

ELEMENT 1- WORKPLACE HAZARDS AND RISK CONTROL

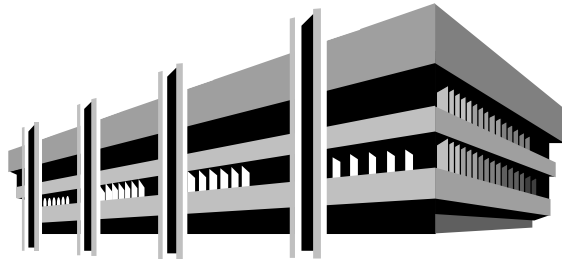
- 1.1 Outline common health, welfare and work environmental requirements in the workplace.
- 1.2 Explain the risk factors and appropriate controls for violence at work.
- 1.3 Explain the effects of substance misuse on health and safety at work and control measures to reduce such risks.
- 1.4 Explain the hazards and control measures for the safe movement of people in the workplace.
- 1.5 Explain the hazards and control measures for safe working at height.
- 1.6 Outline the hazards & control measures associated with works of a temporary nature

Important Note: To assist in separating the NGC1 and the GC2 handouts please note the GC2 handouts commence at page 200.

1.1 WORKPLACE ISSUES

WORKPLACE (HEALTH SAFETY AND WELFARE) REGULATIONS 1992 as amended

A number of amendments were made in 2002, these did not replace the whole set of regulations but rather amended or added to the current requirements. A new ACOP and guidance notes was issued in November 2013.



Regulation 1 **Citation & Commencement**

Regulation 2 **Interpretations** - Definitions used

Regulation 3 **Application of the regulations and exclusions.** They do not cover ships, construction sites covered by CDM, extraction of minerals in a quarry. Other temporary work sites, farming and forestry are covered in relation to welfare facilities only.

Regulation 4 **Requirements** - Every employer shall ensure that every workplace which is under their control and where any of their employees work, complies with the regulations. They support the requirement to provide a 'safe place of work' within the Health and Safety at Work Act 1974. In addition the **Building Structure** must be stable and solid, appropriate to its use.

Regulation 5 **Maintenance of workplace, equipment, devices and systems** - Maintained in a clean and efficient state of repair. Equipment failure which could put employees at serious risk must be checked at regular intervals.

Regulation 6 **Ventilation** - sufficient quantity of fresh or purified air. Free from any impurity which is likely to be offensive or cause ill-health. Mechanical ventilation must be regularly cleaned. Warning or alarm systems need to be in place where dilution ventilation failure could lead to exposure to agents hazardous to employee health.

Regulation 7 **Temperatures** - for indoor workplaces the temperature must be reasonable. There are recommendations within the guidance at 16°C for sedentary work e.g. office and 13°C for work requiring extreme physical effort. The effects of sunlight on temperature must be avoided where possible. The workplace must be adequately thermally insulated depending on the type of work carried out there.

Exercise

Hot work	Working in cold areas
Ill-health effects	Ill-Health effects
Dehydration	Cold burns
Controls	Controls
Shielding and screens	Thermal clothing

If the work area has to be cold then consideration must be given to enclosing the area, keeping the chilled area as small as possible, providing insulated walls and floors, suitable thermal PPE, exclude draughts and installing self closing doors. If the room is uncomfortably hot, measures such as insulating hot plant or machinery, providing air cooling, shading windows, sitting work stations away from radiant heat sources should be implemented. Any heating or cooling systems must be maintained so that combustible products do not enter the workplace.

Regulation 8 **Lighting** - "Suitable & Sufficient", Lighting must be suitable for the work being undertaken. Guidance is available on the lighting levels for different working areas. Lighting levels are normally measured in lux. Emergency lighting should be from an independent source.

Regulation 9 **Cleanliness & Waste materials** – The workplace, furniture and fittings must be kept clean with regular disposal of waste.

Regulation 10 **Room Dimensions and Space** – Every room where people work must have sufficient floor area and height and unoccupied space to allow workers to work and move around unimpeded, 11 cubic metres per person – taking into account the height of the ceiling but using 3m as a maximum in the calculation.

Regulation 11 **Workstations and Seating** - Suitable for person and task – footrests where necessary. Seating should support the lower back.

Regulation 12 **Condition of Floors and Traffic Routes** – suitable for the traffic which will use it, free from obstructions, hand rails and guards to protect people from moving traffic.

Regulation 13 **Falls or Falling Objects** – So far as is reasonably practicable, suitable and effective measures shall be taken to prevent any person falling a distance likely to cause injury, also protection against falling objects. (Now covered by Work at Height Regulations). Traffic routes near uncovered tanks must be securely fenced.

Regulation 14 **Windows and Transparent Doors, Gates and Walls** – made of safety material or protected from breakage and incorporate features to show the window is there e.g. by signage or colouring. There are a range of different safety materials for windows and glazing, the larger the window the thicker it needs to be. Example 1.10m X 1.10 m = 8mm thick. 3.m X 4.5m = must be at least 12 mm thick.

Regulation 15 **Windows, Skylights and Ventilators** - open easily without risk of injury and must not present a risk to those outside.

Regulation 16 **Ability to Clean Windows Safely**

Regulation 17 **Organisation of Traffic Routes** – Arrangements to ensure the workplace is designed so that pedestrians and vehicles can circulate in a safe manner. Traffic routes should be provided with an emphasis on separation of people and moving vehicles. Traffic routes should also be clearly marked and indicated.

Regulation 18 **Doors and Gates** - suitably constructed and fitted with necessary safety devices.

Regulation 19 **Escalators and Moving Walkways** - safe operation & emergency stops.

Regulation 20 **Sanitary Conveniences** and Regulation 21 **Washing Facilities**

Number at work per sex	Water cubicles	Wash basins
1 – 5	1	1
6 – 25	2	2
26 – 50	3	3
51 – 75	4	4
76 – 100	5	5

Toilets must be well ventilated, clean and tidy. Separate toilets for men and women except where they are located in completely separate rooms which can be locked from the inside. Washing facilities must be located by toilets, near changing rooms with hot and cold water, soap and a means of drying hands.

Regulation 22 **Drinking Water** - adequate supply of wholesome drinking water.

Regulation 23 **Accommodation for Clothing** – warm dry storage for home and work clothing when not in use.

Regulation 24 **Facilities for Changing Clothing** - for special purpose & health reasons. Changing Rooms must be provided if people have to wear special work wear – they must have seating and be easily accessible.

Regulation 25 **Facilities for Rest and to Eat Meals** - where food could become contaminated in the work area. There must also be an area available for pregnant and nursing mothers to rest in. Room must be equipped with adequate numbers of tables and seating, for able and disabled people at work.

Regulation 25(a) **Disabled person** – those parts of the workplace used or occupied by disabled people shall be organised to take their needs into account. This may require adjustments to stairs, doors, passageways, wash basins or toilets if required. This amendment was introduced in 2002.

Question: List five welfare aspects of the Workplace (H,S,W) Regs.

- 1.
- 2.
- 3.
- 4.
- 5.

1.2 SAFE MOVEMENT OF PEOPLE IN THE WORKPLACE

Slips, trips and falls remains one of the largest causes of workplace accidents, although the severity is not normally as extreme as with other hazards such as electricity or manual handling the overall number of incidents still provides cause for concern. There are a number of hazards which present a risk as people move around their workplace.

