UNIT-14 Working in the Height

Learning Outcomes
By the end of this unit the learner will be able to:

Unit 14

Working in the Height

Introduction

Work at height means work in any place where, if there were no precautions in place, a person could fall a distance liable to cause personal injury. For example you are working at height if you:

- are working on a ladder or a flat roof;
- could fall through a fragile surface;
- could fall into an opening in a floor or a hole in the ground.

Take a sensible approach when considering precautions for work at height. There may be some low-risk situations where common sense tells you no particular precautions are necessary and the law recognises this.

There is a common misconception that ladders and stepladders are banned, but this is not the case. There are many situations where a ladder is the most suitable equipment for working at height.

Before working at height you must work through these simple steps:

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

Figure 1 gives further guidance and examples for each of the above steps to help you comply with the law.

You should:

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

Who do the Regulations Apply to?

If you are an employer or you control work at height (for example if you are a contractor or a factory owner), the Regulations apply to you.

How do you comply with these Regulations?

Employers and those in control of any work at height activity must make sure work is properly planned, supervised and carried out by competent people. This includes using the right type of equipment for working at height.

Low-risk, relatively straightforward tasks will require less effort when it comes to planning. Employers and those in control must first assess the risks.

Take a sensible, pragmatic approach when considering precautions for work at height. Factors to weigh up include the height of the task; the duration and frequency; and the condition of the surface being worked on. There will also be certain low-risk situations where common sense tells you no particular precautions are necessary.

How do you decide if someone is 'competent' to work at height?

You should make sure that people with sufficient skills, knowledge and experience are employed to perform the task, or, if they are being trained, that they work under the supervision of somebody competent to do it.

In the case of low-risk, short duration tasks (short duration means tasks that take less than 30 minutes) involving ladders, competence requirements may be no more than making sure employees receive instruction on how to use the equipment safely (eg how to tie a ladder properly) and appropriate training. Training often takes place on the job, it does not always take place in a classroom.

When a more technical level of competence is required, for example drawing up a plan for assembling a complex scaffold, existing training and certification schemes drawn up by trade associations and industry is one way to help demonstrate competence.

What measures should you take to help protect people?
Always consider measures that protect everyone who is at risk (collective protection) before measures that protect only the individual (personal protection).

Collective protection is equipment that does not require the person working at height to act to

be effective, for example a permanent or temporary guard rail. Personal protection is equipment that requires the individual to act to be effective.

An example is putting on a safety harness correctly and connecting it, via an energy-absorbing lanyard, to a suitable anchor point.

The step-by-step diagram in Figure 1 should be used alongside all other advice in this leaflet. You do not always need to implement every measure in Figure 1. For example when working on a fully boarded and guarded scaffold that is already up, not being altered or taken down, workers would not need to wear personal fallarrest equipment as well.

What are the most common causes of accidents when working at height?

Roof work is high risk and falls from roofs, through fragile roofs and fragile roof lights are one of the most common causes of workplace death and serious injury. As well as in construction, these accidents can also occur on roofs of factories, warehouses and farm buildings when roof repair work or cleaning is being carried out.

The following are likely to be fragile:

- roof lights;
- liner panels on built-up sheeted roofs;
- non-reinforced fibre cement sheets;
- corroded metal sheets;
- glass (including wired glass);
- rotted chipboard;
- slates and tiles.

Deaths caused by falls through fragile surfaces occur mainly to those working in the building maintenance sector when carrying out small, short-term maintenance and cleaning jobs.

On average 7 people are killed each year after falling through a fragile roof or fragile roof light. Many others suffer permanent disabling injury.

These accidents usually occur on roofs of factories, warehouses and farm buildings when roof repair work or cleaning is being carried out.

Which surfaces present a particular risk?

The following are likely to be fragile:

- old roof lights;
- old liner panels on built-up sheeted roofs;
- non-reinforced fbre cement sheets;

- corroded metal sheets;
- glass (including wired glass);
- rotted chipboard; and
- slates and tiles.

Remember: Fragile roof incidents are not inevitable. They can be prevented by careful planning, using trained and experienced workers with suitable equipment and employing a high level of supervision.

What you should do as a building owner or occupier

Before work starts:

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

After work starts:

- Ensure the planned safe system of work is implemented.

What is a safe system of work?

