

Safety Code of Practice 47

2nd Edition, July 2011

EXCAVATIONS



be noted that this covers not only mechanical and hand digging but any operation that pierces the ground e.g. driving a stake into the ground for a guy rope on a marquee.

It provides management and general guidance that will be relevant to all Schools/Directorates. In addition, it provides detailed guidance on specific types of excavation and safety critical aspects of ground works. This includes, for example, trenches, large open pits, drainage channels, ground spiking operations and major excavations for roads and buildings.

3 SCOPE

Excavations include almost any operation involving the ground, including:

- archaeological digs
- digging new drainage ditches
- trenching operations for laying new services
- excavations for the foundation of new buildings
- investigation works
- contaminated land removal
- post holing for lighting and fences
- driving of pegs or spikes for support guys/ropes on masts and tents
- earth spikes for portable generating equipment.

The following are not classified as excavation work for the purpose of this guide:

- lifting of manhole covers
- surface skimming of roads for the relaying of a new wearing surface
- the lifting of existing paths and slabs for the purpose of relaying.

4 RESPONSIBILITIES

4.1 Duties of managers

Heads of Schools/Directorates and other unit managers must ensure that:

- you have gathered all the available information on the proposed excavation in order to fully assess the risk, including, where necessary, a survey of the location for underground services and ground conditions;
- where the dig/excavation is on University premises, **approval has been obtained from Facilities Management Directorate (FMD) prior to any work starting (this includes work associated with social events, such as erecting marquees, using tent pegs) see http://www.fmd.reading.ac.uk/docs/maintenance/Permit_to_dig.pdf;**
- if digging on non University property you should confirm that there is no other authorisation that you need to obtain;
- staff and students are suitably trained before taking part in any dig or excavation;
- where the work is to be undertaken by a contractor, that a competent contractor with experience in the type of work is selected;
- the selected contractor has sufficient information to carry out the required hazard appreciation and risk assessment;

all involved in the excavation have been briefed on the hazards and on the procedures/
techniques to be adopted (see Annex 1 for an example of a briefing sheet);
where an agreed dig location has been marked, that no digging outside of that area takes place

any fuels stored near the excavation must be sited so that the fuel vapours do not enter the excavation (most fuels are heavier than air and will 'flow' into the excavation);
if it becomes necessary to pump out water from an excavation, an assessment of the need to apply for a permit to discharge consent will be required. A consent will normally be required if the discharge is to a water course (stream or river) or to surface or foul drainage systems.

5.5.1 Marking and fencing

All excavations must be marked and fenced. Where the excavation is accessible by the public, fencing capable of keeping children out (e.g. full height Heras fencing) must be in place around the whole excavation including any spoil heaps. Fencing should also be provided for any plant machinery, particularly any cranes where the swing arc of the counter weight at the rear needs to be isolated from people walking by.

5.5.2 Barriers for animal control

A frequent requirement of planning is the protection of wildlife; this is particularly difficult where animals are concerned. If the excavation is in a wild life protection zone or near a residential area (household pets) there may well be a need for specific protection measures e.g.:

- placement of a timber cover over the excavation;
- placement of a ramp to allow rabbits, foxes, badgers and hedgehogs to get out;
- installation of an amphibian barrier round the excavation.

5.5.3 Protection of landscape

Where digging is likely to cause damage to university grounds, landscaping or is in close proximity to trees or shrubs on campus, the prioETB5.i8464.23 412.27 .03 0h3m[)JT@the pric in6Ms

6.1.1 Angle of repose

Any material has a limit to its ability to stack; loose materials like soils will form a mound with the slope of its sides forming an angle; this angle is called the Angle of Repose. The angle formed by a material as it is tipped or naturally forms has an angle in a direct relationship to its material qualities. Different materials will have different angles. The issues to consider are:

- the spoil material can dry out and change its angle of repose ratio;
- rain can cause it to slip;
- vibration from nearby plant and vehicle movements can affect the stability;
- large boulders or lumps of concrete etc. should be pushed down into the spoil heap to prevent them rolling back toward the excavation.

6.1.2 Quick assessment guide

There are three quick 'Rules of Thumb' to be used in excavations:

- the edge of a spoil heap should be no closer to the excavation than half the base of the spoil heap e.g. if the spoil heap is 2m high and 3m across on the base, the edge of the spoil should be no closer to the edge of the trench than 1.5m;
- on any sloping ground always stack the spoil on the down slope side;
- for any excavation where workers have to crouch down to work in i.e. their head is below the top edge of the trench, the 1m depth rule should be discounted and the trench should either be widened, or protected from collapse e.g. by shoring.

6.2 Inspection

The HSE guidance document HS(G) 150, Safety in Construction has details of the inspection regime for construction sites and has a section on inspecting trench/excavations.

6.2.1 Adverse conditions

Weather can have a significant effect on an excavation, e.g. the ability for rain water to cause the collapse of a trench. On excavations where the ground slopes toward the hole a full drainage calculation should be undertaken to assess the risk and, if required, suitable interceptor gullies and channels must be constructed to prevent flooding and collapse.

Any pumping out of an excavation (dewatering) may be subject to Environment Agency waste management controls (see above 4.4).

6.3 Specialist and mobile equipment

Certain types of equipment require means to prevent it overturning and causing injury to operators working in excavations (e.g. piling rigs or cranes etc.). These will normally be identified by

to prevent access and to maintain a safe site, even for uninvited guests, the risk of litigation from a trespasser who has been injured is low. H&SS will advise on what is considered reasonable.

7.3 Modern Age Archaeology

Excavations on sites and in particular battlefields, from 1700 onwards have a particular hazard from weapons (guns and firearms). Investigators must exercise great caution and not make assumptions about the nature and condition of any weapons.

8 AGRICULTURE AND HORTICULTURAL EXCAVATIONS

8.1 Agriculture

Many agricultural field works are extensive and involve the movement of many tonnes of earth; there is a perception that this type of works is not subject to the same rules as construction. However the risks are the same. Farm excavations may be undertaken by less experienced wor

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