Typical hazards

- Uneven flooring
- Damaged flooring
- Wet surfaces
- Slopes and kerbs
- Moving vehicles
- Falling objects
- Being crushed against a fixed object
- Working at height
- Poor lighting
- Lack of hand rails

Control measures which may be able to reduce the risks

- Slip resistant surfaces
- Spillage procedures
- Drainage for liquids
- Designated walkways marked out
- Fencing
- Signage
- PPE – high visibility clothing and safety footwear
- Training
- Maintenance of the workplace
- Suitable floor surfaces
- Fault reporting systems
- Regular workplace inspections
- Good lighting in walkways
- Good housekeeping
- Tidy storage areas – away from walkways

1.3 THE RISKS OF VIOLENCE

What is workplace violence?

Violence at work has received increasing interest over the last decade. High profile cases have been reported in the media and publicity surrounding initiatives to reduce the risks of violence in the workplace has helped to raise awareness of the issue among the general public, the media, employers, trade unions and the government.

VIOLENCE *“All assaults or threats which occurred whilst the victim was working and were perpetrated by members of the public.”* British Crime Survey (BCS).

“Any incident where an employee is abused, threatened or assaulted by a member of public during the course of his / her employment” HSE – Preventing Violence to Retail Staff

Note that both the above definitions focus on the risks of violence from third parties rather than from other employees. Bullying and harassment between employees can also be a problem but will normally be covered by human resources policies rather than the general company health and safety policy. Although the employer could be held responsible in civil and criminal actions if they do not protect their staff from the risks both internally and externally.

1.3.1 RISK ASSESSMENT AND PERSONAL SAFETY

i) Identification of Hazards

Who presents risk?

- Those using drugs / alcohol
- Those with mental health issues
- Aggressive

What factors may increase the risk of injury?

- Jobs / premises where there is a public interface
- Lone working
- Carrying cash
- Unsocial or shift work
- Mentally / emotionally unstable people
- People under the influence of drugs / alcohol
- Working alone and working outside normal hours
- Handling drugs – these may be seen as a target by some
- Travelling across sites
- Staff attitude – if a member of staff rises to a comment or action they may find that their attitude could make the situation worse.

ii) Who is at risk?

Those staff who meet the public face to face are at greater risk, however those dealing with people on the telephone may also have to deal with verbal abuse. Additionally verbal abuse and attacks may on rare occasions be carried out by colleagues rather than third parties.

iii) Identify any existing controls

What action has the organisation already taken to reduce the risk of injury?

- Have people been trained?
- Have safe procedures been implemented for cash handling?
- Is the environment suitable and well designed with no blind corners?
- Are staffing levels satisfactory?
- Have staff received induction training?
- Are ID badges worn?
- Are incidents and accidents reported?

iv) Risk evaluation – See risk assessment section

v) Controlling the risks of injury

There are many practical steps which can be taken to help ensure the safety of staff, equally there are steps that we can all take to contribute to a safer environment for all.

- Improved lighting internally and externally
- Security locks on main entrances
- Observation panels – so that you can see if there are other people within the area
- Limited access out of hours to the main buildings
- Staff training - difficult behaviour, break away techniques, customer care
- Counselling - post incident debriefing
- Accompanied across sites out of hours where required
- Personal attack alarms available
- Alarms in key areas
- Planned routes to be known
- Limiting the amount of valuable equipment carried
- Providing training on issues such as defusing difficult situations
- Rotating staff so their exposure time is reduced
- Storage and security of items in cars
- Checks on lone workers
- Staff identification badges
- Accident/Incident investigation to follow up and take further action.
- CCTV in key areas
- Staffing levels – to ensure adequate numbers of staff are available

1.4 SUBSTANCE MISUSE AT WORK

Research has shown that up to 5% of all sickness absence is believed to be due to alcohol abuse and alcohol is involved in up to 25% of industrial accidents. The individual effects of drugs and alcohol may include:

- Mood changes
- Irritability/aggression/confusion
- Theft/dishonesty (to pay for an expensive habit)
- Poor concentration/production
- Poor time-keeping

In addition, there are effects on a business, which may include:

- Increased absenteeism
- Increased staff turnover (persistent abusers may be dismissed from their employment)
- Reduced productivity
- Increased risk of accidents - alcohol and drugs affect judgment and physical co-ordination and so can increase the risk of accident (particularly in safety critical tasks)

Useful information is published by the HSE and can be downloaded free of charge INDG91 deals with Drugs Misuse at Work and *Don't mix it: A guide for employers on alcohol at work* INDG240.

1.4.1 Strategy for Control

As with any other hazard of work, the first stage of control is to establish whether there is, in fact, a problem. There may be staff in the organisation who use drugs recreationally or drink excessively, but this does not necessarily mean there is a safety issue. Examine data on absenteeism, productivity, accidents and disciplinary records which may indicate a problem exists.

If a problem is indicated, then it is necessary to develop and implement an Alcohol & Drugs Policy. A written policy should be developed in consultation with the workforce, through the normal consultation channels. Consultation with medical personnel is also desirable, especially where invasive sampling is a part of the strategy.

A control strategy may employ measures to reduce alcohol/drug-related problems such as:

- Proper management and supervision (not encouraging behaviour which incites misuse of alcohol/drugs).
- Proper arrangement of work (not placing a rehabilitated worker in a situation which may have contributed to the problem).
- Prohibition/restriction of the availability of alcohol/drugs on the premises.
- Training, including:
 - Providing details of effects of alcohol/drugs on health.
 - Training for supervisors/managers on identification/counselling/confidential referral of individuals with alcohol/drugs issues.
 - Rules to be followed and consequences of non-compliance.
- Identification, assessment and referral of individuals with alcohol/drug issues.
- Alcohol/drugs testing of individuals – particularly in safety critical jobs.
- Creating and enforcing rules governing conduct and disciplinary measures for their infringement (including dismissal).
- Arrangements to ensure the confidentiality of any persons affected.

Employers may want to think about the following:

- A programme of awareness for **all** staff
- There are many ways to provide such training: group sessions, seminars etc. This programme may also cover an explanation of your drugs policy
- A programme of training for managers or supervisors on recognising the signs of drug misuse. This could be the most crucial part of managing drug misuse at work as they will need to be clear about the business' rules about drug misuse. They will need to know what to do if they suspect an employee is misusing drugs or if they are approached by an employee who declares a drugs problem. Local drug or health advisory services may be able to help train managers to recognise the signs of misuse and how to handle the situation. The service may charge for training
- Encouraging those with a drugs problem to seek help
- The need for confidentiality if an employee admits to a drugs problem. People with a drugs problem may be persuaded to come forward if they are assured that their problems will be dealt with discreetly. However, you will also have to consider your own legal position, if evidence or information supplied to you suggests that an employee's drug problem has involved breaking the law at work
- The nature of the work you do. Are there any aspects of the work that are safety-critical, e.g. using machinery, electrical equipment or ladders, as well as driving or

operating heavy lifting equipment, where instances of drug misuse could have serious consequences?

1.4.2. Testing For Drugs and Alcohol

Random drug & alcohol testing is employed in some industries, but usually only where safety-critical work is undertaken, such as in the railway industry. In order to impose such a strategy it must be a condition of an individual's contract that they are prepared to undergo such testing. Breathalyser kits such as the Lion intoximeter, may be used for alcohol, and drug testing may be undertaken using proprietary kits analysing blood, urine or saliva. There are issues of accuracy with some kits that are prone to give false positives. Higher accuracy may be achieved, but this needs expensive laboratory analysis.

1.5 CONSTRUCTION AND DEMOLITION

What is construction?

