Risk management guidance for the construction industry

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Introduction

Construction activities can take many forms and vary in complexity from a simple domestic house extension to very large multi-million pound construction projects.

However irrespective of size or complexity all employers who operate in the building and construction trades have a legal, economic and moral reason to reduce the risk of injury to their employees and members of the public.

The information contained within this document is intended as a general guide only and is not necessarily comprehensive. You should seek appropriate professional advice when devising any risk assessment or management programme. AXA Insurance will not be liable for loss or damages arising, in contract, tort or otherwise, directly or indirectly from the use of or reliance upon any information contained in this document.

The construction industry remains one of the largest in Great Britain, bringing employment to around 2 million people; it also remains extremely hazardous and a cause for significant concern. The characteristics of the industry and the challenges it creates for health and safety are well documented.

There have been significant reductions in the numbers and rates of injury over the last 20 years or more. Nevertheless, construction remains a high risk industry. Although it accounts for only about 5% of the employees in Britain it accounted for 31% of fatal injuries to employees and 10% of reported major/specified injuries.

The latest results in construction show:

- There has been a substantial reduction in the number of fatal injuries in construction in the last 40 years; falling from ladders, scaffolds and other work places
- nevertheless there were 42 fatal injuries to workers – 14 of these fatalities were to the self-employed. This compares with an average of 46 over the previous five years. They remain unacceptable and we must continue to reduce this burden of death as well as the associated injuries and incidences of ill health.

The main causes of the fatal accidents in the construction sector were:

- falling through fragile roofs and rooflights
- falling from ladders, scaffolds and other work places
- being struck by excavators, lift trucks or dumpers
- being struck by falling loads and equipment
- being crushed by collapsing structures.

Construction Design and Management (CDM) Regulations

The new Construction Design and Management Regulations (CDM 2015) came into force in April 2015.

The key aims are to:

- Encourage everyone to work together to make health and safety an integral part of the design, construction and management of projects
- Improve planning and management from day one to identify hazards so that they can be eliminated or properly managed
- Target effort where it can be most effective in terms of health and safety
- Encourage co-operation and co-ordination of the project.

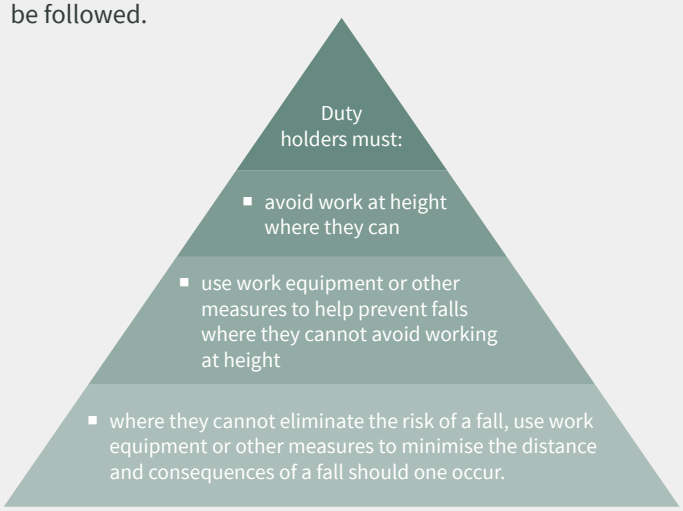
Work at Height Regulations

The Work at Height Regulations, require you to make an assessment of the risks presented by working at height before any work begins. You should therefore appoint someone who is competent to undertake such an assessment, using the guidelines in the panel to the right.

Work at height is the biggest single cause of fatal and serious injury in the construction industry, particularly on smaller projects.

Over 60% of deaths during work at height involve falls: from ladders, scaffolds, working platforms and roof edges, and through fragile roofs or rooflights.

The following diagram indicates the route endorsed by the Health and Safety Executive (HSE) under the new regulations and the general approach to work at height that must now be followed.



We recommend that you do not undertake work at height unless:

- all work at height is properly planned and organised
- all work at height takes account of weather conditions that could affect health and safety
- those involved in work at height are trained and competent
- the place where work at height is done is safe
- equipment for work at height is appropriately inspected
- the risks from fragile surfaces are properly controlled
- the risks from falling objects are properly controlled
- ensure that information concerning personal safety has been provided to employees via method statements, risk assessments and toolbox talks.

We recommend that you:

- ensure that no work is done at height if it is possible to do it by another means
- plan for emergencies and rescue
- ensure that the work is postponed while weather conditions endanger health or safety
- have assessed the risks involved, particularly with regard to providing safe access and exit to the working area
- provide other means of protection for employees and members of the public who may be affected by the work that is being carried out.

Ladder safety

One third of all reported accidents involving a fall-from-height incident involve ladders and stepladders. On average 13 people a year die at work falling from ladders and nearly 1200 suffer major injuries.

Controlling ladder work

This selection process has to take into account the hierarchy of controls:

- firstly to avoid work at height where possible
- then to prevent falls from height; and failing that
- to reduce the consequences of a fall.

Where work at height is necessary you need to justify whether a ladder or stepladder is the most suitable access equipment compared to other access equipment options. You do this by using risk assessment and the hierarchy of controls.

Is it a suitable activity?

This refers to the type of work and its duration.

Ladders and stepladders are not banned under health and safety law.