Avoidance

Avoid workers having to go on the roof at all by adapting a method that allows profled roof sheets or roof lights to be replaced from underneath using a suitable work platform – this may involve the use of adapted roof fxings, available from materials suppliers. The National Federation of Roofng Contractors can advise (www.nfrc.co.uk).

Prevention

If the work cannot be done from underneath and workers need access to the topside of the roof:

- use a mobile elevating work platform (MEWP) that allows people to work from within the basket without standing on the roof itself.

If access onto the fragile roof cannot be avoided, mitigate fall distance and consequences:

- install perimeter edge protection and use stagings on the roof surface to spread the loads;

- ensure all the work and access stagings or platforms are ftted with guard rails;
- if this is not possible, install safety nets underneath the roof or use a harness system; and
- where harnesses are used, make sure they have adequate anchorage points and they are properly used – through appropriate discipline, training and supervision.

Note: Proprietary covers, which can serve as either a temporary or a permanent installation, are available to prevent someone who is passing or working near fragile material from falling through.

Safe systems of work must be planned and followed to protect those installing the safety measures.

What enforcement action might be taken by HSE?

Working on fragile surfaces is extremely dangerous and the precautions are well established.

The law says you must organise and plan all roof work so it is carried out safely. If inspectors encounter failure to control risk, work will be prohibited and prosecution may follow.

Examples of safe systems of work

Safe systems for replacing roof sheets and roof lights from underneath

Removing hook bolts from existing sheet

Locating replacement sheet

Securing fixings to newly installed sheet

Mobile elevating work platforms

Using a MEWP to inspect a vent

Using a MEWP to clean a gutter

Using netting to provide protection

Safety netting used to provide protection for roof lights during minor roof works

Covers can be fitted to existing roofs or included as part of the design (Image courtesy of Safesite)

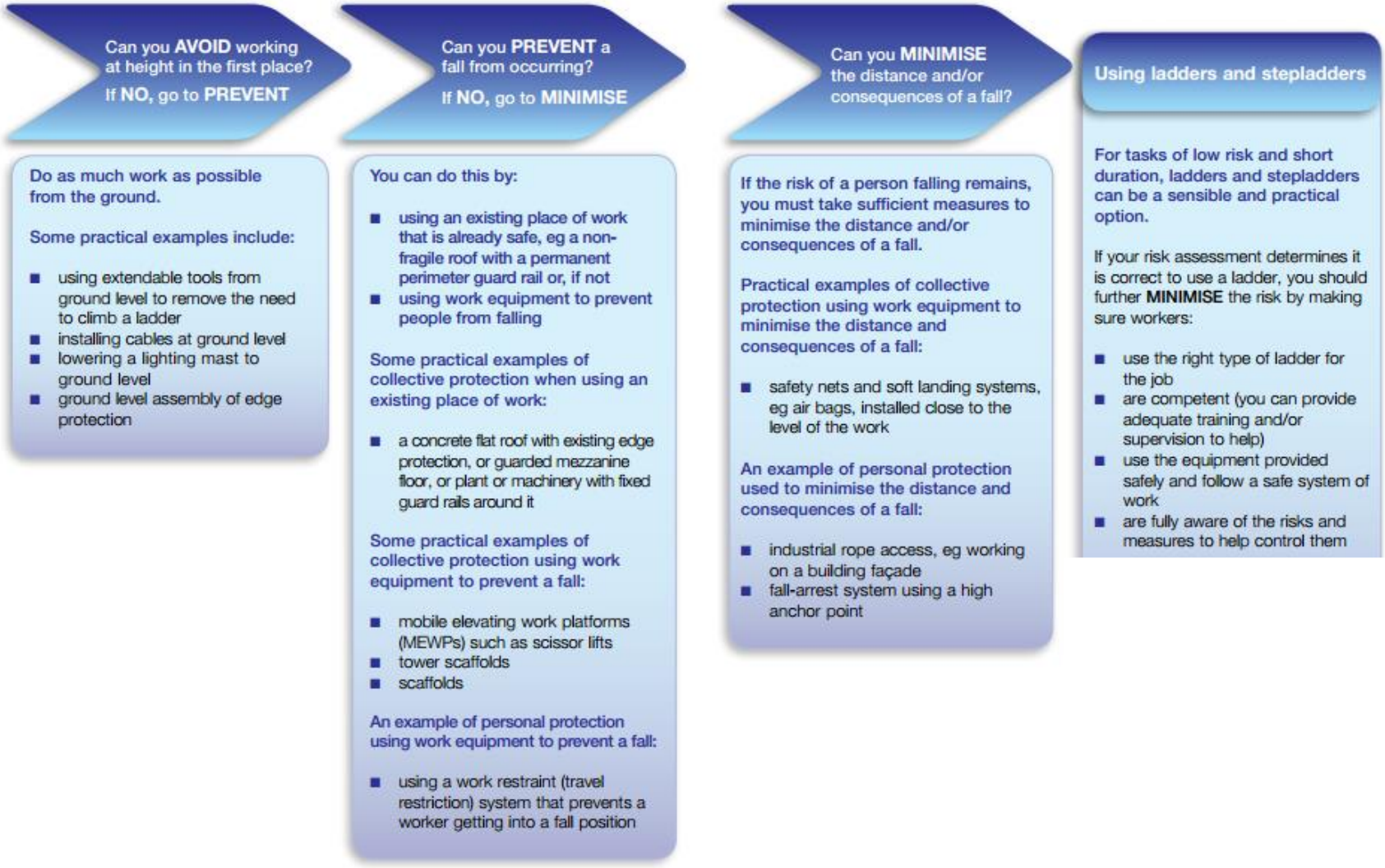
What do you need to consider when planning work at height?

