

Smaller Building Projects: Health and Safety

Most construction industry fatal injuries now occur on smaller building projects involving refurbishment of existing work places and homes.

This Information Document is designed to alert Building Control and Environmental Health professionals to the:

- **Hazards** causing most deaths on smaller building projects and
- **Precautions** that should be implemented by contractors and others.

Hazards causing most deaths on smaller building projects



- ◀ **Falls from Height**
over 60% of deaths involve falls from ladders, scaffolds, working platforms, roof edges and falls through fragile roofs or rooflights.
see pages 2 and 3



- ◀ **Structural Collapses**
cause traumatic injury or asphyxiation when unstable trenches, basement excavations, walls, floors or ceilings collapse.
see page 4



- ◀ **Lifting Operations**
cause fatal and serious injury when materials fall or strike workers during both manual and mechanical lifting operations.
see page 4



- ◀ **Electricity**
electrocution and burns are caused by contact with underground cables, overhead power lines and conductors within buildings.
see page 5



- ◀ **Plant and Vehicles**
excavators, dumpers, fork lift trucks and other vehicles cause serious injuries when they overturn or strike those working nearby.
see page 6



- ◀ **Harmful Substances**
construction workers may be exposed to asbestos, respirable crystalline silica and other substances that can cause cancer.
see page 7

The following 7 pages of this Information Document contain examples of:

- what can go wrong
- how to avoid the risk of serious injury
- where to obtain further information

Falls from Height: over 60% of deaths involve falls from ladders, scaffolds, working platforms, roof edges and falls through fragile roofs or rooflights.

Ladders: should be used only for work that can be undertaken safely from a ladder and secured to prevent outwards or sideways movement.



◀ Gutters are being fixed from an unsecured ladder placed in the road at an unsafe angle. The work being done makes it impossible for the user to hold the ladder.



◀ Work from ladders can be undertaken more safely from a tower scaffold or a mobile access platform. Towers and mobile access platforms should be erected and used by competent people.

Working platforms: scaffolds, stagings and towers must be fitted with double guardrails, toe boards and properly erected by trained and competent persons.



◀ Tower scaffolds and ladder platforms should not be used without guard rails when replacing gutters etc. Assembly instructions provided with towers should be followed.



◀ This photograph shows a properly erected proprietary working platform. Such system scaffolds should be erected in accordance with the suppliers instructions.



◀ Guard rails are missing from this scaffold. Scaffolding must be erected by competent people, to a recognised standard, properly maintained and inspected regularly.



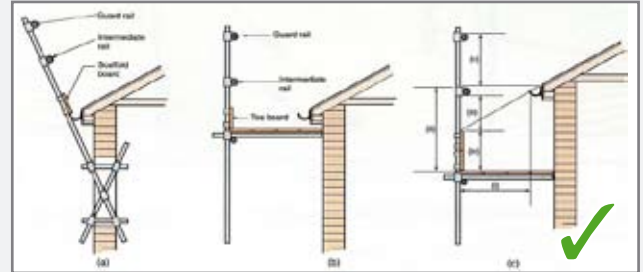
◀ A well-constructed scaffold is based on solid foundations and fitted with guardrails, toe boards and bracing. It must be tied to the building unless designed to be free standing. This also shows use of netting to prevent falls of material.

continued from page 2

Roofs: require safe access and physical protection to prevent falls from edges



◀ These men are re-roofing a sloping roof without edge protection to prevent falls. This is highly dangerous.



▲ This illustrates the simple edge protection options that can be implemented to prevent falls.



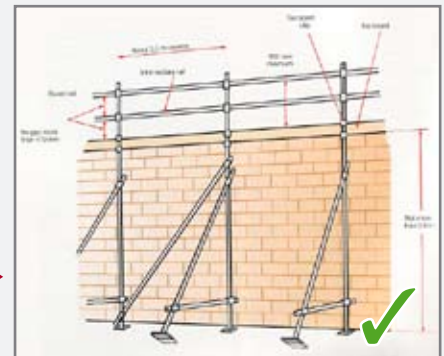
◀ Roof ladders can be used to make minor repairs to sloping roofs. The ladders must be suitable and properly used. This photograph shows ladders being used in a manner that could easily lead to a catastrophic fall of the ladders and the roofer from the slope.



Shows a properly used roof ladder. ▶



◀ Repairs to flat roofs (including single storey) present a significant risk of falling and injury. These men are refelting a flat roof without suitable edge protection.



This illustration shows what can be provided to prevent falls from the edge of a flat roof. ▶

Fragile roofs: always follow a safe system of work using a platform beneath the roof where possible. Work on the roof requires a combination of stagings, guard rails, fall restraint, fall arrest and safety nets slung beneath and close to the roof.