In fact they can be a sensible and practical option for low-risk, short-duration tasks, although they may not automatically be your first choice. Make sure you use the right type of ladder and you know how to use it safely.

The law calls for a sensible, proportionate approach to managing risk, and further guidance on what you should do before deciding if a ladder is the right type of equipment for a particular task is provided in our AXA Work at height guide.

Is it possible to maintain a safe working position?

- is there a handhold on the ladder or stepladder where you can maintain three points of contact (hands and feet) at the working position
- on a ladder where you cannot maintain a handhold, other than for a brief period of time, other measures will be needed to prevent a fall or reduce the consequences of one
- on stepladders where a handhold is not practicable a risk assessment will have to justify whether it is safe or not.

On a ladder or stepladder **do not**:

- overload it – the person and anything they are taking up should not exceed the highest load stated on the ladder
- overreach – keep your belt buckle (navel) inside the stiles and both feet on the same rung throughout the task.

When working on stepladders you should avoid work:

- that requires a side loading, such as side-on drilling through solid materials (eg bricks or concrete), by having the steps facing the work activity
- where side-on loadings cannot be avoided you should prevent the steps from tipping over, for example by tying the steps to a suitable point. Otherwise a more suitable type of access equipment should be used.

You should also avoid holding items when climbing (for example by using tool belts):

- on a ladder where you must carry something you must have one free hand to grip the ladder
- on a stepladder where you cannot maintain a handhold (eg putting a box on a shelf), the use of a stepladder will have to be justified by taking into account:
  - the height of the task
  - a safe handhold still being available on the stepladder
  - whether it is light work
  - whether it avoids side loading
  - whether it avoids overreaching
  - whether the user's feet are fully supported
  - whether you can tie the stepladder.

Source: Health & Safety Executive website.

The selection and purchase of safe ladders and stability devices

When buying a new ladder, think about the worst type of surface conditions you come across (e.g. smooth, wet floor tiles). Manufacturers should be able to indicate the types of surfaces their products are intended to be used on when they are unsecured (untied).

Only buy the ladder and associated stability devices that suppliers/manufacturers can confirm will be stable enough to be used unsecured in your worse-case scenario, otherwise you will need to take additional measures to secure it.

More than a quarter of falls happen from ladders.

The greatest majority of these injuries are caused by inappropriate or incorrect use of the equipment. Further detailed guidance is available on the HSE website.

This guidance is aimed at helping employers:

- know when to use a ladder
- decide how to go about selecting the right sort of ladder for the particular job
- understand how to use it safely
- know how to look after it
- take sensible safety precautions.

As with all work equipment, users need adequate information and training to be able to use ladders and stepladders safely. Adequate supervision is needed so that safe practices continue to be used. All training instruction and assessment should be recorded so that you can prove how you have arrived at your decision, this will also assist in the event of any employers liability injury claim.

Fragile surfaces

You must ensure that no one working under your control goes onto or near a fragile surface unless that is the only reasonable way to carry out the work safely. The demands of the task, equipment and working environment should be taken into account.

Contractors and employers must manage the danger by avoiding work on or near fragile surfaces and controlling any remaining risk by use of stagings, guard rails, and fall prevention/protection systems.

Those at risk must be told what the necessary safety precautions are and people carrying out the work have to be trained and instructed in the precautions required.

On business premises contractors should work closely with the client and agree arrangements for managing the work.

Fragile surfaces and materials will not safely support the weight of a person and any materials they may be carrying.

All roofs, once fixed, should be treated as fragile until a competent person has confirmed that they are non-fragile. In particular, the following are likely to be fragile:

- **Fibre-cement sheets** – non-reinforced sheets irrespective of profile type
- **Rooflights** – particularly those in the roof plane that can be difficult to see in certain light conditions or when hidden by paint
- **Liner panels** – on built-up sheeted roofs
- **Metal sheets** – where corroded
- **Glass** – including wired glass
- **Chipboard** – or similar material where rotted
- **Others** – including wood wool slabs, slates and tiles.

Precautions

Effective precautions are required for all work on or near fragile surfaces, no matter how short the duration, whether the work concerns construction, maintenance, repair, cleaning or demolition.

Health and safety in roof work (www.hse.gov.uk/pubns/books/hsg33.htm) is FREE to download and provides full details of the dangers presented by fragile surfaces and the precautions available. This guidance should be consulted by all involved in such work.

The hierarchy of steps to be taken to deal with the danger is.

Avoidance: Plan and organise work to keep people away from fragile surfaces so far as possible, e.g. by working from below the surface on a mobile elevating work platform or other suitable platform.

Control: Work on or near fragile surfaces requires a combination of stagings, guard rails, fall restraint, fall arrest and safety nets slung beneath and close to the roof.

Communication: Warning notices must be fixed on the approach to any fragile surface. Those carrying out the work must be trained, competent and instructed in use of the precautions required.

Co-operation: On business premises, contractors should work closely with the client and agree arrangements for managing the work.

Mobile plant and vehicles

Common to the use of all mobile plant and vehicles is the need to segregate vehicles from pedestrians, train staff to use the machines competently; and make sure that the machines are regularly inspected, serviced and maintained.