The following are all requirements in law that you need to consider when planning and undertaking work at height. You must:

- take account of weather conditions that could compromise worker safety;
- check that the place (eg a roof) where work at height is to be undertaken is safe. Each place where people will work at height needs to be checked every time, before use;
- stop materials or objects from falling or, if it is not reasonably practicable to prevent objects falling, take suitable and sufficient measures to make sure no one can be injured, eg use exclusion zones to keep people away or mesh on scaffold to stop materials such as bricks falling off;
- store materials and objects safely so they won't cause injury if they are disturbed or collapse;
- plan for emergencies and rescue, eg agree a set procedure for evacuation.

Think about foreseeable situations and make sure employees know the emergency procedures. Don't just rely entirely on the emergency services for rescue in your plan.

Figure 1 Step-by-step diagram



How do you select the right equipment to use for a job?

When selecting equipment for work at height, employers must:

- provide the most suitable equipment appropriate for the work (use Figure 1 to help you decide);
- take account of factors such as:
- the working conditions (eg weather);
- the nature, frequency and duration of the work;
- the risks to the safety of everyone where the work equipment will be used.

If you are still unsure which type of equipment to use, once you have considered the risks, the Work at height Access equipment Information Toolkit (or WAIT) is a free online resource that offers possible solutions. It provides details of common types of equipment used for work at height.

How do you make sure the equipment itself is in good condition?

Work equipment, for example scaffolding, needs to be assembled or installed according to the manufacturer's instructions and in keeping with industry guidelines.

Where the safety of the work equipment depends on how it has been installed or assembled, an employer should ensure it is not used until it has been inspected in that position by a competent person.

A competent person is someone who has the necessary skills, experience and knowledge to manage health and safety.

Any equipment exposed to conditions that may cause it to deteriorate, and result in a dangerous situation, should be inspected at suitable intervals appropriate to the environment and use. Do an inspection every time something happens that may affect the safety or stability of the equipment, eg adverse weather, accidental damage.

You are required to keep a record of any inspection for types of work equipment including: guard rails, toe-boards, barriers or similar collective means of protection;

Working platforms (any platform used as a place of work or as a means of getting to and from work, eg a gangway) that are fixed (eg a scaffold around a building) or mobile (eg a mobile elevated working platform (MEWP) or scaffold tower); or a ladder.

Any working platform used for construction work and from which a person could fall more than 2 metres must be inspected:

- after assembly in any position;
- after any event liable to have affected its stability;
- at intervals not exceeding seven days.

Where it is a mobile platform, a new inspection and report is not required every time it is moved to a new location on the same site.

You must also ensure that before you use any equipment, such as a MEWP, which has come from another business or rental company, it is accompanied by an indication (clear to everyone involved) when the last thorough examination has been carried out.

What must employees do?

