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resources & energy



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Remediation of a worldwide hazard: Unexploded Ordnance

CIRIA will be launching “Unexploded Ordnance (UXO) – a guide for the construction industry”

Launch date: 14 October 2009

***Place: America conference centre, 1 America Square**

17, Cross Wall London EC3N2LD

17:30-19:00 drink and canapé reception and presentation

The Second World War (WWII) may have ended over 60 years ago but Unexploded Bombs (UXB) and other military ordnance can still be a serious problem to construction projects throughout the UK. There is currently, little publicly available guidance to specifically assist construction professionals (particularly clients, developers and ground-works contractors) in assessing the risks associated with encountering UXO during the intrusive engineering phase of a project.

This lack of previous guidance and direct legislation regarding the potential risks the construction industry faces from UXO hazards, and the limited knowledge many developers have on the subject, often means that construction professionals depend solely on specialist advice to deal with potential UXO risk at a site. This lack of guidance and understanding has resulted in project delays and growing widespread concerns that the construction industry is not being well served by UXO contractors; including:

- A lack of any consistency in the assessment and reporting of UXO risk
- An absence of quantifiable processes when assessing UXO risk.
- The perceived conflict of interest in a UXO specialist providing advice on required mitigation measures and then offering contractor services to mitigate their own assessed risk level.

UXO Risk in the UK

What is the real UXO risk in the UK? During WWII many defensive establishments, cities and towns throughout UK were subjected to comprehensive bombing campaigns, which resulted in extensive damage to city centre, railway infrastructure, docks, associated industrial areas and military installations. The German Luftwaffe mainly achieved this destruction by deploying High Explosive and Incendiary bombs.

In recent decades there have been several incidents in Europe where Allied UXBs have been detonated with at least three incidents causing fatalities. Although no fatal incidents related to UXB has occurred in UK, data from the Explosive Ordnance Disposal industry show that from 2006 to 2009 approximately 15,000 items of ordnance ranging from aerial delivered bombs to Land Service Ammunition (such as mortar rounds and grenades) have been removed from construction sites. Of that total, it is estimated that about 5% were live and still retained the ability to fully function.

Clients have a legal duty under CDM2007 to provide designers and contractors with the project-specific health and safety information needed to identify hazards and risks associated

with the design and construction work. The possibility of UXO being encountered on a site falls within the category of a potentially significant risk and is therefore, a matter that should be addressed as early as possible in the lifecycle of a project.

Case Studies

The legacy of UXO has caused many problems for construction projects throughout the UK, for example:

- In April 2009, 1,000 homes were evacuated in Plymouth when workers on a building site in the Prince Rock area discovered an UXB sticking six inches out of the ground. In the same month, a 200 metre cordon was put up near Oxford Road station in Manchester when workmen found an unexploded mortar shell on a building site.
- Bristol was severely disrupted June 2008 when a suspected WWII bomb was found on Land Securities' and Hammerson's, Cabot Circus retail development site, which closed much of the Broadmead area of the city for two days despite the suspicious object turning out to be a piece of reinforced concrete!
- In June 2008 a 1000kg bomb was found at Bow in East London during construction for the Olympic Games. The Police spokesperson said it was the largest unexploded bomb found in London in three decades. Services on two nearby subway lines were suspended as a precaution while the bomb was being defused

CIRIA Guide overview

CIRIA has consulted across a wide group of associated stakeholders and it was clear that a framework document was required to enable the construction industry to assess and mitigate UXO risk appropriately and cost effectively. It also sought to start the process of developing best practice across the UXO industry in the UK. Consequently CIRIA have produced "*A clients' guide for assessing risk on UXO sites*" which has been approved by the Health & Safety Executive.

The report is based on a rigorous Four Phased approach to assessing and mitigating UXO risk. The first critical step in dealing with UXO risk is to commission a Preliminary Assessment at the site investigation stage. There are cost effective risk mapping products on the market that will enable site developers to rapidly assess the overall UXO risk to their project, which in most cases will be negligible. If a risk is perceived a more Detailed Risk Assessment should be conducted.

If a significant UXO risk is assessed for the site the next phase is to design Risk Mitigation activities. There is a drive in the UXO industry to employ the 'As Low as Reasonably Practicable' (ALARP) principle where the costs (time, costs and effort) of mitigating the UXO risk is balanced against reducing the risk to an acceptable level. This process should alleviate the previous issue of unwarranted UXO mitigation works being conducted.

The final phase is the Implementation of risk mitigation works to reduce the UXO risk to an acceptable level, thus enabling construction to continue. Advice is also offered in the Guide on Emergency Response planning and the appointment of UXO specialists.