Excavators – http://www.hse.gov.uk/construction/safetytopics/excavators.htm

Telescopic handlers – http://www.hse.gov.uk/construction/safetytopics/telescopic.htm

Mobile elevated work platforms – http://www.hse.gov.uk/construction/safetytopics/mewp.htm

Dumper trucks – http://www.hse.gov.uk/construction/safetytopics/dumpers.htm

Training

A significant factor in the cause of accidents on construction sites is a lack of employee training, inappropriate training.

Training needs to be:

- Focused and relevant
- Delivered to all members of the workforce, including managerial, supervisory staff and subcontractors.

Site safety induction training is crucial for:

- New employees.
- Visitors to the site and other people who are unfamiliar with the site.

On large projects of a longer duration refresher training for existing employees needs to be considered. Often, there is an extended time period between a piece of mechanical plant being installed and used.

You must keep signed records of all the training given to employees and subcontractors. This must detail the content of the training and the signature of the recipient to record his/her understanding of the training. You may be asked for these records by the enforcing authorities.

As a minimum you should include the following areas in the training you provide:

- Working at height
- Excavations
- Mobile plant
- Temporary electrical supplies
- Welfare arrangements
- First aid
- Site emergency procedures
- Protective clothing and equipment
- Plant and equipment
- Risk assessments
- Method statements
- Reporting of unsafe practices
- Discovered hazards
- Fire Safety and Hot Work
- Precautions and activities.

Training can be undertaken on site or as part of 'Tool Box Talk' briefing sessions.

Safety topics

Site organisation
www.hse.gov.uk/construction/safetytopics/siteorg.htm

Slips trips falls
www.hse.gov.uk/construction/safetytopics/falls.htm

Work at height
www.hse.gov.uk/construction/safetytopics/workingatheight.htm

Structural stability
www.hse.gov.uk/construction/safetytopics/stability.htm

Cranes
www.hse.gov.uk/construction/safetytopics/cranes.htm

Electricity
www.hse.gov.uk/electricity/information/construction.htm

Fire
www.hse.gov.uk/pubns/books/hsg168.htm

Plant
www.hse.gov.uk/construction/safetytopics/mobileplant.htm

Demolition
www.hse.gov.uk/construction/safetytopics/demolition.htm

Managing health and safety in multicultural and ethnically diverse workforces

The last 10 years has seen a significant increase in the number of ethnically diverse workforces operating in various trade sectors across UK industry.

This in turn has produced a number of challenges for employers. One of the most significant is to manage Health and Safety and ensure that concerns, communication, consultation, supervision and training is properly addressed for ethnolinguistic groups.

Construction workers - Your safety at work

UK Health and safety law protects you even if you are not working here legally.

Employers have existing legal duties to provide information, instruction, training and supervision in a comprehensible format for all employees, irrespective of their nationality, lingual ability, or level of literacy.

There is an increasing concern that many employees are unable to communicate effectively in either written or spoken English language and in some sectors tend to rely on other employees whose own lingual skills and translation ability is an unknown quantity. These potential problems make delivery of training ineffectual and tend to prevent communication of urgent problems in the working environment.

Furthermore, employers are increasingly unable to prove through civil litigation, that adequate instruction, training or supervision has actually been given in a language that employees can comprehend.

With respect to the above the law requires that employers should not discriminate against employees on the grounds of, amongst other things, their race, colour, nationality, ethnic or national origins, gender, religion, or religious belief. In addition principal stakeholders etc. are increasingly aware and seek to establish that businesses are conducting their activities in an ethically acceptable working environment.

In common with other areas of Risk Management there are generally 5 principle topics to achieving a satisfactory level of management control.

These can be summarised as follows:

- **Integration – Managing culture and diversity** this area requires some expertise and preplanning regarding the employment of immigrant and multicultural workforces. It is important to comply with any discriminatory aspects that apply and some forethought must be given to the training and communication of employees whose first language is not English or who may be at a disadvantage in terms of their literacy ability.
- **Recruitment – Policy and practice** when recruiting potential employee's irrespective of their social, cultural or ethnic background you must ensure that your recruitment policy is transparent and unbiased. The policy should seek to address areas of literacy, multicultural and ethnically diverse aspects that exist in modern work forces to ensure that communication on all aspects of employment and health and safety is adequately addressed and understood.
- **Risk Awareness – Hazard knowledge management** when carrying out risk assessments, it is vital to ensure that all employees fully understand the meaning of 'risk awareness'. This is particularly important where English is not the employees' first language. Essential communication of safety information should be unambiguous and easily understood for non-English speakers. Use of photographs and pictorial risk assessments to show hazards and safety procedures are essential to help understanding.

As a minimum the main areas of hazard in the construction industry should be addressed including the following:

- falling through fragile roofs and rooflights
- falling from ladders, scaffolds and other work places
- being struck by excavators, lift trucks or dumpers
- being struck by falling loads and equipment
- being crushed by collapsing structures.

Supervisory considerations are essential, supervisors must be able to communicate with employees clearly and to the extent that they may need to learn certain non-English language phrases and/or use language prompt cards with common phrases so that they can be understood.

- **Communication – Induction, instruction, information and training**. Throughout these topic areas there is a critical theme regarding language translations and cultural awareness which must be managed sensibly and with care.

  Construction Skills www.constructionskills.net/ offers a number of publications in 12 different languages covering basic Construction Safety topics, however if using these it is advisable to check beforehand on the degree of literacy amongst the work force.