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

For an employee, or those working under someone else's control, the law says they must:

- report any safety hazard they identify to their employer;
- use the equipment and safety devices supplied or given to them properly, in accordance with any training and instructions (unless they think that would be unsafe, in which case they should seek further instructions before continuing).

You must consult your employees (either directly or via safety representatives), in good time, on health and safety matters. Issues you must consult employees on include:

- risks arising from their work;
- proposals to manage and/or control these risks;
- the best ways of providing information and training.

Employers can ask employees and their representatives what they think the hazards are, as they may notice things that are not obvious and may have some good, practical ideas on how to control the risks.

What must architects and building designers do?

When planning new-build or refurbishment projects, architects and designers have duties under The Construction (Design and Management) Regulations, to consider the need for work to be carried out at height over the lifespan of a building, eg to clean, maintain and repair it. They should design out the need to work at height if possible.

Safe Use of Ladders

When is a ladder the most suitable equipment?

The law says that ladders can be used for work at height when a risk assessment has shown that using equipment offering a higher level of fall protection is not justified because of the low risk and short duration of use; or there are existing workplace features which cannot be altered.

Short duration is not the deciding factor in establishing whether use of a ladder is acceptable or not – you should have first considered the risk. As a guide, if your task would require staying up a leaning ladder or stepladder for more than 30 minutes at a time, it is recommended that you consider alternative equipment.

You should only use ladde rs in situations where they can be used safely, eg where the ladder will be level and stable, and where it is reasonably practicable to do so, the ladder can be secured.

Who can use a ladder at work?

To use a ladder you need to be competent, ie have had instruction and understand how to use the equipment safely.
Appropriate training can help. If you are being trained, you should work under the supervision of somebody who can perform the task competently. Training can often take place on the job.

Check your ladder before you use it

Before starting a task, you should always carry out a 'pre-use' check to spot any obvious visual defects to make sure the ladder is safe to use.

A pre-use check should be carried out:

- by the user;
- at the beginning of the working day;
- after something has changed, eg a ladder has been dropped or moved from a dirty area to a clean area (check the state or condition of the feet).

Check the stiles – make sure they are not bent or damaged, as the ladder could buckle or collapse.
Check the feet – if they are missing, worn or damaged the ladder could slip. Also check ladder feet when moving from soft/dirty ground (eg dug soil, loose sand/ stone, a dirty workshop) to a smooth, solid surface (eg paving slabs), to make sure the foot material and not the dirt (eg soil, chippings or embedded stones) is making contact with the ground.
Check the rungs – if they are bent, worn, missing or loose the ladder could fail.

Check any locking mechanisms – if they are bent or the fixings are worn or damaged the ladder could collapse. Ensure any locking bars are engaged.
Check the stepladder platform – if it is split or buckled the ladder could become unstable or collapse.
Check the steps or treads on stepladders – if they are contaminated they could be slippery; if the fixings are loose on steps, they could collapse.

If you spot any of the above defects, don't use the ladder and notify your employer.

Use your ladder safely

Once you have done your 'pre-use' check, there are simple precautions that can minimise the risk of a fall.

Leaning ladders

When using a leaning ladder to carry out a task:

- only carry light materials and tools – read the manufacturers' labels on the ladder and assess the risks;
- don't overreach – make sure your belt buckle (navel) stays within the stiles;
- make sure it is long enough or high enough for the task;
- don't overload it – consider workers' weight and the equipment or materials they are carrying before working at height. Check the pictogram or label on the ladder for information;
- make sure the ladder angle is at 75° – you should use the 1 in 4 rule (ie 1 unit out for every 4 units up) – see Figure 1;
- always grip the ladder and face the ladder rungs while climbing or descending – don't slide down the stiles;
- don't try to move or extend ladders while standing on the rungs;
- don't work off the top three rungs, and try to make sure the ladder extends at least 1 m (three rungs) above where you are working;
- don't stand ladders on moveable objects, such as pallets, bricks, lift trucks, tower scaffolds, excavator buckets, vans, or mobile elevating work platforms;
- avoid holding items when climbing (consider using a tool belt);
- don't work within 6 m horizontally of any overhead power line, unless it has been made dead or it is protected with insulation. Use a non-conductive ladder (eg fibreglass or timber) for any electrical work;
- maintain three points of contact when climbing (this means a hand and two feet) and wherever possible at the work position – see Figures 2 and 3;
- where you cannot maintain a handhold, other than for a brief period (eg to hold a nail while starting to knock it in, starting a screw etc), you will need to take other measures to prevent a fall or reduce the consequences if one happened;

- for a leaning ladder, you should secure it (eg by tying the ladder to prevent it from slipping either outwards or sideways) and have a strong upper resting point, ie do not rest a ladder against weak upper surfaces (eg glazing or plastic gutters – see Figure 4);
- you could also use an effective stability device.

