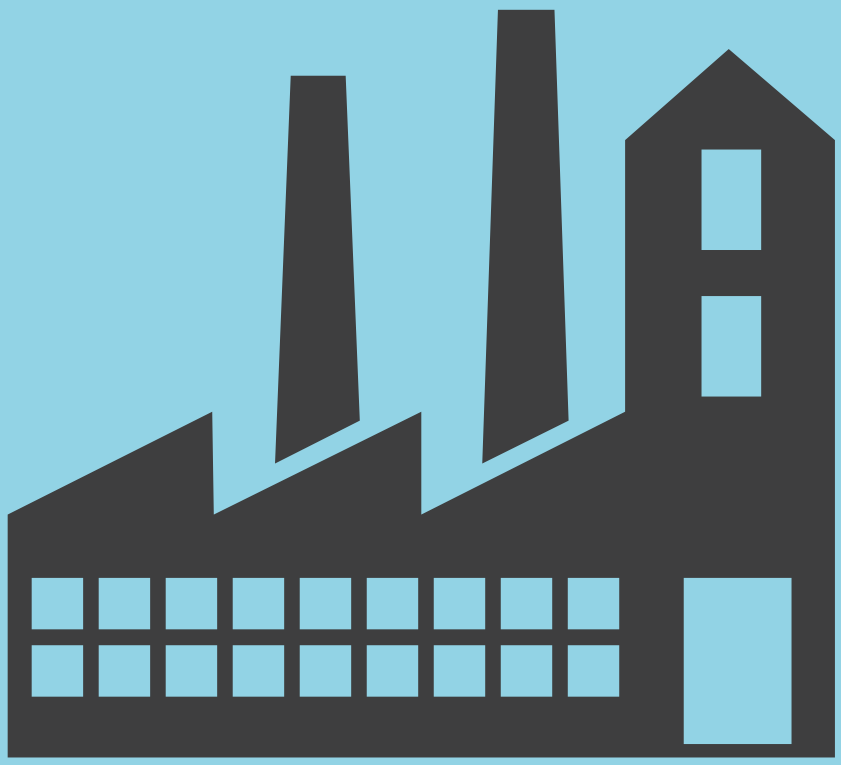
NEBOSH International General Certificate in Occupational Health and safety



Element 8

Other general workplace issues

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8.0 Learning outcomes

The learner should be able to:

- Do a general risk assessment in their own workplace – profiling and prioritising risks, inspecting the workplace, recognising a range of common hazards, evaluating risks (taking account of current controls), recommending further control measures, planning actions.

  5-11 **Produce** a risk assessment of a workplace which considers a wide range of identified hazards (drawn from elements 5-11) and meets best practice standards (*'suitable and sufficient'*).

Welfare facilities

'Welfare facilities' are those that are necessary for the well-being of employees, such as washing, toilet, rest and changing facilities, and somewhere clean to eat and drink during breaks.

Sanitary conveniences and washing facilities

Suitable and sufficient sanitary conveniences and washing facilities should be provided at readily accessible places.

The criteria necessary for suitability are shown in Table 8.1.

Suitable sanitary conveniences and washing facilities	Suitable washing facilities only

• The facilities and the rooms containing them are:
  • adequately ventilated and lit
  • kept in a clean and orderly condition.
• Separate rooms are provided for men and women except where and so far as each convenience is in a separate room the door of which is capable of being secured from inside
	• In the immediate vicinity of every sanitary convenience, and changing room
	• Supply of clean hot and cold, or warm running water
	• Soap or other suitable means of cleaning
	• Towels or other suitable means of drying.

Table 8.1: Suitable sanitary conveniences and washing facilities

To be *sufficient* facilities should enable everyone at work to use them without undue delay. Provision should be made if necessary for disabled access.

Minimum numbers of facilities are given in Table 8.2.

Number of people at work	Number of water closets	Number of wash stations
1 to 5	11	1
6 to 25	2	2
26 to 50	3	3
51 to 75	4	4
76 to 100	5	5

Table 8.2: Minimum provision of sanitary conveniences and wash stations

To be *readily accessible* the facilities do not have to be within the workplace, but they should if possible be within the building. They should be available at all material times. The use of public facilities is only acceptable as a last resort, where no other arrangement is possible.

Drinking water

An adequate supply of wholesome drinking water (usually mains) should be provided at readily accessible places and where necessary be suitably signed if there may be confusion with non-drinking water.

The supply should be via a water fountain with an upward drinking jet or if by tap suitable cups should be provided.

Drinking water supplies should not be sited in work areas which pose a risk of contamination and *'so far as is reasonably practicable'* should not be installed in sanitary accommodations.

Water should only be provided in refillable enclosed containers where it cannot be obtained directly from a mains supply.

Facilities for changing and accommodation for clothing

Changing facilities should be provided for workers who change into special work clothing. The facilities should be: readily accessible, have adequate space, ensure the privacy of the user, and be provided with seating.

Adequate secure storage space should be provided to store workers' own clothing and special clothing. Clothes drying facilities should be provided if reasonably practicable to do so.

Facilities for rest and to eat meals

Rest areas or rooms should be large enough and have sufficient seats with backrests and tables for the number of workers likely to use them at any one time.

Where workers regularly eat meals at work, suitable and sufficient facilities should be provided for the purpose. Such facilities should also be provided where food would otherwise be likely to be contaminated.

Work areas can be counted as rest areas and as eating facilities, provided they are clean and have a suitable surface on which to place food.

Where provided, eating facilities should include a facility for preparing or obtaining a hot drink. Where hot food cannot be obtained in or reasonably near to the workplace, workers may need to be provided with a means for heating their own food (*e.g.* microwave oven).

Canteens or restaurants may be used as rest facilities provided there is no obligation to purchase food.

Suitable rest facilities should be provided for pregnant women and nursing mothers. They should be near to sanitary facilities and, where necessary, include the facility to lie down.

Work environment requirements

There are specific requirements for the following aspects of the work environment:

- lighting
- ventilation
- temperature.

Lighting

Every workplace shall have suitable and sufficient lighting, which should so far as is reasonably practicable, be by natural light.

Suitable and sufficient emergency lighting should also be provided in any room in which workers are exposed to danger in the event of failure of artificial lighting.

Good lighting at work is important to ensure the efficient identification and avoidance of hazards in the workplace. Poor lighting can cause eyestrain, migraine and headaches, and is also linked to Sick Building Syndrome in new and refurbished buildings.

Different levels of lighting are required for different types of work. In general, the more detailed the task, the greater the light requirement. A process control room should be lit at an illuminance of 300 lux, a corridor or walkway may only require 50 lux, whilst studying an engineering drawing may require 750 lux.

Activity	Type of work/typical locations	Minimum measured illuminance (lux)	Average illuminance (lux)
Movement of people and vehicles	Circulation routes Car park	5	20
Movement of people and vehicles in hazardous areas Rough work not requiring perception of detail	Construction sites Loading bays Bottling/canning plants	20	50

Activity	Type of work/typical locations	Minimum measured illuminance (lux)	Average illuminance (lux)
Work requiring limited perception of detail	Catering kitchens General factory work	50	100
Work requiring perception of detail	General offices Sheet metal work	100	200
Work requiring perception of fine detail	Drawing offices Assembling electrical components	200	500

Table 8.3: Recommended illuminances

Hazards from Lighting Effects

Glare

Glare occurs when one part of the visual field is much brighter than the average brightness to which the visual system is adapted.

If there is direct interference with vision the effect is termed disability glare, if it causes discomfort or annoyance it is referred to as discomfort glare.

Colour effects

A surface lit by different artificial light sources, or by daylight under changing sky conditions, may appear to vary in colour. Where colour discrimination is required (as for some electrical work) this can affect safety.

Colours will not be identifiable under monochromatic light sources, such as low pressure sodium discharge lamps, or at very low levels of illuminance.

Stroboscopic effects

Lamps that operate from an AC electrical supply may produce oscillations in light output. When the magnitude of these oscillations is great, machinery will appear to be stationary or moving in a different manner. This is called the stroboscopic effect. It is not common with modern fluorescent lights.

Flicker

Light modulation at lower frequencies (about 50 Hz or less) which is visible to most people, is called flicker. Flicker can be a source of discomfort and fatigue. It may cause epileptic seizures in photosensitive people.

Veiling reflections

High luminance reflections can overlay the detail of the task. Such reflections can affect task performance and cause discomfort.

Radiation

Optical radiation can be harmful if too much enters the eye. As people automatically look away when dazzled by an excessively bright source it is very difficult to get exposed to a harmful dose.

Adequacy of lighting

Factors to consider when assessing the adequacy of lighting would include:

- the tasks undertaken, and the equipment used
- the size and layout of the work area
- the availability of natural light at different times of the day and year
- the shift times/patterns
- suitability of the type, number, intensity and hue of artificial lights
- glare on computer screens
- areas in shadow
- need for localised lighting
- maintenance of lighting, *e.g.* non-functioning, flickering, damaged, dirty
- provision and adequacy of emergency lighting.

Ventilation

Effective and suitable provision shall be made to ensure that every enclosed workplace is ventilated by a sufficient quantity of fresh or purified air.

The fresh air supply rate should not normally fall below 5 to 8 litres per second, per occupant. Detailed guidance is available from the Chartered Institution of Building Services Engineers (CIBSE). Factors to be considered include the floor area per person, the processes and equipment involved, and whether the work is strenuous.

In most workplaces windows and other openings will provide adequate ventilation although in some cases mechanical ventilation will be required.

Mechanical ventilation systems should be regularly and properly cleaned, tested and maintained to ensure that they are kept clean and free from anything which may contaminate the air. Recirculated air should be filtered to remove impurities and purified air should be blended with fresh air before recirculating.

Any mechanical ventilation plant should include an effective device to give visible or audible warning of any failure of the plant where necessary for reasons of health or safety. This may apply to *'dilution ventilation'* systems used to reduce concentrations of dust or fumes in the atmosphere and to any other situation where a breakdown in the ventilation system would be likely to result in harm to workers.

Note:

This requirement does not cover local exhaust ventilation (LEV) for controlling employees' exposure to asbestos, lead, ionising radiations or other substances hazardous to health. (See **Section 7.4**).

Temperature

During working hours, the temperature in all workplaces inside buildings should be reasonable.

What is reasonable depends on the nature of the workplace, e.g. expectation in an office will be different than in a warehouse.

Note:

reasonable thermal comfort, depends on a range of variables other than ambient temperature, including air movement and relative humidity.'

Heating and cooling systems should be installed, maintained and used so that harmful fumes, gases or vapours do not injure or offend workers, or others who may be affected.

Thermometers should be readily available to enable persons at work to measure temperatures throughout the workplace but need not be provided in each workroom.

Extremes of temperature

Thermal comfort is affected by more than just the room temperature. Whether or not a person feels too hot or too cold depends on a combination of *environmental factors*, including the temperature, sources of heat and relative humidity and *personal factors* such as the level of physical activity and the amount of clothing being worn.

The term thermal comfort describes a person's psychological state of mind regarding whether they are feeling too hot or too cold. ISO 7730 defines it as:

"that condition of mind which expresses satisfaction with the thermal environment."

Thermal comfort studies should be considered in context. In hot climates, the consideration is generally on how to cool the indoor environment to provide conditions of thermal comfort by use of increase air movement or air conditioning. In cold climates the focus is on how to heat the environment.

In the USA the research work into thermal comfort emphasises the relative importance of air temperature and humidity and the use of air-conditioning which are not considered in such detail in Europe. In the UK the emphasis has been on environmental warmth and freshness.

The HSE have defined thermal comfort in the workplace, as:

'An acceptable zone of thermal comfort for most people in the UK lies roughly between 13°C (56°F) and 30°C (86°F), with acceptable temperatures for more strenuous work activities concentrated towards the bottom end of the range, and more sedentary activities towards the higher end.'

The further outside this range the working temperature is the more likely that harm will be caused. Heat stress and cold stress can both result in serious health problems.

The effects of heat stress can include dehydration, heat cramps, vomiting, fainting and heat stroke. Cold stress can include shivering, loss of concentration, hypothermia, chilblains and frostbite.

Control measures for maintaining thermal comfort include:

- appropriate timing – if the temperature fluctuates between comfortable and uncomfortable
- climate control by air warming, cooling or conditioning
- local heating, cooling or ventilation equipment
- suitable thermally protective clothing

- rest facilities with means for warming or cooling
- work planning (*e.g.* task rotation) to limit the time that individual workers are exposed to uncomfortable temperatures
- provision of hot/cold drinks
- individual assessment – health conditions etc.

8.2 Working at height

In the UK working at height accidents typically account for 30-40 fatalities and around 6000 other reported injuries each year

Examples of working at height, where there is a risk of injury include:

- gutter cleaning
- putting up a display
- minor roof work
- shelf stacking
- window cleaning
- unloading a vehicle
- machine maintenance.

Factors to consider when assessing the risk from working at height include:

- vertical distance
- fragile surfaces
- vehicle and pedestrian movements in the work area
- tools, equipment and materials used when working at height
- length of task
- overhead obstructions – cables, pipes, building overhang etc.
- use and condition of access equipment – MEWPs, scaffold towers etc.
- working environment – weather, ground condition and slope
- health of individual.

Under the Regulations, duty holders (employers, the self-employed, and any person that controls the work of others *e.g.* facilities managers or building owners who may contract others to work at height) must ensure:

- all work at height is properly planned and organised
- those involved in work at height are competent
- the risks from work at height are assessed and appropriate work equipment is selected and used
- the risks from fragile surfaces are properly controlled
- equipment for work at height is properly inspected and maintained.
- avoid work at height where possible
- use work equipment or other measures to prevent falls (where working at height cannot be avoided)
- use work equipment or other measures to minimise the distance and consequences of a fall should one occur (where the risk of a fall cannot be eliminated).

In addition, collective protection systems should be given priority over personal protection systems, and passive systems (*i.e.* those that do not require the worker to do anything) take priority over active systems, which do (*e.g.* attaching a lanyard).

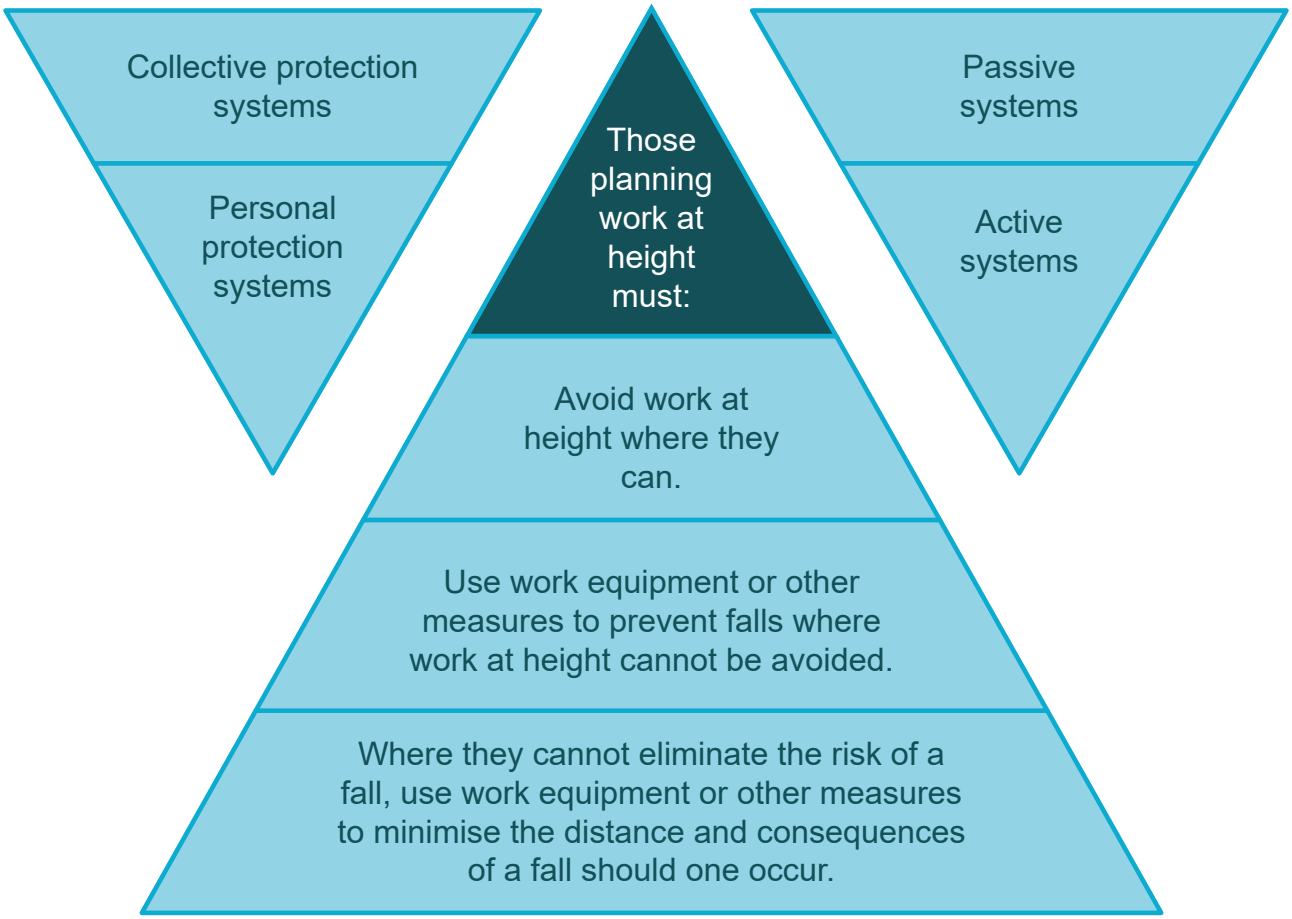


Figure 8.2: Work at height – Hierarchies of control

Avoiding the need to work at height

The first step in the risk management hierarchy in the Work at Height Regulations is to consider whether or not the need to work at height could be avoided.

Examples of solutions, across a range of industrial sectors include:

- building structures at ground level and lifting them into position on completion, (or in the case of road bridges tunnelling beneath them) for example these roof trusses have been built at ground level and lifted into position, avoiding the need to work over open joisting later on

- tilt and turn windows which can be cleaned from a safe position inside the building
- use of water fed poles that allow windows to be cleaned from ground level
- use of long handled tools that can be utilised from ground level *e.g.* long handled vacuum cleaners to clean dusty surfaces from ground level
- vacuum filling raised hoppers from ground level
- shrink-wrapping pallets at ground level can remove the need to sheet vehicles, which requires working at height.

Preventing falls and minimising the consequences of falls

The options available for preventing falls or minimising the consequences of a fall are shown in Figure 8.2.

As shown in Figure 8.3, prevention takes priority over consequence minimisation (arrest), collective measures take priority over personal protective measures, and passive measures are preferred to active measures.

