



Health and Safety on Steel Construction Sites: Guide for Employees

The British Constructional Steelwork Association Limited

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The British Constructional Steelwork Association Ltd.

4, Whitehall Court, Westminster, London SW1A 2ES

Telephone: +44 (0) 20 7839 8566

Fax: +44 (0) 20 7976 1634

E-mail: postroom@steelconstruction.org

Website: www.steelconstruction.org

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HEALTH AND SAFETY ON SITE

As an employee you have a legal duty to work in accordance with UK Law to comply with your employer's Company Health and Safety Policy, rules and procedures. You also have a responsibility to report dangerous situations or any shortcomings in health and safety arrangements.

The guidance given in this booklet will help you to meet these legal obligations, setting out the guidelines which you should follow when working on site. Please read it carefully and consult your immediate supervisor if you require further information or advice on any of the matters listed.

This information is supported by your employer's health and safety policy and accompanying policy statement. The latter document details the company's key health and safety objectives and should be displayed in the site office or cabin notice board for you to read.

In undertaking operational tasks you are reminded to always adopt the following precautions:

- Do not commence work until it is clear what needs to be done.
- Do not undertake work outside the limits of your competence.
- Do not undertake tasks without the necessary tools and equipment.
- Be clear about the arrangements for supervision in terms of the chain of command.
- Do not deviate from what has been planned without checking with those in the chain of command.
- Ensure that the area around the worksite is kept clear of hazards.
- Watch out for hazardous activities being undertaken by other operatives, including others in your own gang.
- Ensure that others not involved in the task do not encroach into an exclusion zone around the worksite.

Peter Walker CFIOSH
BCSA
Health and Safety Manager

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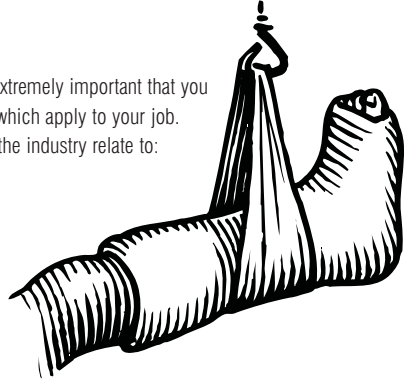
1. INTRODUCTION

This booklet has been written to help you understand the various health and safety rules and procedures which apply to construction sites. Please take a little time to read through each page and try to follow the advice given whenever possible. If you are not sure about a particular topic or need further information on specific site rules and regulations then check with your immediate supervisor.

2. ACCIDENTS AT WORK

Construction sites can be dangerous places and therefore it is extremely important that you work in accordance with the site rules and specific procedures which apply to your job. The most frequent causes of accidental death and injury within the industry relate to:

- Falls particularly from a height.
- Slips, trips and falls on the same level.
- Falling material and collapses.
- Contact with machinery.
- Moving objects including mobile plant and site transport.
- Handling loads.



There are others, but you should pay particular attention to those parts of the booklet which deal with these topics

You must report any work related injury or ill health problem as soon as you are able to do so to your supervisor and enter details in the Accident Book BI 510, which is available for this purpose. Remember all injuries should be recorded in the book.

It is equally important to co-operate in any subsequent investigation to establish the cause so that appropriate action can be taken to prevent a recurrence.

Your help is essential if underlying accident causes are to be successfully eliminated.

3. HEALTH AND SAFETY LAW

The Health and Safety at Work etc. Act 1974 is the principal law for ensuring that appropriate health and safety standards are met. This legal framework is supplemented by more specific requirements relating to construction sites. However, the law places a legal responsibility on you to:

- Take reasonable care of your own health and safety, as well as others who may be affected by what you do and, perhaps more importantly, what you forget to do.
- Avoid misusing anything provided in the interest of health, safety and welfare and to co-operate with your employer in carrying out safety requirements.

Failure to comply with these statutory responsibilities constitutes a criminal offence and may result in action being taken against you by the enforcing authorities. Equally your company may take appropriate disciplinary action in circumstances where these obligations have not been met.



4. COMPANY POLICY

The General Statement of Health and Safety Policy should be displayed in the site office or cabin for your benefit. Further information on the policy should also be available for reference and will explain the arrangements which have been introduced as well as the responsibilities assigned to key job holders to ensure these arrangements are put into practice.

5. INFORMATION AND TRAINING

You will receive appropriate training or re-training to ensure you have the necessary skills to carry out your work safely and without risk to health. New employees will also be given appropriate induction training, in order to familiarise them with the rules and procedures which apply to the site. Depending on their job, more specific training may be provided where appropriate.

6. ABRASIVE WHEELS

Abrasive wheels are used primarily for grinding and cutting. Eye injuries and contact with moving machinery and flying particles are the main dangers so always wear appropriate eye protection such as goggles, a dust respirator (mask) and check that protective screens and guards are in place and properly adjusted before using the equipment.



- Also check the general condition of the grinding machine for damage or defects. Make sure the start/stop controls work properly before grinding and that lighting is satisfactory.
- Adjust the guard to expose the minimum amount of wheel surface necessary for the operation and avoid grinding with the side of the wheel.
- Don't exert heavy pressure on the wheel and keep fingers clear of the cutting edge.
- Remember, only trained and appointed personnel are permitted to change abrasive wheels and therefore, unless you have been appointed in writing to carry out this task, you must not attempt to replace or change a worn or damaged wheel.
- Check that sparks from the process will not ignite material or injure other personnel in the vicinity.