Construction includes a wide range of different activities including:-

- construction, alteration, conversion, renovation
- repair, redecoration, maintenance, decommissioning and demolition
- preparation for a structure
- assembly and disassembly of prefabricated elements
- removal of a structure
- installation, commissioning, maintenance of services fixed within the structure, (structure includes any building, timber, masonry, metal or reinforced concrete structure, caisson, mast or tower).

Typical Construction activities

- Site clearance
- Demolition
- Excavation e.g. earthwork, trench work, shaft, tunnel or underground working.
- Loading and lifting materials
- Fabrication
- Cleaning
- Installation and removal of services
- Landscaping
- Decoration



THE MAIN HAZARDS:

a. WHEN WORKING ABOVE GROUND LEVEL

- Incorrectly erected scaffold - no toe boards or guard rails
- High winds
- Falling objects
- Overhead electric cables
- Unsecured ladders - ladder too short, ladder broken, unsuitable
- Lack of space
- Uneven floor surfaces
- Manual handling of loads
- Fragile roofs
- Unguarded edges

b. BELOW GROUND LEVEL

- Lack of oxygen
- Collapse of earth
- Underground cables
- Underground gas pipes
- Vermin/contaminated land
- Flooding
- Falling objects (into the trench)
- Fumes



- Lack of space
- Noise from plant and equipment
- Collapse of adjacent structures

c. GENERAL

- Moving machinery
- Uneven floor surfaces
- Noise
- Chemicals - highly flammables, asbestos, dust, cement etc.
- Lack of training
- Unguarded trenches
- Poor housekeeping
- Trailing electric cables
- Vibration from power tools
- Falling objects – from above ground level

d. AT GROUND LEVEL

Almost all hazards which exist in other non construction workplaces are likely to exist on a typical construction site, due to the nature of the work and environment it may be that the risks are greater.

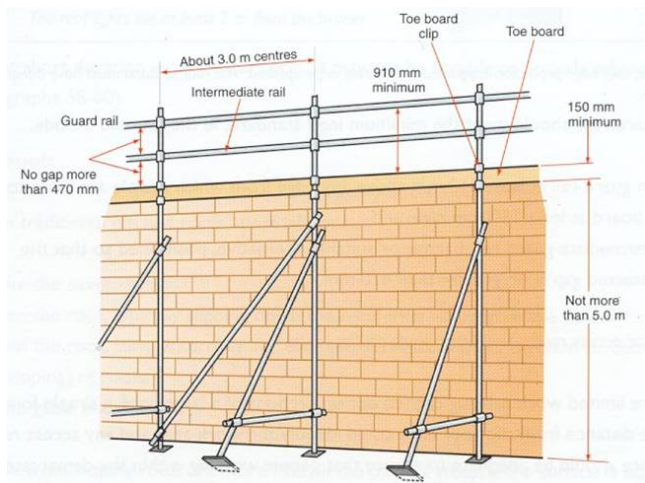


A few hazards of working at ground level include:-

- Moving vehicles and plant
- Use of hazardous substances e.g. cement
- Manual handling
- Noise
- Vibration
- Damaged electrical cables
- Uneven floor surfaces
- Dirt and dust
- Contaminated soil
- Adverse weather – rain, snow, ice, sun

e. GENERAL CONTROL MEASURES

- Good security - fencing, passes & gates
- Lock up equipment at the end of the day
- Training – Specific and general H&S
- Information and instruction
- Competent people only – adequate supervision arrangements
- PPE - hard hats, safety shoes, ear defenders and harnesses
- Traffic routes around the site
- Warning signs
- Put out fires at night
- Safe and secure storage of flammables and chemicals
- Support adjacent structures to avoid collapse
- Testing of electrical equipment
- Use of 110V equipment, centre tapped earth.
- Lock ladders away so children cannot climb up them
- Fire extinguishers
- Safety nets for falling items
- Guard rails on scaffolding
- Damp down surfaces before cutting into them
- Health surveillance e.g. for cement dust, lead etc.
- Crawling boards for roof work
- Board over excavations out of hours
- Control access of visitors



f. DEMOLITION

The main hazards are likely to be:-

- flying particles
- explosion
- moving plant and equipment
- falls from height
- premature collapse
- asbestos/lead



- dust
- broken glass
- un-isolated services

DEMOLITION CONTROLS

This is undoubtedly one of the most dangerous activities which will be undertaken on any construction site. Nearly 20 workers have been killed on demolition sites in the last three years as well as several members of the public including some children. Before any demolition occurs it is essential that a pre-demolition survey be undertaken. This will allow the individual situation to be examined and for the relevant safe systems of work to be determined before work commences. The survey should aim to identify:-



- the method used to construct the building originally
- whether there are any adjacent buildings which may be affected
- the location of overhead and underground services
- any hazardous substances present
- any items which could affect the buildings stability e.g. underground tanks or vaults

The survey would normally include the making of exploratory holes in walls to find out how they are supported and what they are made of as usually this information is not readily available.

This information should allow the surveyor to identify how the building can be safely demolished, the nature of the work that will need to be carried out and in what sequence the work must take place. (BS 6187 gives guidance on demolition)

Before demolition takes place, several different bodies need to be informed of the planned project. Namely: HSE (Via Form 10 which should be completed prior to work commencing), Gas, Water, Electricity companies and any owners of adjoining properties. Many HSE inspectors will willingly visit a site when the preliminary survey is being carried out. After the survey decisions will need to be taken on how the task is to be done. A majority of demolition is not completed with the use of explosives.

All services will need to be isolated before work on demolition commences.

A competent site supervisor must be appointed to co-ordinate the demolition. He / she will decide what measures are required to ensure that work can be carried out safely, not only for those involved in the work but also anyone else who may be affected.

Precautions include:-

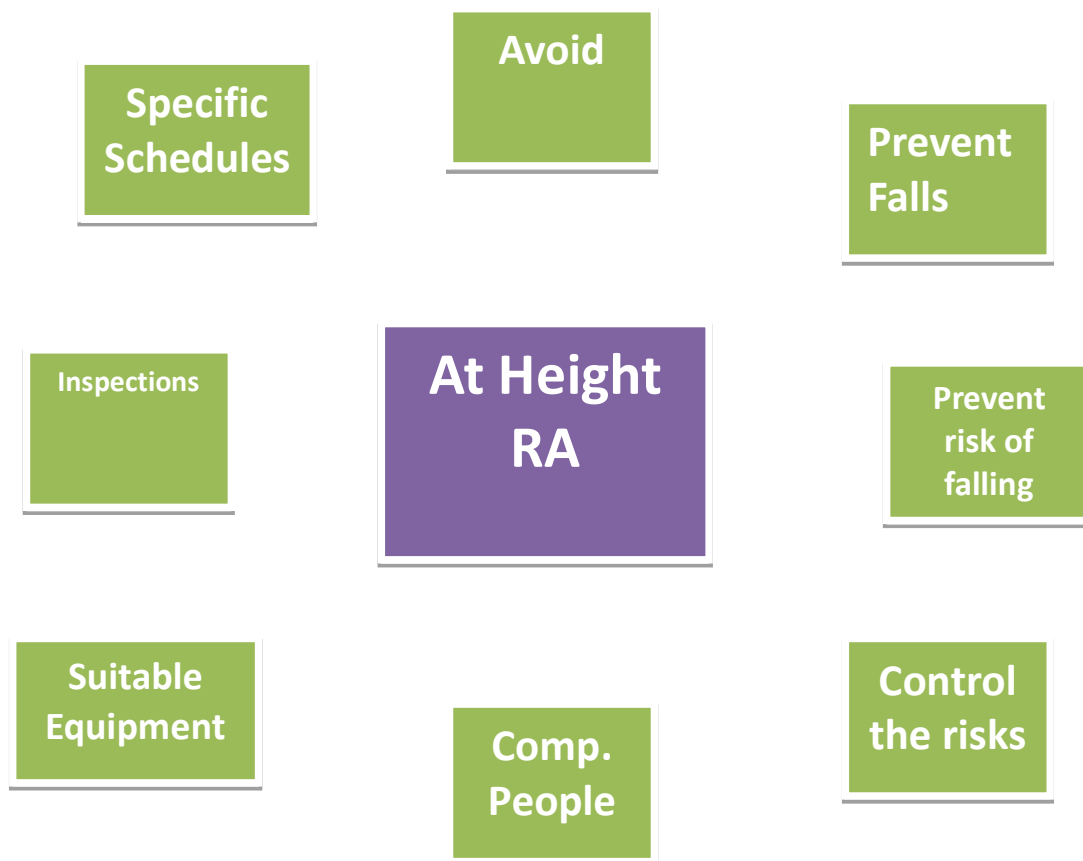
- Barrier off areas
- Warning signs
- Catching platforms / nets / sheets for materials
- PPE - hard hats, goggles, safety foot wear, respiratory protection etc.
- Supports and bracing may be required to restrain remaining parts of the building