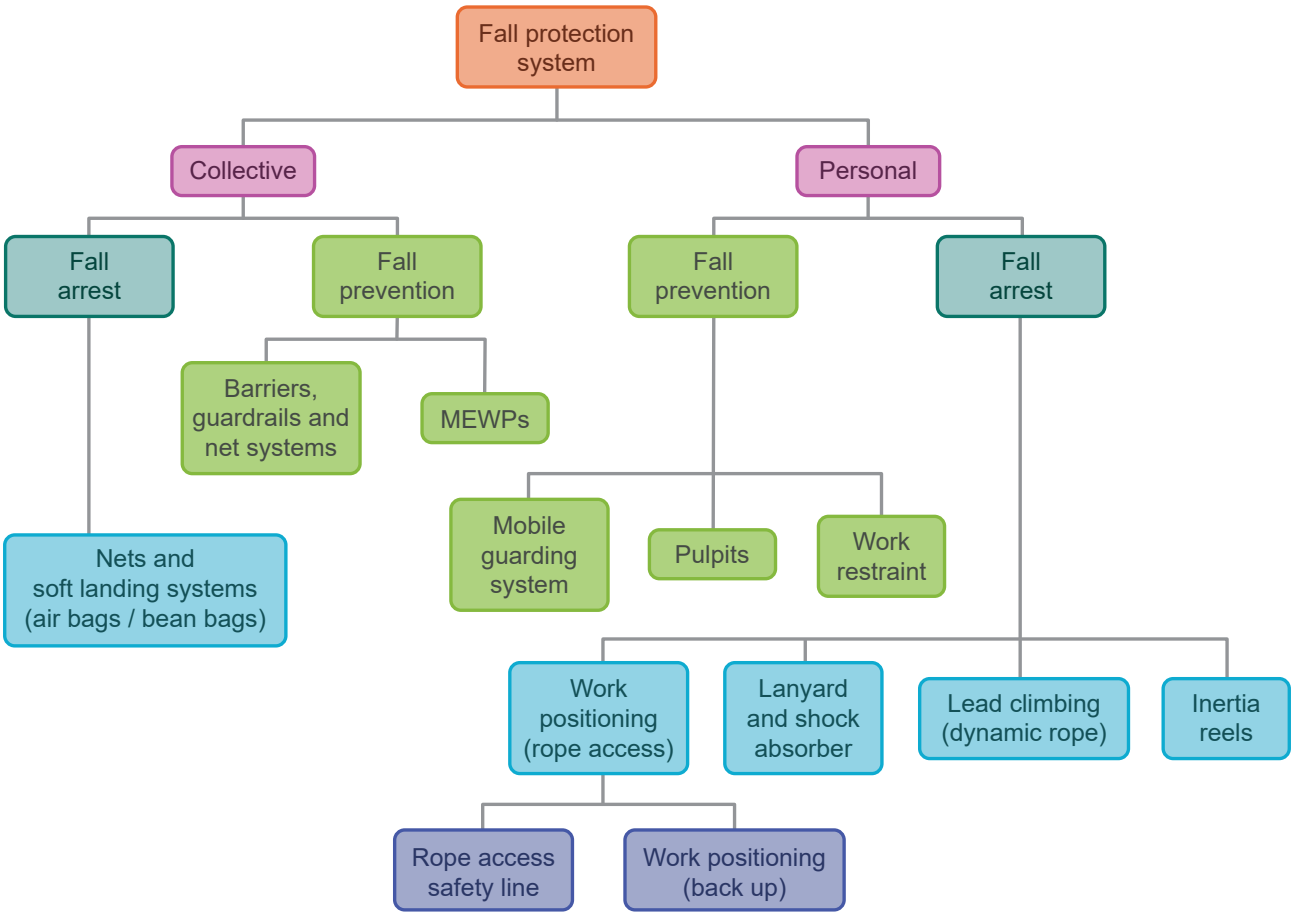


Figure 8.3: Fall protection systems

This section considers the following control measures:

- Fall prevention equipment:
  - guard rails
  - work restraint.
- Fall Arrest Equipment:
  - lanyard and shock absorber (and/or inertia reel)
  - landing systems.

Fall prevention equipment

Guard rails

Guard rails will, in many cases, be the best option for fall prevention as they are passive and afford collective protection.

When used as roof edge protection guard rails should include or be equivalent to:

- a main guard rail at least 950 mm above the edge
- a toe board and brick guard where there is risk of objects being kicked off the edge of the platform
- a suitable number of intermediate guard rails or suitable alternatives positioned so that there is no gap more than 470 mm.

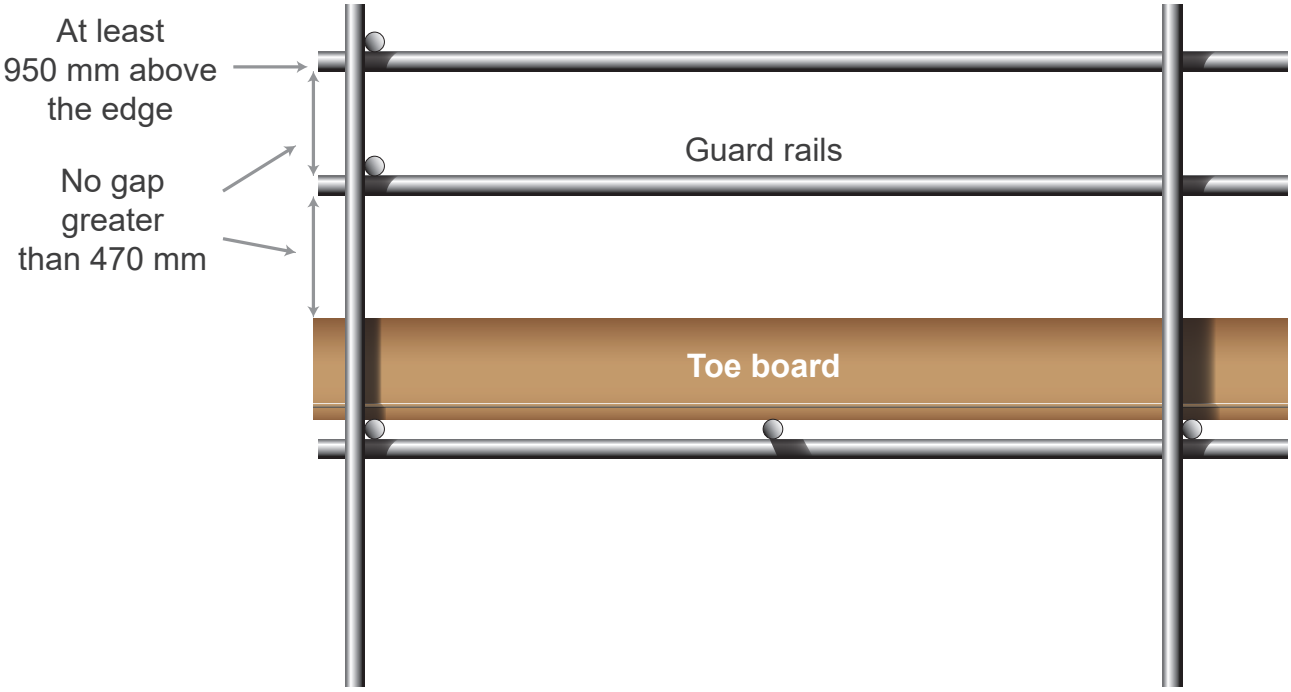


Figure 8.4: Guard rails and toe board

Work restraint

Work restraint is a personal fall prevention system whereby the user is physically prevented from reaching an edge by using a harness and a fixed length lanyard attached to a suitably located anchor.

Fall arrest equipment

Lanyard and shock absorber (or inertia reel)

A fall arrest system uses a harness connected to a reliable anchor to arrest and restrict a fall preventing the user from colliding with the ground or structure whilst limiting the forces on the body.

The means of absorbing energy and limiting the forces on the body once deployed is either an *energy-absorbing lanyard* or an *inertia reel*.

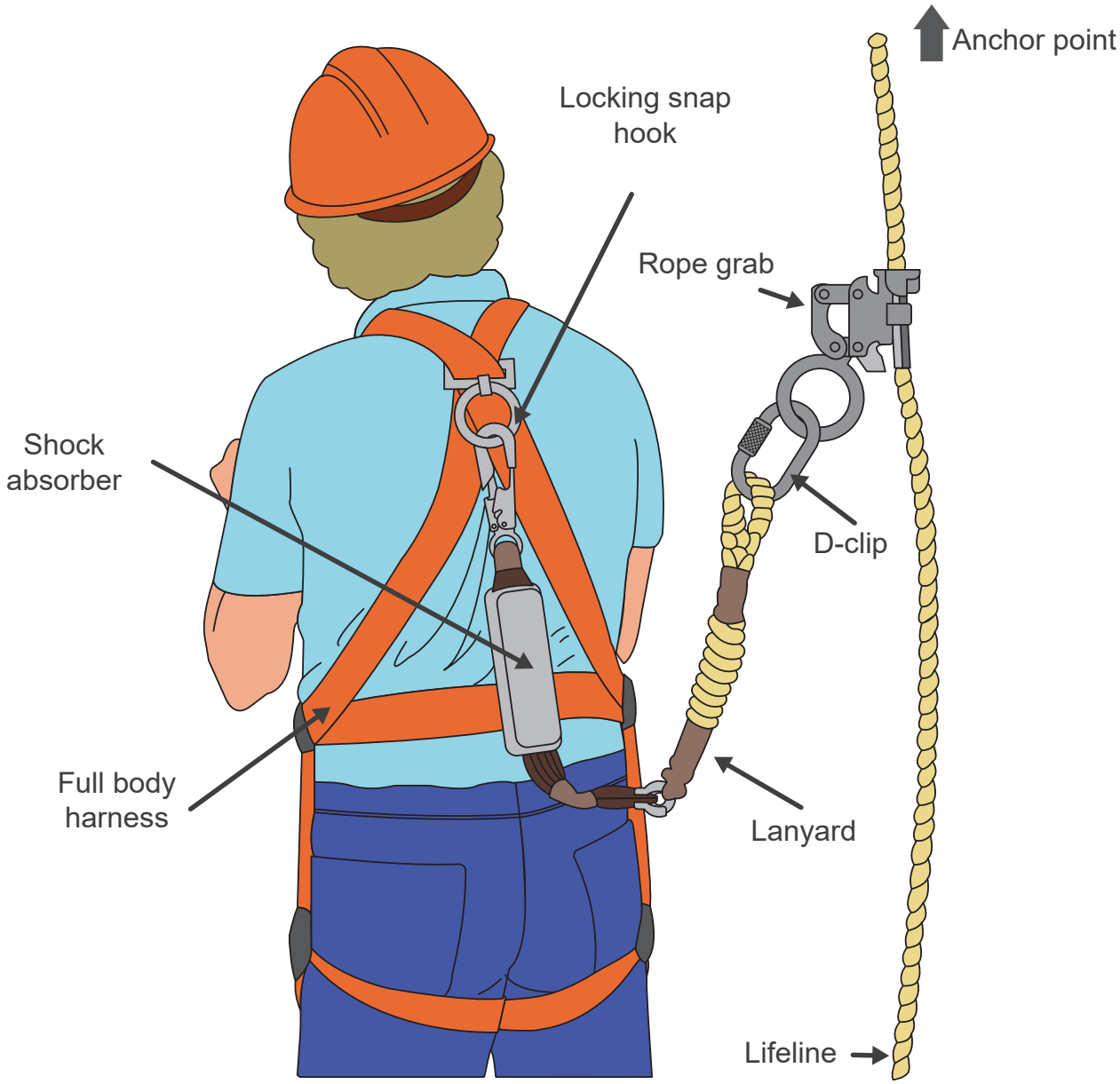


Figure 8.5: harness, lanyard and shock absorber

A typical fall arrest system will take 5 metres to deploy so there must be adequate clearance for the lanyard and energy absorber to deploy. Protection against sharp edges may be

needed if the lanyard can come into contact with *e.g.* a sharp roof edge on deployment.

Inertia reels should generally be anchored in the vertical position (*i.e.* above the user) so that the fall factor (fall distance divided by lanyard length) is minimised.

The user should remain within a 30-degree cone (or as per manufacturers' instructions) under the anchor, as deployment at a greater angle can result in the device failing to arrest a fall.

Harnesses and lanyards should only be selected as the last choice for protection against falls.

Anchorages and supporting structures, lanyards and harnesses, etc. should be compatible, identifiable, regularly inspected and the inspections recorded.

Equipment should be properly stored to avoid contamination with dirt or chemicals, abrasion or other damage.

Users should be trained in pre-use checks and how to use PPE, specifically:

- how to wear and adjust it to the body
- how to manage the lanyard and other equipment
- how to fall so as to minimise the risk of injury
- how to assemble the system correctly, including safe anchorages.

Landing systems

Work equipment such as safety nets or airbags can be used to provide a safe landing by minimising the distance and/or consequences of a fall.

Figure 8.6: Air bags and safety nets

Safety helmets

It is quite common for personal protective equipment such as safety helmets (sometimes referred to as hard hats), often with a chin strap, to be worn whilst working at height. This is mainly to protect the head from striking objects or the ground should a fall occur.

Fragile roofs

A fragile roof has a surface covering that would be liable to fail if any reasonably foreseeable loading were to be applied to it.

Fragile roof coverings include:

- asbestos cement sheet
- plastic sheet
- corroded metal sheet
- glass
- wood
- wool slabs
- roof lights.

Precautions

- Assume that roofs are fragile unless you can confirm otherwise.
- Provide warning at roof access points.
- Avoid working on a roof if it is possible to carry out the work in another way, *e.g.* approaching the roof from below.
- Do not go onto a fragile roof without using weight supporting platforms.
- Do not walk along the line of the purlin bolts.
- Ensure that platforms are wide enough and long enough to give adequate support across roof members and that there are enough platforms.
- Protect against falling through the fragile roof adjacent to the platform by providing:
  - safety net or scaffolding close to the underside of the roof
  - suitable guard rails and toe boards at the edges of the platform
  - further suitable coverings over all fragile materials within 2 m of the working platform.

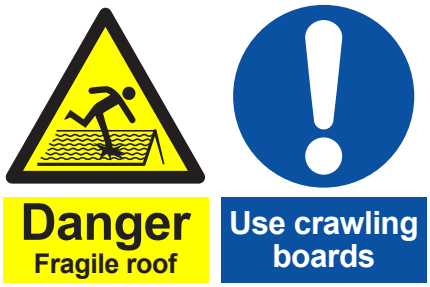


Figure 8.7: Warning signs

Common access equipment

This section looks at hazards and control measures for common access equipment including:

- ladders and step ladders
- trestles and staging platforms
- independent tied scaffolds
- mobile tower scaffolds
- Mobile Elevating Work Platforms (MEWP)
- leading edge protection systems.

Ladders and step ladders

In the UK a third of all reported fall-from-height incidents involve ladders and stepladders, typically accounting for more than 10 deaths and 1200 major injuries to workers each year.

A ladder should only be used for work at height if a risk assessment has demonstrated that the use of more suitable work equipment is not justified because of:

- the low risk:
  - *'light work'* (loads < 10 kg or otherwise justified by a detailed manual handling assessment)
  - a handhold is available on the ladder or stepladder
- three points of contact (hands and feet) can be maintained at the working position
- the short duration of use (maximum of 30 minutes in one position)
- existing features on site which cannot be altered.

Hazards and precautions

When working on a ladder or stepladder, care should be taken to avoid:

- overloading – the maximum load stated on the ladder should not be exceeded
- overreaching – the workers body should remain between the stiles and both feet should be planted on the same rung throughout the task.

Carrying of tools and equipment should be avoided (*e.g.* wearing a tool belt) so that three point contact can be maintained.

Where the job means that a handhold cannot be maintained other access equipment should be used. For some work off a step ladder such as loading or unloading from shelves the use of a stepladder may still be justified by a risk assessment, taking into account:

- the height of the task
- a safe handhold still being available on the stepladder
- whether it is light work
- whether it avoids side loading
- whether it avoids overreaching
- whether the user's feet are fully supported
- whether the stepladder can be tied.

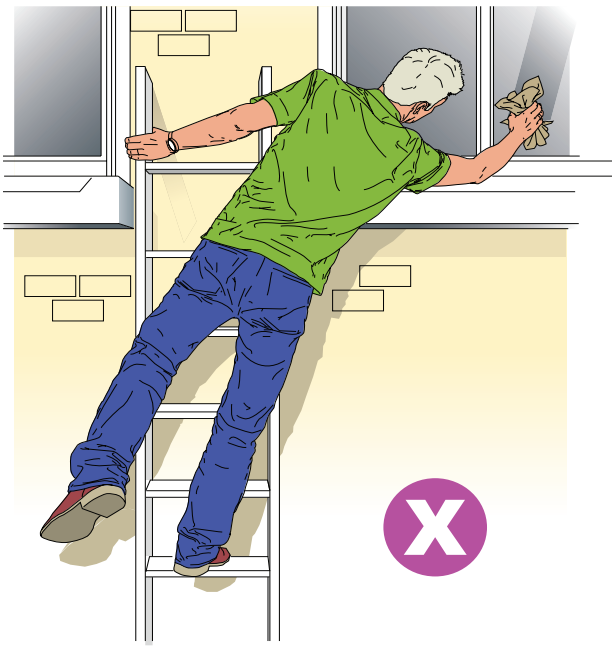


Figure 8.8: Overreaching

On stepladders side loading should be avoided by having the steps facing the work activity. Where side-on loadings cannot be avoided the steps should be tied to a suitable point, or a more suitable type of access equipment should be used.