7. ACCESS AND EGRESS

- Keep material and equipment clear of roadways, thoroughfares and walkways, particularly hoses and cables which can cause trips and falls.
- If it is necessary to leave material in accessways for short periods, make sure there is alternative safe access and mark the obstruction to highlight the danger.
- Always keep to the recognised walkway or pedestrian route.
- Avoid straying into work areas or traffic routes unless necessary.
- Never block fire exits - they may be the only way of escape in an emergency.

8. ASBESTOS

The term asbestos relates to certain types of material such as chrysotile, amosite and crocidolite. If you work with this type of material any dust given off can be harmful to health. Your employer must have a register that shows the areas that potentially could contain asbestos.

- Old lagging around boilers and steam pipes and cement/asbestos sheets used to clad buildings are fairly obvious areas to watch out for, but there may be other situations where asbestos is present.
- If you are concerned that any material/dust where you are working may contain asbestos, stop work immediately and report to your supervisor.
- Asbestos removal must be carried out only by trained and competent personnel who are licensed to undertake this type of work.

9. COMPRESSED AIR

Compressed air must only be used for its intended purpose.

- Never direct compressed air at your skin or clothes. This type of practice can result in particles being forced beneath the skin causing infection, pierced eardrums, etc.
- When using portable pneumatic equipment, always keep a firm grip on the tool to avoid any possible whipping action.
- Make sure the supply is properly isolated before changing nozzles or tools.
- Never kink the hose to stop the supply, always close the valve.
- Do not leave hoses lying around, they may create a tripping hazard.
- Report leaking hoses so they can be repaired or replaced.

10. CONDUCT

Irresponsible behaviour can lead to serious accidents. The way you behave will have an impact on how people respond to you. Bad behaviour can result in disciplinary action being taken against you, especially if it is a serious breach of health and safety.

- Always walk, don't run – running creates unnecessary risks.
- Look where you are going, particularly at blind spots and watch out for moving vehicles and equipment such as cranes, excavators, etc. Look both ways when crossing traffic routes, and keep to the proper accessway or pavement whenever possible.
- Don't interfere with faulty electrical equipment; arrange for a qualified person to undertake repairs.
- Don't leave material or equipment in accessways – if you do, people may trip over them.
- Never indulge in horseplay or practical jokes.
- When working near moving machinery, secure or remove loose items of clothing which may be caught in the equipment.

11. CONFINED SPACES

Any place where there may be an oxygen deficiency, or in which dangerous fumes are liable to be present to such an extent as to overcome personnel, must be regarded as a confined space.

You should only enter a confined space under a permit to work procedure and, if you are required to enter always follow the correct procedure which will require specific training and a responsible person to certify that the space has been:

- Effectively isolated to prevent the ingress of dangerous fumes.
- Cleared of deposits liable to give off dangerous fumes.
- Vented/tested and has an adequate supply of fresh air.

This will form part of the safe system of work and permit arrangements. Therefore, it is essential that you understand and follow the rules before entering confined spaces.

12. CONTRACTORS/VISITORS/MEMBERS OF THE PUBLIC

- Contractors, visitors and members of the public can be affected by what you do or forget to do.
- When carrying out your job always check that the risks during such operations as slinging, grinding etc. cannot injure others.
- Remember all contractors must conform to the same rules and regulations as you - if you see them acting unsafely, report it to your supervisor so that the matter can be addressed.
- Don't enter areas where barriers or warning signs restricting access have been erected unless you are authorised.

13. CONSULTATION

When reporting unsafe or unhealthy conditions you must follow the proper procedure - report the matter to your supervisor initially. However, if the matter is not resolved within a reasonable period, discuss the issue with your Safety Representative or manager.

Good communications e.g. tool box talks, on health and safety issues will help to maintain a safe working environment and in turn reduce the risk of accidents and injuries.

14. COSHH

The Control of Substances Hazardous to Health (COSHH) Regulations are intended to protect workers from the effects, whether immediate or delayed, of exposure to hazardous substances, including:

- solvents
- glues
- weedkiller
- fillers
- silica dust
- micro-organisms
- ground contamination
- cement
- plaster
- bitumen
- brick dust
- animal droppings
- concrete additives
- PCBs e.g. from transformers

The results of a COSHH assessment may result in a particular procedure or the requirement to wear specific PPE or additional equipment to protect you from the hazards.

The Employer's Responsibilities

Under the COSHH Regulations, the following health and safety precautions must be implemented. Employers must:

- Know the substances their employees (e.g. you) may be exposed to.
- Assess the hazard to health that these substances can cause. The assessment must cover the level of risk and the degree of exposure.
- Eliminate or control the identified hazards by:
 - using a non-hazardous alternative
 - eliminating the effects of exposure of individuals by the use of the appropriate PPE
 - restricting the number of people exposed to the substance
- Inform, instruct and train their employees on:
 - the nature of the risk and the controls that must be adopted
 - the reasons for using PPE
 - the monitoring that must be carried out
- Monitor the effectiveness of controls and initiate health monitoring where necessary.
- Keep records of these activities.