- Scaffold working platforms should be used to give access to areas where debris is liable to build up and possibly overload the structure.
- Individual isolated walls should not be left unsupported unless designated safe by a competent person
- Regular inspections prior to work each day
- Isolation of services
- Trained workers
- Method statements / safe systems of work / permits to work

1.6 THE WORK AT HEIGHT REGULATIONS 2005

OVERVIEW OF MAIN REQUIREMENTS

Work at Height: means work in any place, including a place at or below ground level; OR obtaining access to or egress from such a place while at work, except by a staircase in a permanent workplace, where, if measures required by these Regulations were not taken, a person could fall a distance liable to cause personal injury.



Organisation and Planning: the employer and self employed must ensure that work at height is planned, supervised and carried out in a manner which is, so far as is reasonably practicable, safe. Planning of work includes planning for emergencies and rescue.

Competence: every employer shall ensure that no person engages in any activity, including organisation, planning and supervision, in relation to work at height unless they are competent to do so or, if being trained, are being supervised by a competent person.

Avoidance of Risks From Work at Height: the employer has the general obligation to complete a risk assessment under regulation 3 of the Management Regs and apply the hierarchy of control (Avoid work at height, avoid the risk of falling, minimising the risk of falling).

Selection of Work Equipment for Work at Height: must be suitable based on task, work area and risks

Requirements for Particular Work Equipment: there are specific schedules on items such as ladders, scaffolds and platforms which set minimum standards.

Fragile Surfaces: no one at work should pass across or near, or work on a fragile surface where it is reasonably practicable to carry out work safely in other ways. Suitable and sufficient platforms, coverings, guard rails etc must be strong enough for the foreseeable loadings required.

Falling Objects: steps must be taken to prevent injury from falling materials or objects. Areas below where there is a risk of falling items must be marked.

Inspection of Work Equipment: equipment installed to enable work at height must be inspected prior to use. Every employer shall ensure that work equipment exposed to conditions causing deterioration which is liable to result in dangerous situations is inspected -

- at suitable intervals
- each time that exceptional circumstances which are liable to jeopardise the safety of the work equipment have occurred

Working platforms used for construction work; and from which a person could fall 2 metres or more should not be used in any position unless it has been inspected in that position or, in the case of a mobile working platform, inspected on the site, within the previous 7 days.

Inspection of Places of Work at Height : surfaces and parapet, permanent rail or other such fall protection measure of every place of work at height should be checked on each occasion before the place is used.

Duties of Persons at Work: employees and others must report any activity or defect relating to work at height which is likely to endanger the safety of himself or another. They must also use any work equipment or safety device provided for work at height in line with any training / instruction received.



1.7 WORKING AT HEIGHT

There are some activities where it may be impossible to eliminate the need to work at height, this may include some elements of construction work, carrying out maintenance of buildings and roofs and in some cases the cleaning of windows, may not be completed from ground level. Other tasks which may still need to be undertaken and will need to be undertaken at height include changing light bulbs, hanging up wall fittings, plastering and decorating walls and ceilings. Although a variety of equipment is now available to work from ground level in some cases this is just not possible.

If a person falls from height they may break bones, incur head injuries or crush various parts of the body. They may also fall on sharp or rough surfaces making the injuries incurred even worse. Falls from height are commonly the largest cause of workplace fatalities in the UK.

Hazards when working above ground

- Incorrectly erected scaffold - no toe boards or guard rails
- High winds
- The height of the work
- Falling objects
- Overhead electric cables
- Unsecured ladders - ladder too short, ladder broken, or unsuitable
- Lack of space
- Uneven floor surfaces
- Manual handling of loads
- Biological hazards
- Large plant moving overhead e.g. cranes
- Fragile roofs and deterioration of materials
- Unstable or poorly maintained access equipment
- Unguarded edges
- Weather
- Fragile sky lights
- Work on sloping roofs

Methods of avoiding work at height

- Preforming items when they are manufactured – construction
- Predrilling components during construction to avoid having to go up and drill
- Washing windows using an extendable hose rather than from a ladder
- Lowering objects down to complete work at ground level – some modern light fittings allow this to be carried out

Work at height - general controls

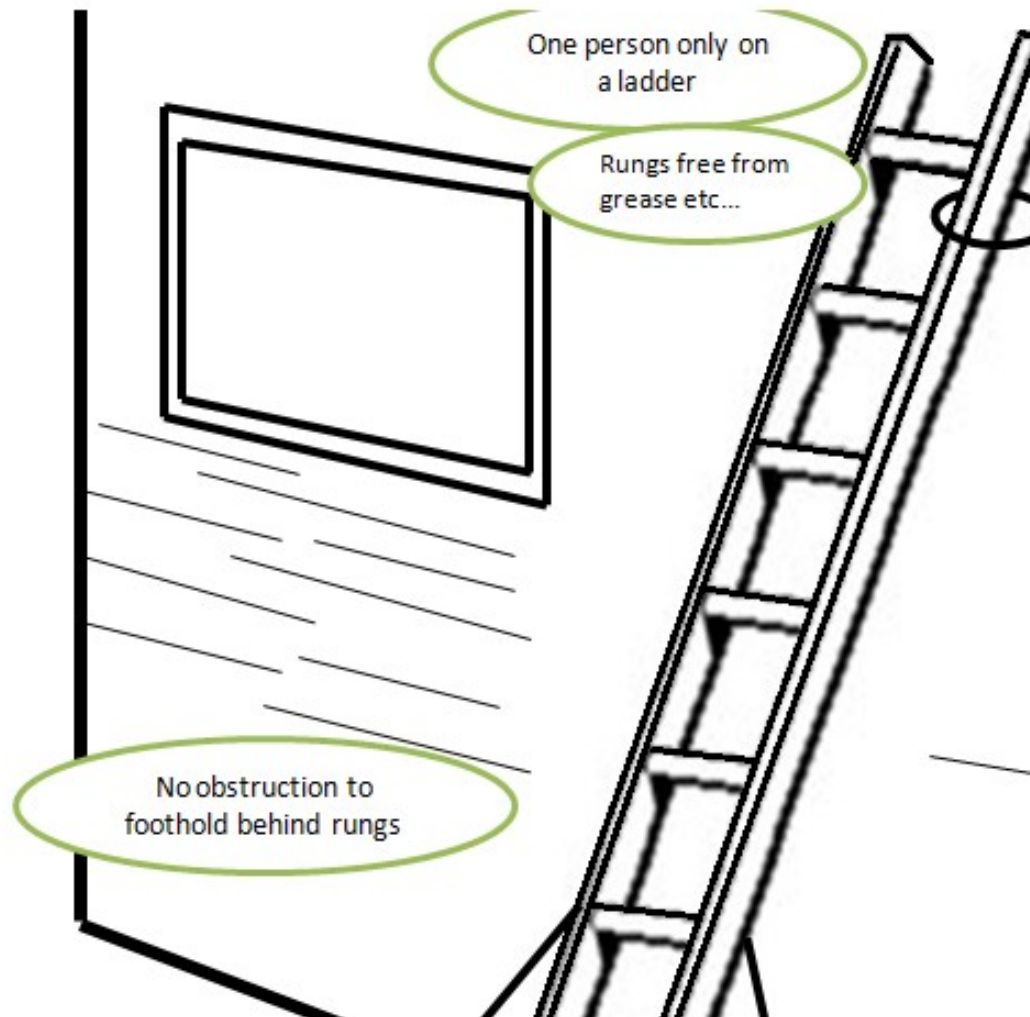
- Planning the task
- Supervision
- Training, information, and instruction on any equipment used to work at height
- Emergency procedures may be needed to ensure if an accident occurs at height there are arrangements in place to evacuate casualties
- Edge protection - guard rails a main one and intermediate
- Toe boards to prevent falling objects
- Work platforms that are closely boarded with edge protection
- Suitable means of access - scaffold/ladder
- Crawling boards for moving on fragile surfaces
- Cover/guard skylights
- Harness and fall arrest systems – but only if there are suitable attachment points