- **Record keeping** is an important area for any organisation in order to define and defend its legal position with respect to compliance with civil and statutory requirements. Where the employment of a multicultural or ethnically diverse workforce is concerned it is even more critically important to ensure that there is a proper record keeping system for each employee:
  - Nationality and immigration status checks
  - Interview process and pre-employment medical questionnaires
  - Literacy and language checks and degree of understanding of spoken English
  - Records relating to hazard identification and understanding
  - Basic Health and Safety induction training and general safety awareness
  - Issue and instruction regarding wearing of personal protective equipment
  - Any specialist training provided for the use of tools, plant and equipment that may be in use.

Construction risk assessment

Construction based risk assessments need to be undertaken to ensure that all significant risks are identified and that good practical and workable controls are in place.

Risk assessments in construction tend to be dynamic. Identify the people who are at risk from the various working activities. Remember this can include:

- your own employees
- the employees of other contractors
- visitors to the site
- people who work in a building that you are refurbishing who could be at risk from your activities
- members of the public
- take into account the type of the work you are undertaking, including the work that you will be involved in throughout the contract, so the assessment remains valid for the duration of the working activities
- highlight the significant risks that arise out of your assessment. From here you should be able to identify
  - » the control measures necessary to reduce the risks to an acceptable level
  - » the degree of priority you should attach to each of the control measures
  - » take care to communicate the information contained in your risk assessments. Your employees (and other people such as subcontractors and visitors) need to be kept informed about the risks and the appropriate control measures so that they can work safely. Always use method statements in conjunction with risk assessments, as these provide the work instructions or procedures for working safely
  - » regularly review your risk assessments. Consider amending them if they become invalid. All changes to assessments must be properly documented and communicated to the workforce.

Asbestos

We have a specific guide which has been produced with the intention of providing AXA policyholders with practical guidance on the revised Control of Asbestos Regulations.

It explains the duties of building owners, tenants and any other parties who have legal responsibility for the premises. It will also give guidance on what is required of people who have a responsibility to co-operate with the main duty holder to enable them to comply with the new legal requirements. (The term duty holder applies to, the owner, tenant, landlord, managing agent or other party who maintains or owns the building.)

The duty to manage asbestos in premises applies to common parts of premises i.e. areas frequented by members of the public and includes housing developments and blocks of flats, but it does not place any direct duties on landlords in respect of individual houses or flats. Guidance is included on the methods of managing the risk posed by asbestos in premises. The main aim is to protect contractors' employees, tenants and others who may come across asbestos in the course of their day-to-day activities.

The types of work that release fibres include, for example, drilling holes with power tools and sawing or sanding material. Simply working near to material containing asbestos may however result in the release of fibres, particularly if the asbestos is in poor condition.

Asbestos Containing Material's (ACMs) are still present in many buildings, and people can cut, sand or drill into them or near them without being aware of what they are.

Information for contractors

Research into disease causation factors carried out by the HSE has identified that those employees most at risk from asbestos-related diseases are building maintenance employees and contractors who may be brought in to supplement or assist with building repairs.

Employers of building maintenance and repair workers are required to carry out a risk assessment before undertaking any work which exposes, or is liable to expose, employees to asbestos. They must then implement the most appropriate controls required by the Control of Asbestos Regulations to prevent or control the exposure to employees.

In the majority of cases, the contractors and their employees have little or no information about the premises where they will undertake work, and will not be aware if any asbestoscontaining materials are present.

As a consequence it is difficult for contractors to assess the risks accurately and take the most appropriate precautions. To address this difficulty, the duty to manage the risk from asbestos in premises has been added to the Control of Asbestos Regulations.

In addition to their duty to manage asbestos, all employers must:

- undertake risk assessments before beginning work which exposes, or is liable to expose, employees or contractors to asbestos or materials containing asbestos
- produce a plan of work detailing how the work is to be carried out
- either prevent exposure to asbestos or reduce it to as low a level as is reasonably practicable
- make any relevant information available so that employees and contractors also know of the presence of asbestos and asbestos-containing materials, and do so as soon as possible so that they can carry out their own accurate risk assessments on the work to be carried out
- comply with a range of other legislative requirements, for example on the use and maintenance of control measures and personal protective clothing, and the duty to prevent the spread of asbestos.

Excavation

Excavation is a common feature of many construction projects. It is vital to provide safe working conditions for:

- employees working in (or adjacent to) excavation sites
- any members of the public or others who may also be at risk.

A safe system of work must be in place that will enable the excavation to be carried out without interruption and will protect adjacent property and/or public services.

Before the work begins, you must always ensure that the following measures have been carried out.

