Guidelines on Safe Operating Procedures

Work at Height Industry

Qualification

This guidance has been prepared by Apple Group Training to help Installers work safely at height when using ladders or fall arrest in the workplace.

Introduction

This document outlines the recommended equipment, training and system for safe work at height. The proposed fall protection system is compatible with the use of ladders. The system is applied to several commonly found situations and guidance is given on the basic principles of safe working at heights to help engineers with installations of a difficult or special character.

The requirement to work safely at height and to use fall protection in certain situations is applicable to all engineers, self - employed including sub - contractors.

Training for work at height

All employees, self - employed including sub - contractors who work at height must be trained on the safe use of ladders and associated ladder stabilisation devices and any associated fall protection devices. You must also be trained on the correct use of your fall protection PPE and associated fall arrest, including risk assessment and the provision of rescue.

The Hierarchy for Safe Work at Height

Prevent falls – By using the correct equipment for the job
Minimise the consequences of a fall – Take enough measures to prevent so far as is reasonably practicable falling a distance liable to cause injury.

Source: HSE

Written by Richard Appleyard in accordance with the HSE

The Health & Safety at Work Act 1974

Places a duty of care on employers to protect the health & safety of employees and others who they may not employ, this basic duty involves providing you with: -

1. A Safe Place to Work
2. A Safe System of Work
3. Safe Plant and Equipment
4. Training and Information
5. Instruction and Supervision

Duties of the Employer.

(1) It shall be the duty of every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all his employees, sub-contractors and others.

Duties of the Employee

It shall be the duty of every employee and others while at work—

To take reasonable care for the health and safety of themselves and of other persons who may be affected by your acts or omissions at work; and

The Work at Height Regulations 2005

What is 'work at height'?

A place is 'at height' if (unless these Regulations are followed) a person could be injured falling from it, even if it is at or below ground level.

Do the rules apply to you?

The Work at Height Regulations 2005 applies to all work at height where there is a risk of a fall liable to cause personal injury.

In practice, this means that you must assess all work to be carried out at height and decide on the appropriate precautions to be taken with due consideration to hierarchy control measures. The precautions necessary will depend on such things as the complexity of the work, weather conditions etc., however in all cases the selection of precautions to reduce the risk of falls must use the following hierarchy:

- Fall protection has priority over fall restraint.
- Fall restraint has priority over fall arrest.

Ladders may be used as a means of access and as a place of work, but only if it is reasonable to do so having regard to the nature of the work and its duration and only when the ladder is adequately stabilised and secured, regardless of the type of ladder, step ladder, combi ladders to be used i.e. single, double or triple section including your roof ladder.

You must always follow the advice as per training when using ladders, and where roof ladders are used, it is not acceptable to leave a roof ladder and walk on or work from a pitched roof without a fall protection system.

Failure to take appropriate precautions to control the risks involved with work at height is a contravention of health and safety law and may result in enforcement action being taken by the Health and Safety Executive or a local authority.

Provision and Use of Work Equipment Regulations 1998 PUWER

These regulations place duties on employers and suppliers to provide equipment for use at work which meets three basic criteria.

- It must be fit for use (it must work)
- It must be fit for its intended purpose (it must do what you want it to do)
- It must comply legally and meet all British and European Standards

The provision of instructions, information and training on the safe use of work equipment or the provision of competent supervision is a mandatory requirement under these regulations.

What does PUWER do?

In general terms, the regulations require that equipment provided for use at work is suitable for the intended use, it must be maintained in a safe condition and inspected daily.

The equipment may only be used only by people who have received information, instruction and training.

If you find any work equipment unsafe you MUST not use it.
Isolate it, tag it, report it, or destroy it.

Management of Health and Safety at Work Regulations 1999

These regulations place duties on employers and employees to carry out **Risk Assessments** on all work activities which will identify significant risks to people's health and safety.

- Hazards found during work activities which have the potential to cause harm need to be removed if possible or if this is not possible, they must be controlled in such a way to reduce the likelihood of harm to the lowest possible risk.
- Safe systems of work are formulated from these risk assessments usually in the form of method statements which detail a safe method of work, the hazards identified, the controlling provisions put in place to protect workers and any residual risks for which appropriate PPE will be issued and must be worn.
- Employers are duty bound to Manage Health and Safety in such a way as to prevent foreseeable accidents and injuries to their employees.
- Workers who are to carry out working operations covered by this method statement must follow the safe method of work if this cannot be done then stop working and inform your **supervisor**.