- Barrier off below to reduce the risks to others below from falling objects or people
- Chutes/mechanical means of moving equipment up and down to avoid falling objects
- Tool belts
- No working in high winds
- Suitable PPE - gloves, safety shoes etc
- Head protection for those working below
- Barrier off below to keep vehicles and people away
- Lock away ladders at the end of each day to reduce the risks if others come on site

LADDER SAFETY

Ladders are simple pieces of work equipment yet their use and misuse results in many serious accidents every year including some fatalities. The following safety precautions can help to prevent these accidents easily and effectively. Staff using ladders whether on site or indoors should be given some practical training to ensure they are aware of the basic steps which they must take to use a ladder safely.

- Ladders used with scaffolding should be at least 1m taller than the platform it leads to
- Ladders should be inspected prior to use and on a regular basis
- Ladders must be free from defects and not painted
- Rungs must be clean and not greasy
- The angle of use should be 1 in 4 (75°)
- A firm level base is required
- Attach ladder if possible to wall or scaffold
- “Foot” if ladder is over 5m in length – this is where another person stands on the bottom rung to support the ladder
- Do not use a ladder for tasks where both hands are needed
- Aluminium ladders should not be used near overhead cables.



Ladder Check List

- Is ladder suitable for intended use? – Long enough, strong enough
- Is ladder in good condition, is it damaged, warped or split, rungs broken or missing?
- Is ladder clean, free from mud and grease?
- Is help available to carry to place of use?
- Is ladder set on firm level ground?
- Is ladder properly erected and secured? – correct angle, projects 5 rungs above landing place, rung aligned with landing, secured at top and bottom?
- Is there a safe method of raising tools?
- Can you work safely without over reaching
- Is ladder properly cleaned and stored after use?

Picture: Ladder tie.



STEPS

- Check hinges, fittings, cords are in good condition
- Check treads are secure, not cracked, broken or missing
- Check steps are set correctly – level and secure, open to full extent, set at right angle
- Check you can reach job safely keeping knees below top of steps
- Use a more modern design with handrails
- If steps have top platform, check handrails are sound and safe.

g. SCAFFOLDING

There are three main types of scaffolding: independent (this supports itself), putlog (this is supported by the building) and towers, which can be portable.

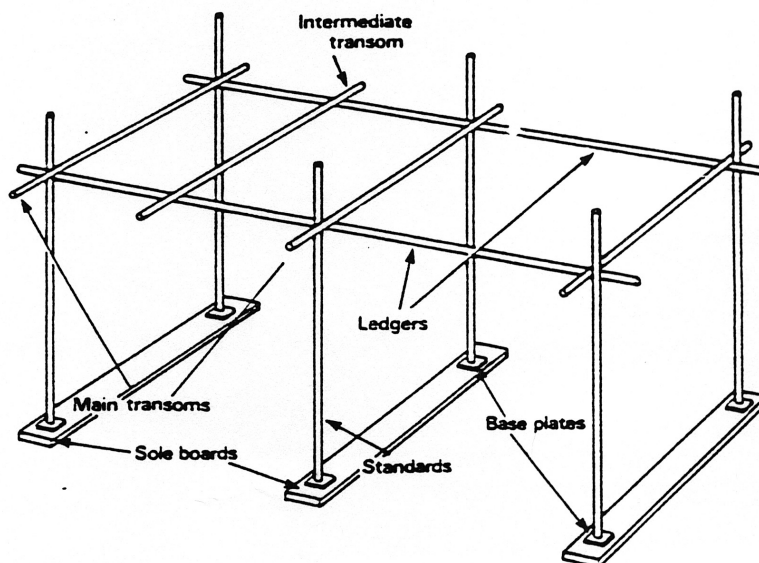
Each of these should be tied to the building for additional support: reveal or through ties can be used.

Scaffolding should be inspected:

- prior to use
- after alteration
- after adverse weather
- weekly

Scaffolding must be erected by competent people.

Main components: Sole board, base plate, standards, ledgers, transoms, couplings and bracing.