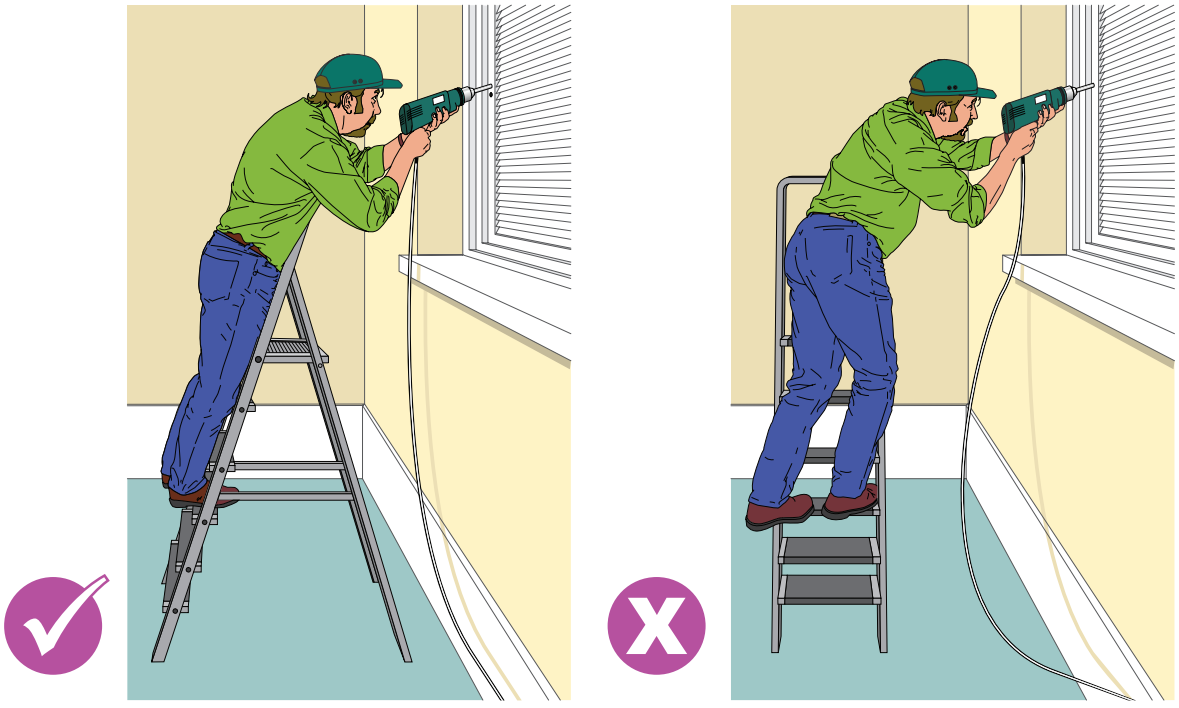


Figure 8.9: Avoiding side loading a step ladder

Selecting a ladder

- suitable for worst case surface conditions (*e.g.* smooth, wet floor tiles)
- suitable for the task/environment – *e.g.* non-conducting ladder for electrical work
- Industrial class ladders or stepladders for use at work
- suitable size for the work
- the use of the manufacturers recommended stability devices.

Safe positioning/setting up

A ladder or stepladder should only be used:

- on firm ground or on a suitable board to spread the load)
- on clean, solid surfaces, free of loose material so the feet can grip
- on level ground – for leaning ladders the maximum safe ground slopes on a suitable surface are:
  - side slope 16° (with level rungs)
  - back slope 6°.

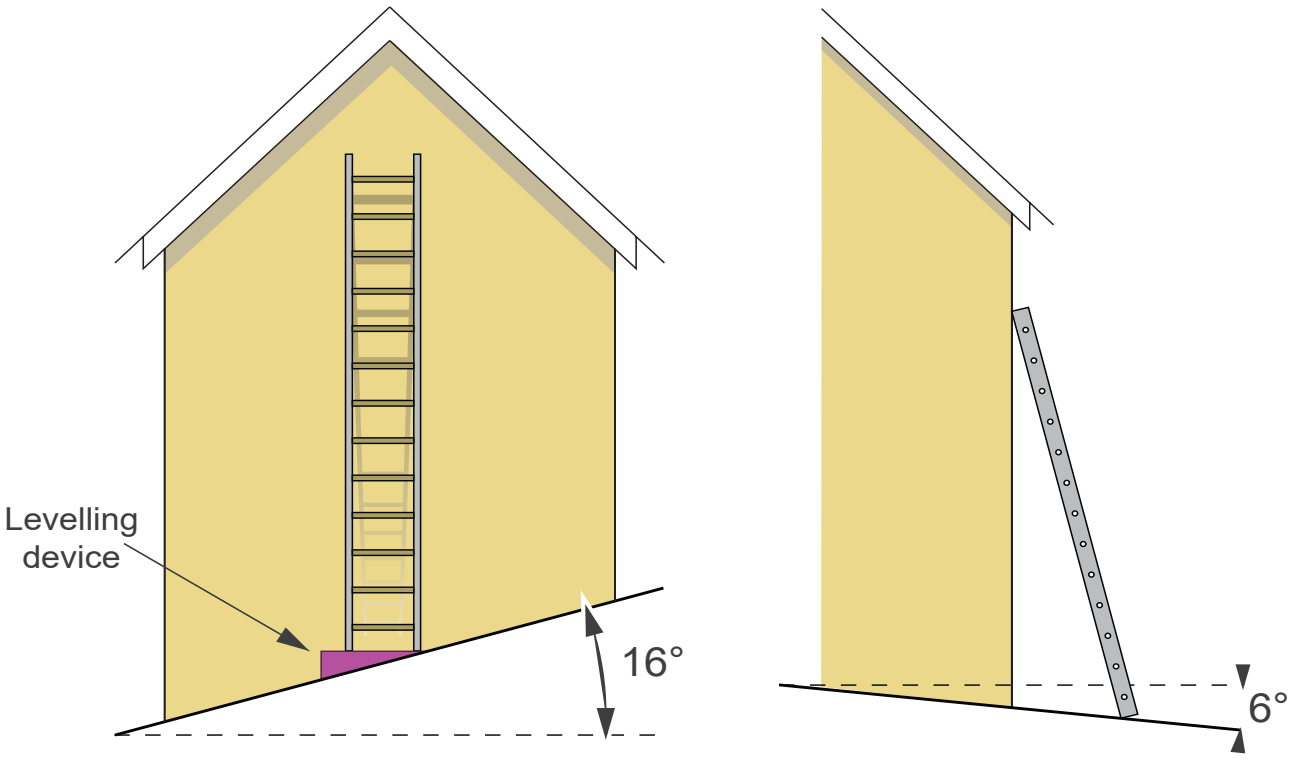


Figure 8.10: Maximum safe ground slopes

Securing a Ladder

The options for securing a ladder are:

- tie the ladder to a suitable point, making sure both stiles are tied
- where this is not practical, use a safe, unsecured ladder or a ladder supplemented with an effective ladder stability device
- if this is not possible, then securely wedge the ladder, *e.g.* against a wall
- if none of the above can be achieved, foot the ladder (footing is the last resort and should be avoided, where reasonably practicable, by the use of other access equipment).

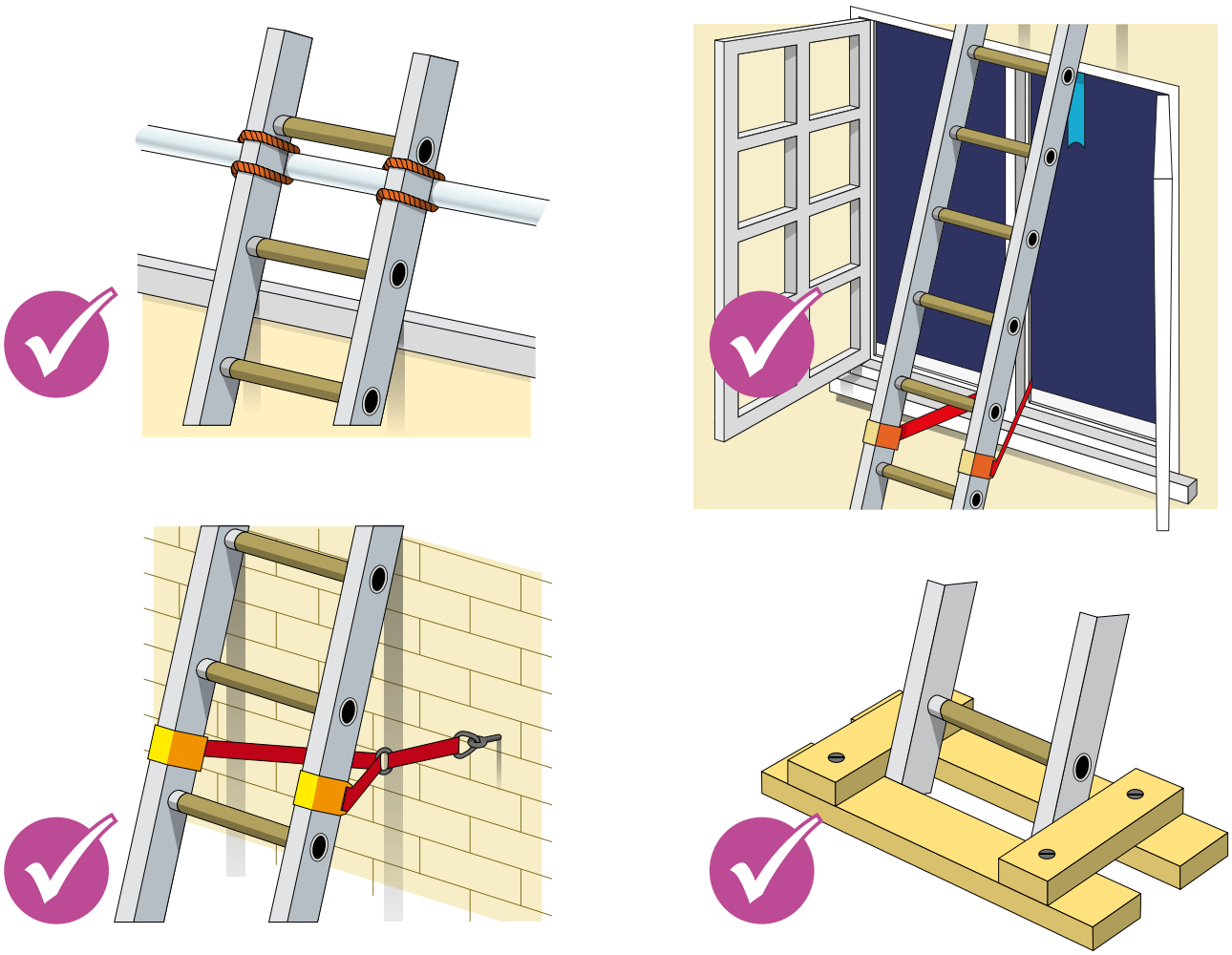


Figure 8.11: Securing a ladder

Training in safe use

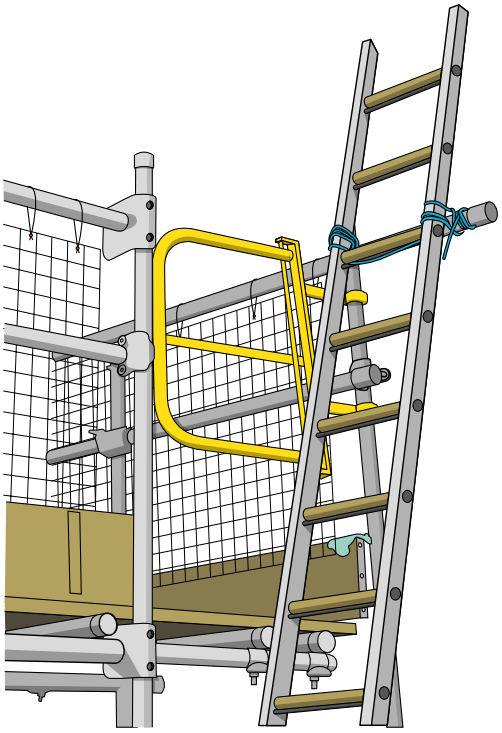
Ladders, stepladders and stability devices should only be used by people who are competent to do so.

Users should be trained and instructed to use the equipment safely, in accordance with the following rules:

1. Ensure the ladder or stepladder is long enough:
    - For ladders:
        - don't use the top three rungs

      Ladders used for access should project at least 1 m above the landing point and be tied.

    - For stepladders:
        - don't use the top two steps of a stepladder, unless a suitable handrail is available
        - don't use the top three steps of swing-back or double-sided stepladders, where a step forms the very top of the stepladder.



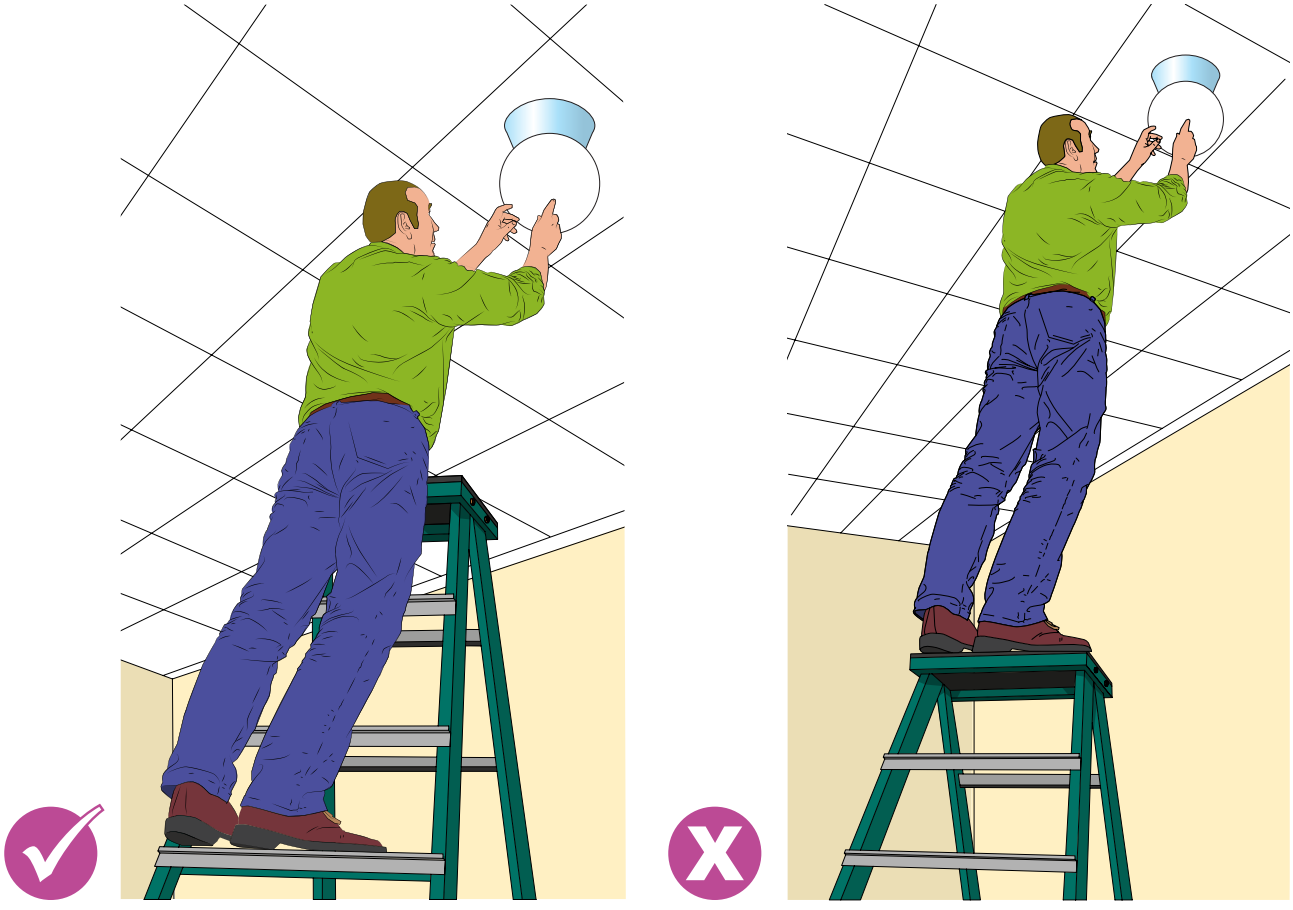


Figure 8.12: Stepladder – don't use top steps

2. Ensure the ladder or stepladder rungs or steps are level for use:
   - judged by naked eye
   - adjusted by specially designed devices.
3. Ensure the weather is suitable:
   - do not use in strong or gusting winds (follow manufacturer's advice).
4. Wear robust, sensible footwear (*e.g.* safety shoes/boots or trainers):
   - intact soles
   - no dangling laces
   - no mud/slippery contaminants.
6. Know how to prevent members of the public and unauthorised workers from using them.
7. Know that certain medical conditions or medication, alcohol or drug abuse could stop them from using ladders.
8. Know how to tie a ladder or stepladder properly.

Trestles and staging platforms

Trestles are made with a swing back similar to step ladders but both halves have heavy cross bearers to support a working platform. Platforms should be of lightweight staging. Access to trestle platforms should be by means of a step ladder.

Trestles can be used if the risk assessment shows that the risk of a person falling and injuring themselves is low and the work on top of the trestle is of short duration.

Steel or aluminium trestles are used in conjunction with scaffold boards or staging. Guardrail systems are available for trestles and if they are not used the decision would need to be justified by risk assessment.

Other supports, such as bandstands, are used with staging and are often referred to as trestles.

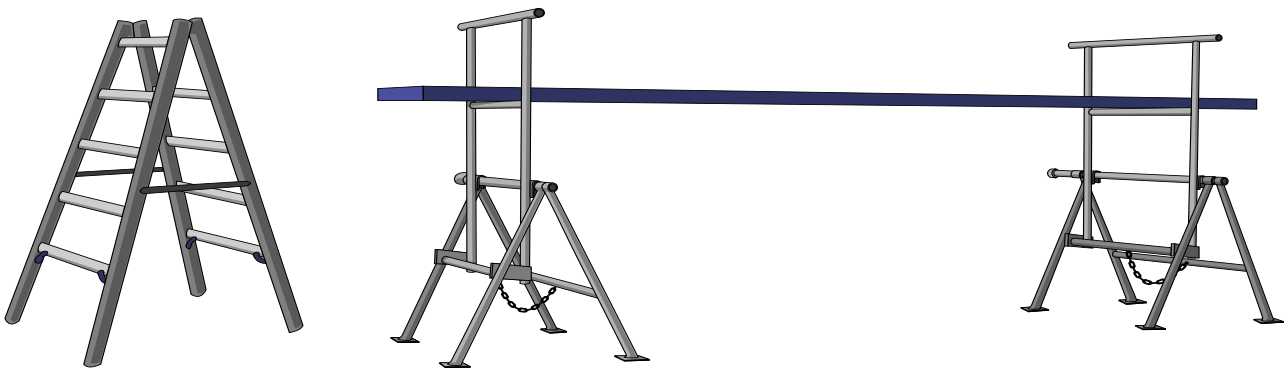


Figure 8.13: A frame trestle and extending trestles with working platform

Independent tied scaffold

An independent tied scaffold is a traditional tube and coupler scaffold. It is independent because it is free standing although it is tied into the building being worked on to provide increased horizontal stability.

An independent scaffold is constructed with two rows of standards (vertical tubes) – internal (close to the structure) and external.

The distance between the standards, parallel with the face of the building, is called the bay-length. A shorter bay length means that the scaffold is stronger and capable of supporting heavier loads.

The components are illustrated in Figure 8.14 (a simplified illustration) and described in Table 8.6.