The ground must be properly surveyed to determine:

- the stability of the soil
- presence of buried cables, pipes, drains or other services
- soil type
- water table level
- whether the ground has been contaminated as the result of previous working activities on the site
- access and egress to the excavations need to be carefully considered so that you can make use of the quickest and safest means of access
- you should appoint a supervisor who is fully experienced, trained and competent in the support of excavations. The supervisor should be experienced in the shoring of deep excavations, the use of trench boxes, the dispersal of spill tips, and the battering and benching of the sides of excavations
- all existing services in and around the site (such as pipelines and cables) must be located, and you must have proof of exactly where they are. This is clearly essential when excavating on brown field sites or in built-up areas, but it is also necessary in remote areas as main gas pipelines cross the country. Detailed checks must always be undertaken
- cable avoidance tools (CAT) or other locating devices must be used when detecting services, and employees must be trained to use these
- any cables or services located must first be exposed by hand digging using non-conductive tools, and employees must be trained to work under excavation permit conditions if required
- all necessary drawings or sketches must be made available to the people who will be working on the excavation. All the operatives must be properly briefed and instructed as to what is required of them
- all the materials necessary for the excavation should be available on site. You need to select where they will be stored on the site, to avoid imposing additional ground loading on the sides of excavation
- excavations should not be carried out close to busy site roads or main roads off the site, as the constant passing of traffic can erode the sides of the excavation great care is needed when excavating near walls or structures. A structural engineer's report and advice must be obtained first, as structures may have to be shored up or supported to prevent undermining and collapse
- excavations must be securely fenced to avoid people or equipment falling into the excavation
- if there is a risk of someone falling on to something such as a rebar (re-enforcing bar), additional measures should be taken to prevent injury
- where excavations are carried out on the coast or adjacent to rivers or canals, there is a danger that the excavation may flood. Regular inspection before and after the excavation should be carried out and documented. Overnight pumping may be necessary to reduce this possibility. Personal buoyancy aids should be provided to lessen the risk of people drowning if there is a flood.

Excavations must always be treated as a confined space for the purposes of your risk assessment. Pay particular attention to any deep shafts or trenches, as you will need to provide:

- forced ventilation
- air monitoring
- breathing apparatus
- confined space permits to work
- a rescue plan.

Records

Records must be maintained that clearly identify how and when key information was recorded and cascaded to contractors and employees on site. As a minimum, the information you provide must include:

- Health and safety information at the site safety induction
- All toolbox or task talks administered
- Site specific training
- All site monitoring activities including audits, inspections and accident/incident investigations
- Visits by the HSE or other enforcing bodies
- Any Prohibition or Improvement notices that have been served
- Inspection of scaffolding
- Inspection of excavations
- Lifting equipment and other statutory recording requirements
- Air monitoring records
- First aid treatments
- Waste transfer and consignment notes
- Design criteria and design risk assessments
- Construction safety plan
- Health and safety file
- General safety correspondence, minutes of any safety meetings held and general site safety instruction notices.

All records should be kept for a minimum period of three years after the final completion date of the project.

Demolition works

Under the Construction Design and Management Regulations, the client must:

- inform the HSE about all demolition
- appoint a Principal Designer
- provide all appropriate information (after making reasonable enquiries, as necessary).

On the basis of this information, the Principal Designer is responsible for preparing an initial health and safety plan. This will provide contractors with enough information to carry out an assessment (or survey) of the demolition work to be undertaken.

A pre-demolition survey must identify:

- the presence of any adjoining properties – it is particularly important to identify premises
  - » where noise and dust may be a problem, such as hospitals
  - » where the structural integrity of adjoining premises could be affected
- the type of structure and its key structural integrity elements
- the condition of structural members such as internal steelwork, floors, roofs, walls, etc
- the need for temporary support works, shoring or false work
- known health hazards such as asbestos, lead, dust or residues from previous occupants or processes
- safe and suitable access (taking into account the proposed method of demolition)
- safety exclusion zones and restricted areas and controls
- environmental considerations such as noise, dust, the storage of fuel oils for plant, or any waterways which run near the site where surface run-off water could lead to contamination
- ground conditions and potential hazards from adjacent activities that could affect the structure when it is in a weakened state following partial demolition – for example, heavy vehicle traffic or adjacent industrial processes
- potential damage to personal property such as cars and adjacent housing
- agreed vehicle routes and locations where contractors' vehicles can park and if necessary be cleaned – including provisions for preventing debris from spreading to the surrounding roads, wheel washing facilities and the containment of soiled water
- waste removal from the site, including:
  - » the correct classification of waste
  - » suitable licensed waste disposal contractors that can be appointed
  - » the destination to which the debris will be taken for final disposal.

Potential damage to the property of third parties is best identified – using site plans, photographs and other appropriate visual media – in a separate dilapidation survey, which should be carried out as part of the pre-demolition survey and attached to the survey documentation.

Manual handling

Lifting and moving heavy loads by hand is one of the most common causes of bodily injury at work. The Manual Handling Operations Regulations require employers to avoid the need for their employees to lift or carry heavy loads wherever practical.

If this is not possible, employers must adhere to the following guidelines:

- Plan all working activities so as to avoid the need for excessive manual handling
- Carry out a risk assessment of all activities that require manual handling
- Examine and implement alternative methods of lifting or carrying – for example, using mechanical aids to minimise the amount of manual handling needed
- Share heavy or awkward loads which have to be lifted by hand
- Position loads that will need to be lifted so that they are as close as possible to their final destination
- Train employees in the correct kinetic lifting techniques and the safe handling of loads
- Order bagged goods in smaller, more manageable sizes to avoid the need to handle heavy loads.

Electricity

The Electricity at Work Regulations require certain precautions to be taken against the risk of death or personal injury resulting from the use of electricity at work.

The design and installation of electrical power systems on construction sites are matters for specialists. However, consideration should be given to the following guidelines:

- Where a high voltage supply is taken from a sub-station, you must ensure that suitably competent employees are available to operate the equipment and supervise any maintenance or repair works
- All completed electrical installations (including temporary installations used on sites) must be inspected, tested and commissioned prior to use
- All inspections and testing must be carried out in accordance with the requirements of the IET (formerly the IEE) Wiring Regulations 17th edition.

