

Toolbox talks: unexploded ordnance

Land projects

What?

Most of the UK has, at one time or another, been involved in some type of military activity. These can range from historic and modern training of British or Allied forces to aerial bombing in two world wars. Historic military activities also include formal and informal area denial measures and tipping or abandonment of ordnance items post conflict or ahead of land transfer.

Although there are no official records of the number of unexploded ordnance (UXO) incidents in UK, in recent years there have been several reports of construction workers and members of the public being injured due to partial functioning of UXO. The term 'UXO' covers a range of items including aerial delivered ordnance (eg high explosive or incendiary bombs) and military ordnance (eg projectiles (shells), rockets, grenades, mortars, land mines, or small arms ammunition). The risk to projects can be very different depending on the UXO hazard and the depth it is located at.

Why?

- **Avoid harm:** UXO can cause significant and potentially fatal injuries to site workers and visitors, people living and working in the area and other stakeholders including livestock and wildlife.
- **Avoid delay:** when UXO is found, construction works often have to stop until the items are cleared.
- **Avoid extra cost:** project delays can lead to extra cost to the project.
- **Avoid prosecution:** organisations can be prosecuted under the Health and Safety at Work Act 1974, Construction (Design and Management) Regulation 2015 (CDM 2015) and the Corporate Manslaughter and Corporate Homicide Act 2007.



Image courtesy Dynsafe BACTEC

- **Avoid disturbing people living and working in the area:** members of the public may need to be evacuated to safe areas when UXO is found nearby. Roads may have to be closed and public transport suspended.
- **Avoid damage:** UXO has the potential to damage and destroy existing assets, surveys and infrastructure on and near to the works being undertaken.

Questions

- 1 How do site workers know if UXO is present?
- 2 At what stage should the potential UXO risk be considered?
- 3 What does UXO look like?
- 4 What should be done if working on a site that may have UXO risk?
- 5 When should advice from a UXO specialist be obtained?
- 6 What should be done if an unexpected item of UXO is found?

Do

- ✓ Carry out a preliminary UXO risk assessment before the project starts. Guidance on how to assess UXO risk is given by Stone *et al* (2009).
- ✓ A preliminary risk assessment (PRA) should be carried out by a competent person either a suitable member of the project team or contact a UXO specialist.
- ✓ Consider UXO risk ahead of site investigations work as well as the main construction activities.
- ✓ Review a wide range of historic information including bomb maps and recorded defensive positions. Consider the extent of post-war redevelopments and understand the proposed intrusive works.
- ✓ Prepare an emergency response plan and list of contact details.
- ✓ Understand the next stages of risk mitigation including detailed risk assessments and site-based mitigation approaches if recommended by the PRA.
- ✓ Include UXO risk in site safety inductions for all people working on or attending the site including visitors.
- ✓ Contact UXO specialists for detailed risk assessment and risk mitigation advice.
- ✓ Get quotations from several different UXO specialists.
- ✓ Consider the qualification and experience of the UXO specialists before appointing one.
- ✓ Follow industry good practice for UXO risk mitigation (eg Stone *et al*, 2009).
- ✓ Share lessons learned with colleagues and the construction profession.
- ✓ Maintain a permit to dig system and other site controls even after UXO survey has been completed.
- ✓ Consider UXO risk if changes to work mean work starts outside of previously mitigated work areas.

Don't

- ✗ Think as there have not been any fatalities in the UK, you will not have UXO problems on the site.
- ✗ Think that a UXO specialist is always needed to carry out every stage of the risk assessment. PRA's can also be produced by a competent person.
- ✗ Underestimate the potential delays and costs associated with finding unexpected UXO on site.
- ✗ Handle any item of UXO found.
- ✗ Panic if unexpected UXO is found. Advice and guidance can be sought to support the project.
- ✗ Assume that because the UXO is old or damaged that it does not have the potential to detonate.
- ✗ Think that a UXO specialist or the Army will be available instantly to deal with UXO problems.
- ✗ Think that previous redevelopment of a site means all UXO risk is removed.
- ✗ Think that every UXO specialist offers a comprehensive range or the most appropriate UXO risk mitigation techniques for the projects risk.
- ✗ Think that if a site has a clearance certificate, it is guaranteed to be completely clear of UXO.

References

STONE, K, MURRAY, A, COOKE, S, FORAN, J, GOODERHAM, L (2009) *Unexploded ordnance (UXO) A guide for the construction industry*, C681, CIRIA, London, UK (ISBN: 978-0-86017-681-7) www.ciria.org