

Hurak
Learning

Level 1
Health & Safety
in a construction environment

Handbook



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A1

The importance of Health and Safety

What is 'Health and Safety'?

Health and safety is about regulations and procedures intended to prevent accident or injury in workplaces or public environments.

What is the difference between 'Health' and 'Safety'?

When referring to 'health' we normally think about factors effecting your insides (the body), for example, poor 'health' can result in long-term (chronic) issues like back pains, lung disease, asbestosis etc.

'Safety' on the other hand generally relates to the environment and objects, for example, poor 'safety' will usually result in short-term issues like cuts, bruises, broken bones etc.

Health and Safety Statistics

Every year, thousands of people in the UK are forced to take time off work due to health and safety-related issues, in fact HSE reported that in the year 2016/17 1.3 million people suffered from a work-related illness, resulting in 31.2 million working days lost, which in turn led to £14.9 billion estimated cost of injuries and ill health from current working conditions.

Time off work and incurred costs are just some of the consequences of poor health and safety and in some cases, people suffer major injuries and even death!

The harsh reality of the matter is that most of these incidents could have been avoided if better health and safety procedures were put in place.

A2

Reasons for good Health and Safety

Health and safety is very important in the workplace for many reasons such as: moral obligations, legal compliance and financial purposes.

The **cost** of poor health and safety

- Accidents
- Employee illnesses
- Complaints
- Bad reputation
- Low staff morale
- Legal challenges e.g. fines, prosecution or closure

The **benefits** of good health and safety

- Safe working environments
- Customer satisfaction
- Good reputation
- Greater productivity
- Lower staff turnover
- Legal compliance
- Higher profits

A3

The importance of Health and Safety

HASAWA – Health and Safety at Work etc. Act 1974

The Health and Safety at Work etc. Act 1974 (HASAWA) is the primary piece of legislation in the UK that deals with health and safety at work. It places duties on employers and employees.

Employers must ensure:

- the workplace is safe to operate
- visitors, customers and others are kept safe
- risk assessments are carried out, recorded and in date
- staff are aware of health and safety controls
- competent persons are appointed to carry out duties
- all accidents, injuries, diseases or dangers are reported to the HSE
- each staff member has insurance
- to communicate and consult with staff.

Employers must provide:

- Health and Safety Policy
- basic welfare facilities e.g. toilets
- protective equipment and clothing
- free and appropriate health and safety training
- first aid facilities
- all relevant information and supervision
- fire and emergency plan
- work equipment

Employees also have some legal duties in relation to the health and safety.

Employees must ensure to:

- take appropriate care and responsibility
- comply with training, safety measures and policies
- report any issues or potential risks relating to health and safety
- communicate and work with the employer on issues
- maintain awareness of potential hazards e.g. jewellery
- use all facilities and equipment professionally and safely

A4

Key Terms / Definitions

Health	An individual's well-being or condition.
Safety	The protection of an individual from dangers that can cause injury.
Accident	An unplanned and uncontrolled event that results in injury or damages.
Incident	An event that effects the flow of work but doesn't result in injury or damages.
Near Miss	An unplanned and uncontrolled event that could have caused harm but didn't.
Control Measure	Procedures and/or actions put into place to reduce risk to an acceptable level.
Hazard	Something that may cause harm.
Risk	Likelihood of harm occurring.
Competence	The ability to do something successfully or efficiently.

A5

Typical Hazards and Risks on Site

Hazards and risks associated with poor general site control measures:

Term/Situation	Hazard and Risk
Resources	Lone working, poor construction materials, incompetent workers
Equipment	Cutting, entanglement, entrapment, electrocution
Obstructions	Slips, trips and falls, contact with vehicles or plant, overturning
Storage	Contamination, explosion, spillage, falling materials
Services	Burst pipes, flooding, contact with overhead cables
Wastes	Harmful/contaminated waste (asbestos), pollution, contamination of sewers
Work activities	Repetitive strain syndrome, exposure to noise, unsafe method of work

Hazard	Something that may cause harm.
Risk	Likelihood of harm occurring.
Competence	The ability to do something successfully or efficiently.

A6

Risk assessments and method statements

What is a 'risk assessment'?

A risk assessment is a careful examination of the hazards and the risks in the workplace, which helps to determine the best ways to reduce or eliminate the potential risks.

These assessments are used to identify what could cause harm to people at work and what are the necessary protective measures that must be put in place.

Under the Management of Health and Safety Regulations 1999, it is a legal requirement for every employer and self-employed person to make an assessment of the health and safety risks arising out of their work.

Legally, you only need to record the assessment if you have 5 or more employees.

You need to record:

- the significant findings - what the risks are, what you are already doing to control them and what further action is needed
- details of any particular groups of employees who you have identified as being especially at risk

A **dynamic risk assessment** allows us to identify hazards/risks and apply control measures on the spot. It is an ongoing/continuous process e.g. a worker seeing a tool lying on the ground, picks it up and puts it in the right storage place realising it is a trip hazard on the ground.

Carrying out a risk assessment

STEP 1: Identify the Hazard – electricity, fire, equipment, plant, machinery

STEP 2: Decide who could be harmed – workers, contractors, visitors

STEP 3: Evaluate the risks and compare with existing safety provisions – is it possible for the hazard to be completely removed

STEP 4: Record results – write findings simply, clearly and accurately

STEP 5: Review and update

What is a 'method statement'?

A work method statement is a document that details the way a work task or process is to be completed. The method statement should outline the hazards involved and include a step by step guide on how to do the job safely.

Method statements are used as a means of controlling specific health and safety risks that have been identified, such as lifting, demolition, working at height etc.

A7

Accidents

Reporting and recording accidents and near misses is a legal requirement.

It is important to report accidents and near misses so that the data collected can be reviewed, any patterns identified in order to help reduce such occurrences from happening in the future.

The employer is responsible for providing an accident book and ensuring records are kept.

Anybody who witnesses an accident at work or is involved in one; can and should complete an accident report. This includes: the employer, employees, self-employed persons and visitors.

If you witness or are involved in an accident you should complete the accident book. If you are unable to continue working safely you must stop and report to your line manager.

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) require **employers and others who control or manage the premises**, to report to the relevant enforcing authority and keep records of:

- work-related deaths
- work-related accidents which cause serious injuries to workers
- certain 'dangerous occurrences' (near-miss accidents)
- injuries to a person who is not at work, such as a member of the public

Accident reports must include the date, time and place of the event and a brief description of the occurrence.

A8

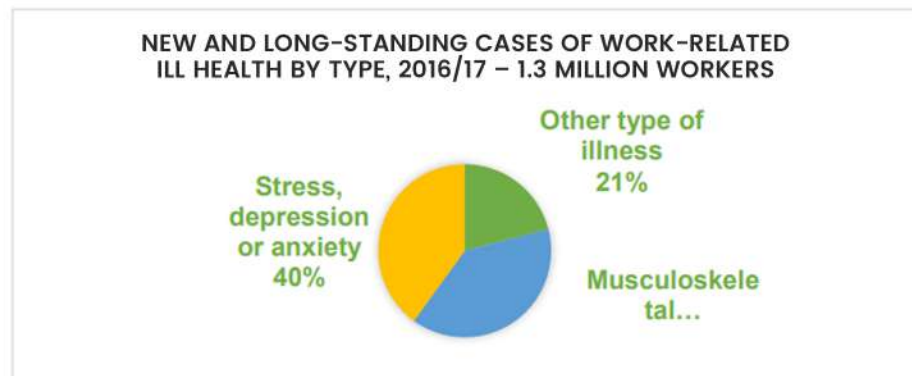
Work-related Ill Health, Major Injuries, Fatalities

Ill Health

Common ill-health problems: occupational lung disease, back problems, noise-induced hearing loss, hand-arm vibration, stress, dermatitis, asthma.