The Personal Protective Equipment at Work Regulations 1992

These regulations place a duty on employers to supply personal protective equipment to reduce the risk of personal injuries by using: -

1. PPE which must be suitable for the task
2. PPE which must also be maintained

What do the Regulations require?

The main requirement of the PPE at Work Regulations 1992 is that personal protective equipment is to be supplied and used at work wherever there are risks to health and safety that cannot be adequately controlled in other ways.
The Regulations also require that PPE:
_ is properly assessed before use to ensure it is suitable.
_ is maintained and stored properly.
_ is provided with instructions on how to use it safely; and
_ is used correctly by employees.

Assessing suitable PPE

To allow the right type of PPE to be chosen, carefully consider the different hazards in the workplace. This will enable you to assess which types of PPE are suitable to protect against the hazard and for the job to be done.

Consider the following when assessing whether PPE is suitable:
Is it appropriate for the risks involved and the conditions at the place where exposure to the risk may occur?
Eye protection do you have the correct safety glasses for drilling.
Does your height safety kit prevent or adequately control the risks involved without increasing the overall level of risk? Can your harness be adjusted to fit correctly?
If more than one item of PPE is being worn, make sure it is compatible?

Manual Handling Regulations 1992, as amended

You must comply with your risk assessments on work activities which may involve manually handling loads.

The risks of manually handling injuries must be reduced by: -

1. Following the advice as per training when lifting ladders or equipment.
2. Redesigning the workplace or equipment or redesigning the working process to reduce manual handling operations
3. Reducing the size, weight, shape or centre of gravity of loads

For more information on manual handling, you can download the INDG 143 on the HSE web site

Ladders

You should use extendable ladders to an appropriate industrial standard. **You must not use Domestic**

Ladder Standards

Please note that ladder standards changed in December 2018, It is accepted if you are using the old standard of ladder and they are in good condition this is fine.

New standard EN131 Professional and non- professional come into force December 31st, 2018

Ladder standards 2018

- Timetable
- The revised EN 131 standards are now published and manufacturers are in the process of changing over to new designs, which meet the requirements of the revised standard.
- Ladders certified to the withdrawn British Standards, BS 2037 and BS 1129 (often referred to as Class 1 and Class 3 ladders) will no longer be available after a transition period.

Ladders

Is It Strong Enough? – The Safe Working Load

An important aspect of ladder quality and strength is the Load Rating – this is the maximum static vertical load which a ladder can safely support without movement, the ratings of these standards are as follows: -

European Standard EN131 professional and non - professional
Maximum static vertical load 150kg

Is it the safest means of accessing the job?

Where work at height is necessary you need to justify whether a ladder or stepladder is the most suitable form of access equipment compared to other access equipment options. You do this by using risk assessment and the hierarchy of controls. Is using a ladder or step ladder a suitable activity, this refers to the type of work and its duration.

15-30 minutes is the maximum recommended time at which we should be standing at the work position, after which we should be getting off and having a walk around, either go back to your van to fetch equipment or have a short break.

Whenever we climb steps or ladders and even standing at the work position, we need to be able to maintain three points of contact, hands and feet at the working position, if this is not possible please follow instructions as per training.

Is it strong enough?
We should always be very wary of carrying heavy or awkward objects on a ladder, never carry loads heavier than 25kg – any over 10kg should be avoided if possible.

Tool belts: these are used to avoid having to carry tools by hand up or down a ladder, leaving both hands free, again to maintain three points of contact, re – ladder training level two and three. Do not overload

Ladders, Is it long enough?

Always try and make sure a ladder extends at least 1m or three rungs above where you will be working, the same rule applies if you are using the ladder for access onto a landing place to gain access to another level, but make sure it does not project so far that it could pivot around the landing point and always remember never stand on any of the top five rungs when working on your ladder.

