

Health and safety in construction

September 2005



sharing knowledge
building best practice

Of all the topics with which the construction industry is concerned, the most important and pervasive is that of ensuring the safety and health of everyone concerned with construction.

CIRIA and its member companies have played and continue to play a full and active part in the industry's agenda for improvement in both safety and health, initially in response to legislation but increasingly because good health and safety is seen to be good business.



The weather and cleanliness of the small or large site can impact on your health

CIRIA's activities concentrate on both the provision of clear information about good practice in particular areas of activity and assisting with the development of an informed industry understanding of the problems and what we can all do about them.

CIRIA's outputs in this area fall mainly into two categories: small portable Handbooks aimed at staff on site who need to have concise and clear information to hand in their daily activities, and more extensive Reports and Toolkits that explain their topics in greater detail.

Handbooks for site staff

Among CIRIA's range of guidance for staff on site are our handbooks which provide advice on how to avoid health and safety risks:

Site safety

CIRIA's all-time best selling publication, now in its third edition. This guide is used by many major contractors as the essential introductory guidance for young professionals to working safely on construction sites, but its content is important even for the most experienced staff. With an introduction by HSE's chief inspector of construction, it highlights the common hazards that can be met on a daily basis and promotes safer practices by explaining the basic safety standards that should be applied.

Site safety for the water industry

A companion guide to Site safety and funded by the water sector, this guide focuses specifically on the water industry's sites. Many of the issues covered are the same, but the guide emphasises specific hazards of working with water – such as exposure to toxic materials, leptospirosis, working in confined spaces, exposure to gases, working over water and high pressure mains.

Site health

For many years, safety was the principal focus of worker welfare on site in recent years the health of workers has come into the foreground.

The site health guide is a companion to both of CIRIA's site safety handbooks providing practical advice on recognising the health risks that may be met with on site and the best ways of minimising them. It considers the need for effective management of health on site and the importance of improving the industry's health



An example of vibration white finger



Water that has collected in trenches may have become stagnant and infected

culture. It highlights the biological, chemical, physical and psychological hazards that may face workers on site and emphasises that it is everyone's duty to reduce those dangers as much as possible. Advice is given on site inductions, personal protective equipment, first-aiders, accident reporting and health screening. The guide comes with a CD-Rom structured for toolbox talks on site.

Crane stability on site

Cranes are some of the most useful and widely operated items of plant on construction sites of all sizes. If misused they can cause serious harm – there is no other item of construction equipment that has the capacity for causing as much damage or injury to people as a crane in an accident.

Most serious accidents involving cranes are a result of inadequate planning and unsafe use leading to instability and overturning.

This guide combines in a single volume the main points to be considered to ensure that a crane remains stable at all times. The guide is divided into five main sections:

- management, planning, legislation, plus basic principles of loading, ground conditions and foundation design
- a detailed description of mobile cranes and their stability requirements
- tower cranes and their foundations
- some special situations and other lifting appliances
- required inspections and the documentation that should be in place.

Temporary access to the workforce

Temporary access facilities to the workforce can bring hazards to users and can be a source of accidents. Accidents with scaffolding were historically the cause of many deaths and serious injuries to site workers and the general public. Fortunately these are somewhat reduced today.

This handbook is designed to guide and benefit site professionals, managers and supervisors who are involved in the specification, installation or checking of temporary access to the workforce. Aimed principally at younger staff, the guide will also be of benefit to mature professionals wishing to refresh their knowledge.

Much of the report concerns working at height, but there are also sections on access below ground, over water, in confined spaces, and adjacent to transport corridors.

Retention of masonry façades – Site handbook

This site handbook is a companion to the more extensive guide described later. It focuses on the site issues involved in retaining a façade, including staff tasks, site issues, investigation and enabling work, erection alteration and removal of the retention system, inspection and reporting. All of these issues should be carried out in a careful, controlled manner if safety is to be maintained on site.

Noise on construction sites

A guide to the measurement and management of noise issues, providing guidance on how to avoid problems or deal with them when they occur.

Reports and Toolkits

These are more formal publications covering subjects in detail and, usually, dealing with the health and safety consequences of design.

CDM Regulations

CIRIA's renowned guides to the CDM Regulations are now in their second edition. There are three separate publications; for clients and their advisers, for planning supervisors, and for designers. Also available is a mixed media training pack for designers.

