

1. HSE Guidance and Legal Requirements

Although any proposed dig would not form part of a construction site or operational mine/ quarry site the use of excavators presents a potential hazard to members of the Society attending any dig and to the general public. On this basis, The Russell Society has decided that available safety guidance on the use of excavators must be applied to digs involving machinery.

Excavation using machinery on construction sites in the UK is covered by HSE guidance at:

<https://www.hse.gov.uk/construction/safetytopics/excavators.htm>

The HSE guidance refers to legislation that is applied to excavations in the UK under The Construction (Design and Management) Regulations 2007:

<https://www.legislation.gov.uk/uksi/2007/320/regulation/31/made>

Please note that this legislation has been revoked and has been replaced by new legislation under The Construction (Design and Management) Regulations 2015:

<https://www.legislation.gov.uk/uksi/2015/51/regulation/22>

Copies of the above HSE guidance and the CDM Regulations (2015) part 22 (Excavations) are included at Appendix 1 and Appendix 2 to this guidance.

Key safety principles outlined by the guidance and legislation, and to be adhered to at all times during digs, are:

- i. keep pedestrians and vehicles separate at all times;**
- ii. take all practicable steps to ensure that excavations are undertaken in a manner that prevents danger to any person.**

The organiser of the dig and those taking part in the exercise must read the above guidance and legislation and the following Russell Society guidance before arranging and undertaking any dig. Council authorisation must be obtained before commencing any dig.

2. Training and Competence

Machine Driver

The machine operator must hold a relevant competent operator card for the type of machinery being used (eg CPCS red Trained Operator Card for 180° or 'JCB' type machinery, or CPCS blue Competent Operator Card for 360° or larger rotating machines, or equivalent card/ certification system).

Banksman

All digs must be managed by a trained banksman. The banksman shall be a member of the Society who has received appropriate training in advance of the dig. The Society will fund training. Many courses are available including:

<https://www.thelearningstation.co.uk/banksman-traffic-marshall-training-online-course>

3. Before the Dig

Obtain written landowner permission and advise them beforehand that use of an excavator is proposed. Agree with the landowner the condition the site is to be left in after the dig (see At the End of the Visit below). Obtain other written permissions if the excavator has to pass over ground owned by other landowners.

Obtain a competitive quote for machine hire based on location of the site, hire period, machine type required and any special requirements associated with the site.

Ensure that the equipment hire company provide a copy of their Employers Liability Insurance and Public Liability Insurance Cover before any machine is brought to site. Ensure that Hired-in Plant Insurance is put in place before the visit. Hired-in Plant Insurance may be taken out as part of the hire arrangement or may be arranged with a separate insurer. In either instance ensure that the hire company and insurer are aware of the nature of the site and any specific hazards that might be present. Retain details of all insurances for a minimum period of 12 months after the work is finished. Obtain confirmation of driver competence (eg training certificates, construction card).

Obtain Council approval of proposed dig arrangements and costs before placing any orders.

Normally, sites to be excavated will be abandoned rural brownfield locations where utilities are absent. Check for below ground and above ground utilities within the working area and along the access route to it prior to considering use of an excavator. Look out for signs of utilities including overhead powerlines, manholes, meter points, utility indicator markers and manhole covers. If in doubt about the presence or absence of utilities undertake checks with utility companies ahead of the work and determine locations and safe working distances to any apparatus. **Under no circumstances should excavators be used where a machine would have to pass under an overhead electricity line or work within 10m of one.**

Check the area of proposed excavation for known and potential mineshafts, other underground voids or unstable ground by obtaining available mining maps and records where available beforehand and by visual inspection of the site. **Under no circumstances should excavations be undertaken within potential failure cones of shaft tops or voids. If in doubt do not excavate.** Ensure excavator routes to the working area do not cross known or potential shafts.

Create a photographic record of the condition of the site before work commences including the access route to the site and any pinch points or sensitive features.