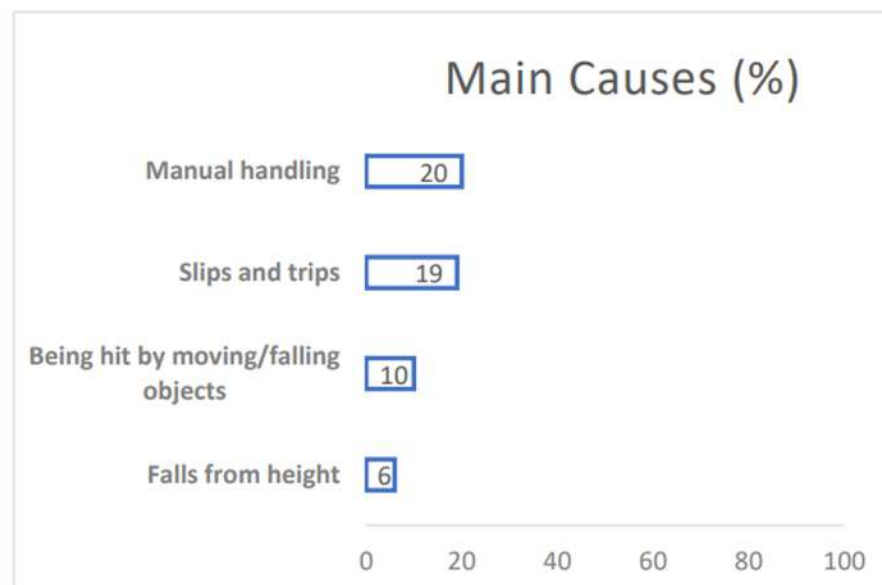
13,000 deaths each year estimated to be linked to past exposure at work, primarily to chemicals or dust.

1.3 million workers suffering from work-related ill health (new or long-standing) in 2016/17.



Major Injuries

These include person losing consciousness, amputations, loss of sight, fractures, crush injuries causing damage to the brain or internal organs, etc.

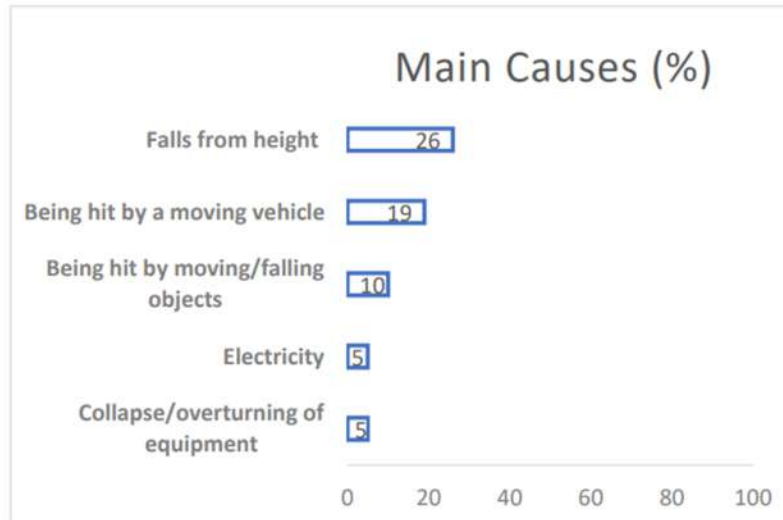


A8

Work-related Ill Health, Major Injuries, Fatalities

Fatalities

In 2016/17 there were 30 fatalities in the UK construction industry.



B1

Common Health Risks in Construction

Although there have been improvements over recent years in reducing the number and rate of injuries to workers, construction remains a high-risk industry and accounts for a high percentage of fatal and major injuries.

What is less recognised is that construction is a high-risk industry for health issues too!

Many materials or substances used or created at work could harm your health. These substances could be:

- dust, gases or fumes that you breathe in
- liquids, gels or powder that come into contact with your eyes or skin
- harmful microorganisms present that can cause infection, an allergic reaction or are toxic.

Some other common health risks in construction include noise and vibration.

B2

Dust and fumes

The Source

Dust is produced when materials are broken down into smaller particles (such as during sanding, cutting, sawing etc.).

Fumes are produced by heating metals to high temperatures (such as during soldering, gas cutting, welding etc.)

The Problem

Dust and fumes are respiratory hazards, when inhaled, they can cause a range of illnesses/diseases and can also lead to breathing problems like occupational asthma.

Wood dust and silica dust is particularly hazardous.

The Effect

Exposure to dust and fumes can also cause lung cancer, silicosis, damage to the liver and kidneys.

The effects of inhaling small amounts are not always immediate and can build up over time (months or years) which in turn can cause incurable damage.

Safety Provisions

- On-tool dust extraction
- Wet cutting
- Wearing a dust mask
- Dampening down
- Use an industrial vacuum cleaner (do not sweep dust with a broom)

B3

Noise

The Source

Many construction tasks, tools and equipment can produce high noise levels (such as angle grinders, drills, concrete breakers, etc.).

Lower exposure action value – 80dB.

Upper exposure action value – 85dB.

The Problem

Construction sites can have very hazardous noise levels.

Frequent exposure to these levels causes hearing problems like deafness or ringing/buzzing in one or both ears (tinnitus).

The Effect

Exposure to repetitive, excessive noise can cause short or long-term hearing problems. People suffering from hearing loss usually struggle to hear conversations or parts of words, this can be very dangerous on a construction site, where communication is key!

Safety Provisions

Employer responsibilities:

- Plan work using the quietest methods
- Buy quietest equipment
- Provide PPE

Employee responsibilities:

- Wear ear defenders
- Do not exceed safe time limit
- Understand and keep within protection zones

B4

Vibration

The Source

Many construction tasks, tools and equipment can cause vibration (such as hand-held drills, disc cutters, wall chasers, concrete breakers, circular saws, sanders, etc.).

The Problem

Vibration from hand-held tools can cause hand-arm vibration syndrome (HAVS).

Hand-arm vibration can cause significant ill health (painful and disabling disorders of the blood vessels, nerves and joints)

The Effect

HAVS can cause changes in sensory perception which can lead to permanent numbness of the fingers.

Other symptoms include: tingling, numbness, loss of grip, blanching (loss of colour), loss of strength in the hands etc.

Safety Provisions

Employer responsibilities:

- Minimise the use of vibrating equipment
- Limit the time workers are using vibrating tools

Employee responsibilities:

- Keep hands warm
- Avoid gripping a tool more than necessary
- Take regular break

B5

Skin conditions – Dermatitis and Skin Cancer

The Cause

Dermatitis: caused by exposure to certain chemicals and working with cement.

Skin cancer: caused by exposure to certain chemicals and the sun.

The Effects

Dermatitis: can cause blisters and extreme pain to affected areas.

Skin cancer: can cause severe pain and in some cases even death.

The Symptoms

Dermatitis symptoms include: redness, itching, dryness

Usually affects the hands and forearms but can affect other body parts too.

Skin cancer symptoms include: bleeding, itching, scaly and crusty skin, never completely heal

Safety Provisions

Dermatitis:

- Wear gloves
- Be extra cautious when working with chemicals
- Cover up exposed skin

Skin cancer:

- Cover up exposed skin
- Drink plenty of water
- Use sun block

B6

Diseases – Tetanus, Legionella and Hepatitis

The Cause

Tetanus (lockjaw): enters the body through cuts and grazes.

Legionella: Caught by breathing in contaminated water.

Hepatitis: Caught from contact with contaminated needles and syringes.