Compilation of the Guide

The CIRIA Guide was written by K. Stone (Worley Parsons), A. Murray (WorleyParsons), S. Cooke (6 Alpha Associates Ltd.), J. Foran (6 Alpha Associates Ltd.) & L. Gooderham (6 Alpha Associates Ltd.). CIRIA 's research manager for this project was Joanne Kwan .

The report has been through a rigorous consultation process and has been distributed widely across the industry for comment and input on a number of occasions. It was also endorsed by the HSE.

The project is supported by:

- Cross London Rail Links Limited
- Health and Safety Executive
- Soil Mechanics Limited
- Norwest Holst Limited
- Fugro Engineering Services Limited
- RPS Group Plc
- Olympic Delivery Authority (ODA)
- Peter Brett Associates LLP
- Zetica Limited
- Bactec International Limited
- Keller Ground Engineering
- Transport for London
- CIRIA Core members.

*America Square conference centre provides a genuine bit of history too, as the original London Wall, (one of the largest construction projects carried out in Roman Britain) runs right through the venue, providing a fascinating and unique feature.

ENDS

Notes to the Editors

WorleyParsons

WorleyParsons is a leading provider of Professional Services to the energy, resource and complex process industries and employs 31, 700 people in 114 offices in 37 countries around the globe.

Our Infrastructure & Environment group delivers technically outstanding, cost effective solutions to some of the most challenging projects in the world. Our services span the entire project life cycle from feasibility through decommissioning and have been undertaken in a number of diverse geographic and cultural settings.

Our comprehensive consulting and engineering capabilities, hands-on knowledge and experience, understanding of project issues and our customer-focus have formed the foundation for project success. Our emphasis on long term solutions comes from our commitment to safety, constructability, operability and sustainability.

www.worleyparsons.com

6ALPHA

6 Alpha Associates not only employs exceptional individuals who have proven core and functional competences in risk management but our consultants are also motivated to deliver outstanding solutions for our clients – our reputation depends on their success.

With a strong business focus and competences in counter terrorism, business continuity, engineering and ux0, they are able to design a team of consultants to match specific needs.

Their consultants are natural problem solvers with significant experience and expertise drawn from backgrounds as diverse as: ex British Army Officers with counter-terrorist and special forces experience, to corporate finance, PLC leadership, civil engineering and associated construction/project management disciplines.

Visit www.6alpha.com

About the project manager

Joanne Kwan

About Joanne Kwan

Hong Kong-born, British citizen Joanne Kwan is **a widely recognised expert on contaminated land and environmental management**. Her track record, engaging with the highest rank of industry and regulation authorities has placed her in a prominent position to address key issues and disseminate knowledge through numerous conferences, seminars and workshops.

Holder of the DTI BIOWISE Demonstration Programme 2001, Biffaward 2004 awards, Joanne has been granted the title of honorary lecturer at Cardiff University, Wales. A chartered chemist, she also holds a BSc(Hons) in Biochemistry, a MSc in Environmental Control and Pollution and a Master in Town and Country Planning.

Joanne's full dedication to her research topic has led her to take on more responsibilities at **CIRIA**. To date, she has contributed among other things to implementing **LACL** (Local Authority Contaminated Land Network), developing the contaminated land website www.contaminated-land.org, and managing research projects that have resulted in highly pertinent content in remediation and decontamination topics.

Government and non-government bodies such as the ODA (Olympic Delivery Authorities), the EA (Environment Agency), and GLA (Greater London Authority) frequently resort to Joanne's expertise.

Member of the Institute of Environmental Science and of the Royal Society of Chemistry and friend of the Hong Kong University, Joanne has been collaborating with local experts in Hong Kong organising high-frequency seminars for the second consecutive year. Her objective is to work towards transferring knowledge and sharing information across both the UK and China through more events each year.

If you wish to contact Joanne Kwan, please email the press office at CIRIA. presse@ciria.org

About CIRIA

Established in 1960, CIRIA is a highly regarded, industry-responsive, not for profit research and information association, which encompasses the construction and built environment industries.

CIRIA operates across a range of market sectors and disciplines, providing a platform for collaborative projects and dissemination by enhancing industry performance, and sharing knowledge and innovation across the built environment.

As an authoritative provider of best practice guidance, solutions and information, CIRIA operates as a knowledge-base for disseminating and delivering a comprehensive range of business improvement services and research products for public and private sector organisations, as well as academia.

CIRIA provides competitive advantage to over 700 subscribing organisations co-ordinating collaborative projects, networking events, seminars and conferences, and delivering high standard publications and training courses to its members and affiliates.

In 2008, CIRIA ran over 70 projects, organised nearly 150 events, published 12 books and delivered up to 60 theme-based training courses to top industry stakeholders.

CIRIA is led by a member-wide council with an Executive Board chaired by Peter Gammie and CEO Bill Healy.

For more information on CIRIA's products and services please visit our website: www.ciria.org

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