■ Guidance for clients and clients' agents

This guide leads the client through their new responsibilities under the CDM legislation and provides a wealth of practical guidance.

■ Guidance for planning supervisors

Prepared with the full participation of leading practitioners, this guide clearly highlights what a planning supervisor should do – and how to do it in a non-bureaucratic manner.

■ Work sector guidance for designers

An assembly of leading-edge information from experts in each of the work sectors, from foundations to off-shore working. The key issues are identified and designers can gain an extensive understanding of the many complex and interactive issues that arise on site as a result of their decisions.

Safe access for maintenance and repair

About £30 billion is spent annually on maintaining and repairing the UK's constructed asset base. It is vital, not just in protecting the public and the workforce, but also in economic terms, that there should be well-designed provision for access to elements requiring inspection, maintenance and repair.

However, the need to provide such access, or to consider how access might be arranged is often overlooked by designers, notwithstanding their obligations under the CDM Regulations. This report provides practical advice to all those with an ability to influence the design of safe access for maintenance and repair.

The guide concentrates on new buildings; however it is also of use in refurbishment projects. It includes information on statutory requirements, risk assessment, possible design solutions, and contains a wide range of case study examples of good and poor practice.

Glazing at height

Written by the Centre for Window and Cladding Technology, this guide provides a risk-based methodology for assessing risks due to glass breakage. Particular emphasis is given to the safety and attendant issues concerning glass facades, roofs and canopies, and glass barriers that protect a drop – plus all you could ever need to know about glass as a material.



Retention of masonry façades

The conception and design of façade retention systems is a safety-critical activity which requires judgements to be made. This CIRIA guide is the prime source of information to assist in these tasks. The scope of the guide is wide and considers the types of construction usually encountered in the UK. The benefits of allowing time and money for early investigation are emphasised.

The Off-site project toolkit

The objective of this toolkit is to increase the use of standardisation (in both processes and components) and pre-assembly to improve the efficiency and quality of construction and reduce time and costs. There are attendant health and safety benefits that are discussed in the toolkit.

The toolkit helps project teams to assess the opportunities for using standardisation and pre-assembly, identify the key project drivers and

constraints and thus develop a strategy of options and actions at all stages of the project, so that the benefits of S and P are optimised. It contains over 140 examples of offsite construction.

The impact of procurement method on health and safety performance

This study was commissioned by the HSE to examine the premise that there was a relationship between the type of construction procurement method, and the health and safety performance on site.

110 construction sites were investigated, approximately half of which employed 'design and construct' contracts, with the remainder spread across methods ranging from traditional to partnering. The study was unable to identify any linkage, either statistical or intuitive, between the type of contract and the health and safety performance.

At the same time, the study identified issues for further investigation which included the effectiveness of main contractor's control of sub-contractors performance in this area; whether there is a correlation between accident records and language disability, and how to bring health (as opposed to safety) into clearer focus across the industry.

Although most CIRIA health and safety studies are based in and around buildings, these are by no means the only places of concern. Studies that are important in other areas include:

Safety in ports: ship-to-shore linkspans and walkways

Following the failure and multiple fatalities at Ramsgate Harbour, this report was commissioned to assist all those involved in the conception, design, operation and maintenance of linkspans and walkways. Recommendations are given on management systems, which were found to be at the heart of safety issues involved.

Safegrounds

"SAFEGROUNDS" stands for SAFETY and Environmental Guidance for the Remediation of Nuclear and Defence Sites. As a project it began in 1998 when nuclear industry committees sponsored by the Department of Trade and Industry (DTI) were discussing the difficulties of estimating and managing the liabilities posed by contaminated land on nuclear sites.

It was developed to produce guidance to support good practice in the health, safety and environmental aspects of managing contaminated land on 'nuclear-licensed sites' and 'defence sites'. The term 'defence site' is used to mean any site that is owned by MoD that is not a nuclear-licensed site and where it is known or suspected that radioactive contamination is present.

The project addresses radioactively contaminated land and land with mixed radioactive and chemical (non-radioactive) contamination. Guidance is developed primarily for site owners, site operators and

their contractors, but it is also intended to be useful to others, including regulators and groups within the public.

There is widespread 'buy-in' to the guidance documents produced because they are developed through processes that build consensus amongst a wide range of stakeholders. These are involved at all stages of guidance development.