◀ This workman is at risk of falling through the roof, through a roof light or from the roof edge. The ladder access is unsecured and too short. Walking along the line of the purlins (roof supports) is not acceptable.



This shows a mobile elevating work platform being used to replace a rooflight from below the roof. ▶

Structural Collapses: cause traumatic injury or asphyxiation when unstable trenches, basement excavations, walls, floor or ceilings collapse.

Excavations: all excavations must be regarded as liable to collapse unless adequate temporary support is installed or the sides battered back to a safe angle.



◀ The workman in this trench is at significant risk of being killed should the sides of the excavation collapse. No-one should ever enter an unsupported excavation.

Trench boxes or other means of support must be provided if the sides of the excavation cannot be battered back to a safe angle. ▶



Structures: a thorough survey and assessment should be undertaken before any potentially load bearing parts of a structure are altered.



◀ A workman died when this wall fell during remedial work on the wall.

Structures must be assessed by a competent person before any structural alterations are undertaken. Any required temporary support must be installed and maintained. ▶



Lifting Operations: cause fatal and serious injury when materials fall or hit workers during both manual and mechanical lifting operations.

Movement of heavy loads: must be carried out with properly used lifting machines and safe slinging to avoid loads falling due to mechanical failure or instability.



◀ These workmen are lifting and installing a steel beam by hand from unsafe working 'platforms' located in a live roadway.

Lifting operations require thorough planning and supervision. The safe slinging of loads is essential. ▶



Electricity: electrocution and burns are caused by contact with conductors within buildings and external overhead or underground cables.

Electrical systems: should be isolated when they are being worked on. Only trained, competent people should undertake work on electrical systems and equipment. Temporary electrical supplies to construction sites should be low voltage (110V) from transformers.



◀ These 240-volt conductors were involved in the death of a builder working on a domestic property. Isolation of supplies, use of earth leakage devices and reduced voltage minimise the risk.



Photograph shows a 110v (centre tapped to earth) electrical supply from a ▲ transformer commonly used on construction sites to reduce the risk of electrocution.

Overhead power lines: are a hazard to large items of plant and equipment. Physical contact with the power lines is not needed to cause danger as electrical energy can arc across to metal components.



◀ The jib on this lorry has hit the overhead power line. Tipper lorries, lighting towers, excavators, scaffold tubes and metal ladders have all been involved in fatalities when contacting or coming into close proximity with overhead cables.



Detailed planning, selection of ► plant, barriers and signs are all required to minimise the chance of contact. The 'goalposts' in this photograph will alert drivers to the risk.

Underground cables: utility plans and detection devices should be used to locate cables before work starts. Suitable systems of work and equipment should be used to prevent contact with or close approach to conductors.



Underground cables are commonly struck ► during ground work. This can cause explosions, flash burns and electrocutions. Obtaining drawings from utility companies is not enough. Cable locating devices should be used with drawings and safe digging techniques to avoid excavating over the top of an indicated line of a cable.



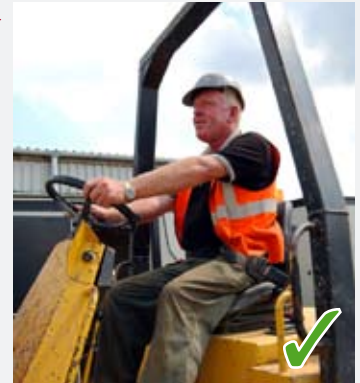
▲ A workman died when a powered breaker he was using to uncover a water pipe inadvertently struck an underground cable.

Plant and Vehicles: excavators, dumpers, forklift trucks and other vehicles can cause serious injuries when they overturn or strike those working nearby.

Safe driver: drivers of mobile plant and vehicles must be fit, well, trained and competent to operate this type of vehicle.



Drivers of plant and vehicles should be able to show that they have been trained to operate the type of plant or vehicle driven. The contractor should make reasonable checks to verify training and competence. High visibility clothing should be provided to, and worn by, everyone at risk.



▲ This shows the catastrophic consequences of failure to train and secure competent plant and vehicle operations.

Safe vehicle: mobile plant and vehicles must be suitable for the work being carried out and properly maintained.



◀ The wing mirror on this telescopic fork lift truck is damaged and obscured by tape. Incidents usually occur when plant is reversing or slewing so driver visibility is vital. Maintenance systems must be in place for checking brakes, steering, lights etc.

This mirror is in good condition and enables the operator to see if anyone is at risk before slewing or reversing. The provision, use and maintenance of such safety and warning devices are critical. Devices may include rollover protection, seat belts, mirrors, CCTV, radar, reversing alarms.