The Effects

Tetanus (lockjaw): painful muscle spasms and even death in some cases.

Legionella: high fever, muscle aches and diarrhoea.

Hepatitis: fever, muscle aches and even death in some cases.

The Symptoms

Tetanus (lockjaw): difficulty in opening the mouth or jaw, stiffness in the jaw.

Legionella: similar to the symptoms of flu: chills, coughs etc.

Hepatitis: dark urine, yellowing of the skin, weakness and fatigue, joint pain, loss of appetite.

Safety Provisions

Tetanus: Wear PPE

Legionella: A method statement (safe system of work) is needed

Hepatitis: Report drug taking equipment to your supervisor

If you think you may be suffering from one of these diseases seek medical attention!

B7

Diseases – Tetanus, Legionella and Hepatitis

Weil's disease is caused by *Leptospira* bacteria and spread by rodents. Rodents carry the bacterium and can spread it to humans who come into contact with these contaminated settings. Construction workers are at a high risk of infection, particularly if they are located within these potentially contaminated environments. Weil's disease poses serious long-term and life-threatening health risks. If left untreated, the infection could lead to internal bleeding, organ failure and mental health problems. Leptospirosis bacteria can enter the body through the eyes, nose and through cuts and grazes in the skin. Whilst at work, workers ought to avoid touching their face and follow good person hygiene practice. Employers ought to allocate protective clothing and specialised hand wipes in order for workers to conveniently disinfect their hands and keep protected.

Psittacosis is an infectious disease caused by a bacterium called *Chlamydia psittaci* and is contracted from infected birds. Construction workers may be exposed to bird droppings on some sites. The symptoms of the disease range from inapparent illness to systemic illness with severe pneumonia. Control measures include using disposable coveralls, washing hands and forearms before eating drinking or smoking, taking rest and meal breaks to avoid contamination.

B8

Hazardous substances

Hazardous substance: Any solid, liquid, or gas that can harm people, other living organisms, property, or the environment.

Hazardous substances can enter the body in 4 ways:

- 1 **Inhalation** - hazardous substance being breathed in.
- 2 **Absorption** - hazardous substance being absorbed by the skin.
- 3 **Ingestion** - hazardous substance being swallowed.
- 4 **Injection** - hazardous substance being injected.

Hazardous substances can have immediate (acute) and long-term (chronic) effects on health.

The ill-health effects of hazardous substances include:

- Skin irritation
- Burns to the skin
- Asthma
- Lung disease (silicosis)
- Infection from bacteria
- Skin cancer
- Dizziness
- Stinging eyes
- Airway obstruction
- Nervous system diseases
- Cancer in other parts of the body
- Disorders of reproductive organs

When working with different hazardous substances:

- use the right type of PPE, for example:
- Vented goggles for splash hazard substances would be appropriate whereas non-vented goggles for vapour releasing substances would be required.
- Puncture and liquid proof rubber gloves would be more suitable than cotton gloves when working with chemicals.
- learn about their specific characteristics and dangers.
- handle, store, and get rid of them safely and according to approved procedures. Never pour them down sewers or drains.
- have a basic understanding of COSHH assessments - A COSHH assessment is a risk assessment that concentrates on the hazards and risks from hazardous substances in **your** workplace.
- don't mix or combine unless you know you can do so safely.
- always carry chemicals in approved containers.
- always wash your hands after using any unsafe material.
- store materials properly, as directed on their labels.
- follow safe procedures. Don't take shortcuts!

B8

Hazardous substances

Key symbols used to indicate hazardous substances:



Toxic



Harmful



Flammable



Gas under pressure



Explosive



Hazardous to the environment



Corrosive



Oxidising gases

Some combustibles and chemicals are extremely flammable, so it is important they are stored correctly on site to prevent fires

B9

Asbestos

What is it?

Asbestos is the name given to a group of naturally occurring fibrous solid minerals.

Asbestos has many useful building properties including its resistance to fire and its affordability. However, it can also be very damaging to the health of workers.

It is only recently that we have become fully aware of the health problems caused by exposure to asbestos, and measures have now been put in place to protect workers tasked with its removal.

One method of controlling risk is labelling asbestos removal as either **licensable** or **non-licensed**, so that the appropriate measures and actions can be applied.

Where can you find it?

Found in buildings across the UK built before the year 2000 (houses, factories, offices, schools, hospitals etc).

Before its dangers were known, it was a widely used building material especially for insulation and sprayed coatings on ceilings and walls.

Common materials that may contain asbestos:

- Loose asbestos in ceiling or floor cavity
- Lagging
- Sprayed coatings on ceilings, walls and beams/columns
- Asbestos insulating board
- Floor tiles, textiles and composites
- Textured coatings
- Roofing felt

Types of Asbestos

There are a number of different types of asbestos, often categorised by their colour:

- White (Chrysotile) – the most common type of asbestos
- Brown (Amosite) – the second most common type of asbestos
- Blue (Crocidolite) – the most lethal form of asbestos

B9

Asbestos Continued

There are 3 main conditions/diseases associated with exposure to asbestos: lung cancer, Mesothelioma and Asbestosis.

When working with **Asbestos**:

Do:

- Stop work and speak to your employer, or the building owner if you are suspicious something may be asbestos.
- Follow the plan of work and the essentials guidance sheets.
- Use your protective equipment, including a suitable face mask, worn properly.
- Clean up as you go - stop waste building up.
- Make sure waste is double-bagged and is disposed of properly at a licensed tip.
- Wash before breaks and before going home.
- Make sure you have had adequate training before you start work.

DON'T:

- Use methods that create a lot of dust, like using power tools.
- Sweep up dust and debris - use an industrial (Type H) vacuum cleaner or wet rags
- Take home overalls used for asbestos work.
- Reuse disposable clothing or masks.
- Smoke.
- Eat or drink in the work area.

B10

Stress and Mental Health

Over 11 million days are lost at work a year because of stress at work. Furthermore, one in four people in the UK will have a mental health problem at some point. Work-related stress can lead to heart disease, anxiety, depression etc. Employers have a legal duty to protect employees from stress at work by doing a risk assessment and acting on it.

The six main areas that can lead to work-related stress (if they are not managed properly) are: demands, control, support, relationships, role and change.

Below are some of the causes of stress and mental health problems at work employees may face:

- Not being able to cope with the demands of the job.
- Not being able to control the way they do their work.
- Not receiving enough information and support.
- Having trouble with relationships at work or are being bullied.
- Not fully understanding their role and responsibilities.
- Not being engaged when a business is undergoing change.

The signs and symptoms of stress and mental health are very similar.

Below are some of the signs of stress and mental health problems.

An **employee** may:

- take more time off
- take more sick leave
- arrive for work later
- be more twitchy or nervous
- have mood swings
- feel withdrawn
- Underperform
- have arguments with other employees
- lack motivation, commitment and confidence
- have increased emotional reactions – being more tearful, sensitive or aggressive

B11

Alcohol and Drugs

The misuse of alcohol and drugs at work can have the following effects:

- Tiredness
- Increase the risk of accidents
- Reduced productivity
- Bad image on the company
- Reduced ability to recognise dangers
- Lateness
- Absenteeism
- Bad behaviour
- Increased mistakes
- Poor performance

Employers should seek to help employees who admit to drug (or excessive alcohol) use rather than lead simply to dismissing them.

Employees should always follow their employer's policy on alcohol and drugs.

B12

Welfare facilities

Welfare provision is fundamental in safeguarding the health and well-being of workers. These facilities must be kept clean and easy to reach.