Provided the scaffold is properly designed, constructed, maintained and used it provides a safe means of access and a safe working platform which through the provision of guard rails and toe boards prevents falls and falling objects.

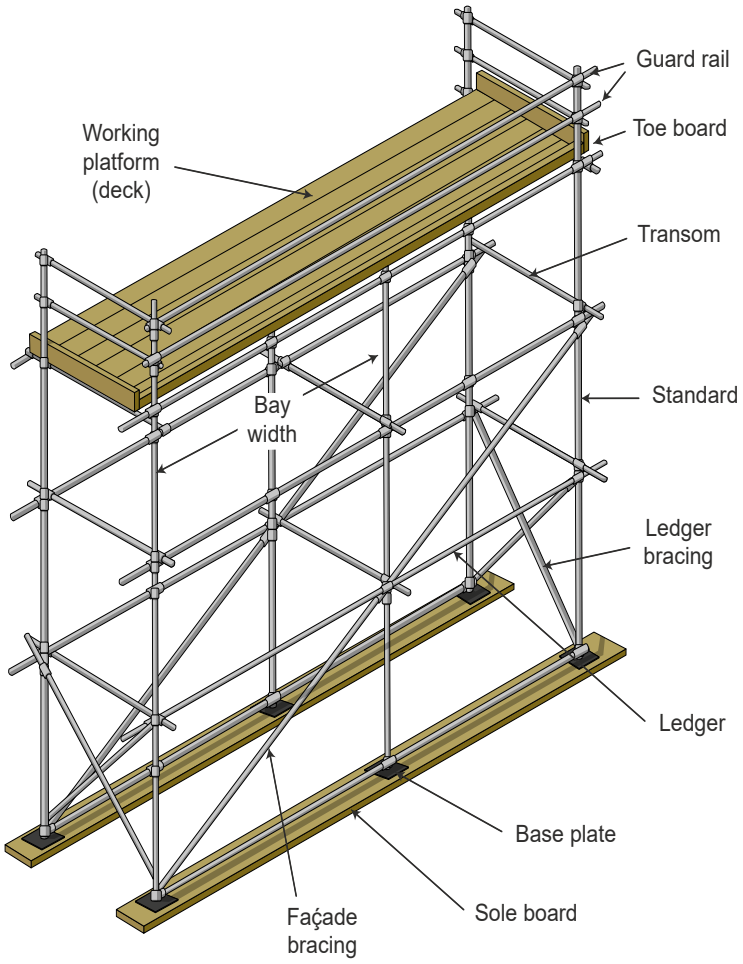
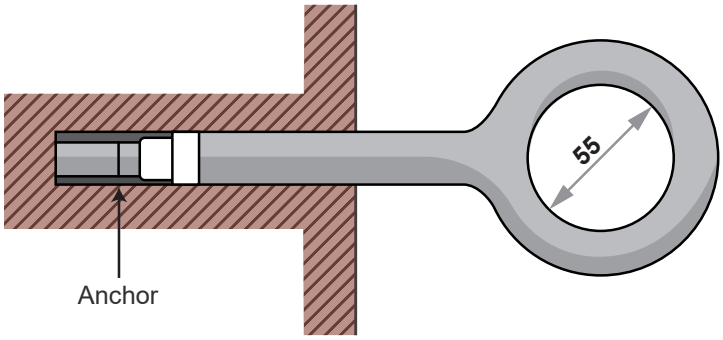


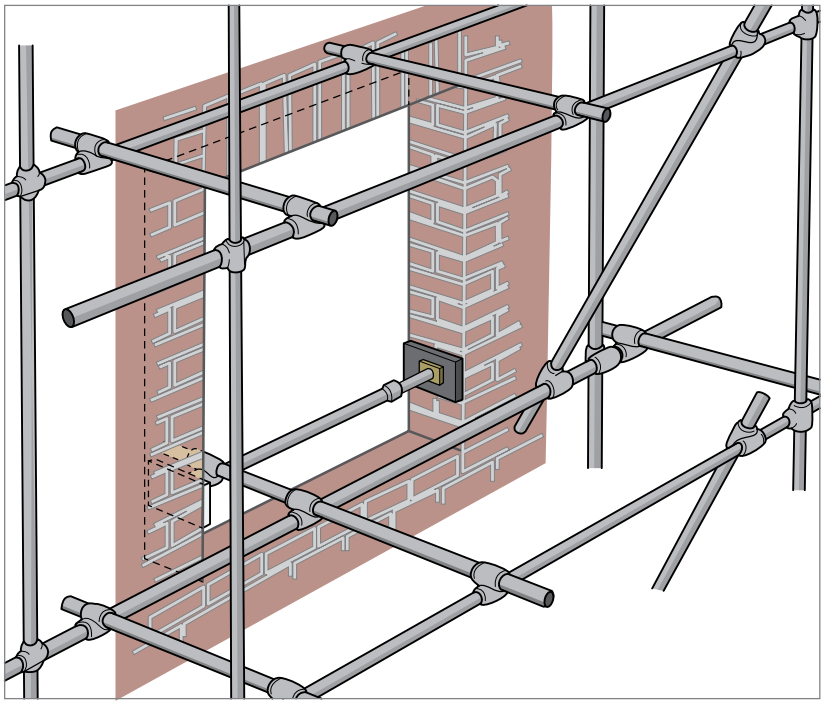
Figure 8.14: Independent tied scaffold

Component	Description
Standard	Vertical (upright) tube
Ledger	Horizontal tube – in the direction of the larger dimension of the working scaffold
Transom	Horizontal tube – in the direction of the smaller dimensions of the working scaffold
Raker	Load-bearing tube inclined at 75° and coupled to the second lift. Used where normal ties are inappropriate
Façade (Face) bracing	Diagonal tube parallel to the façade of the building
Ledger bracing	Diagonal tube perpendicular to the face of the building
Base plate	Metal plate used to spread the load from a standard (Base plates with vertical adjustment are called base jacks)
Sole board	Timber plank positioned beneath two or more base plates to evenly distribute the scaffold load over the ground
Coupler	Device used to connect two tubes
Tie	Means of securing the scaffold to the building (See Figure 8.15)
Bay	Distance between pairs of standards (parallel to face of building)
Lift	A storey

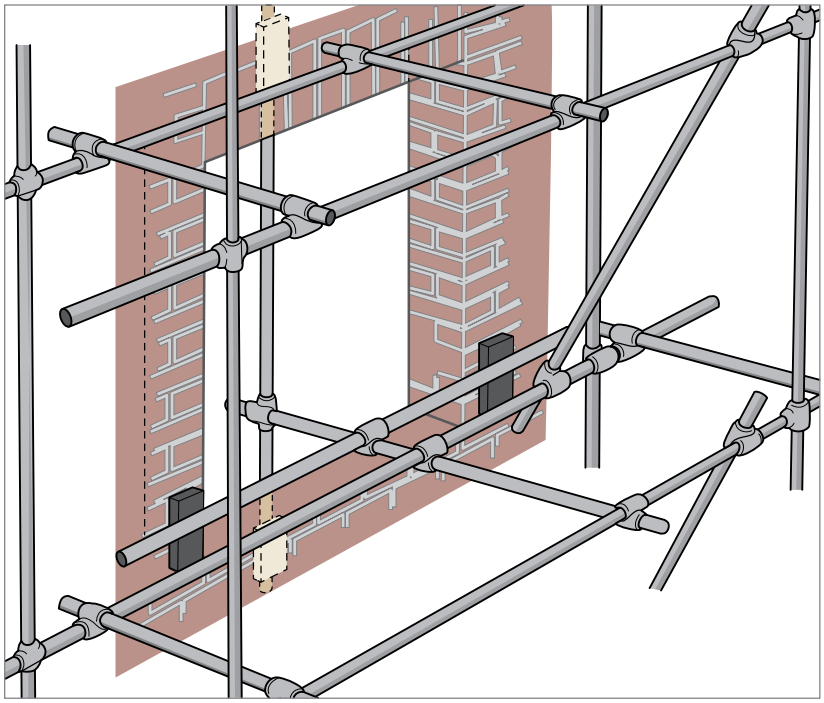
Table 8.6: Scaffold components and features



Eye bolt



Reveal tie



Through tie

Figure 8.15: Scaffold ties

Scaffolding – hazards and precautions

The main hazards associated with scaffolds are:

- collapse of the scaffold
- people falling from the scaffold
- objects (including components) falling, or being dropped from the scaffold
- people walking into the scaffold.

The risk factors and precautions are outlined in Table 8.7.

Hazards	Precautions
Collapse: • inadequate design and construction • overloading • wind loading if sheeted • vehicular impacts.	Designed and constructed by competent scaffolders. Loaded within specification of design class. Additional ties provided if sheeted to cope with additional wind loading. Segregated from vehicular traffic and/or protected by barriers.
Fall from height: • workers • trespassers.	Safe means of access provided. Working platforms fully boarded and edge protected. Site security. Ladders removed and secured outside of working hours.
Falling objects: • construction materials/tools • scaffold components.	Provision of toe boards/brick guards. Segregated or protected pedestrian walkways. Safe systems and adequate supervision for erection and taking down.

Hazards	Precautions
People walking into scaffold: • workers • public – pedestrians if scaffold on pavement/highway.	Highlighted with hazard warning tape and lighting. Guide rail for visually impaired (if on highway). Padding of tube ends.

Table 8.7: Scaffold – major hazards and precautions

General advice for scaffolds

- only competent people should design, alter, erect or dismantle a scaffold
- scaffolds should be:
  - erected on a firm, level foundation, capable of supporting the weight of the scaffold and any loads likely to be placed on it
  - fully braced and tied into the building being worked on
- scaffolds should not be overloaded and should be designed for the appropriate class of use (See Table 8.8)
- working platforms should be fully boarded and edge protected and be wide enough for the class of use (Table 8.8).

Load Class	Type of scaffold	Use of scaffold	Platform loadings		No of boards	Max. bay length
			kN/m²	Kg/m²		
1	Very light duty	Inspection Access	0.75	75	3-5	2.4 m
2	Light duty	Plastering Painting Cleaning	1.5	153	4-5	2.4 m
3	General purpose	Building work Light brick work	2.0	200	4-5	2.0 m
4	Heavy duty	Brickwork Heavy cladding	3.0	300	4-5	1.8 m

Table 8.8: Independent tied scaffold – classes of use (National Access & Scaffolding Confederation – NASC UK)

Statutory inspection of scaffolds

Scaffolds must be regularly inspected by a competent person:

1. immediately after it has been constructed (the scaffold contractor should provide a hand-over certificate within 24 hours of completing the scaffold)
2. before anybody goes on to it (this may be some time after it has been built)
3. after any incident that may have damaged it. *e.g.* after a storm or vehicle impact
4. every 7 days (a formal report must be completed and entered into the site register).

A written report should be made following inspection and before the end of the working shift. The report or a copy should be provided to the person on whose behalf the inspection was carried out within 24 hours.

The following information should be included:

- name and address of person on whose behalf the inspection was carried out
- location of the workplace inspected
- description of workplace or part of workplace inspected
- date and time of inspection
- details of any matter identified that could lead to a health or safety risk
- details of any action taken as a result of any identified health or safety risk.

Mobile tower scaffold

Mobile access towers are widely used and can provide an effective and safe means of gaining access to work at height. However, aluminium and thin-wall steel towers are light and can easily overturn if used incorrectly.

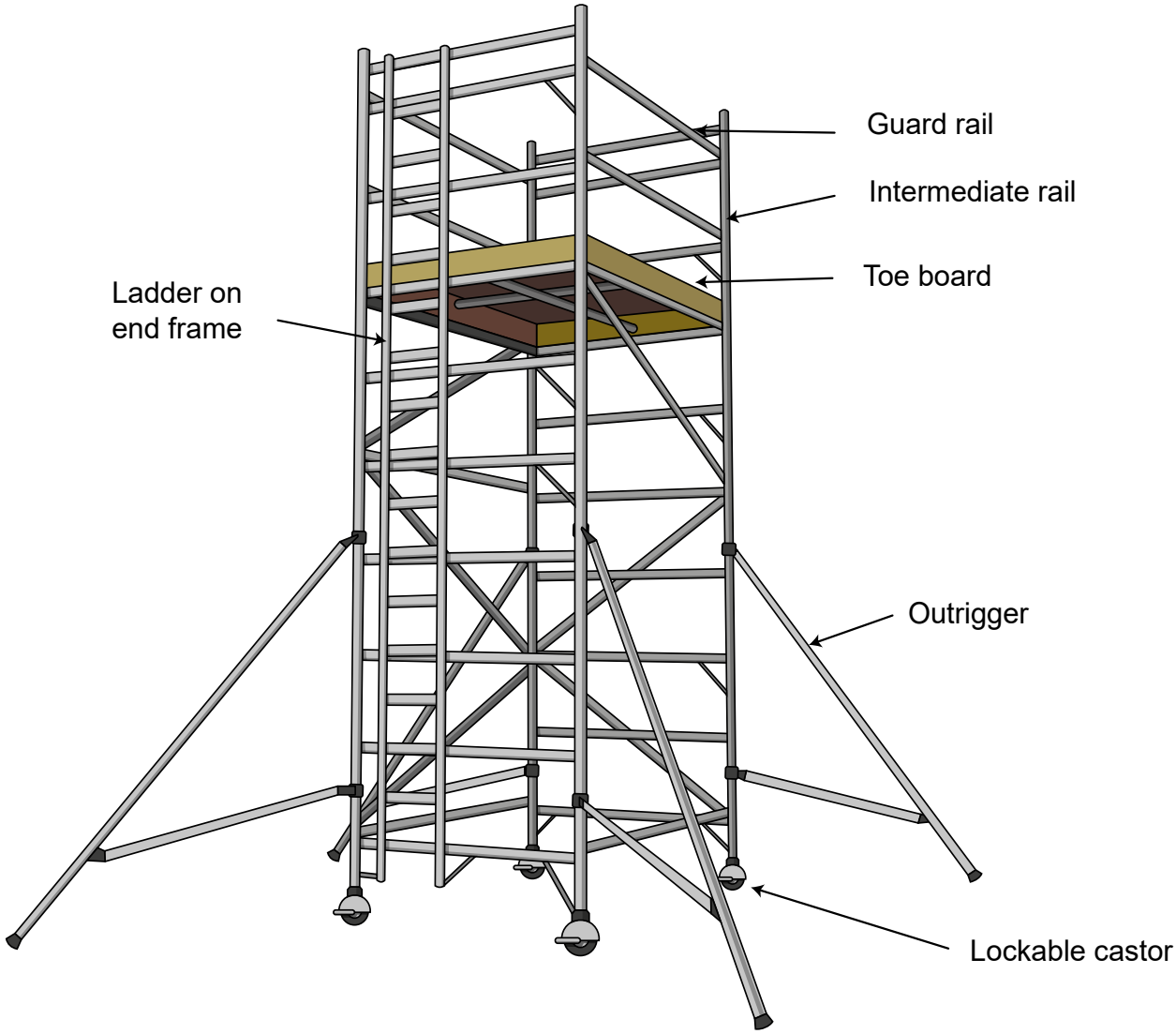


Figure 8.16: Mobile tower scaffold

Safe erection

Mobile tower scaffolds should be constructed by competent personnel in accordance with the erection sequence specified in the manufacturers' instructions.

Towers should not be erected taller than manufacturers' instructions (maximum height is usually a multiple of shortest base dimension) and should only be constructed with compatible components, in good order.

In the UK the Prefabricated Access Suppliers and Manufacturers Association (PASMA) has worked with the HSE to develop safe methods of work for tower scaffold erection. There are two approved methods:

- **Advance guard rail systems** – Uses specially designed temporary guard rail units, which are locked in place from the level below and moved up to the platform level.
- ***'Through the Trap'*** **(3T)** – Makes use of standard tower components with the operator taking up a working position in the trap door of the platform, from where they can add or remove the components which act as the guard rails on the level above the platform.

Safe use

The tower should be used on firm, level ground. The castors should be locked, or base plates properly supported. Outriggers should be used in accordance with the manufacturer's recommendations.

Barriers should be erected at ground level to prevent people walking in the area adjacent to the tower.

The tower should not be over loaded with heavy materials or equipment. Side loading should also be avoided as this will affect the tower stability, *e.g.* supporting ladders, trestles and rubbish chutes, and strong winds, especially when sheeted.

Safe access must be provided to the work platform. This is usually by an integral internal ladder. The rungs on the tower end frames should not be climbed unless specifically designed for the purpose.

The working platform must be provided with suitable edge protection including guard rail, intermediate rail and toe boards.

Moving the tower

The route of travel should be checked for overhead obstructions, poor ground conditions and other hazards such as moving vehicles.

The tower height should be reduced to less than 4 m.

The tower should only be moved by manual force (pushing or pulling) applied at waist to shoulder height. The tower should never be towed by a vehicle.

The tower should not be moved with people, materials or equipment on it, and should not be moved in high winds.

Inspections and reports

The inspection requirements for mobile towers scaffold depends upon the height of the scaffold as in Table 8.9:

Working platform < 2 m high	Working platform 2 m or higher
• after assembly in any position • after any event liable to have affected its stability • at suitable intervals depending on frequency and conditions of use.	• after assembly in any position • after any event liable to have affected its stability • at intervals not exceeding seven days.

Table 8.9: Inspection requirements for mobile tower scaffolds

The results of the inspection should be recorded and kept until the next inspection.

For towers over 2 m inspected after assembly or to comply with the seven-day regime the report must be written in the same shift as the inspection and forwarded to the responsible person within 24 hours.

The report must be kept on site until construction work is complete and in any case be retained for 3 months.

Mobile Elevated Work Platforms (MEWPs)

MEWPs are either of a scissor lift or *'cherry picker'* design. Cherry pickers may have telescopic or articulated booms. MEWPs may be vehicle mounted, trailer mounted, or self-propelled.

Figure 8.17: MEWPs – Self-propelled scissors lift and articulated boom

The increasing use of MEWPs is believed to have reduced the numbers of fatal fall from height accidents in the construction sector. However, between 2003 and 2009 seven people were killed as a result of being crushed between a MEWP and a fixed structure. Other fatalities have been reported as a result of a MEWP collapsing or overturning, and as a result of operators being thrown from the carrier.

Safe systems of work for using a MEWP can be developed by considering the hazards and corresponding precautions relating to the plant, workplace and operator.

Safe plant

The right MEWP should be selected for the job, following consideration of ground conditions, working height, load and manoeuvrability.

The platform should be of sufficient size and be fitted with edge protection comprising guard rail, intermediate rail and toe boards.

If there is still a risk of a person falling appropriate fall protection equipment should be provided: *work restraint systems* which prevent falling from the carrier or *fall arrest systems* which stop a person falling to the floor.

Manufacturers' instructions should be followed regarding moving a MEWP with the carrier raised.