The Employee's Duties

The employee's duties under COSHH include:

- Taking part in training programmes.
- Reading container labels and information sheets.
- Following safe working practices and COSHH risk assessments.
- Using the correct PPE.
- Paying attention to personal hygiene.
- Storing chemicals and equipment safely.
- Reporting any hazard or defect to your manager.
- Taking part in health surveillance.
- Knowing the general emergency procedures, and the specific procedures applicable to any particular hazardous substance that the employee is required to use or handle.

You should be aware of the risks to third parties posed by your work within the site, e.g. airborne paint spray or dust, or by accidental discharge, e.g. pollution of rivers and drains.

Hazardous Substances

Several hazardous substances may be present on site. Where any of these substances are held in storage, whether in tankers, storerooms, drums or containers, they must be identified by the appropriate 'hazard diamond', examples of which are shown here.



15. ELECTRICAL EQUIPMENT

- Check that the equipment has a Portable Appliance Test (PAT) which should show a re-test date for reference.
- Never tamper with electrical equipment or attempt to make repairs. Remember - even low voltage equipment can be dangerous.
- Report electrical faults to your supervisor or manager so that repairs can be carried out by a competent person.
- Always make sure covers and doors protecting electrical apparatus remain securely in place.
- Keep trailing electrical cables to a minimum to minimise tripping hazards. If cables have to cross passageways or traffic routes, cover them with a cable ramp to avoid tripping passers-by or damage to the cables.
- Don't overload circuits - check that the supply can safely deliver the electrical load required.
- Watch out for overhead cables and lines especially when carrying or moving metal objects - remember electricity can arc.
- Don't attempt to excavate or penetrate the ground without first checking with your supervisor that there are no buried electrical cables or other services.
- Always check equipment and cables for any exposed wiring, loose connections, etc. before use and report any damage.



16. EMERGENCY PROCEDURES

Emergency situations may arise from time to time:

- Familiarise yourself with the procedure for dealing with incidents such as fire, chemical spills, etc.
- Always respond to alarms and other emergency signals.
- Keep escape routes clear.
- If you are required to evacuate the site follow the correct procedure and assemble at a designated area. Remain at the assembly point until the "all clear" is given.
- Never tamper with emergency rescue equipment as your life may depend on it one day.



17. ENVIRONMENT

Accidental spills and discharges can have an adverse impact on the environment.

- Make sure chemicals and other harmful substances are not stored next to drains, rivers, canals, etc.
- Always place chemicals and other harmful substances in their appropriate storage areas.
- Don't discharge chemicals or other harmful substances down drains, sinks, toilets etc. - always follow the correct disposal procedure.
- Do not tamper with or open discharge valves on tanks or vessels containing harmful substances unless you are authorised to undertake this work.
- Always re-fuel equipment in designated areas in order to minimise the risks from fire.
- Report any leaks from plant or equipment so that it can be repaired.
- Dispose of all waste materials in the correct manner, the waste segregation system will be made known to you during the induction training.

18. LOADING AND UNLOADING

Falls from vehicles usually result in serious or fatal injuries and safe systems of work must be adopted to eliminate or reduce the risk of falling during loading and unloading operations.

The location of the loading and unloading operation will have an influence on the way in which the vehicle is to be accessed, some examples of safe systems are:

- Steps to access the vehicle.
- Pre constructed access gantries or barriers beside the vehicle.
- Nets or guardrails fitted to the side of the vehicle.
- Harness and lanyard to be worn with overhead attachment point.
- Airbags positioned around the vehicle to create a soft landing should a fall take place.

Your employer will inform you of the result of the risk assessment that has taken place to identify the most appropriate method of reducing the risks normally associated with loading and unloading.

19. WORK AT HEIGHT

Working at height includes any height that a person could fall a distance liable to cause personal injury; including below ground level. If the work can be carried out at ground level then it should be done so, otherwise the distance and consequence of a fall must be reduced so far as reasonably practicable.

The law requires that fixed handrails are to be used as the first option, followed by the use of harnesses and lanyards as the next alternative. Ladders and steps can be used for short duration work where other means of protection are not practicable.

Scaffolds

Properly erected scaffolds provide a safe means of access and place of work when carrying out jobs at a height - make sure you eliminate falls by following these simple rules:

- Do not erect or alter scaffolds unless you have been properly trained and are competent to do so.
- Do not remove or interfere with ties, guardrails, bracing, boards and ladders.
- Always use the ladder or access provided.
- Do not erect any makeshift platforms.
- Never exceed the load bearing capability of the scaffold - if in doubt check with your supervisor.
- Never leave loose items on the scaffold. If you stack materials on a scaffold, always leave a two-board wide (minimum) passageway.
- Always stack materials safely to prevent them falling - use guards or netting if necessary.
- Always report defects to your supervisor.

Working Platforms

Working platforms that have been incorrectly erected or maintained can be liable to sudden collapse. Before using a platform, check that:

- The platform is fully boarded to eliminate gaps and that boards are not damaged or split.
- It is wide enough to accommodate materials safely if necessary, and will still allow the free movement of personnel - 600mm, e.g. 3 boards wide.
- All boards are adequately supported to prevent sagging, and that they overlap the support by at least 50 mm but not more than 4 times the board thickness.
- Check that guardrails and toeboards have been fitted. Toeboards should be at least 150 mm high and guardrails at least 950 mm above the platform, with an intermediate rail to ensure there is no unprotected gap more than 470 mm in height.