Your employer has a legal duty to provide the following:

- Toilets (separate for men and women)
- Hand-washing facilities
- Running hot (or warm) and cold water
- Changing facilities
- A supply of drinking water
- Somewhere to take breaks and eat meals
- Somewhere for securing valuables
- Somewhere for storing and drying clothing

For mobile workers these facilities can be provided at a central location.

B13

Personal hygiene

Maintaining personal hygiene is necessary for many reasons. For example, keeping a good standard of hygiene helps to prevent the development and spread of infections, illnesses.

To ensure good **personal hygiene** and prevent illnesses:

- wash hands before breaks – to prevent transferring germs from hands to mouth
- wash hands thoroughly with soap – make sure your finger nails are clean
- have toilet paper for toilet cubicles
- have towels for drying hands
- apply lotion at the end of the shift – the lotion will replace the moisture
- keep clothing clean and have a separate set of clothing for work – to prevent transfer of substances such as dust
- seek medical advice if something concerns you

Good personal hygiene is essential to promoting good health.

B14

Personal protective equipment (PPE)

Personal protective equipment (PPE) is equipment that will protect the user against health or safety risks at work.

Personal protective equipment (PPE) must be:

- worn by employees whenever necessary
- provided by employers free of charge
- replaced if it gets damaged
- properly looked after and stored when not in use
- monitored and reported for any faults or damages
- chosen carefully (size, fit and weight)
- used as a last resort if it is still required after implementing other controls

PPE does not completely remove the risks, but it can help protect against them.

Types of PPE you can use:



B15

Emergency procedures

Construction sites need a plan for emergencies such as serious injuries, explosion, flood, poisoning, electrocution, fire, and chemical spills.

In **emergencies** people are more likely to respond reliably if they:

- are well trained and competent
- take part in regular and realistic practice
- have clearly agreed, recorded and rehearsed plans, actions and responsibilities

In the event of an **emergencies** it is extremely important you:

- know how to raise the alarm and what it looks/sounds like
- know where to go (i.e. assembly point)
- know the escape route (leave the premises by the quickest and safest route)
- contact the emergency services

B16

Emergency procedures

The minimum **first-aid** provision on any workplace is:

- a suitably stocked first-aid box
- an appointed person to take charge of first-aid arrangements
- For higher risk workplaces, like construction sites, you should also have trained first aiders and a dedicated first-aid room if possible.

The following information must be known to all **employees**:

- the first-aiders and their details (i.e. where to find them, how to contact them etc.)
- where to find the first-aid kit
- location of the first-aid room or where to get first-aid treatment
- actions to take on discovering a casualty (i.e. isolate the hazard, seek medical advice, do not put yourself in danger etc.)

C1

Introduction to Manual Handling

Manual handling – ‘any transporting or supporting of a load, by hand or bodily force’.

Manual handling includes:

- Lifting
- Putting down
- Pushing
- Pulling
- Carrying
- Moving

Employees should discontinue work and report the following problems to management when a task involves handling materials and equipment:

- Personal conditions which may be detrimentally affected
- Faulty or missing lifting aids and/or equipment

C2

Manual Handling Injuries

Ensuring safe manual handling is important because if not done appropriately there is a risk of injury. Manual handling causes over a third of all workplace injuries and it is the biggest cause of ‘lost time’ accidents in the UK.

Typical injuries include:

- Arthritis – A disease causing painful inflammation and stiffness of the joints due to repetitive tasks.
- Back Pain – A result of muscular or nerve damage due to both heavy and/or incorrect lifting and poor posture.
- Cuts & Fractures – Broken bones or broken skin due to an accident.
- Hernia – Occurs when a tissue pushes through a weakness in the muscle or surrounding tissue wall, caused by lifting heavy objects incorrectly.
- Ligament Sprain – The most common location for a sprain is in your ankle.
- Muscle or Tendon Strain – stretching or tearing of muscle or tendon.

C3

Manual Handling Law

Manual Handling Operations Regulations 1992 (MHOR)

The Manual Handling Operations Regulations 1992 (MHOR) outlines the responsibilities of both the employer and the employee on preventing or reducing the risk of harm or injury associated with manual handling.

Employee responsibilities:

- Comply with safety procedures, policies and training
- Take reasonable care of themselves and others
- Report hazards or safety concerns
- Use any mechanical lifting equipment provided
- Follow safety standards when using equipment
- Store equipment and work materials correctly
- Get help if required
- Never lift anything above their capability
- Report problems to their line manager

Employer responsibilities:

Outlined in the regulations, the employer must follow a sequence of 3 steps, known as a 'Hierarchy of Control' which is the ranking of measures for dealing with the risks of manual handling.

- **Avoid** - avoid hazardous manual handling operations so far as reasonably practicable.
- **Assess** - assess any hazardous manual handling operations that cannot be avoided.
- **Reduce** - reduce the risk of injury so far as is reasonably practicable.

C4

Manual Handling Assessment

If manual handling tasks are unavoidable, then the factors that make up **TILE** can be used to assess and reduce the associated risks.

Task

Assessing the task:

- Repetition of work
- Twisting, stretching or bending
- Level of strain caused
- Sudden movement
- Distance a load must be carried
- Duration and frequency of duties

Controls for reducing risk:

- Make employees take turns and breaks
- Reduce tasks that cause strain or discomfort
- Provide sufficient PPE
- Shorten distance

Individual

Assessing the individual:

Age

- Health status e.g. ill or pregnant?
- Posture
- Abilities
- Strength
- Competency

Controls for reducing risk:

- Match the carrier's capabilities with the loads (never exceeding)
- Provide adequate information and training e.g. good handling techniques

C4

Manual Handling Assessment

Load

Assessing the task:

- Weight
- Size
- Shape
- Stability
- Harmful (i.e. hot etc.)

Controls for reducing risk:

- Provide handling aids and equipment
- Stabilising
- Lighten the loads
- Supply PPE

Environment

Assessing the individual:

- Design and layout of premise
- Lighting
- Floor levels
- Staff numbers (to help share the load)
- Training, reporting and safety procedures
- Management

Controls for reducing risk:

- Improve work conditions and layout
- Increase staff numbers
- Implement better training, reporting and safety procedures

C5

Manual Handling Equipment

It is important to use lifting aids and other site safety equipment provided; not only because these make tasks less laborious, but also because these help reduce risks of injuries and may also be mandatory requirements of your employer.

If carrying handles or vacuum devices are provided, these must be used.

Some other examples include:

- Conveyor belts
- Forklifts
- Pallet trucks
- Cranes
- Trolleys
- Wheelbarrows
- Kerb lifters
- Hoist equipment

Employers must also consider the risks involved in introducing work equipment to help with manual handling tasks, and that risk assessments will need to be conducted.

C6

Principles of Safe Manual Handling

The 6 safe lifting techniques:



1. Stop and think



2. Position yourself



3. Bend your knees



4. Grip firmly and straighten back



5. Lift with your legs



6. Hold load close to the body

D1

Safety Signs

There are five safety sign categories: Safe condition, Warning, Mandatory and Prohibition.



D2

Electricity

The law says you must take precautions against the risk of death or injury from electricity.

Working with electricity can be extremely dangerous because unlike other hazards on the construction site, you cannot see or smell electricity, however contact with it can cause serious injury or even death!

When working with **electricity**:

- Before carrying out any work identify any/all existing underground cables.
- Assume any exposed cables are live, avoid contact and report them immediately.
- Be cautious, as due to the nature of a construction site they can be damaged.
- Remember there is no visible way of knowing if a cable is live.

Only in exceptional circumstances should work be carried out on live systems, and then only by a competent authorised person.

D3

Different Voltages

The four common electrical voltages you may come across on site are: 110 volts, 230 volts, 400 volts and battery power.