Outriggers, if fitted, should be fully extended and chocked in place prior to raising the carrier.

The MEWP must be maintained in safe working order. Planned preventative maintenance should be carried out by competent persons in accordance with the manufacturer's instructions.

The MEWP should be regularly inspected to ensure it remains in safe working order. The inspection regime should include:

- pre-use checks by the operator
- weekly inspections by a responsible person
- thorough examination by a competent person at least once every six months.

Safe workplace

Environment

- ground conditions – softness, slopes, pot holes etc.
- overhead obstructions, especially electricity cable
- weather conditions (*e.g.* maximum wind speed).

Management

- segregation of other site traffic from the proposed work area
- effective communication systems
- permit to work procedures
- emergency plans.

Safe operator

The operator must be competent to use the class of MEWP in the operating environment (Approved training by Construction skills or International Powered Access Federation – IPAF).

Operators should also be provided with any necessary task-specific training for the operations to be conducted from the MEWP.

Leading edge protection systems

Purlin trolleys are used as an alternative to fall arrest systems and safety netting during roofing operations and are suitable for many industrial roofing situations.

Purlin trolley systems are essentially passive systems and offer collective protection.

The exposed leading edge (*i.e.* the opposite side to that being worked on) is protected at all times, prior-to and following roof sheet installation, as the fixed double guardrail is always in front of the roofing operations.

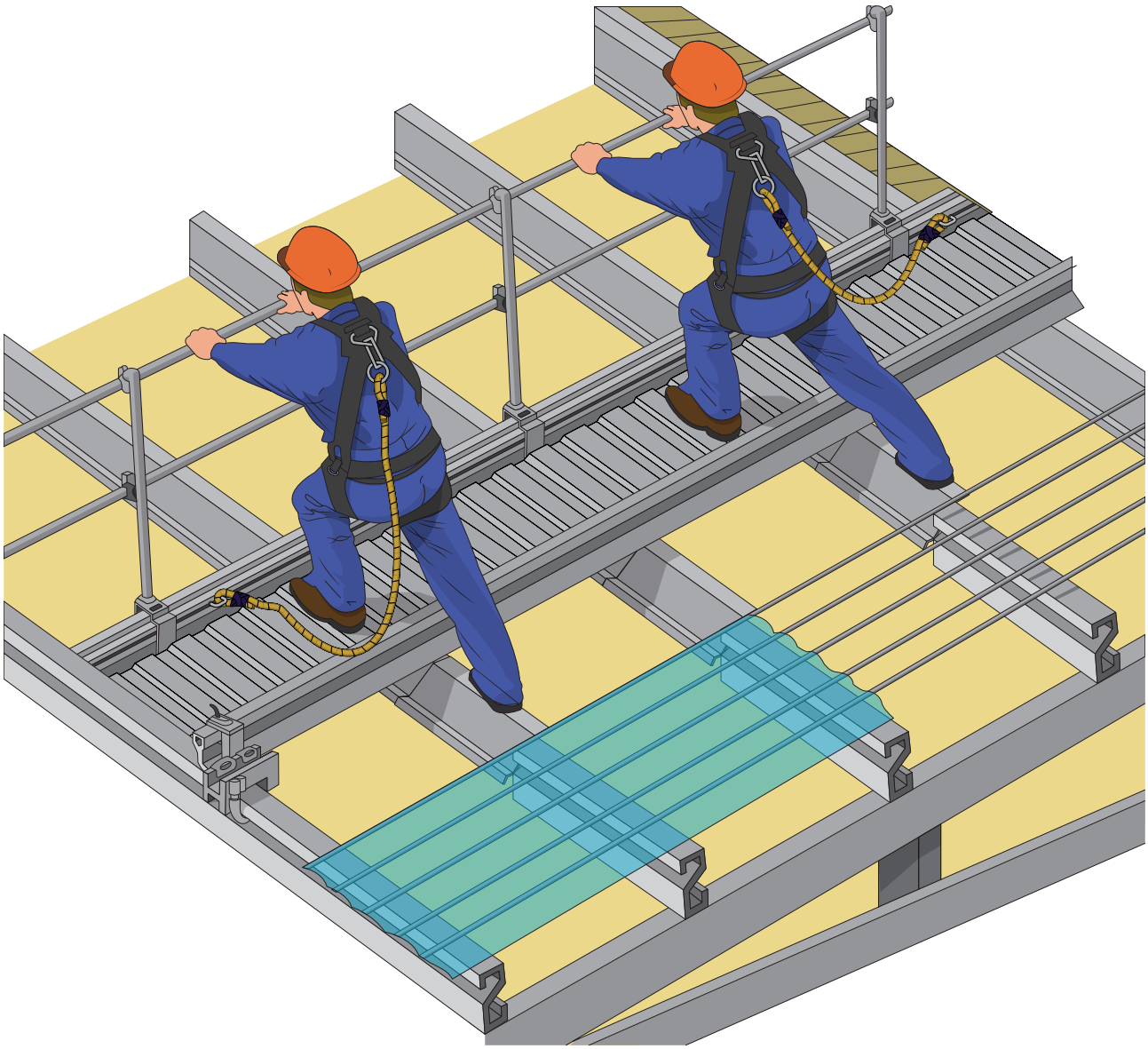


Figure 8.18: Purlin trolley – leading edge protection system

The systems provide a safety deck for the users to walk on, and to store their hand tools. No access is required to the area below the roof for the installation and use of purlin trolley systems.

The working edge is protected by a support framework, positioned between the roof purlins, which prevent the operative falling into the gap when the trolley is moved along as the installation progresses.

Emergency rescue

All rescue planning and operations should address the following issues:

- the safety of the persons carrying out or assisting with the rescue
- the anchor points to be used for the rescue equipment
- the suitability of equipment (anchors, harnesses, attachments and connectors) that has already arrested the fall of the casualty for use during the rescue
- the method that will be used to attach the casualty to the rescue system
- the direction that the casualty needs to be moved to get them to the point of safety (raising, lowering or lateral)
- the first aid needs the casualty may have with respect to injury or suspension trauma
- the possible needs of the casualty following the rescue.

Suspension trauma

The longer the casualty is suspended without moving, the greater the chances are of suspension trauma developing and the more serious it is likely to be.

The term *'suspension trauma'* is used to describe the situation of a person falling into suspension in a harness and then becoming unconscious.

A casualty who is experiencing pre-syncopal symptoms or who is unconscious whilst suspended in a harness should be rescued as soon as is safely possible.

If the rescuer is unable to immediately release a conscious casualty from a suspended position, elevation of the legs by the casualty or rescuer where safely possible may prolong tolerance of suspension.

First responders to persons in harness suspension should be able to recognise the symptoms of pre-syncope. These include:

- light headedness
- nausea
- sensations of flushing
- tingling or numbness of the arms or legs
- anxiety
- visual disturbance
- a feeling they are about to faint.

Motionless head up suspension can lead to pre-syncope in most normal subjects within 1 hour and in a fifth within 10 minutes.

Emergency services should be alerted early of suspected suspension trauma as the casualty might need dialysis to protect the kidneys.

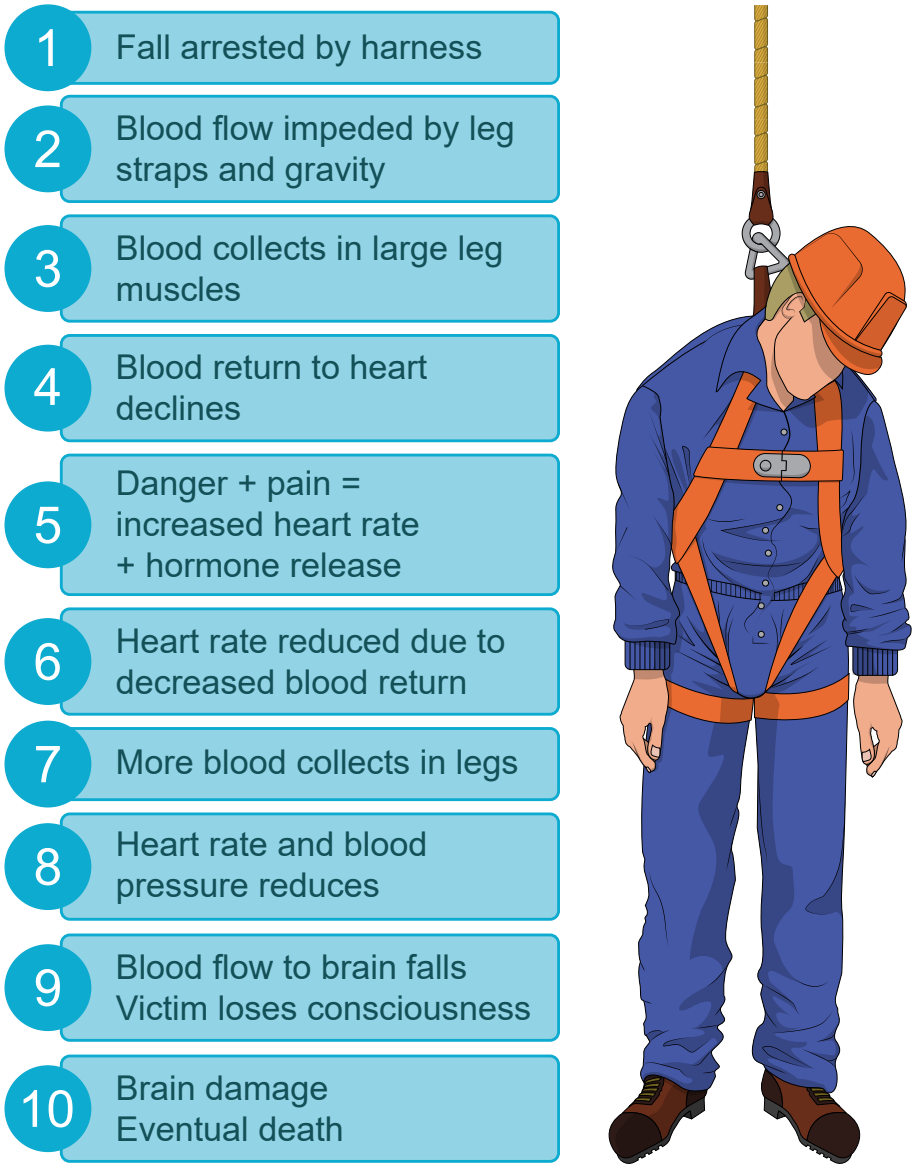


Figure 8.19: Suspension trauma

Storage systems

The most common methods of storing goods and materials use either pallets and/or racking.

Common causes of items falling include:

- goods disturbed from a congested shelf
- goods pushed through the back of a racking location due to carelessly positioned stock or excessive stock levels
- goods falling from pallets during handling on a fork-lift truck
- material falling from a poorly loaded vehicle.

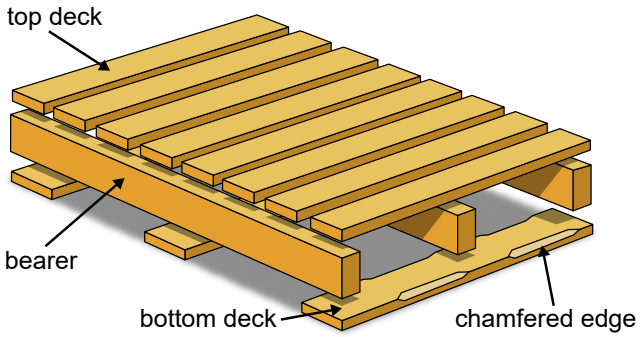
If there are areas or specific activities in the workplace with a risk of someone being struck by falling objects or materials, *e.g.* a warehouse, the area should only be accessible to authorised, competent personnel.

Pallets

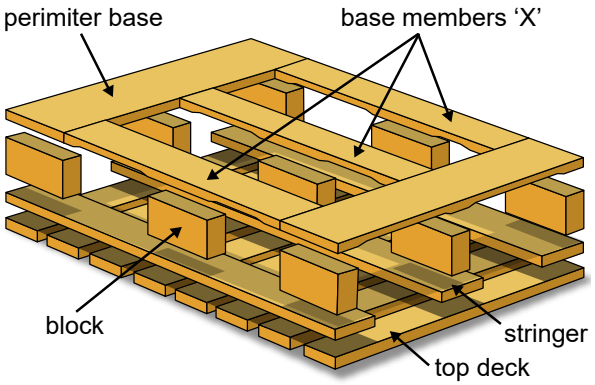
A pallet is simply a portable platform designed to store and transport goods and materials.

Flat pallets, *post pallets* and *box pallets* are the most common types of pallets used in warehouses.

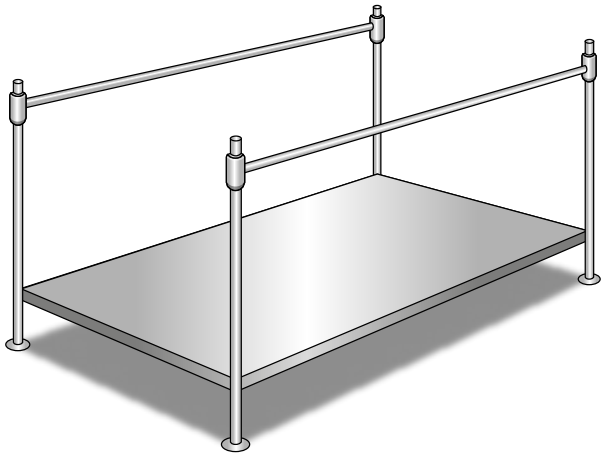
Flat pallet - two-way entry non-reversible (topside view)



Flat pallet (b) four-way entry (underside view)



Post pallet



Box pallet

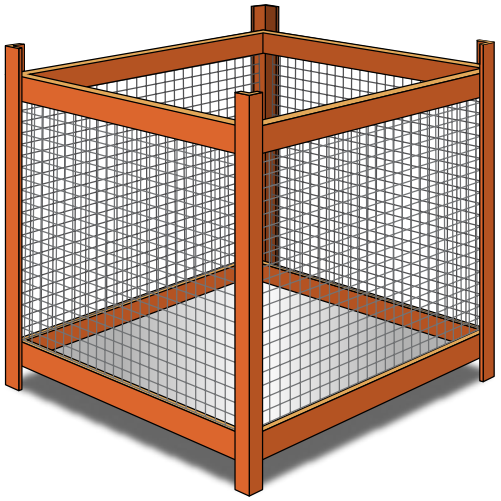


Figure 8.20: Examples of types of pallets

Regardless of type, pallets should be of:

- sound construction
- sound material
- adequate strength
- appropriate size and shape, especially when used with racking – the design and dimensions of pallets vary worldwide.

Pallets are heavy, so when accidents occur they tend to be serious. Falling pallets have caused a number of fatal accidents

Accidents directly attributable to pallets are usually caused by:

- Using a pallet which is unsuitable for a particular load, handling or storage method, or environment;

- Unsafe stacking resulting in falling stacks or pallets;
- Mixing smaller europallets (800 mm x 1200 mm) with larger uk pallets (1200 mm x 1000 mm) in racking systems. The smaller pallet may fall from the rack beams or be displaced by the larger pallet;
- Using a damaged pallet;
- Bad mechanical handling techniques;

Racking systems

The term *'racking'* is used to describe a skeletal framework, of fixed or adjustable design, to support loads generally without the use of shelves.

Racking systems are widely used in warehouses to provide space and provide for easy access and retrieval of goods.

All racking systems should be of good mechanical construction, of sound material, adequate strength and installed and maintained in accordance with the manufacturer's instructions. The maximum safe working load and design configuration for any racking installation should be conspicuously displayed (Figure 8.21).

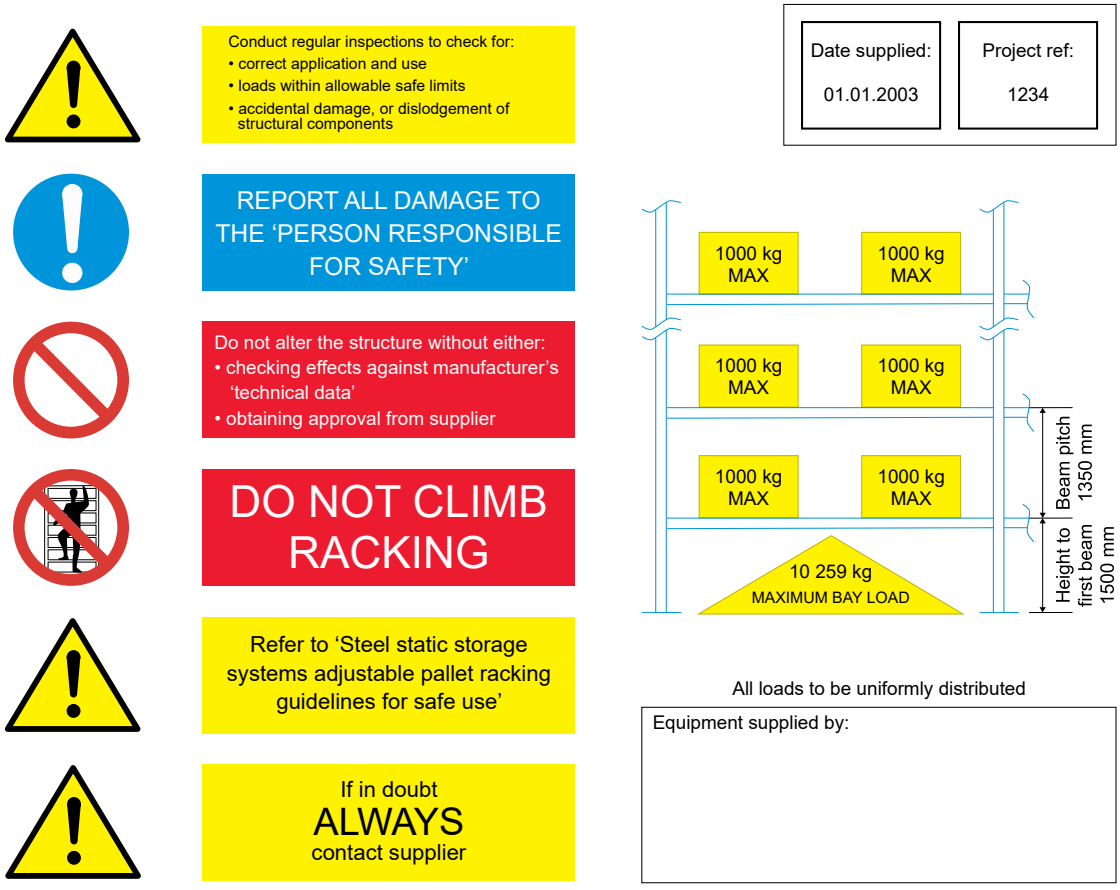


Figure 8.21: Example of a racking notice

Racking installation

The requirements for the safe installation of racking depending on the:

- type and size of the system
- nature of the building or area for which it is intended.