The Dangerous Substances and Explosive Atmospheres Regulation applies to all workplaces including construction sites.

In view of the risks from damaged or faulty equipment, you should:

- put an appropriate maintenance system in place
- ensure that all equipment is serviced in accordance with the manufacturer's instructions.

A pre-works survey should be carried out to identify any overhead or underground cables. This survey should be undertaken in conjunction with the local electricity company.

Temporary lighting and supplies for hand tools must all be rated at the safe voltage of 110 volts or lower.

Pedestrian access routes

Accidents frequently happen when people are accessing site accommodation and cabins. When setting up the site, serious consideration must be given to the ground conditions and the routes that employees and others will traverse when working on the site.

Always ensure that:

- the conditions underfoot are checked, particularly in periods of adverse weather, i.e. snow, ice, rain, or when it is very dry or dusty
- there is adequate lighting for winter nights and shift working, etc
- vehicular and pedestrian traffic are kept separate on the site
- delivery drivers and plant operators avoid pedestrian areas
- the location of pedestrian routes forms part of the site induction training given to all people on the site.

Waste controls

Environmental permitting is a single environmental permitting and compliance system that simplifies and combines pollution prevention and control (PPC) permitting and waste management licensing (WML).

All other regulatory permitting regimes such as discharge consenting, water abstraction, radioactive substance regulation, remain in force. You need to consider the following points:

- A site survey must be undertaken by a competent person(s) to identify the type of waste that will be produced on site. Certain types of waste are deemed special or controlled, and appropriate controls must be put in place
- Documentation of all waste handling must be maintained by the duty-holder and be available for inspection at any time
- All waste removal contractors must be suitably licensed to carry the type of waste that you produce. The waste must be taken to a licensed site.

You must ensure that all waste ends up where it is supposed to go. This means that you will have to monitor the operations of waste disposal contractors, which is best done by carrying out an audit and following their vehicles from the site to the point of disposal.

The regulations apply to all forms of waste. For example, even waste water from vehicle wheel cleaning pits must be controlled and disposed of at a licensed waste disposal site.

There are a number of free guidance notes on waste and pollution available from the Environment Agency and Scottish Environmental Protection Agency.

Site security

As an employer, you have a legal duty of care for the safety of employees and other people who may be affected by construction site activities. This duty extends to cover people who enter a construction site without authorised permission such as children.

Consideration should therefore be given to the following points:

- Is the outer perimeter fence secured, intact and does it provide adequate protection for the site? All fences must be of the anti climb type. If the fencing is of the Herras type it must be secured with a minimum of two (and preferably three) brackets per fencing panel. However, it may be more appropriate to use security steel hoardings to protect a site with a minimum of 2 metres height
- Regular planned inspections of all site fencing should be made which are formally documented
- Are out of hours, manned security, CCTV or temporary intruder alarms required in high risk areas such as city centres or sites near large housing estates?
- All security guards must be licenced by the Security Industry Authority (SIA) and it is an offence to employ non accredited guards, the penalties of which can be a £5,000 fine and/or 6 months imprisonment. Licences can be checked via www.sia.homeoffice.gov.uk
- Manned security guarding companies should also be members of NSI (National Security Inspectorate – www.nsi.org.uk). Guards should patrol the perimeter of the site and record their patrols using 'clocking points' which assist in auditing the security patrol regime. All guards must be provided with a form of mobile communication to a permanently manned control room, and must in addition provide check calls between the site and the control room at regular intervals outside normal site operating hours
- CCTV installations should be installed and maintained by NSI NACOSS Gold registered contractors. NACOSS Gold companies are continually audited by NSI for those contractors, approved for CCTV, to satisfy the stringent requirements of NSI and the police. Recording and/or offsite transmission equipment must be located within secure buildings. Cameras should be located in positions where they are safe from vandalism or thieves. It is also important that the conditions of the Data Protection Act are complied with
- Temporary intruder alarm installations, which incorporate remote communication and twoway audio links are now available for buildings in the course of renovation and temporary monitored CCTV systems have improved considerably which if approved under BS8418 can gain Police response
- Are there any public rights of way through the site? Is the site near a school, a road or a railway?
- Are hired plant and tools sufficiently secure? You may need to think about providing shutters and screens for hired mobile plant such as excavation equipment
- Are there adequate secure and lock-fast facilities for small hand tools and employees' personal effects?
- The storage areas need to be of substantial construction (or alternatively, where temporary, portable stores are used, of steel construction). The method of securing stores is critical and mortice locks to BS 3621 are essential. Where padlocks are used, they should be to a minimum security standard of CEN Grade 5 (or alternatively they should incorporate a 6-lever/pin mechanism)
- Avoid accumulations of rubbish and debris as this encourages arson attempts. Where skips are used for storing combustible waste, they should be located at least 10 metres from any building structure, external boundary fence or vehicle/plant storage area. Where this is really not possible, metal lidded skips must be used with the lids locked and padlocked outside normal site operation hours
- Again, where enclosed structures are used, these can be alarm protected with temporary battery operated systems (if approved under Security Systems and Alarm Inspection Board (SSAIB) code of practice for temporary alarm systems).