Mobile Elevating Work Platforms (MEWPs)

MEWPs are used for a variety of tasks during steelwork erection and provide collective protection to the operator. However, there is still a requirement to wear the appropriate personal fall protection equipment as the following risks exist during the use of MEWPs:

Falls from the Basket e.g.:

- Equipment struck by another vehicle or moving plant.
- Failure of the levelling system or major component of the MEWP.
- Using the handrail as a work platform.

Overturning or movement e.g.:

- Incorrect use on a gradient.
- Voids, services or manhole covers.
- Excessive wind loading.
- Excessive platform loading.
- Outriggers not in use, soft or uneven ground.
- Collision with fixed installations.
- Entrapment of operator

Other people being struck by MEWP or falling objects e.g.:

- Struck by tools or equipment falling from the platform.
- Becoming trapped or being struck by the machine or its moving parts.
- Driver colliding with overhead obstruction.

Tower Scaffolds

- Check the scaffold is on firm level ground.
- Make sure wheels are locked before use.
- Don't climb the scaffold frame - use the ladder or stair provided.
- Don't attempt to move mobile scaffolds with people on them.
- Check working platforms are fully boarded.
- Check platforms have suitable guardrails and toeboards around all four sides. (See working platforms).
- If using outriggers make sure they are fully extended and properly support the tower at all four corners.
- Check that "free standing" mobile towers do not exceed the height to smallest base dimension of 3.5 :1 for inside work or 3 :1 for outside work.

Ladders

- Check the ladder is in good condition before use. Look out for warping, cracked or split stiles, and missing, broken or loose rungs.
- Make sure it is on a firm level base at an angle of 75° to the horizontal. To achieve this angle, for every 1 m in height, the bottom of the ladder should be 0.25 m out. For example if the ladder is placed 4m up it should be 1m out.
- Check that the ladder is resting on a firm surface.
- Get someone to foot the bottom until you secure the top.
- Ensure the ladder height above any landing gives sufficient handhold for the user.
- Check your footwear is in good condition and that the soles are clean before climbing ladders.
- Use both hands as you climb - don't try to carry things in your hand. If you have to carry tools put them in a

shoulder bag or tool belt. Always maintain three points of contact.

- Ladders should only be used for short duration work. Never attempt to do things from a ladder which require two hands.
- Don't overstretch - move the ladder to a new position.
- Don't allow more than one person on the ladder at a time.
- Don't use aluminium or part metal ladders near live electrical equipment.

Step Ladders

- Check that the cords secured to each section are of adequate length and in good condition and that there are no damaged or broken hinges.
- Open steps and trestles to their fullest extent.
- Position steps on a level surface facing the work, whenever possible, and avoid pulling or pushing sideways.
- Avoid standing on the top section, unless they are specifically designed 'podium' steps.



Roofs

Roofs can be dangerous places unless proper safeguards are taken.

- Never go onto a roof without authorisation.
- Access onto roofs requires a safe system of work to prevent people falling.
- Some roofs are fragile and will not support your body weight.
- Fragile roofs and pitched roofs with a slope greater than 10° require crawling boards as part of the safe system of work.
- Make sure you understand and follow all the safety precautions required by the work before attempting to access roofs.

Roofwork is specialist work and further guidance is available from the Health and Safety Executive publication HS(G)33 Safety during roofwork.

Personal Fall Protection Equipment

In situations where it is not reasonably practicable to provide access equipment or working platforms to prevent personnel falling, fall protection equipment must be worn and used. Such situations can arise during construction, maintenance, installation, repair etc. You should:

- Find out where to obtain personal fall protection equipment.
- Must be trained in its use.
- Ensure that you know how to wear and adjust it properly.
- Always check for wear or damage before use.
- Make sure you put it on before leaving the ground.
- Always attach the lanyard to a suitable anchor point - if you are not sure, check with your supervisor.
- Return the equipment to its correct storage area, when finished.

20. FIRE PREVENTION





Fire can cause serious injury and extensive property damage:

- Read the fire instructions displayed on site and follow the correct procedure in the event of a fire.
- Get to know the location and types of extinguishers available on site.
- Always ensure that fire fighting equipment is kept clear of material and other obstructions. Don't tamper with fire equipment - leave it in its designated location unless you need it to extinguish a fire.
- Clear or cover flammable or combustible material when carrying out any hot work (e.g. sparks from grinding, burning etc.) and follow any permit conditions which may apply.
- Make sure you are familiar with escape routes so that you know which route to follow in an emergency.
- Always ensure that you have a clear escape route when tackling fires to avoid being trapped.
- Keep combustible materials particularly clothing well away from heaters.
- Regularly remove combustible and flammable material to a safe area to minimise potential fire risks.

Types of Fire Extinguishers

All new portable fire extinguishers are painted red. They may have a separately coloured panel that indicates the extinguisher medium and hence the type of fire they are capable of extinguishing. The one exception is the "all red" extinguisher which uses water as its extinguishing medium.