Safe working loads, heights, widths and equipment tolerances should be set by the designers and manufacturers of the total system.

Racking should only be installed by competent people in accordance with the manufacturer's instructions *i.e.* those registered under SEIRS (Storage Equipment Installers Registration Scheme) via SEMA (Storage Equipment Manufacturers' Association).

Racking stability

The main factors that influence the stability of the racking installation are:

- the height-to-depth ratio
- whether it is fixed to the floor or other suitable parts of the building structure.

Racking inspection and maintenance

Racking should be inspected on a regular basis. The frequency of inspections should be determined by a competent person to suit the operating conditions of the warehouse.

The inspection programme should follow a hierarchical approach using several levels of inspection, *i.e.*:

Immediate reporting

- employees should be trained to recognise damage or other safety problems and to promptly report their concerns

Visual inspections

- Managers should undertake a formal weekly inspection (or other regular interval based on risk assessment) and keep a written record. weekly or other regular intervals based on risk assessment. A formal written record should be maintained.

'Expert' Inspections

- thorough inspections should be undertaken by a technically competent person at intervals not exceeding 12 months
- a written report should be submitted to the PRRS with observations and proposals for any action necessary.

A technically competent person might be a trained specialist within an organisation, a specialist from the rack supplier, or an independent qualified rack inspector.

Rack inspections are generally undertaken at ground level unless there are indications of problems at high level that need investigation.

Automated and high-bay systems cannot be fully observed from the ground. Formal inspection of these systems should include:

Where damage is identified that affects the safety of the racking system, the racking should be offloaded, and controls introduced to prevent it being used until remedial work has been carried out.

8.3 Safe working within confined spaces

Many people are killed each year in confined space accidents at work. Incidents often involve multiple fatalities as untrained rescuers are also killed during a rescue attempt.

A confined space is defined as:

'any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk.'

Although usually substantially enclosed, a confined space need not be totally enclosed.

Specified risks are risks of:

- serious injury from a fire or explosion
- loss of consciousness as a result of an increase in body temperature
- loss of consciousness or asphyxiation arising from gas, fume, vapour or the lack of oxygen
- drowning from an increase in the level of liquid
- asphyxiation from a free flowing solid or entrapment by a free flowing solid preventing access to a breathable atmosphere.

Examples of confined spaces may include cellars, deep excavations, sewers, silos, storage tanks and ductwork etc.

As well as the *'specified risks'* work in confined spaces may present a broad range of hazards associated with the type of confined space, or arising from a particular work activity with an increased risk when undertaken in a confined space.

No work person should enter a confined space for work if it is reasonably practicable to undertake the task without entering. *i.e.* there is a presumption against entry, wherever possible entry should be avoided.

Examples of doing work without entering a confined space include:

- sampling contents using long handled tools
- inspection of vessel interiors by remote controlled cameras and CCTV monitors
- cleaning by designed in self-cleaning systems.

If it is necessary to enter a confined space for work the entry must be in accordance with a system of work which renders the work safe and without risks to health. (Except in an emergency).

The precautions required in a safe system of work will depend on the nature of the confined space and the risk assessment findings. The risks involved and precautions needed for cleaning car interiors with solvents are straightforward compared to those needed for undertaking welding work inside a chemical reactor vessel.

The main elements to consider when designing a safe system of work are:

Supervision

The degree of supervision should be based on the findings of the risk assessment. The supervisor's role is to ensure that:

- the necessary safety precautions are taken
- anyone in the vicinity of the confined space is informed of the work being done
- if used, the permit-to-work system operates properly.

Competence

Competence to work safely in confined spaces requires adequate training and experience in the particular work involved.

Communication

Adequate systems will be needed to ensure effective communication:

- between those inside the confined space
- between those inside the confined space and those outside
- to summon help in case of emergency.

The impact of breathing apparatus and the possible presence of flammable or explosive atmospheres will be relevant factors in determining the suitability of the communication system.

Testing/monitoring the atmosphere

The atmosphere within a confined space may need testing for hazardous gas, fume or vapour or to check the concentration of oxygen prior to entry. Regular monitoring of the

atmosphere may also be necessary to check that there is no change in the atmosphere while the work is being carried out.

Wherever possible, testing and sampling should be done without entering the confined space.

Gas purging

Where it is believed that flammable or toxic gases or vapours are present there may be a need to purge the gas or vapour from the confined space. This can be done with air or an inert gas where toxic contaminants are present, but with inert gas only for flammable contaminants.

Ventilation

Mechanical ventilation may be required to provide sufficient fresh air to replace the oxygen that is being used up by people working in the space, and to dilute and remove gas, fume or vapour produced by the work.

Fresh air may be blown into the confined space using a fan and trunking, or foul air may be drawn from the confined space if there is an adequate supply of fresh air to replace it.

Check should be made to ensure air supplies are not contaminated. Oxygen should not be used because of the fire/explosion hazards posed by an oxygen enriched environment.

Removal of residues

Hazardous gases, fume or vapour may be released when residues are disturbed or, particularly, when heat is applied to them. Appropriate control measures might include the use of powered ventilation equipment, specially protected electrical equipment for use in hazardous atmospheres, and respiratory protective equipment.

Isolation from gases, liquids, and other flowing materials

Confined spaces will often need to be isolated from ingress of hazardous substances. An effective method is to disconnect the confined space completely from every item of plant either by removing a section of pipe or duct or by inserting blanks. If this cannot be done a lockable valve may be used as long as it cannot be unlocked when people are inside the confined space.

Isolation from mechanical and electrical equipment

Unless necessary to enable the task to be undertaken or to provide vital services (*e.g.* lighting or communications) the power should be disconnected, separated from the equipment, and checked for effective isolation. This may be achieved by locking off and tagging the switch and formally securing the key in accordance with a permit-to-work.

Selection and use of suitable equipment

Any equipment provided for use in a confined space needs to be suitable for the purpose, *e.g.* specially protected electrical equipment for use in flammable or potentially explosive atmospheres.

Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE)

The confined space should be safe to work in without the need for PPE and RPE. PPE/RPE should only be used as a last resort or for rescue work. The type of PPE provided will depend on the hazards identified but may include safety lines and harnesses, and suitable breathing apparatus.

Portable gas cylinders and internal combustion engines

Portable gas cylinders and internal combustion engines should not be used within confined spaces unless exceptional precautions are in place for ventilation.

Access and egress

Safe ways in and out of the confined space are required. Quick, unobstructed and ready access should be provided where possible. The size of opening need to be sufficiently large to allow the safe passage of persons wearing PPE, and to allow adequate access for rescue purposes.

Fire prevention

Flammable and combustible materials should not be stored in confined spaces that have not been specifically created or allocated for that purpose.

Lighting

Adequate and suitable lighting, including emergency lighting, should be provided. If used where flammable or potentially explosive atmospheres are likely to occur an appropriate level of protection is required.

Static electricity

Static discharges and all sources of ignition should be excluded if there is a risk of a flammable or explosive atmosphere in the confined space. All conducting items such as steel trunking and airlines should be bonded and effectively earthed.

Limiting working time

There may be a need to limit the time for work in a confined space *e.g.* when respiratory protective equipment is used, or under extreme conditions of temperature and humidity.

8.4 Lone working

As discussed in **section 3.5** on specific risk assessments lone working covers a range of activities with very different potential hazards.

To develop a SSW for lone working the particular task would need to be systematically assessed to identify the associated hazards which could involve practical difficulties when handling an unwieldy load, or concerns of violence or aggression when dealing with clients in their home, or concerns of dealing with the first aid consequences should a worker be injured when alone.

The basic considerations in developing the safe system of work would include:

- making a decision as to whether the job was suitable for lone work or not
- developing and documenting a suitable procedure for the work (method statement)
- ensuring the competence and physical fitness of the worker
- providing appropriate equipment, including PPE
- implementing an effective communication system for general contact and emergency situations
- providing an appropriate level of personal supervision and/or technological monitoring systems
- requirements for first aid or other emergency arrangements.

8.5 Slips and Trips

In the UK slips and trips consistently account for around 1 in 3 non-fatal major injuries, and for more than 20 000 injuries per year.

Most of these accidents are slips, most of which occur when floor surfaces are contaminated with water, talc, or grease etc.

Slips occur when the foot and floor cannot make effective contact, usually when something has been spilled, or when the shoe sole and floor finish are incompatible.

Trips occur when an obstruction prevents normal movement of the foot resulting in loss of balance, usually caused by objects on the floor or uneven surfaces.

Figure 8.22 shows a slip/trip potential model which identifies the relative importance of the factors contributing to slips and trips.

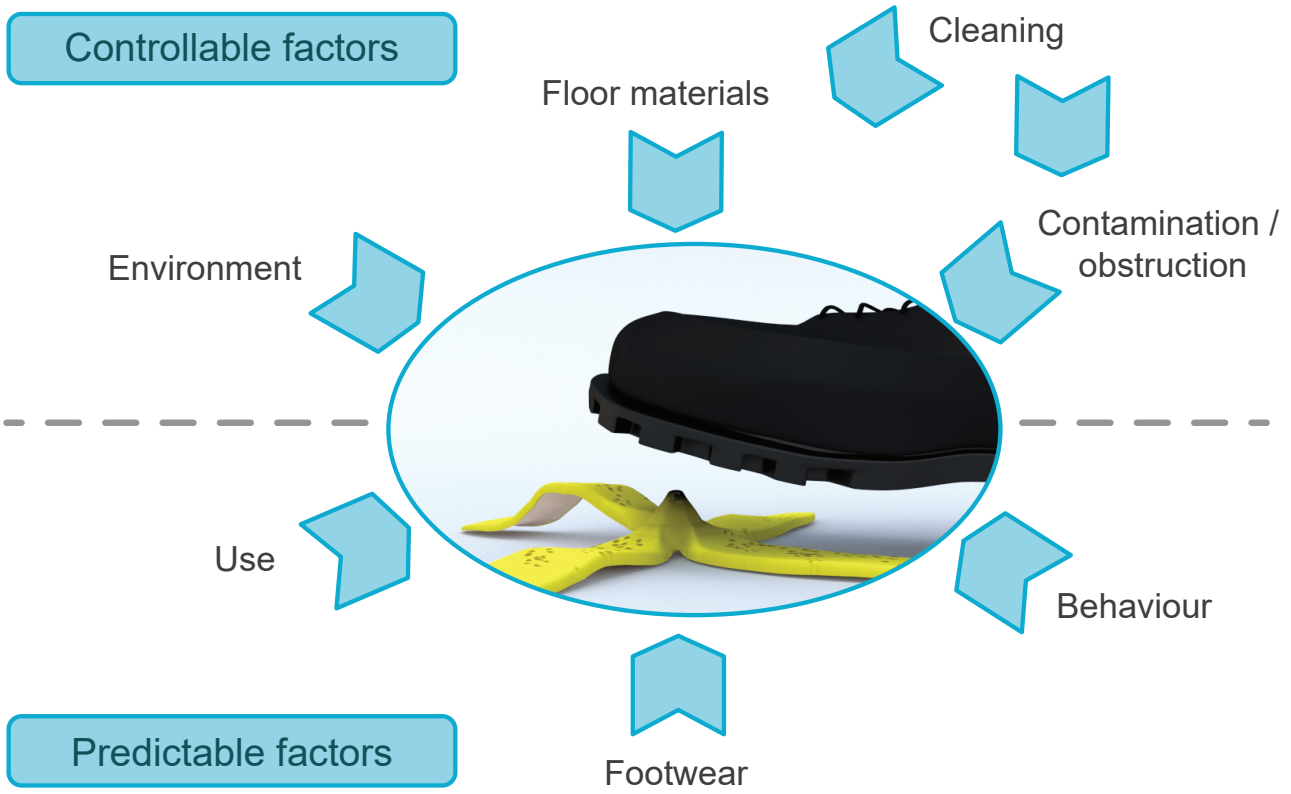


Figure 8.22: Slip/trip potential

Environment

The workplace should be properly designed in the first instance to ensure adequate space, planned walkways, and adequate lighting.

Suitable floor materials

Flooring should be specified to ensure that it has sufficient slip resistance to cope with its intended use.

Where floor surfaces of different slip resistance join it should be visually apparent. A pedestrian going from a high to low friction surface is more likely to slip if they do not adjust their gait accordingly.

Contamination/obstructions

Contamination is not limited to liquids, dust or loose particulate can also cause slip hazards due to loss of grip. Obstructions from lack of storage or poor housekeeping create the corresponding trip hazard. Required precautions include:

- good housekeeping to keep the workplace free of clutter and obstructions
- suitable cleaning materials, methods and equipment to properly clean up spills and other contaminants
- management control of cleaning and maintenance activities to ensure no additional hazards are introduced.

Use

Floors likely to be used by *'high risk'* groups (such as the very young, the very old, disabled or infirm) should offer a greater slip resistance.

Floors used for transporting of significant loads by pulling or pushing should also offer a greater frictional resistance as workers will need good traction to gain momentum. Monitoring for wear and tear will also be important.

Behaviour

Inappropriate behaviour, such as running or horseplay, can be a major contributing factor in a slip on an otherwise safe floor. Managers should look to lead by example, demonstrating expected behaviours, and also to ensure that:

- employees are properly informed and trained in understanding their roles and responsibilities under safe systems of work
- regular workplaces inspections are undertaken to ensure issues are identified and addressed address them.

Footwear

'Sensible footwear' policies, specifying flat shoes to maximise sole/floor contact and friction, have been shown to be effective in reducing the numbers of slip incidents.

Falls and falling objects

The hazards and precautions for controlling the risks from working at height are discussed in more detail in **Section 8.2**.

Secure fencing should normally be provided to prevent people falling from edges, and to also prevent objects falling onto people below.

Fencing should be sufficiently high and filled in to prevent falls (of people or objects) over or through the fencing.

As a minimum, fencing should consist of two guard-rails (a top rail and a lower rail) at suitable heights, with toe boards or upstands provided to prevent falling objects.

Tanks or pits may be covered instead of fenced. Covers should be:

- capable of supporting all loads liable to be imposed upon them, and any traffic which is liable to pass over them
- should not be capable of being easily displaced, detached or removed.

Safe movement of vehicles

Safe movement of vehicles is discussed in detail in **Section 8.6**.

Any traffic route which is used by both pedestrians and vehicles should be wide enough to enable any vehicle likely to use the route to pass pedestrians safely.

Vehicles should be separated from pedestrians in doorways, gateways, tunnels, bridges, and other enclosed routes.

Where pedestrian and vehicle routes cross appropriate crossing points should be provided and used.

8.6. Safe movement of people and vehicles in the workplace

'Workplace transport' means any vehicle or piece of mobile equipment that is used by employers, employees, self-employed people or visitors in any work setting (apart from travelling on public roads).

It includes cars, vans, lorries, and any other vehicle that is used in a work setting, such as forklift trucks, compact dumpers, tractors or mobile cranes.

It specifically excludes transport on the public highway, air, rail or water transport, although a goods vehicle that is loading or unloading on the public highway is regarded as *'workplace transport'*.

Workplace transport is the second biggest cause of fatal accidents at work in the UK, after falls from a height.

In 2017/18 26 workers were killed after being struck by a moving vehicle and a further 16 died after being trapped by something collapsing/overturning (which included overturned vehicles).

Being struck by a moving vehicle also accounted for more than 1 500 non-fatal injuries, with around 500 reportable injuries and 1 000 07D injuries

The main causes of fatal accidents and major injuries are:

- being struck by a moving vehicle
- people falling off a vehicle or its load
- loads falling off vehicles
- vehicles overturning.

Other typical accidents include:

- vehicle to vehicle collisions
- vehicle impacts with structures or other fixed objects.

Key hazards therefore include:

Vehicle movements *e.g.:*

- driving too fast especially round bends
- reversing
- silent operation of machinery
- poor visibility (around loads etc.)
- overturning
- collisions with other vehicles, pedestrians and fixed objects.

Non-movement *e.g.*:

- loading/unloading/overloading
- securing loads
- sheeting
- coupling
- vehicle maintenance work.

Control measures for safe workplace transport operations

Control measures for safe workplace transport focus on the following three areas:

- safe site
- safe vehicles
- safe people.

Safe site

A well-designed and maintained workplace will reduce the likelihood of transport accidents. Every site is different and presents different hazards and risks. These should be recognised in a thorough risk assessment, and addressed in the site design and procedures.

The key features of a well-designed site are:

Suitable and sufficient traffic routes

There should be enough traffic routes to prevent overcrowding. Plenty of room should be allowed to accommodate all foreseeable types of vehicle movements including emergency vehicles. Additional room should be allowed for safety margins wherever possible.

Entrances and gateways should be wide enough, where possible, to allow two vehicles to pass each other without causing a blockage.

Vehicle routes should be designed to give the safest routes between places they are likely to call. In particular they should avoid passing close to:

- overhead obstructions
- unprotected chemical tanks or pipes
- unprotected edges from which vehicles could fall
- unprotected and vulnerable structural features.

The need for vehicles to reverse should be designed out wherever possible. One-way systems with drive-through loading areas can be very effective. One-way systems should normally work clockwise around a site, as this is the direction most drivers will expect.

Where one-way systems are not practical, suitable turning arrangements should be made to allow vehicles to turn safely with minimal need for reversing. Roundabout or *'banjo'* arrangements are preferable to hammerhead' and *'stub'* arrangements.