Safe site: every site must be organised, so far as possible, to separate vehicles and pedestrians and eliminate reversing.



◀ This shows a very poorly organised site. The forklift truck is manoeuvring in a very restricted area where other workers may be present and materials are stored. No effective steps have been taken to separate vehicles and pedestrians.

Reversing should be avoided where possible, minimised and controlled e.g. one-way systems and trained banksman working from a safe place to one side of vehicle. Pedestrians should be separated from movements e.g. at site entrance/exits and during slewing and loading.



Harmful Substances: construction workers may be exposed to asbestos, respirable crystalline silica and other substances that can cause cancer.

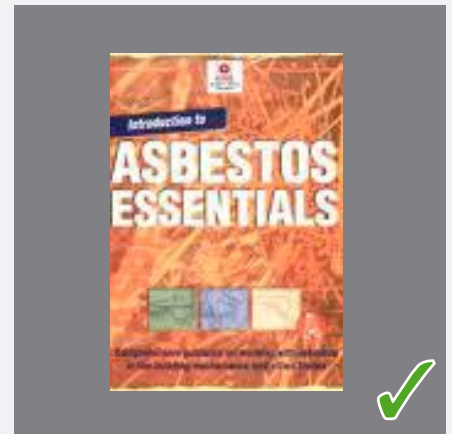
Asbestos: workplaces and homes built or refurbished before 2000 may contain asbestos. Work with asbestos insulation or asbestos insulating board must, in most cases, be carried out by a licensed asbestos remover and always with proper controls in place.



▲ A survey is essential to detect the presence and location of any asbestos-containing materials before any work starts. All work should be planned to avoid disturbing the material.



▲ This shows what can happen when a survey is not undertaken or the findings not acted upon. Asbestos insulating board is shown strewn on the floor having been swept with a broom.



▲ Contractors should follow good practice as set out in published guidance. A plan of work is required to minimise dust. The plan should include control measures and protective equipment e.g. RPE.

Respirable crystalline silica: silica is present in many common building products. Tasks which generate respirable crystalline silica e.g. disc cutting, grinding and other 'high energy' processes, require proper dust control precautions.



▲ Water suppression is being used here to properly control the dust. Water is fed from the yellow container direct to the cutter area.



▲ No measures are being taken to control the dust generated by the use of this disc cutter. Workmen and others will be inhaling the damaging dusts.



▲ Dust extraction equipment fitted to the tools can be used to control silica dust where the use of water is not practicable.

FURTHER INFORMATION

This Information Document highlights the main causes of death on smaller building projects and the precautions that should be implemented by contractors and others.

Further information and guidance can be obtained from:

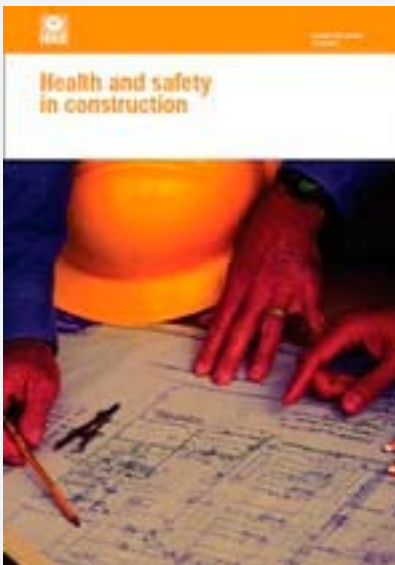


■ HSE on the Internet

The HSE website includes a section dedicated to the Construction Industry. Go to www.hse.gov.uk/construction/index.htm

Key publications are being made available as either purchasable publications or as free downloadable pdf files.

The two most relevant publications are:



■ Health and Safety in Construction HSG150

This book explains the essential tasks for achieving healthy and safe construction sites. It helps the reader to identify hazards and control risks and explains how to plan, organise, control, monitor and review health and safety throughout the life of a project. It is aimed at everybody involved in construction work, including clients, designers, contractors and individual workers. It applies to work on all kinds of construction sites, including: general building and construction; refurbishment; maintenance and repair and civil engineering work.



■ Managing Health and Safety in Construction L144

This Approved Code of Practice (ACOP) provides practical guidance on complying with the duties set out in the Construction (Design and Management) Regulations 2007 (CDM 2007).

The key aims of CDM 2007 are to integrate health and safety into the management of the project and to encourage everyone involved to work together to improve the planning and management of projects; identify risks early on; target effort where it can do the most good in terms of health and safety; and discourage unnecessary bureaucracy. These Regulations are intended to focus planning and management throughout construction projects, from design concept onwards.