Since late 2002 the project has been run as a learning network with a mission to be 'a forum for developing and disseminating good practice guidance for the management of contaminated land on nuclear and defence sites'. There is a popular and active web site (<http://www.safegrounds.com/>) that contains guidance and consultation documents.

Chemical storage tank systems

Essential reading for all involved in the storage of chemicals on a site, this guide offers advice on the avoidance of system failures leading to health and safety or environmental risks. It ranges from system concepts to a checklist of good-practice points to consider.



Safe working on contaminated sites

Some construction dangers are hidden, like those from apparently clean, safe sites which were contaminated in the past, leaving a legacy of pollution to affect the health of site workers, occupiers and neighbours. Safe working practices on sites that may have been contaminated are essential and are described in this guide.

The Methane guides

A series of six guides on the protection of development and people from the hazards of methane gas. The guides cover the occurrence of methane, the principles of protection from methane, investigation strategies, the measurement of methane, interpretation of measurements, and techniques for risk assessment. Current work at CIRIA described below will update these guides and widen them to cover other gases as well as methane.

New work

The slip resistance of floors

Sponsored by the HSE, this guide will provide designers, specifiers, operators and cleaners with a pool of knowledge, based on research at the HSE's own laboratories.

The project is co-sponsored by the Rail Safety and Standards Board, LUL, NHS Estates, the British Council of Shopping Centres, Tubelines and Metrolink. These organisations have advised and contributed from their own experience. The project is monitored by a strong Steering Group including representatives from BAA, ODPM and the BRE; representatives from industry were also involved and consulted at a workshop event at the Health and Safety Laboratory (HSL) in Buxton.

The resulting guide will provide not only a wealth of information but also a logical basis for designers and operators to make decisions. The decision path is explained and preferred test methods given, based upon extensive testing at the HSL.

Tower cranes

The HSE estimates there are around 800 tower cranes available for use in the UK. Two recent high profile crane collapses occurred on 21 May 2000 at Canary Wharf, East London killing three people and on 11 February 2005 when two men died after a crane collapsed in the grounds of a school in Sussex. Collapse of tower cranes can also presents a risk to adjacent railways and roads.

This project aims to assist in the reduction in risk associated with tower crane collapses and resulting injury incident rate. It offers best-practice guidance on how to ensure the stability and safe use of tower cranes. The guidance will bring together important practical and design issues that impact on health and safety such as safe location, erection, dismantling and operation of tower cranes, the safe use of climbing frames, training and maintenance requirements, design of crane foundations, and the stability of crane masts. It will not only help temporary and permanent works designers and building designers in terms of best practice guidance on design of tower crane foundations, location of tower cranes and their stability, but also site managers and crane operators.

Assessment of selected gases for buildings

This project is principally concerned with providing a risk-based approach to strategies for minimising risk to either commercial or residential developments from hazardous gases from the ground. There are important health and safety aspects associated with such gases, both during construction and in long-term use of the sites. There is debate over the potential health risks of living close to sources of ground gases, and increasing awareness of the links between trace gases and health, particularly stress.

The report resulting from this research will provide guidance on investigation and appropriate design to minimise the risk of damage to health. It will update earlier CIRIA guidance which focused largely on methane.

Site decommissioning: sustainable practices for the use of resources – ‘SD: SPUR’

The aim of the project is to establish safe, socially, economically and environmentally sustainable practices in the use of construction resources arising from nuclear site decommissioning and defence sites. Designed primarily to guide waste managers and strategy developers on nuclear sites on the incorporation of sustainability and waste hierarchies into their decision-making procedures, the highest ranking priorities in the management of radioactive waste are the health and safety of the public and the workforce.

This study will have a limited audience, but will demonstrate how sustainable resource use can be optimised without risk to health and safety.

Summary

We hope that this description of available CIRIA reports and forthcoming work has shown how health and safety issues need to be considered and allowed for in every stage of a project's life and in every facet of construction if the industry is to raise its standards ever higher.

Need to know more about health and safety in construction? Visit the HSE's website at www.hse.gov.uk/construction/index.htm for details of the Working Well Together campaign, the CDM Regulations and SCOSS.

To order any of the above CIRIA publications visit our online bookshop at www.ciriabooks.com