Fire safety

Fire kills and injures people, destroys property and jobs, disrupts production, and may put a company out of business.

The practical steps taken to prevent and control fire represent a cost effective and responsible investment that can have great benefits for all concerned.

The scale and intensity of fire varies greatly, however, certain fundamental factors are common to all fires, and knowledge of these is essential to the prevention and control of fires. Equally important is an understanding of the different sources of fires, since an error in the selection and use of equipment can make things worse. Forexample, water applied to hot burning oil would cause a violent reaction.

The legislation relating to fire safety is designed to limit the risk of a fire occurring and to ensure that, if it does occur, there is adequate provision for means of escape and for controlling the fire. All precautions and measures should be taken with these ends in mind.

Once started, fire can be disastrous. Fire prevention is better than fire fighting.

Steps to be taken:

- Formulate and regularly update the Site Fire Safety Plan
- Ensure that all procedures, precautionary measures and safety standards are clearly understood and complied with by all personnel on site
- Ensure that the system for Hot Work Permits is established and is in use – importantly this must be monitored to ensure compliance
- Conduct daily inspections of escape routes, fire access, fire fighting facilities and work areas
- Give consideration to the materials in use and combustibility. A higher degree of site security may be required if combustible materials are exposed during the construction phases which could become a target for arsonists
- Keep detailed records of all inspections and remedial actions taken
- Liaise with the Fire Brigade and ask them to arrange training exercises, site inspections and familiarisation tours
- Maintain a written record of all checks, inspections, tests and fire drill procedures
- During an alarm, execute those duties required for the safe evacuation of the site and ensure that all staff and visitors report to the designated assembly area
- You should become familiar with the Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation document which should be complied with and may form part of the insurance contract where the contract value is £2.5m and above.

Copies of the Code are available via www.thefpa.co.uk.

Site plans

Site plans should be developed to detail the following:

- Fire brigade access, fire fighting shafts, fire lifts and temporary hoist facilities
- Dedicated emergency escape routes and staircases
- Positions of hydrants, dry risers and wet risers
- Positions of fire points and ensure they are operational
- Temporary buildings and temporary accommodation
- List of hazardous items and storage of these including, flammable liquids, gas cylinders, gas mains, electrical risers, temporary holes in floor slab, etc.

Timber framed construction

Use of modern engineered timber frame for new buildings has caught the headlines in recent years due to a number of high profile fires, especially during construction phase where the unprotected frame may be highly vulnerable to ignition and rapid fire growth. A number of steps can be taken to reduce risks where timber frame has been specified:

- Utilise guidance within the Fire Prevention on Construction Sites, the "Joint Code of Practice" for large timber frame structures and follow the Structural Timber Association (previously known as UK Timber Frame Association) "Site Safe" procedures
- Seriously consider having the ground floor built from non combustible construction as a "podium" to avoid low level fires
- Avoid leaving the timber frame exposed for any length of time, or enclose the frame as the build progresses with non combustible linings. It is also possible that so called "closed cell" installations can be carried out to avoid exposed timber. Use fire rating boarding to act as temporary fire compartments through the structure as work progresses
- Increase the security on site, even in areas that might be considered low risk. This may require permanent security 24/7 presence and/or CCTV systems as well as perimeter site hoardings
- Check with your insurers that they are aware of the construction methods being used.

Emergency procedures

On all sites, a means of giving warning of a fire must be established. Hand bells, whistles, klaxons or manually operated sounders may be practical so long as they are clearly audible above background noises in all areas, and can be readily identified as being a fire alarm. As sites become more complex however, then more advanced fire alarm systems may be required.

Written emergency procedures must be displayed in prominent locations and given to all employees on site.

Clear access to the site and buildings must be maintained at all times.

Nominated personnel, e.g. security guards, must have been briefed to provide clear access to the site in the event of an emergency.

Clear signs must be installed and maintained in prominent positions indicating the locations of fire access routes, escape routes and the positions of dry riser inlets and fire extinguishers.

Fire protection

The project should be designed and planned, so far as is reasonably practical, in a logical sequence that will allow each of the following to be installed and put into operation as early as possible:

- Permanent fire escape stairs, with compartment walls protecting the stair enclosures
- Fire compartments within buildings, including the installation of fire doors and the completion of fire stopping – it will be necessary to pay particular attention to lift shafts, service ducts and voids which offer a passageway for smoke, fire and heat
- Fire protective materials to protect steelwork
- Lightning conductors
- Automatic fire detection systems
- Automatic sprinkler installations and any other fixed fire fighting equipment
- Adequate water supplies – rising and temporary mains should be considered
- Hydrants – that are kept clear of obstruction and are suitably marked.

Portable fire extinguishers

An adequate number of suitable types of fire extinguisher should be provided throughout the site.

Extinguishers must be provided in conspicuous positions near exits on all floors. If in the open they should be situated in red painted boxes raised 500mm above ground level with a sign ‘Fire Point’ at a height that can be readily seen above any intervening huts or storage.

As work proceeds, the provision of fire fighting equipment must be regularly reviewed.

‘Ride-on’ mechanically propelled site plant should carry an appropriate fire extinguisher where reasonably practical.

Temporary buildings and temporary accommodation (TAU’s)

Temporary buildings should be separated by at least 10 metres from the building under construction or refurbishment and other permanent buildings.