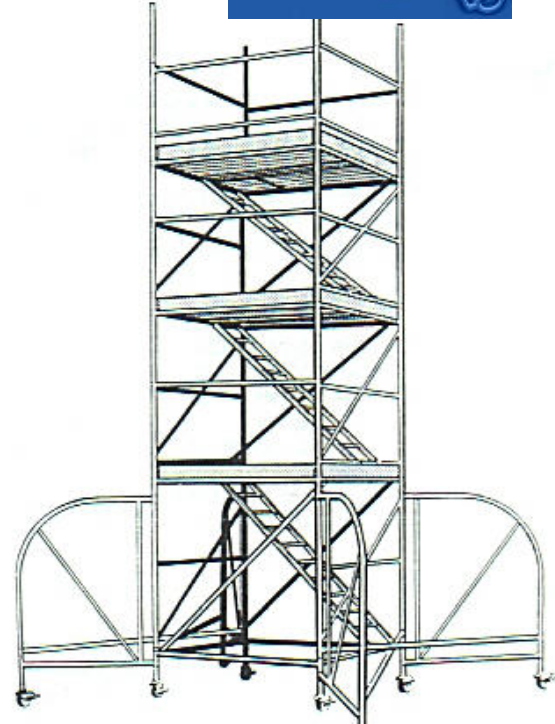
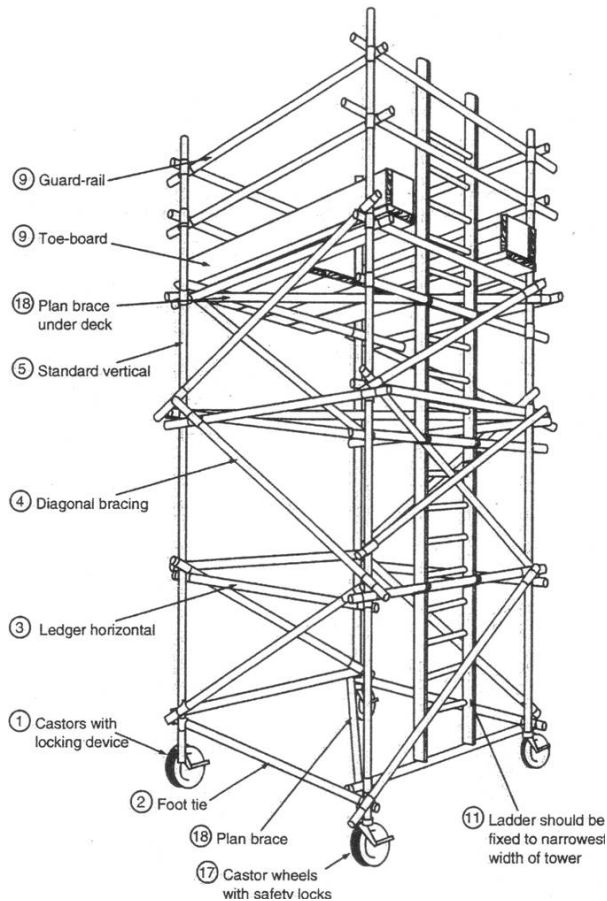
The scaffold working platform should be close boarded, with guard rails and toe boards to prevent falls. Safety netting and chutes can be fitted to help stop falling items and give a route for items which need to be lowered from a height.

The platform should be kept as free from obstructions as possible, as they may fail or cause an obstruction for those working on the platform.

If ladders are used to access scaffolding they should protrude at least 1m above the work platform height. The worker should be able to climb onto the platform whilst still holding onto the ladder.

h. TOWER SCAFFOLDS

Coupling



These are mobile and have the same components as normal scaffold but may be on wheels for easy movement. To give them additional support they may have outriggers which can be pulled out to widen the base of the tower as shown above.

Height/base ratio – The base to height ratio is now determined by the manufacturer's specification rather than being a set figure such as 3:1, 4:1 etc.

General Controls for Scaffolding

- Ensure it is correctly assembled
- Use outriggers if they are fitted (mobile only)
- Ensure ladders will not overload scaffold
- Regular inspections – prior to use, on erection, after adverse weather & after any alterations
- Stable, flat ground needed
- The height of the base should not exceed the recognised base/height ratio (mobile only)
- Use brakes (mobile)
- Ensure wooden platform boards are thick enough and in good condition
- Do not use in high winds

Nebosh Certificate © Jackie Cambridge, CSSLLP Version 2 2019



- Guard from collisions with vehicles
- Use chutes for waste to be lowered into skips
- Harnesses and fall arrest equipment

I. OTHER EQUIPMENT FOR ASSISTING WHEN WORKING AT HEIGHT

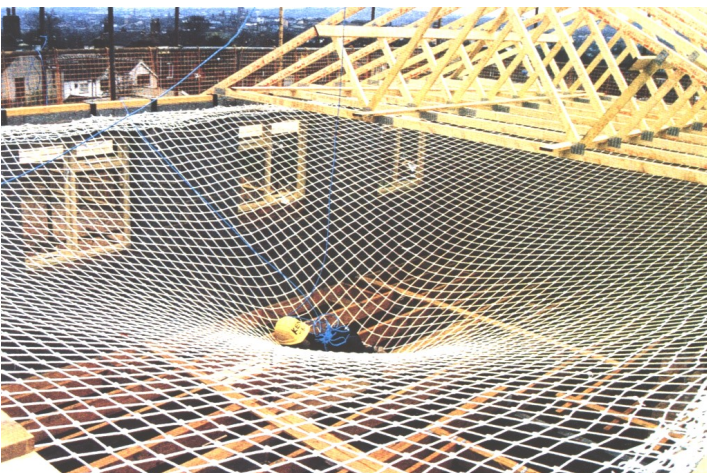
Mobile Elevated Working Platforms (MEWP)



Scaffold system



Safety Nets



Air bags



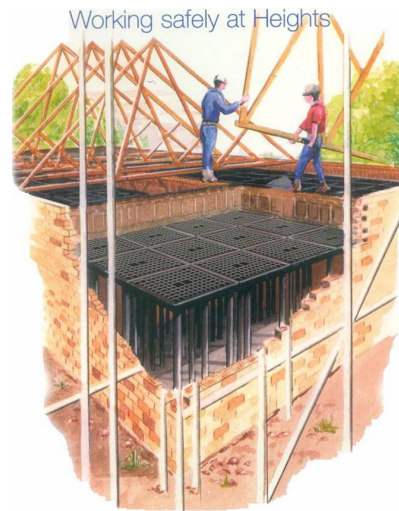
Bean Bags



Trestles



Crash Decks

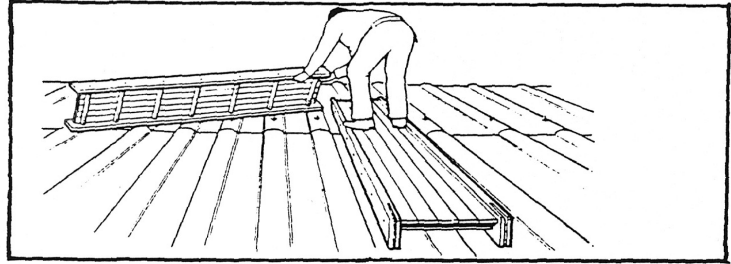


Staging platforms

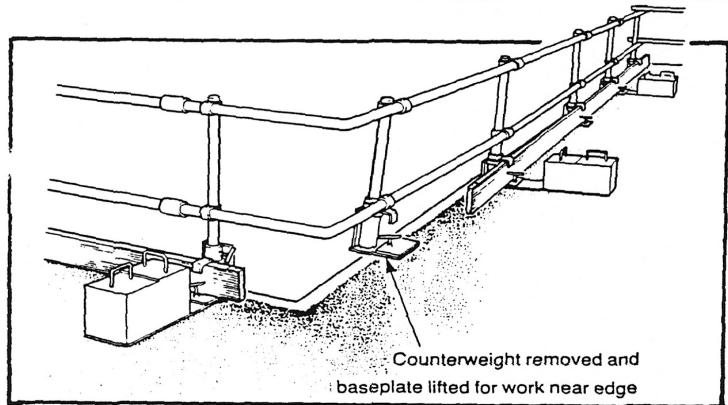


j. ROOF WORK PRECAUTIONS

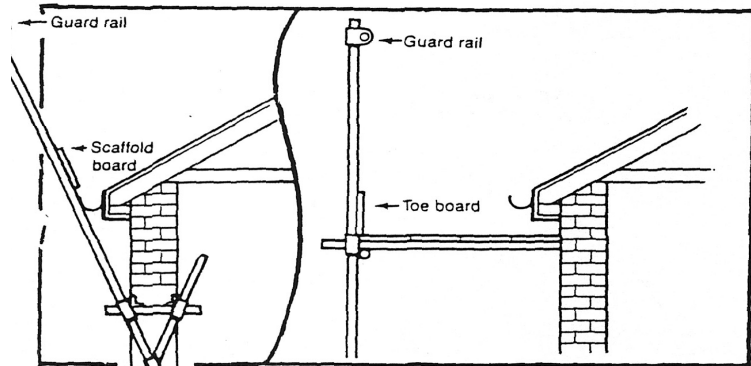
Fragile Roofs – use crawling boards and ladders to spread the weight.