Do not overreach, work within the stiles of your ladder as per training received,

On step ladders you should avoid work that imposes a side loading, such as side on drilling through solid brick or concrete, always use the steps facing the work activity. When side loading cannot be avoided always prevent the steps from tipping over by tying the steps to a suitable point, otherwise use a more suitable type of access equipment, and never use the top two steps of a stepladder unless it has a suitable handrail fitted

Can the ladder be secured?

We should all be aware of the 4 areas of potential failure.

Base Slip

This failure is the one that is most often imagined as the cause of a ladder system failure. A loss of grip occurs at the base points of a ladder and, because a ladder is at an angle to the vertical surface, the ladder base slides horizontally away from the vertical surface. In this fashion the ladder top slides down the vertical surface in an unrestricted fashion, taking the ladder user with it. This is normally associated with a low grip surface at the ladder base, which offers poor retention.

Top Slip

Top slip occurs when the top of the ladder moves sideways left or right against the vertical surface to the point where the ladder system becomes unstable and there is a complete lateral failure. This type of failure is immediate and results in the user falling to the side of the ladder system.

Flip

Flip failure is a less obvious failure mode system. It involves all the forces of the ladder system being directed through a single stile, such that a rotation occurs. This causes the ladder to flip around such that the side which was facing the vertical surface now faces away from it. This action destabilises the ladder system and would typically cause the ladder to fall to the side, although it may invoke either base slip or top slip as part of the failure process.

Loss of Top Contact or Back Flip

Loss of top contact failure involves the top of the ladder moving away from the vertical surface, primarily in the plane of the ladder, whilst not immediately unstable when this happens, the whole system is then entirely dependent upon the user to restore stability or topple. Unfortunately, the user may not always be able to take the appropriate action and so such failure may be unavoidable.

Conclusion

Taking these potential areas of failure into consideration, wherever & whenever possible we should tie a ladder to prevent it from slipping. This can either be at the top or bottom or both. Making sure that both stiles are always tied, please remember if only one stile is tied, we still have the potential to initiate a flip. Never ever tie a ladder by its rungs. If you can't tie a ladder use an effective ladder stability device that suppliers or manufacturers can confirm will be stable enough to use. Unsecured is really your worst-case scenario.

Always remember if ladders are tied or ladder stability devices are used, they are designed to provide an extra level of protection and not to enable you to do something that would otherwise be unsafe.

Is the building onto which the ladder is resting safe and strong enough?

For example, never rest the top of a ladder against fragile surfaces such as plastic guttering or glazing as this might give way and cause instability. Alternatively use effective spread bars or effective standoff brackets, a Microlite would be an excellent choice.

Is the environment safe?

Weather, movements of persons or vehicles) Could the ladder be knocked by a door or window, if so, may be another person needs to stand guard at a doorway or inform workers not to open windows until they are told to do so, maybe the ladder could be in danger of being struck by a passing vehicle, by which a suitable area of protection will need to be set up using collective measures of safety, in the same way a similar area needs to be set up when working in close proximity to the public, we all know how nosey the public can be, these area are set up for their benefit as well as yours. As per training it is not just about your health and safety, you must think of others.

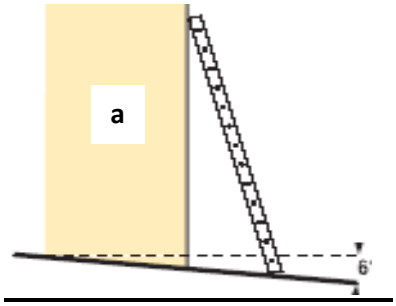
Power lines also prove to be another form of hazard and if we are working within 6mtr we need to be sure that the line has been temporarily disconnected or insulated otherwise do not use a ladder.

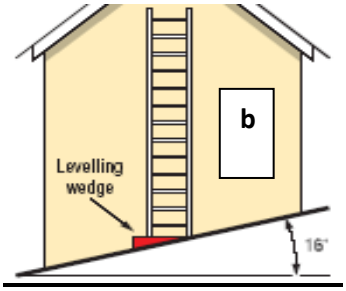
Do you have a safe handhold and are they close enough to the work?

As we have said before we need to be able to maintain three points of contact, hands and feet at the working position. Where you cannot maintain a hand hold other measures will be needed to prevent a fall or reduce the consequences of one, and once again never overreach.