110 VOLTS YELLOW	230 VOLTS BLUE	400 VOLTS RED	BATTERY POWERED
Colour code for 110 volts: Yellow	Colour code for 230 volts: Blue	Colour code for 400 volts: Red	Colour code for battery power: N/A
Use: Maximum voltage for electrical tools is 110 volts	Use: Mains power supply	Use: Equipment/plant requiring a lot of power	Use: Safest option
Electrical shock: At 110 volts a person will feel the shock, but the pain will only be temporary.	Electrical shock: At 230 volts a person will get a severe electrical shock.	Electrical shock: At 400 volts Cardiac arrest and severe burns occur. Death is probable.	Electric shock: Slight shock felt. Disturbing, but not painful. Most people can "let go."

D4

Electrical Hazards

Each construction site is likely to have different hazards that are unique to it, however, some hazards are common on all construction sites.

Common **electrical safety hazards** on construction sites:

- Improper grounding
- Exposed electrical parts
- Bare wires on an electric-powered tool
- Inadequate wiring
- Damaged insulation
- Wet conditions
- Damaged tools and equipment
- Overloaded circuits
- Damaged plugs
- Overhead powerlines
- Underground power cables

D5

Overhead Powerlines

The Health and Safety Executive estimates that over 50% of fatal electrical accidents are caused by contact with overhead electric power lines.

Often this is due to lack of awareness because a risk assessment hasn't been conducted or workers haven't educated themselves about the hazards.

If machinery or vehicles get too close to power lines, then electricity will be conducted through them – as well as through anyone using or touching the equipment at the time.

If you need to carry out work near overhead power lines, then it's vital to take precautions to prevent accidents happening.

This includes consulting the local electricity company about how to proceed safely; asking the local electricity company if power lines can be switched off before work begins and always assuming that power lines pose a risk, never being complacent.

D6

Underground Power Cables

Underground power cables can be more hazardous than overhead ones as they are hidden from view and you may not know about them until it's too late.

It's also impossible to tell by sight whether these cables are live when they are uncovered.

Care needs to be taken when carrying out digging tasks on all construction sites, particularly if working on streets, pavements or near buildings.

If you need to carry out work near underground power cables, then you'll need to take appropriate precautions.

This includes consulting the local electricity company, highways authority and council for up-to-date maps of buried services; using suitable cable-avoidance tools; following safe digging practices and always assuming that cables will be present before beginning any sort of digging work.

D7

Overhead Powerlines

Construction sites are covered with electrical hazards. It is mandatory on workers to know risks and proper precautions.

Electrical safety for construction site workers:

- Wear PPE – The amount of personal protection required is based on your potential exposure to electricity.
- Cord protectors – As an extra measure, use cable covers and cord protectors.
- Training – adequate training will help identify the unknown improper shortcuts and thus reduce the risk of equipment-related electrocution.
- Close openings – junction boxes, pull boxes and fittings must have approved covers.
- Risk assessments – carry out an exhaustive and comprehensive risk assessment before any kind of work starts on the construction site.
- Residual Current Device (RCD) – RCDs work by cutting the power immediately if there is a fault.
- Portable appliance testing (PAT) – equipment and tools should be tested regularly

D8

Hand-held Tools and Equipment

Selection and conformity of work equipment and hand-held tools

Work equipment and tools must be suitable for the purpose for which they are used or provided and used only for operations for which they are suitable. In selecting work equipment, employers must take account of:

- the working conditions and risk to health and safety from the premises they will be used in
- who will use the equipment
- the work equipment itself

Employers should also take account of:

- ergonomic factors, to avoid undue strain on the user
- the forms of energy used or produced (e.g. radiation, vibration, noise)
- the substances used or produced (e.g. fumes)

Before giving any work equipment to employees, employers should make checks:

- that the equipment is not obviously unsafe
- comes with all features necessary for safety (e.g. guarding for machinery)
- is suitable for the purpose to which it is to be used or provided
- that it comes with user instructions, which should be in English
- if machinery, that information on noise and vibration emissions is provided

Before carrying out any work using work equipment employees should:

- receive suitable instructions and training
- inspect any/all hired equipment (equipment should only be hired from reputable companies)
- ensure that it is suitable for the task and for use on site
- check that it is PAT labelled

D9

Work Equipment Hazards

Some of the hazards from work equipment are from moving parts and chains, rotating drill bits and blades.

These include:

Entanglement - where hair, clothing or jewellery could get caught in parts of a machine (i.e. drills).

Entrapment - where parts of the body could be caught in parts of equipment (i.e. moving rollers)

Contact - where the body could touch sharp edges, hot surfaces or abrasive surfaces. (i.e. contact with a blade)

Ejection - where parts of equipment or materials being worked on could fly off and hit the body (i.e. ejected abrasive wheel)

Impact - where the body could be crushed by moving parts or by items being processed (i.e. crushed fingers from a hammer).

D10

Types of Work Equipment

Common types of work equipment on construction sites:

- Lasers
- Saws
- Angle grinders
- Tile cutters
- Compressed air tools
- Compressed gas tools
- Cartridge-operated tools
- Petrol-driven hand tools
- Powered tools
- Non-powered tools (chisels, sledge hammers etc.)

Each tool will present its own hazards, as stated before, it is important that you have received adequate training before using work equipment and know the risks and hazards.

D11

Types of Work Equipment

When operating work equipment and machinery:

You should **ALWAYS**:

- Know how to start and stop it
- Report any faults to your manager
- Use in accordance with specific requirements
- Ensure work equipment is only used for suitable purposes
- Wear PPE
- Take effective measures to prevent access to dangerous parts of machinery
- Take measures to prevent parts and substances falling or being ejected from work equipment
- Where appropriate, provide suitable means of isolating work equipment from all power sources

You should **NEVER**:

- Work in unsafe conditions
- Use with any guards or safety devices removed
- Be under the influence of drugs or alcohol
- Carry out work when you are tired or sleepy
- Work without equipment being stabilised by clamping
- Operate a machine unless you have been specifically trained
- Remove any guards or safety devices unless authorised to do so

E1

Introduction to Fire Safety

Why is fire safety important?

Every year:

More than 50 individuals lose their lives due to fires in the workplace.

Over 2000 people are seriously injured from fire related incidents.

Fire damage results in over £1 billion worth of insurance claims.

Most fires are preventable. Those responsible for workplaces and other buildings to which the public have access can avoid them by taking responsibility for and adopting the right behaviours and procedures.

E2

The Fire Triangle

For a fire to start, it needs 3 things: fuel, oxygen and heat.

FUEL - Anything that burns is fuel for a fire. Examples of fuel include: wood, paper, plastics, flammable liquids, rubber, textiles, waste packaging materials, petrol, etc.

When a fire has no fuel left, it will die due to starvation.

OXYGEN - The main source of oxygen for fires is the air around us, which is contains around 20% oxygen.

We can remove oxygen from a situation by restricting ventilation and/or using fire-fighting equipment to smother and extinguish the fire.

HEAT - Any potential source of heat in the workplace, coupled with the other two elements of the fire triangle, can ignite a fire. Heat sources may include: hot works, portable heaters, naked flames, lighting, plant and equipment etc.

Removing heat through cooling can extinguish the fire.

E3

Common Causes of Fire in the Workplace

Although any scenario in which you bring the three elements of the fire triangle together results in a fire, the most common causes in the workplace are:

ARSON - acts of arson include: setting vehicles, buildings and objects alight with the intent to cause damage.

ELECTRICAL EQUIPMENT - Neglect and misuse of equipment is another leading cause of workplace fires. Always follow manufacturers' instructions.

HEATERS - can easily be knocked over and overheat if obstructed.

SMOKING - matches, lighters and cigarettes are another common cause of ignition for many workplace fires.