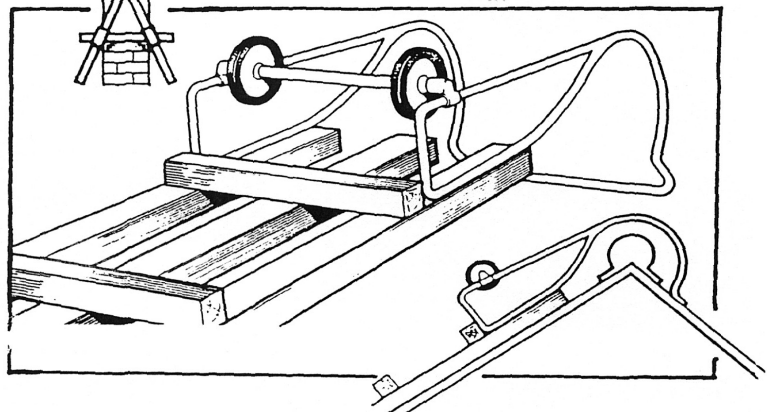
Flat Roof – Edge protection can be put up on a temporary basis, however the building could be designed with permanent protection if roof access will occur on a regular basis.



Scaffold Platforms - may be needed to allow work on the edge of pitched roofs.



Sloping ladders - can be used to clip over the top of the roof.



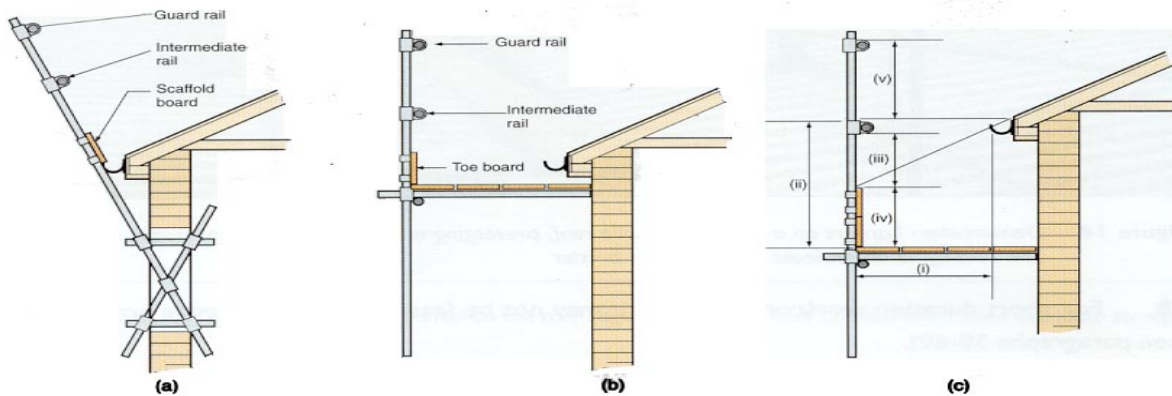
Temporary edge protection



Leading edge protection systems



Edge Protection



Sloping roof edge protection; typical arrangement in conventional tube and fittings

- (a) Supported from window opening
- (b) Working platform below the eaves
- (c) Top lift of a scaffold. Dimensions should be as follows:
 - (i) Working platform minimum width 600 mm
 - (ii) Minimum 910 mm
 - (iii) Maximum gap 470 mm
 - (iv) To rise to the line of the roof slope with a minimum height of 150 mm
 - (v) Gap between rails no more than 470 mm

K. PREVENTION OF FALLING MATERIALS

- Chutes
- Netting
- Sheeting
- Tool belts
- Do not overload platforms
- No gaps between platform boards
- Do not allow people to walk at ground level under scaffolding working platforms if there is a risk of items falling through the gaps
- Use hoists and conveyors to raise and lower loads
- Use slides to move loads (See photo)



1.8 EXCAVATIONS



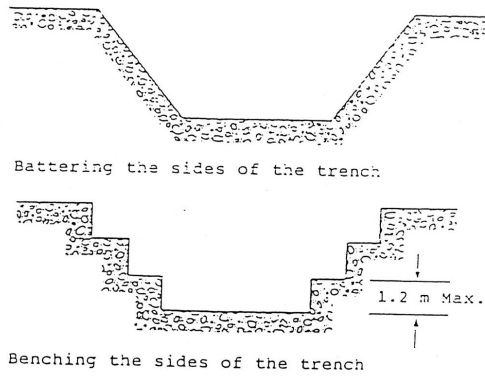
HAZARDS WHEN WORKING BELOW GROUND LEVEL

- Lack of oxygen
- Collapse of earth
- Underground cables
- Underground gas pipes
- Vermin/contaminated land
- Flooding
- Falling objects (into the trench)
- Fumes
- Lack of space
- Noise from plant and equipment
- Collapse of adjacent structures

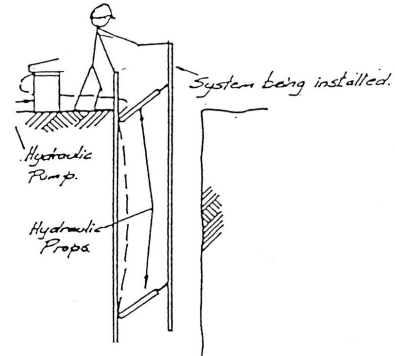
To reduce the risks from these hazards there is a requirement to carry out statutory examinations under the Construction Design and Management Regs 2007.

Excavation Statutory Examinations

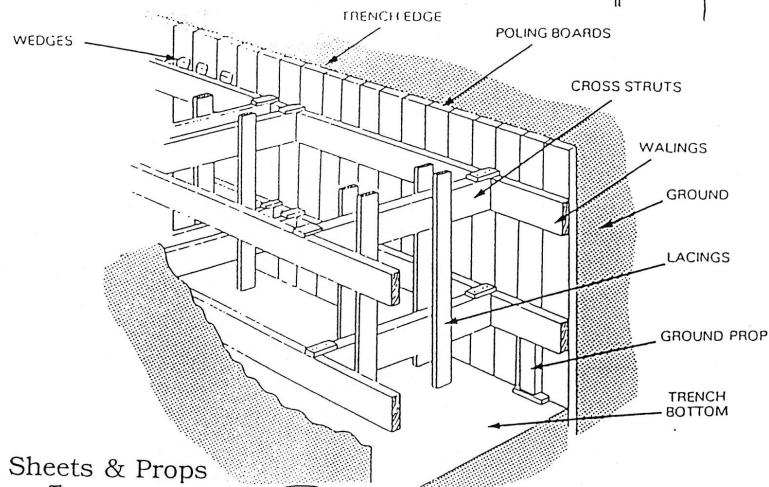
- After adverse weather
- Adverse events which may affect ground stability
- At the beginning of every day
- Any changes or alterations
- Every seven days – recorded