ALWAYS PLACE THE BASE OF THE LADDER ON A FIRM, DRY AND LEVEL BASE

a. Place a board under the stiles to prevent the ladder sinking into soft ground.
b. Or use a proprietary device in accordance with the manufacturer's instructions.
c. Do not put a ladder on top of boxes, bricks or wedge up the stiles or place ladders on any unstable surface to gain extra height.
d. Leaning Ladders should always be set at an angle of 75° or at a ratio of 4:1.
e. For example, for every 4 units we go up vertically the ladder comes out 1 unit at the bottom. Rung spacing's are normally set at about 250mm, so 4 rung spacing equals about 1 metre. using this as a rough guide it is easy to set the correct angle.
f. The more the base of the ladder is moved out the greater the risk that it will slip outwards suddenly and fall without any warning.
g. Likewise, if the ladder is set at a steep angle it will be at risk of losing top contact and will fall backwards without any warning.
h. When working on soft ground, you can tie the ladder stiles at the base to stakes driven into the ground or use fixed blocks or sandbags to help guard against the base of the ladder slipping. You can use proprietary devices, but they must be used in accordance with the manufacturer's instructions.
i. A rope or strap tied from the stile, onto a fixed object, at about the height of the fifth rung from the bottom, will help to stop any further movement.
j. Fitted ring bolts secured into the building allows for securing at the bottom and top of the ladder if necessary
k. The diagrams below show the maximum angles that ladders can be used at when working on (a) a back slope and (b) a side slope.





Correct Usage of Steps & ladders

1. Always check your access equipment before using it.
2. Check that the equipment has its own identification number and that it has been inspected if it has not DO NOT USE IT.
3. Only one person at a time must stand on either a ladder or a step ladder.
4. Ladders must be set at the correct angle of 75 degrees.
5. Extension overlaps: On all double or triple extension ladders each section is overlapped one section with the other
   For a ladder up to 3 metres long 2 rungs must be overlapped.
   For a ladder up to 4 metres long 3 rungs must be overlapped.
   For a ladder over 4 metres long 4 rungs must be overlapped.
6. Where & when we can, access equipment must be securely fixed to prevent any potential failure.
7. When ascending or descending, operatives must always face the ladder always.
8. Never overreach on a ladder.
9. Do not use metal or metal reinforced ladders near live electrical cables.
10. Always work off a firm base.
11. Never climb on or above the fifth rung from the top when using ladders against a wall.
12. When accessing a pitched or flat roof structure never climb above the third rung.
13. If in doubt get advice.
14. The equipment must be used only for the purpose it was designed.
15. Remember SAFETY always.

Equipment Inspection

The Work at Height Regulations recommends that formal inspections are carried out every 6 months as a minimum standard.

Checking the fitness of a ladder or step ladder is paramount to the safety of the operative.

The inspection process combined with a positive pre-use checking procedure of equipment will assist in accident avoidance as far as equipment failure is concerned.

All ladders and step ladders should be inspected as a minimum standard by a competent person, i.e. someone who has been trained to look after and maintain this type of equipment.

Steps and Ladders

Check for the following: -

1. Bent distorted or worn rungs & treads.
2. No equipment should have any sharp edges.
3. Defective metal fittings.
4. Securing hooks and locks working properly.
5. Rubber base feet, head caps and friction cleat pads if fitted are not excessively worn.
6. Any Dents greater than 5mm may render the equipment unfit for use. (may be repairable)
7. On roof ladders the roof hook assembly must be secure with no signs of buckling.
8. All wheels secure and in working Order.
9. Stabiliser bars secure.
10. No twisting and distortion of stiles.
11. No oxidization and corrosion.
12. No movement in rungs or treads.
13. No broken or loose rivets.
14. No missing fittings including rung hooks or ladder guides.

Ladder Security and Eye Bolt Installation

- The rules for the safe use of ladders apply.
- The rules for the wearing of PPE apply.
- The rules for protecting yourself apply.
- The rules for protecting others apply.
- You must inspect the base material to ensure it is suitable for a mechanical expansion anchor or a screw eye.
- Never fit less than 600mm from edges/corners, into mortar joints, or wooden fascia's, or cladding.
- Never drill through the back of the brickwork 75mm max.
- Maintain a safe working position always and ensure you cannot drop anything onto people below.
- Test fixing by screwing eyebolt home fully and pushing and pulling on the bolt. No signs of movement should be seen.
- ON completion remove assembly and cap hole or seal.