Where the fire break is of necessity less than 6 metres, the temporary buildings should be designed and constructed so as to comply with the test specification laid down in LPS 1195 Specification for Testing of Temporary Buildings for Use on Construction Sites.

Heaters must be fixed, preferably above ground level, fitted with securely fixed metal guards and maintained in sound condition.

Coat stands and drying racks must be firmly positioned at a safe distance from heaters.

All heaters and cooking appliances must be properly installed and adequate ventilation should be provided.

Heaters should be thermostatically controlled and have enclosed elements.

Automatic fire detection should be provided in all buildings used for cooking.

Temporary buildings should not contain more than the absolute minimum of furniture and fittings made from synthetic materials.

Spaces or voids under cabins should be meshed or boarded in order to prevent an accumulation of debris and rubbish which can pose a serious fire risk.

Site storage of flammable liquids & LPG

Containers of highly flammable liquids and Liquified Petroleum Gases (LPG) cylinders should preferably be stored in open compounds, which are securely fenced and shaded from the sun. Stores containing highly flammable liquids must be surrounded by a bund sufficient to contain the maximum contents of the largest drum stored plus 10%, and the bund must not be allowed to fill with water or waste material.

Highly flammable liquids and LPG must NOT be stored together. The requirements of the Dangerous Substances and Explosive Atmospheres Regulations apply to temporary storage locations and need to be taken into account; (INDG 370 should be consulted – it is available from HSE Books).

Where flammable liquids and gases are outside the central store, they must be limited to 50 litres or half a day's supply, whichever is less. The containers must be kept in a store, cupboard or bin which is of fire resistant construction.

Products which could add to the intensity of fire, such as oxygen, or to the toxic hazard in the event of fire e.g. chlorine, must not be stored in the same compound as flammable liquids and LPG.

Appropriately worded warning signs (e.g. 'HIGHLY FLAMMABLE LIQUIDS', 'NO SMOKING' and 'NO NAKED LIGHTS') must be boldly displayed at the entrances to stores.

Electrical fittings, e.g. lights and switches, within stores must be safe. Adequate numbers of fire extinguishers must be provided.

Acetylene

Due to the hazardous nature and instability of acetylene at elevated temperatures, alternative methods of cutting and welding should be adopted on construction sites.

In the event of fire where acetylene is present, the Fire & Rescue Service will create up to 200 metre exclusion zone with a one hour period of cooling and a further hour of monitoring.

If acetylene has to be used, then spare cylinders must be kept to an absolute minimum and all removed from site once the period of work involving acetylene has completed.

Waste materials

Good housekeeping is essential on ALL sites.

Waste, packaging materials, wood, shavings and oily rags must be regularly removed. Special attention should be paid to corners, the bases of shafts and other out-of-the-way places.

Unwanted materials from the more open areas of a site must be collected for disposal at regular intervals.

Separate metal bins, with close fitting metal lids, must be provided for flammable materials, e.g. oily rags.

All collected waste materials awaiting disposal must be kept in an area away from temporary accommodation, stores or equipment.

All dry vegetation must be cleared regularly.

Rubbish must not be burned on site.

Plant

Stationary plant, such as compressors and generators, should be positioned in the open air or in well-ventilated non-combustible enclosure. They must be sited so that exhaust pipe and exhaust gases are kept clear of combustible materials and other buildings.

Fuel tanks must not be filled whilst engines are running.

Compressors should be housed singly away from other plant and in separate enclosures.

Plant and equipment must be protected against accidental damage.

Air intakes must be situated so that the air is cool, uncontaminated and free from flammable gases or vapours.

Where appropriate, sand trays should be provided to absorb drips of fuel or lubricant.

Materials storage

Where it is reasonably practical to do so, combustible materials should be stored outside the building that is under construction or undergoing refurbishment, and should not be so close to it that fire is able to spread from the materials to the building.

Where combustible materials are stored inside the building, the area used for storage should:

- be designated a ‘no smoking area’ and sign-posted accordingly
- have controlled access
- not be in an area where hot work is carried out
- either be within the area covered by a fire detection system or be included on the route of regular fire checks
- have fire fighting equipment close by.

All combustible wrapping and packaging should be removed and disposed of at the earliest opportunity and in any case not less than once per day.

In addition, the protection of combustible materials with a layer of a material conforming to the requirements of Loss Prevention Standard LPS 1207 Fire Requirements for Protective Covering Materials is strongly recommended.

Smoking

A ‘No Smoking’ policy should be established on the site which also supports The Smokefree (Premises and Enforcement) Regulations in England and Wales, plus the Prohibition of Smoking in Certain Premises (Scotland) Regulations.

Smoking on site must be restricted to a designated area in a clear space away from the building(s) under construction, storage areas and temporary buildings. Failure to enforce this can carry a fine of up to £2,500.

A designated area for smoking can be allowed providing this is away from:

- Building(s) under construction
- storage areas including those containing combustible materials, flammable liquids, gas cylinders, foam plastics, fibreboard or timber
- Temporary site buildings or containers.

Smoking shelters are acceptable providing they are of non combustible construction, are clear of combustible materials and contain fire fighting equipment, ashtrays, sand buckets or other receptacles for the safe disposal of smokers’ materials.

‘NO SMOKING’ notices must be displayed in areas where smoking is not permitted.

AXA Insurance

Risk management guidance for the construction industry

ACLD0834-C