POOR HOUSEKEEPING - effective housekeeping can help eliminate the accumulation of rubbish which in turn is an unnecessary source of additional fuel.

HOT WORKS - a high percentage of workplace fires are started by blow lamps and cutting/welding equipment.

E4

Hazards of Fire

A fire presents numerous hazards: reduced visibility, flames, smoke, lack of oxygen, heat and structural collapse.

FLAMES

Burns from flames can cause serious damage. Even non-fatal burns can result in hospitalisation. Burns that cover over 20% of the body can be life threatening.

SMOKE

Inhalation of smoke and fumes can cause burning to the airway and lungs. A build-up of carbon monoxide and other toxic gases in the body can lead to unconsciousness and then death.

HEAT

Breathing in superheated gases causes damage to the airway and lungs. In some severe cases this can kill people due to cardiac arrest.

STRUCTURAL COLLAPSE

Fire damage may lead to a building becoming weaker. If the structural integrity is affected greatly the building can collapse.

LACK OF OXYGEN

As a fire burns it reduces the oxygen levels around, resulting in unconsciousness and then death.

E5

How Does Fire Spread?

Generally, there are four ways in which fire can spread: convection, conduction, radiation and direct burning.

CONVECTION - In the event of a fire, air warms up and then rises to the highest point. There the air superheats and mixes with other combustible gases produced by the fire.

This mixture then moves around often igniting other combustible materials resulting in the fire spreading.

CONDUCTION - Is the transmission of heat through materials that readily absorb heat and transfer it along their structure.

An example of conduction is where the walls of a pan become very hot though there is no direct contact with the heat that is only applied at the base.

A conduction fire will generally follow the heat or sometimes the heat from conduction may cause a new fire to ignite elsewhere in the building via heat moving through the walls.

DIRECT BURNING - Fire normally spreads through direct contact with combustible materials until the heat of the fire builds up and is enough to spread by the other methods.

A lit match can easily burn paper, for example. The more combustible materials that a fire comes into contact with the more it spreads.

RADIATION - This is the transmission of heat by electromagnetic waves travelling until heat is absorbed by other objects. These objects or materials will be heated up until they reach combustion point and ignite.

The main principle of radiation is: the closer the material is to the fire the more radiated heat it will receive.

Radiated heat from a burning building can in some circumstances give rise to fire in a nearby building.

E6

Flashover and Backdraught

Flashover

In a compartment fire the temperature continues to rise until all of the combustible materials in the compartment start giving off flammable gases.

With the build-up of heat these gases ignite, throughout their extent, resulting in near-simultaneous ignition of all exposed combustible surfaces.

Where the compartment is adequately ventilated, this sudden temperature driven and sustained transition of a growing fire to a fully developed fire is known as a Flashover.

Backdraught

A backdraught is where limited ventilation, due to closed windows or well fitted doors, can lead to a fire in a compartment producing flammable gases containing significant proportions of partial combustion products and unburnt pyrolysis products.

Though the fire will start to reduce in size due to the lack of oxygen, the flammable gases present in the room will remain. If these accumulate, the admission of air when an opening is made to the compartment can lead to the fire restarting with an explosive force.

This deflagration moving through the compartment and out of the opening is a backdraught.

E7

Fire Classification

Not all fuels burn in the same manner, hence different fuels result in different fires. There are 6 different types of fires.

CLASSIFICATION OF FIRES		TYPES OF FIRES	
 CLASS 	Solids such as paper, wood, plastic		
 CLASS 	Flammable liquids such as paraffin, petrol, oil		
 CLASS 	Flammable gases such as propane, butane, methane		
 CLASS 	Metals such as aluminium, magnesium, titanium		
 CLASS 	Cooking oil and fat		
 CLASS 	Fires involving electrical apparatus		

E8

Fire Prevention

Fire safety measures can be broken into two groups, good house-keeping and an effective fire safety policy.

Good house-keeping:

Examples include:

- Keep fire doors closed, don't wedge open
- Ensure fire exits and points are unobstructed
- Keep routes clear and exits labelled correctly
- Organise electrical wires and report faults
- Manage waste disposal

Fire safety policy:

Examples include:

- Fire safety procedures and training e.g. regular fire drills
- Fire detection system and raising the alarm
- Evacuation plan and a well-designed escape route
- Fire-fighting equipment
- Regular tests on electrical equipment, fire alarms and fire equipment
- Information on fire safety
- Provisions for the prevention of fire spread e.g. fire doors
- Record keeping system e.g. risk assessments and training

E9

Fire Extinguishers

Not all fuels burn in the same manner, hence different fuels result in different fires. There are 6 different types of fires.

WATER		
Suitability	How it works	Warning
Class A, solid material fires such as wood, paper and fabrics.	By cooling the surface of the fuel.	Should not be used on electrical or cooking oils and fats fires.

CO2		
Suitability	How it works	Warning
Electrical and Class B, flammable liquid fires	By cooling the surface of the fuel.	Should not be used on electrical or cooking oils and fats fires.

FOAM		
Suitability	How it works	Warning
Class A, solid material fires such as wood, paper and fabrics. Class B, flammable liquids such as petrol and diesel.	A water based foaming agent smothers the fire hence suffocating it.	Should not be used on electrical or cooking oils and fats fires.

POWDER		
Suitability	How it works	Warning
Class A, B, C and electrical fires Class D (special powder extinguishers only).	The powder smothers the fire thus starving it of oxygen. Some powders can also stop the chemical reaction needed by a fire.	Should not be used on cooking oils and fats fires. Should not be used in confined space as can affect visibility and result in breathing difficulties.

FIRE BLANKET		
Most commonly found in the kitchen as these are used to smother small fires.		
Fire blankets are made of a fire-retardant material and usually designed for single use, unless stated otherwise.		
Before using one, it is important to read manufacturer instructions.		
Fire blankets should never be used on fires bigger than the blanket.		

E10

Emergency Procedures

Actions on discovering a fire:

- Raise the alarm to warn others
- Call the fire service
- Evacuate the building and report to the assembly point

Actions on discovering a fire:

You should **ALWAYS**:

- Stay calm and react immediately
- Leave the building using the safest and quickest escape route
- Close windows and doors behind you (if you are the last to leave)
- Report to the assembly point
- Report any unaccounted persons to the person in charge of the roll call

You should **NEVER**:

- Delay your evacuation (by waiting for others, finishing a task or collecting your belongings)
- Try fighting a fire (unless you are confident, safe and have been trained to do so)
- Use Lifts
- Re-enter the building until an All Clear has been given by the fire service

E11

Fire Safety Order

Regulatory Reform (Fire Safety) Order 2005 – Fire Safety Order

It replaced more than 70 different laws and brought uniformity to the enforcement of fire safety. The Fire Safety Order deals with general fire safety measures including fire prevention, fire-fighting and protection of people in the event of a fire.

Employer duties:

- Carrying out a fire risk assessment
- Providing adequate training to employees
- Providing adequate information to non-employees
- Ensuring fire preventative and protective measures in place are satisfactory
- Liaising with emergency services

Employee duties:

- Co-operating with the responsible person
- Reporting all fire-related hazards
- Assisting the employer in maintaining a safe workplace by not doing anything which will put themselves or others at risk

E12

Fire Wardens and Fire Marshals

Fire wardens are trained individuals with the primary job of ensuring that in the event of a fire people can get out of an area safely. They are often called 'fire marshals'.