4. During the Dig

One trained banksman shall be appointed by the field trip leader, ideally this person shall be the field trip leader themselves. The banksmen shall be responsible for directing the machine operator and for excluding pedestrians from the working area. Other persons in the group shall adhere to the banksman's instructions at all times. **No one shall enter any area of excavation, including the safe working area of the machine, until it has been deemed safe to do so by the banksman and the machine has moved away from the excavation to a safe distance.**

Recheck pre-visit hazards and ensure safe clearances are marked out and maintained at all times during the visit.

Cordon off the active working area (note that this may include several separately marked working areas for more complex sites) using road pins and high visibility tape before excavations commence. Ensure the cordon is sufficient to allow working room for the machine including reversing and slew distances. **Under no circumstances should persons other than the banksman enter the active working area whilst excavation is in progress. Wherever possible, the banksman must instruct the machine operator from a position outside the working area. Where the banksman has to enter the working area they must stay forward of the machine, maintain eye contact with the operator and stay outside the safe operating distance of the machine at all times.**

If the tip is covered by a vegetated layer remove this first and store in a separate area to other excavated material.

Do not excavate in areas likely to undermine structures, embankments, trees or adjoining land owned by other parties. If in doubt leave a minimum 5m standoff from the top lip of the excavation to any such features. Do not excavate within 20m of any railway line.

Excavations normally take the form of a shallow trench or test pit. Ensure excavations are formed with safe sloping entry at the ends. No excavations deeper than 1.2m shall be entered. Ensure any loose material is removed from the top edges of excavations before entering. Safe working batters should be formed where necessary e.g. in areas of loose ground or where tip material comprises or contains boulders/ blocks in excess of 150mm size where rolling or falling material could cause injury. In these circumstances form batters to a safe angle (i.e. where any movement of material would not result in that material reaching the excavation floor). As a general principle, batters should be formed to a minimum angle of 45 degrees with shallower angles used if necessary. Take additional care on sloping ground to ensure that any material above the excavation is stable. **If in any doubt about the stability of ground conditions do not enter the excavation, arrange for excavated material to be placed at a safe distance from the excavation and examine outside of the excavation.**

5. At the End of the Dig

Backfill excavations as close as possible to original ground layers or as otherwise agreed with the landowner. Compact the ground lightly, in layers if necessary, to ensure that it is left in stable condition. This will be more relevant where excavations have been made into a slope.

If a separate vegetated layer has been stripped replace this last, level and firm lightly.

Remove all temporary pins and markings from site.

Take record photographs of the reinstated site at the end of the works.

End

APPENDIX 1: HSE GUIDANCE

Excavators

What you need to do

The [law](#) says you must organise your site so as to segregate pedestrians and excavators. Those excavators used must be carefully selected, maintained and operated by trained drivers. Key issues are:

- [Excavator hazards](#)
- [Controlling the risk](#)
- [Training and competence](#)
- [Inspection and maintenance](#)

What you need to know

A safe workplace for all vehicle operations must be established by separating pedestrians and vehicles and providing hazard-free traffic routes. See [Traffic management](#)

Excavator hazards

Most fatal and serious injuries involving excavators occur when the excavator is:

- **Moving** – and strikes a pedestrian, particularly while reversing;
- **Slewing** – trapping a person between the excavator and a fixed structure or vehicle; or
- **Working** – when the moving bucket or other attachment strikes a pedestrian or when the bucket inadvertently falls from the excavator.