✔ **Figure 1** Ladder showing the correct 1 in 4 angle (means of securing omitted for clarity)

✔ **Figure 2** Correct – user maintaining three points of contact (means of securing omitted for clarity)

✘ **Figure 3** Incorrect – overreaching and not maintaining three points of contact (means of securing omitted for clarity)

✔ **Figure 4** Correct – use of a stand-off device to ensure a strong resting point. Do not rest a ladder against weak upper surfaces such as glazing or plastic gutters. Follow the manufacturer's instructions

Stepladders

When using a stepladder to carry out a task:

- check all four stepladder feet are in contact with the ground and the steps are level;
- only carry light materials and tools;
- don't overreach;

- don’t stand and work on the top three steps (including a step forming the very top of the stepladder) unless there is a suitable handhold;
- ensure any locking devices are engaged;
- try to position the stepladder to face the work activity and not side on.

However, there are occasions when a risk assessment may show it is safer to work side on, eg in a retail stock room when you can’t engage the stepladder locks to work face on because of space restraints in narrow aisles, but you can fully lock it to work side on;

- try to avoid work that imposes a side loading, such as side-on drilling through solid materials (eg bricks or concrete);
- where side-on loadings cannot be avoided, you should prevent the steps from tipping over, eg by tying the steps. Otherwise, use a more suitable type of access equipment;
- maintain three points of contact at the working position. This means two feet and one hand, or when both hands need to be free for a brief period, two feet and the body supported by the stepladder (see Figure 5 and associated text).

When deciding if it is safe to carry out a particular task on a stepladder where you cannot maintain a handhold (eg to put a box on a shelf, hang wallpaper, install a smoke detector on a ceiling), this needs to be justified, taking into account:

- the height of the task;
- whether a handhold is still available to steady yourself before and after the task;
- whether it is light work;
- whether it avoids side loading;
- whether it avoids overreaching;
- whether the stepladder can be tied (eg when side-on working).

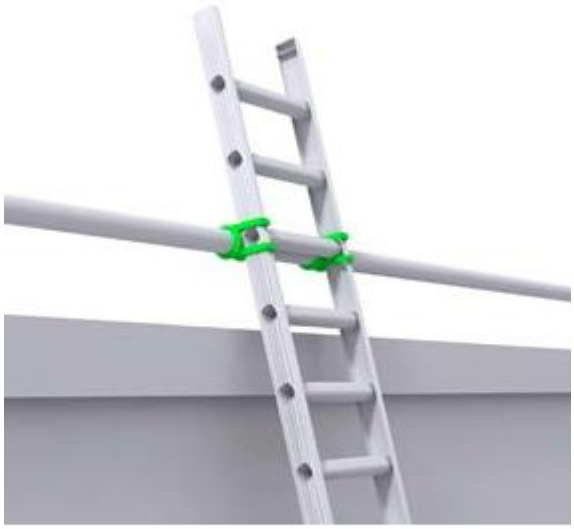
What about the place of work where the ladder will be used?

As a guide, only use a ladder:

- on firm ground;
- on level ground – refer to the manufacturer's pictograms on the side of the ladder. Use proprietary levelling devices, not ad-hoc packing such as bricks, blocks, timbers etc;
- on clean, solid surfaces (paving slabs, floors etc). These need to be clean (no oil, moss or leaf litter) and free of loose material (sand, packaging materials etc) so the feet can grip. Shiny floor surfaces can be slippery even without contamination;
- where they will not be struck by vehicles (protect the area using suitable barriers or cones);

Figure 5 Example where two hands need to be free for a brief period for light work. Keep two feet on the same step and the body (knees or chest) supported by the stepladder to maintain three points of contact. Make sure a safe handhold is available

- where they will not be pushed over by other hazards such as doors or windows, ie secure the doors (not fire exits) and windows where possible;
- where the general public are prevented from using it, walking underneath it or being at risk because they are too near (use barriers, cones or, as a last resort, a person standing guard at the base);
- where it has been secured.