Main types of portable extinguishers, their uses and colour coding

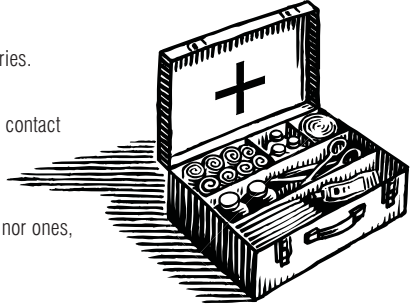
| WATER | POWDER | FOAM | CARBON DIOXIDE (CO ₂) |
|---|---|---|---|
| <p>For wood, paper, textile and solid material fires</p>  | <p>For liquid and electrical fires</p>  | <p>For use on liquid fires</p>  | <p>For liquid and electrical fires</p>  |
| <p>DO NOT USE on liquid, electrical or metal fires</p> | <p>DO NOT USE on metal fires</p> | <p>DO NOT USE on electrical or metal fires</p> | <p>DO NOT USE on metal fires</p> |

The contents of an extinguisher are indicated by a zone of colour on the red body. Halon extinguishers are not shown since no new Halon production is permitted in the UK

21. FIRST AID

First aid equipment is provided for treating various types of injuries. Consult the notice board about first aid arrangements on site.

- Get to know where the first aid equipment is kept and who to contact in an emergency.
- Do not interfere with or misuse first aid equipment.
- Report all injuries (see section 2 accidents at work), even minor ones, so that proper treatment can be given.



22. FLAMMABLE LIQUIDS

Highly flammable liquids are liquids with a flash point below 32°C, such as petroleum spirits, thinners, etc. They should always be marked with a warning label.

- If you use highly flammable liquid, keep it in its proper storage area and only withdraw enough liquid to carry out your immediate task.
- If you transfer liquid from one container to another, do so only in a well ventilated area.
- Always use funnels or proprietary filling devices and containers to avoid spills.
- Replace lids and caps as soon as possible since the liquid will evaporate at ambient temperature and may ignite if there is a heat source nearby.
- If spillages occur, soak up with a spill kit and leave in a safe place in the open air.
- Keep flammable liquids clear of sources of ignition e.g. electrical motors, switches etc.
- Keep all flammable liquids in a safe place to avoid accidental spills etc.

23. FORKLIFT TRUCKS & TELESCOPIC HANDLERS

You must not operate forklift trucks or telescopic handlers unless you have been trained and authorised to do so. Before you operate the truck, check that it is in a safe condition.

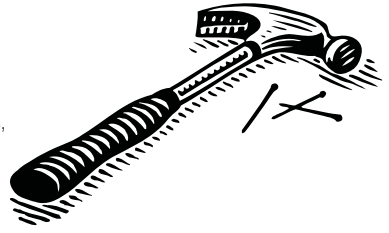
- Do not travel with unsecure loads and never overload the truck.
- Make sure the forks are fully engaged.
- Always keep a clear view whilst travelling.
- Travel with the load near the ground and, where appropriate, tilt back the forks.
- Don't turn the truck on ramps or slopes.
- Do not exceed the site speed limit and watch out for holes and slippery surfaces.
- Slow down and sound your horn at blind spots to warn personnel of your approach.
- Always stop and start the vehicle smoothly.
- When parking – lower the forks fully, apply the parking brake and remove the key.



24. HAND TOOLS

Always use the correct hand tool for the job and inspect it before use.

- Don't use hammers with loose heads, chisels with mushroom heads, worn spanners and screwdrivers.
- Protect sharp edged tools when not in use.
- When using knives for cutting, keep your hands behind the cutting edge wherever possible. Avoid cutting towards the body and wear cut resistant gloves or gauntlets if necessary.
- Do not use screwdrivers whilst holding work in your hand. It is much safer to put the work piece down just in case the screwdriver slips.
- Make sure files are fitted with the correct size of handle.
- Keep tools in boxes or racks when not in use and scrap tools which are worn or damaged beyond repair.



25. HEALTH HAZARDS

There may be substances or work practices on site which could be harmful to health if used improperly such as solvents, epoxy-based products, etc.

Substances:

- Always read and follow the instructions on the container, hazard datasheet and assessment form for the substance you are using.
- If you are required to wear protective equipment, make sure you put it on before handling the container.
- Never sniff a container to find out what is inside.
- Ensure there is adequate ventilation or wear suitable respiratory protection when using a substance that gives off harmful vapour/dust.
- Never put harmful substances in unmarked containers in case they are mistaken for something else.
- Never mix substances together that react with one another.
- Make sure lids, caps or bungs are replaced, as soon as possible, and place the container in its correct storage area.
- Do not eat, drink or smoke when using harmful substances and always wash your hands and face at the end of the work to avoid contamination.
- Never discharge harmful substances down drains, sinks etc.
- In the case of spills, follow the emergency procedure detailed in the data/assessment sheet.

Hand Arm Vibration:

- Ensure you are aware of any limitations of use there may be for the equipment you are using.
- Keep your hands warm (wear appropriate gloves).
- Check equipment and has it been registered and inspected?
- Do not continually use equipment for extended periods. Intersperse powered hand tool work with other activities or share the work with others.
- Do report damage to any equipment and get it repaired.
- Do report any early symptoms to your supervisor (or the company occupational health practitioner).

Hearing Loss:

- As a rule of thumb, if you cannot hold a conversation without raising your voice you need to wear hearing protection.
- You must be provided with ear defenders (muffs) or plugs. You should be instructed in the use and storage of this equipment (instructions will come with the equipment).
- A record should be kept of its issue to you.