Day-to-day general duties of a **fire warden** include:

- Check the general fire safety of their area.
- Check fire doors are not propped open or tied.
- Monitor escape routes, call points and final exit doors to ensure they are free from obstructions.
- Observe good housekeeping and maintenance of fire systems.
- Check that fire extinguishers are where they should be and are in order.
- Carry out fire safety inspections.
- Ensure all means of escape signs and lighting are in good working conditions.
- Check electrical equipment (wiring, plugs, sockets, fuses, overloading etc.)
- Report faulty electrical equipment.
- Provide all relevant people with adequate fire information and training.

E13

Fire Safety Briefing

One of the main roles of a fire warden is to carry out fire safety briefings for new members of staff, contractors and visitors.

Content of a **fire safety briefing** include:

- The emergency plan and evacuation strategy in place.
- Location of the assembly point, fire exit signs, alarm and escape routes.
 - Actions to be taken on discovering a fire.
 - Actions to be taken on hearing the alarm.
 - Special arrangements for people with any disabilities.
 - How to call the fire service.
 - Any significant findings of the fire risk assessment and control measures in place.
 - Relevant site specific special fire precautions for the premises.
 - Information on fire drills, alarm tests and the housekeeping policy
 - The operating instructions for fire panels and escape doors.
 - Procedures for employees and non-employees

F1

Working at Height

Work at height means work in any place where, if precautions were not taken, a person could fall a distance liable to cause personal injury.

You are **working at height** if you:

- work above ground/floor level
- could fall from an edge, through an opening or fragile surface or
- could fall from ground level into an opening in a floor or a hole in the ground

Work at height does not include a slip or a trip on the level, as a fall from height has to involve a fall from one level to a lower level, nor does it include walking up and down a permanent staircase in a building.

Falls from height are the main cause of deaths in the UK construction industry.

F2

Working at Height Regulations

Work at Height Regulations 2005

The purpose of The Work at Height Regulations 2005 is to prevent death and injury caused by a fall from height.

Employer responsibilities:

Employers and those in control of any work at height activity must make sure work is properly planned, supervised and carried out by competent people. This includes using the right type of equipment for working at height. Low-risk, relatively straightforward tasks will require less effort when it comes to planning.

Employers and those in control must first assess the risks.

Employee responsibilities:

Employees have general legal duties to take reasonable care of themselves and others who may be affected by their actions, and to co-operate with their employer to enable their health and safety duties and requirements to be complied with.

F3

Hierarchy of Controls

Before **working at height**, you must follow these simple steps:

- avoid work at height where it is reasonably practicable to do so
- where work at height cannot be easily avoided, prevent falls using either an existing place of work that is already safe or the right type of equipment
- minimise the distance and consequences of a fall, by using the right type of equipment where the risk cannot be eliminated

You should:

- do as much work as possible from the ground
- ensure workers can get safely to and from where they work at height
- ensure equipment is suitable, stable and strong enough for the job, maintained and checked regularly
- not overload or overreach when working at height
- take precautions when working on or near fragile surfaces
- provide protection from falling objects
- consider emergency evacuation and rescue procedures

F4

Hazards and Risks Associated with Working at Height

Term/Situation	Hazard and Risk
Dropping tools and debris	Damage to equipment, injury or death by tools or debris falling on person, damage to structure
Stability of ladders	Falls because of slippery surfaces, uneven ground and strong winds, overreaching
Overhead cables	Electrocution
Fragile roofs	Falling through fragile roofs, asbestos
Scaffolds	Lack of edge protection, incomplete, excessive weight
Internal voids	Falling through internal voids, unmarked voids, Asbestos
Equipment	Entanglement, ejection, entrapment, noise
The working area	Lack of welfare facilities, poor housekeeping
Other people	Incompetent/untrained workers, not following safe systems of work, under the influence of drugs or alcohol

F5

Working with Ladders

When using a ladder:

You should ALWAYS	You should NEVER
<ul style="list-style-type: none">• Ensure that the ladder is at the correct angle (75°)• Do a pre-use check beforehand to make sure that it is safe for use• Secure the ladder at the top and bottom• Position the ladder on flat ground• Ensure 3 points of contact as a minimum requirement (i.e. two feet and at least one hand on the ladder)• Wear clean slip-resistant shoes• Keep metal ladders away from live electricity outlets• Face the ladder when climbing and descending• check that it is clean and dry	<ul style="list-style-type: none">• Overload ladders• Overreach on ladders or stepladders• Rest a ladder against weak upper surfaces, e.g. glazing or plastic gutters• Use ladders or stepladders for strenuous or heavy tasks• Use ladders near overhead powerlines• Allow more than one person on the ladder at any one time• Use a ladder in bad weather• Lean off the side of the ladder• Balance your ladder on top of an object• Use a ladder if you feel tired or dizzy• Place a ladder in front of closed doors that can open towards the ladder

F6

Working with Scaffolds

When working with scaffolding:

You should ALWAYS	You should NEVER
<ul style="list-style-type: none">• Carry out a health and safety check before using a scaffold.• Know the safe working limits for the type and nature of scaffolding you are building.• Ensure materials are stacked correctly and cannot fall.• See the site manager if the scaffold is not safe to work on or dismantle.• Carry out an inspection prior to use.	<ul style="list-style-type: none">• Climb up or down the scaffold or enter the scaffold from an unapproved entry point.• Leave yourself exposed to any fall risks.• Use makeshift platforms. Use the correct type of scaffolding boards.• Overload any scaffold or loading bay.• Throw, drop or tip materials from any height.• Climb along the scaffolding steel work.

F7

When working with mobile tower scaffolding

When working with mobile tower scaffolding:

You should ALWAYS	You should NEVER
<ul style="list-style-type: none">• Ensure guard rails are fitted to the working platform.• Follow the manufacturer's or supplier's instruction manual for assembly and use.• Ensure that these manuals are available to everyone on site.• Ensure the tower is resting on firm, level ground, free from potholes, with the locked castors or base plates properly supported.• Check that there are no power lines or other obstructions overhead.	<ul style="list-style-type: none">• Work on a platform without guardrails.• Stand on an unprotected platform when building or dismantling a tower.• Use the tower in bad weather like strong winds.• Use the tower as a support for ladders or other access equipment.• Use a tower with broken or missing parts.• Use a tower with incompatible components.• Move a tower while people or materials are on the tower, or in windy conditions.

F8

Working with Mobile Elevating Work Platforms (MEWPs)

When working with mobile elevating work platforms (MEWPs):

You should ALWAYS	You should NEVER
<ul style="list-style-type: none">• Follow the manufacturer's instructions for operation.• Carry out an inspection prior to use.• Position the MEWP on firm, level ground ensuring that the tyres are inflated.• Barrier off the area around the platform so that falling tools or objects do not strike people below.• Make sure the work platform is fitted with effective guard rails and toe boards.• Set a maximum safe wind speed for operation. Storms and snowfalls can also damage platforms.	<ul style="list-style-type: none">• Climb out of the MEWP while it is elevated.• Allow untrained workers to operate the MEWP.• Exceed the safe working load.• Use a MEWP near power lines or other overhead obstructions.• Stand on the guardrails of the MEWP.• Operate the MEWP outside the manufacturer's maximum wind speed.

F9

Internal Voids

It is often necessary to create internal voids in buildings under construction or find existing ones in buildings being refurbished.

Planning to anticipate when these voids will constitute a risk to workers is essential.

Key things to consider include using mesh guards or covers which are permanently fixed into concrete floors – these provide protection to all workers throughout the job.

Where coverings on the floor are used these must be robust, securely fixed and signed.

You can protect voids from underneath by using fixed scaffold.

If you carry out short duration works around the void, you should provide protection, for example, scaffold underneath.

F10

Fragile Roofs

Working at height remains one of the biggest causes of fatalities and major injuries. Many construction projects involve roof work.

All roof surfaces should be treated as fragile.

Falls through fragile roofs and fragile roof lights cause death and severe injury.