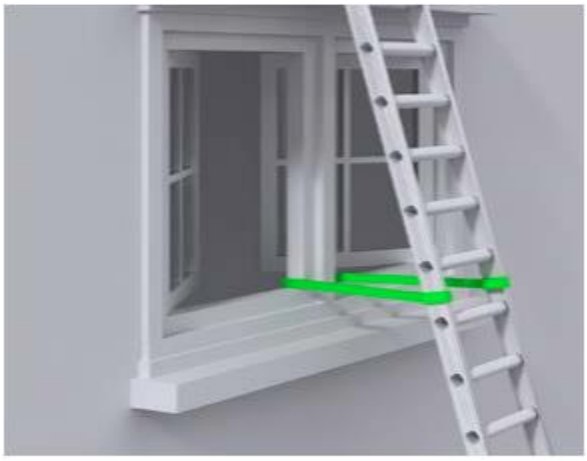


✔ **Figure 6** Correct – ladder tied at top stiles (correct for working on, but not for gaining access to a working platform/roof etc)

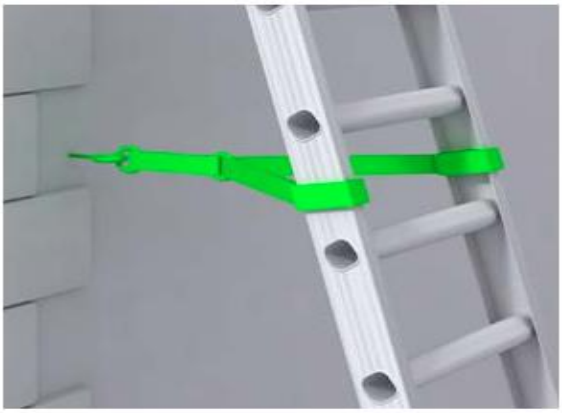
What are the options for securing ladders?

The options are as follows:

- tie the ladder to a suitable point, making sure both stiles are tied, see Figures 6, 7 and 8;
- where this is not practical, secure with an effective ladder stability device;
- if this is not possible, then securely wedge the ladder, eg wedge the stiles against a wall;
- if you can't achieve any of these options, foot the ladder. Footing is the last resort. Avoid it, where 'reasonably practicable', by using other access equipment.



✔ **Figure 7** Correct – tying part way down



✔ **Figure 8** Correct – tying near the base

✔ **Figure 9** Correct – access ladders should be tied and extend at least 1 m above the landing point to provide a secure handhold

What about ladders used for access?

In general:

- ladders used to access another level should be tied (see Figure 9) and extend at least 1 m above the landing point to provide a secure handhold. At ladder access points, a self-closing gate is recommended;
- stepladders should not be used to access another level, unless they have been specifically designed for this.

What about the condition of the equipment?

Employers need to make sure that any ladder or stepladder is both suitable for the work task and in a safe condition before use. As a guide, only use ladders or stepladders that:

- have no visible defects. They should have a pre-use check each working day;
- have an up-to-date record of the detailed visual inspections carried out regularly by a competent person. These should be done in accordance with the manufacturer's instructions. Ladders that are part of a scaffold system still have to be inspected every seven days as part of the scaffold inspection requirements;
- are suitable for the intended use, ie are strong and robust enough for the job. HSE recommends British Standard (BS) Class 1 'Industrial' or BS EN 131 ladders for use at work (see 'Further reading');
- have been maintained and stored in accordance with the manufacturer's instructions. A detailed visual inspection is similar to 'pre-use' checks', in that it is used to spot defects. It can be done in-house by a competent person (pre-use checks should be part of a user's training) and detailed visual inspections should be recorded. When doing an inspection, look for:
- twisted, bent or dented stiles;
- cracked, worn, bent or loose rungs;
- missing or damaged tie rods;
- cracked or damaged welded joints, loose rivets or damaged stays.

Make pre-use checks and inspect ladder stability devices and other accessories in accordance with the manufacturer's instructions.