26. HOUSEKEEPING

Poor housekeeping is the cause of many accidents and it is the sign of poor workmanship. If you leave your work area without tidying up first then you are putting yourself and your work mates at risk of an injury:

- Keep your work area tidy by removing unwanted waste regularly.
- Always stack material safely in the storage areas provided.
- Coil up hoses and cables when not in use.
- Clean up spills to prevent slips.
- Store tools safely when not in use.
- Never overload storage racks - always check the safe working load of the rack to ensure the item is within this load.
- Keep gangways, passageways, fire exits and access to fire fighting equipment clear at all times.

27. ISOLATION

You may need to isolate equipment if you are carrying out maintenance work or to change parts of a machine; e.g. a grinding wheel or milling tool. Isolation means breaking the energy supply (electricity, gas, compressed air, etc.) in a secure manner so that it cannot be accidentally re-connected. Always isolate properly before attempting to work on dangerous equipment.

If you need to isolate, follow these simple rules:

- Get to know the correct isolation points.
- Disconnect from source or open the switch/close valve fully.
- Apply your own personal padlock.
- Remove the padlock only when you are clear of the equipment.
- Keep the key with you at all times.

If you need to isolate more than one valve or switch:

- Apply a personal padlock to each switch/valve.
- Always keep the keys with you.
- Use a multi-locking device if more than one person requires to apply a padlock to the switch/valve.

If special isolation procedures apply (permits) - ensure you clearly understand how the system operates, if in doubt ask your supervisor or manager.



28. MANUAL HANDLING

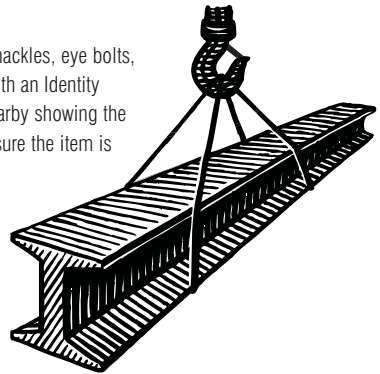
Bad lifting techniques can lead to serious back strain and other injuries. If you have to lift or carry something, follow these simple rules:

- Use mechanised systems, whenever possible, to reduce the need for manual handling.
- Make sure there are no obstructions or tripping hazards on your planned travel route.
- Think about where and how you'll put the load down.
- If necessary ask for assistance to make the task easier.
- If the load is within your capability keep your feet slightly apart with one in front of the other and with your back straight, bend your knees, get a firm grip, hold the item close to your body and use your legs to straighten up.
- Try to avoid twisting, turning or stretching whilst holding material. If you need to change direction turn your whole body.
- Make sure you can see where you are going and be careful not to crush your fingers when lowering the load.

29. LIFTING ACCESSORIES

Various items are provided for lifting e.g. wire rope slings, chains, shackles, eye bolts, etc. These are known as lifting accessories and should be marked with an Identity Number and Safe Working Load (SWL) or there should be a table nearby showing the SWL for various lifting configurations. Establish the SWL and make sure the item is in good condition before use.

- Remember the SWL may vary depending on the configuration of the sling during use.
- Never exceed the SWL of either the lifting accessories or lifting equipment.
- Always inspect items of lifting accessories before use, especially soft slings such as nylon, to ensure they are in good condition and identified with the designated colour code (if this system is in use).
- Never leave slings hanging from crane hooks since they may catch on obstructions whilst the crane is travelling.
- Avoid crawling or standing under suspended loads and warn others to keep clear of moving loads.
- When lowering, provide proper support beneath the load, where appropriate, to avoid crushing the sling/chain.
- Once the load has been lowered, check it is secure and stable before releasing the lifting equipment.
- Take good care of all lifting accessories and return them to their proper storage area when not in use.



30. LIQUIFIED PETROLEUM GAS AND OXYGEN

Liquified Petroleum Gas (LPG)

Liquified Petroleum Gas (LPG) is the common name used to describe compressed gases such as Propane, Butane, etc. Acetylene is another compressed fuel gas that has similar industrial uses to those of LPG. LPG is normally stored in fixed tanks or portable cylinders. LPG is heavier than air and will ignite easily when released and therefore the precautions listed below must be followed when handling or using this gas.

- Always store cylinders in secure designated open air compounds preferably at ground level and check valves are properly closed.
- Keep full and empty cylinders separate and store oxygen well away from LPG.
- Never use cylinders as bearers, rollers or supports.
- Secure LPG cylinders upright at all times well away from low level areas such as trenches, manholes etc.
- Use a cylinder trolley to transport LPG, whenever possible.
- If you need to use a forklift truck to transport a cylinder then make sure they are properly positioned and secure.
- Keep cylinders away from sources of heat such as tar boilers, welding, sparks from abrasive wheels, blow lamps, smoking areas etc.
- Do not place cylinders in confined spaces - keep them outside.
- Before use always check cylinders, particularly valves and gauges, for damage or leaks. Report any faults immediately - do not use damaged equipment.
- Close valves tightly when not in use and coil up hoses to avoid creating tripping hazards.

Oxygen

Oxygen is a colourless and normally odourless and non-flammable gas, but can be very dangerous if misused. Normal atmosphere contains 21% of oxygen. In higher concentrations, substances ignite much more easily and burn at a much faster rate.

- Never use oxygen to 'sweeten' the air.
- Never use oxygen instead of compressed air.
- Never use oxygen to blow dust off clothing.
- Never use oil or grease on oxygen equipment.