Microlite, top ladder stabiliser

Check for the following: -

Secure fixing to top of the ladder as per the manufacturer's instructions
Spring holding device in good condition and functioning
No sign of buckling and twisting
No sign of corrosion and oxidization
Any rubber pads secure and in position

Ladder - mate, bottom ladder stabiliser

Check for the following: -

Secure the attachment to the ladder as per the manufacturer's instructions
The rubber feet if fitted must be secure and in good condition
Not deformed of distorted in any way
No corrosion or oxidization

Ladders EN131 Professional (stabilisation)

The new standard ladder has a stabilisation bar fitted to the bottom to help reduce the risk of any sideways movement.

Level (1) Work at height procedures when using a ladder or small universal ladder.

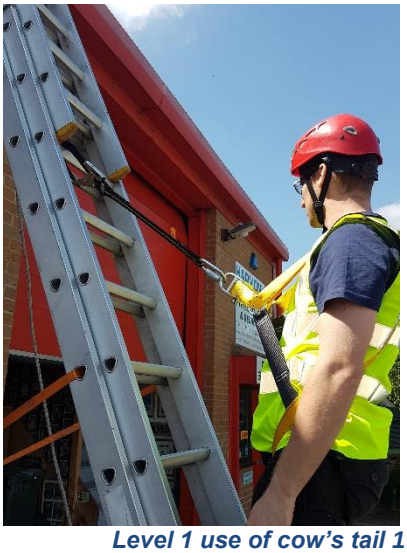
(1) Risk assessment, this must be completed by law, you must identify all potential hazards and the risks, followed by your safe working procedures to reduce the hazard to the lowest possible form of risk.

(2) Collective measures, cones, hazard tape, warning signs, second person may be required, but you must create a safe working zone to warn others that you are working at height.

(3) Make sure the ladders are stable using the appropriate stabilisation devices. Secure, top and bottom, tie the ladder into the wall, make sure the ladder is at the correct angle.

(4) Use of additional PFPE (personal fall protection equipment}, harness, hard hat with 2-point chin strap, and restraint lanyard with karabiner and scaffold hook, (cows' tail).

(5) If you can safely attach tools, drill, work equipment to yourself, and you do not exceed the maximum load on the leaning ladder, you can climb the ladder with both hands and feet maintaining 3 points of contact always. When you reach your workstation, attach your restraint lanyard to the ladder as high and tight as possible, this way if you fall, your fall factor should be zero.



Level 1 use of cow's tail 1

Cows tail attached to top rung of ladder

Level 1 safety kit. Cost £99.00 plus vat

1 x Harness (Ridgegear)

1 x restraint lanyard - cow tail

2 x 5 mtr ratchet strap

2 x purple webbing slings

1 x helmet with chin strap **FREE**

1 x microlite ladder standoff. **Additional £95.00 plus vat**

Delivery is generally around £10.00

Work at height procedures when using ladders as a place of work level 2

(1) Same procedure as level 1, Risk assessment and collective measures. Paragraph 1, 2 and 3.

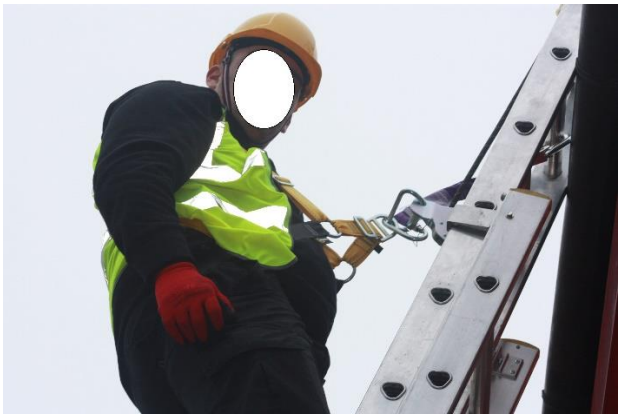
(2) The procedures for safe working at height when using ladders are the same as level one.