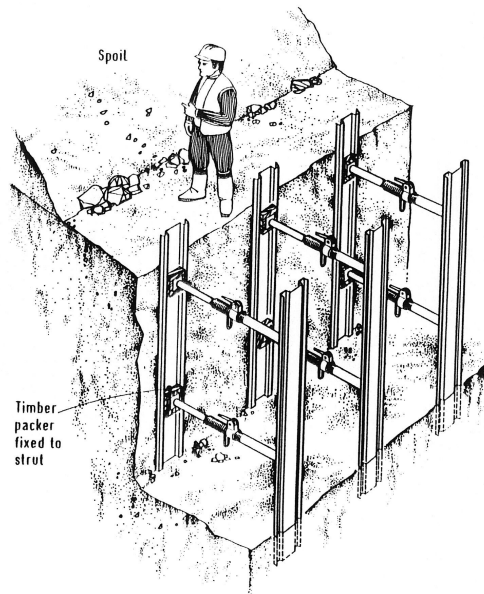
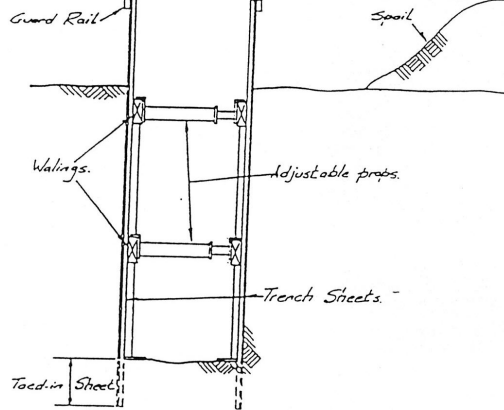
Hydraulic System Being Installed

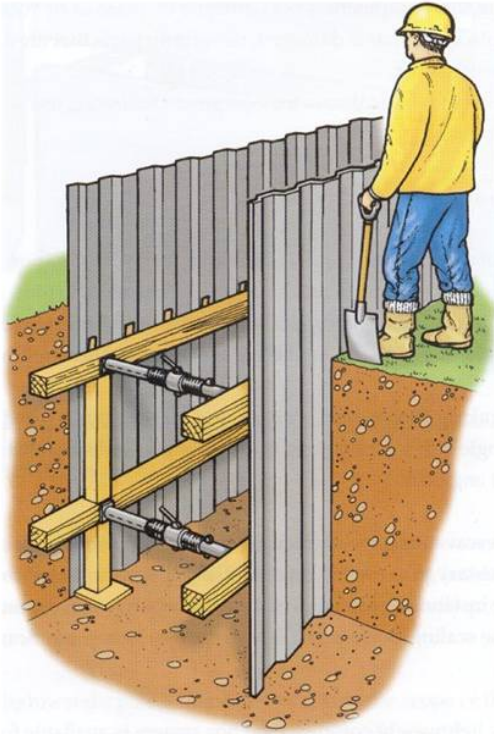


Close Timbered Shoring

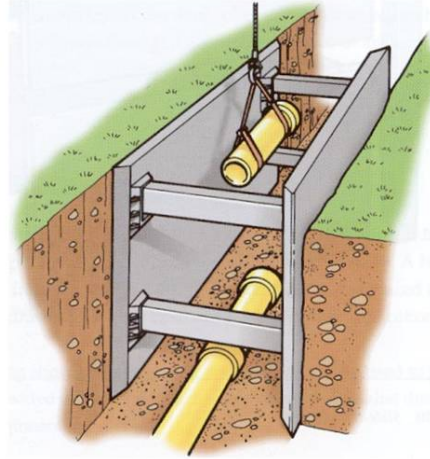


Trench Sheets & Props

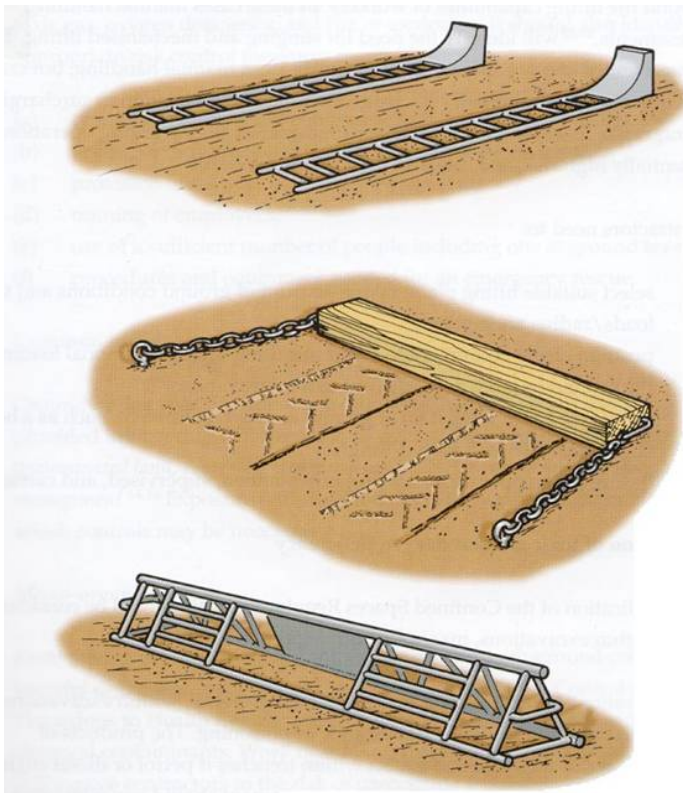




Close sheeting



Drag Box



- Testing oxygen levels
- Suitable lighting – intrinsically safe
- Checking for underground services

Stop blocks to stop vehicles getting too close to excavations.

Excavation controls

- Barriers
- Cover over
- Lighting
- Signage
- Removal of spoil
- Means of access
- Checks for buried services
- Vehicle routes
- PPE e.g. boots, hard hat

MEASURES TO REDUCE THE RISKS FROM UNDERGROUND UTILITY SERVICES

- Obtain plans
- Cat scanners and service detectors
- Contact electricity provider
- Hand digging
- No power tools
- Spade not pick axe
- Mark cables when identified
- Limit work in wet weather
- Safe back filling
- Support cables
- Trial holes
- Isolation/disconnect if possible
- Supervision



Exercise

What measures would you consider taking when carrying out construction work next to a primary school?

1.9 CONSTRUCTION LEGAL REQUIREMENTS

Key issues covered by the Construction Design and Management Regulations (CDM) include:-

- Safe Place of Work - above ground, at height and below ground
- Protection Against Falls and Falling Objects (amended by Work at Height Regs)
- To Protect During Work on Structure Including Demolition
- To prevent Collapse During Excavations – have suitable equipment available, identify underground services
- To Prevent or Avoid Drowning
- Safe Traffic Routes, doors and gates
- Prevention and Control of Emergencies including fire fighting equipment
- Welfare Facilities – sanitary conveniences, washing facilities, drinking water, rest facilities, changing areas and storage of clothing.
- Workplace issues: ventilation, temperature, protection against adverse weather, lighting, cleanliness, plant is sound. Signage and security perimeter fencing.
- Supervision, Training, Inspection and Reports - Inspections by competent people of work at height, excavation and cofferdams.

See NGC 1 for further details of the management of construction projects required by CDM.

1.10 SAFETY SIGNS AND SIGNALS

There are four main categories of safety sign.



THE HEALTH AND SAFETY (SAFETY SIGNS AND SIGNALS) REGULATIONS 1996

Coverage:

- Signs:- Prohibition, Mandatory, Warning, Safe Condition, Fire Appliance, Pipe Markings and Warning Hashes.
- Verbal signs & signals “STOP” “GO”
- Acoustic signals – This includes warning beepers on fork lift trucks or HGVs.
- Body signals – Hand signals may be used to direct traffic or cranes.

Main Requirement

Where a risk cannot be solved by another means, a safety sign must be provided.

All signs and signals must be clear, unambiguous and easy to understand.

The key focus should be on the use of pictograms and not just words for signage.