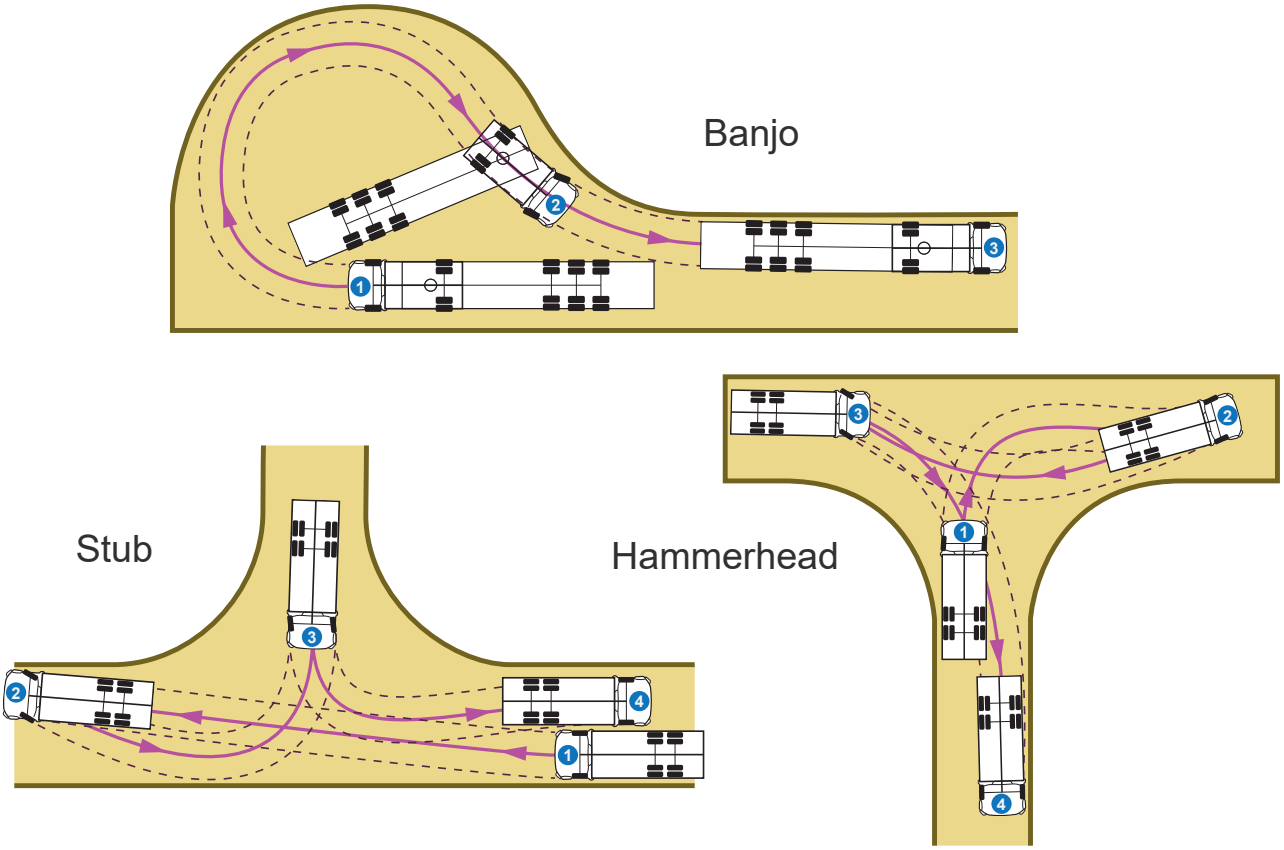


Figure 8.23: Turning arrangements

Road junctions and sharp/blind bends should be designed out wherever possible. If they have to be used junctions should be designed with good forward visibility and be clearly signed and marked to show the right of way. If sharp bends cannot be designed out mirrors can be provided to help see what is around the corner.

Suitable road markings and signs, including speed limits and parking controls should be used to alert drivers to other likely hazards.

Specific site rules may also be needed to enforce locations for the following away from pedestrian and vehicular traffic:

- staff parking

- waste storage/collection
- loading/unloading areas, etc.

Segregation of pedestrians and vehicles

Vehicles and pedestrians should be segregated where possible and in all instances should be able to move around each other and do their work safely.

At vulnerable points such as pedestrian access points (which should be separate) and crossing points, physical barriers should be provided. In other areas floor markings may be more appropriate.

Additional controls include secure access, vision panels, safety signs, adequate lighting and the wearing of high visibility clothing.

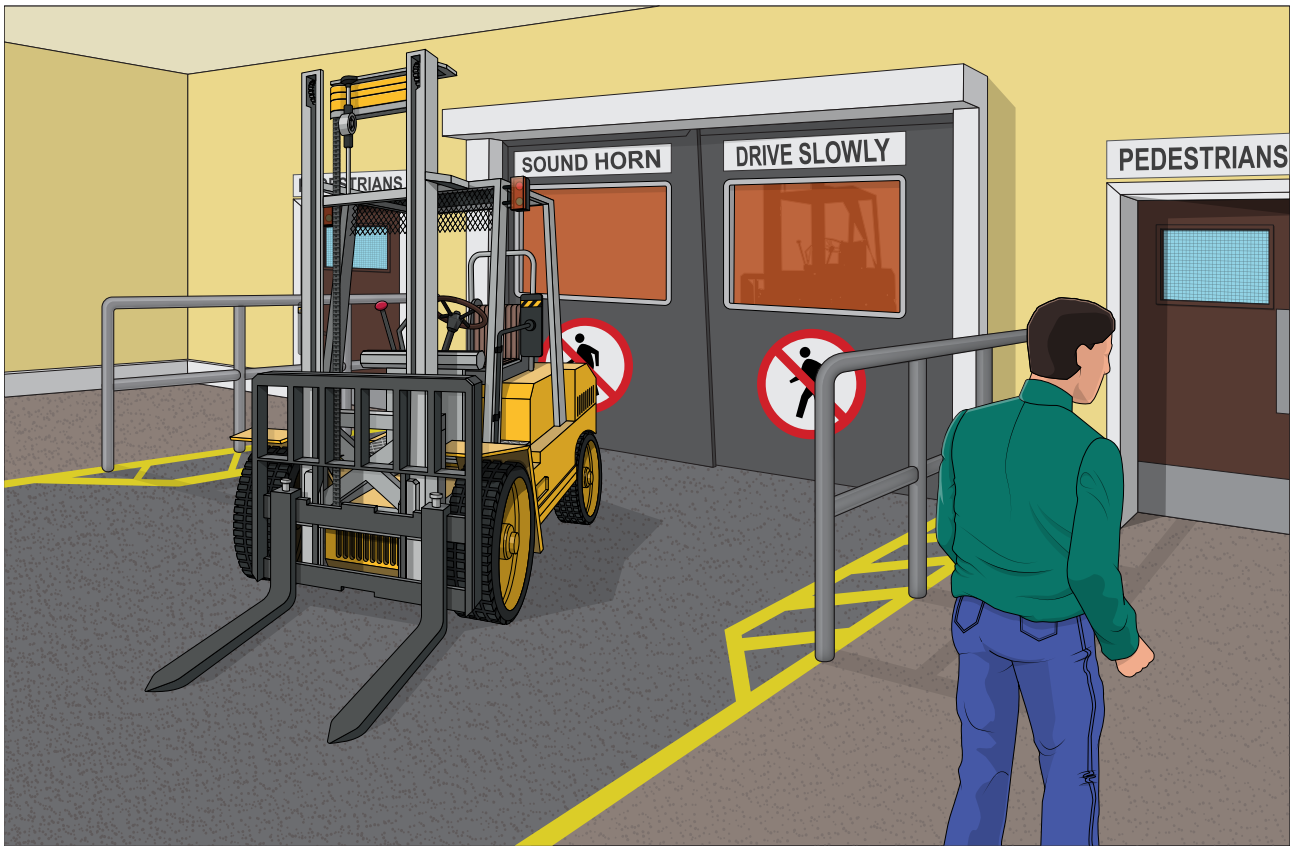


Figure 8.24: Separate pedestrian access with barriers

Roadway design and construction

Roadways should be made of a suitable material, and be constructed soundly enough to safely bear the loads that will pass over them.

Slopes steeper than 1 in 10 should be avoided as they can affect vehicle handling and make vehicles and loads less stable.

Safe vehicles

All work equipment (including vehicles) must be suitable for its purpose.

When selecting work vehicles account must be taken of:

- the working conditions
- the risks to the health and safety of people using the work vehicle
- any further risk posed by the use of chosen work vehicle.

Vehicles used on public roads have to meet specific legal standards, set out in the Road Vehicles (Construction and Use) Regulations 1986. The overall standard of vehicles used in workplaces should be at least as good as for public roads.

Suitable for the task

Workplace vehicles should be stable under working conditions and provide a safe way to get into and out of the cab, and any other parts of the vehicle that need to be accessed regularly.

Access features on vehicles, such as ladders, steps or walkways, should have the same basic features as site-based access systems.

Drivers should be able to see clearly around their vehicle, to allow them to spot hazards and avoid them. Vehicles should have large enough windscreens (with wipers where necessary) and external mirrors to provide adequate all-round visibility.

Vehicle windows may need to be impact resistant and windows and mirrors should be kept clean and in good repair.

Closed-circuit television (CCTV) may be appropriate for some vehicles where the driver can't see clearly behind or around the vehicle. CCTV can cover most blind spots but does have its limitations:

- if vehicles are leaving a darker area to a more strongly lit area CCTV systems do not work for a moment as they adjust
- it can be difficult for drivers to judge heights and distances on CCTV monitors
- a dirty lens will make a camera much less effective.

Consideration should be given to fitting a horn, vehicle lights, reflectors, reversing lights and other warning devices (for example, rotating beacons or reversing alarms).

Reversing alarms may be appropriate (based on risk assessment) but might be most

effectively used along with further measures to reduce risks that result from reversing vehicles, such as warning lights.

Reversing alarms may not be useful if they will be drowned out by other noise, or are so common on a busy site that pedestrians do not take any notice.

If fitted they should be kept in good working order. The alarm should be loud and distinct enough to make sure that it does not become part of the background noise.

Vehicles should be painted and marked in conspicuous colours to make the vehicle stand out.

Vehicles should have seats and seat belts (or other restraints where necessary) that are safe and comfortable.

The dangerous parts of the vehicle (*e.g.* power take-offs, chain drives, exposed hot exhaust pipes) must be adequately guarded.

Vehicles should be suitable for any loads carried, with adequate anchor points that are designed in accordance with relevant international Standards and suitably rated for the load.

Drivers should be adequately protected from bad weather, and inhospitable working environments (*e.g.* very high or low temperatures, dirt, dust, fumes, or excessive noise or vibration).

Where necessary vehicles should protect the driver from injury if the vehicle overturns (Roll-over Protection System – ROPS and seat restraints), or from being hit by falling objects (Falling Object Protection System – FOPS).

Manoeuvrability

Accidents often happen because people become trapped or crushed by part of a rear-wheel steer or tracked vehicle (like the counterbalance on a lift truck) that they were not expecting to move in a certain way.

It is important that the workplace transport risk assessment takes account of the handling characteristics of the vehicles used on site.

Vehicle-based ways to stop vehicles from moving

It is important to make sure that vehicles do not move when they are parked (and during loading, unloading and other operations) so that people who might be working on or around the vehicle are protected.

Vehicles should have suitable and effective brakes, both for general service and for parking.

If manufacturers provide wheel chocks, use these at all times when vehicles are stationary. Information on chocking should be provided with the vehicle operating instructions.

Drivers should be instructed to make sure that the wheels remain in contact with the ground when operating outriggers, and to use chocks where provided.

Skips, containers and demountable containers

A range of *'demountable'* containers (such as chain-lift skips, hook-lift containers, compactors and *'twist-lock'* shipping containers) are used in industry. They vary greatly in size and condition. Serious and fatal accidents have been caused by poor maintenance or the failure of door locks, or failure of the parts that secure demountables to vehicles.

'Jogging' is where drivers reverse and brake hard to free blocked material from skips. Avoid this because it can lead to too much wear to the parts securing the containers, leading to their failure and the uncontrolled release of the container itself.

Drivers and operators should be instructed and trained to regularly inspect bins, doors and restraining devices and to report faults.

Systems are required to ensure faults are put right and that skips and containers are adequately maintained. Records should be kept of the checks carried out and any resulting action.

Inspection and maintenance, repair and retrofitting

All work equipment, including vehicles, must be maintained in an efficient state, in efficient working order and in good repair.

Regular inspections should be undertaken to ensure that the vehicle remains in good order. This might involve:

- pre use inspections or daily safety checks by drivers to ensure that tyres are properly inflated, horn, lights and brakes work etc.
- regular preventive maintenance inspections carried out based on time or mileage in accordance with manufacturer's guidance.

Planned maintenance helps to prevent failures during use. Special attention should be paid to:

- the braking system

- the steering system
- the tyres
- mirrors and any fittings that allow the driver to see clearly (*e.g.* CCTV cameras)
- the windscreen washers and wipers
- any warning devices (*e.g.* horns, reversing alarms or lights)
- any ladders, steps, walkways or other parts that support people or make it easier for them to access parts of the vehicle
- any pipes, pneumatic or hydraulic hoses, rams, outriggers, lifting systems or other moving parts or systems
- any specific safety systems (*e.g.* control interlocks to prevent the vehicle or its equipment from moving unintentionally), racking, securing points for ropes and so on.

Fitting further features to existing vehicles (*'retrofitting'*) needs careful planning:

- retrofitting must not significantly weaken the chassis or body structure
- in particular, you should not consider drilling holes in the chassis and welding to it without the approval of the original manufacturer
- retrofitting should also take account of the structure of the vehicle, sensitive points such as fuel tanks will need to be avoided.

Safe people

Employers are required to:

- take account of employees' capabilities regarding health and safety when allocating them tasks
- give adequate training to employees to ensure health and safety (on recruitment and whenever exposed to new or increased risks)
- only permit authorised drivers to drive workplace vehicles.

Employers' procedures for recruitment, checking references, induction, training, supervision, auditing and assessing competence should all work together to ensure that workers are fit to operate the specific vehicles and attachments they use at work, in all of the environments in which they are used.

The same (or higher) standards needed to drive on public roads should apply to choosing people to drive in the workplace:

Choosing drivers

Drivers should be fully able to operate the vehicle and related equipment safely, and should receive comprehensive instruction and training so that they can work safely.

Drivers should be selected on the basis of:

- a mature attitude and reliable nature
- reasonable levels of physical and mental fitness, and intelligence.

Fitness for drivers should be judged individually as some less physically able people can develop skills to compensate.

The medical standards of fitness to drive on UK roads allow for the exclusion of drivers for a range of medical conditions in the following categories:

- neurological disorders
- cardiovascular disorders
- diabetes mellitus
- psychiatric disorders
- drug or alcohol dependency and misuse
- visual disorders
- renal disorders
- respiratory and sleep disorders
- impairment of cognitive function
- miscellaneous conditions.

The fitness and abilities of a driver should be matched with the requirements of a particular vehicle, task and situation.

A suitable level of fitness for a fork lift truck operator might require the ability to fully move their whole body, to allow maintenance of good awareness of hazards all around their vehicle.

Anyone who is unfit through drink or drugs (prescription or otherwise) should never be allowed to drive any vehicle.

If there are third party (*e.g.* contractor) drivers working on site, the site operator or principal employer should liaise with their employer to ensure that they are competent to carry out their duties responsibly and carefully.

Driver training and competence

The amount of training each driver needs will depend on their previous experience and the type of work they will be doing. The greatest need for training is likely to be on recruitment.

It is likely that training will need to cover the following:

- general information about the job, *e.g.*:
  - the layout of the workplace routes
  - how and where to report faults or hazards
  - procedures for reporting accidents
- specific training to ensure health and safety, including:
  - how to use the vehicle and equipment safely
  - information about particular dangers, speed limits, parking and loading areas, procedures etc.
  - what personal protective equipment is required and how to use it
  - information on the structure and level of supervision that will apply
  - the penalties for failing to follow instructions and safe working practices.

Checks should be made to ensure that trainees understand what they have been trained to do. Trainees should be tested on site, even when they provide evidence of previous training or related work experience. Competence is demonstrable and should be demonstrated.

As people lose skills if they do not use them regularly an ongoing programme of training and refresher training will usually be necessary for all drivers and other employees, to make sure their skills continue to be up to date.

Regular refresher training is useful in ensuring that drivers:

- maintain good driving habits
- learn new skills where appropriate
- reassess their abilities.

The frequency of refresher training should be determined based on risk. Many organisations work on a cycle of between three to five years, although other companies provide refresher training more often than this.

Training records

Training records should be kept for each employee, including enough information to be able to identify the employee, the full training history, planned training, and details of any certificates or qualifications gained.

When satisfied that an employee is competent to use a type of vehicle safely, the details should be recorded and referred to as necessary to make sure that employees are trained and competent before being allowed to operate particular vehicles.

The information should be kept on a central register.

An authorisation to drive a particular vehicle may be issued as a photo ID badge.

A driver should not be authorised unless they have satisfactorily demonstrated their competence.

Reversing and reversing assistants (banksmen)

Nearly a quarter of all deaths involving vehicles at work happen during reversing. Reversing accidents may also cause injury and/or expensive damage.

Poor visibility is the primary problem. In many vehicles, especially larger industrial ones, it is very difficult for the driver to see backwards.

The most effective way of dealing with the risks caused by reversing is to remove the need for to do it. Measures which help to prevent the need for reversing include:

- one-way systems
- ring roads
- drive-through loading and unloading positions
- parking areas with entrances and exits on either side.

Where reversing cannot be avoided, traffic routes should be organised to reduce as far as possible the need for reversing and the distance vehicles have to travel backwards.

Other controls include:

- dedicated, clearly identified reversing areas
- reversing should only be permitted where there is enough light for drivers and pedestrians to clearly see what is happening

- fixed mirrors or other visibility aids to improve visibility around vehicles
- signs alerting drivers to the dangers of reversing, and any necessary precautions (think: visiting drivers)
- highly visible barriers, buffers, bollards and wheel stops to warn drivers that they need to stop where vehicles reverse up to structures or edges (for example, loading, delivery or parking areas)
- white lines or guide rails on the floor to help the driver position the vehicle accurately.

If drivers are not able to see clearly behind the vehicle for any reason, they should apply the brakes and stop the engine, leave the cab and check behind the vehicle before reversing. However, in a busy place this precaution may not be enough, because people can move behind a vehicle after the driver has returned to the cab. Segregating pedestrians and vehicles, and improving the ability of the driver to see around the vehicle from the driving position, are more effective ways of improving pedestrian safety during reversing.

Consideration should only be given to employing a banksman (reversing assistant) where there is no other way to control reversing risks. To do their job they have to stand close to where a vehicle is reversing, which can put them at risk.