Controlling the risk

It is important to select the right excavator for the job. There are five main precautions needed to control excavator hazards. These are:

- **Exclusion:** People should be kept away from areas of excavator operation by the provision of suitable barriers. Most excavator related deaths involve a person working in the vicinity of the excavator rather than the driver. Bunting or fencing can be used to create and maintain a pedestrian exclusion area.
- **Clearance:** When slewing in a confined area the selection of plant with minimal tail swing is preferred. Clearance of over 0.5m needs to be maintained between any part of the machine, particularly the ballast weight, and the nearest obstruction.
- **Visibility:** Excavators with the best view around them directly from the driver position should be selected. Excavators should be equipped with adequate visibility aids to ensure drivers can see areas where people may be at risk from the operation of the machine.
- **Plant and vehicle marshaller:** A Plant and vehicle marshaller should be provided in a safe position to direct excavator operation and any pedestrian movements.
- **Bucket attachment:** Quick hitches can be used to secure buckets to the excavator arm. Check that you are able to implement and manage any quick hitch used. A number of deaths have occurred in recent years when the bucket has fallen from the machine.

Training and competence

There are three categories of worker who must be trained and competent regarding the excavator hazards and precautions:

- **Drivers:** should be trained, competent and authorised to operate the specific excavator. Training certificates from recognised schemes help demonstrate competence and certificates should be checked for validity;
- **Plant and vehicle marshallers:** should be trained, competent and authorised to direct excavator movements and, where possible, provided with a protected position from which they can work in safety; and

- **Pedestrians:** should be instructed in safe pedestrian routes on site and the procedure for making drivers aware of their presence.

Inspection and maintenance

A programme of daily visual checks, regular inspections and servicing schedules should be established in accordance with the manufacturer's instructions and the risks associated with each vehicle.

Drivers should be encouraged to report defects or problems. Reported problems should be put right quickly and the excavator taken out of service if the item is safety critical.

Resources

- [Health and safety in construction HSG 150](#)
- [Safe use of vehicles on construction sites HSG144](#)
- [Safe use of lifting equipment L20](#)
- [Avoiding danger from underground services HSG47](#)

See also

- [Excavator quick hitch safety](#)
- [Workplace transport](#)
- [Electrical hazards from underground and overhead cables](#)
- [Shoring Technology Interest Group – Construction Plant-hire Association](#)
- [CDM 2015 Regulations](#)
- [CDM 2015 Traffic routes Regulation 27](#)
- [CDM 2015 Vehicles Regulation 28](#)

APPENDIX 2: CDM REGULATIONS 2015

The Construction (Design and Management) Regulations 2015

UK Statutory Instruments ▶ 2015 No. 51 ▶ PART 4 ▶ Regulation 22

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What Version

- Latest available (Revised)
- Original (As made)

Advanced Features

- Show Geographical Extent (e.g. England, Wales, Scotland and Northern Ireland)
- Show Timeline of Changes

Opening Options

More Resources

Changes over time for: Section 22

06/04/2015

Changes to legislation: There are currently no known outstanding effects for the The Construction (Design and Management) Regulations 2015, Section 22.

Excavations

22.—(1) All practicable steps must be taken to prevent danger to any person, including, where necessary, the provision of supports or battering, to ensure that—

- (a) no excavation or part of an excavation collapses;
- (b) no material forming the walls or roof of, or adjacent to, any excavation is dislodged or falls; and
- (c) no person is buried or trapped in an excavation by material which is dislodged or falls.

(2) Suitable and sufficient steps must be taken to prevent any person, work equipment, or any accumulation of material from falling into any excavation.

(3) Suitable and sufficient steps must be taken, where necessary, to prevent any part of an excavation or ground adjacent to it from being overloaded by work equipment or material.

(4) Construction work must not be carried out in an excavation where any supports or battering have been provided in accordance with paragraph (1) unless—

- (a) the excavation and any work equipment and materials which may affect its safety have been inspected by a competent person—
 - (i) at the start of the shift in which the work is to be carried out;
 - (ii) after any event likely to have affected the strength or stability of the excavation; and
 - (iii) after any material unintentionally falls or is dislodged; and
- (b) the person who carried out the inspection is satisfied that construction work can be safely carried out there.

(5) Where the person carrying out an inspection informs the person on whose behalf the inspection is carried out of any matter about which they are not satisfied (under regulation 24(1)), construction work must not be carried out in the excavation until the matter has been satisfactorily remedied.

Extracted wording:

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