Use only leak detection fluid to check for gas leaks, do not use soap and water.

31. MACHINERY

Moving parts of machines can inflict serious injuries unless proper safeguards are taken to eliminate or minimise the risk.

- Make sure guards are in place, properly secured and correctly adjusted, before operating machines.
- Check that safety devices (such as interlocks, trip wires, emergency stops) work properly - if not, report defects immediately.
- Never bypass or work without these devices in place.
- Do not wear loose clothing or other items such as bracelets near moving machinery in case they catch on moving parts.
- Keep away from moving parts - if necessary use push sticks etc.
- Certain work on machinery, such as making adjustments or alterations, can be inherently dangerous and therefore requires a safe system of work to eliminate or minimise the danger. Always follow the safe systems when carrying out such activities. If you are unsure about the correct procedure, check with your supervisor.
- Machines must be effectively isolated before undertaking work such as cleaning or repairs. Never rely on a stop button or socket switch even if the job will only take a few minutes. Always securely isolate using a padlock or disconnect the plug (see section 27).

32. NOISE

Excessive noise can affect your hearing and over a period of time will result in noise-induced deafness. Some processes, such as grinding and hammering of steelwork, can be very noisy. Therefore, you should:

- Look out for noise warning and hearing protection signs. Wear suitable hearing protection before entering these areas or using noisy plant and equipment.
- When using hearing protection, make sure that you position the ear cup or insert the plug properly to make an effective seal.
- Never use damaged or dirty hearing protection.
- Take care of your hearing protection and replace it when necessary.
- Unless necessary, do not remove acoustic covers or panels from noisy equipment such as compressors, and always replace these covers or panels as soon as possible.
- To minimise the risk, always switch off noisy machines when not in use.

33. OVERHEAD AND UNDERGROUND SERVICES

Serious accidents have resulted from inadvertent contact with overhead or underground services.

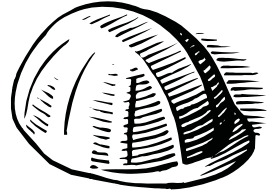
- Keep well clear of live overhead power lines since contact could result in fatal injuries. Pay particular attention to overhead risks when using cranes, fork lift trucks, telescopic handlers, aluminium ladders, etc.
- Always keep within fences and bunting erected to keep plant and personnel a safe distance from overhead lines.
- Ground penetration or excavation should not be carried out until appropriate checks have been made for underground services.
- Always dig trial holes carefully, using hand tools, if near buried services in order to confirm their position and direction. It is better to dig alongside rather than above services.
- Always assume a buried cable is "live" or underground pipe contains gas until positively identified.

Although older services may not conform, the national colour code system for buried services is:

| Colour | Service |
|---------------|--------------------------------|
| Black | Electricity |
| Red | Electricity - some 11KV cables |
| Blue | Water |
| Yellow | Gas |
| Grey/White | Telecommunications |
| Green | Cable television |

34. PERSONAL PROTECTIVE EQUIPMENT (PPE)

It is not possible or practicable to eliminate all risks and therefore you may need to wear PPE to avoid injury or ill health. PPE is normally provided to enable you to work safely as it creates a barrier between you and the hazard. Therefore, you must wear the protection provided. The type of PPE will largely depend on the risks involved, as shown in the following examples;



1. Head – Safety Helmet will only protect the head if worn correctly
2. Eyes – Glasses for dusty atmosphere, but goggles or face mask must be worn for what is high impact risk such as grinding.
3. Face – A full face screen will offer better protection for the eyes and face if longer periods of exposure are expected.
4. Hearing – Wearing the correct ear defenders will prevent permanent damage to your quality of hearing.
5. Respiratory – A respirator (dust mask) is designed to stop particles from entering your lungs, if it is not worn then there is nothing else to stop them!

Remember that all PPE is designed to protect you from a known hazard. If you alter the PPE or do not fit/wear it correctly then it will not work effectively.

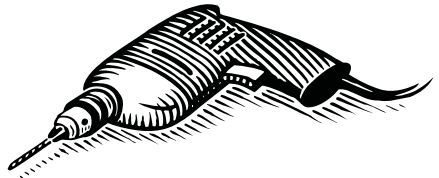
Make sure you know what to wear before commencing work - if in doubt, check with your supervisor.

- Look out for PPE signs in the area or labels on containers, drums, etc. which tell you what to wear.
- Check if there are published datasheets which stipulate what protective equipment should be worn.
- Always wear the PPE required for the job.
- Report defects to your supervisor.

35. PORTABLE ELECTRIC TOOLS

Portable tools can inflict serious injury if used improperly.

- Always check the supply and tool are both 110V, with the appropriate plug and socket.
- Check the casing and supply cable to make sure they are in good condition before use.
- Make sure the supply cable is long enough to avoid straining. If necessary, use a suitable extension.
- Only use portable tools for their intended purpose and avoid using worn, blunt or damaged bits, drills or other accessories.
- Always wear eye protection when using tools to carry out work which may eject particles.
- Hearing protection and a respirator may also be needed if noise and dust are created using the tool.
- Try to avoid standing on damp or wet surfaces when using electrical equipment, and keep equipment dry at all times.



36. SAFETY SIGNS

Signs may be displayed around the site to help you understand the action which needs to be taken in particular situations. These signs now conform to standard colours, shapes and symbols as shown below:

RED - means stop/prohibition. Remember red means danger.