On average 7 people are killed each year after falling through a fragile roof or fragile

roof light.

On top of this, over 2,000 major injuries such as broken bones or fractured skulls are reported to HSE each year by the construction industry involving falls from height.

Which surfaces present a risk?

The following are likely to be **fragile**:

- Old roof lights
- Old liner panels on built-up sheeted roofs
- Non-reinforced fibre cement sheets
- Corroded metal sheets
- Glass (including wired glass)
- Rotted chipboard
- Slates and tiles

Fragile roof incidents can be prevented by careful planning, using trained and experienced workers with suitable equipment and employing a high level of supervision.

What an employer should do

Before work starts:

- Ensure that a competent person assesses the roof using a safe system of work
- Ensure the work is properly planned in advance by a contractor with sufficient expertise in working on fragile roofs.
- Specify non-fragile assemblies for new and replacement roofs.
- Satisfy yourself that the contractors have allowed sufficient time to carry out the work safely.

After work starts:

- Ensure the planned safe system of work is implemented.

G1

Mobile Plant and Vehicles

The term 'plant' refers to machinery, equipment and apparatus used for an industrial activity. Typically, in construction, 'plant' refers to heavy machinery and equipment used during construction works.

Examples include:

- Bulldozers
- Cherry pickers
- Breakers
- Cranes
- Dumper trucks
- Earth-moving plant
- Excavators
- Forklift trucks
- Mobile elevating work platforms (MEWPs)

G2

Hazards Associated with Mobile Plant and Vehicles

There are many potential hazards, risks and potential injuries associated with mobile plant and vehicles.

Hazards include:	Risks include:
<ul style="list-style-type: none">• Moving vehicles and plant• Operation of vehicles and plant• Operating on or near uneven ground• Reversing• Objects on vehicles• People on vehicles• Lack of working space• Operating near overhead Cables• Operating on or near buried Services	<ul style="list-style-type: none">• Being struck or hit by moving vehicles or plant• Accidental or wrongful operation of vehicles & plant• Vehicles or plant toppling over• Being hit by a vehicle or plant• Objects falling from vehicles• People falling from vehicles• Being crushed between a vehicle and a structure• Striking or hitting cables• Striking or hitting buried services

G3

Reversing

Nearly a quarter of all deaths involving vehicles at work occur during reversing.

It remains the most common cause of fatalities and major injuries when it comes to mobile plant and vehicles.

Most of these accidents can be avoided by taking simple precautions.

Ideally, it is best to remove the need for reversing altogether, in locations where reversing cannot be avoided:

- 'Reversing areas' should be planned out and clearly marked.
- People who do not need to be in reversing areas should be kept well clear.
- If drivers lose sight of the signallers, they should know to stop immediately.
- Consider whether portable radios or similar communication systems would be helpful.
- Vehicle mirrors need to be kept clean and in good repair.
- Reversing alarms can be fitted.
- White lines on the floor can help the driver position the vehicle accurately.

G4

Control Measures

It is important to have certain safeguards in place where plant and machinery is being used in order to preserve life and prevent injury.

Examples of **control measures**:

- Provide suitable training and instructions
- Separate pathways, exits and entries between people and moving plant
- Schedule workers and moving plant to operate at different times
- Use guards, barriers and rails between people and the machinery
- Provide safety and warning signs e.g. exit signs
- Ensure workers are wearing high visibility clothing
- Install adequate lighting
- Manage traffic and restrict pedestrian access

G5

Control Measures

Method statements or 'safe systems of work' are very useful in providing guidance on how to best to carry out a task when working with or around mobile plants or equipment.

They include information on the existing hazards in the workplace and outline the necessary steps, actions or measures that must be taken to prevent or reduce the risks of harm.

A mobile plant and equipment, **method statement** should include details such as:

- The identified hazards
- Control measures
- An outline of the tasks involved
- Scheduled times and locations for the work
- Map and plan of construction site
- Traffic management system

G6

Employer and Employee Responsibilities

The law places certain responsibilities on employers and employees in relation to mobile plant and vehicles.

Employers should	Employees should
<ul style="list-style-type: none">• Ensure there are separate routes for vehicles and pedestrians• Provide lighting, signage, barriers and warning systems (e.g. horns)• Provide safe methods of operating mobile plant and vehicles• take account of the working conditions• make sure that work equipment (which includes vehicles) is suitable for its purpose• Brief workers on the site traffic rules at inductions	<ul style="list-style-type: none">• Always wear PPE provided (e.g. high visibility clothing)• Follow site traffic rules• Follow safe methods of operating mobile plant and vehicles• Look after work equipment (which includes mobile plant and vehicles)• Only use designated walking routes• Do not operate plant or vehicles if they are untrained• Report any concerns relating to mobile plant or vehicles to their manager

G7

Communication Between Operators and Others

Communication is key!

Before approaching a moving plant or equipment, it is important to firstly alert the driver of their presence and ensure the vehicle is at rest.

Workers may need to assist the driver in moving around blind spots or areas where there they have limited vision.

This shows how communication is key between the driver and other workers in ensuring a safe work environment.

Workers need to be extra cautious of their surroundings to keep themselves safe. They should not rely on the driver seeing them!

G8

Employer and Employee Responsibilities

What is a banksman? Banksmen are operatives trained to direct vehicle movement on or around site, they are often called traffic marshals.

What is a signaller? Signallers are operatives who are trained to direct crane drivers during lifting operations.

Banksmen should only be used in circumstances where other control measures are not possible.




G9




Banksmen Safety



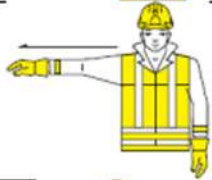
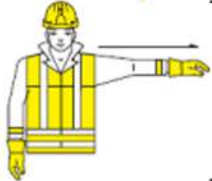
Banksmen safety is crucial during a manoeuvre where banksmen are required. They pose a great danger from the moving vehicle/s.




To ensure a **banksman's** safety:

- confirm that they are trained and competent to direct lifting operations
- provide a protected position from which they can work in safety
- provide distinctive high visibility clothing for identification
- tell drivers that if they cannot see the signaller they should stop immediately
- agree on the use of standard signals

GENERAL SIGNALS		
Command	Description	Signal
'START' or 'Attention' or 'Start of command'	Both arms are extended horizontally with the palms facing forwards.	
'STOP' or 'Interruption' or 'End of movement'	Both arms are extended horizontally with the palms facing forwards.	
'END of the operation'	Both hands are clasped at chest height.	

VERTICAL MOVEMENTS		
Command	Description	Signal
'RAISE'	The right arm points upwards with the palm facing forward and slowly makes a circle.	
'LOWER'	The right arm points downwards with the palm facing inwards and slowly makes a circle.	
'VERTICAL DISTANCE'	The hands indicate the relevant distance.	

HORIZONTAL MOVEMENTS		
Command	Description	Signal
'MOVE FORWARDS'	Both arms are bent with the palms facing upwards and the forearms make slow movements towards the body.	
'MOVE BACKWARDS'	Both arms are bent with the palms facing downwards and the forearms make slow movements away from the body.	
'RIGHT to the signalman'	The right arm is extended more or less horizontally with the palm facing downwards and slowly makes small movements to the right.	
'LEFT to the signalman'	The left arm is extended more or less horizontally with the palm facing downwards and slowly makes small movements to the left.	

DANGER		
Command	Description	Signal
'DANGER' or 'Emergency stop'	Both arms point upwards with the palms facing forwards.	
'QUICK'	All movements faster.	
'SLOWER'	All movements slower.	

Banksman's signals

Below you find some warning signs and symbols used when operating, working with, around or in close proximity to plant, machinery or equipment:



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