider battering the excavation sides to a safe angle of repose to make it safer.
  - In granular soils, the angle of the slope should be less than the natural angle of repose of the material being excavated.
  - In wet ground a considerably flatter slope will be required.
- Protect the edges of excavations by installing guard rails and toe boards inserted into the ground immediately next to the supported excavation side. Use fabricated guard rail assemblies that connect to the sides of the trench box or the support system itself (utilising trench box extensions or trench sheets longer than the trench depth, for instance).
- Provide appropriate and secured means of getting in and out of the excavation, as required.
- Make sure that anyone working in an excavation or other underground environment is wearing appropriate head protection that will protect them against falling materials.
- Avoid parking or moving vehicles and plant near to the sides of an excavation – the extra weight can make a collapse more likely.
- Consider and assess other associated risks, including drowning, asphyxiation, confined space work and leptospirosis (provision of appropriate welfare facilities is essential), ensuring that appropriate control measures are identified and implemented and, as much as possible, the need to access an excavation is avoided or eliminated.
- Ensure that all work involving excavations is appropriately supervised and that a competent person is appointed to undertake required inspections (start of shift, after any event likely to have affected the strength or stability of the excavation, and after any material unintentionally falls or is dislodged).
  - Managers and supervisors should monitor compliance with safe working procedures including method statements, risk assessments and permits to work.
- Review the control measures implemented to make sure they are working and remain adequate. The importance of monitoring should not be underestimated, particularly with any construction site environment likely to be constantly changing and evolving.

- Provide appropriate information, instruction and training for site operatives and other personnel covering the hazards and risks, appropriate control measures, and what to do in the event of an emergency.