GREEN - means safe condition. Such as emergency escape routes.

YELLOW - means caution. Remember yellow warns of a hazard

BLUE - means mandatory. Remember blue is something you must do such as Wear Eye Protection.



**Safety Glasses
Must be Worn**



**No
Entry**



**Hazard
Warning**



**Emergency
Escape Route**

37. SLIPS, TRIPS AND FALLS

Slips, trips and falls result in a high number of accidents each year, and falling from a height often results in a fatality. A great deal can be done to prevent slips, trips and falls, but this requires your commitment and action to reduce the risks.

To prevent falls on the same level:

- Pay attention to where you are going - many accidents are caused by people not looking out for obstructions.
- Walk, don't run - running only increases the risks.
- Clear up as you go - do not leave things lying around for others to slip, trip or fall over.
- Put waste in the skips and bins provided.
- Report poor site conditions such as holes, oil or excess water, so that action can be taken to rectify the problem.
- Wear suitable footwear and try to avoid contamination from oil, mud, water etc. which may cause you to slip.

To prevent falls from height:

- Always use the correct access equipment for work at heights (see section 19).
- Never climb a structure without a proper access.
- Do not approach a leading edge without a personal fall protection system being in place.
- Never leave an opening or edge without protection or a means of warning of the danger, the next person along could fall.
- Do not remove the fall prevention equipment – even for that ‘five minute job’ as history is full of cases where people have fallen in such circumstances.
- Report all broken or damaged fall prevention equipment to your supervisor to enable repairs to be carried out.

38. SAFE SYSTEMS OF WORK INCLUDING PERMITS

Some jobs and activities are inherently dangerous which means that certain risks remain. To avoid injury or ill health these risks need to be properly controlled by adopting a safe way to do the work. Such procedures are called safe systems of work; method statements often include these.

- Get to know what safe systems exist, e.g. isolation procedures, erecting steel, dismantling etc. - if you are not sure, check with your supervisor.
- Read through the procedure and make sure you understand it - if you don't, ask for help.
- Always follow the procedure - don't take short cuts or make it up as you go along.
- If the procedure seems out-of-date or mentions things which no longer exist, bring the matter to the attention of your supervisor.

If you ignore written safe systems it can lead to serious injury and may well result in disciplinary action or criminal prosecution - so remember to follow the correct procedure at all times.

39. UNSAFE ACTS AND CONDITIONS

Remember that it is easy to get into bad habits so try not to be influenced by others to take short cuts or put yourself at unnecessary risk. Before you carry out a task take a little bit of time to think what can go wrong and, if it did, how would it affect you or your work mate(s).

Keep yourself and the site safe;

- Don't take short cuts or act unsafely.
- If you see others at risk bring it to their attention.
- If you see unsafe conditions:
 - Eliminate them without putting yourself at risk
 - If this is not possible, warn others about the hazard and report the matter to your supervisor immediately.

40. WELDING AND CUTTING

Arc/gas welding and cutting can cause serious injury unless it is carried out properly. Read and follow the simple precautions detailed below.

Gas Welding and Cutting

The fuel gas may be LPG used in conjunction with oxygen. Read the section on LPG and oxygen (section 30) as well as these precautions;

- Make sure the area is clear of combustible and flammable material.
- Check condition of hoses and couplings for signs of damage, excessive wear, loose connections, etc.
- Make sure flashback arrestors or other suitable blowback protection has been fitted and blowpipe valves work properly.
- Check regulators have been correctly fitted and work properly.
- Do not apply excessive force when fitting regulators and gauges.
- Never oil or grease threads on regulators or gauges. Oil and grease will react violently with these gasses.



- Open cylinder valves slowly using the correct spindle key or valve.
- Always check the work piece for explosion or health risks. If you apply heat to a vessel or drum which contained flammable vapours it may explode unless properly cleaned, purged and vented.
- Galvanized coatings, chrome, special steels or cadmium plated alloys may give off harmful fumes when heated and will require extraction and/or respiratory protection.
- Use screens to protect other personnel from sparks.

Electric Arc Welding

Make sure the area is clear of combustible material.

- Check the general condition and earthing of the transformer and primary supply. In an emergency, you should be able to reach the main switch quickly.
- Check that secondary leads and connectors are in good condition and properly insulated.
- Jaws and connections on electrode holders should be clean, tight and properly insulated.
- Avoid standing on wet surfaces when changing electrodes.
- Don't coil welding cable around your body.
- Make sure the work piece is properly earthed.
- Wear appropriate protective equipment to shield you from sparks and radiation. Erect non combustible screens to protect passers-by.
- Use extraction equipment/respiratory protection, where appropriate.

41. WELFARE FACILITIES

You are legally entitled to suitable and sufficient welfare facilities such as changing rooms, washing facilities, toilets, etc. However, you have a responsibility to look after these facilities.

- Always use the facilities provided for eating, washing, changing, etc.
- Try to keep these areas clean and tidy. Simple things like wiping surfaces, hanging up clothes, rinsing basins, flushing toilets properly go some way to maintaining welfare standards.
- Report any damaged or broken equipment to your supervisor so that it can be repaired.
- Always wash your hands before eating and drinking after you have been to the toilet.

42. ACKNOWLEDGMENTS

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