(3) The only difference is, that if you cannot maintain three points of contact when climbing the ladder, you must fasten a safety line, (rope, webbing sling to the top off the ladder, tie the rope to the bottom of the ladder attach a rope grab, to your front D ring of your harness, attach to the rope as per instruction received in training.

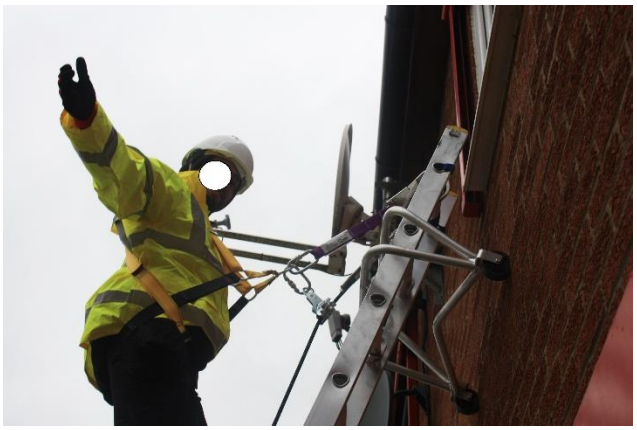
(4) Climb the ladder as this will allow one hand free to carry tools or equipment up the ladder, once you reach your work station push the rope grab as high and tight as possible, this will the put you in a fall restraint position, please note if you have a short lanyard with karabiner, scaffold hook, (cow and tail) then you may also attach this to the ladder thus allowing both hands free to complete your work safely.

(5) Please note this is a safe working procedure for working at height, you must check with your H/S representative that they are happy for you to follow this safe working procedure.

(6) You must not work at height if you do not fail safe or it is not safe to do so, you must stop work and contact those with the responsibility within your workplace.



Engineer attached to rope on ladder



Attached to ladder with rope, viper and restraint lanyard

Safety kit requirements Level 2 £169.00 plus vat

1 x Harness (Ridgegear)

1 x rope with karabiner

1 x restraint lanyard - cow tail

1 x rope grab with karabiner

1 x 1mtr ratchet strap

1 x karabiner to be used if you connect 2 x slings from ladder stiles as per training

2 x 5 mtr ratchet straps

2 x purple webbing slings for single or double use 1 x blue webbing sling

1 x helmet with chin strap **FREE**

2 x re-usable rubber eye bolt and 4 x screw eye. (**Delivery is generally around £10.00)**

1 x microlite ladder standoff. **Additional £95.00 plus vat**

Work at height procedures when using a ladder and roof ladder to gain access onto a pitched roof, level 3

(1) Follow the same procedure as level 1 and 2,

(2) Make sure the ladders are secure, top and bottom, tie the ladder into the wall. Make sure the ladder is at the correct angle 1 – 4 rule 75%

(3) Make sure you have completed and put your collective measures in place.

(4) The only difference is that now you are going to climb a leaning ladder using the same procedure as level two which allows you to have one hand free whilst climbing the ladder.

(5) Once you have reached the top off the leaning ladder, hook your cow and tail onto the ladder as high and tight as possible, place your roof ladders onto the roof, make sure your second rope is attached to the roof ladder.

(6) Pull down on your roof ladders to make sure they are secure as per training, attach your roof ladder to the leaning ladder or microlite using a ratchet strap, do not over tighten as this will twist the roof ladder. Once both ladders are secured to each other, you are ready to proceed.

(7) Disconnect your rope grab off the rope that is attached to the leaning ladder and fasten to the rope on the roof ladder, do not disconnect from the cow and tail that is fastened to yourself and the leaning ladder that is secured top and bottom to the wall.

(8) Once your rope grab is attached to yourself and the roof ladder step across onto the roof ladder, keeping hold off the roof ladder and the leaning ladder that must be projecting above the landing point at least 3 rungs. If you want, you can also clip your short restraint lanyard onto the rungs of the roof ladder as you proceed to your workstation.