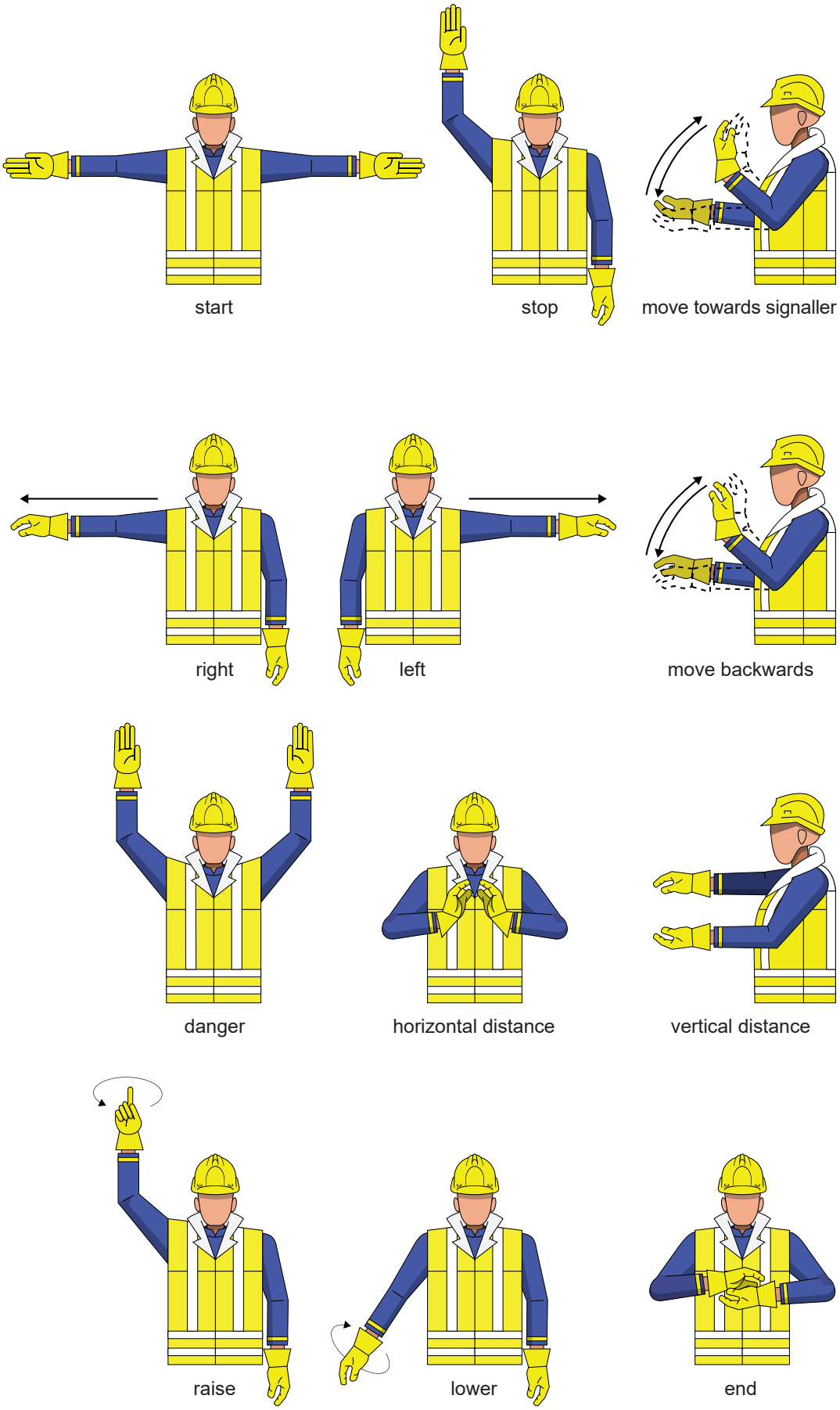


Figure 8.25: Banksmen's signals

By law banksmen in the UK must use certain hand signals, and employers must make sure that the correct signals are used. These signals are standard across Europe, and should be used for guiding most vehicles around a workplace. All drivers and banksmen should know them (Figure 8.25).

Hand signals should be faster to show that an operation should happen quickly and slower to indicate that it should occur slowly.

If these signals are not enough, further signals can be used based on existing signalling practice.

Whatever signals are going to be used, banksmen and drivers should clearly agree before guided manoeuvring begins.

It is essential that hand signals are used consistently throughout the workplace. All employees involved in guiding vehicles should be trained as appropriate, especially new employees, who may have used a different system before.

Banksmen need to be visible to drivers at all times. They must have a safe position from which to guide the reversing vehicle without being in its way. Additional precautions include:

- high-visibility equipment (vests, arm or cuff bands, gloves, bats, batons or flags)
- vehicle- or site-fixed visibility aids (such as mirrors)
- if drivers lose sight of a banksman, they should know to stop immediately – portable radios or similar communication systems may also be used.

Some employers (for example, quarries) do not allow banksmen to be used due to the size of vehicles involved and the difficulty that drivers have in seeing them.

Where banksmen are to be used, they must be readily available when needed.

Everyone involved in reversing should be trained and competent. You should identify all the people who are involved, and take account of their abilities when allocating tasks and deciding what training they should receive. Specific training may be needed to deal with reversing or using reversing aids fitted to vehicles.

Non-movement related workplace transport hazards

Hazards may arise from a range of non-movement related workplace transport activities including:

- loading, unloading and securing loads
- sheeting
- coupling
- vehicle maintenance work.

Loading and unloading

Loading and unloading can be dangerous. Machinery can seriously hurt people. Heavy loads, moving or overturning vehicles and working at height (see sheeting) can all lead to injuries or death.

- poorly balanced or inadequately secured loads can shift in transit and fall unexpectedly during unloading
- shifting loads can cause a vehicle to overturn
- fork lift trucks, used for loading and unloading operations, pose a risk of impact injuries to workers in the loading area
- workers may fall from the bed of a delivery lorry if manually loading or unloading
- manual handling injuries (**Element 3**) may well occur.

Control strategies for loading and unloading operations are shown in Table 8.11.

Safe workplace	Safe vehicle	Safe driver
loading areas should be clear of passing traffic and pedestrians	not loaded beyond rated capacity	clear instructions and training on securing specific loads
designed to eliminate or minimise need for reversing	loads spread evenly	able to refuse an unsafe load or stop unsafe loading
firm, level ground	suitable anchor points	
free of overhead obstructions	suitable lashings (ropes, webbing, chains, cables, clamps) in good condition	

Table 8.11: Controls for loading and unloading

Sheeting and unsheeting

Sheeting is used on tipper lorries for a variety of reasons:

- to keep materials dry
- to prevent loss of load during transit as required by Road Traffic Act 1991
- to keep materials hot
- to comply with authorisations for waste transfer.

Many falls from tipper lorries occur during sheeting and unsheeting, typically because of:

- slipping or tripping on the material or strappings and ropes when climbing on the load
- trimming the load when the level is uneven or too high (*e.g.* balancing a tipped load)
- spreading or unfolding the sheet over the load
- pulling the sheet tight
- inadequate access to the body of the tipper resulting in poor positioning of the worker
- high winds creating a sail-effect of the sheeting.

Many tipper sheeting accidents could be prevented if automated sheeting devices were used and there was better co-operation between the parties involved.

A hierarchy of solutions for managing the risk would be:

a. leave the load unsheeted (if road traffic and environmental law allows it)

b. use automated or mechanical sheeting systems, which don't require people to go up on the vehicle

c. use manual sheeting systems which don't require people to go up on the vehicle

d. use work platforms to provide safe access to carry out sheeting from the platform without having to access the load

e. use gantry/harness systems to prevent or arrest a fall.

Safe workplace	Safe vehicle	Safe driver
suitable level ground close to loading/unloading area	mechanical sheeting methods that avoid people walking on vehicles or loads	fully trained in sheeting procedures – from ground or gantry and harness
suitable tools, *e.g.* long handled rake for trimming loads	purpose-made load sheets (which include webbing straps) have a *'rated load capacity'* to secure a load up to that weight	provided with suitable PPE including footwear, gloves and head and eye protection
suitable work platforms for trimming and sheeting		

Table 8.12: Safe sheeting and unsheeting

Coupling and uncoupling

Failure to follow safe coupling and parking procedures for large goods vehicles (LGVs) often leads to accidents and dangerous situations such as vehicle runaway or trailer rollaway.

Both can result in serious and fatal injury to the driver or others, and costly damage to both vehicles and property. Drivers are often badly injured or killed while trying to climb back into the cab of a runaway vehicle to apply the brakes.

Coupling or uncoupling on unsuitable ground can also result in problems. If the ground is not firm enough to support the weight of the trailer it can sink into the ground and topple over. If the ground is not flat and parking brakes are not applied the tractive unit or trailer could move.

Safe workplace	Safe vehicle	Safe driver
well lit	suitable wheel stops and handholds	fully trained in coupling and uncoupling procedures
firm and level ground	suitable lighting (to rear of cab)	provided with suitable PPE including footwear, gloves and high visibility clothing
clear of other vehicles and pedestrians	safe access to 5th wheel (behind cab where trailer attaches to tractor unit)	

Table 8.13: Precautions for safe coupling/uncoupling

Coupling procedures

Coupling procedures will vary between different vehicles. A safe procedure should be determined for each individual vehicle following a risk assessment. In general though the stages of a safe coupling procedure are:

a. apply trailer handbrake (if fitted) (handbrakes may be absent if the trailer air brakes are fail-safe or there are other measures to prevent movement)

b. for automatic coupling:

- reverse cab slowly under the trailer, with the *'kingpin'* lined up to the *'V'* of the locking mechanism

c. for manual coupling:

- reverse the vehicle into place
- make sure that the parking brakes are applied
- manually attach the locking mechanism

d. *'tug test' i.e.* drive forward slowly in a low gear to check that the fifth wheel is in place

e. make sure that the parking brakes are applied

f. leave the cab and inspect the locking mechanism to make sure that it is secure

g. fit any safety clips and connect all brake hoses and the electrical supply to the trailer, and check that they are secure

h. wind up any landing legs on the trailer and secure the handle.

For uncoupling the procedure is followed in reverse order, using brakes and stabilisers as appropriate. The tractive unit parking brake should be set before leaving the cab.

Vehicle maintenance work

Wherever relevant, the following precautions should be taken when maintaining vehicles:

- brakes should be applied and, where necessary, wheels should be chocked
- engines should always be started and run with brakes on and in neutral gear
- raised parts should be suitably propped or supported
- a way of restraining wheels, such as a tyre cage, should be used when inflating tyres on split-rim wheels
- tyres should be removed from wheels before welding, cutting or heating work begins on a wheel or wheel rim fitted with a tyre, even if the tyre is deflated
- fuel tanks should never be drained or filled when the equipment is hot or in a confined space, nor should they be drained over a pit
- batteries should be charged in well-ventilated areas. Suitable personal protective equipment should be provided and used for handling battery acid
- measures should be taken to prevent maintenance staff from breathing asbestos dust from brake and clutch lining pads
- only people who have received the relevant information, instruction and training should be allowed to carry out maintenance work.

8.7 Work-related driving

The European Road Safety Observatory (ERSO) defines a work-related crash as:

'those at the site of work, and/or crashes during work journeys (except commuting).'

Across the EU work-related motor vehicle crashes are estimated to contribute at least one quarter to over one third of all work-related deaths.

In the UK the HSE has estimated that up to a third of all road traffic accidents involve somebody who is at work at the time, accounting for over 20 fatalities and 250 serious injuries every week.

Professional driving involves far higher risks than virtually any other occupation although the road crash death rate of professional drivers is lower than for other groups of road users.

High mileage work-related driving in cars and light vans has been shown to have a higher risk of crash involvement than similar non-work driving.

Risk factors

The additional risk faced by drivers at work is attributable to pressures of work, notably driving long distances and for long hours, in all weather conditions to complete scheduled work to the satisfaction of the employer and the customer.

Risk assessment

Risk assessments for work-related driving activities follow the same principles as general workplace risk assessments (**NGC1 Element 4**), however a key consideration is that failure to manage work-related road safety risks is more likely to endanger non-employees.

The detail of the risk assessment should be proportionate to the risk and in many cases need not be overcomplicated. A competent person, with practical experience, should undertake the risk assessment and a range of employee views should be considered.

The five steps to risk assessment approach is summarised below with some examples of issues to be addressed in a work-related driving activity risk assessment.

Step 1: Identify hazards (the things that can cause harm)

The range of hazards will be wide and the main areas to think about are the driver, the vehicle and the journey.

Step 2: Decide who might be harmed

Consider:

- the driver
- passengers
- other road users and/or pedestrians
- any groups who may be particularly at risk, such as young or newly qualified drivers and those driving long distances.

Step 3: Evaluate the risk and decide whether existing precautions are adequate or more should be done

For each significant hazard identified a decision has to be made as to whether the remaining risk is acceptable.

Consideration should be given to eliminating the hazard (*e.g.* tele- or video-conferencing instead of travelling to a meeting).

If not, the following risk control principles should be considered in order:

- whether the company policy actively encourages employees to drive rather than consider alternative means of transport
- consider alternatives to driving, *e.g.* train or aeroplane
- avoid situations where employees feel under pressure (*e.g.* unrealistic delivery schedules encouraging drivers to drive too fast for the conditions, or exceed speed limits)
- regularly maintain vehicles to reduce the risk of vehicle failure, *e.g.* ensure that maintenance schedules are in place and that vehicles are regularly checked by a competent person to ensure they are safe
- ensure that protective equipment such as seatbelts, airbags, crash helmets etc. are of the appropriate standard, are correctly fitted, work properly and are used
- ensure that company policy covers the important aspects of the Highway Code, such as not exceeding speed limits.

Step 4: Record the findings

Employers with five or more employees are required to record the significant findings of their risk assessment.

A written record is useful to help show that:

- a proper check was made
- affected employees, or their representatives, were consulted
- all obvious hazards were addressed
- employees were informed of the hazards, risks and preventive and protective measures.

Step 5: Review the assessment and revise it if necessary

Arrangements for monitoring and reviewing the assessment are necessary to ensure that the risks to those who drive, and others, are suitably controlled.

The system should gather record and analyse information about road incidents and record details of driver and vehicle history.

Assessments should be reviewed in the light of changing circumstances, *e.g.* the introduction of new routes, new equipment or a change in vehicle specification.

All risk assessments should be periodically reviewed (*e.g.* every 12 months, depending on level of risk) to ensure that precautions are still controlling the risks effectively.

Evaluating the risks

The key risks relate to:

- the driver
- the vehicle
- the journey.

The driver

Competency

Checks should be in place to ensure that drivers are competent and capable of doing their work in a way that is safe for them and other people. In particular the following should be checked:

- relevant previous experience
- references from previous employers
- validity of the driving licence on recruitment and periodically thereafter
- standards of skill and expertise required for the particular job.

Training

When allocating work to employees, the employer should ensure that the employee is able to carry out the work without risk to him or others, taking into account the employees' capabilities and level of training, knowledge and experience.

New drivers should be given adequate induction training and arrangements should be in place for providing all drivers with periodic refresher training. Priority should be given to training those at highest risk, *e.g.* those with high annual mileage, poor accident records, or young drivers.

Employees should be tested to ensure they have taken on board the required knowledge, and work practises should be monitored to ensure behaviours are appropriate.

Fitness and health

Those who drive at work should be sufficiently fit and healthy to drive safely and not put themselves or others at risk.

Large Goods Vehicle (LGV) (formerly Heavy Goods Vehicle HGV) and Passenger Carrying

Vehicles (PCV) (formerly Passenger Service Vehicles – PSV) drivers are legally required to have medical examinations. Depending on the level of risk it may be appropriate for other drivers to have periodic medical checks.

In addition to general well-being drivers must be able to meet the eyesight requirements set out in the Highway Code.

Procedures are required to ensure that staff do not drive, or undertake other duties, while under the influence of drugs or alcohol or when taking a course of medicine that might impair their judgement.

The vehicle

Suitability

All work vehicles must be fit for the purpose for which they are used.

Purchasing or leasing procedures should pay appropriate weight to health and safety considerations when sourcing new or replacement vehicles.

Privately owned vehicles should not be used for work purposes unless they are insured for business use and, where necessary have a valid MOT certificate.

Condition

Work vehicles should be maintained in a safe and fit condition. Planned preventative maintenance should be carried out in accordance with manufacturers' recommendations and checks should be made to ensure maintenance and repairs are carried out to an acceptable standard.

Drivers should be trained to carry out basic safety checks and procedures should be implemented to ensure pre-use checks and periodic safety inspections are undertaken.

Safety equipment

The pre-use checks and periodic safety inspections should ensure that all safety equipment (*e.g.* seatbelts and head restraints) provided is appropriate and in good working order.

Safety critical information

Drivers should be provided with appropriate information to help them reduce risks, *e.g.*:

- recommended tyre pressures
- how to adjust headlamp beam to compensate for load weight

- how to adjust head restraints to compensate for the effects of whiplash
- action to be taken should a driver consider their vehicle to be unsafe.

Ergonomic considerations

Ergonomic considerations should be considered before purchasing or leasing new vehicles. Drivers' health, and possibly safety, should not be compromised by appropriate seating position or driving posture.

Drivers should be provided with guidance on good posture and, how to set up their seat correctly.

The journey

Routes

Routes should be planned thoroughly to ensure they are appropriate and safe for the type of vehicle undertaking the journey. Consideration should be given to road width, overhead restrictions or other hazards which may present problems for particular vehicles.

Scheduling

Work schedules must be realistic. Allowances should be made for:

- trainee or inexperienced drivers
- rush hour traffic
- the potential for sleep related accidents (between 2 am and 6 am and between 2 pm and 4 pm).

Tachographs should be checked regularly to ensure drivers are not cutting corners and putting themselves and others at risk.

Time

Sufficient time should be allowed to complete journeys safely. Planned journey times should take account of road types and conditions, and rest breaks.

Drivers should take a 15 minute break at least every two hours.

Distance

Drivers should not be put at risk from fatigue caused by driving excessive distances without appropriate breaks. Journey planning should ensure trips are not so long they contribute to fatigue. Consideration should be given to the length of the overall working day.

Weather conditions

Weather conditions, such as snow or high winds, should be given adequate consideration when planning journeys. Journey times and routes should be rescheduled as necessary to take account of adverse weather conditions.

Vehicles should be properly equipped to operate in poor weather conditions and drivers should not be pressurised to complete journeys in exceptionally difficult weather conditions.

Managing work related road safety

Work-related road safety can only be effectively managed if it is integrated into the general arrangements for managing health and safety at work. The main areas to be addressed are policy, responsibility, organisation, systems and monitoring.

Policy

The health and safety policy statement should address work-related road safety. The company position on the relative importance of work-related road safety compared to the operational aspects of logistics, distribution and service delivery etc. should be expressed clearly and communicated to the workforce.

Responsibility

Top level responsibility for work-related road safety should be clearly defined. The responsible person should have sufficient authority and influence to bring the policy into effect.

All operational staff (*e.g.* drivers) should be made clear of their individual responsibilities and expected standards of behaviour.

Organisation and structure

The organisational structure should be sufficiently integrated to ensure effective cooperation across departments with different responsibilities for work related road safety.

Systems

A range of systems will need to be implemented to manage work-related road safety effectively, *e.g.*:

- purchasing or leasing of suitable vehicles
- training of drivers and other staff
- servicing and inspection of vehicles.

Monitoring

Active and reactive methods for monitoring performance should be implemented to ensure that the work-related road safety policy is effective. Active systems should use inspection and auditing techniques to proactively check the ongoing suitability of vehicles, employees and arrangements for scheduling. Reactive systems include arrangements for the comprehensive reporting of accidents and near misses. Collected information should be sufficient to allow informed decisions to be made regarding the ongoing effectiveness of existing policy and the need for changes.

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