(9) Remember you must maintain 3 points of contact always. If you must climb of your roof ladder to reach other parts of the roof, you must make sure roof ladders are secured on roof, you must use two separate anchor points, you must not exceed the fall difference from ridge to gutter line, you must keep a minimum of 2 metres from any open edge. **This procedure may only be completed with advance training.**

Safety kit requirements Level 3 £235.95 plus vat

1 x Harness (Ridgegear)

2 x ropes with karabiners

1 x restraint lanyard - cow tail

1 x rope grab with karabiner

2 x 1mtr ratchet straps

2 x 5 mtr ratchet straps

2 x blue webbing slings

2 x purple webbing slings

1 x karabiner to be used if you connect 2 x slings from ladder stiles as per training

1 x climbing helmet with 2 – point chin strap (White)

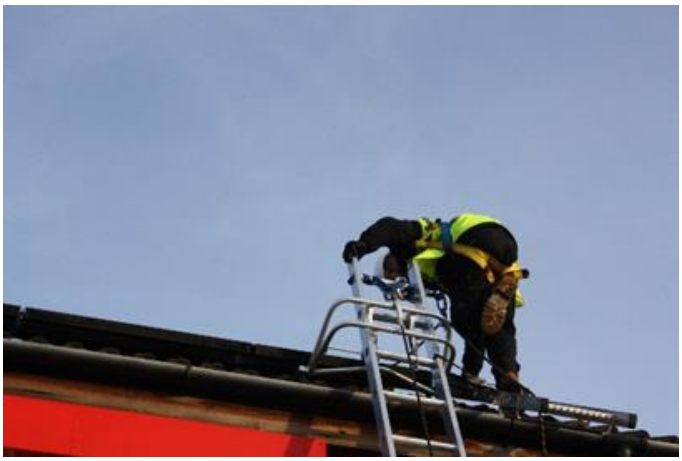
2 x Re-usable rubber eye bolt and 4 x screw eye.

1 x microlite ladder standoff, **additional £95.00 plus vat.** (**Delivery is generally around £10.00)**

Ladder training level 3 images

Lifting roof ladder 1

Placing roof ladder



Stepping across

Top of roof ladder

Carrying roof ladders up

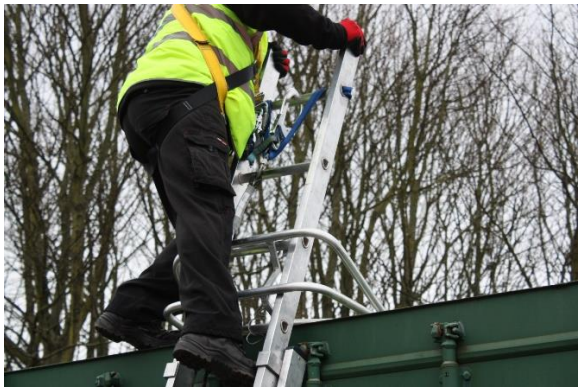
Microlite attached to ladder, notice 3 rung projection

Working at Height Procedures on a Flat Roof. When using a ladder for access

1. Check the environment, complete risk assessment.
2. Choose the correct ladder, fit top ladder standoff (microlite) 5th rung down from top, fit webbing sling through top of the ladder (stiles).
3. Connect rope to the webbing sling via karabiner.
4. Place ladder against structure, drill hole in wall and tie ladders to eye bolt using a ratchet strap.
5. Tie rope on the bottom rung central to the ladder, and climb the ladder using a rope grab which is connected to the rope.
6. When you reach the top of ladder, connect your cows' tail (short restraint lanyard) to the top rung. Disconnect rope grab, keep the grab fastened to the front anchor point of your harness, climb onto the flat roof and step behind your ladder. Do not stand against the open edge.
7. Then disconnect from ladder, walk across to the wall fit 20 ml anchor to wall, connect a karabiner, then connect your work positioning lanyard to karabiner.
8. Remember as per training adjust the slider on your work positioning lanyard to the required length,
9. Follow the same procedure in reverse when walking back to your ladder.
10. Do not allow any slack in line when standing near any open edge.
11. Remember do not put yourself in a position where you can fall and remember your rescue procedure.

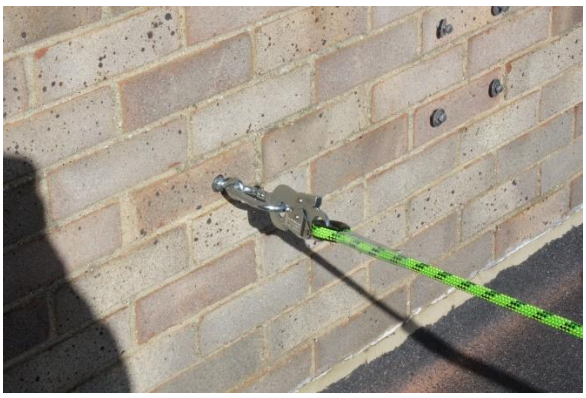
Flat roof Images

Engineer attached to ladder with cows' tail



Stepping of ladder onto a flat roof

Engineer stood behind ladder attached with restraint lanyard



Work positioning lanyard attached to anchor in wall

Images of work positioning lanyard secured to concrete anchor

Connected to work position lanyard

Anchored in a restraint position

Cost of this equipment £137.95

Work positioning lanyard

Re – usable concrete D ring anchor

Self-Rescue from a ladder

If you should fall of a ladder, you will be suspended in the air by your rope grab which is attached to the rope tied to the ladder as per training.

Remember: Make sure you get a good foot hold, raise your legs, compose yourself and pull yourself back onto the ladder as per training.

Engineer suspended after fall

Engineer attached to rope suspended after a fall

What to Do If You Fall

Fall victims can slow the onset of suspension trauma by: -

1. Moving their legs in the harness and trying to push against any footholds, windowsill, wall or ladder.
2. Pushing down with your legs as hard as you can.
3. Getting your legs as high as possible and your head as close to horizontal as possible.

Trauma Suspension
Many people naturally assume that once a fall has been arrested, the fall protection system has successfully completed its job.

A worker suspended in an upright position with your legs dangling in a harness of any type is subject to suspension trauma.

You could be unconscious in 5 minutes and unless you can self-rescue or be rescued be dead within 15 minutes.

Orthostatic Syndrome

Suspension trauma death is caused by what the medical profession term as orthostatic syndrome or syncope (in layman's terms a faint due to a slow reduction of blood supply to the brain).

Orthostatic Syndrome happens because the legs remain relaxed, straight and below heart level.

What Happens Initially

The legs are immobile with the worker suspended in an upright posture, so gravity then pulls blood into the lower legs, which have a very large storage capacity.

Enough blood eventually accumulates so that return blood flow to the right chamber of the heart is reduced.

The heart can old pump the blood available, so the hearts output begins to fall.

The heart speeds up to maintain enough blood flow to the brain, but if the blood supply is restricted enough, beating faster is ineffective, and the body abruptly slows the heart.

In most instances, this solves the problem by causing the worker to faint, which typically results in slumping to the ground where the legs, the heart and the brain are on the same level.

Signs & Symptoms

Faintness, Breathlessness, Sweating, Paleness, Hot Flushes, Increased Heart Rate, Nausea, Dizziness, Unusually Low Heart Rate, Unusually Low Blood Pressure, "Greying" or Loss of Vision.

Factors that Increase the Risk

Inability to move the legs, Pain, Injuries during a fall, Fatigue, Dehydration, Hypothermia, Shock, Cardiovascular Disease, Respiratory Disease, Blood Loss.

This post rescue death is apparently caused by the hearts inability to tolerate the abrupt increase in blood flow to the right side of the heart after removal from the harness.

Incident Flow Chart

Start of incident. Fall is arrested by the safety harness
Legs suspended blood flow impeded by leg straps and by gravity. Blood pools in the large leg muscles
Blood return to the heart recedes. Panic + Pain causes heart rate to increase and hormones are released
Pumping action of the heart is reduced due to the decreased blood return. More blood pools in the legs
Body reflex reduces the heart rate and blood pressure. Blood flow to the brain falls
Worker losses consciousness. Blood flow to the brain continues to fall. Brain damage occurs.
EVENTUAL DEATH

Universal ladders

These ladders come in different sizes and can be used in 3 different modes, step ladder, A frame ladder or as a general extension ladder.

If using the equipment as an extension ladder, then you must follow the same procedure as level 1 and 2.

Remember you must always work within the constraints of the ladder.

You must not over stretch or overreach.

You must follow the instructions as per training and the information that is on the side of the ladder.

Make sure the bars are locked

Read the label

This is not safe

Do not stand on the platform

If using steps or ladders in A frame mode external they must be on a level surface and tied to the structure.